ZCC·CT



2024-2025

CUTTING TOOLS

◎Turning Tools ◎Milling Tools ◎Holemaking Tools



ZHUZHOU CEMENTED CARBIDE
CUTTING TOOLS CO., LTD.

By using this catalogue, you can get the following information:

- Information on new products.
- Product information: Turning tools, milling tools, boring tools, standard product series of tool holding system, description, basic dimensions, recommended grade and cutting parameters, stock, etc.
- Technical instruction: Tool selection and application, selection of insert chipbreaker and grade, typical machining case, etc.
- General technical information.

To better understand and use this catalogue, please pay more attention to the "how to choose ***", "*** overview" sections in the front of each main catalogue introduction.

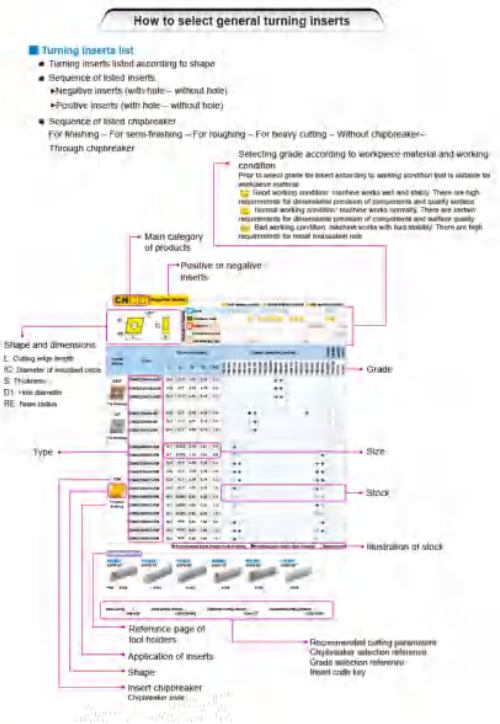
Symbol explanation

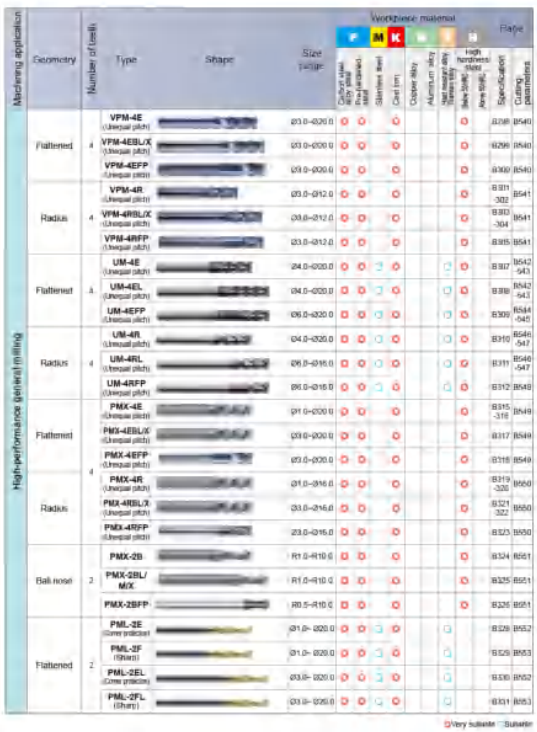
- Good working condition
- Normal working condition
- Bad working condition

★ Recommended grade (always stock available)
● Available grade (always stock available)
○ Make-to-order
▲ Stock available △ Make-to-order
◎ Very suitable ○ Suitable

Statement

- The product only provides the specifications information based on current productive conditions. We will continuously improve and innovate along with the development of technology.
- The product photos in the catalogue are for demonstration only. Due to different production technologies, product color (such as insert coating color, tool surface color) might be different from the colors shown in this catalogue. It would be advisable to refer to the real product.
- Please note that in the catalogue, the minimum ordering quantity of common inserts and ceramic insert is 10 pcs, and the minimum ordering quantity of CBN & PCD inserts is 2 pcs.
- The stock may change because new product or new grade is released.





Welcome to order product on our website

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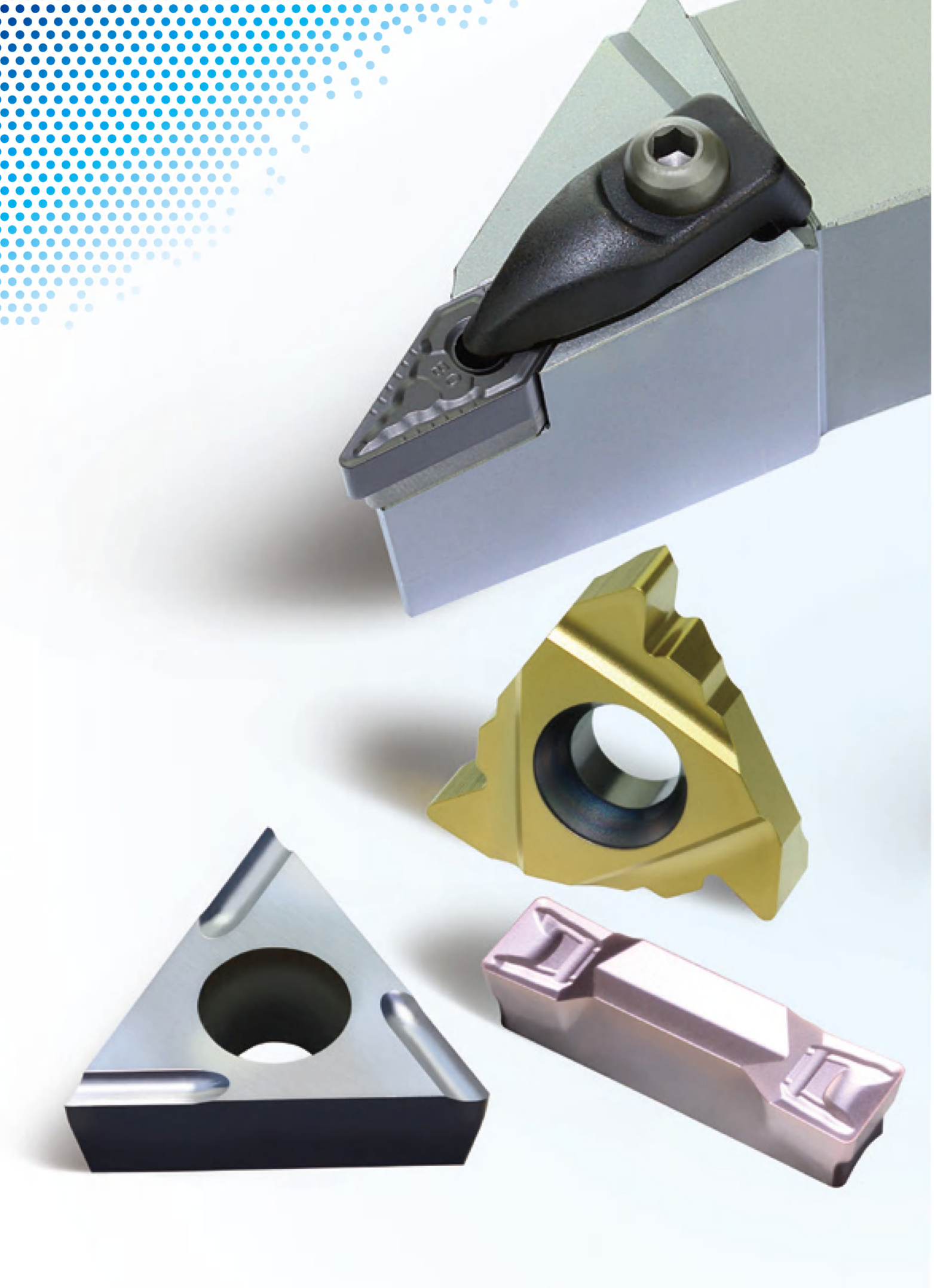



Turning Tools

General turning tools
Parting and grooving tools
Threading tools









Turning

A

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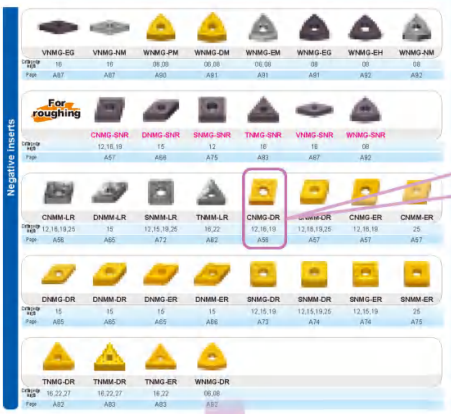
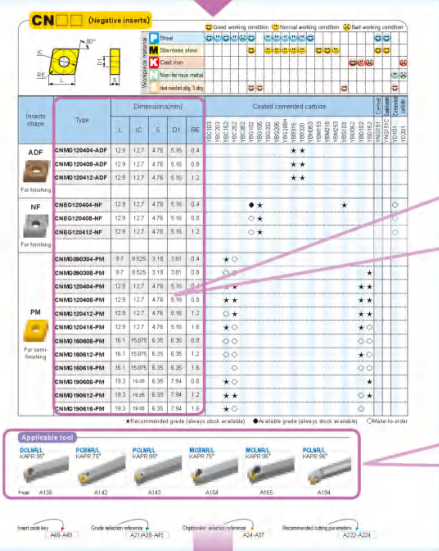
Guide to select general turning tools

Selection A



1 I want to order inserts

♦Shape, ♦Size, ♦Chipbreaker



Dimensions(mm)				
L	IC	S	D1	RE
12.9	12.7	4.76	5.16	0.4

2 Details of inserts

♦Shape, ♦Size,
♦Chipbreaker,
♦Grade, ♦Stock

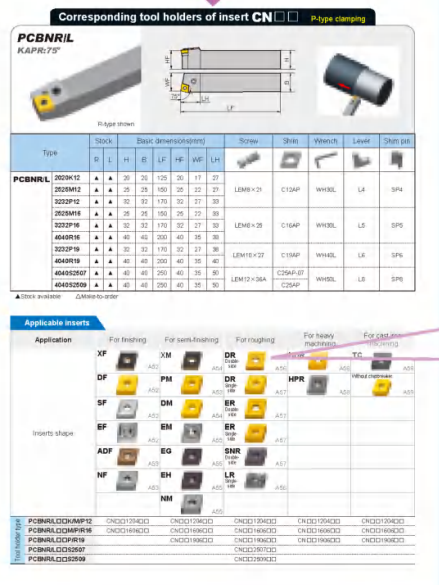
Applicable tool holders

♦Approach angle,
Page





4 Return to locate inserts



3 Selecting tool holder

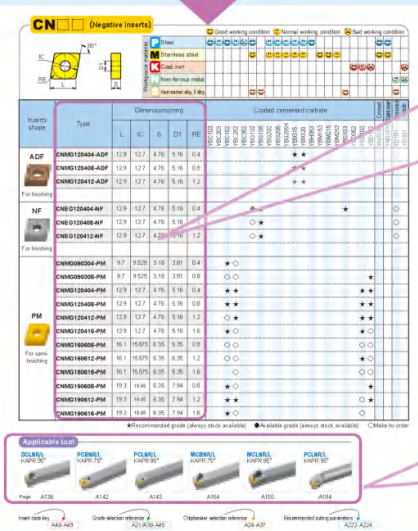
♦Tool holder type, Size
♦Stock
♦Operation gener
♦Applicable inserts

Guide to select general turning tools

Selection B







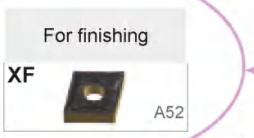




1 I want to order tool holders

♦Approach angle,

♦Clamping system



2 Details of tool holder

♦Tool holder type, Size

♦Operation genre

♦Applicable inserts



4 Return to locate tool holder

Dimensions(mm)				
L	IC	S	D1	RE
12.9	12.7	4.76	5.16	0.4

3 Details of insert

♦Shape, ♦Size,

♦Chipbreaker,

♦Grade, ♦Stock

Applicable tool holders

♦Approach angle,

♦Page



Guide to select parting and grooving tools

Parting and grooving tools



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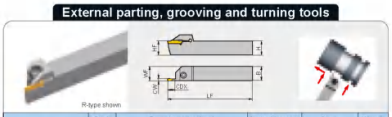
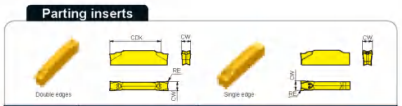
External parting, grooving and turning tools



Type		Stock R	Stock L	Basic dimensions(mm) H×B	HF	LF	WF	CW	CDX max	Applicable inserts	Screw	Wrench
QEAD	1212R/L07	▲	▲	12×12	12	125	12.15	1.5	7	ZQA0015□□	GB70-85-M4×12	WH3BL
	1212R/L12	▲	▲	12×12	12	125	12.15	1.5	12	ZQA0015□□		
	1616R/L07	▲	▲	16×16	16	125	16.15	1.5	7	ZQA0015□□	GB70-85-M5×16	WH4BL
	1616R/L12	▲	▲	16×16	16	125	16.15	1.5	12	ZQA0015□□		
	2020R/L07	▲	▲	20×20	20	125	20.15	1.5	7	ZQA0015□□		
	2020R/L12	▲	▲	20×20	20	125	20.15	1.5	12	ZQA0015□□		
QESD	1212R/L07	▲	▲	12×12	12	125	12.2	2	7	ZQBD02□□	GB70-85-M4×12	WH3BL
	1212R/L10	▲	▲	12×12	12	125	12.2	2	10	ZQBD02□□		
	1212R/L14	▲	▲	12×12	12	125	12.2	2	14	ZQBD02□□		
	1616R/L07	▲	▲	16×16	16	125	16.2	2	7	ZQBD02□□	GB70-85-M5×16	WH4BL
	1616R/L10	▲	▲	16×16	16	125	16.2	2	10	ZQBD02□□		
	1616R/L14	▲	▲	16×16	16	125	16.2	2	14	ZQBD02□□		
	2020R/L07	▲	▲	20×20	20	125	20.2	2	7	ZQBD02□□		
	2020R/L10	▲	▲	20×20	20	125	20.2	2	10	ZQBD02□□		
	2020R/L14	▲	▲	20×20	20	125	20.2	2	14	ZQBD02□□		
	2525R/L07	▲	▲	25×25	25	150	25.2	2	7	ZQBD02□□	GB70-85-M6×20	WH5DL
	2525R/L10	▲	▲	25×25	25	150	25.2	2	10	ZQBD02□□		
	2525R/L14	▲	▲	25×25	25	150	25.2	2	14	ZQBD02□□		
QEED	1616R/L10	▲	▲	16×16	16	125	16.25	2.5	10	ZQE0025□□	GB70-85-M5×20	WH4DL
	1616R/L17	▲	▲	16×16	16	125	16.25	2.5	17	ZQE0025□□		
	2020R/L10	▲	▲	20×20	20	125	20.25	2.5	10	ZQE0025□□	GB70-85-M6×20	WH5DL
	2020R/L17	▲	▲	20×20	20	125	20.25	2.5	17	ZQE0025□□		
	2525R/L10	▲	▲	25×25	25	150	25.25	2.5	10	ZQE0025□□		
	2525R/L17	▲	▲	25×25	25	150	25.25	2.5	17	ZQE0025□□		
QEFD	1616R/L10	▲	▲	16×16	16	125	16.3	3	10	ZQFD03□□	GB70-85-M5×20	WH4DL
	1616R/L17	▲	▲	16×16	16	125	16.3	3	17	ZQFD03□□		
	2020R/L10	▲	▲	20×20	20	125	20.3	3	10	ZQFD03□□	GB70-85-M6×20	WH5DL
	2020R/L17	▲	▲	20×20	20	125	20.3	3	17	ZQFD03□□		
	2525R/L10	▲	▲	25×25	25	150	25.3	3	10	ZQFD03□□		
	2525R/L17	▲	▲	25×25	25	150	25.3	3	17	ZQFD03□□		
QEGD	2020R/L13	▲	▲	20×20	20	140	20.6	4	13	ZQG04□□	GB70-85-M6×20	WH5DL
	2020R/L22	▲	▲	20×20	20	140	20.6	4	22	ZQG04□□		
	2525R/L13	▲	▲	25×25	25	165	25.6	4	13	ZQG04□□		

▲Stock available △Make-to-order

Parting inserts



Type		Basic dimensions(mm) CW±0.1	REmax	Cutting depth CDXmax	Grade CVD Coating YBC151	CVD Coating YBC251	PVD Coating YBG202	PVD Coating YBG302	Cemented carbide YD101
Double edges	ZPAD01502-MG	1.5	0.2	12		○	★	○	
	ZPBD0202-MG	2.0	0.2	14		○	★	○	
	ZPED02502-MG	2.5	0.2	17		○	★	★	
	ZPFD0302-MG	3.0	0.2	17		○	★	○	
	ZPGD0402-MG	4.0	0.2	22		○	★	○	
	ZPHD0503-MG	5.0	0.3	22		○	★	○	
	ZPKD0604-MG	6.0	0.4	22		○	★	○	
Single edge	ZPES02502-MG	2.5	0.2			○	★	★	
	ZPFS0302-MG	3.0	0.2			○	★	○	
	ZPGS0402-MG	4.0	0.2			○	★	○	
	ZPHS0503-MG	5.0	0.3			○	★	○	
	ZPKS0604-MG	6.0	0.4			○	★	○	

Single edge tool for cutter plate only

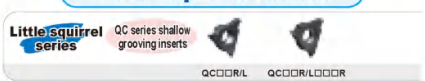
★Recommended grade (always stock available) ●Available grade (always stock available) OMake-to-order

1 Selection of tool holder type

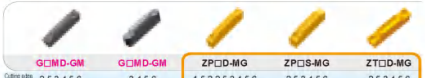
2 Tool holder type, Size and applicable inserts

3 Insert type, Chip-breaker, Size and grade

Little squirrel series

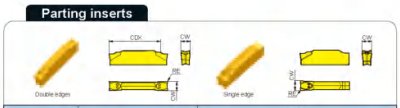


	QC□□R/L	QC□□R/L□□□R
Cutting edge width	1.1~4.8	1.0~4.0
Page	A251-252	A252



	G□MD-GM	G□MD-GM	ZP□D-MG	ZP□S-MG	ZT□D-MG
Cutting edge width	2.5,3,4,5,6	3,4,5,6	1.5,2,2.5,3,4,5,6	2.5,3,4,5,6	2.5,3,4,5,6
Page	A248	A249	A241	A241	A242

Parting inserts



Type		Basic dimensions(mm) CW±0.1	REmax	Cutting depth CDXmax	Grade CVD Coating YBC151	CVD Coating YBC251	PVD Coating YBG202	PVD Coating YBG302	Cemented carbide YD101
Double edges	ZPAD01502-MG	1.5	0.2	12		○	★	○	
	ZPBD0202-MG	2.0	0.2	14		○	★	○	
	ZPED02502-MG	2.5	0.2	17		○	★	★	
	ZPFD0302-MG	3.0	0.2	17		○	★	○	
	ZPGD0402-MG	4.0	0.2	22		○	★	○	
	ZPHD0503-MG	5.0	0.3	22		○	★	○	
	ZPKD0604-MG	6.0	0.4	22		○	★	○	
Single edge	ZPES02502-MG	2.5	0.2			○	★	★	
	ZPFS0302-MG	3.0	0.2			○	★	○	
	ZPGS0402-MG	4.0	0.2			○	★	○	
	ZPHS0503-MG	5.0	0.3			○	★	○	
	ZPKS0604-MG	6.0	0.4			○	★	○	

Single edge tool for cutter plate only

★Recommended grade (always stock available) ●Available grade (always stock available) OMake-to-order

1 Selecting insert type

2 Insert type, Chip-breaker, Size and grade

Guide to select threading tools

Threading tools



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1 Selection of tool holder type

External threading tools



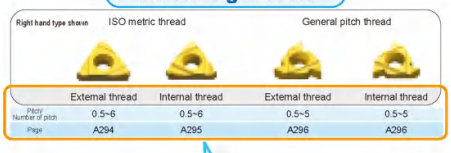
2 Tool holder type, Size and applicable inserts

ISO metric thread (with end)



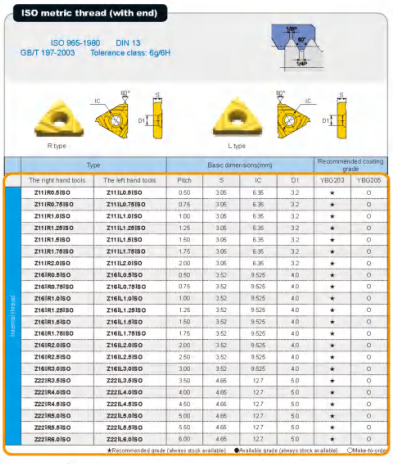
3 Insert type, Chip-breaker, Size and grade

Threading inserts



1 Selecting insert category

ISO metric thread (with end)



2 Insert type, Chip-breaker, Size and grade

Cemented carbide and cermet inserts

Negative inserts

For finishing

	CNMG-XF	DNMG-XF	SNMG-XF	TNMG-XF	VNMG-XF	WNMG-XF
Cutting edge length	12	11,15	12	16	16	06,08
Page	A52	A60	A68	A78	A85	A88

	DNEG-NGF	VNEG-NGF	CNMG-DF	CNMG-SF	CNMG-EF	CNMG-ADF	CNEG-NF	DNMG-DF
Cutting edge length	15	16	09,12	09,12	09,12	12	12	11,15
Page	A62	A86	A52	A52	A52	A53	A53	A60

	DNMG-SF	DNMG-EF	DNMG-ADF	DNEG-NF	SNMG-DF	SNMG-EF	SNMG-ADF	SNMG-SF
Cutting edge length	11,15	11,15	11,15	15	09,12	09,12,15	12	09,12,15
Page	A60	A61	A61	A61	A68	A68	A69	A69

	TNMG-DF	TNMG-SF	TNMG-EF	TNMG-ES	TNMG-ADF	VNMG-DF	VNMG-EF	VNMG-ADF
Cutting edge length	16,22	11,16,22	11,16,22	16	16	16	16	16
Page	A78	A78	A79	A79	A79	A85	A85	A85

	VNEG-NF	VNMG-SF	WNMG-DF	WNMG-SF	WNMG-EF	WNMG-ES	WNMG-ADF	WNEG-NF
Cutting edge length	16	16	06,08	06,08	06,08	08	06,08	08
Page	A85	A86	A88	A88	A89	A89	A89	A89

For semi-finishing

	CNMG-XM	DNMG-XM	SNMG-XM	TNMG-XM	VNMG-XM	WNMG-XM
Cutting edge length	12,16,19	11,15	12,15,19	16,22	16	06,08
Page	A54	A63	A70	A80	A86	A90

	CNMG-PM	CNMG-DM	CNMG-EM	CNMG-EG	CNMG-EH	CNMG-NM	DNMG-PM	DNMG-DM
Cutting edge length	09,12,16,19	09,12,16,19	12,16	12	12	12	11,15	11,15
Page	A53	A54	A55	A55	A55	A55	A62	A63

Negative inserts

								
	DNMG-EM	**DNMG-EG**	**DNMG-NM**	**SNMG-PM**	**SNMG-DM**	**SNMG-EM**	**SNMG-EG**	**SNMG-NM**
Cutting edge length	11,15	11,15	15	09,12,15,19	09,12,15,19	12,15	12	12
Page	A64	A64	A64	A70	A71	A71	A72	A72

								
	TNMG-PM	**TNMG-DM**	**TNMG-EM**	**TNMG-EG**	**TNMG-EH**	**VNMG-PM**	**VNMG-DM**	**VNMG-EM**
Cutting edge length	11,16,22	11,16,22	16,22	16	16	16	16	16
Page	A80	A81	A81	A81	A82	A86	A86	A87

								
	VNMG-EG	**VNMG-NM**	**WNMG-PM**	**WNMG-DM**	**WNMG-EM**	**WNMG-EG**	**WNMG-EH**	**WNMG-NM**
Cutting edge length	16	16	06,08	06,08	06,08	08	08	08
Page	A87	A87	A90	A91	A91	A91	A92	A92

For roughing							
	CNMG-SNR	**DNMG-SNR**	**SNMG-SNR**	**TNMG-SNR**	**VNMG-SNR**	**WNMG-SNR**	
Cutting edge length	12,16,19	15	12	16	16	08	
Page	A57	A66	A75	A83	A87	A92	

								
	CNMM-LR	**DNMM-LR**	**SNMM-LR**	**TNMM-LR**	**CNMG-DR**	**CNMM-DR**	**CNMG-ER**	**CNMM-ER**
Cutting edge length	12,16,19,25	15	12,15,19,25	16,22	12,16,19	12,16,19,25	12,16,19	25
Page	A56	A65	A72	A82	A56	A57	A57	A57

								
	DNMG-DR	**DNMM-DR**	**DNMG-ER**	**DNMM-ER**	**SNMG-DR**	**SNMM-DR**	**SNMG-ER**	**SNMM-ER**
Cutting edge length	15	15	15	15	12,15,19	12,15,19,25	12,15,19	25
Page	A65	A65	A65	A66	A73	A74	A74	A75

	TNMG-DR	**TNMM-DR**	**TNMG-ER**	**WNMG-DR**
Cutting edge length	16,22,27	16,22,27	16,22	06,08
Page	A82	A83	A83	A92

Negative inserts

For heavy machining








	CNMM-HPR	SNMM-HPR	CNMM-HDR	DNMM-HDR	SNMM-HDR	TNMM-HDR
Cutting edge length	19,25	19,25	12,16,19	15	12,15,19,25	16,22,27
Page	A58	A76	A58	A66	A75	A84




	LNUX-RF	LNUX-RH
Cutting edge length	19,30	19,30
Page	A94	A94

All round









	CNMG-TC	CNMG	DNMG-TC	SNMG-TC	SNMG	TNMG-TC	VNMG-TC
Cutting edge length	04,08,12,16	12,16,19	15	12	12,15,19,25	16,22	16
Page	A58	A59	A66	A76	A76	A84	A87



Without chipbreaker







	WNMG-TC	CNMA	DNMA	SNMA	TNMA	WNMA
Cutting edge length	08	12,16,19	11,15	09,12,15,19	16,22,27	06,08
Page	A93	A59	A67	A77	A84	A93

Positive inserts

For extra finishing









	CCGT-SF	DCGT-SF	TCGT-SF	VCGT-SF	VBGT-SF	CPGT-SF	DPGT-SF
Cutting edge length	06,09	07,11	06,09,11	11	11	06,09	07,11
Page	A95	A100	A109	A114	A117	A120	A120





	TBGH-L	TPGH-L	TPGT-SF
Cutting edge length	06	09,11	09,11
Page	A121	A121	A122

For finishing





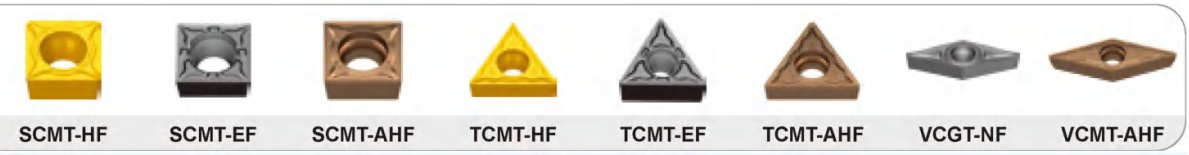



	CCMT-XF	DCMT-XF	SCMT-XF	TCMT-XF	VBMT-XF	VCMT-XF
Cutting edge length	06,09	07,11	09	09,11,16	11,16	11,16
Page	A95	A100	A106	A109	A117	A114

Positive inserts



	VCGT-NGF	VBET-NGF	CCMT-HF	CCMT-EF	CCMT-AHF	DCMT-HF	DCMT-EF	DCMT-AHF
Cutting edge length	16	16	06,09,12	06,09,12	06,09,12	07,11	07,11	07,11
Page	A114	A118	A95	A96	A96	A100	A101	A101



	SCMT-HF	SCMT-EF	SCMT-AHF	TCMT-HF	TCMT-EF	TCMT-AHF	VCGT-NF	VCMT-AHF
Cutting edge length	09	09	09	06,09,11,16	09,11,16	11,16	16	16
Page	A106	A106	A106	A109	A109	A111	A114	A114



	VBMT-AHF	VBMT-HF	VBMT-EF	VBET-NF
Cutting edge length	16	11	11,16	16
Page	A118	A117	A117	A118

For semi-finishing



	CCMT-XM	DCMT-XM	SCMT-XM	TCMT-XM	VBMT-XM	VCMT-XM
Cutting edge length	09,12	07,11	09,12	16	16	16
Page	A96	A101	A107	A111	A118	A115



	CCMT-HM	CCMT-EM	CCMT-EG	DCMT-HM	DCMT-EM	SCMT-HM	SCMT-EM	TCMT-HM
Cutting edge length	06,09,12	06,09,12	06,09	07,11	07, 11	09,12	09,12	09,11,16
Page	A97	A97	A97	A102	A102	A107	A107	A112



	TCMT-EM	TCMT-EG	VBMT-HM	VBMT-EM
Cutting edge length	09,11,16	11	16	11
Page	A111	A111	A119	A118

For roughing



	VBMT-SNR	CCMT-HR	DCMT-HR	SCMT-HR	TCMT-HR	VBMT-HR
Cutting edge length	16	06,09,12	11	09,12	09,11,16,22	16
Page	A119	A98	A102	A108	A112	A119

Positive inserts

For Al machining







	CCGX-LC	DCGX-LC	SCGX-LC	TCGX-LC	VCGX-LC
Cutting edge length	06,09,12	07,11	09,12	09,11,16	11,16,22
Page	A99	A103	A108	A113	A116








	CCGX-LH	DCGX-LH	RCGX-LH	SCGX-LH	TCGX-LH	VCGX-LH
Cutting edge length	06,09,12	07,11	08	09,12	09,11,16	11,16,22
Page	A99	A103	A104	A108	A113	A116

All round





	CCMT-TC	RCM(G)T	RCMX
Cutting edge length	06,09,12	08,10,12,16	08,10,12,16,20,25,32
Page	A98	A104	A105

Parting and grooving inserts

Little squirrel series — QC series shallow grooving inserts




	QC□□R/L	QC□□R/L□□□R
Cutting edge width	1.1~4.8	1.0~4.0
Page	A251-252	A252









	G□MD-GM	G□MD-GM	ZP□D-MG	ZP□S-MG	ZT□D-MG	ZT□D-MM	ZT□S-MG
Cutting edge width	2.5,3,4,5,6	3,4,5,6	1.5,2,2.5,3,4,5,6	2.5,3,4,5,6	2.5,3,4,5,6	1.5,2,2.5,3,4,5,6,8	5,6
Page	A248	A249	A241	A241	A242	A242	A242









	ZT□D-EG	ZT□D-EG	ZIMF-NM	ZIMF-SM	ZR□D-MG	ZR□D-NM	ZR□D-EG
Cutting edge width	1-2.4(tailor-made)	2.4-6.5(tailor-made)	3,4,5,6	3,4,5,6	2.5,3,4,5,6	3,4,5,6	3,4,5,6
Page	A243	A243	A244	A244	A245	A245	A245






	ZIGQ-NM	ZIGQ-NF	ZR□D-LH	ZILD-LC
Cutting edge width	3,4,5,6	3,4,5,6	6,8	8
Page	A246	A246	A247	A247

Supplemental series



	ZQMX-1E
Cutting edge width	3.125,4.125,5.125,6.4,7.05
Page	A253

Threading inserts

Right hand type shown	ISO metric thread		General pitch thread		Whitworth thread	
						
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	0.5~6	0.5~6	0.5~5	0.5~5	8~19	8~19
Page	A294	A295	A296	A296	A297	A297

Right hand type shown	Unified thread		British taper pipe thread		American taper pipe thread	
						
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	8~24	8~24	11~28	11~28	8~27	8~27
Page	A298	A298	A299	A299	A300	A300

Right hand type shown	ISO metric thread		General pitch thread		Whitworth thread	
Threading inserts with PP chipbreaker						
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	1.0~3.0	1.0~3.0	0.5~5.0(5~48)	0.5~5.0(5~48)	11~19	11~19
Page	A301	A301	A302	A302	A303	A303

Right hand type shown	Unified thread		British taper pipe thread		American taper pipe thread	
						
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	12~16	12~16	11~19	11~19	11~19	11.5~18
Page	A304	A304	A305	A305	A306	A306

Right hand type shown	ISO metric thread		General pitch thread		Whitworth thread	
Thick threading insert						
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	0.5~6	0.5~6	0.5~5	0.5~5	8~16	8~16
Page	A311	A312	A313	A313	A314	A314

Right hand type shown	Unified thread		British taper pipe thread		American taper pipe thread	
						
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	8~24	8~24	11~28	11~28	8~27	8~27
Page	A315	A315	A316	A316	A317	A317

Tool holders for external turning

D-type clamping system

DCLNR/L	DDJNR/L	DSBNR/L	DTGNR/L	DVVNN	DVJNR/L	DWLNR/L
						
Approach angle 95°	93°	75°	91°	72°30'	93°	95°
Page A136	A137	A138	A139	A140	A140	A141

P-type clamping system

PCBNR/L	PCLNR/L	PDJNR/L	PDPNN	PSBNR/L	PSDNN	PSKNR/L
						
Approach angle 75°	95°	93°	62°30'	75°	45°	75°
Page A142	A143	A144	A145	A146	A147	A148

PSSNR/L	PTFNR/L	PTTNR/L	PTGNR/L	PWLNR/L
				
Approach angle 45°	91°	60°	90°	95°
Page A149	A150	A151	A152	A153

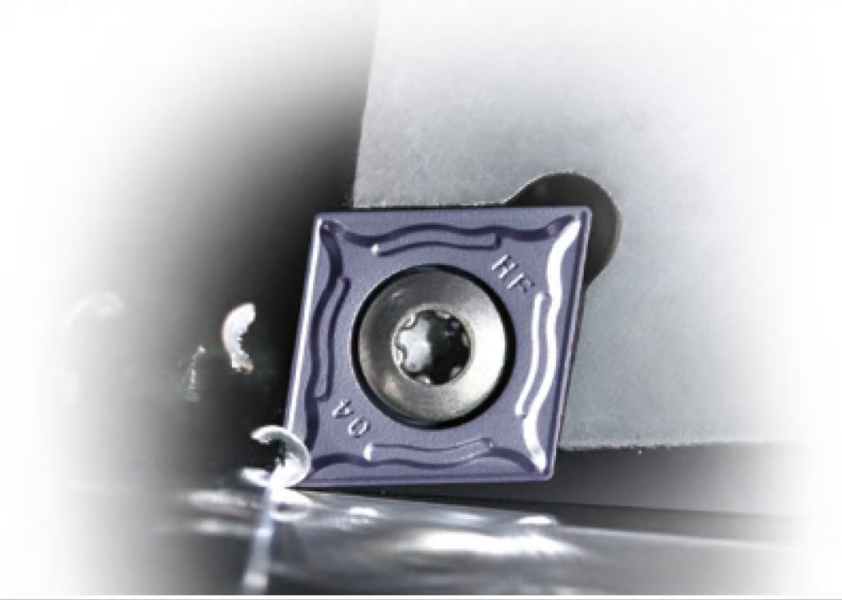
M-type clamping system

MCBNR/L	MCLNR/L	MDJNR/L	MDPNN	MSBNR/L	MSRNR/L	MSKNR/L
						
Approach angle 75°	95°	93°	62°30'	75°	45°	75°
Page A154	A155	A156	A157	A158	A159	A160

MSDNN	MTGNR/L	MTJNR/L	MTJNR/L-Z	MTFNR/L	MVVNN	MVJNR/L
						
Approach angle 45°	90°	93°	93°	91°	72°30'	93°
Page A161	A162	A163	A164	A165	A166	A167

MWLNR/L

Approach angle 95°
Page A168



S-type clamping system

SCACR/L	SCLCR/L	SDACR/L	SDJCR/L	SDNCN	SVJBR/L	SVABR/L
						
Approach angle 90°	95°	90°	93°	62°30'	93°	90°
Page A169	A170	A171	A172	A173	A174	A175

SVVBN	SVVCN	SVJCR/L	SSBCR/L	SSDCN	SSKCR/L	SSSCR/L
						
Approach angle 72°30'	72°30'	93°	75°	45°	75°	45°
Page A176	A177	A178	A179	A180	A181	A182

STACR/L	STFCR/L	STGCR/L	SRDCN	SRGCR/L
				
Approach angle 90°	91°	91°		
Page A183	A184	A185	A186	A187

Turning tool holders for internal machining

P-type clamping system

PCLNR/L	PDPNR/L	PDUNR/L	PSKNR/L	PTFNR/L	PWLNR/L
					
Approach angle 95°	62°30'	93°	75°	90°	95°
Page A194	A195	A196	A197	A198	A199

S-type clamping system

SCLCR/L	SDQCR/L	SDUCR/L	SDZCR/L	SSKCR/L	STFCR/L	SVQCR/L
						
Approach angle 95°	107°30'	93°	93°	75°	91°	107°30'
Page A200	A201	A202	A203	A204	A205	A206

SVUCR/L	SVQBR/L	SVUBR/L	SCLPR/L	SDQPR/L	SDUPR/L	STUPR/L
						
Approach angle 93°	107°30'	93°	95°	107°30'	93°	93°
Page A207	A208	A209	A210	A211	A212	A213

SCFCR/L	SCLCR/L
	
Approach angle 90°	95°
Page A214	A215

Damping tool holders

SCLPR/L	SDQPR/L	SDUPR/L	STUPR/L	SVQCR/L	SVUCR/L
					
Approach angle 95°	107°30'	93°	93°	107°30'	93°
Page A217	A218	A219	A220	A221	A221

Parting and grooving tools

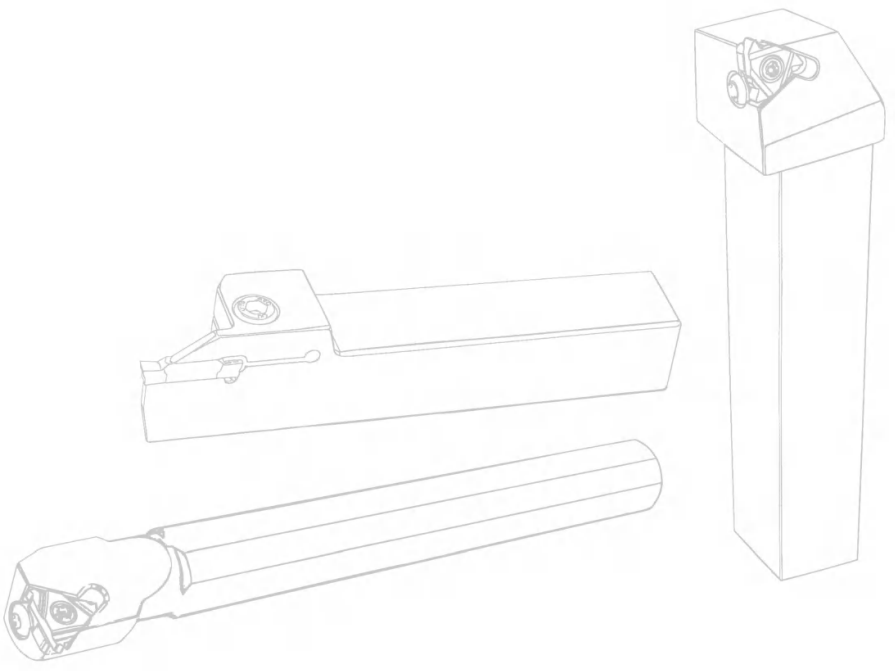
QE□□R/L	QECDR/L	QX□DR/L	QE□SR/L	QE□S□□N	QZS□	QF□□R/L
						
Page A256-257	A257	A258	A258	A259	A259	A260-261

QF□□RR/LL	QF□DR/L	C□□□-Q□DR/L	C40X-Q□DR/L	GED□□R/L	GFD□□RR/LL	GFD□□R/L
						
Page A262-265	A266-267	A268	A268	A269-271	A272-275	A276-277

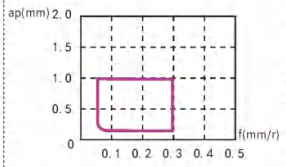
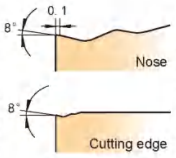
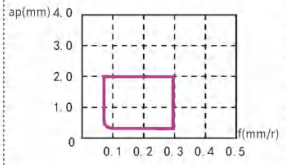
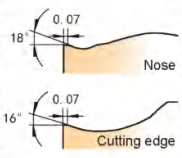
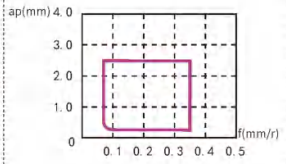
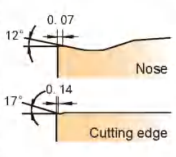
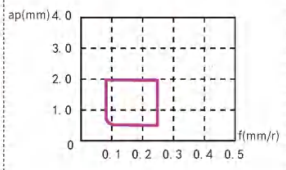
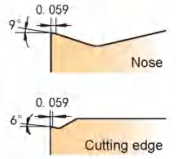
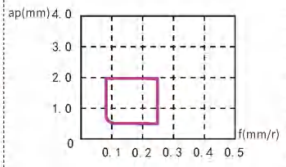
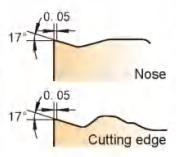
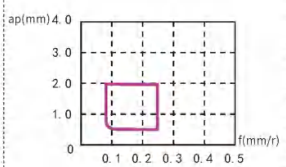
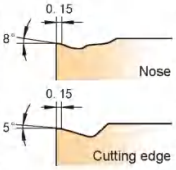
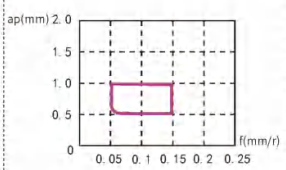
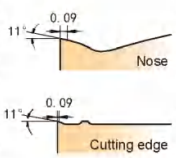
GID□□R/L	QZQ□□R/L	GQCR/L	S□□□-QC□□□□R/L
			
Page A278	A282	A280	A280

Threading tools

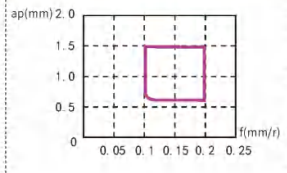
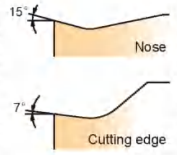
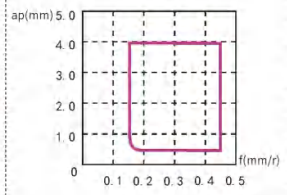
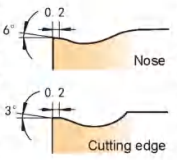
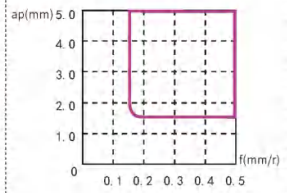
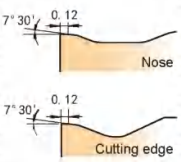
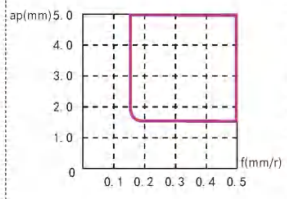
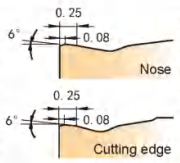
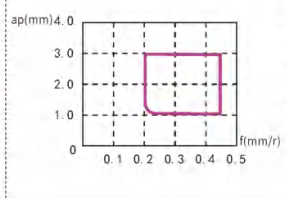
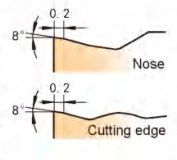
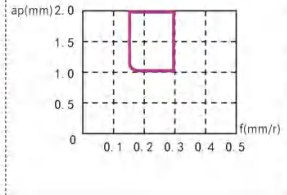
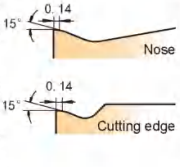
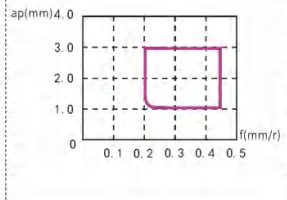
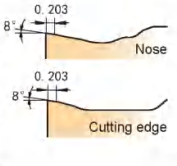
ZSER/L	ZSIR/L	SWR/L	SNR/L
			
Page A308	A309	A319	A320



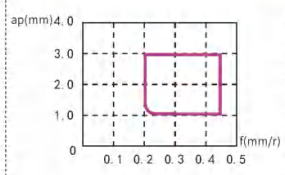
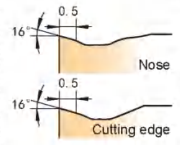
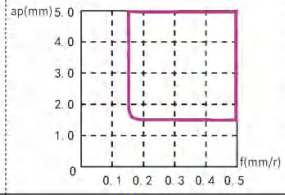
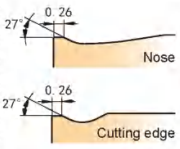
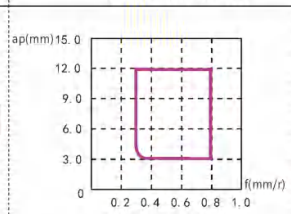
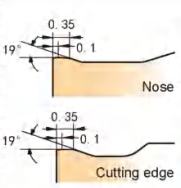
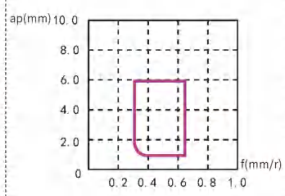
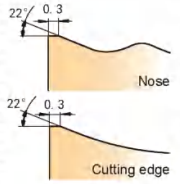
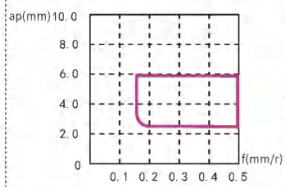
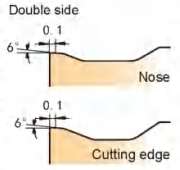
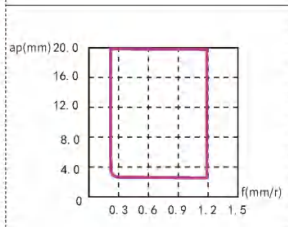
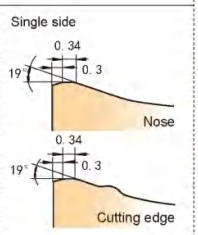
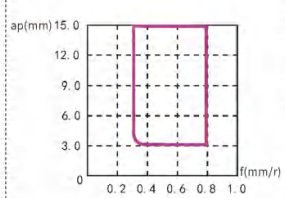
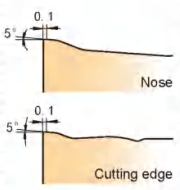
Negative inserts with hole

Application	Chipbreaker	Precision	Recommended cutting parameters	Chipbreaker profile	Feature / Shape of insert
For finishing	SF 	M			**Recommended chipbreaker for finishing of P-type mild steel** Double-sided chipbreaker with M-level tolerance has outstanding perfprmance in finishing, achieving good surface quality. 
	XF 	M			**Recommended chipbreaker for finishing of P-type materials** The curved edge angle ensures the strength of the cutting edge, effectively reduces the cutting resistance, and the special chipbreaker design can ensure the chip control performance in the finishing range. 
	DF 	M			**Recommended chipbreaker for finishing of P-type materials** Double-sided chipbreaker with M-level tolerance has sharp edges, which can effectively cut off stainless steel and avoid adhering and surface hardening, achieving high surface quality. 
	EF 	M			**Recommended chipbreaker for finishing of M-type materials** Double-sided chipbreaker with M-level tolerance can prevent wear and harding to achieve high machining precision and good surface quality. 
	ES 	M			**Brand new recommended chipbreaker for M-type material finishing** Sharp large rake angle design reduces cutting resistance with a good machining surface quality. The unique chipbreaker structure realizes good chip control and reduces cutting heat. 
	ADF 	G			**Recommended chipbreaker for M-type material universal finishing** G-level tolerance. High dimensional and repeatable positioning accuracy can be obtained. Special design of the rake face structure ensures the strength of the insert meanwhile greatly reduces the cutting resistance. Advanced technology for edge treatment process and coating post-treatment ensure machining parts with excellent surface finish. 
	NF 	E			**Recommended chipbreaker for finishing of S-type materials** Double-sided chipbreaker with E-level tolerance can prevent wear and harding to achieve high machining precision and good surface quality. 

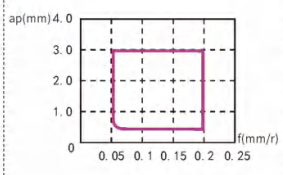
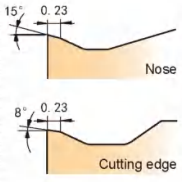
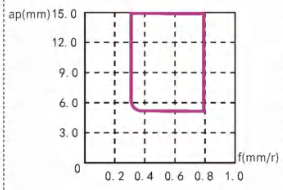
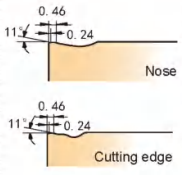
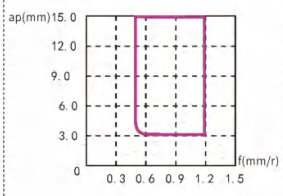
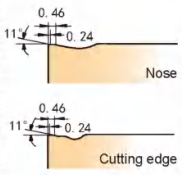
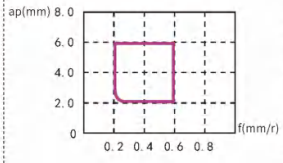
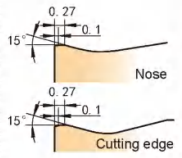
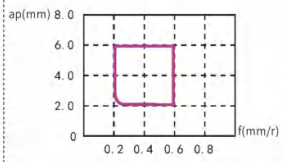
Negative inserts with hole

Application	Chipbreaker	Precision	Recommended cutting parameters	Chipbreaker profile	Feature / Shape of insert
For finishing	NGF	E			**Recommended chipbreaker for finishing of S-materials** E-level double side chipbreaker with excellent sharp type edge. High positioning accuracy, light cutting force, which is recommended chip breaker for S-type material general finishing. 
For semi-finishing	XM	M			**Recommended chipbreaker for semi-finishing of P-type materials** Special cutting edge structure, taking into account cutting sharpness and insert strength, the newly designed chipbreaker, to ensure the chip control performance in the semi-finishing range. 
	DM	M			**Recommended chipbreaker for semi-finishing of P-type materials** Double-sided chipbreaker with M-level tolerance produces small cutting forces and has large chip breaking range, which ensures good performance for machining highly adhesive alloy steel. 
	PM	M			**Recommended chipbreaker for semi-finishing of P-type materials** Double-sided chipbreaker with M-level tolerance has higher strength of cutting edge than chipbreaker DM. It is suitable for semi-finishing under unstable working conditions as well as machining cast iron with small cutting forces. 
	EH	M			**Brand new recommended chipbreaker for M-type material semi-finishing** M-level tolerance. Double positive rake angle take into account the sharpness and strength of the tool tip. Suitable for efficient machining of stainless steel in intermittent working conditions. 
	NM	M			**Recommended chipbreaker for semi-finishing of S-type materials** Double-sided chipbreaker with M-level tolerance keeps high precision after inserts are turned, with good capability to prevent wear and hardening to achieve higher machining efficiency than chipbreaker NF. 
	EM	M			**Recommended chipbreaker for semi-finishing of M-type materials** Double-sided chipbreaker with M-level tolerance can solve the processing problems such as chip breaking and adhering of stainless steel, achieving higher machining efficiency than chipbreaker EF. 

Negative inserts with hole

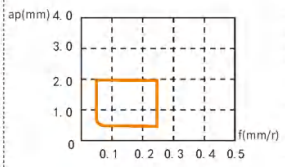
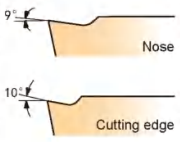
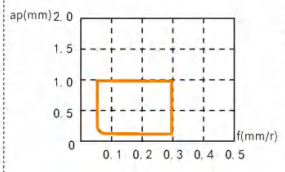
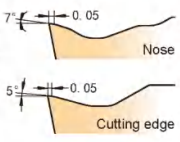
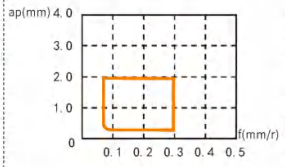
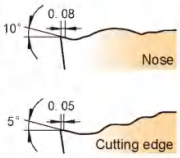
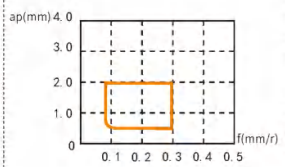
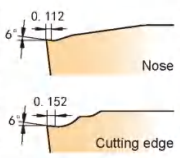
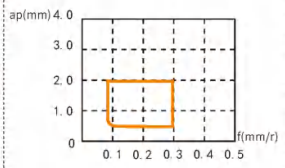
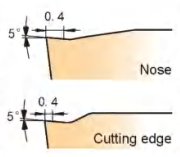
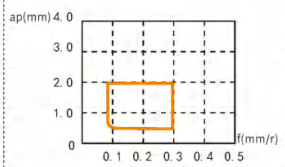
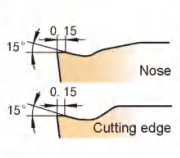
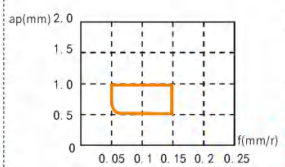
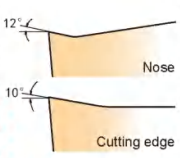
Application	Chipbreaker	Precision	Recommended cutting parameters	Chipbreaker profile	Feature / Shape of insert
For semi-finishing	EG	M			**Recommended chipbreaker for M-type material universal machining** M-level tolerance. Reasonable chipbreaker design realizes good chip control. Sharp rake angle effectively suppresses burr generation. 
	All round	M			**From semi-finishing to roughing of P-type,M-type,K-type materials** Double-sided chipbreaker with M-level tolerance has good cutting edge strength and wide application. 
Light-load roughing	DR Double-side	M			**Recommended chipbreaker for light roughing of P-type and K-type materials** Double-sided chipbreaker with M-level tolerance is the first choice for light roughing, can achieve high evacuation rate and effciency of cutting edge. 
	LR Single-side	M			**Recommended chipbreaker for light-load roughing of P-type materials** Single-sided general chipbreaker with M-level tolerance, has wide chip breaking range and sharp cutting edge is designed with inclined angle, which enables it to cut lightly and easily and control the chip flow direction. Chip-leaded-stages can reduces the contact area with chips, so that heat can easily be dissipated. 
For roughing	ER Single/ Double side	M			**Recommended chipbreaker for roughing of M-type materials** Single / double-sided chipbreaker with M-level tolerance has good capacity of impact-resistance. It is designed to achieve balance between security and sharpness of the cutting edge, and it can achieve high effciency by preventing the problems of adhering and high cutting heat when roughing stainless steel. 
					
	DR Single-side	M			**Recommended chipbreaker for roughing of P-type materials** Single-sided chipbreaker with M-level tolerance has high security of cutting edge, which can achieve high feed rate and low cutting forces at great cutting depth and high feed rate. 

Negative inserts with hole

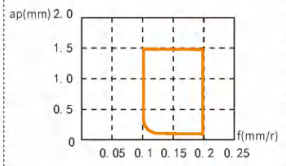
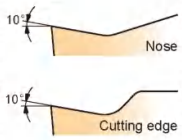
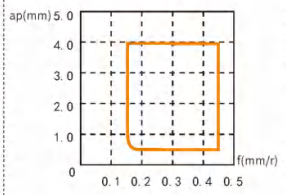
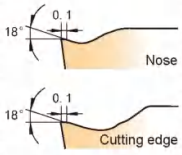
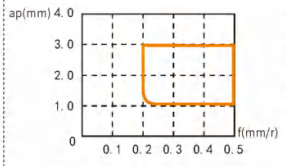
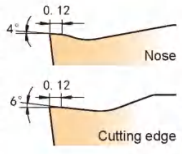
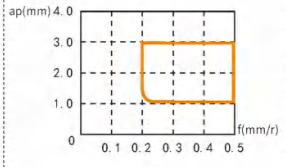
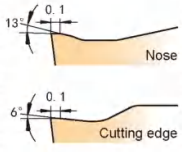
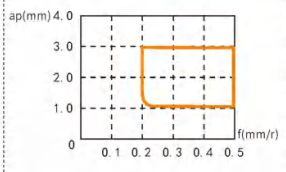
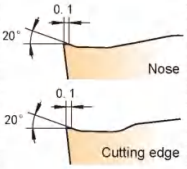
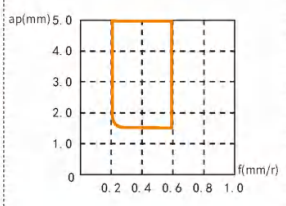
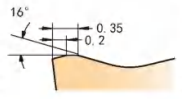
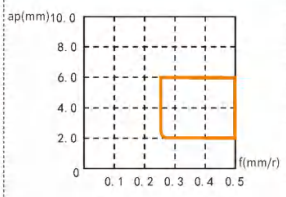
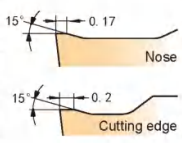
Application	Chipbreaker	Precision	Recommended cutting parameters	Chipbreaker profile	Feature / Shape of insert
For roughing	SNR	M			**Recommended chipbreaker for S-type material high effciency roughing** M-level double-sided chipbreaker perfectly combines sharpness and strength of the cutting edge, with small cutting resistance and high edge strength can effectively reduce groove wear. SNR is recommended chipbreaker for high depth roughing of S- materials. 
Heavy-load machining	HDR Single-side	M			**Recommended chipbreaker for heavy load machining of P-type materials** M level single-sided chipbreaker with strengthen cutting edges, high safety and excellent plastic deformation resistance under high metal removal rate. 
	HPR Single-side	M			**Recommended chipbreaker for heavy-load machining of P-type materials** Single-sided chipbreaker with M-level tolerance, strong cutting edge. Multi-stages chipbreaker ensures the flowing of chip and heat dissipation of insert. It is suitable for machining under unstable and relatively bad working condition, especially for external roughing of workpiece with a rough oxidized surfaces. 
Cast iron machining	TC	M			**Universal chipbreaker for K-type material machining** M-level tolerance. High edge strength, excellent impact resistance and stable performance, which is suitable for cast iron material finishing to rough machining occasions. 
	Without chipbreaker	M			**For cast iron machining** Double-sided chipbreaker with M-level tolerance has high cutting edge strength. It can overcome inferior factors such as intettruption and vibration, etc. when machining cast iron. 

General turning inserts overview

Positive inserts with hole

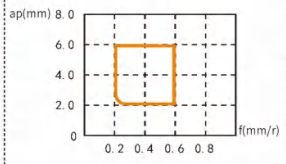
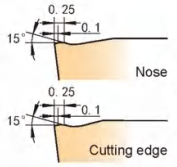
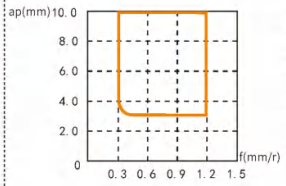
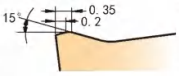
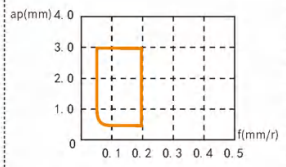
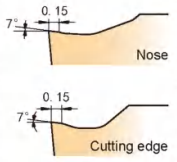
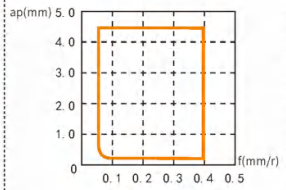
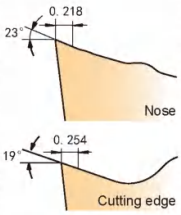
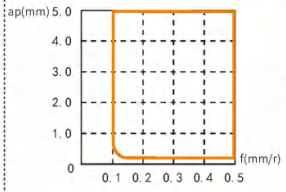
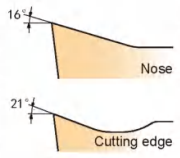
Application	Chipbreaker	Precision	Recommended cutting parameters	Chipbreaker profile	Feature / Shape of insert
For extra finishing	R/L 	G			**Recommended chipbreaker for precise boring inserts** G-level tolerance, sharp cutting edge and small nose radius, it can effectively reduce the vibration in machining and is suitable for boring and external turning. 
	SF 	G			**First choice for finishing with high requirements on chipbreaker** G-level tolerance, it is the first choice for precise fnishing due to its excellent performance on chip breaking. 
For finishing	XF 	M			**Recommended chipbreaker for finishing of P-type materials** The curved edge angle ensures the strength of the cutting edge, effectively reduces the cutting resistance, and the special chip breaking groove design can ensure the chip control performance in the finishing range. 
	HF 	M			**Chipbreaker for fnishing with wide application** M-level tolerance, it is suitable for internal and external fnishing of various materials such as steel and cast iron. 
	EF 	M			**Recommended chipbreaker for finishing of M-type materials** M-level tolerance, it has sharp cutting edges and is suitable for cutting adhesive materials such as stainless steel, soft steel, etc. 
	AHF 	G			**Recommended chipbreaker for M-type material universal finishing** G-level tolerance. High dimensional and repetitive positioning accuracy can be obtained. Unique vibration-damping chipbreaker design realizes good surface quality even when machining long and thin shaft parts. 
	NF 	E G			**Recommended chipbreaker for finishing S-type materials** E and G-level tolerance and sharp cutting edges, it is suitable for internal and external finishing of high-temperature alloy materials. 

Positive inserts with hole

Application	Chipbreaker	Precision	Recommended cutting parameters	Chipbreaker profile	Feature / Shape of insert
For finishing	NGF 	E G			**Recommended chipbreaker for S-type material general finishing** E, G-level tolerance, for inner hole fnishing of S-type materials. 
For semi-finishing	XM 	M			**Recommended chipbreaker for semi-finishing of P-type materials** Special cutting edge structure, taking into account cutting sharpness and insert strength, the newly designed chipbreaker, to ensure the chip control performance in the semi-finishing range. 
	HM 	M			**Chipbreaker for semi-finishing with wide application** M-level tolerance, it is suitable for internal and external semi-finishing of materials like steel, cast iron, etc. 
	EM 	M			**Recommended chipbreaker for semi-finishing of M-Type materials** M-level tolerance, it has higher hardness of cutting edge than EF and can achieve higher effciency. 
	EG 	M			**Recommended chipbreaker for M-type material universal machining** M-level tolerance. Reasonable chipbreaker design realizes good chip control. Sharp rake angle effectively suppresses burr generation. 
	All round 	M			**Recommended chipbreaker for semi-finishing of M-type materials** M-level tolerance, it is suitable for profle machining materials like steel, cast iron, etc. 
For roughing	HR 	M			**General chipbreaker for roughing** M-level tolerance, it is suitable for both internal and external roughing of materials such as steel, stainless steel, cast iron, etc. 

General turning inserts overview

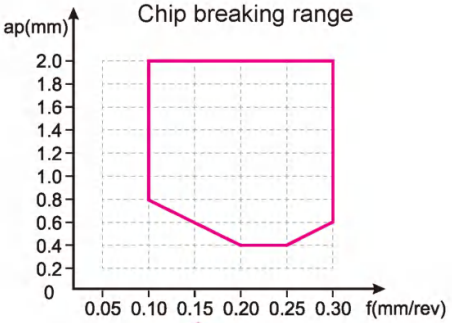
Positive inserts with hole

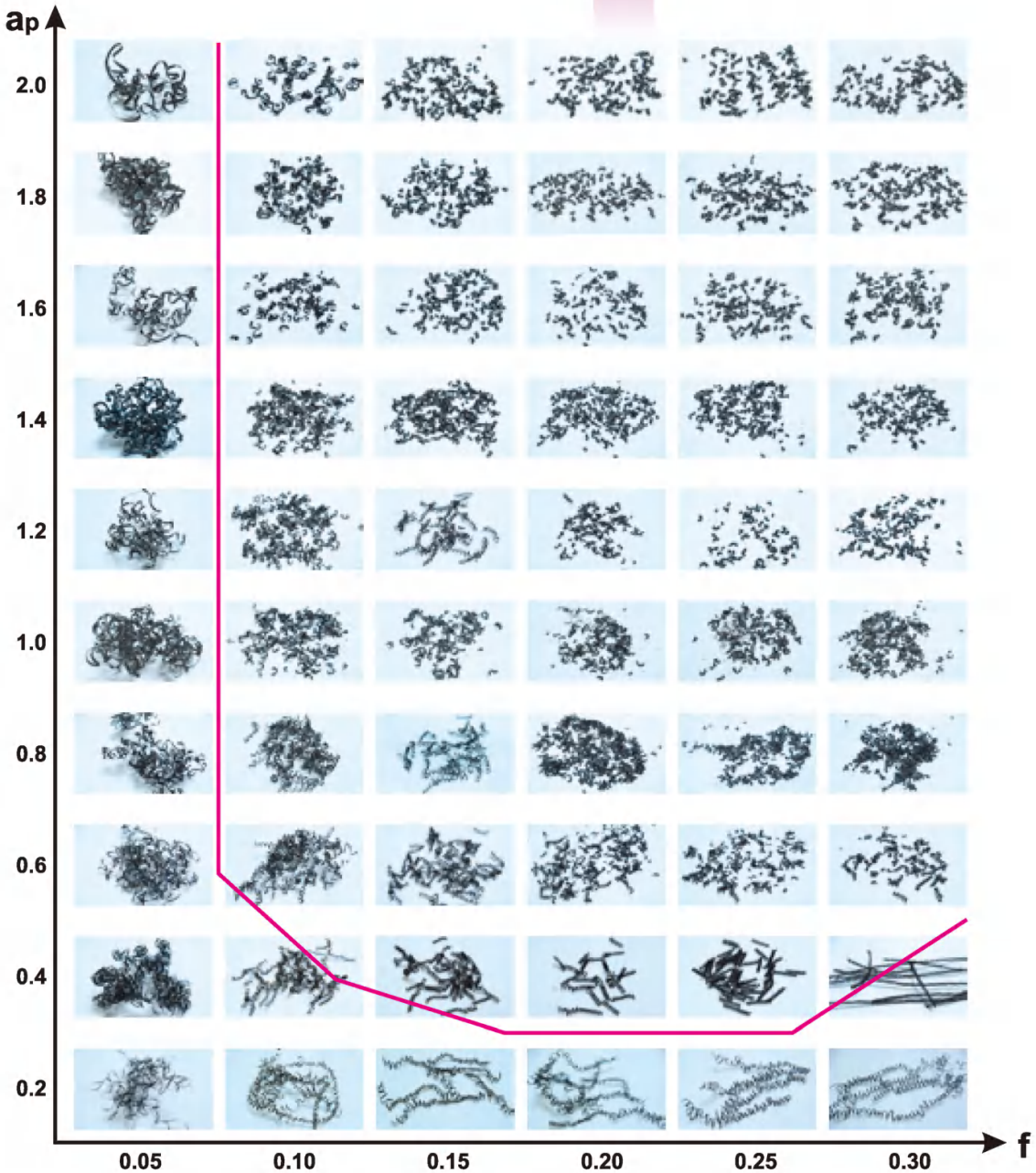
Application	Chipbreaker	Precision	Recommended cutting parameters	Chipbreaker profile	Feature / Shape of insert
For roughing	TC 	M			**Universal chipbreaker for K-type material machining** M-level tolerance. High edge strength, excellent impact resistance and stable performance, which is suitable for cast iron material finishing to rough machining occasions. 
	Special chipbreaker 	M			**Recommended chipbreaker for heavy machining of P-type materials** Single-sided with M-level tolerance, it has good cutting edge strength with high security. It is the first choice for profle roughing. 
	SNR 	M			**Recommended chipobreaker for S-type material high effciency roughing** M-level tolerance, for inner hole roughing of S materials. 
For Al machining	LC 	G			**Chipbreaker for machining of Al alloy** G-level tolerance, large rake angle and clearance angle make the cutting edge sharper, ensuring easy and fast cutting while remaining effective chip breaking. 
	LH 	G			**Special chipbreaker for machining of Al alloy** G-level tolerance, large rake angle and polishing treatment on surface, it can effectively prevent built-up edge and achieve high workpiece surface quality while maintaining long life. 

Cutting test for chip breaking range of general turning inserts

Case

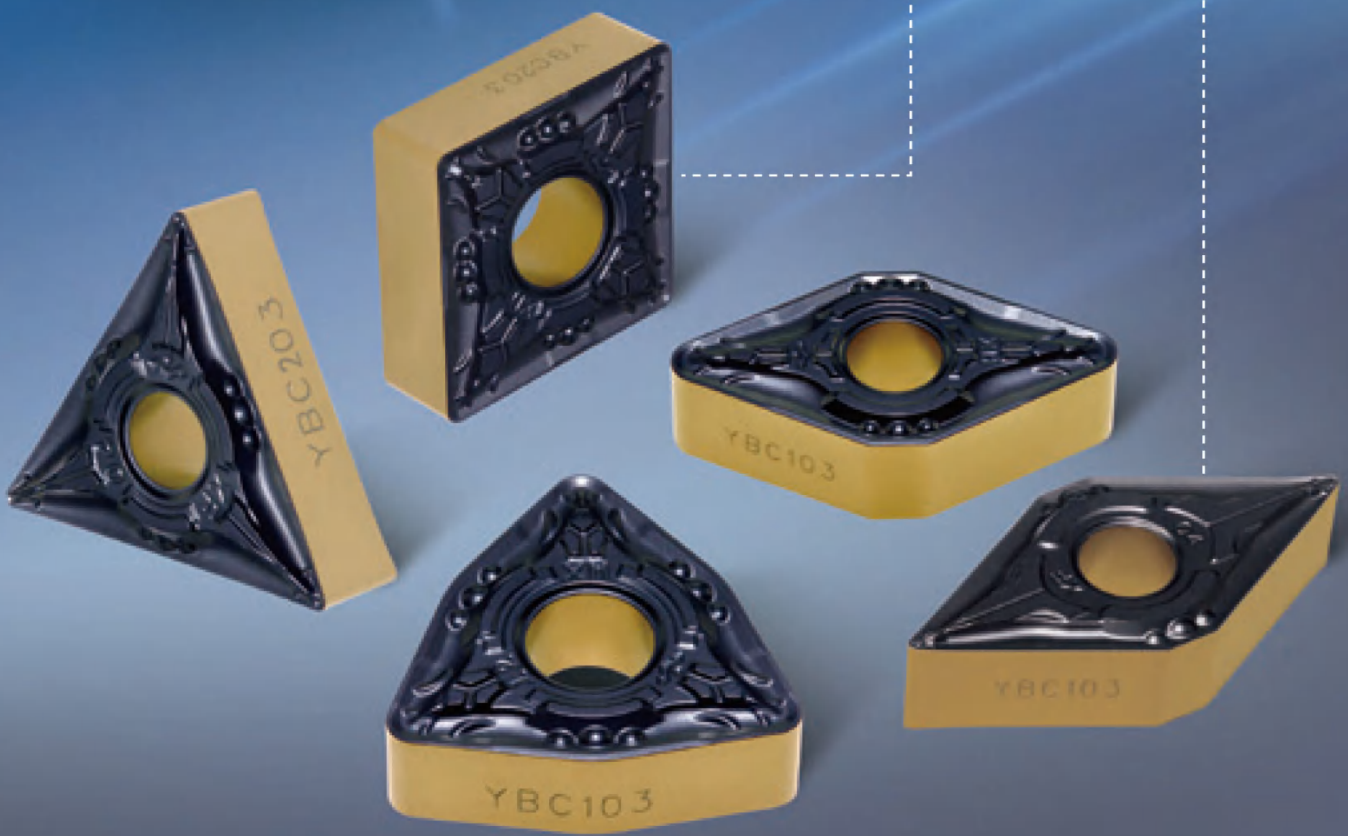
Insert: CNMG120408-DF
Toolholder: PCLNL2525M12
Workpiece material: 45# steel
Cutting speed: 200m/min

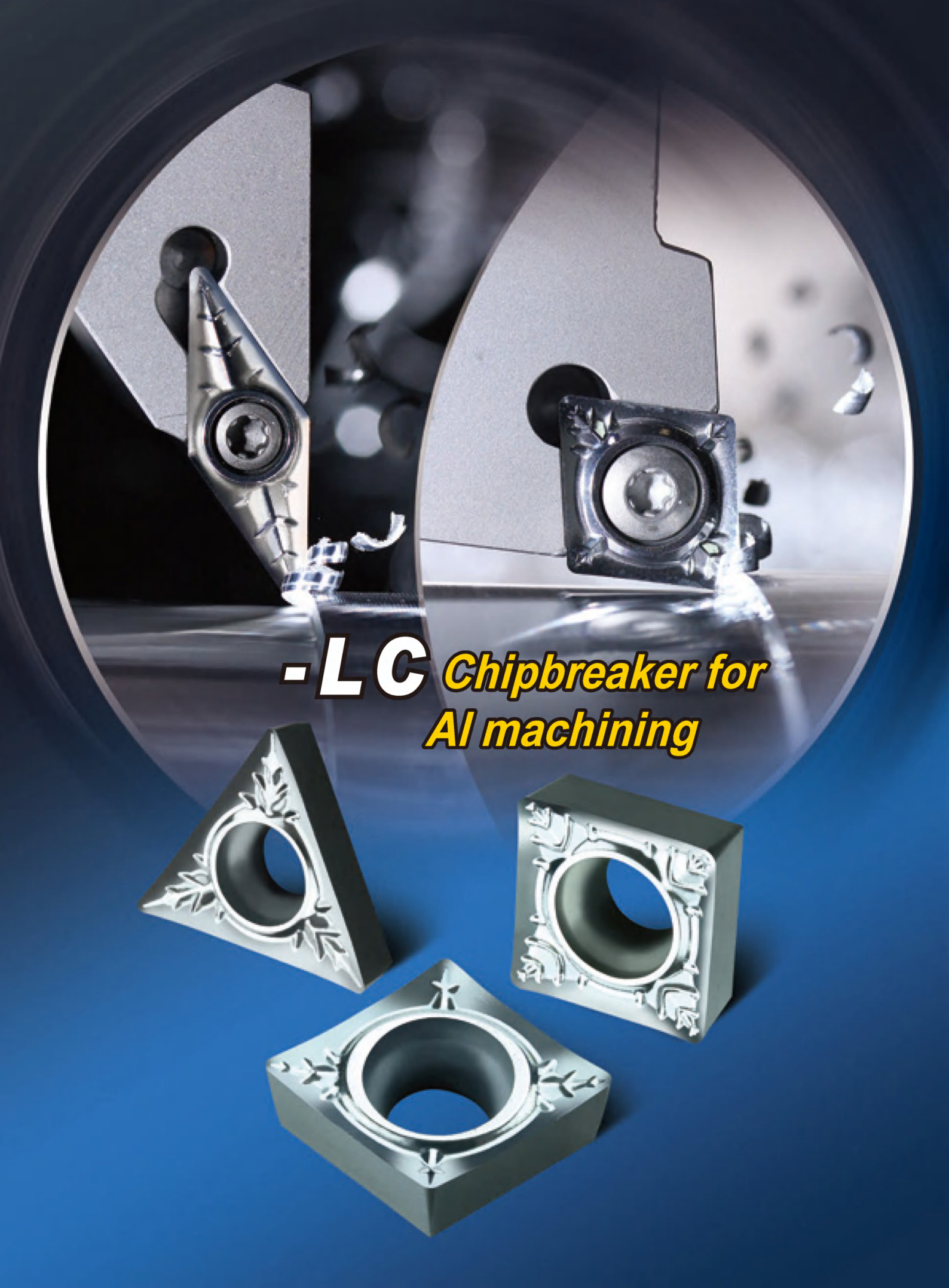




New turning grade for P-type materials

YBC103
YBC203




-LC Chipbreaker for
Al machining


-HPR
New generation of
roughing chipbreaker
-LR



YBM215

Outstanding wear resistance, extends the tool life
achieves high efficient processing

Grade for stainless steel machining



YBM153

Best choice for cutting stainless steel
with high speed under good working condition

ISO		General turning						Threading	Parting and grooving		
Code		Coating		Cermet	Coated cermet	Ceramic	Cemented carbide	Coating	Coating		Cemented carbide
		CVD	PVD					PVD	CVD	PVD	
P Steel	01										
	10	YBC152 YBC103	YBG102	YNG151	YNG151C			YBG202		YBG205	
	20	YBC252 YBC203	YBG202					YBG203		YBG302	
	30	YBC352									
	40										
M Stainless steel	01										
	10	YBM153	YBG202	YNG151	YNG151C			YBG202		YBG205	
	20	YBM251	YBM215 YBG205					YBG203		YBG302	
	30	YBM253									
	40										
K Cast iron	01										
	10	YBD052 YBD102		YNG151	YNG151C	CN3100	YD201	YBG202		YBG205	YD201
	20	YBD152						YBG203		YBG302	
	30										
N Non ferrous metal	01										
	10						YD101	YBG202			YD101
	20							YBG203			
	30										
S Heat resistant alloy & Ti alloy	01										
	10		YBS103 YBG102			CN3100	YD101	YBG202		YBS103 YBG102	YD101
	20		YBG105 YBG202					YBG203		YBG105 YBG302	
	30		YBG212							YBG212 YBG202	
H Super hard material	01										
	10					CN3100		YBG202			
	20							YBG203			
	30										

How to select general turning inserts

Turning inserts list

- Turning inserts listed according to shape
- Sequence of listed inserts:
  - ▶Negative inserts (with hole – without hole)
  - ▶Positive inserts (with hole – without hole)
- Sequence of listed chipbreaker

  For finishing – For semi-finishing – For roughing – For heavy cutting – Without chipbreaker– Through chipbreaker

Selecting grade according to workpiece material and working condition

Prior to select grade for insert according to working condition that is suitable for workpiece material

😊 Good working condition: machine works well and stably. There are high requirements for dimensional precision of components and quality surface.

😐 Normal working condition: machine works normally. There are certain requirements for dimensional precision of components and surface quality.

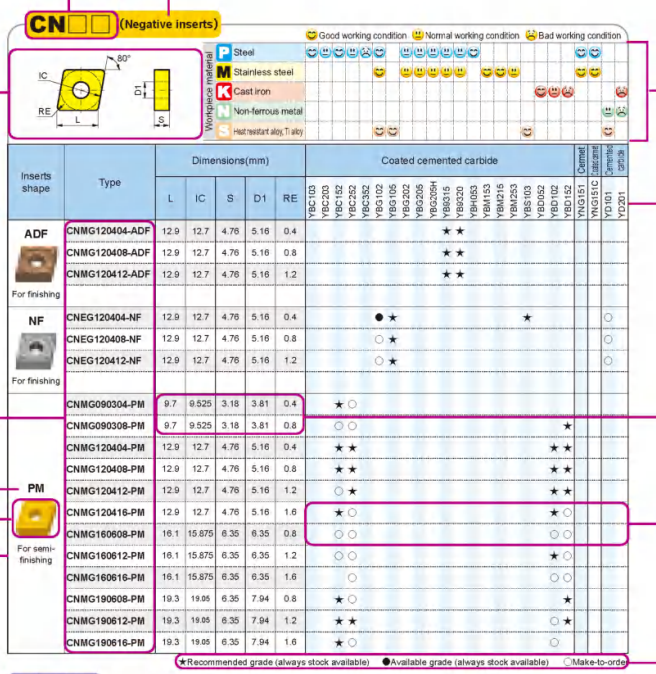
☹ Bad working condition: machine works with bad stability. There are high requirements for metal evacuation rate.

Main category of products

Positive or negative inserts

Shape and dimensions

L: Cutting edge length
IC: Diameter of inscribed circle
S: Thickness
D1: Hole diameter
RE: Nose radius



Type

Grade

Size

Stock

Illustration of stock



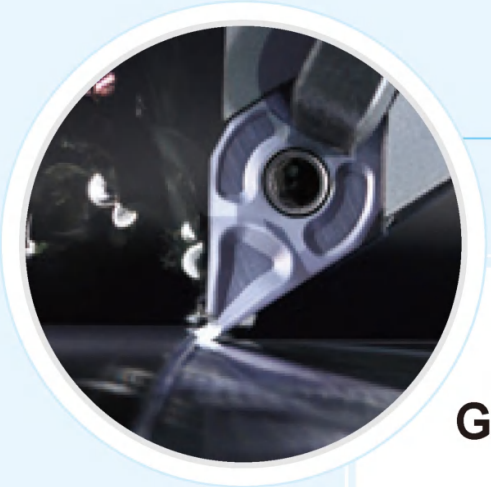
Reference page of tool holders

Application of inserts

Shape

Insert chipbreaker
Chipbreaker code

Recommended cutting parameters
Chipbreaker selection reference
Grade selection reference
Insert code key



TURNING A

General turning inserts

General turning inserts overview A24-A30

Application instruction for general turning inserts A31-A47

General turning inserts A48-A122

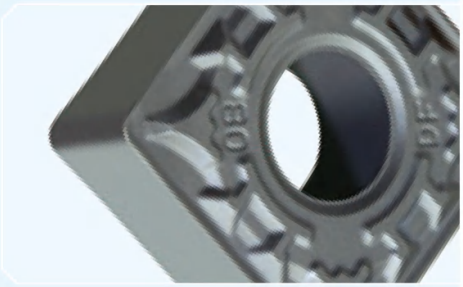
General turning inserts code key A48-A49

Metric-inch comparison table for general turning inserts A50-A51

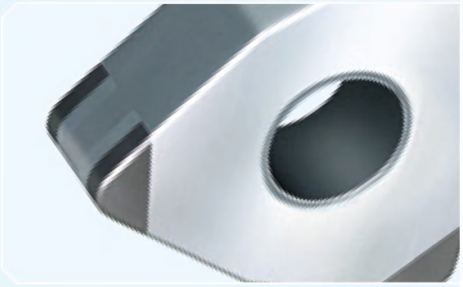
Cemented carbide and cermet inserts A52-A122

Negative inserts A52-A94

Positive inserts A95-A122

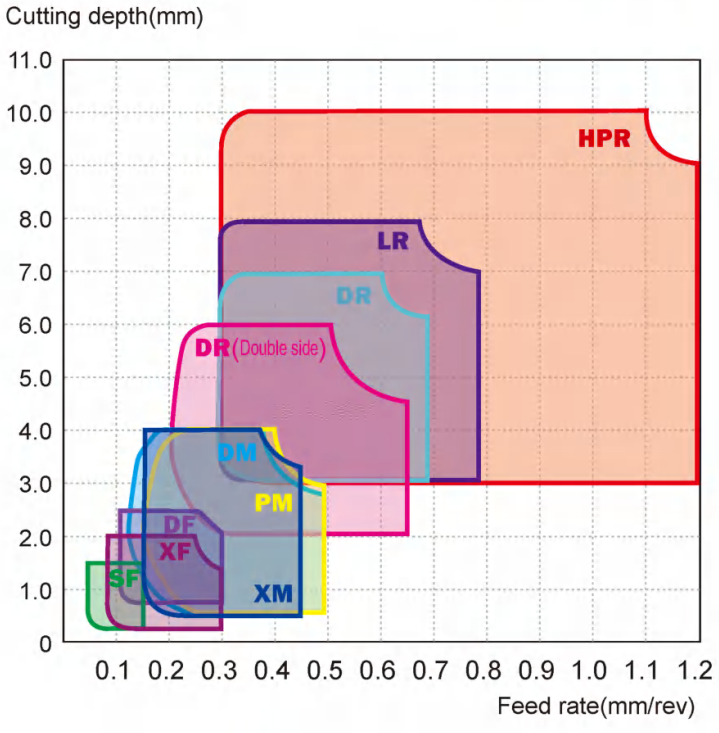




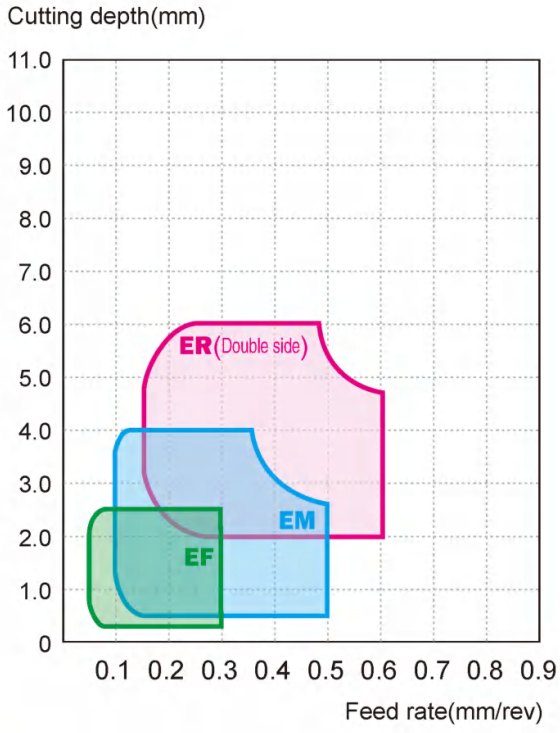


Chip breaking range reference for general turning inserts

Negative inserts

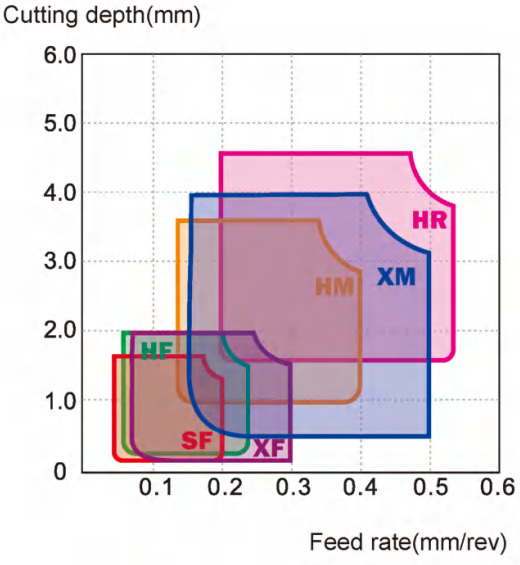


▶ Workpiece material: 45# steel

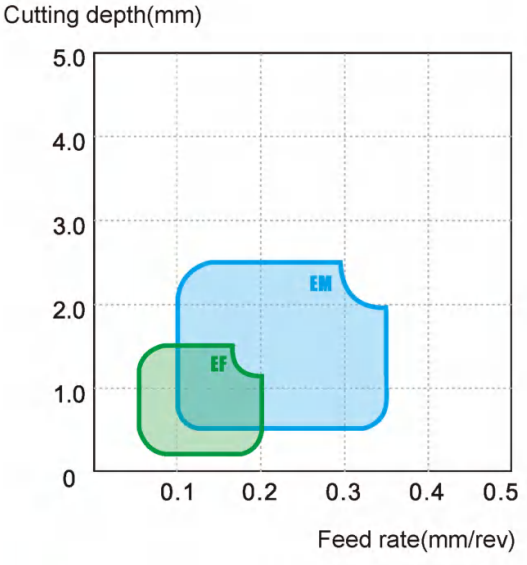


▶ Workpiece material: stainless steel (1Cr18Ni9Ti)

Positive inserts



▶ Workpiece material: 45# steel



▶ Workpiece material: stainless steel (1Cr18Ni9Ti)

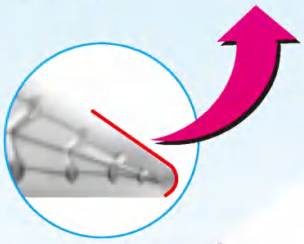
-LC chipbreaker for aluminum

- -LC inserts are designed with a special chipbreaker. Large rake angle and clearance angle make the cutting edge sharper, ensuring easier cutting while remaining effective chip breaking.
- Achieved the mirror rake face after special treatment. Reduced the friction resistence, and stick free. Accordingly, make the chip removal fluently and improve the surface quality and tool life.
- The G-class tolerance of insert, higher Repeated Position Accuracy, at the same time, it can effectively avoid the vibration during the machining process.

Optimized inclined angel makes controlling the chipping flow direction valid.



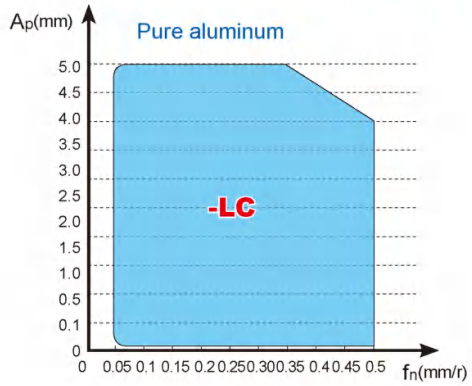
Smooth connection of insert nose and cutting edge makes rake face smoother.

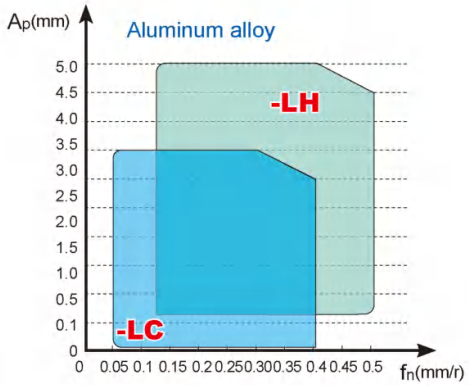




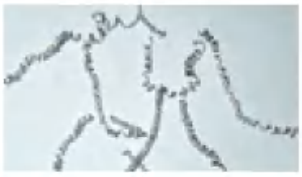
–LC and –LH chipbreaker characteristics and machining range

-LC chipbreaker can be used in machining of pure Al, while -LH chipbreaker can not.
-LC chipbreaker expand the chip breaking range of Al alloy machining.





Workpiece material: Pure aluminum

Cutting parameters	Vc=350m/min Ap=0.2mm F=0.2mm/r	
Chips		
Surface quality		
	-LC chipbreaker	Similar products from overseas manufacturers

- **-LH chipbreaker is more suitable for machining aluminum alloy in condition of large cutting depth and high feed rate.**
- **-LC chipbreaker is more suitable for machining aluminum alloy in condition of small cutting depth and low feed rate.**
- **-LC chipbreaker can be used in machining pure aluminum.**

-EF -EM -ER

Specially designed for machining intensively adhesive and high-plasticity materials such as stainless steel, etc



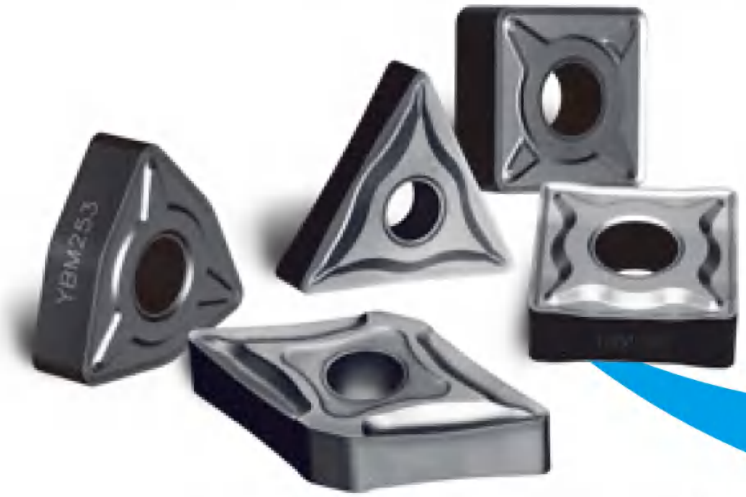
-EF

Rake angle and inclined angle are specially designed for intensively adhesive stainless steel and high-plasticity materials which are hard to be machined. Sharp cutting edge enables it to cut lightly and easily and achieve good surface quality by well controlling chip breaking. It is especially suitable for finishing these kinds of materials.



-EM

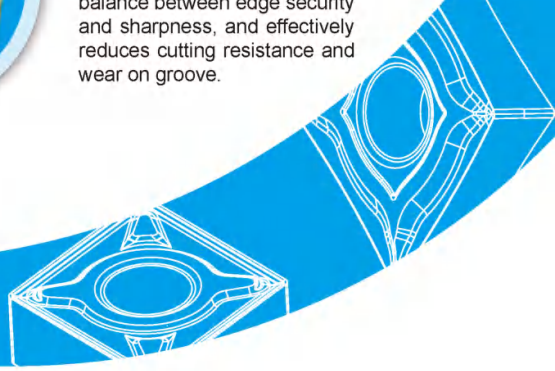
Inserts meet the requirements of machining intensively adhesive materials. Impact resistance of cutting edge is improved in addition to sharpness, which makes it suitable for semi-finishing and intermittent machining of adhesive materials such as austenitic stainless steel, etc.



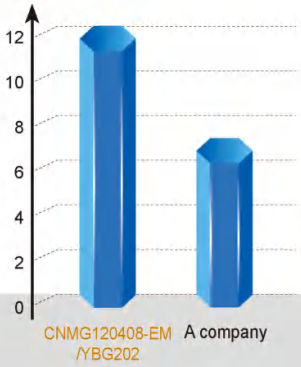


-ER

Specially designed double rake angle with wide land achieves balance between edge security and sharpness, and effectively reduces cutting resistance and wear on groove.



Number of machined parts / Cutting edge

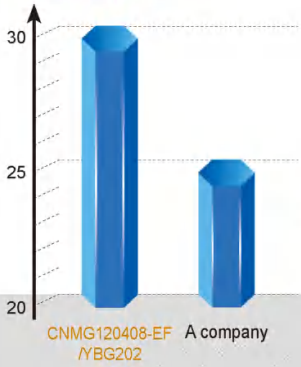




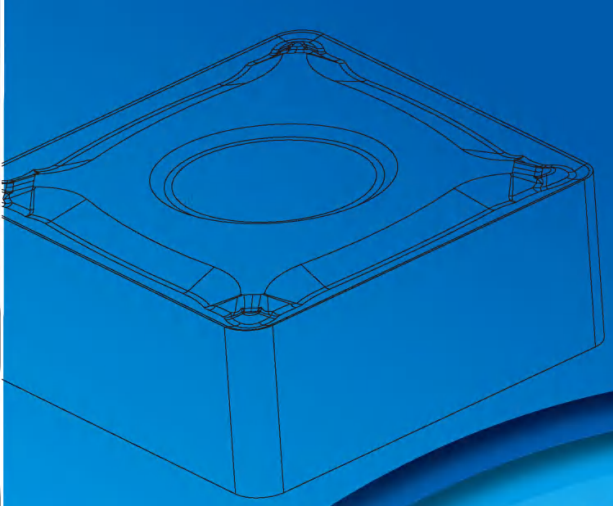
Machining external of valve

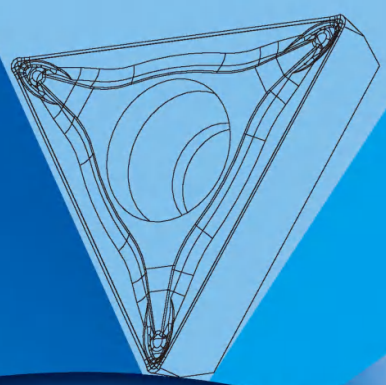
Machining end surface of valve
(intermittent machining)
Workpiece diameter:135mm
Rotating speed:350rpm
Feed rate:0.25mm/r
Cutting depth:1.5mm

Number of machined parts / Cutting edge



Machining external of valve
Workpiece diameter:89mm
Rotating speed:635rpm
Feed rate:0.15mm/r
Cutting depth:1.0mm



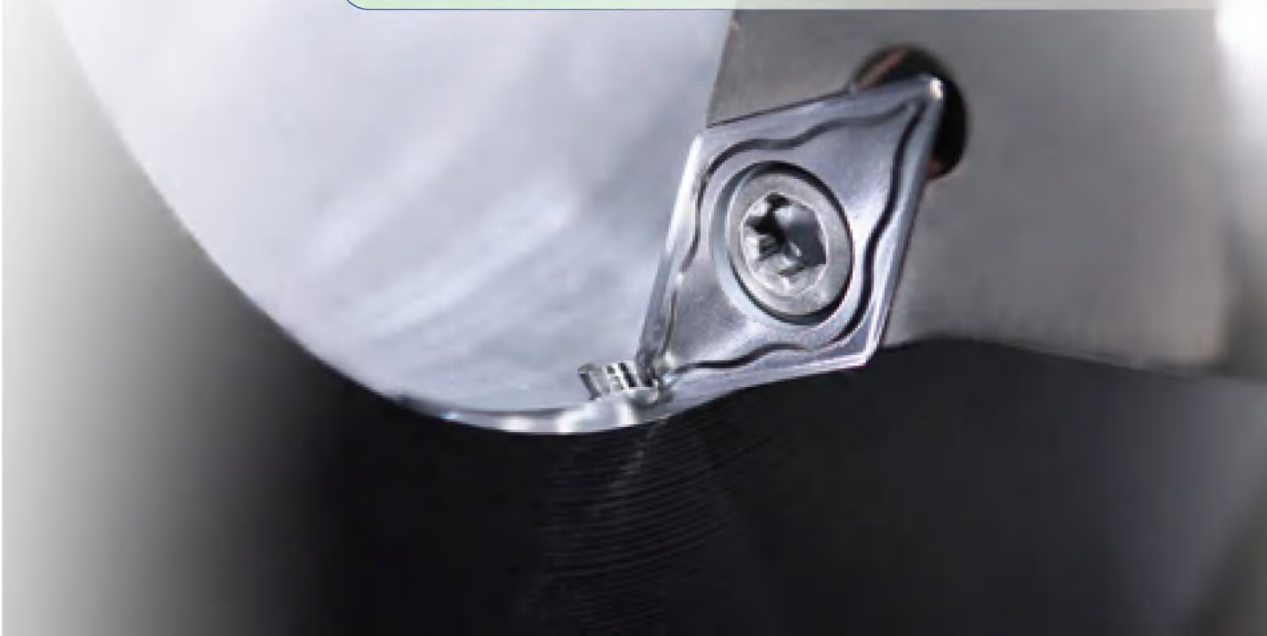




-SF Chipbreaker for finishing

- Unique nose design and sharp cutting edge lead to small cutting resistance and effectively reduce vibration of the tool holder.
- With high re-positioning precision, the insert is compatible with specially developed cemented carbide tool holders, which can increase the capability of vibration resistance and improve machining quality.
- Special treatment on insert's surface can reduce the possibility of chips adhering to the rake face of insert. Good performance of chip breaking and chip flowing ensures improved surface quality of workpiece.
- By adopting excellent grade, it is suitable for extra finishing of various materials.





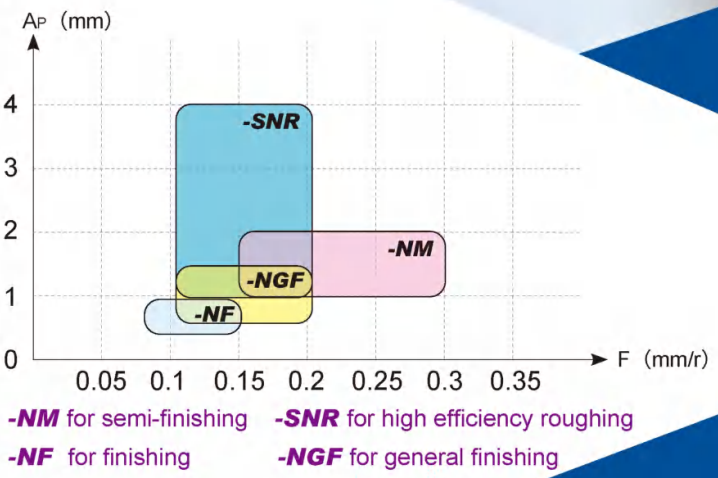
S- Ni-based Superalloy Machining

Difficulties Overcame

Features of Ni-based superalloy machining

- High cutting resistance (containing a large amount of alloying elements, severe hardening, great plastic deformation;
- High cutting temperature;
- Severe wear of inserts.

Chipbreaker for machining of Ni-based superalloy should have tough and sharp insert nose, smooth rake face and proper inclination angle.



-NM for semi-finishing ***-SNR*** for high efficiency roughing

-NF for finishing ***-NGF*** for general finishing

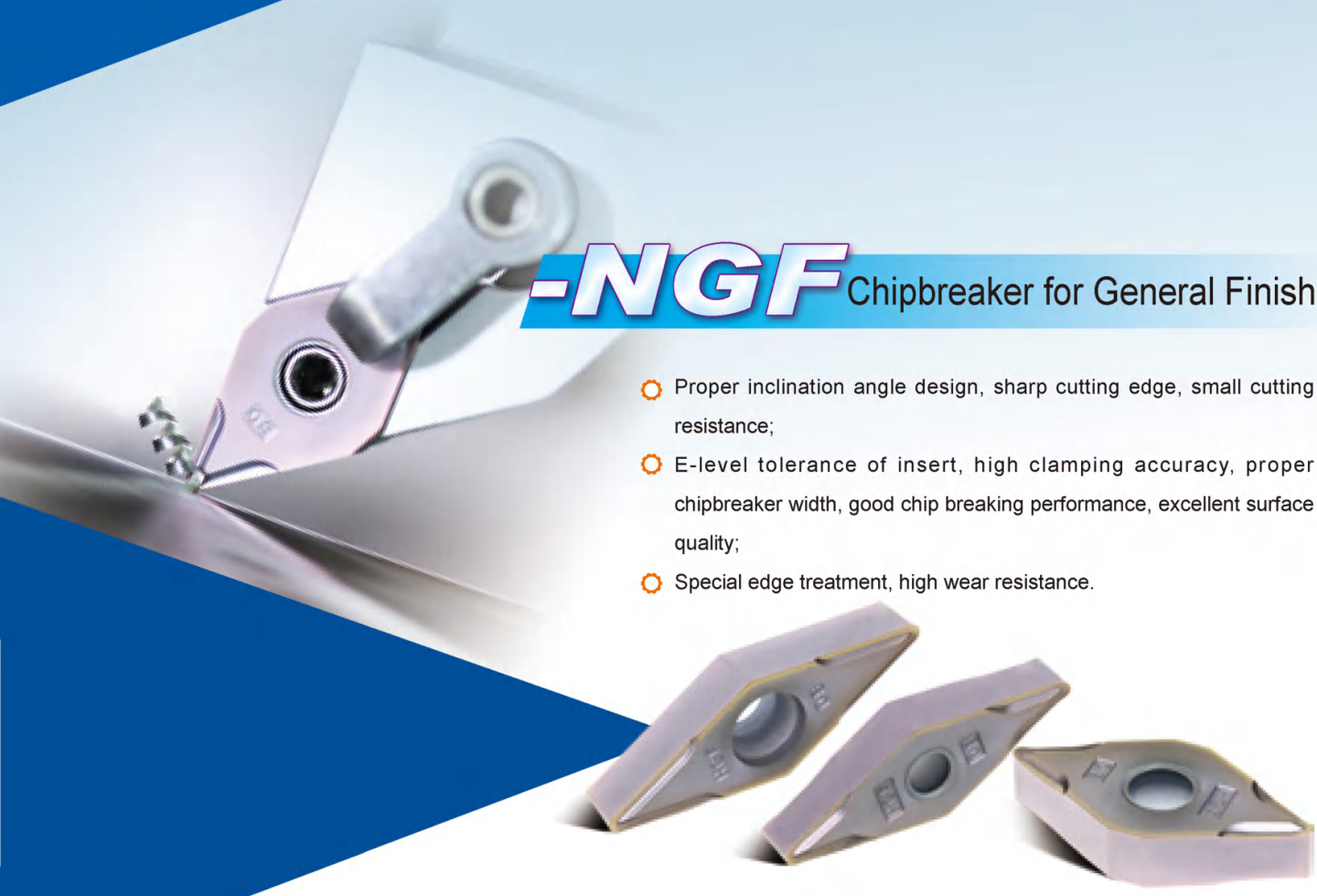




-SNR Chipbreaker for roughing with large depth of cut



- Positive rake angle design, sharp cutting edge, low cutting resistance, effectively reducing groove wear;
- Cutting edge with variable rake angles increase cutting edge strength at large depths of cut. Edge strength increases as the depth of cut increases;
- Large slot width combined with unique edge rib design not only provides excellent chip breaking performance but also can effectively improve edge strength.

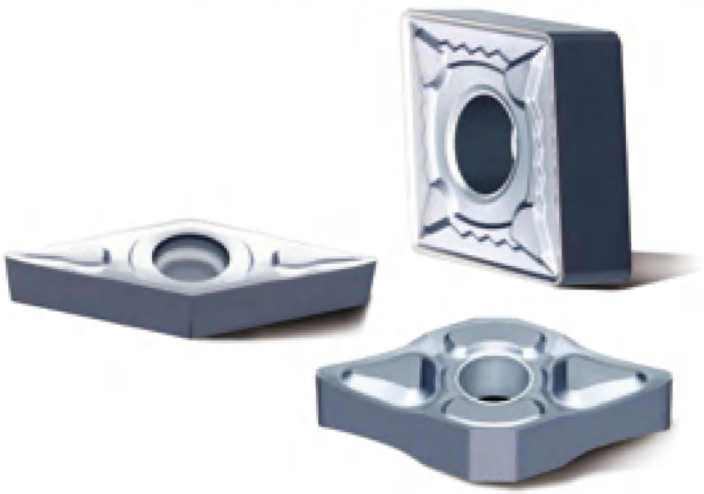


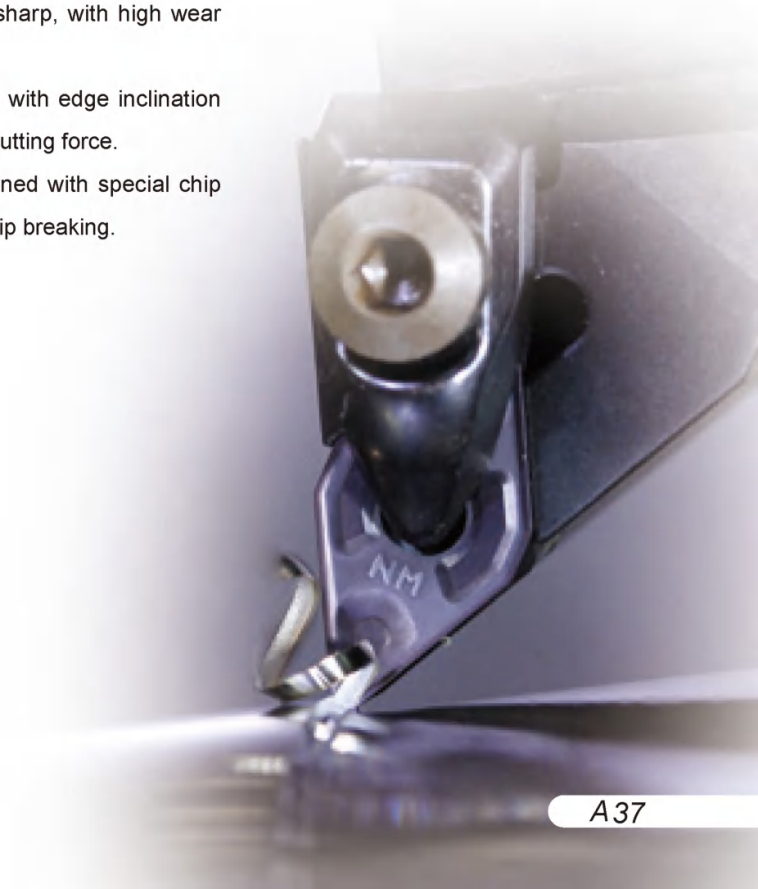
-NGF Chipbreaker for General Finishing

- Proper inclination angle design, sharp cutting edge, small cutting resistance;
- E-level tolerance of insert, high clamping accuracy, proper chipbreaker width, good chip breaking performance, excellent surface quality;
- Special edge treatment, high wear resistance.

-NF/NM Chipbreaker for General Finishing

- The chipbreaker have smooth surface and smooth chip guide.
- The cutting edge is specially treated, strong and sharp, with high wear resistance.
- -NF chipbreker large front angle design, combined with edge inclination and special edge design, sharp cutting edge, small cutting force.
- -NM chipbreaker double front angle design, combined with special chip cutting groove design, high cutting strength, good chip breaking.





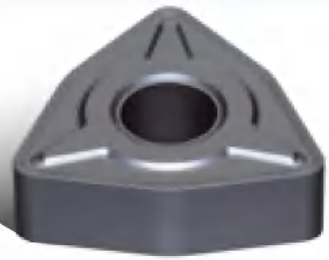
BLACK DIAMOND INSERTS

Innovation of machining techniques for stainless steel turning

YBM

Coated Cemented Carbide CVD

YBM153



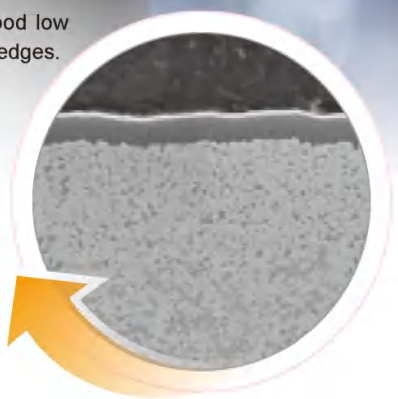
Best choice for roughing of stainless steel with high-speed under good working condition

Coating

- CVD coating with advanced ultra-fine grain coating technology, greatly improves wear resistance of inserts.
- Thanks to special treatment on transition layer, multi-layer coating are combined firmly.
- The exceptionally smooth coating surface and good low friction ability can reduce the occurrence of built-up edges.

Substrate

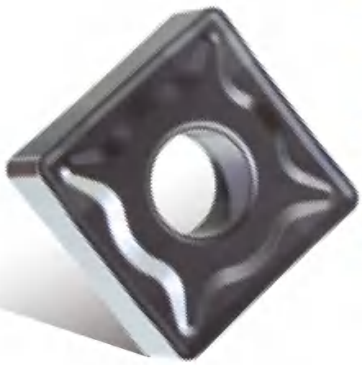
- Added with resist high temperature rare element, inserts shows a good capability against plastic deformation and good capability of Red Hardness.
- Unique manufacturing technology improves high temperature toughness and wear resistance of substrate.



Application fields: YBM153 is suitable for finishing and semi-finishing of stainless steel with high cutting efficiency under stable working condition. Such as medium-size fluid valve components in petrochemical industry, flange and other parts in auto pipeline, valve and valve body in auto engine systems, ship mechanical parts, aviation hydraulic parts, adapting pieces in IT and semiconductor industry, medium and long-axis in food processing machinery, construction machinery and general machinery.



YBM253



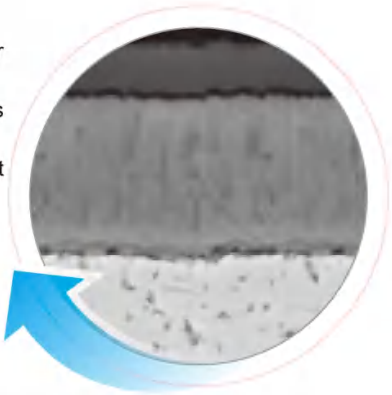
Ideal grade for turning of stainless steel with high cutting depth and high feed rate under bad working condition

Coating

- Ultra-fine grain coating technology provides better wear resistance and toughness;
- Improved remain internal stress design ensures good toughness and anti-cracking performance;
- Polishing treatment on coating surface makes it suitable for cutting adhesive materials.

Substrate

- With gradient carbide substrate insert has better impact resistance and cutting edge strength.



Application fields: YBM253 grade is suitable for roughing of heavy stainless steel parts with high cutting depth and high feed rate under the condition with great impact.








Second generation of YBC

BLACK DIAMOND INSERTS

Achieving both higher cutting speed and longer tool life

Coated Cemented Carbide CVD

YBC152

Thick TiCN and thick Al_2O_3 coatings improve the impact toughness and abrasion resistance, which makes it suitable for finishing and semi-finishing of steel at high speed. Cutting speed can increase by more than 25%, while the tool life can increase by more than 30% at the same cutting speed.

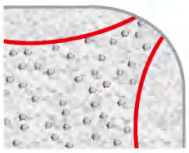
YBC252

Comprising of thick TiCN and thick Al_2O_3 coatings, the grade has high capability against plastic deformation and good hardness of cutting edge. It is preferred grade for machining of steel from finishing to roughing. Under the same cutting conditions, the cutting speed can be increased by more than 25%, while the tool life can be 30% longer under the same cutting speed.

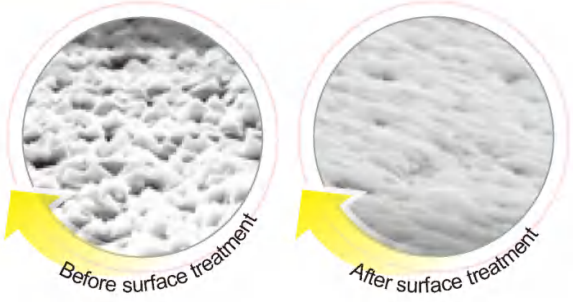
YBC352

Thickness TiCN and Al_2O_3 coating, with strongest toughness and plastic deformation resistance, the ideal grade for high efficient steel rough machining under the bad condition.

- Perfect unification of toughness and anti-plastic deformation.
  Specially designed cutting edge with “skeleton” realizes perfect unification of toughness and anti-plastic deformation.



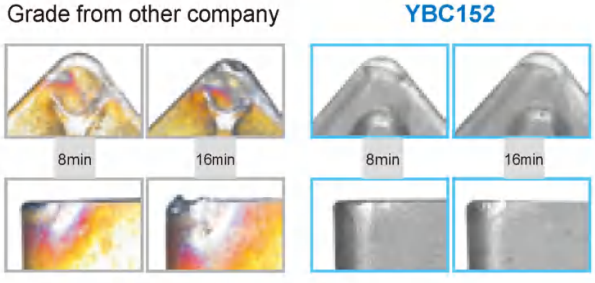
- Roughness of insert surface is improved after special treatment on surface, which effectively reduces cutting forces, prevents workpiece adhering to surface of inserts and improves operation stability of inserts.

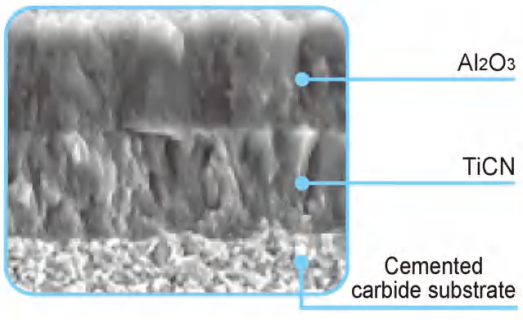


- The perfect combination of fibrous TiCN and fine grain Al_2O_3 obviously improves abrasion resistance and anti-breakage of inserts.

Test comparison of inserts abrasion

Workpiece material： 45#steel
Inserts：CNMG120408-DM
Cutting parameters：Vc=400m/min a_p=1mm fn=0.2mm/r







YBD052

CVD coated grade, which is characterized by super fine grain and smooth surface, is the combination of hard substrate and coating (extra thick Al_2O_3 + thick TiCN). The grade is optimized for best wear resistance when machining gray cast iron at high speed under dry condition.

YBD102

CVD coated grade, which is the combination of hard substrate and coating (thick Al_2O_3 + thick TiCN), shows excellent wear resistance and impact resistance when machining nodular cast iron at high speed.

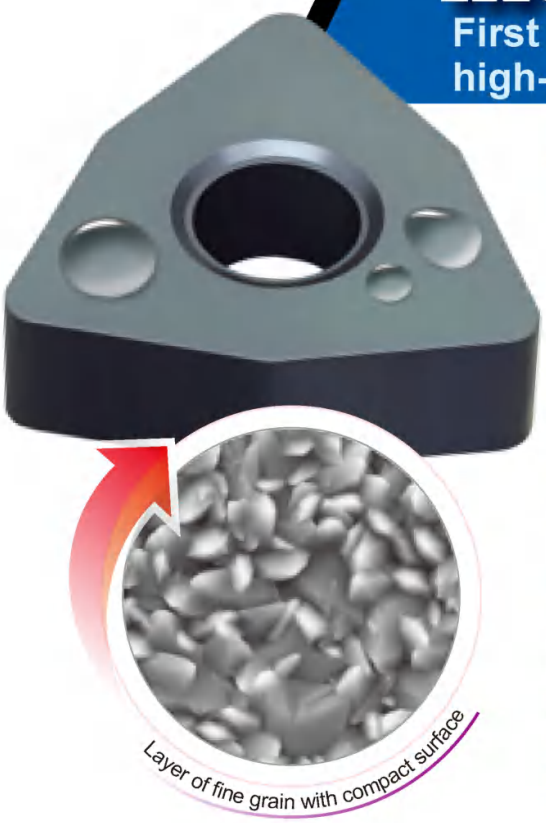
YBD152

CVD coated grade, which is the combination of hard substrate and coating (medium thick Al_2O_3 + thick TiCN), has good flaking resistance. It is suitable for turning of cast iron at high speed, and light intermittent cutting can be supported even at moderate speed. It is also suitable for milling of cast iron.

Coated Cemented Carbide CVD

BLACK DIAMOND INSERTS YBD

First choice for high-efficiency and high-speed machining of cast iron

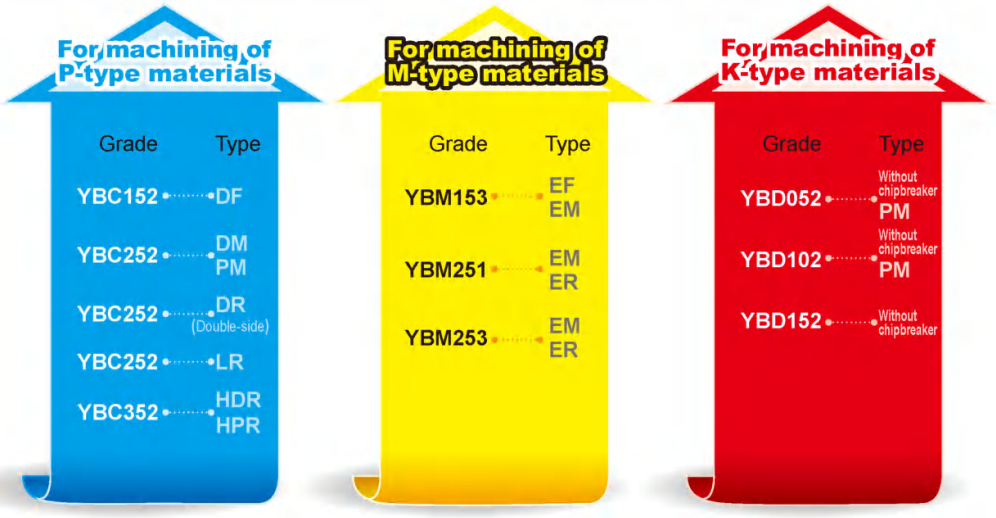


- The combination of thick coating and substrate with good hardness and impact resistance gives the inserts excellent impact resistance and stability under high temperature, and improves wear resistance of inserts. Inserts also satisfy the requirements of high speed and high feed rate when machining cast iron.
- The appearance of shining full black is easily identified.

Significant results

- Working efficiency has been improved. Both the coating and the substrate are suitable for machining cast iron at high speed and high feed rate. **Cutting speed can be increased by 30% to 40%.**
- Cost is reduced as tool life **is increased by 40%-50%.**
- High machining stability.

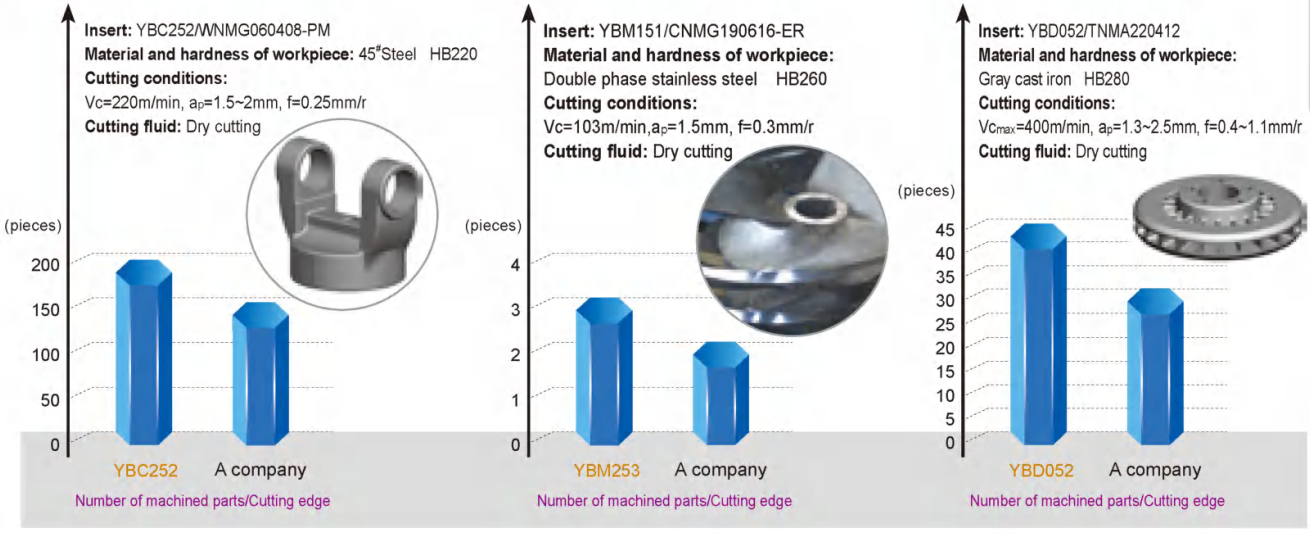
Recommended combination of grade and chipbreaker



Recommended cutting parameters

Workpiece material	Range of machining	Grade	Recommended cutting speed (m/min)
P Steel	For finishing	YBC152	220-500
	For semi-finishing	YBC252	180-480
	For roughing	YBC352	130-380
M Stainless steel	For finishing	YBM153	110-280
	For semi-finishing	YBM251	
	For roughing	YBM253	
K Cast iron	For finishing	YBD052	200-500
		YBD102	200-480
	For semi-finishing	YBD152	190-450

Case



Coated Cemented Carbide PVD

makes it easy to machine materials which are hard to be machined

New nano coating grade

- Special coating techniques make inserts smooth, which leads to low friction and unobstructed chip flow.
- Unique coating with nano structure closely integrates with substrate, ensuring higher hardness and toughness.
- Excellent thermal stability and chemical stability can effectively protect cutting edge.





nc-TiAlN coating (YBG202)

TiAlN base multi-elements coating(YBG105)

High-performance nanostructure coating guarantees good toughness and hardness of inserts. Special coating technology guarantees smooth surface and excellent wear resistance. Outstanding thermal stability and chemical stability effectively protect cutting edge.

YBG102

The combination of nc-TiAlN coating and fine grain substrate makes it suitable for turning of various materials and finishing and semi-finishing of high-temperature alloys.

YBG202

nc-TiAlN coating and ultra-fine grain substrate makes it suitable for finishing and semi-finishing of various materials and turning of super alloy.

YBG302

The combination of nc-TiAlN coating and tough cemented carbide substrate, which integrates security and wear resistance, makes it suitable for parting and grooving of various materials.

YBG105

Finishing and semi-finishing for materials difficult to cut PVD coated grade

PVD coated grade, new TiAlN based multilayer coating, has higher wear resistance and Anti-thermal-oxidation ability. It is suitable for finishing and semi-finishing turning of various materials difficult to cut, such as high temperature alloy, heat resistant alloy, etc.

YBG205

PVD coating grade for finishing of stainless steel

Suitable for relatively small workpieces which require high surface smoothness.

Superfine TiAlN nano coating added with wear-resistant and heat-resistant rare elements has high hardness and excellent heat-resistance, providing effective protection for the cutting edge. Special coating technology ensures stronger combination of coating and substrate. It is suitable for extra finishing of stainless steel.

YBG205H New

It adopts high-cobalt ultra-fine grain matrix, and through special sintering process and tungsten toughness enhancement technology, the wear resistance, impact resistance and high temperature oxidation resistance are greatly improved. The new TiAlN-based composite coating effectively improves the hardness, thermal shock resistance, and crack expansion resistance of the coating, and is suitable for fine and semi-finish turning of stainless steel.

YBG212

Nc-TiAlN coating combined with super tough substrate which made of super fine grain.It's suitable for finishing and roughing materials which are hard to be machined.

YBH053 New

Special high hard material processing grade

The high cobalt ultrafine particles are evenly distributed by special sintering process;
Excellent thermal conductivity and high temperature resistance, greatly improve the thermal crack resistance and plastic deformation resistance of the substrate, effectively prevent abnormal cutting edge failure;
Excellent red hardness and wear resistance of the substrate, greatly improve the life of the substrate, delay the size change of processing.

YBM215 New

PVD coating of multiple layer nanometer

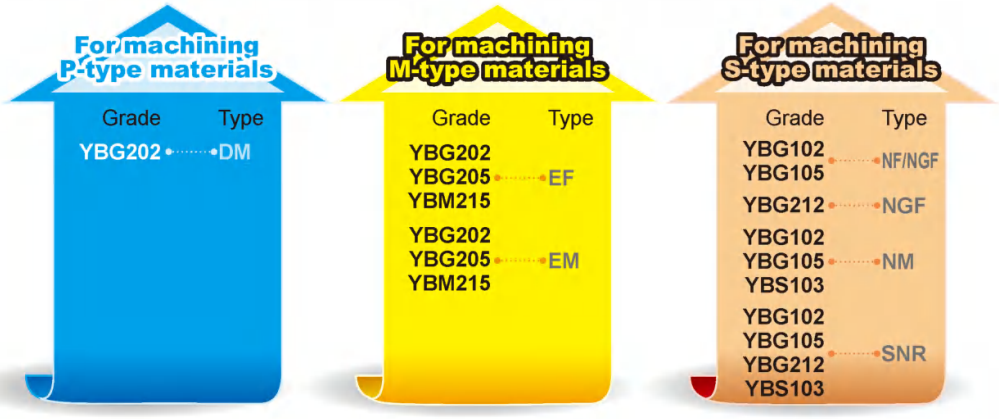
Improved capability of grade's wear resistance and anti-high temperature increases the strength between grade and substrate and the tool stability. This grade is very suitable for turning for stainless steel.

YBS103 New

Turning grade for Ni-based S material

Fine wear resistance, and good capability against built-up edge and heat resistance. Suitable for turning of Ni-based materials.

Recommended combination of grade and chipbreaker



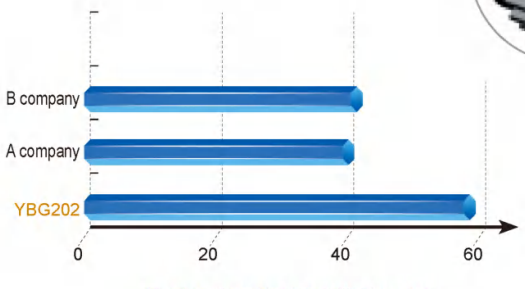
Recommended cutting parameters

Workpiece material	Range of machining	Grade	Recommended cutting speed (m/min)
P Steel	For finishing	YBG102	180-460
	For semi-finishing	YBG202 YBG205	150-380
M Stainless steel	For finishing ~ for semi-finishing	YBG202 YBG205 YBM215	170-300
S Heat resistant alloy Ti alloy	For finishing ~ for semi-finishing	YBG102	30-60
		YBG105	40-70
		YBG212	30-50
		YBS103	40-90
	For roughing	YBG102	20-40
		YBG105	30-40
		YBG212	20-40
		YBS103	20-50

Case

Insert: YBG202/TNMG120404-EF
Hardness and material of workpiece: 0Cr18Ni9 HB240
Cutting conditions: Vc=200m/min, a_p=1mm, f=0.15mm/r
Cutting fluid: Dry cutting

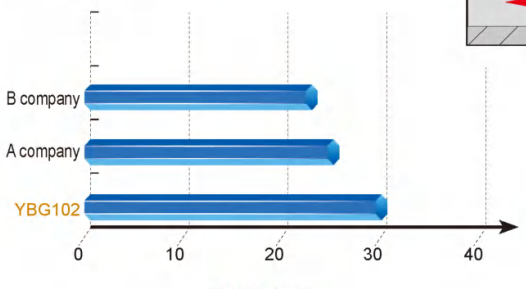




Number of machined parts/Cutting edge

Insert: YBG102/DNEG150404-NF
Hardness and material of workpiece:
High temperature alloy Inconel 718 HRC≥39
Cutting conditions: Vc=80m/min, a_p=0.3mm, f=0.15mm/r
Cutting fluid: Dry cutting





Tool life (min)

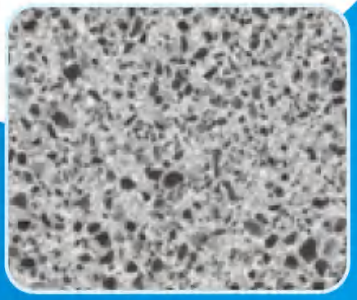
Cermet & Coated Cermet

The chemical stability between Ti(CN) base cermet inserts and workpieces is relatively high, which reduces the friction and temperature of the cutting edge during cutting, preventing mutual diffusion of atoms of the workpiece material and the inserts, and improving resistance to bonding abrasion. Therefore, Ti(CN) base cermet shows good capability of Red Hardness and resistance to crater wear. It is an optimal material for high-speed finishing and semi-finishing of steel. High temperature strength of cermet is higher than that of WC-Co, and toughness better than that of Al_2O_3 and Si_3N_4 ceramic. This fulfils the application blank of WC-base cemented carbide and Al_2O_3 and Si_3N_4 ceramic from finishing to semi-finishing at high speed.

Product features

Scientifically designed structure ensures good material performance and long tool life. Refined production management assures the stability of product quality.

- Symmetrical fine grain organization, together with the control of symmetrical organization and toric phase structure, improves the strength and hardness of cermet.
- Intensified bonding phase and well-designed grain boundary improve the high temperature capacity, heat conductibility and thermal vibration resistance.
- Coating of Physical Vapor Deposition (PVD) is applied to cermet substrate with high toughness, so that the grade has high hardness and toughness with wide-range application.



Substrate of cermet grade of YNG151 (homogenized ultra-fine structure)



PVD coating organization structure of cermet

Recommended cutting parameters

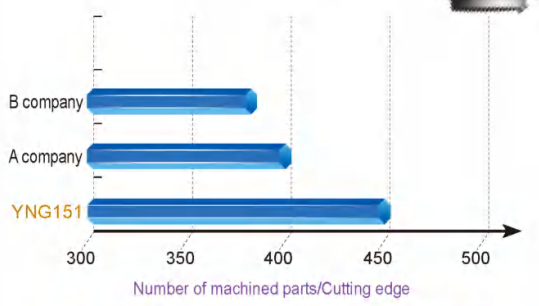
Workpiece material	Range of machining	Grade	Recommended cutting speed (m/min)
P Steel	For finishing	YNG151	260-550
		YNG151C	260-580
M Stainless steel		YNG151	170-330
		YNG151C	160-350
K Cast iron		YNG151	250-400
		YNG151C	270-420



Case

Insert: YNG151/CNMG120404-SF
Hardness and material of workpiece:
20CrMnTi HB180-223
Cutting parameters: V_C=220m/min
a_p=0.5~1.0mm
f=0.14mm/r





Outstanding chip breaking Good surface quality

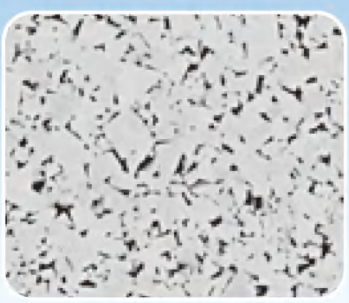




Substrate of YD101: the combination of cemented carbide phrase WC of fine grain and bonding phase Co

Cemented Carbide Grade

Uncoated cemented carbide grade is widely used for machining of non-ferrous metal, high temperature alloy, etc. It is economical and can be universally applied.



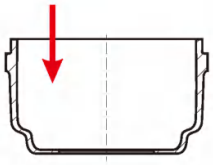
Substrate of YD201: the combination of cemented carbide phase WC of middle grain and bonding phase Co

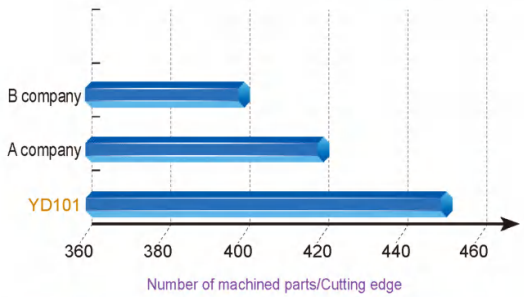
Recommended cutting parameters

Workpiece material	Range of machining	Grade	Recommended cutting speed (m/min)
K Cast iron	For semi-finishing For roughing	YD201	60-130
N Non-ferrous metal	For finishing For semi-finishing	YD101	110-1750
S Heat resistant alloy Ti alloy	For finishing	YD101	20-50

Case

Insert: YD101/CCGX09T304-LH
Workpiece material: ZL105 HB70
Cutting parameters: Vc=400m/min
a_p=1mm
f=0.3mm/r





Workpiece has high surface quality and high dimensional precision.

Table of correctional coefficient between material hardness and cutting speed

Workpiece material		Theoretical Hardness	Correctional coefficient between hardness of materials and cutting speed								
			Hardness decrease ← Hardness difference(Measured value – Theoretical value) → Hardness increase								
			-60	-40	-20	0	+20	+40	+60	+80	+100
P		HB180	1.42	1.24	1.11	1.0	0.91	0.84	0.77	0.72	0.67
M		HB180	1.44	1.25	1.11	1.0	0.91	0.84	0.78	0.73	0.68
K	Grey cast iron	HB220	1.21	1.13	1.06	1.0	0.95	0.90	0.86	0.82	0.79
	Nodular cast iron	HB250	1.33	1.21	1.09	1.0	0.91	0.84	0.75	0.70	0.65
N		HB75			1.05	1.0	0.95				
S		HB350			1.12	1.0	0.89				
Rockwell hardness HRC				-6	-3	0	+3	+6	+9		
H		HRC60		1.10	1.02	1.0	0.96	0.93	0.90		

Actual Cutting Speed = Recommended Cutting Speed×Correctional Coefficient of Cutting Speed

※Please find recommended cutting parameters on insert packing box.
Example: If the material you are going to machine is normal alloy steel, whose theoretical hardness is HB180, and the selected insert is CNMG120404-DF/YBC151, then the recommended cutting speed is V=150m/min. If the hardness measured value of the material is HB220, then the hardness difference value is 220-180= +40. Correctional coefficient found in the table is 0.84. Therefore, the actual applicable cutting speed is Vc=250×0.84=210m/min.

Correctional coefficient table between tool life and cutting speed

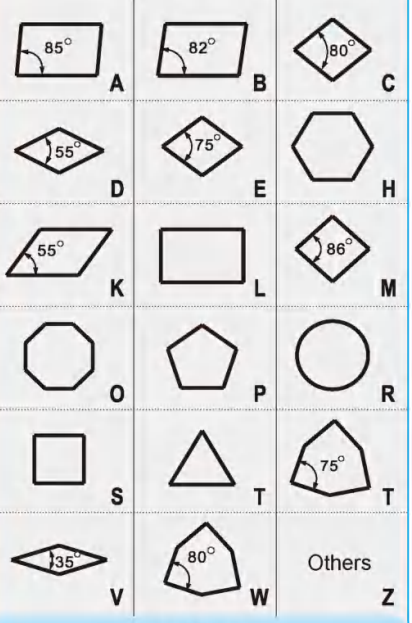
Tool life / Insert materials	Correctional coefficient between tool life and cutting speed					
	10 minutes	15 minutes (Standard life)	30 minutes	45 minutes	60 minutes	90 minutes
YBC152	1.25	1.00	0.68	0.54	0.46	0.37
YBC252	1.55	1.00	0.47	0.30	0.22	0.14
YBM153	1.32	1.00	0.64	0.48	0.37	0.31
YBM215	1.22	1.00	0.85	0.77	0.72	0.67
YBM251	1.19	1.00	0.75	0.63	0.56	0.47
YBM253	1.22	1.00	0.73	0.61	0.54	0.45
YBG202	1.10	1.00	0.85	0.77	0.72	0.66
YBG205	1.15	1.00	0.82	0.74	0.69	0.64
YBD052	1.22	1.00	0.80	0.65	0.60	0.55
YBD102	1.20	1.00	0.75	0.62	0.58	0.50
YBD152	1.11	1.00	0.70	0.60	0.50	0.40
YBG105	1.28	1.00	0.79	0.72	0.63	0.58
YBG212	1.25	1.00	0.75	0.70	0.60	0.50
YBS103	1.35	1.00	0.85	0.78	0.68	0.62

Actual cutting speed = Recommended cutting speed × Correctional coefficient of cutting speed

Example: If the material you are going to machine is normal alloy steel, and the selected insert is CNMG120404-DF/YBC151, then the recommended cutting speed is V=250m/min (standard life is 15 minutes). If you expect the tool life to reach 60 minutes, the correctional coefficient found in the table is 0.67, then the applicable cutting speed is Vc=250×0.67=167.5m/min.

General turning inserts code key

Insert shape/Code



Insert shape

Metric

Code	With/Without hole	With/Without chipbreaker	Section plane of insert	Code	With/Without hole	With/Without chipbreaker	Section plane of insert
B	With	Without	>65°	N	Without	Without	
H	With	Single-side	>65°	R	Without	Single-side	
C	With	Without	>65°	F	Without	Double-side	
J	With	Double-side	>65°	A	With	Without	
W	With	Without	≤65°	M	With	Single-side	
T	With	Single-side	≤65°	G	With	Double-side	
Q	With	Without	≤65°	X	---	---	Special
U	With	Double-side	≤65°				

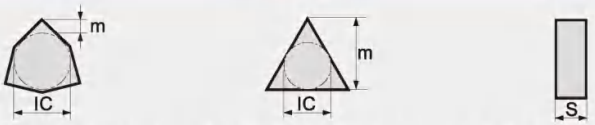
Chipbreaker and clamping system

T N M G

Clearance angle of main cutting edge

Code	Clearance angle	Code	Clearance angle
A	3°	B	5°
C	7°	D	15°
E	20°	F	25°
G	30°	N	0°
P	11°	O	Other clearance angles

Tolerance



Code	Nose height m Tolerance(mm)	Inscribed circle IC Tolerance(mm)	Thickness S Tolerance(mm)
A	±0.005	±0.025	±0.025
F	±0.005	±0.013	±0.025
C	±0.013	±0.025	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.005	±0.05-±0.13	±0.025
K	±0.013	±0.05-±0.13	±0.025
L	±0.025	±0.05-±0.13	±0.025
M	±0.08-±0.18	±0.05-±0.13	±0.13
N	±0.08-±0.18	±0.05-±0.13	±0.025
U	±0.13-±0.38	±0.08-±0.25	±0.13

(Reference) Details of M-level tolerance (Identified by shape)

● Nose height tolerance(mm)

Inscribed circle	Regular triangle	Square	Diamond with 80°	Diamond with 55°	Diamond with 35°	Round
6.35	±0.08	±0.08	±0.08	±0.11	±0.16	---
9.525	±0.08	±0.08	±0.08	±0.11	±0.16	---
12.7	±0.13	±0.13	±0.13	±0.15	---	---
15.875	±0.15	±0.15	±0.15	±0.18	---	---
19.05	±0.15	±0.15	±0.15	±0.18	---	---
25.4	---	±0.18	---	---	---	---

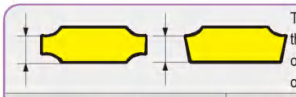
● Tolerance of inscribed circle IC(mm)

Inscribed circle	Regular triangle	Square	Diamond with 80°	Diamond with 55°	Diamond with 35°	Round
6.35	±0.05	±0.05	±0.05	±0.05	±0.05	---
9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
12.7	±0.08	±0.08	±0.08	±0.08	---	±0.08
15.875	±0.10	±0.10	±0.10	±0.10	---	±0.10
19.05	±0.10	±0.10	±0.10	±0.10	---	±0.10
25.4	---	±0.13	---	---	---	±0.13

General turning inserts code key

Diameter of IC	Insert shape C	D	R	S	T	V	W	K
3.97					06			
5.0			05					
5.56					09			
6.0			06					
6.35	06	07			11	11		
8.0			08					
9.525	09	11	09	09	16	16	06	16
10.0			10					
12.0			12					
12.7	12	15	12	12	22	22	08	
15.875	16		15	15	27			
16.0		19	16					
19.05	19		19	19	33			
20.0			20					
25.0	25	25	25					
25.4			25	25				
31.75			31					
32			32					

Length of cutting edge



Thickness is defined as the height from the bottom of insert to the highest part of cutting edge

Code	Insert thickness(mm)
00	0.79
T0	0.99
01	1.59
T1	1.98
02	2.38
T2	2.58
03	3.18
T3	3.97
04	4.76
T4	4.96
05	5.96
T5	5.95
06	6.35
T6	6.75
07	7.94
09	9.52
T9	9.72
11	11.11
12	12.70

Insert thickness

22 04 08 - DM (ISO)

4 3 2 (inch)

Inscribed circle

Code	Diameter of IC(mm)
2	6.35
3	9.525
4	12.7
5	15.875
6	19.05
8	25.4

Thickness

Code	Thickness (mm)
2	3.18
3	4.76
4	6.35
5	7.94
6	9.52

Nose radius

Code	Nose radius (mm)
0	0.2
1	0.4
2	0.8
3	1.2
4	1.6
5	2.0
6	2.4

Nose radius code

Code	Nose radius (mm)
00	No radius
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
32	3.2
X	Others
Diameter of insert (Metric)	Round insert

Chipbreaker code

DF	DM	DR
HF	HM	HR
EF	EM	ER
NF	NM	SF
PM	SNR	

Metric-inch comparison table for general turning inserts

Metric and inch comparison table for negative inserts

C-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	090304	321	-XF -XM -DF -SF -EF -NF -PM -DM -EM -NM -DR -ER -LR -HDR -HPR -SNR
	090308	322	
	120404	431	
	120408	432	
	120412	433	
	120416	434	
	160608	542	
	160612	543	
	160616	544	
	190608	642	
	190612	643	
	190616	644	
	190624	646	
	250724	856	
	250732	858	
	250924	866	
	250932	868	

D-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	110404	331	-XF -XM -EF -DF -SF -NF -PM -DM -EM -NM -DR -ER -LR -HDR -SNR -NGF
	110408	332	
	110412	333	
	150404	431	
	150408	432	
	150412	433	
	150604	441	
	150608	442	
	150612	443	
	150616	444	
	190608	542	
	190612	543	

V-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	160404	331	-XF -XM -DF -EF -SF -NF -PM -DM -EM -NM -SNR -NGF
	160408	332	
	160412	333	

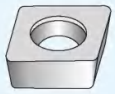
R-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	120400	43	

W-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	06T304	3(2.5)1	-XF -XM -DF -SF -EF -NF -PM -DM -EM -NM -DR -SNR
	06T308	3(2.5)2	
	06T312	3(2.5)3	
	060404	331	
	060408	332	
	060412	333	
	080404	431	
	080408	432	
	080412	433	

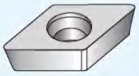
T-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	110304	221	-XF -XM -DF -SF -EF -PM -DM -EM -DR -ER -LR -HDR -SNR
	110308	222	
	160404	331	
	160408	332	
	160412	333	
	220404	431	
	220408	432	
	220412	433	
	220416	434	
	270608	542	
	270612	543	
	270616	544	

S-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	090304	321	-XF -XM -DF -SF -EF -PM -DM -EM -NM -DR -ER -LR -HDR -HPR -SNR
	090308	322	
	090312	323	
	120404	431	
	120408	432	
	120412	433	
	120416	434	
	150608	542	
	150612	543	
	150616	544	
	190412	633	
	190424	636	
	190612	643	
	190616	644	
	250724	856	
	250732	858	
	250924	866	
	250932	868	

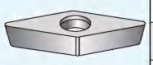
Metric and inch comparison table for positive insert

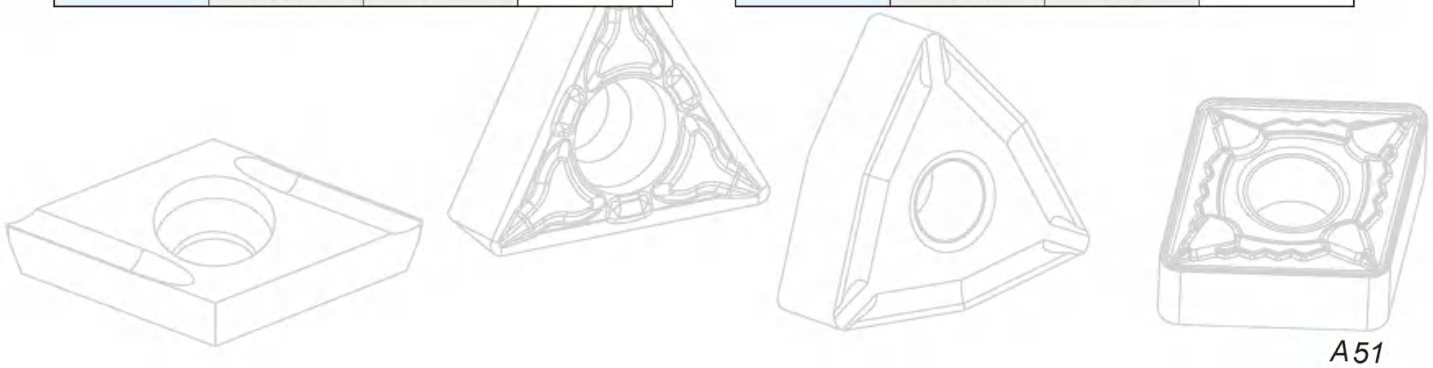
C-type positive angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	060202	2(1.5)0	-XF -XM -SF -HF -EF -HM -EM -HR -LH -LC
	060204	2(1.5)1	
	060208	2(1.5)2	
	09T302	3(2.5)0	
	09T304	3(2.5)1	
	09T308	3(2.5)2	
	120404	431	
	120408	432	
	120412	433	

T-type positive angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	06T102	1.2(1.2)0	
	06T104	1.2(1.2)1	
	06T108	1.2(1.2)2	
	090202	1.8(1.5)0	
	090204	1.8(1.5)1	
	090208	1.8(1.5)2	
	110202	2(1.5)0	
	110204	2(1.5)1	-XF
	110208	2(1.5)2	-XM
	110302	220	-SF
	110304	221	-HF
	110308	222	-EF
	16T302	3(2.5)0	-HM
	16T304	3(2.5)1	-EM
	16T308	3(2.5)2	-HR
	16T312	3(2.5)3	-LH
	160400	330	-LC
	220408	432	
	220412	433	
	220416	434	
	270408	532	
	270412	533	
	330612	643	
	330616	644	

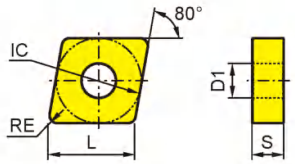
D-type positive angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	070202	2(1.5)0	-XF -XM -SF -HF -EF -HM -EM -HR -LH -LC
	070204	2(1.5)1	
	070208	2(1.5)2	
	11T302	3(2.5)0	
	11T304	3(2.5)1	
	11T308	3(2.5)2	
	11T312	3(2.5)3	

S-type positive angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	060204	2(1.5)1	
	09T302	3(2.5)0	
	09T304	3(2.5)1	-XF
	09T308	3(2.5) 2	-XM
	120404	431	-HF
	120408	432	-EF
	120412	433	-HM
	150404	531	-EM
	150408	532	-HR
	150412	533	-LH
	190408	632	-LC
	190412	633	
	190416	634	

V-type positive angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	110202	2(1.5)0	
	110204	2(1.5)1	-XF
	110208	2(1.5)2	-XM
	110302	220	-SF
	110304	221	-HF
	110308	222	-NF
	160402	330	-LH
	160404	331	-LC
	160408	332	-NGF
	160412	333	



CN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊 😐 😊 😐 ☹ 😊 😐 😐 ☹ 😊 😊 😊
M	Stainless steel	😊 😐 😐 😊 😊 😊 😐 😐
K	Cast iron	☹ 😊 😊 😐 😐 ☹ 😐 ☹
N	Non-ferrous metal	😐 ☹
S	Heat resistant alloy, Ti alloy	😊 😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
XF	CNMG120404-XF	12.9	12.7	4.76	5.16	0.4	★	★																						
	CNMG120408-XF	12.9	12.7	4.76	5.16	0.8	★	★																						
	CNMG120412-XF	12.9	12.7	4.76	5.16	1.2	★	★																						
For finishing																														
DF	CNMG090304-DF	9.7	9.525	3.18	3.81	0.4			○	○				○																
	CNMG090308-DF	9.7	9.525	3.18	3.81	0.8			○	○																				
	CNMG120404-DF	12.9	12.7	4.76	5.16	0.4			★	★				○							○						○			
	CNMG120408-DF	12.9	12.7	4.76	5.16	0.8			★	★				○							○						●			
For finishing	CNMG120412-DF	12.9	12.7	4.76	5.16	1.2			★	○											○									
SF	CNMG090304-SF	9.7	9.525	3.18	3.81	0.4						○															○			
	CNMG090308-SF	9.7	9.525	3.18	3.81	0.8						○															○	★		
	CNMG120404-SF	12.9	12.7	4.76	5.16	0.4						○						★										★		
	CNMG120408-SF	12.9	12.7	4.76	5.16	0.8						○						★										★		
For finishing	CNMG120412-SF	12.9	12.7	4.76	5.16	1.2						○															○			
EF	CNMG090304-EF	9.7	9.525	3.18	3.81	0.4								●	★				★	○										
	CNMG090308-EF	9.7	9.525	3.18	3.81	0.8								○	★				★	○										
	CNMG120404-EF	12.9	12.7	4.76	5.16	0.4								●	★				★	★										
	CNMG120408-EF	12.9	12.7	4.76	5.16	0.8						●		●	★				★	★										
For finishing	CNMG120412-EF	12.9	12.7	4.76	5.16	1.2								○	★				★	★										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DCLNR/L KAPR:95°
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PCBNR/L KAPR:75°
A142

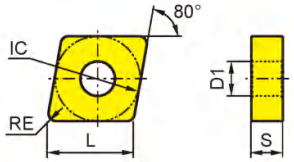

PCLNR/L KAPR:95°
A143


MCBNR/L KAPR:75°
A154


MCLNR/L KAPR:95°
A155


PCLNR/L KAPR:95°
A194

CN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YB9315	YB9320	YBH053	YBM153	YBM215	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
ADF	CNMG120404-ADF	12.9	12.7	4.76	5.16	0.4											★	★												
	CNMG120408-ADF	12.9	12.7	4.76	5.16	0.8											★	★												
	CNMG120412-ADF	12.9	12.7	4.76	5.16	1.2											★	★												
For finishing																														
NF	CNEG120404-NF	12.9	12.7	4.76	5.16	0.4						●	★										★						○	
	CNEG120408-NF	12.9	12.7	4.76	5.16	0.8						○	★																○	
	CNEG120412-NF	12.9	12.7	4.76	5.16	1.2						○	★																○	
For finishing																														
PM	CNMG090304-PM	9.7	9.525	3.18	3.81	0.4			★	○																				
	CNMG090308-PM	9.7	9.525	3.18	3.81	0.8			○	○																★				
	CNMG120404-PM	12.9	12.7	4.76	5.16	0.4			★	★															★	★				
	CNMG120408-PM	12.9	12.7	4.76	5.16	0.8			★	★															★	★				
	CNMG120412-PM	12.9	12.7	4.76	5.16	1.2			○	★															★	★				
	CNMG120416-PM	12.9	12.7	4.76	5.16	1.6			★	○															★	○				
	CNMG160608-PM	16.1	15.875	6.35	6.35	0.8			○	○															○	○				
	CNMG160612-PM	16.1	15.875	6.35	6.35	1.2			○	○															★	○				
	CNMG160616-PM	16.1	15.875	6.35	6.35	1.6				○															○	○				
	CNMG190608-PM	19.3	19.05	6.35	7.94	0.8			★	○																★				
	CNMG190612-PM	19.3	19.05	6.35	7.94	1.2			★	★															○	★				
	CNMG190616-PM	19.3	19.05	6.35	7.94	1.6			★	○															○					

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



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A143



A154



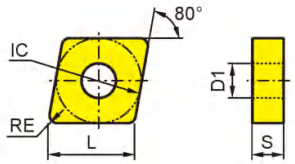
A155



A194

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

CN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
XM  For semi-finishing	CNMG120404-XM	12.9	12.7	4.76	5.16	0.4	★	★																						
	CNMG120408-XM	12.9	12.7	4.76	5.16	0.8	★	★																						
	CNMG120412-XM	12.9	12.7	4.76	5.16	1.2	★	★																						
	CNMG120416-XM	12.9	12.7	4.76	5.16	1.6	★	★																						
	CNMG160608-XM	16.1	15.875	6.35	6.35	0.8	★	★																						
	CNMG160612-XM	16.1	15.875	6.35	6.35	1.2	★	★																						
	CNMG160616-XM	16.1	15.875	6.35	6.35	1.6	★	★																						
	CNMG190608-XM	19.3	19.05	6.35	7.97	0.8	★	★																						
	CNMG190612-XM	19.3	19.05	6.35	7.97	1.2	★	★																						
	CNMG190616-XM	19.3	19.05	6.35	7.97	1.6	★	★																						
DM  For semi-finishing	CNMG090304-DM	9.7	9.525	3.18	3.81	0.4			○	○											●									
	CNMG090308-DM	9.7	9.525	3.18	3.81	0.8				○											●									
	CNMG120404-DM	12.9	12.7	4.76	5.16	0.4			★	★				●		○					●						●			
	CNMG120408-DM	12.9	12.7	4.76	5.16	0.8			★	★				●		●					●						●			
	CNMG120412-DM	12.9	12.7	4.76	5.16	1.2			★	★				○							●									
	CNMG120416-DM	12.9	12.7	4.76	5.16	1.6				○											○									
	CNMG160608-DM	16.1	15.875	6.35	6.35	0.8			★	★											●									
	CNMG160612-DM	16.1	15.875	6.35	6.35	1.2			○	★											○									
	CNMG160616-DM	16.1	15.875	6.35	6.35	1.6			★	○											○									
	CNMG190608-DM	19.3	19.05	6.35	7.94	0.8			○	○											○									
	CNMG190612-DM	19.3	19.05	6.35	7.94	1.2			★	★											○									
	CNMG190616-DM	19.3	19.05	6.35	7.94	1.6				★											○									

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DCLNR/L KAPR:95°
Page A136


PCBNR/L KAPR:75°
A142

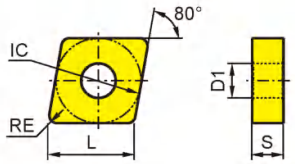

PCLNR/L KAPR:95°
A143


MCBNR/L KAPR:75°
A154


MCLNR/L KAPR:95°
A155


PCLNR/L KAPR:95°
A194

CN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐😐😐☹😊 😊😊
M	Stainless steel	😊 😐😐😐😐 😊😊😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YB9315	YBG302	YBH053	YBM153	YBM215	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
EM	CNMG120404-EM	12.9	12.7	4.76	5.16	0.4								●	★	★					★	★								
	CNMG120408-EM	12.9	12.7	4.76	5.16	0.8								●	★	★					★	★								
	CNMG120412-EM	12.9	12.7	4.76	5.16	1.2								●	★						★	★								
	CNMG160608-EM	16.1	15.875	6.35	6.35	0.8						○		○	★						○	★								
	CNMG160612-EM	16.1	15.875	6.35	6.35	1.2								○	★						○	★								
	CNMG160616-EM	16.1	15.875	6.35	6.35	1.6								○	★						○	★								
EG	CNMG120404-EG	12.9	12.7	4.76	5.16	0.4											★													
	CNMG120408-EG	12.9	12.7	4.76	5.16	0.8											★													
	CNMG120412-EG	12.9	12.7	4.76	5.16	1.2											★													
EH	CNMG120408-EH	12.9	12.7	4.76	5.16	0.8											★													
NM	CNMG120404-NM	12.9	12.7	4.76	5.16	0.4						○	★										★							○
	CNMG120408-NM	12.9	12.7	4.76	5.16	0.8						●	★										★							○
	CNMG120412-NM	12.9	12.7	4.76	5.16	1.2						○	★										○							○

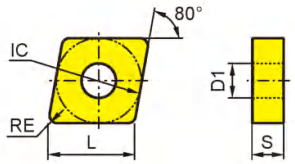
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

DCLNR/L KAPR:95°	PCBNR/L KAPR:75°	PCLNR/L KAPR:95°	MCBNR/L KAPR:75°	MCLNR/L KAPR:95°	PCLNR/L KAPR:95°
					
Page A136	A142	A143	A154	A155	A194

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

CN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
LR  Light-load roughing	CNMM120408-LR	12.9	12.7	4.76	5.16	0.8			★																					
	CNMM120412-LR	12.9	12.7	4.76	5.16	1.2			★																					
	CNMM120416-LR	12.9	12.7	4.76	5.16	1.6			★																					
	CNMM160608-LR	16.1	15.875	6.35	6.35	0.8			★																					
	CNMM160612-LR	16.1	15.875	6.35	6.35	1.2			★																					
	CNMM160616-LR	16.1	15.875	6.35	6.35	1.6			★																					
	CNMM160624-LR	16.1	15.875	6.35	6.35	2.4			★																					
	CNMM190612-LR	19.3	19.05	6.35	7.94	1.2			★																					
	CNMM190616-LR	19.3	19.05	6.35	7.94	1.6			★																					
	CNMM190624-LR	19.3	19.05	6.35	7.94	2.4			★																					
	CNMM250924-LR	25.79	25.4	9.525	9.12	2.4			★																					
DR  Light-load roughing	CNMG120408-DR	12.9	12.7	4.76	5.16	0.8			★	★												●			●					
	CNMG120412-DR	12.9	12.7	4.76	5.16	1.2			○	★												●			●					
	CNMG120416-DR	12.9	12.7	4.76	5.16	1.6			○	○												●			●					
	CNMG160608-DR	16.1	15.875	6.35	6.35	0.8				○												○								
	CNMG160612-DR	16.1	15.875	6.35	6.35	1.2				★												●			○					
	CNMG160616-DR	16.1	15.875	6.35	6.35	1.6				★																				
	CNMG190608-DR	19.3	15.875	6.35	7.94	0.8				○												●			○					
	CNMG190612-DR	19.3	19.05	6.35	7.94	1.2			○	★												○			○					
	CNMG190616-DR	19.3	19.05	6.35	7.94	1.6			○	★															○					
	CNMG190624-DR	19.3	19.05	6.35	7.94	2.4			○	○																				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DCLNR/L KAPR:95°
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PCBNR/L KAPR:75°
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PCLNR/L KAPR:95°
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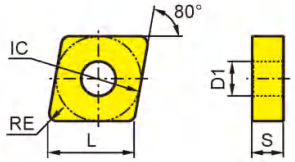
MCBNR/L KAPR:75°
A154


MCLNR/L KAPR:95°
A155


PCLNR/L KAPR:95°
A194

CN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition 😞

Workpiece material		
P	Steel	😊😐😊😐😞😊 😐😐 😞😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐😞 😞
N	Non-ferrous metal	😐😞
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
DR  For roughing	CNMM120412-DR	12.9	12.7	4.76	5.16	1.2			○																				
	CNMM160612-DR	16.1	15.875	6.35	6.35	1.2			○																				
	CNMM160616-DR	16.1	15.875	6.35	6.35	1.6			○																				
	CNMM190612-DR	19.3	19.05	6.35	7.94	1.2			○																				
	CNMM190616-DR	19.3	19.05	6.35	7.94	1.6			★																				
	CNMM190624-DR	19.3	19.05	6.35	7.94	2.4			○																				
	CNMM250924-DR	25.79	25.4	9.525	9.12	2.4			★																				
ER  For roughing	CNMG120408-ER	12.9	12.7	4.76	5.16	0.8															★								
	CNMG120412-ER	12.9	12.7	4.76	5.16	1.2															★								
	CNMG160612-ER	16.1	15.875	6.35	6.35	1.2															★								
	CNMG160616-ER	16.1	15.875	6.35	6.35	1.6															★								
	CNMG190612-ER	19.3	19.05	6.35	7.94	1.2															★								
	CNMG190616-ER	19.3	19.05	6.35	7.94	1.6															★								
ER  For roughing	CNMM250724-ER	25.79	25.4	7.94	9.12	2.4				★											★								
	CNMM250732-ER	25.79	25.4	7.94	9.12	3.2				★											★								
	CNMM250924-ER	25.79	25.4	9.525	9.12	2.4				★											★								
	CNMM250932-ER	25.79	25.4	9.525	9.12	3.2				★											★								
SNR  For roughing	CNMG120408-SNR	12.9	12.7	4.76	5.16	0.8						○	●		○							★							
	CNMG120412-SNR	12.9	12.7	4.76	5.16	1.2						○	●		○							★							
	CNMG160608-SNR	16.1	15.875	6.35	6.35	0.8						○	●		○							★							
	CNMG190616-SNR	19.3	19.05	6.35	7.94	1.6						○	●		○							★							

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DCLNR/L KAPR:95°
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PCBNR/L KAPR:75°
A142


PCLNR/L KAPR:95°
A143

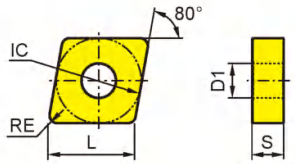

MCBNR/L KAPR:75°
A154


MCLNR/L KAPR:95°
A155


PCLNR/L KAPR:95°
A194

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

CN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152C	YNG151	YNG151C	YD101	YD201
HDR  For heavy machining	CNMM120408-HDR	12.9	12.7	4.76	5.16	0.8			○	○	○																		
	CNMM120412-HDR	12.9	12.7	4.76	5.16	1.2				○	○																		
	CNMM120416-HDR	12.9	12.7	4.76	5.16	1.6					○																		
	CNMM160612-HDR	16.1	15.875	6.35	6.35	1.2					○																		
	CNMM160616-HDR	16.1	15.875	6.35	6.35	1.6				○	○																		
	CNMM190616-HDR	19.3	19.05	6.35	7.94	1.6				○	○																		
	CNMM190624-HDR	19.3	19.05	6.35	7.94	2.4			○	○	○																		
HPR  For heavy machining	CNMM190616-HPR	19.5	19.05	6.35	7.94	1.6				★	○																		
	CNMM250924-HPR	25.19	25.4	9.525	9.12	2.4				★	○																		
TC 	CNMG120404-TC	12.9	12.7	4.76	5.16	0.4																			★				
	CNMG120408-TC	12.9	12.7	4.76	5.16	0.8																			★				
	CNMG120412-TC	12.9	12.7	4.76	5.16	1.2																			★				
	CNMG120416-TC	12.9	12.7	4.76	5.16	1.6																			★				
	CNMG160608-TC	16.1	15.875	6.35	6.35	0.8																			★				
	CNMG160612-TC	16.1	15.875	6.35	6.35	1.2																			★				
	CNMG160616-TC	16.1	15.875	6.35	6.35	1.6																			★				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DCLNR/L KAPR:95°
Page A158


PCBNR/L KAPR:75°
A164

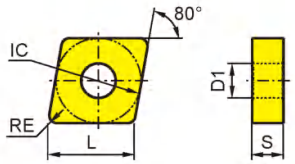

PCLNR/L KAPR:95°
A165


MCBNR/L KAPR:75°
A176


MCLNR/L KAPR:95°
A177


PCLNR/L KAPR:95°
A216

CN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
Without chipbreaker	CNMA120404	12.9	12.7	4.76	5.16	0.4																		★	○	○				
	CNMA120408	12.9	12.7	4.76	5.16	0.8																		★	★	★				
	CNMA120412	12.9	12.7	4.76	5.16	1.2																		★	★	★				
	CNMA120416	12.9	12.7	4.76	5.16	1.6																		★	★	○				
	CNMA160608	16.1	15.875	6.35	6.35	0.8																			○					
	CNMA160612	16.1	15.875	6.35	6.35	1.2																			★					
	CNMA160616	16.1	15.875	6.35	6.35	1.6																		○	★	○				
	CNMA160620	16.1	15.875	6.35	6.35	2.0																				○				
	CNMA160630	16.1	15.875	6.35	6.35	3.0																				○				
	CNMA190612	19.3	19.05	6.35	7.94	1.2																		★	○	★				
	CNMA190616	19.3	19.05	6.35	7.94	1.6																		○	★	★				
All round	CNMG120404	12.9	12.7	4.76	5.16	0.4															●				○					
	CNMG120408	12.9	12.7	4.76	5.16	0.8			★	★											●				★	★				
	CNMG120412	12.9	12.7	4.76	5.16	1.2			★	★														○	○	○				
	CNMG160608	16.1	15.875	6.35	6.35	0.8															○									
	CNMG160612	16.1	15.875	6.35	6.35	1.2																			○					
	CNMG160616	16.1	15.875	6.35	6.35	1.6																			○					
	CNMG190608	19.3	19.05	6.35	7.94	0.8																			○					
	CNMG190612	19.3	19.05	6.35	7.94	1.2																			○					
	CNMG190616	19.3	19.05	6.35	7.94	1.6																			○					

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



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A164



A165



A176



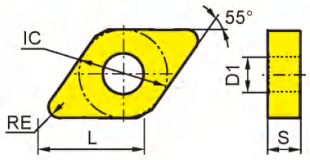
A177



A216

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

DN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
XF	DNMG110404-XF	11.6	9.525	4.76	3.18	0.4	★	★																						
	DNMG110408-XF	11.6	9.525	4.76	3.18	0.8	★	★																						
	DNMG150604-XF	15.5	12.7	6.35	5.16	0.4	★	★																						
	DNMG150608-XF	15.5	12.7	6.35	5.16	0.8	★	★																						
For finishing	DNMG150612-XF	15.5	12.7	6.35	5.16	1.2	★	★																						
DF	DNMG110404-DF	11.6	9.525	4.76	3.81	0.4			○	○																	●			
	DNMG110408-DF	11.6	9.525	4.76	3.81	0.8			○	○																				
	DNMG110412-DF	11.6	9.525	4.76	3.81	1.2			○																					
	DNMG150404-DF	15.5	12.7	4.76	5.16	0.4			★	★																				
	DNMG150408-DF	15.5	12.7	4.76	5.16	0.8			★	★																				
For finishing	DNMG150412-DF	15.5	12.7	4.76	5.16	1.2			○	○																				
	DNMG150604-DF	15.5	12.7	6.35	5.16	0.4			★	★											○									
	DNMG150608-DF	15.5	12.7	6.35	5.16	0.8			★	○																				
	DNMG150612-DF	15.5	12.7	6.35	5.16	1.2			○	○																				
SF	DNMG110404-SF	11.6	9.525	4.76	3.81	0.4						○															○	★		
	DNMG150404-SF	15.5	12.7	4.76	5.16	0.4						○															○	★		
	DNMG150408-SF	15.5	12.7	4.76	5.16	0.8						○															○	★		
	DNMG150604-SF	15.5	12.7	6.35	5.16	0.4						○															○	★		
For finishing	DNMG150608-SF	15.5	12.7	6.35	5.16	0.8						○						★									○	★		

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DDJNR/L
KAPR:93°
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PDJNR/L
KAPR:93°
A144


PDPNN
KAPR:62°30'
A145

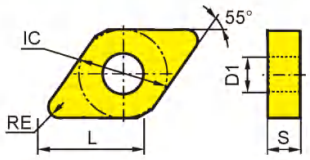

MDJNR/L
KAPR:93°
A156


MDPNN
KAPR:62°30'
A157


PDPNR/L
KAPR:62°30'
A195


PDUNR/L
KAPR:93°
A196

DN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YB9315	YB9320	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
EF	DNMG110404-EF	11.6	9.525	4.76	3.81	0.4								●	★				★	★										
	DNMG110408-EF	11.6	9.525	4.76	3.81	0.8								○	★				★	○										
	DNMG110412-EF	11.6	9.525	4.76	3.81	1.2								○	★				★	○										
	DNMG150404-EF	15.5	12.7	4.76	5.16	0.4								●	★				★	○										
	DNMG150408-EF	15.5	12.7	4.76	5.16	0.8								●	★				★	○										
	DNMG150412-EF	15.5	12.7	4.76	5.16	1.2								○	★				★	○										
	DNMG150604-EF	15.5	12.7	6.35	5.16	0.4								●	★				★	★										
	DNMG150608-EF	15.5	12.7	6.35	5.16	0.8								●	★				★	★										
	DNMG150612-EF	15.5	12.7	6.35	5.16	1.2								○	★				★	★										
ADF	DNMG110408-ADF	11.6	9.525	4.76	3.81	0.8										★	★													
	DNMG150404-ADF	15.5	12.7	4.76	5.16	0.4										★	★													
	DNMG150408-ADF	15.5	12.7	4.76	5.16	0.8										★	★													
	DNMG150412-ADF	15.5	12.7	4.76	5.16	1.2										★	★													
	DNMG150604-ADF	15.5	12.7	6.35	5.16	0.4										★	★													
	DNMG150608-ADF	15.5	12.7	6.35	5.16	0.8										★	★													
	DNMG150612-ADF	15.5	12.7	6.35	5.16	1.2										★	★													
NF	DNEG150404-NF	15.5	12.7	4.76	5.16	0.4						○	★																	○
	DNEG150408-NF	15.5	12.7	4.76	5.16	0.8						○	★																	○
	DNEG150604-NF	15.5	12.7	6.35	5.16	0.4						●	★										★							○
	DNEG150608-NF	15.5	12.7	6.35	5.16	0.8						●	★																	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DDJNR/L KAPR:93°
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PDJNR/L KAPR:93°
A144


PDPNN KAPR:62°30'
A145


MDJNR/L KAPR:93°
A156

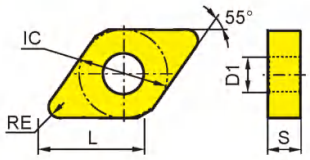

MDPNN KAPR:62°30'
A157


PDPNR/L KAPR:62°30'
A195


PDUNR/L KAPR:93°
A196

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

DN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊 😐 😊 😐 ☹ 😊 😐 😐 ☹ 😊 😊 😊
M	Stainless steel	😊 😐 😐 😊 😊 😊 😊 😊 😐 😐 😊 😊
K	Cast iron	😊 😐 ☹ ☹
N	Non-ferrous metal	😐 ☹
S	Heat resistant alloy, Ti alloy	😊 😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
NGF  For finishing	DNEG150408-NGF	15.5	12.7	4.76	5.16	0.8						○	●			○														
	DNEG150412-NGF	15.5	12.7	4.76	5.16	1.2						○	●			○														
	DNEG150608-NGF	15.5	12.7	6.35	5.16	0.8						○	●			○														
	DNEG150612-NGF	15.5	12.7	6.35	5.16	1.2						○	●			○														
PM  For semi-finishing	DNMG110404-PM	11.6	9.525	4.76	3.81	0.4			●	○															●					
	DNMG110408-PM	11.6	9.525	4.76	3.81	0.8			●	○															★	○				
	DNMG110412-PM	11.6	9.525	4.76	3.81	1.2				○																				
	DNMG150404-PM	15.5	12.7	4.76	5.16	0.4			●	○																				
	DNMG150408-PM	15.5	12.7	4.76	5.16	0.8			●	○															★	★				
	DNMG150412-PM	15.5	12.7	4.76	5.16	1.2				○		○													○	★				
	DNMG150416-PM	15.5	12.7	4.76	5.16	1.6				○																				
	DNMG150604-PM	15.5	12.7	6.35	5.16	0.4			●	○															★	★				
	DNMG150608-PM	15.5	12.7	6.35	5.16	0.8			○	★															★	★				
	DNMG150612-PM	15.5	12.7	6.35	5.16	1.2			★	★															★	○				
	DNMG150616-PM	15.5	12.7	6.35	5.16	1.6				○																				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DDJNR/L KAPR:93°
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PDJNR/L KAPR:93°
A144


PDPNN KAPR:62°30'
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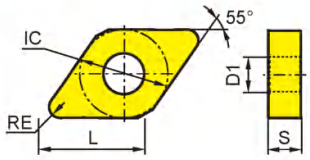
MDJNR/L KAPR:93°
A156


MDPNN KAPR:62°30'
A157


PDPNR/L KAPR:62°30'
A195


PDUNR/L KAPR:93°
A196

DN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
XM For semi-finishing	DNMG110404-XM	11.6	9.525	4.76	3.18	0.4	★	★																						
	DNMG110408-XM	11.6	9.525	4.76	3.18	0.8	★	★																						
	DNMG110412-XM	11.6	9.525	4.76	3.18	1.2	★	★																						
	DNMG150404-XM	15.5	12.7	4.76	5.16	0.4	★	★																						
	DNMG150408-XM	15.5	12.7	4.76	5.16	0.8	★	★																						
	DNMG150412-XM	15.5	12.7	4.76	5.16	1.2	★	★																						
	DNMG150604-XM	15.5	12.7	6.35	5.16	0.4	★	★																						
	DNMG150608-XM	15.5	12.7	6.35	5.16	0.8	★	★																						
	DNMG150612-XM	15.5	12.7	6.35	5.16	1.2	★	★																						
	DNMG150616-XM	15.5	12.7	6.35	5.16	1.6	★	★																						
DM For semi-finishing	DNMG110404-DM	11.6	9.525	4.76	3.81	0.4			●	○											○									
	DNMG110408-DM	11.6	9.525	4.76	3.81	0.8			★	★											●									
	DNMG110412-DM	11.6	9.525	4.76	3.81	1.2			○	○																				
	DNMG150404-DM	15.5	12.7	4.76	5.16	0.4			○	★																	○			
	DNMG150408-DM	15.5	12.7	4.76	5.16	0.8			★	★																	●			
	DNMG150412-DM	15.5	12.7	4.76	5.16	1.2			★	★																				
	DNMG150416-DM	15.5	12.7	4.76	5.16	1.6				○																				
	DNMG150604-DM	15.5	12.7	6.35	5.16	0.4			★	★											●						●			
	DNMG150608-DM	15.5	12.7	6.35	5.16	0.8			★	★											●									
	DNMG150612-DM	15.5	12.7	6.35	5.16	1.2			●	★																				
	DNMG150616-DM	15.5	12.7	6.35	5.16	1.6			○	○																				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DDJNR/L
KAPR:93°
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PDJNR/L
KAPR:93°
A144


PDPNN
KAPR:62°30'
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MDJNR/L
KAPR:93°
A156

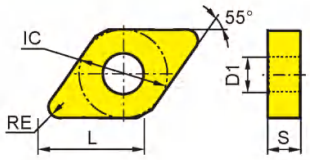

MDPNN
KAPR:62°30'
A157


PDPNR/L
KAPR:62°30'
A195


PDUNR/L
KAPR:93°
A196

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

DN□□ (Negative inserts)



Workpiece material		YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YB9315	YBG302	YBH053	YBM153	YBM215	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
P	Steel	😊	😐	😊	😐	☹	😊		😐	😐	😐	😐	☹	😊								😊	😊		
M	Stainless steel						😊		😐	😐	😐	😐			😊	😊	😐					😊	😊		
K	Cast iron																		😊	😐	☹				☹
N	Non-ferrous metal																							😐	☹
S	Heat resistant alloy, Ti alloy						😊	😊										😊						😊	

😊 Good working condition 😐 Normal working condition ☹ Bad working condition

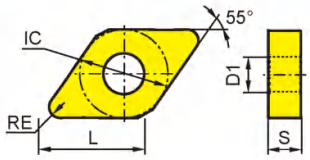
Inserts shape	Type	Dimensions(mm) L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YB9315	YBG302	YBH053	YBM153	YBM215	YBM253	YBS103	YBD052	YBD102	YBD152	Cermet YNG151	Coated cermet YNG151C	Cemented carbide YD101	YD201
EM  For semi-finishing	DNMG110404-EM	11.6	9.525	4.76	3.81	0.4								○	★						○	★								
	DNMG110408-EM	11.6	9.525	4.76	3.81	0.8								○	★						○	★								
	DNMG110412-EM	11.6	9.525	4.76	3.81	1.2								○	★						○	★								
	DNMG150404-EM	15.5	12.7	4.76	5.16	0.4								●	★	★					★	★								
	DNMG150408-EM	15.5	12.7	4.76	5.16	0.8								●	★	★					★	★								
	DNMG150412-EM	15.5	12.7	4.76	5.16	1.2								○	★						★	★								
	DNMG150604-EM	15.5	12.7	6.35	5.16	0.4						○		●	★						○	★								
	DNMG150608-EM	15.5	12.7	6.35	5.16	0.8								●	★						○	★								
	DNMG150612-EM	15.5	12.7	6.35	5.16	1.2								○	★						○	★								
EG  For semi-finishing	DNMG150404-EG	15.5	12.7	4.76	5.16	0.4											★													
	DNMG150408-EG	15.5	12.7	4.76	5.16	0.8											★													
	DNMG150604-EG	15.5	12.7	6.35	5.16	0.4											★													
	DNMG150608-EG	15.5	12.7	6.35	5.16	0.8											★													
	DNMG150612-EG	15.5	12.7	6.35	5.16	1.2											★													
NM  For semi-finishing	DNMG150412-NM	15.5	12.7	4.76	5.16	1.2						○	★										○						○	
	DNMG150612-NM	15.5	12.7	6.35	5.16	1.2						●	★										○						○	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

DDJNR/L	PDJNR/L	PDPNN	MDJNR/L	MDPNN	PDPNR/L	PDUNR/L
KAPR:93°	KAPR:93°	KAPR:62°30'	KAPR:93°	KAPR:62°30'	KAPR:62°30'	KAPR:93°
						
Page A137	A144	A145	A156	A157	A195	A196

DN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
LR	DNMM150608-LR	15.5	12.7	6.35	5.16	0.8			★																				
	DNMM150612-LR	15.5	12.7	6.35	5.16	1.2			★																				
	DNMM150616-LR	15.5	12.7	6.35	5.16	1.6			★																				
Light-load roughing																													
DR	DNMG150408-DR	15.5	12.7	4.76	5.16	0.8			○																				
	DNMG150412-DR	15.5	12.7	4.76	5.16	1.2			○																				
	DNMG150416-DR	15.5	12.7	4.76	5.16	1.6			○																				
	DNMG150608-DR	15.5	12.7	6.35	5.16	0.8			★	○															●	●				
Light-load roughing	DNMG150612-DR	15.5	12.7	6.35	5.16	1.2			○	★															○	●				
	DNMG150616-DR	15.5	12.7	6.35	5.16	1.6																			○					
DR	DNMM150608-DR	15.5	12.7	6.35	5.16	0.8			○																				
	DNMM150612-DR	15.5	12.7	6.35	5.16	1.2			○																				
	DNMM150616-DR	15.5	12.7	6.35	5.16	1.6			○																				
For roughing																													
ER	DNMG150608-ER	15.5	12.7	6.35	5.16	0.8																★								
	DNMG150612-ER	15.5	12.7	6.35	5.16	1.2																★								
For roughing																													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DDJNR/L KAPR:93°
Page A137


PDJNR/L KAPR:93°
A144


PDPNN KAPR:62°30'
A145


MDJNR/L KAPR:93°
A156

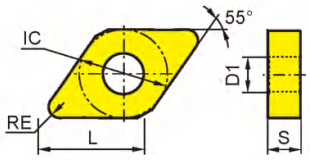

MDPNN KAPR:62°30'
A157


PDPNR/L KAPR:62°30'
A195


PDUNR/L KAPR:93°
A196

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

DN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152C	YNG151	YNG151C	YD101	YD201
ER	DNMM150608-ER	15.5	12.7	6.35	5.16	0.8																★								
	DNMM150612-ER	15.5	12.7	6.35	5.16	1.2																★								
For roughing																														
SNR	DNMG150608-SNR	15.5	12.7	6.35	5.16	0.8						○	●			○							★							
	DNMG150612-SNR	15.5	12.7	6.35	5.16	1.2						○	●			○							★							
For roughing																														
HDR	DNMM150608-HDR	15.5	12.7	6.35	5.16	0.8					○																			
	DNMM150612-HDR	15.5	12.7	6.35	5.16	1.2					○																			
For heavy machining	DNMM150616-HDR	15.5	12.7	6.35	5.16	1.6					○																			
TC	DNMG150404-TC	15.5	12.7	4.76	5.16	0.4																				★				
	DNMG150408-TC	15.5	12.7	4.76	5.16	0.8																				★				
	DNMG150412-TC	15.5	12.7	4.76	5.16	1.2																				★				
	DNMG150608-TC	15.5	12.7	6.35	5.16	0.8																				★				
	DNMG150612-TC	15.5	12.7	6.35	5.16	1.2																				★				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DDJNR/L KAPR:93°
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PDJNR/L KAPR:93°
A144


PDPNN KAPR:62°30'
A145

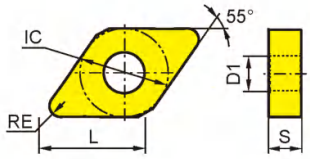

MDJNR/L KAPR:93°
A156


MDPNN KAPR:62°30'
A157


PDPNR/L KAPR:62°30'
A195


PDUNR/L KAPR:93°
A196

DN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide														Cermet	Coated cermet	Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
Without chipbreaker 	**DNMA110416**	11.6	9.525	4.76	3.81	1.6																				○				
	DNMA110424	11.6	9.525	4.76	3.81	2.4																				○				
	DNMA150404	15.5	12.7	4.76	5.16	0.4																				○				
	DNMA150408	15.5	12.7	4.76	5.16	0.8																		★	★	○				
	DNMA150604	15.5	12.7	6.35	5.16	0.4																		○	○	○				
	DNMA150608	15.5	12.7	6.35	5.16	0.8																		○	★	★				
	DNMA150612	15.5	12.7	6.35	5.16	1.2																		○	○	○				
	DNMA150616	15.5	12.7	6.35	5.16	1.6																			○	○				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DDJNR/L KAPR:93°
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PDJNR/L KAPR:93°
A144


PDPNN KAPR:62°30'
A145


MDJNR/L KAPR:93°
A156

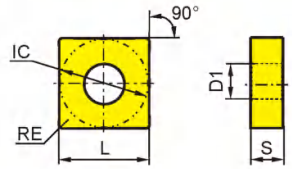

MDPNN KAPR:62°30'
A157


PDPNR/L KAPR:62°30'
A195


PDUNR/L KAPR:93°
A196

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

SN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
XF	SNMG120404-XF	12.7	12.7	4.76	5.16	0.4	★	★																						
	SNMG120408-XF	12.7	12.7	4.76	5.16	0.8	★	★																						
	SNMG120412-XF	12.7	12.7	4.76	5.16	1.2	★	★																						
For finishing																														
DF	SNMG090304-DF	9.525	9.525	3.18	3.81	0.4			○																					
	SNMG090308-DF	9.525	9.525	3.18	3.81	0.8			○																					
	SNMG120404-DF	12.7	12.7	4.76	5.16	0.4			○																					
	SNMG120408-DF	12.7	12.7	4.76	5.16	0.8			○	○																	○			
For finishing	SNMG120412-DF	12.7	12.7	4.76	5.16	1.2			○	○																				
EF	SNMG090304-EF	9.525	9.525	3.18	3.81	0.4								○	★				★	○										
	SNMG090308-EF	9.525	9.525	3.18	3.81	0.8								○	★				★	○										
	SNMG090312-EF	9.525	9.525	3.18	3.81	1.2								○	★				★	○										
	SNMG120404-EF	12.7	12.7	4.76	5.16	0.4								●	★				★	★										
	SNMG120408-EF	12.7	12.7	4.76	5.16	0.8								●	★				★	★										
For finishing	SNMG120412-EF	12.7	12.7	4.76	5.16	1.2								○	★				★	★										
	SNMG150608-EF	15.875	15.875	6.35	6.35	0.8								○	★				★	○										
	SNMG150612-EF	15.875	15.875	6.35	6.35	1.2								○	★				★	○										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DSBNR/L KAPR:75°
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PSBNR/L KAPR:75°
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PSDNN KAPR:45°
A147


PSKNR/L KAPR:75°
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PSSNR/L KAPR:45°
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MSBNR/L KAPR:75°
A158

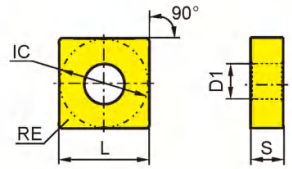

MSRNR/L KAPR:75°
A159


MSKNR/L KAPR:75°
Page A160


MSDNN KAPR:45°
A161


PSKNR/L KAPR:75°
A197

SN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YB9315	YB9320	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
ADF	SNMG120404-ADF	12.7	12.7	4.76	5.16	0.4										★	★													
	SNMG120408-ADF	12.7	12.7	4.76	5.16	0.8										★	★													
	SNMG120412-ADF	12.7	12.7	4.76	5.16	1.2										★	★													
For finishing																														
SF	SNMG090304-SF	9.525	9.525	3.18	3.81	0.4						○															○	★		
	SNMG090308-SF	9.525	9.525	3.18	3.81	0.8						○															○	★		
	SNMG120404-SF	12.7	12.7	4.76	5.16	0.4						○						★									○	★		
	SNMG120408-SF	12.7	12.7	4.76	5.16	0.8						○						★									○	★		
For finishing	SNMG120412-SF	12.7	12.7	4.76	5.16	1.2						○															○			
	SNMG150608-SF	15.875	15.875	6.35	6.35	0.8						○															○			

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DSBNR/L KAPR:75°
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PSBNR/L KAPR:75°
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PSDNN KAPR:45°
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PSKNR/L KAPR:75°
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PSSNR/L KAPR:45°
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MSBNR/L KAPR:75°
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MSRNR/L KAPR:75°
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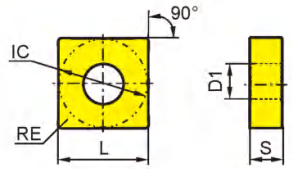
MSKNR/L KAPR:75°
Page A160


MSDNN KAPR:45°
Page A161


PSKNR/L KAPR:75°
Page A197

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

SN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
PM	SNMG090304-PM	9.525	9.525	3.18	3.81	0.4			○	○																				
	SNMG090308-PM	9.525	9.525	3.18	3.81	0.8			○	○															○					
	SNMG090312-PM	9.525	9.525	3.18	3.81	1.2			○	○																				
	SNMG120404-PM	12.7	12.7	4.76	5.16	0.4			○	○															○					
	SNMG120408-PM	12.7	12.7	4.76	5.16	0.8			●	○															★	★				
	SNMG120412-PM	12.7	12.7	4.76	5.16	1.2			●	○															★	★				
	SNMG120416-PM	12.7	12.7	4.76	5.16	1.6				○																○				
	SNMG150608-PM	15.875	15.875	6.35	6.35	0.8				○																				
	SNMG150612-PM	15.875	15.875	6.35	6.35	1.2			●	○															○	●				
	SNMG190616-PM	19.05	19.05	6.35	7.94	1.6				○																				
XM	SNMG120404-XM	12.7	12.7	4.76	5.16	0.4	★	★																						
	SNMG120408-XM	12.7	12.7	4.76	5.16	0.8	★	★																						
	SNMG120412-XM	12.7	12.7	4.76	5.16	1.2	★	★																						
	SNMG120416-XM	12.7	12.7	4.76	5.16	1.6	★	★																						
	SNMG150608-XM	15.875	15.875	6.35	6.35	0.8	★	★																						
	SNMG150612-XM	15.875	15.875	6.35	6.35	1.2	★	★																						
	SNMG150616-XM	15.875	15.875	6.35	6.35	1.6	★	★																						
	SNMG190608-XM	19.05	19.05	6.35	7.94	0.8	★	★																						
	SNMG190612-XM	19.05	19.05	6.35	7.94	1.2	★	★																						
	SNMG190616-XM	19.05	19.05	6.35	7.94	1.6	★	★																						


For semi-finishing

For semi-finishing

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DSBNR/L KAPR:75°
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PSBNR/L KAPR:75°
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PSDNN KAPR:45°
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PSKNR/L KAPR:75°
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PSSNR/L KAPR:45°
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MSBNR/L KAPR:75°
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MSRNR/L KAPR:75°
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MSKNR/L KAPR:75°
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MSDNN KAPR:45°
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PSKNR/L KAPR:75°
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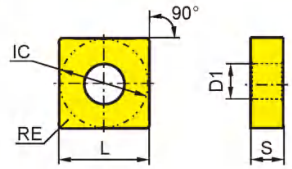
SN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YBG212	YBG302	YBH053	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
DM For semi-finishing	SNMG090304-DM	9.525	9.525	3.18	3.81	0.4			○	○																				
	SNMG090308-DM	9.525	9.525	3.18	3.81	0.8			○	○																				
	SNMG120404-DM	12.7	12.7	4.76	5.16	0.4			★	○																				
	SNMG120408-DM	12.7	12.7	4.76	5.16	0.8				○											○						○			
	SNMG120412-DM	12.7	12.7	4.76	5.16	1.2			★	★																				
	SNMG120416-DM	12.7	12.7	4.76	5.16	1.6				○																				
	SNMG150608-DM	15.875	15.875	6.35	6.35	0.8			○	○											●									
	SNMG150612-DM	15.875	15.875	6.35	6.35	1.2			●	★																				
	SNMG150616-DM	15.875	15.875	6.35	6.35	1.6				○																				
	SNMG190612-DM	19.05	19.05	6.35	7.94	1.2			○	○											○									
	SNMG190616-DM	19.0 5	19.05	6.35	7.94	1.6				○																				
EM For semi-finishing	SNMG120404-EM	12.7	12.7	4.76	5.16	0.4								●	★					★		★								
	SNMG120408-EM	12.7	12.7	4.76	5.16	0.8								●	★					★		★								
	SNMG120412-EM	12.7	12.7	4.76	5.16	1.2								●	★					★		★								
	SNMG120416-EM	12.7	12.7	4.76	5.16	1.6								○	★					○		★								
	SNMG150612-EM	15.875	15.875	6.35	6.35	1.2								●	★					○		★								
	SNMG150616-EM	15.875	15.875	6.35	6.35	1.6								○	★	★				○		★								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DSBNR/L KAPR:75°
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PSBNR/L KAPR:75°
A146


PSDNN KAPR:45°
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PSKNR/L KAPR:75°
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PSSNR/L KAPR:45°
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MSBNR/L KAPR:75°
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MSRNR/L KAPR:75°
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MSKNR/L KAPR:75°
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MSDNN KAPR:45°
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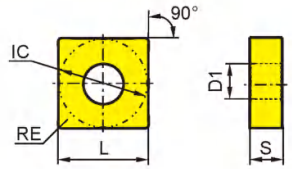
PSKNR/L KAPR:75°
A197

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

SN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐😐☹😊 😊😊
M	Stainless steel	😊 😐😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YB9315	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
EG  For semi-finishing	SNMG120404-EG	12.7	12.7	4.76	5.16	0.4										★													
	SNMG120408-EG	12.7	12.7	4.76	5.16	0.8										★													
	SNMG120412-EG	12.7	12.7	4.76	5.16	1.2										★													
NM  For semi-finishing	SNMG120408-NM	12.7	12.7	4.76	5.16	0.8						● ★											○						○
	SNMG120412-NM	12.7	12.7	4.76	5.16	1.2						○ ★											○						○
LR  Light-load roughing	SNMM120408-LR	12.9	12.7	4.76	5.16	0.8				★																			
	SNMM120412-LR	12.9	12.7	4.76	5.16	1.2				★																			
	SNMM120416-LR	12.9	12.7	4.76	5.16	1.6				★																			
	SNMM150612-LR	15.875	15.875	6.35	6.35	1.2				★																			
	SNMM150616-LR	15.875	15.875	6.35	6.35	1.6				★																			
	SNMM190612-LR	19.3	19.05	6.35	7.94	1.2				★																			
	SNMM190616-LR	19.3	19.05	6.35	7.94	1.6				★																			
	SNMM190624-LR	19.3	19.05	6.35	7.94	2.4				★																			
	SNMM250924-LR	25.79	25.4	9.525	9.12	2.4				★																			

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DSBNR/L KAPR:75°
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PSBNR/L KAPR:75°
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PSDNN KAPR:45°
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PSKNR/L KAPR:75°
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PSSNR/L KAPR:45°
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MSBNR/L KAPR:75°
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MSRNR/L KAPR:75°
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MSDNN KAPR:45°
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PSKNR/L KAPR:75°
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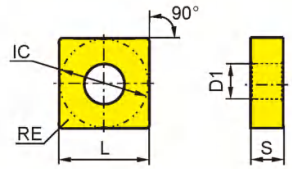
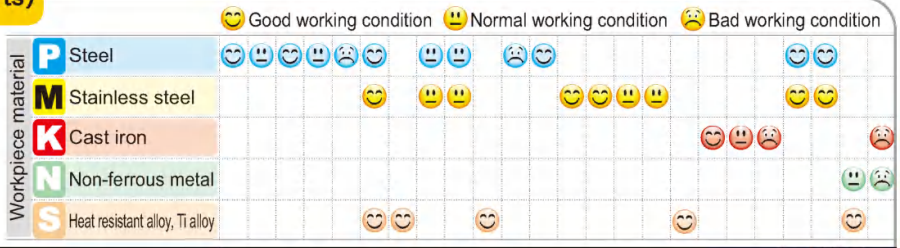
SN□□ (Negative inserts)





Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
DR Light-load roughing	SNMG120408-DR	12.7	12.7	4.76	5.16	0.8			○	★														○	○				
	SNMG120412-DR	12.7	12.7	4.76	5.16	1.2				○														○					
	SNMG120416-DR	12.7	12.7	4.76	5.16	1.6			○	○																			
	SNMG150608-DR	15.875	15.875	6.35	6.35	0.8				○																			
	SNMG150612-DR	15.875	15.875	6.35	6.35	1.2				★														○	○				
	SNMG150616-DR	15.875	15.875	6.35	6.35	1.6				★														○	○				
	SNMG150624-DR	15.875	15.875	6.35	6.35	2.4				○																			
	SNMG190612-DR	19.05	19.05	6.35	7.94	1.2				○																			
	SNMG190616-DR	19.05	19.05	6.35	7.94	1.6				★														○	○				
	SNMG190624-DR	19.05	19.05	6.35	7.94	2.4				○																			

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DSBNR/L KAPR:75°
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PSBNR/L KAPR:75°
Page A146


PSDNN KAPR:45°
Page A147


PSKNR/L KAPR:75°
Page A148


PSSNR/L KAPR:45°
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MSBNR/L KAPR:75°
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MSRNR/L KAPR:75°
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MSKNR/L KAPR:75°
Page A160


MSDNN KAPR:45°
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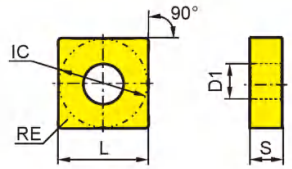
PSKNR/L KAPR:75°
Page A197

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

SN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
DR  For roughing	SNMM120408-DR	12.7	12.7	4.76	5.16	0.8			○																					
	SNMM120412-DR	12.7	12.7	4.76	5.16	1.2			○	○																				
	SNMM120416-DR	12.7	12.7	4.76	5.16	1.6			○	○																				
	SNMM150608-DR	15.875	15.875	6.35	6.35	0.8				○																				
	SNMM150612-DR	15.875	15.875	6.35	6.35	1.2				○																				
	SNMM150616-DR	15.875	15.875	6.35	6.35	1.6				○																				
	SNMM190608-DR	19.05	19.05	6.35	7.94	0.8				○																				
	SNMM190612-DR	19.05	19.05	6.35	7.94	1.2				○																				
	SNMM190616-DR	19.05	19.05	6.35	7.94	1.6			○	★																				
	SNMM190624-DR	19.05	19.05	6.35	7.94	2.4			★	○																				
	SNMM250724-DR	25.4	25.4	7.94	9.12	2.4				○																				
	SNMM250924-DR	25.4	25.4	9.525	9.12	2.4				★																				
ER  For roughing	SNMG120408-ER	12.7	12.7	4.76	5.16	0.8																★								
	SNMG120412-ER	12.7	12.7	4.76	5.16	1.2																★								
	SNMG150608-ER	15.875	15.875	6.35	6.35	0.8																★								
	SNMG150612-ER	15.875	15.875	6.35	6.35	1.2																★								
	SNMG190612-ER	19.05	19.05	6.35	7.94	1.2																★								
	SNMG190616-ER	19.05	19.05	6.35	7.94	1.6																★								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DSBNR/L KAPR:75°
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PSBNR/L KAPR:75°
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PSDNN KAPR:45°
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PSKNR/L KAPR:75°
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PSSNR/L KAPR:45°
A149


MSBNR/L KAPR:75°
A158

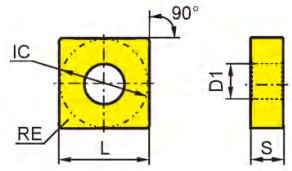

MSRNR/L KAPR:75°
A159


MSKNR/L KAPR:75°
Page A160


MSDNN KAPR:45°
A161


PSKNR/L KAPR:75°
A197

SN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
ER	SNMM250724-ER	25.4	25.4	7.94	9.12	2.4				●												★								
	SNMM250732-ER	25.4	25.4	7.94	9.12	3.2				●												★								
	SNMM250924-ER	25.4	25.4	9.525	9.12	2.4				●												★								
For roughing	SNMM250932-ER	25.4	25.4	9.525	9.12	3.2				●												★								
SNR	SNMG120408-SNR	12.7	12.7	4.76	5.16	0.8						○	●			○							★							
For roughing																														
HDR	SNMM120408-HDR	12.7	12.7	4.76	5.16	0.8					○																			
	SNMM120412-HDR	12.7	12.7	4.76	5.16	1.2					○																			
	SNMM120416-HDR	12.7	12.7	4.76	5.16	1.6					○																			
	SNMM150608-HDR	15.875	15.875	6.35	6.35	0.8					○																			
	SNMM150612-HDR	15.875	15.875	6.35	6.35	1.2					○																			
	SNMM150616-HDR	15.875	15.875	6.35	6.35	1.6					○																			
	SNMM150624-HDR	15.875	15.875	6.35	6.35	2.4					○																			
	SNMM190608-HDR	19.05	19.05	6.35	7.94	0.8					○																			
For heavy machining	SNMM190612-HDR	19.05	19.05	6.35	7.94	1.2					○																			
	SNMM190616-HDR	19.05	19.05	6.35	7.94	1.6					○	○																		
	SNMM190624-HDR	19.05	19.05	6.35	7.94	2.4					○																			
	SNMM250724-HDR	25.4	25.4	7.94	9.12	2.4				★	○																			
	SNMM250924-HDR	25.4	25.4	9.525	9.12	2.4					○																			

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DSBNR/L KAPR:75°
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PSBNR/L KAPR:75°
A146


PSDNN KAPR:45°
A147


PSKNR/L KAPR:75°
A148


PSSNR/L KAPR:45°
A149


MSBNR/L KAPR:75°
A158


MSRNR/L KAPR:75°
A159

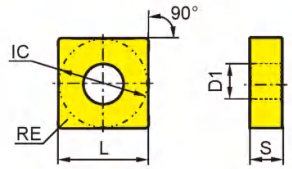

MSKNR/L KAPR:75°
Page A160


MSDNN KAPR:45°
A161

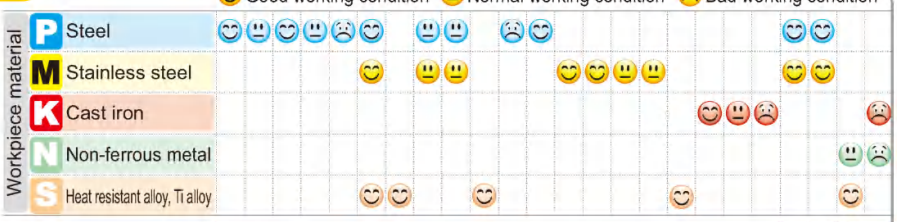

PSKNR/L KAPR:75°
A197

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

SN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152C	YNG151	YNG151C	YD101	YD201
HPR  For heavy machining	SNMM190616-HPR	19.5	19.05	6.35	7.94	1.6				★	○																		
	SNMM250924-HPR	25.4	25.4	9.525	9.12	2.4				★	○																		
TC 	SNMG120408-TC	12.7	12.7	4.76	5.16	0.8																			★				
	SNMG120412-TC	12.7	12.7	4.76	5.16	1.2																			★				
All round 	SNMG120404	12.7	12.7	4.76	5.16	0.4				○																			
	SNMG120408	12.7	12.7	4.76	5.16	0.8			○	○											●				○				
	SNMG120412	12.7	12.7	4.76	5.16	1.2				○																			
	SNMG120416	12.7	12.7	4.76	5.16	1.6				○																			
	SNMG150608	15.875	15.875	6.35	6.35	0.8				○																			
	SNMG150612	15.875	15.875	6.35	6.35	1.2				○																			
	SNMG190612	19.05	19.05	6.35	7.94	1.2				○																			
	SNMG190616	19.05	19.05	6.35	7.94	1.6				○																			
	SNMG250724	25.4	25.4	7.94	9.12	2.4				○																			
	SNMG250924	25.4	25.4	9.525	9.12	2.4				○																			

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DSBNR/L KAPR:75°
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PSBNR/L KAPR:75°
A146


PSDNN KAPR:45°
A147


PSKNR/L KAPR:75°
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PSSNR/L KAPR:45°
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MSBNR/L KAPR:75°
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MSRNR/L KAPR:75°
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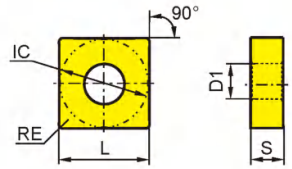
MSKNR/L KAPR:75°
Page A160

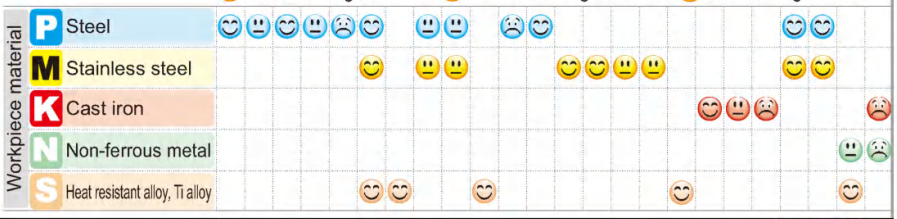

MSDNN KAPR:45°
A161


PSKNR/L KAPR:75°
A197

SN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition

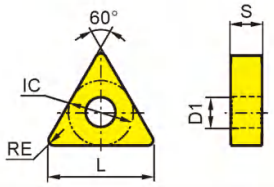


Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
Without chipbreaker 	**SNMA090304**	9.525	9.525	3.18	3.81	0.4																			○				
	SNMA090308	9.525	9.525	3.18	3.81	0.8																		○	○				
	SNMA120404	12.7	12.7	4.76	5.16	0.4																		○					
	SNMA120408	12.7	12.7	4.76	5.16	0.8																		○	★	★				●
	SNMA120416	12.7	12.7	4.76	5.16	1.6																		○	○	★				
	SNMA150608	15.875	15.875	6.35	6.35	0.8																				○				
	SNMA150612	15.875	15.875	6.35	6.35	1.2																				★				
	SNMA190612	19.05	19.05	6.35	7.94	1.2																		○	○	★				
	SNMA190616	19.05	19.05	6.35	7.94	1.6																			★	★				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



TN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊 😐 😊 😐 ☹ 😊 😐 😐 ☹ 😊 😊 😊
M	Stainless steel	😊 😐 😐 😊 😊 😐 😐
K	Cast iron	😊 😊 😊 😐 😐 ☹ 😊
N	Non-ferrous metal	😐 ☹
S	Heat resistant alloy, Ti alloy	😊 😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm) L	IC	S	D1	RE	Coated cemented carbide YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	Cermet YNG151	Coated cermet YNG151C	Cemented carbide YD101	YD201
XF	TNMG160404-XF	16.5	9.525	4.76	3.81	0.4	★	★																					
	TNMG160408-XF	16.5	9.525	4.76	3.81	0.8	★	★																					
For finishing																													
DF	TNMG160404-DF	16.5	9.525	4.76	3.81	0.4			★	★											○					●			
	TNMG160408-DF	16.5	9.525	4.76	3.81	0.8			★	★																●			
	TNMG160412-DF	16.5	9.525	4.76	3.81	1.2			○	○																			
	TNMG220408-DF	22	12.7	4.76	5.16	0.8			★	○																			
For finishing	TNMG220412-DF	22	12.7	4.76	5.16	1.2			○																				
SF	TNMG110304-SF	11	6.35	3.18	2.26	0.4						○														○	★		
	TNMG160404-SF	16.5	9.525	4.76	3.81	0.4						○						★								○	★		
	TNMG160408-SF	16.5	9.525	4.76	3.81	0.8						○						★								○	★		
	TNMG220408-SF	22	12.7	4.76	5.16	0.8						○														○	★		
For finishing	TNMG220412-SF	22	12.7	4.76	5.16	1.2						○														○	★		

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DTGNR/L KAPR:91°
Page A139


PTFNR/L KAPR:91°
A150


PTTNR/L KAPR:60°
A151


PTGNR/L KAPR:90°
A152


MTGNR/L KAPR:90°
A162

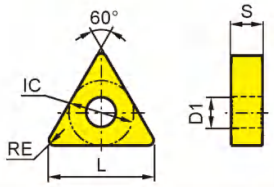

MTJNR/L KAPR:93°
A163


MTJNR/L-Z KAPR:93°
A164

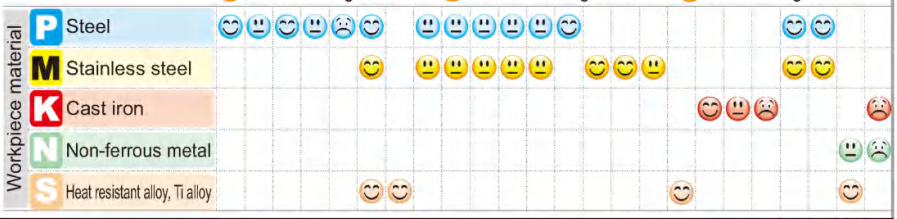

MTFNR/L KAPR:91°
Page A165


PTFNR/L KAPR:90°
A198

TN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YB9315	YB9320	YBH053	YBM153	YBM215	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
EF  For finishing	TNMG110304-EF	11	6.35	3.18	2.26	0.4								○	★					★	○									
	TNMG110308-EF	11	6.35	3.18	2.26	0.8								○	★					★	○									
	TNMG160404-EF	16.5	9.525	4.76	3.81	0.4								●	★	★				★	★									
	TNMG160408-EF	16.5	9.525	4.76	3.81	0.8								●	★	★				★	★									
	TNMG160412-EF	16.5	9.525	4.76	3.81	1.2								○	★					★	★									
	TNMG220404-EF	22	12.7	4.76	5.16	0.4								○	★					★	○									
	TNMG220408-EF	22	12.7	4.76	5.16	0.8								○	★					★	○									
	TNMG220412-EF	22	12.7	4.76	5.16	1.2								○	★					★	○									
ES  For finishing	TNMG160404-ES	16.5	9.525	4.76	3.81	0.4											★													
	TNMG160408-ES	16.5	9.525	4.76	3.81	0.8											★													
	TNMG160412-ES	16.5	9.525	4.76	3.81	1.2											★													
ADF  For finishing	TNMG160404-ADF	16.5	9.525	4.76	3.81	0.4											★	★												
	TNMG160408-ADF	16.5	9.525	4.76	3.81	0.8											★	★												
	TNMG160412-ADF	16.5	9.525	4.76	3.81	1.2											★	★												

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DTGNR/L KAPR:91°
Page A139


PTFNR/L KAPR:91°
A150


PTTNR/L KAPR:60°
A151


PTGNR/L KAPR:90°
A152


MTGNR/L KAPR:90°
A162


MTJNR/L KAPR:93°
A163

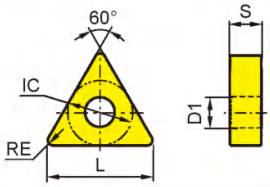

MTJNR/L-Z KAPR:93°
A164


MTFNR/L KAPR:91°
Page A165


PTFNR/L KAPR:90°
A198

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

TN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
PM  For semi-finishing	TNMG110304-PM	11	6.35	3.18	2.26	0.4			★	○																				
	TNMG110308-PM	11	6.35	3.18	2.26	0.8			★	○																				
	TNMG160404-PM	16.5	9.525	4.76	3.81	0.4			★	★															★	★				
	TNMG160408-PM	16.5	9.525	4.76	3.81	0.8			★	★		○													★	★				
	TNMG160412-PM	16.5	9.525	4.76	3.81	1.2			★	○															★	★				
	TNMG220408-PM	22	12.7	4.76	5.16	0.8			★	○															★	○				
	TNMG220412-PM	22	12.7	4.76	5.16	1.2			★	○															○	○				
	TNMG220416-PM	22	12.7	4.76	5.16	1.6				○																○				
XM  For semi-finishing	TNMG160404-XM	16.5	9.525	4.76	3.81	0.4	★	★																						
	TNMG160408-XM	16.5	9.525	4.76	3.81	0.8	★	★																						
	TNMG160412-XM	16.5	9.525	4.76	3.81	1.2	★	★																						
	TNMG160416-XM	16.5	9.525	4.76	3.81	1.6	★	★																						
	TNMG220408-XM	22	12.7	4.76	5.16	0.8	★	★																						
	TNMG220412-XM	22	12.7	4.76	5.16	1.2	★	★																						
	TNMG220416-XM	22	12.7	4.76	5.16	1.6	★	★																						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

DTGNR/L KAPR:91°

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PTFNR/L KAPR:91°

A150

PTTNR/L KAPR:60°

A151

PTGNR/L KAPR:90°

A152

MTGNR/L KAPR:90°

A162

MTJNR/L KAPR:93°

A163

MTJNR/L-Z KAPR:93°

A164

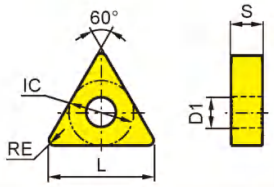
MTFNR/L KAPR:91°

Page A165

PTFNR/L KAPR:90°

A198

TN□□ (Negative inserts)



Good working condition / Normal working condition / Bad working condition

Workpiece material	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YB9315	YBG302	YBH053	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
P Steel	Good	Normal	Good	Normal	Bad	Good		Normal	Normal	Normal	Normal	Bad	Good								Good	Good		
M Stainless steel						Good		Normal	Normal	Normal	Normal			Good	Normal	Normal					Good	Good		
K Cast iron																		Good	Normal	Bad				Bad
N Non-ferrous metal																							Normal	Bad
S Heat resistant alloy, Ti alloy						Good	Good										Good						Good	

Inserts shape	Type	Dimensions(mm) L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YB9315	YBG302	YBH053	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
DM  For semi-finishing	TNMG110308-DM	11	6.35	3.18	2.26	0.8			○	○																				
	TNMG160404-DM	16.5	9.525	4.76	3.81	0.4			★	★				○													●			
	TNMG160408-DM	16.5	9.525	4.76	3.81	0.8			★	★				●							●						○			
	TNMG160412-DM	16.5	9.525	4.76	3.81	1.2			○	★																				
	TNMG220404-DM	22	12.7	4.76	5.16	0.4			★	★											○									
	TNMG220408-DM	22	12.7	4.76	5.16	0.8			★	★											○						○			
	TNMG220412-DM	22	12.7	4.76	5.16	1.2			○	○																				
	TNMG220416-DM	22	12.7	4.76	5.16	1.6			○	○																				
EM  For semi-finishing	TNMG160404-EM	16.5	9.525	4.76	3.81	0.4								●	★	★				★		★								
	TNMG160408-EM	16.5	9.525	4.76	3.81	0.8								●	★	★				★		★								
	TNMG160412-EM	16.5	9.525	4.76	3.81	1.2								○	★					★		★								
	TNMG220408-EM	22	12.7	4.76	5.16	0.8								●	★					○		★								
	TNMG220412-EM	22	12.7	4.76	5.16	1.2								○	★					○		★								
	TNMG220416-EM	22	12.7	4.76	5.16	1.6								○	★					○		★								
EG  For semi-finishing	TNMG160404-EG	16.5	9.525	4.76	3.81	0.4											★													
	TNMG160408-EG	16.5	9.525	4.76	3.81	0.8											★													
	TNMG160412-EG	16.5	9.525	4.76	3.81	1.2											★													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

DTGNR/L KAPR:91°

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PTFNR/L KAPR:91°

A150

PTTNR/L KAPR:60°

A151

PTGNR/L KAPR:90°

A152

MTGNR/L KAPR:90°

A162

MTJNR/L KAPR:93°

A163

MTJNR/L-Z KAPR:93°

A164

MTFNR/L KAPR:91°

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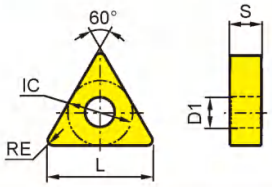
PTFNR/L KAPR:90°

A198

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

TN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐😐☹😊 😊😊
M	Stainless steel	😊 😐😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YB9315	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
EH	TNMG160408-EH	16.5	9.525	4.76	3.81	0.8										★													
For semi-finishing																													
LR	TNMM160408-LR	16.5	9.525	4.76	3.81	0.8				★																			
	TNMM160412-LR	16.5	9.525	4.76	3.81	1.2				★																			
	TNMM220408-LR	22	12.7	4.76	5.16	0.8				★																			
	TNMM220412-LR	22	12.7	4.76	5.16	1.2				★																			
Light-load roughing	TNMM220416-LR	22	12.7	4.76	5.16	1.6				★																			
DR	TNMG160408-DR	16.5	9.525	4.76	3.81	0.8			○	○															○	○			
	TNMG160412-DR	16.5	9.525	4.76	3.81	1.2			○	○															●	●			
	TNMG220408-DR	22	12.7	4.76	5.16	0.8				○															○				
	TNMG220412-DR	22	12.7	4.76	5.16	1.2				○																○			
	TNMG220416-DR	22	12.7	4.76	5.16	1.6				○															○				
Light-load roughing	TNMG270608-DR	27.5	15.875	6.35	6.35	0.8				○																			
	TNMG270612-DR	27.5	15.875	6.35	6.35	1.2				○																			
	TNMG270616-DR	27.5	15.875	6.35	6.35	1.6				○																			

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

DTGNR/L KAPR:91°



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PTFNR/L KAPR:91°



A150

PTTNR/L KAPR:60°



A151

PTGNR/L KAPR:90°



A152

MTGNR/L KAPR:90°



A162

MTJNR/L KAPR:93°



A163

MTJNR/L-Z KAPR:93°



A164

MTFNR/L KAPR:91°



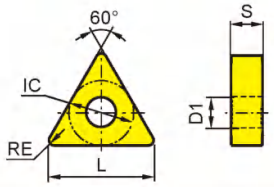
Page A165

PTFNR/L KAPR:90°



A198

TN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
DR  For roughing	TNMM160408-DR	16.5	9.525	4.76	3.81	0.8				○																			
	TNMM160412-DR	16.5	9.525	4.76	3.81	1.2				○																			
	TNMM220408-DR	22	12.7	4.76	5.16	0.8				○																			
	TNMM220412-DR	22	12.7	4.76	5.16	1.2				○																			
	TNMM220416-DR	22	12.7	4.76	5.16	1.6				○																			
	TNMM270612-DR	27.5	15.875	6.35	5.16	1.2				○																			
	TNMM270616-DR	27.5	15.875	6.35	5.16	1.6				○																			
ER  For roughing	TNMG160408-ER	16.5	9.525	4.76	3.81	0.8															★								
	TNMG160412-ER	16.5	9.525	4.76	3.81	1.2															★								
	TNMG220408-ER	22	12.7	4.76	5.16	0.8															★								
	TNMG220412-ER	22	12.7	4.76	5.16	1.2															★								
SNR  For roughing	TNMG160408-SNR	16.5	9.525	4.76	3.81	0.8						○	●		○							★							

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

DTGNR/L KAPR:91°

Page A139

PTFNR/L KAPR:91°

A150

PTTNR/L KAPR:60°

A151

PTGNR/L KAPR:90°

A152

MTGNR/L KAPR:90°

A162

MTJNR/L KAPR:93°

A163

MTJNR/L-Z KAPR:93°

A164

MTFNR/L KAPR:91°

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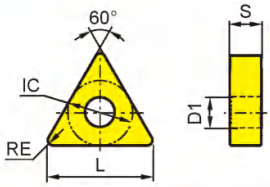
PTFNR/L KAPR:90°

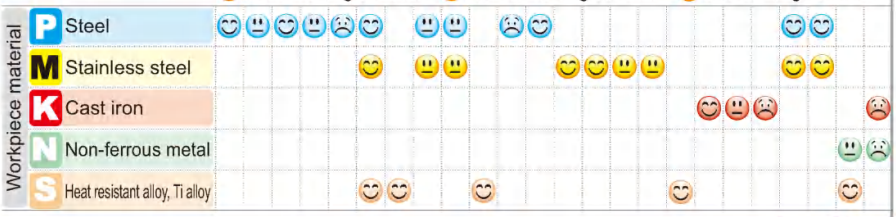
A198

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

TN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152C	YNG151	YNG151C	YD101	YD201
HDR  For heavy machining	TNMM160408-HDR	16.5	9.525	4.76	3.81	0.8					○																			
	TNMM160412-HDR	16.5	9.525	4.76	3.81	1.2					○																			
	TNMM220408-HDR	22	12.7	4.76	5.16	0.8					○																			
	TNMM220412-HDR	22	12.7	4.76	5.16	1.2					○																			
	TNMM220416-HDR	22	12.7	4.76	5.16	1.6					○																			
	TNMM270612-HDR	27.5	15.875	6.35	6.35	1.2					○																			
	TNMM270616-HDR	27.5	15.875	6.35	6.35	1.6					○																			
	TNMM270624-HDR	27.5	15.875	6.35	6.35	2.4					○																			
TC 	TNMG160404-TC	16.5	9.525	4.76	3.81	0.4																				★				
	TNMG160408-TC	16.5	9.525	4.76	3.81	0.8																				★				
	TNMG160412-TC	16.5	9.525	4.76	3.81	1.2																				★				
	TNMG220412-TC	22	12.7	4.76	5.16	1.2																				★				
	TNMG220416-TC	22	12.7	4.76	5.16	1.6																				★				
Without chipbreaker 	TNMA160404	16.5	9.525	4.76	3.81	0.4																		○	★	★				
	TNMA160408	16.5	9.525	4.76	3.81	0.8																		★	★	★			○	
	TNMA160412	16.5	9.525	4.76	3.81	1.2																		★	○	○				
	TNMA160416	16.5	9.525	4.76	3.81	1.6																		○	○	○				
	TNMA220404	22	12.7	4.76	5.16	0.4																		○	○	○				
	TNMA220408	22	12.7	4.76	5.16	0.8																		○	○	○				
	TNMA270616	27.5	15.875	6.35	6.35	1.6																				○				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


DTGNR/L KAPR:91°
Page A139


PTFNR/L KAPR:91°
A150


PTTNR/L KAPR:60°
A151


PTGNR/L KAPR:90°
A152


MTGNR/L KAPR:90°
A162

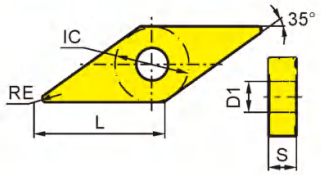

MTJNR/L KAPR:93°
A163


MTJNR/L-Z KAPR:93°
A164


MTFNR/L KAPR:91°
Page A165


PTFNR/L KAPR:90°
A198

VN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐😐😐😊 😊😊
M	Stainless steel	😊 😐😐😐😐 😊😊😐😐 😊😊
K	Cast iron	☹☹☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YB9315	YB9320	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
XF	VNMG160404-XF	16.6	9.525	4.76	3.81	0.4	★	★																						
	VNMG160408-XF	16.6	9.525	4.76	3.81	0.8	★	★																						
	VNMG160412-XF	16.6	9.525	4.76	3.81	1.2	★	★																						
For finishing																														
DF	VNMG160404-DF	16.6	9.525	4.76	3.81	0.4			★	★											●									
	VNMG160408-DF	16.6	9.525	4.76	3.81	0.8			★	○																				
For finishing																														
EF	VNMG160404-EF	16.6	9.525	4.76	3.81	0.4								○	★				★	★										
	VNMG160408-EF	16.6	9.525	4.76	3.81	0.8								○	★				★	★										
	VNMG160412-EF	16.6	9.525	4.76	3.81	1.2								○	★				★	○										
For finishing																														
ADF	VNMG160404-ADF	16.6	9.525	4.76	3.81	0.4										★	★													
	VNMG160408-ADF	16.6	9.525	4.76	3.81	0.8										★	★													
For finishing																														
NF	VNEG160404-NF	16.6	9.525	4.76	3.81	0.4						○	★										★						○	
	VNEG160408-NF	16.6	9.525	4.76	3.81	0.8						○	★																○	
For finishing																														

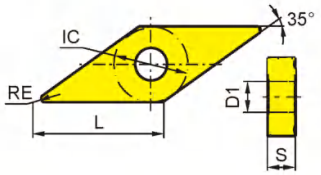
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

DVVNN	DVJNR/L	MVVNN	MVJNR/L
KAPR:72°30'	KAPR:93°	KAPR:72°30'	KAPR:93°
			
Page A140	A140	A166	A167

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

VN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

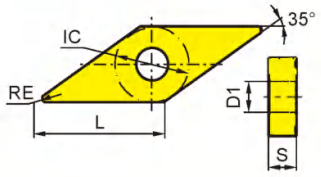
Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
NGF	VNEG160408-NGF	16.6	9.525	4.76	3.81	0.8						○	●			○													
	VNEG160412-NGF	16.6	9.525	4.76	3.81	1.2						○	●			○													
For finishing																													
SF	VNMG160404-SF	16.6	9.525	4.76	3.81	0.4						○						★								○	★		
	VNMG160408-SF	16.6	9.525	4.76	3.81	0.8						○						★								○			
For finishing																													
PM	VNMG160404-PM	16.6	9.525	4.76	3.81	0.4			★	○																○			
	VNMG160408-PM	16.6	9.525	4.76	3.81	0.8			★	○															★	★			
	VNMG160412-PM	16.6	9.525	4.76	3.81	1.2				○															○	○			
For semi-finishing																													
XM	VNMG160404-XM	16.6	9.525	4.76	3.81	0.4	★	★																					
	VNMG160408-XM	16.6	9.525	4.76	3.81	0.8	★	★																					
	VNMG160412-XM	16.6	9.525	4.76	3.81	1.2	★	★																					
For semi-finishing																													
DM	VNMG160408-DM	16.6	9.525	4.76	3.81	0.8			★	★											○								
	VNMG160412-DM	16.6	9.525	4.76	3.81	1.2			○	○											○								
For semi-finishing																													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

DVVNN	DVJNR/L	MVVNN	MVJNR/L
KAPR:72°30'	KAPR:93°	KAPR:72°30'	KAPR:93°
			
Page A140	A140	A166	A167

VN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YB9315	YBG302	YBH053	YBM153	YBM215	YBM253	YBS103	YBD052	YBD102	YBD152C	YNG151	YNG151C	YD101	YD201
EM	VNMG160404-EM	16.6	9.525	4.76	3.81	0.4								●	★	★					★	★								
	VNMG160408-EM	16.6	9.525	4.76	3.81	0.8								●	★	★					★	★								
For semi-finishing																														
EG	VNMG160404-EG	16.6	9.525	4.76	3.81	0.4											★													
	VNMG160408-EG	16.6	9.525	4.76	3.81	0.8											★													
For semi-finishing																														
NM	VNMG160412-NM	16.6	9.525	4.76	3.81	1.2						○	★										○						○	
																														
For semi-finishing																														
SNR	VNMG160408-SNR	16.6	9.525	4.76	3.81	0.8						○	●				○						★							
	VNMG160412-SNR	16.6	9.525	4.76	3.81	1.2						○	●				○						★							
For roughing																														
TC	VNMG160404-TC	16.6	9.525	4.76	3.81	0.4																				★				
	VNMG160408-TC	16.6	9.525	4.76	3.81	0.8																				★				
	VNMG160412-TC	16.6	9.525	4.76	3.81	1.2																				★				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



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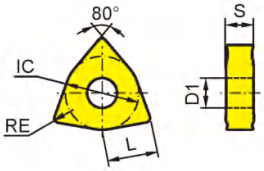
Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

WN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
XF	WNMG060404-XF	6.5	9.525	4.76	3.81	0.4	★	★																						
	WNMG060408-XF	6.5	9.525	4.76	3.81	0.8	★	★																						
	WNMG080404-XF	8.7	12.7	4.76	5.16	0.4	★	★																						
	WNMG080408-XF	8.7	12.7	4.76	5.16	0.8	★	★																						
For finishing	WNMG080412-XF	8.7	12.7	4.76	5.16	1.2	★	★																						
DF	WNMG06T304-DF	6.5	9.525	3.97	3.81	0.4			★																					
	WNMG06T308-DF	6.5	9.525	3.97	3.81	0.8			★	★																				
	WNMG06T312-DF	6.5	9.525	3.97	3.81	1.2			★	★																				
	WNMG060404-DF	6.5	9.525	4.76	3.81	0.4			★	★											○									
	WNMG060408-DF	6.5	9.525	4.76	3.81	0.8			★	★											●									
	WNMG060412-DF	6.5	9.525	4.76	3.81	1.2			★	○											○									
For finishing	WNMG080404-DF	8.7	12.7	4.76	5.16	0.4			★	○											○									
	WNMG080408-DF	8.7	12.7	4.76	5.16	0.8			★	★											●									
	WNMG080412-DF	8.7	12.7	4.76	5.16	1.2			○	○																				
SF	WNMG06T304-SF	6.5	9.525	3.97	3.81	0.4						○															○	★		
	WNMG06T308-SF	6.5	9.525	3.97	3.81	0.8						○															○			
	WNMG06T312-SF	6.5	9.525	3.97	3.81	1.2						○															○			
	WNMG060404-SF	6.5	9.525	4.76	3.81	0.4						○															○	★		
	WNMG060408-SF	6.5	9.525	4.76	3.81	0.8						○															○	★		
For finishing	WNMG080404-SF	8.7	12.7	4.76	5.16	0.4						○						★									○	★		
	WNMG080408-SF	8.7	12.7	4.76	5.16	0.8						○						★									○	★		
	WNMG080412-SF	8.7	12.7	4.76	5.16	1.2						○						★									○			

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



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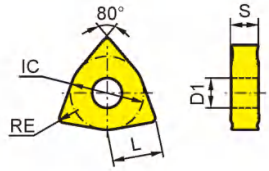
WN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YB9315	YB9320	YBH053	YBM153	YBM215	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
EF	WNMG06T304-EF	6.5	9.525	3.97	3.81	0.4								○	★					★	○									
	WNMG06T308-EF	6.5	9.525	3.97	3.81	0.8								○	★					★	○									
	WNMG06T312-EF	6.5	9.525	3.97	3.81	1.2								○	★					★	○									
	WNMG060404-EF	6.5	9.525	4.76	3.81	0.4								●	★					★	○									
	WNMG060408-EF	6.5	9.525	4.76	3.81	0.8								●	★					★	○									
For finishing	WNMG080404-EF	8.7	12.7	4.76	5.16	0.4						○		●	★	★				★	★									
	WNMG080408-EF	8.7	12.7	4.76	5.16	0.8						○		●	★	★				★	★									
ES	WNMG080404-ES	8.7	12.7	4.76	5.16	0.4											★													
	WNMG080408-ES	8.7	12.7	4.76	5.16	0.8											★													
For finishing																														
ADF	WNMG060404-ADF	6.5	9.525	4.76	3.81	0.4											★	★												
	WNMG060408-ADF	6.5	9.525	4.76	3.81	0.8											★	★												
	WNMG080404-ADF	8.7	12.7	4.76	5.16	0.4											★	★												
	WNMG080408-ADF	8.7	12.7	4.76	5.16	0.8											★	★												
For finishing	WNMG080412-ADF	8.7	12.7	4.76	5.16	1.2											★	★												
NF	WNEG080404-NF	8.7	12.7	4.76	5.16	0.4						○	★																○	
	WNEG080408-NF	8.7	12.7	4.76	5.16	0.8						○	★																○	
For finishing																														

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



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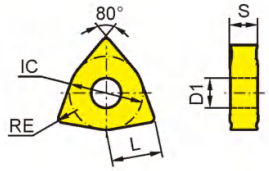
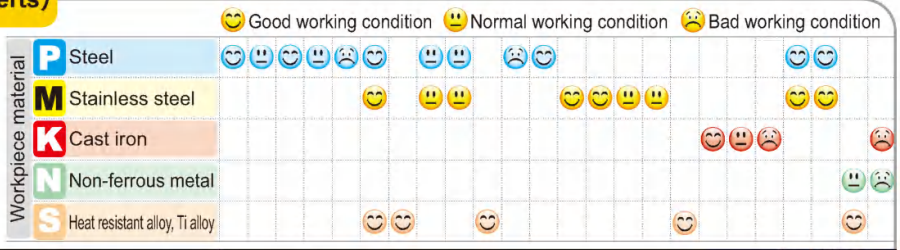
Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

WN□□ (Negative inserts)





Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
PM  For semi-finishing	WNMG060408-PM	6.5	9.525	4.76	3.81	0.8			★	○															★	★				
	WNMG060412-PM	6.5	9.525	4.76	3.81	1.2			○	○															★	★				
	WNMG080404-PM	8.7	12.7	4.76	5.16	0.4			○	○																				
	WNMG080408-PM	8.7	12.7	4.76	5.16	0.8			★	★															★	★				
	WNMG080412-PM	8.7	12.7	4.76	5.16	1.2			★	★															★	★				
	WNMG080416-PM	8.7	12.7	4.76	5.16	1.6				○															○	○				
	WNMG080608-PM	8.7	12.7	6.35	5.16	0.8				○																				
XM  For semi-finishing	WNMG060404-XM	6.5	9.525	4.76	3.81	0.4	★	★																						
	WNMG060408-XM	6.5	9.525	4.76	3.81	0.8	★	★																						
	WNMG060412-XM	6.5	9.525	4.76	3.81	1.2	★	★																						
	WNMG080404-XM	8.7	12.7	4.76	5.16	0.4	★	★																						
	WNMG080408-XM	8.7	12.7	4.76	5.16	0.8	★	★																						
	WNMG080412-XM	8.7	12.7	4.76	5.16	1.2	★	★																						
	WNMG080416-XM	8.7	12.7	4.76	5.16	1.6	★	★																						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



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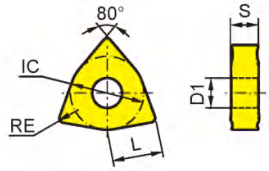
WN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐😐😐☹😊 😊😊
M	Stainless steel	😊 😐😐😐😐 😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YB9315	YBG302	YBH053	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
DM	WNMG06T304-DM	6.5	9.525	3.97	3.81	0.4				○																			
	WNMG06T308-DM	6.5	9.525	3.97	3.81	0.8				○																			
	WNMG06T312-DM	6.5	9.525	3.97	3.81	1.2				○																			
	WNMG060408-DM	6.5	9.525	4.76	3.81	0.8			★	★											●								
	WNMG060412-DM	6.5	9.525	4.76	3.81	1.2				○																			
	WNMG080404-DM	8.7	12.7	4.76	5.16	0.4			★	★				○							○								
	WNMG080408-DM	8.7	12.7	4.76	5.16	0.8			★	★											○								
	WNMG080412-DM	8.7	12.7	4.76	5.16	1.2			★	★											○								
	WNMG080416-DM	8.7	12.7	4.76	5.16	1.6				○																			
EM	WNMG06T304-EM	6.5	9.525	3.97	3.81	0.4								○	★					○		★							
	WNMG06T308-EM	6.5	9.525	3.97	3.81	0.8								○	★					○		★							
	WNMG06T312-EM	6.5	9.525	3.97	3.81	1.2								○	★					○		★							
	WNMG060404-EM	6.5	9.525	4.76	3.81	0.4								○	★					○		★							
	WNMG060408-EM	6.5	9.525	4.76	3.81	0.8								●	★					○		★							
	WNMG080404-EM	8.7	12.7	4.76	5.16	0.4								●	★	★				★		★							
	WNMG080408-EM	8.7	12.7	4.76	5.16	0.8								●	★	★				★		★							
	WNMG080412-EM	8.7	12.7	4.76	5.16	1.2								●	★	★				★		★							
EG	WNMG080404-EG	8.7	12.7	4.76	5.16	0.4											★												
	WNMG080408-EG	8.7	12.7	4.76	5.16	0.8											★												
	WNMG080412-EG	8.7	12.7	4.76	5.16	1.2											★												

For semi-finishing

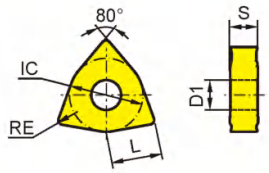
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

DWLNR/L KAPR:95°	PWLNR/L KAPR:95°	MWLNR/L KAPR:95°	PWLNR/L KAPR:95°
			
Page A141	A153	A168	A199

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

WN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐😐☹😊 😊😊
M	Stainless steel	😊 😐😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊

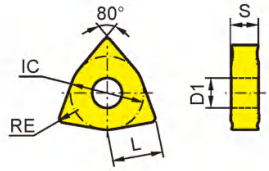
Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YB9315	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
EH	WNMG080404-EH	8.7	12.7	4.76	5.16	0.4										★													
	WNMG080408-EH	8.7	12.7	4.76	5.16	0.8										★													
For semi-finishing	WNMG080412-EH	8.7	12.7	4.76	5.16	1.2										★													
NM	WNMG080408-NM	8.7	12.7	4.76	5.16	0.8						○	★										○						○
	WNMG080412-NM	8.7	12.7	4.76	5.16	1.2						○	★										○						○
For semi-finishing																													
DR	WNMG060408-DR	6.5	9.525	4.76	3.81	0.8			○	○															○				
	WNMG060412-DR	6.5	9.525	4.76	3.81	1.2				○															○	○			
	WNMG080408-DR	8.7	12.7	4.76	5.16	0.8			○	★															●	●			
	WNMG080412-DR	8.7	12.7	4.76	5.16	1.2			○	★															●	●			
For roughing	WNMG080416-DR	8.7	12.7	4.76	5.16	1.6				○															○	○			
SNR	WNMG080408-SNR	8.7	12.7	4.76	5.16	0.8						○	●			○							★						
	WNMG080412-SNR	8.7	12.7	4.76	5.16	1.2						○	●			○							★						
For roughing																													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

DWLNR/L KAPR:95°	PWLNR/L KAPR:95°	MWLNR/L KAPR:95°	PWLNR/L KAPR:95°
			
Page A141	A153	A168	A199

WN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152C	YNG151	YNG151C	YD101	YD201
TC 	WNMG080404-TC	8.7	12.7	4.76	5.16	0.4																			★				
	WNMG080408-TC	8.7	12.7	4.76	5.16	0.8																			★				
	WNMG080412-TC	8.7	12.7	4.76	5.16	1.2																			★				
Without chipbreaker 	WNMA06T308	6.5	9.525	3.97	3.81	0.8																		○					
	WNMA060404	6.5	9.525	4.76	3.81	0.4																				○				
	WNMA060408	6.5	9.525	4.76	3.81	0.8																		★	○	○				
	WNMA060412	6.5	9.525	4.76	3.81	1.2																				○				
	WNMA080404	8.7	12.7	4.76	5.16	0.4																			○					
	WNMA080408	8.7	12.7	4.76	5.16	0.8																		★	★	★				
	WNMA080412	8.7	12.7	4.76	5.16	1.2																		★	★	★				
	WNMA080416	8.7	12.7	4.76	5.16	1.6																				★				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



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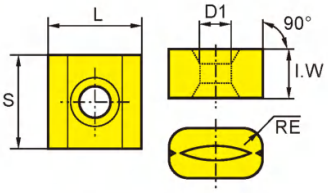
A199

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

LN□□ (Negative inserts)



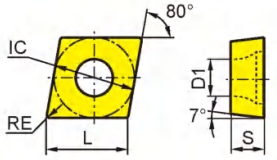
Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	I.W	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
RF 	**LNUX191940-RF**	19.05	10.0	19.05	6.35	4.0	★																							
	LNUX301940-RF	30.0	12.0	19.05	6.35	4.0	★																							
RH 	**LNUX191940-RH**	19.05	10.0	19.05	6.35	4.0	★																							
	LNUX301940-RH	30.0	12.0	19.05	6.35	4.0	★																							

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

CC□□ (Positive inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
SF	CCGT060202-SF	6.4	6.35	2.38	2.8	0.2						○															○	○		
	CCGT060204-SF	6.4	6.35	2.38	2.8	0.4						○						★									○	○		
	CCGT09T304-SF	9.7	9.525	3.97	4.4	0.4						○						★									○	★		
For extra finishing																														
XF	CCMT060202-XF	6.4	6.35	2.38	2.8	0.2	★	★																						
	CCMT060204-XF	6.4	6.35	2.38	2.8	0.4	★	★																						
	CCMT060208-XF	6.4	6.35	2.38	2.8	0.8	★	★																						
	CCMT09T302-XF	9.7	9.525	3.97	4.4	0.2	★	★																						
For finishing	CCMT09T304-XF	9.7	9.525	3.97	4.4	0.4	★	★																						
	CCMT09T308-XF	9.7	9.525	3.97	4.4	0.8	★	★																						
HF	CCMT060202-HF	6.4	6.35	2.38	2.8	0.2			★	★				●													○			○
	CCMT060204-HF	6.4	6.35	2.38	2.8	0.4			★	○				●												●	●		●	
	CCMT060208-HF	6.4	6.35	2.38	2.8	0.8			★					●							○						●			
	CCMT09T302-HF	9.7	9.525	3.97	4.4	0.2				○				●													●			○
	CCMT09T304-HF	9.7	9.525	3.97	4.4	0.4			★	★				●											●	●	●	○		○
For finishing	CCMT09T308-HF	9.7	9.525	3.97	4.4	0.8			★	○				●							○			○	○	○	●		○	○
	CCMT120404-HF	12.9	12.7	4.76	5.56	0.4			○	○																●	○			
	CCMT120408-HF	12.9	12.7	4.76	5.56	0.8			○																					

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



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A200



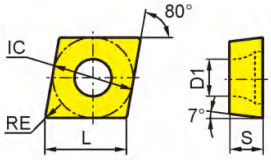
A214



A215

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

CC□□ (Positive inserts)



Good working condition 😃 Normal working condition ☹ Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YB9315	YB9320	YBH053	YBM153	YBM215	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
EF	CCMT060202-EF	6.4	6.35	2.38	2.8	0.2						○		●	★					★	○									
	CCMT060204-EF	6.4	6.35	2.38	2.8	0.4						○		●	★	★				★	○									
	CCMT09T302-EF	9.7	9.525	3.97	4.4	0.2						○		●	★					★	○									
	CCMT09T304-EF	9.7	9.525	3.97	4.4	0.4						○		●	★	★				★	★									
	CCMT09T308-EF	9.7	9.525	3.97	4.4	0.8						○		●	★					○	★									
	CCMT120404-EF	12.9	12.7	4.76	5.56	0.4						○		●	★					★	○									
	CCMT120408-EF	12.9	12.7	4.76	5.56	0.8						○		●	★					○	○									
AHF	CCMT060204-AHF	6.4	6.35	2.38	2.8	0.4											★	★					★							
	CCMT060208-AHF	6.4	6.35	2.38	2.8	0.8											★	★												
	CCMT09T304-AHF	9.7	9.525	3.97	4.4	0.4											★	★					★							
	CCMT09T308-AHF	9.7	9.525	3.97	4.4	0.8											★	★												
	CCMT120404-AHF	12.9	12.7	4.76	5.56	0.4											★	★					★							
	CCMT120408-AHF	12.9	12.7	4.76	5.56	0.8											★	★												
XM	CCMT09T304-XM	9.7	9.525	3.97	4.4	0.4	★	★																						
	CCMT09T308-XM	9.7	9.525	3.97	4.4	0.8	★	★																						
	CCMT09T312-XM	9.7	9.525	3.97	4.4	1.2	★	★																						
	CCMT120404-XM	12.7	12.7	4.76	5.56	0.4	★	★																						
	CCMT120408-XM	12.7	12.7	4.76	5.56	0.8	★	★																						
	CCMT120412-XM	12.7	12.7	4.76	5.56	1.2	★	★																						


For finishing


For finishing


For semi-finishing

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



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A200



A214



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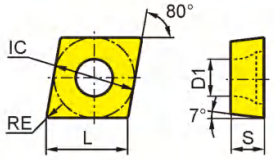
CC□□ (Positive inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YB9315	YBG302	YBH053	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
HM	CCMT060204-HM	6.4	6.35	2.38	2.8	0.4			★	★				●							●				●	●				●
	CCMT060208-HM	6.4	6.35	2.38	2.8	0.8			★	○				●							○				○	●				
	CCMT09T304-HM	9.7	9.525	3.97	4.4	0.4			★	★				●							●				●	●				
	CCMT09T308-HM	9.7	9.525	3.97	4.4	0.8			★	★				●							●				●	●				
	CCMT120404-HM	12.9	12.7	4.76	5.56	0.4			★	○											○				○	○				
For semi-finishing	CCMT120408-HM	12.9	12.7	4.76	5.56	0.8			★	★				○							●				●	●				
	CCMT120412-HM	12.9	12.7	4.76	5.56	1.2			○																○					
EM	CCMT060204-EM	6.4	6.35	2.38	2.8	0.4								●	★	★				○		★								
	CCMT060208-EM	6.4	6.35	2.38	2.8	0.8								●	★	★				○		★								
	CCMT09T304-EM	9.7	9.525	3.97	4.4	0.4								●	★	★				★		★								
	CCMT09T308-EM	9.7	9.525	3.97	4.4	0.8								●	★	★				★		★								
	CCMT120404-EM	12.9	12.7	4.76	5.56	0.4								●	★	★				○		★								
For semi-finishing	CCMT120408-EM	12.9	12.7	4.76	5.56	0.8								●	★	★				○		★								
	CCMT120412-EM	12.9	12.7	4.76	5.56	1.2								●	★					○		★								
EG	CCMT060204-EG	6.4	6.35	2.38	2.8	0.4											★													
	CCMT060208-EG	6.4	6.35	2.38	2.8	0.8											★													
	CCMT09T304-EG	9.7	9.525	3.97	4.4	0.4											★													
For semi-finishing	CCMT09T308-EG	9.7	9.525	3.97	4.4	0.8											★													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



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A170



A200



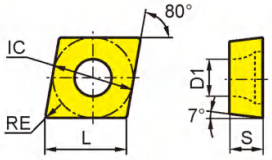
A214



A215

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

CC□□ (Positive inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152C	YNG151	YNG151C	YD101	YD201
HR	CCMT060204-HR	6.4	6.35	2.38	2.8	0.4			○	○				○																
	CCMT060208-HR	6.4	6.35	2.38	2.8	0.8			○												●					●				
	CCMT09T304-HR	9.7	9.525	3.97	4.4	0.4								○																
	CCMT09T308-HR	9.7	9.525	3.97	4.4	0.8			★	★											●			●	●	●			●	
For roughing	CCMT120408-HR	12.9	12.7	4.76	5.56	0.8			★					○							●			●	●	●			●	●
	CCMT120412-HR	12.9	12.7	4.76	5.56	1.2			○												○				●	○				
TC	CCMT060204-TC	6.4	6.35	2.38	2.8	0.4																				★				
	CCMT09T304-TC	9.7	9.525	3.97	4.4	0.4																				★				
	CCMT09T308-TC	9.7	9.525	3.97	4.4	0.8																				★				
	CCMT120404-TC	12.9	12.7	4.76	5.56	0.4																				★				
	CCMT120408-TC	12.9	12.7	4.76	5.56	0.8																				★				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


SCACR/L KAPR:90°
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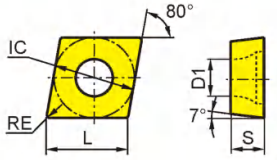
SCLCR/L KAPR:95°
A170


SCLCR/L KAPR:95°
A200


SCFCR/L KAPR:90°
A214


SCLCR/L KAPR:95°
A215

CC□□ (Positive inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
LC  For Al machining	CCGX060202-LC	6.4	6.35	2.38	2.8	0.2																					★	
	CCGX060204-LC	6.4	6.35	2.38	2.8	0.4																					★	
	CCGX09T302-LC	9.7	9.525	3.97	4.4	0.2																					★	
	CCGX09T304-LC	9.7	9.525	3.97	4.4	0.4																					★	
	CCGX09T308-LC	9.7	9.525	3.97	4.4	0.8																					★	
	CCGX120404-LC	12.9	12.7	4.76	5.5	0.4																					★	
	CCGX120408-LC	12.9	12.7	4.76	5.5	0.8																					★	
LH  For Al machining	CCGX060202-LH	6.4	6.35	2.38	2.8	0.2																					★	
	CCGX060204-LH	6.4	6.35	2.38	2.8	0.4																					★	●
	CCGX060208-LH	6.4	6.35	2.38	2.8	0.8																					★	
	CCGX09T302-LH	9.7	9.525	3.97	4.4	0.2																					★	
	CCGX09T304-LH	9.7	9.525	3.97	4.4	0.4																					★	●
	CCGX09T308-LH	9.7	9.525	3.97	4.4	0.8																					★	
	CCGX120402-LH	12.9	12.7	4.76	5.56	0.2																						○
	CCGX120404-LH	12.9	12.7	4.76	5.56	0.4																					★	
	CCGX120408-LH	12.9	12.7	4.76	5.56	0.8																					★	
	CCGX120412-LH	12.9	12.7	4.76	5.56	1.2																						○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

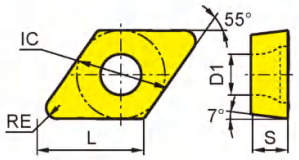
Applicable tool



Page A196 A170 A200 A214 A215

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

DC□□ (Positive inserts)



Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet	Coated cermet	Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
SF	DCGT070202-SF	7.8	6.35	2.38	2.8	0.2						○														○			
	DCGT070204-SF	7.8	6.35	2.38	2.8	0.4						○															○		
	DCGT070208-SF	7.8	6.35	2.38	2.8	0.8						○																	
	DCGT11T302-SF	11.6	9.525	3.97	4.4	0.2						○														○	○		
For extra finishing	DCGT11T304-SF	11.6	9.525	3.97	4.4	0.4						○						★									★		
	DCGT11T308-SF	11.6	9.525	3.97	4.4	0.8						○						★								○	○		
XF	DCMT070202-XF	7.8	6.35	2.38	2.8	0.2	★	★																					
	DCMT070204-XF	7.8	6.35	2.38	2.8	0.4	★	★																					
	DCMT070208-XF	7.8	6.35	2.38	2.8	0.8	★	★																					
	DCMT11T302-XF	11.6	9.525	3.97	4.4	0.2	★	★																					
For finishing	DCMT11T304-XF	11.6	9.525	3.97	4.4	0.4	★	★																					
	DCMT11T308-XF	11.6	9.525	3.97	4.4	0.8	★	★																					
HF	DCMT070202-HF	7.8	6.35	2.38	2.8	0.2			★	○				○													○			
	DCMT070204-HF	7.8	6.35	2.38	2.8	0.4			★	★				●												○	○		●	
	DCMT070208-HF	7.8	6.35	2.38	2.8	0.8			○																					
	DCMT11T302-HF	11.6	9.525	3.97	4.4	0.2			★	○				●													○			○
For finishing	DCMT11T304-HF	11.6	9.525	3.97	4.4	0.4			★	★				●											○	○	●			○
	DCMT11T308-HF	11.6	9.525	3.97	4.4	0.8			★	○				○													○			

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


SDACR/L KAPR:90°
Page A171


SDJCR/L KAPR:93°
A172

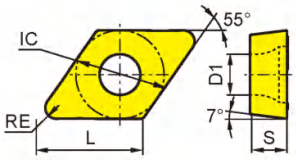

SDNCN KAPR:62°30'
A173


SDQCR/L KAPR:107°30'
A201


SDUCR/L KAPR:93°
A202


SDZCR/L KAPR:93°
A203

DC□□ (Positive inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YB9315	YB9320	YBH053	YBM153	YBM215	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
EF	DCMT070202-EF	7.8	6.35	2.38	2.8	0.2						○		●	★					★	○									
	DCMT070204-EF	7.8	6.35	2.38	2.8	0.4						○		●	★					★	○									
	DCMT11T302-EF	11.6	9.525	3.97	4.4	0.2						○		●	★					★	○									
	DCMT11T304-EF	11.6	9.525	3.97	4.4	0.4						○		●	★	★				★	○									
For finishing	DCMT11T308-EF	11.6	9.525	3.97	4.4	0.8						○		●	★					○	○									
AHF	DCMT070204-AHF	7.8	6.35	2.38	2.8	0.4											★	★												
	DCMT070208-AHF	7.8	6.35	2.38	2.8	0.8											★	★												
	DCMT11T302-AHF	11.6	9.525	3.97	4.4	0.2											★	★												
	DCMT11T304-AHF	11.6	9.525	3.97	4.4	0.4											★	★					★							
For finishing	DCMT11T308-AHF	11.6	9.525	3.97	4.4	0.8											★	★					★							
XM	DCMT070204-XM	7.8	6.35	2.38	2.8	0.4	★	★																						
	DCMT070208-XM	7.8	6.35	2.38	2.8	0.8	★	★																						
	DCMT11T304-XM	11.6	9.525	3.97	4.4	0.4	★	★																						
	DCMT11T308-XM	11.6	9.525	3.97	4.4	0.8	★	★																						
For semi-finishing	DCMT11T312-XM	11.6	9.525	3.97	4.4	1.2	★	★																						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

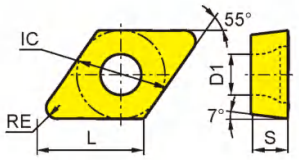
Applicable tool



Page A171 A172 A173 A201 A202 A203

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

DC□□ (Positive inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YBG212	YBG302	YBH053	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
HM	DCMT070204-HM	7.8	6.35	2.38	2.8	0.4			★	★				●						●					●				
	DCMT070208-HM	7.8	6.35	2.38	2.8	0.8			★	★				○						○					○				
	DCMT11T304-HM	11.6	9.525	3.97	4.4	0.4			★	★				●						●					●	●	●		●	○
For semi-finishing	DCMT11T308-HM	11.6	9.525	3.97	4.4	0.8			★	★				●						●					●	○	○			○
	DCMT11T312-HM	11.6	9.525	3.97	4.4	1.2			○	○																				
EM	DCMT070204-EM	7.8	6.35	2.38	2.8	0.4								●	★	★				○		★								
	DCMT070208-EM	7.8	6.35	2.38	2.8	0.8								●	★					○		★								
	DCMT11T304-EM	11.6	9.525	3.97	4.4	0.4								●	★	★				○		★								
For semi-finishing	DCMT11T308-EM	11.6	9.525	3.97	4.4	0.8								●	★	★				○		★								
HR	DCMT11T304-HR	11.6	9.525	3.97	4.4	0.4			○	○											○				○	●				
	DCMT11T308-HR	11.6	9.525	3.97	4.4	0.8			●	★											○			○	●	●				
	DCMT11T312-HR	11.6	9.525	3.97	4.4	1.2			○																					
For roughing																														

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


SDACR/L KAPR:90°
Page A171


SDJCR/L KAPR:93°
A172

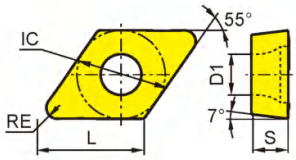

SDNCN KAPR:62°30'
A173


SDQCR/L KAPR:107°30'
A201


SDUCR/L KAPR:93°
A202


SDZCR/L KAPR:93°
A203

DC□□ (Positive inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
LC	DCGX070201-LC	7.8	6.35	2.38	2.8	0.1																					★	
	DCGX070202-LC	7.8	6.35	2.38	2.8	0.2																					★	
	DCGX070204-LC	7.8	6.35	2.38	2.8	0.4																					★	
For Al machining	DCGX11T304-LC	11.6	9.525	3.97	4.4	0.4																					★	
	DCGX11T308-LC	11.6	9.525	3.97	4.4	0.8																					★	
LH	DCGX070202-LH	7.8	6.35	2.38	2.8	0.2																					★	
	DCGX070204-LH	7.8	6.35	2.38	2.8	0.4																					★	○
	DCGX11T302-LH	11.6	9.525	3.97	4.4	0.2																					★	○
For Al machining	DCGX11T304-LH	11.6	9.525	3.97	4.4	0.4																					★	●
	DCGX11T308-LH	11.6	9.525	3.97	4.4	0.8																					★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


SDACR/L KAPR:90° Page A171


SDJCR/L KAPR:93° A172


SDNCN KAPR:62°30' A173

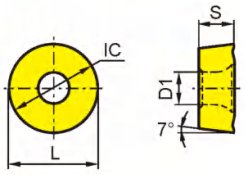

SDQCR/L KAPR:107°30' A201


SDUCR/L KAPR:93° A202


SDZCR/L KAPR:93° A203

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

RC□□ (Positive inserts)

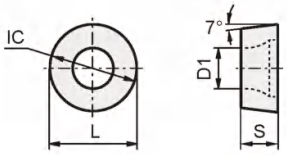


Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)				Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
	RCGT1204MO	12	12	4.76	4.4				○																				
	RCMT0803MO	8.0	8.0	3.18	3.36				○																				
	RCMT10T3MO	10	10	3.97	4.4				○																				
	RCMT1204MO	12	12	4.76	4.4				★														★	★	○				
	RCMT1606MO	16	16	6.35	5.5																		★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)				Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
LH	RCGX0803MO-LH	8.0	8.0	3.18	3.36																							★	
 For Al machining																													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

SRDCN

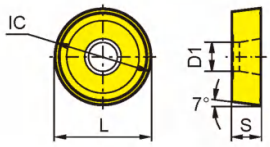


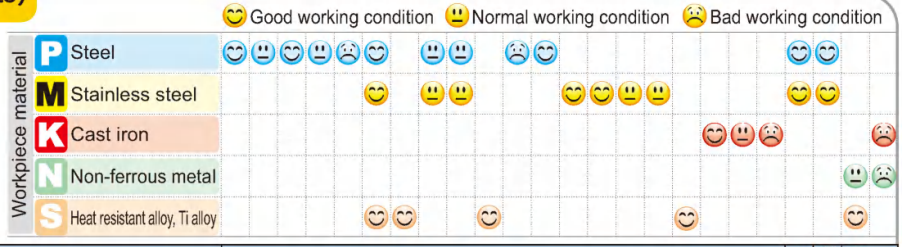
SRGCR/L



Page A186 A187

RC□□ (Positive inserts)

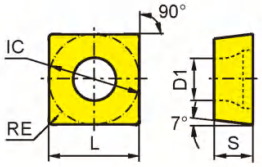




Inserts shape	Type	Dimensions(mm)				Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
	RCMX0803MO	8.0	8.0	3.18	3.36																		○						
	RCMX1003MO	10	10	3.18	3.6																							○	
	RCMX1204MO	12	12	4.76	4.4																							○	●
	RCMX1606MO	16	16	6.35	5.5																							○	
	RCMX2006MO	20	20	6.35	6.5			★	○																★			○	●
	RCMX2507MO	25	25	7.94	7.2			★	○																○				
	RCMX3209MO	32	32	9.52	9.5			○	○															●					

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SC□□ (Positive inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YB9315	YB9320	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
XF	SCMT09T304-XF	9.525	9.525	3.97	4.4	0.4	★	★																						
	SCMT09T308-XF	9.525	9.525	3.97	4.4	0.8	★	★																						
For finishing																														
HF	SCMT09T302-HF	9.525	9.525	3.97	4.4	0.2			○					○																
	SCMT09T304-HF	9.525	9.525	3.97	4.4	0.4			●	○																				
	SCMT09T308-HF	9.525	9.525	3.97	4.4	0.8			●					○												○				○
For finishing																														
EF	SCMT09T302-EF	9.525	9.525	3.97	4.4	0.2						○		●	★				★	○										
	SCMT09T304-EF	9.525	9.525	3.97	4.4	0.4						○		●	★				★	○										
	SCMT09T308-EF	9.525	9.525	3.97	4.4	0.8						○		●	★				○	○										
For finishing																														
AHF	SCMT09T304-AHF	9.525	9.525	3.97	4.4	0.4										★	★													
	SCMT09T308-AHF	9.525	9.525	3.97	4.4	0.8										★	★													
For finishing																														

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


SSBCR/L
KAPR:75°
Page A179

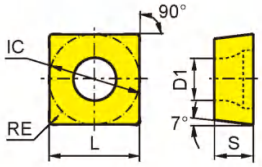

SSDCN
KAPR:45°
A180


SSKCR/L
KAPR:75°
A181

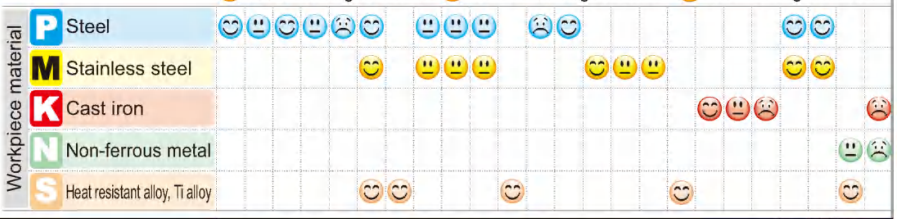

SSSCR/L
KAPR:45°
A182


SSKCR/L
KAPR:75°
A204

SC□□ (Positive inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YBG212	YBG302	YBH053	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
XM	SCMT09T304-XM	9.525	9.525	3.97	4.4	0.4	★	★																						
	SCMT09T308-XM	9.525	9.525	3.97	4.4	0.8	★	★																						
	SCMT09T312-XM	9.525	9.525	3.97	4.4	1.2	★	★																						
For semi-finishing	SCMT120408-XM	12.7	12.7	4.76	5.56	0.8	★	★																						
	SCMT120412-XM	12.7	12.7	4.76	5.56	1.2	★	★																						
HM	SCMT09T304-HM	9.525	9.525	3.97	4.4	0.4			○												●				●	●				
	SCMT09T308-HM	9.525	9.525	3.97	4.4	0.8			●	○				○							●				●	○				
	SCMT120404-HM	12.7	12.7	4.76	5.56	0.4			○																	●				
For semi-finishing	SCMT120408-HM	12.7	12.7	4.76	5.56	0.8			●	○		●		○							●				●					
	SCMT120412-HM	12.7	12.7	4.76	5.56	1.2			○												○									
EM	SCMT09T304-EM	9.525	9.525	3.97	4.4	0.4								●	★					○		★								
	SCMT09T308-EM	9.525	9.525	3.97	4.4	0.8								●	★	★				○		★								
	SCMT120404-EM	12.7	12.7	4.76	5.56	0.4								●	★					○		★								
For semi-finishing	SCMT120408-EM	12.7	12.7	4.76	5.56	0.8								●	★	★				○		★								
	SCMT120412-EM	12.7	12.7	4.76	5.56	1.2								●	★					○		★								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

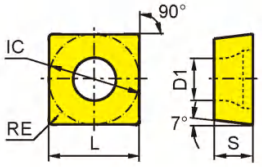
Applicable tool

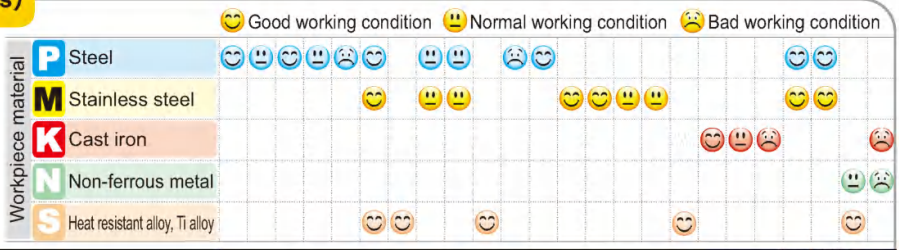


Page A179 A180 A181 A182 A204

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

SC□□ (Positive inserts)





Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
LC	SCGX09T304-LC	9.525	9.525	3.97	4.4	0.4																						★	
	SCGX09T308-LC	9.525	9.525	3.97	4.4	0.8																						★	
	SCGX120408-LC	12.7	12.7	4.76	5.5	0.8																						★	
For Al machining																													
LH	SCGX09T302-LH	9.525	9.525	3.97	4.4	0.2																						○	
	SCGX09T304-LH	9.525	9.525	3.97	4.4	0.4																						○	
	SCGX09T308-LH	9.525	9.525	3.97	4.4	0.8																						★	
	SCGX120404-LH	12.7	12.7	4.76	5.56	0.4																						○	
For Al machining	SCGX120408-LH	12.7	12.7	4.76	5.56	0.8																						★	
HR	SCMT09T304-HR	9.525	9.525	3.97	4.4	0.4			★					●												○				
	SCMT09T308-HR	9.525	9.525	3.97	4.4	0.8			★																●	●				
	SCMT09T312-HR	9.525	9.525	3.97	4.4	1.2			★																					
	SCMT120404-HR	12.7	12.7	4.76	5.56	0.4			○																					
For roughing	SCMT120408-HR	12.7	12.7	4.76	5.56	0.8			★	○				○										○	●	●				
	SCMT120412-HR	12.7	12.7	4.76	5.56	1.2			○															○	○					

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


SSBCR/L KAPR:75°
Page A179

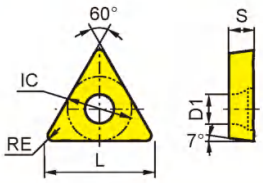

SSDCN KAPR:45°
A180

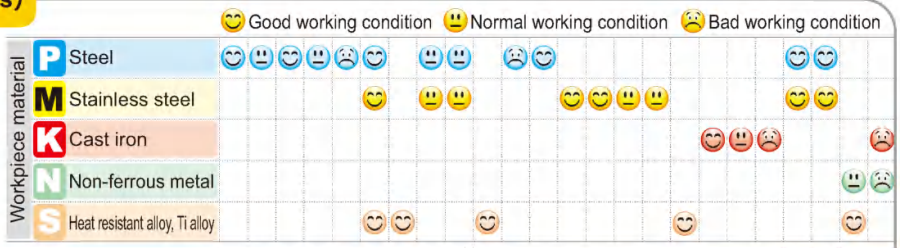

SSKCR/L KAPR:75°
A181


SSSCR/L KAPR:45°
A182


SSKCR/L KAPR:75°
A204

TC□□ (Positive inserts)





Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
SF  For extra finishing	TCGT06T102-SF	6.4	3.97	1.98	2.2	0.2						○																		
	TCGT06T104-SF	6.4	3.97	1.98	2.2	0.4						○																○		
	TCGT090202-SF	9.6	5.56	2.38	2.5	0.2						○																		
	TCGT090204-SF	9.6	5.56	2.38	2.5	0.4						○																○		
	TCGT090208-SF	9.6	5.56	2.38	2.5	0.8						○																		
	TCGT110302-SF	11	6.35	3.18	2.8	0.2						○															○			
	TCGT110304-SF	11	6.35	3.18	2.8	0.4						○						★									○	○		
	TCGT110308-SF	11	6.35	3.18	2.8	0.8						○																		
XF  For finishing	TCMT090202-XF	9.6	5.56	2.38	2.5	0.2	★	★																						
	TCMT090204-XF	9.6	5.56	2.38	2.5	0.4	★	★																						
	TCMT110202-XF	11	6.35	2.38	2.8	0.2	★	★																						
	TCMT110204-XF	11	6.35	2.38	2.8	0.4	★	★																						
	TCMT110208-XF	11	6.35	2.38	2.8	0.8	★	★																						
	TCMT16T304-XF	16.5	9.525	3.97	4.4	0.4	★	★																						
	TCMT16T308-XF	16.5	9.525	3.97	4.4	0.8	★	★																						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



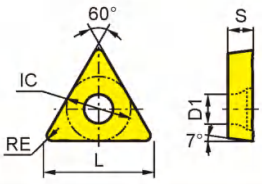
Applicable tool



Page A183 A184 A185 A205

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

TC□□ (Positive inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐😐 😊😊😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
HF  For finishing	TCMT06T104-HF	6.4	3.97	1.98	2.2	0.4			○																					
	TCMT06T108-HF	6.4	3.97	1.98	2.2	0.8			○																					
	TCMT090202-HF	9.6	5.56	2.38	2.5	0.2			★													○					○		○	
	TCMT090204-HF	9.6	5.56	2.38	2.5	0.4			★																		●			
	TCMT090208-HF	9.6	5.56	2.38	2.5	0.8																				○				
	TCMT110202-HF	11	6.35	2.38	2.8	0.2								●								○								
	TCMT110204-HF	11	6.35	2.38	2.8	0.4			★ ★													●				●	○			
	TCMT110208-HF	11	6.35	2.38	2.8	0.8			○ ○					●								○			○				○	
	TCMT16T302-HF	16.5	9.525	3.97	4.4	0.2			○																					
	TCMT16T304-HF	16.5	9.525	3.97	4.4	0.4			●					○												●	●			
	TCMT16T308-HF	16.5	9.525	3.97	4.4	0.8			○																		○		○	
EF  For finishing	TCMT090202-EF	9.6	5.56	2.38	2.5	0.2						○		● ★						★ ○										
	TCMT090204-EF	9.6	5.56	2.38	2.5	0.4						○		● ★						★ ○										
	TCMT110202-EF	11	6.35	2.38	2.8	0.2						○		● ★						★ ○										
	TCMT110204-EF	11	6.35	2.38	2.8	0.4						○		● ★ ★						★ ○										
	TCMT110208-EF	11	6.35	2.38	2.8	0.8						○		● ★						○ ○										
	TCMT16T304-EF	16.5	9.525	3.97	4.4	0.4						○		● ★						★ ○										
	TCMT16T308-EF	16.5	9.525	3.97	4.4	0.8						○		● ★						○ ○										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

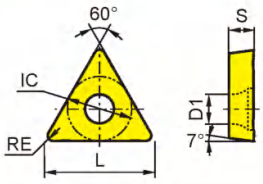

STACR/L KAPR:90°
Page A183


STFCR/L KAPR:91°
A184


STGCR/L KAPR:91°
A185


STFCR/L KAPR:91°
A205

TC□□ (Positive inserts)



Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG205H	YB9315	YB9320	YBH053	YBM153	YBM215	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
AHF	TCMT110204-AHF	11	6.35	2.35	2.8	0.4											★	★												
	TCMT110208-AHF	11	6.35	2.38	2.8	0.8											★	★												
	TCMT16T304-AHF	16.5	9.525	3.97	4.4	0.4											★	★												
For finishing	TCMT16T308-AHF	16.5	9.525	3.97	4.4	0.8											★	★												
EM	TCMT090204-EM	9.6	5.56	2.38	2.8	0.4								●	★	★					○	★								
	TCMT090208-EM	9.6	5.56	2.38	2.8	0.8								●	★						○	★								
	TCMT110204-EM	11	6.35	2.38	2.8	0.4								●	★	★					○	★								
	TCMT110208-EM	11	6.35	2.38	2.8	0.8								●	★						○	★								
	TCMT110212-EM	11	6.35	2.38	2.8	1.2								●	★						○	★								
	TCMT16T304-EM	16.5	9.525	3.97	4.4	0.4								●	★	★					○	★								
	TCMT16T308-EM	16.5	9.525	3.97	4.4	0.8								●	★	★					○	★								
For semi-finishing	TCMT16T312-EM	16.5	9.525	3.97	4.4	1.2								●	★						○	★								
EG	TCMT110204-EG	11	6.35	2.38	2.8	0.4											★													
	TCMT110208-EG	11	6.35	2.38	2.8	0.8											★													
For semi-finishing																														
XM	TCMT16T304-XM	16.5	9.525	3.97	4.4	0.4	★	★																						
	TCMT16T308-XM	16.5	9.525	3.97	4.4	0.8	★	★																						
	TCMT16T312-XM	16.5	9.525	3.97	4.4	1.2	★	★																						
For semi-finishing																														

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



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A184



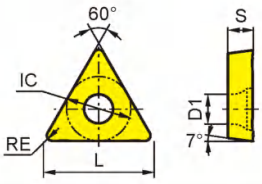
A185



A205

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

TC□□ (Positive inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
HM	TCMT090204-HM	9.6	5.56	2.38	2.5	0.4			★												○					●				
	TCMT090208-HM	9.6	5.56	2.38	2.5	0.8			○																					
	TCMT110204-HM	11	6.35	2.38	2.8	0.4			★	○				●							●				●	●	○			
	TCMT110208-HM	11	6.35	2.38	2.8	0.8			★																	●				
For semi-finishing	TCMT16T304-HM	16.5	9.525	3.97	4.4	0.4			★	★											●				○	●				
	TCMT16T308-HM	16.5	9.525	3.97	4.4	0.8			★	★											●				●	●			○	
	TCMT16T312-HM	16.5	9.525	3.97	4.4	1.2															○									
HR	TCMT090204-HR	9.6	5.56	2.38	2.5	0.4			○																	○				
	TCMT090208-HR	9.6	5.56	2.38	2.5	0.8																				○				●
	TCMT110204-HR	11	6.35	2.38	2.8	0.4			○																	○				
	TCMT110208-HR	11	6.35	2.38	2.8	0.8			○																	○				
For roughing	TCMT16T304-HR	16.5	9.525	3.97	4.4	0.4			○																					
	TCMT16T308-HR	16.5	9.525	3.97	4.4	0.8			●																●	●				
	TCMT16T312-HR	16.5	9.525	3.97	4.4	1.2			○																●	●				○
	TCMT220408-HR	22	12.7	4.76	5.5	0.8			○												●									

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



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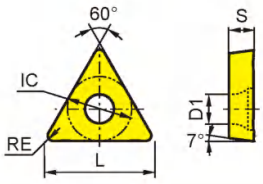
A185

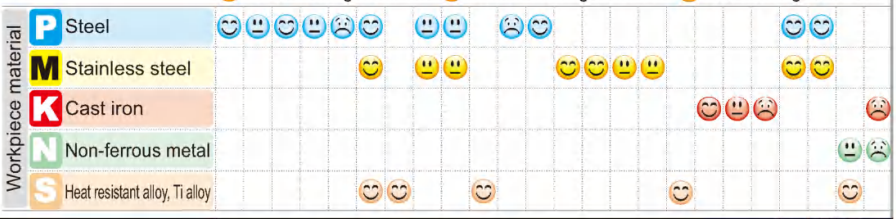


A205

TC□□ (Positive inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition 😞



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
LC	TCGX090202-LC	9.6	5.56	2.38	2.5	0.2																						★	
	TCGX090204-LC	9.6	5.56	2.38	2.5	0.4																						★	
	TCGX110202-LC	11	6.35	2.38	2.8	0.2																						★	
	TCGX110204-LC	11	6.35	2.38	2.8	0.4																						★	
	TCGX110208-LC	11	6.35	2.38	2.8	0.8																						★	
For Al machining	TCGX16T304-LC	16.5	9.525	3.97	4.4	0.4																						★	
	TCGX16T308-LC	16.5	9.525	3.97	4.4	0.8																						★	
LH	TCGX090202-LH	9.6	5.56	2.38	2.5	0.2																						★	
	TCGX090204-LH	9.6	5.56	2.38	2.5	0.4																						★	
	TCGX110202-LH	11	6.35	2.38	2.8	0.2																						★	
	TCGX110204-LH	11	6.35	2.38	2.8	0.4																						★	
	TCGX110208-LH	11	6.35	2.38	2.8	0.8																						★	
For Al machining	TCGX16T302-LH	16.5	9.525	3.97	4.4	0.2																						○	
	TCGX16T304-LH	16.5	9.525	3.97	4.4	0.4																						★	
	TCGX16T308-LH	16.5	9.525	3.97	4.4	0.8																						★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



Page A183



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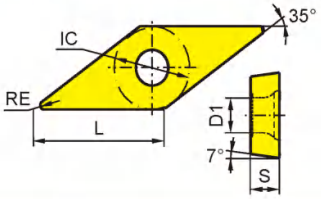
A185



A205

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

VC□□ (Positive inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐😐😐😊 😊😊
M	Stainless steel	😊 😐😐😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YB9315	YB9320	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
SF	VCGT110302-SF	11	6.35	3.18	2.8	0.2						○															○	★		
	VCGT110304-SF	11	6.35	3.18	2.8	0.4						○															○	★		
For extra finishing																														
XF	VCMT110302-XF	11	6.35	3.18	2.8	0.2	★	★																						
	VCMT110304-XF	11	6.35	3.18	2.8	0.4	★	★																						
	VCMT110308-XF	11	6.35	3.18	2.8	0.8	★	★																						
For finishing	VCMT160404-XF	16.6	9.525	4.76	4.4	0.4	★	★																						
	VCMT160408-XF	16.6	9.525	4.76	4.4	0.8	★	★																						
NF	VCGT160408-NF	16.5	9.525	4.76	4.4	0.8						●	★																	
																														
For finishing																														
NGF	VCGT160408-NGF	16.5	9.525	4.76	4.4	0.8						○	●			○														
																														
For finishing																														
AHF	VCMT160404-AHF	16.6	9.525	4.76	4.4	0.4										★	★													
	VCMT160408-AHF	16.6	9.525	4.76	4.4	0.8										★	★													
For finishing																														

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

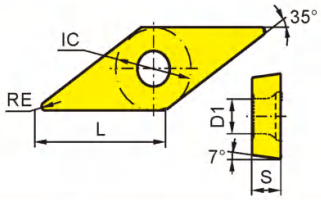

SVVCN
KAPR:72°30'
Page A177


SVJCR/L
KAPR:93°
A178

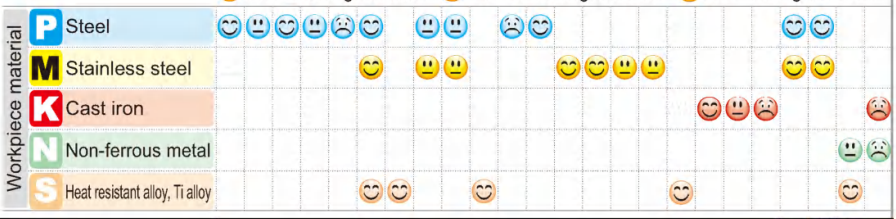

SVQCR/L
KAPR:107°30'
A206


SVUCR/L
KAPR:93°
A207

VC□□ (Positive inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Coated cermet	Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
XM	VCMT160404-XM	16.6	9.525	4.76	4.4	0.4	★	★																						
	VCMT160408-XM	16.6	9.525	4.76	4.4	0.8	★	★																						
For semi-finishing	VCMT160412-XM	16.6	9.525	4.76	4.4	1.2	★	★																						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



Applicable tool



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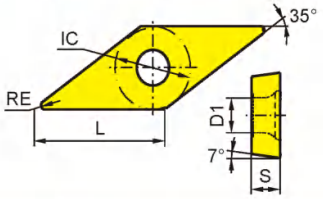
A207

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

VC□□ (Positive inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
LC  For Al machining	VCGX110301-LC	11	6.35	3.18	2.8	0.1																						★	
	VCGX110302-LC	11	6.35	3.18	2.8	0.2																						★	
	VCGX110304-LC	11	6.35	3.18	2.8	0.4																						★	
	VCGX110308-LC	11	6.35	3.18	2.8	0.8																						★	
	VCGX160404-LC	16.6	9.525	4.76	4.4	0.4																						★	
	VCGX160408-LC	16.6	9.525	4.76	4.4	0.8																						★	
	VCGX160412-LC	16.6	9.525	4.76	4.4	1.2																						★	
	VCGX220530-LC	22	12.7	5.56	5.5	3.0																						★	
LH  For Al machining	VCGX110202-LH	11	6.35	2.38	2.8	0.2																						○	
	VCGX110204-LH	11	6.35	2.38	2.8	0.4																						★	
	VCGX110301-LH	11	6.35	3.18	2.8	0.1																						★	●
	VCGX110302-LH	11	6.35	3.18	2.8	0.2																						★	●
	VCGX110304-LH	11	6.35	3.18	2.8	0.4																						★	●
	VCGX110308-LH	11	6.35	3.18	2.8	0.8																						○	
	VCGX160402-LH	16.6	9.525	4.76	4.4	0.2																						★	
	VCGX160404-LH	16.6	9.525	4.76	4.4	0.4																						★	○
	VCGX160408-LH	16.6	9.525	4.76	4.4	0.8																						★	○
	VCGX160412-LH	16.6	9.525	4.76	4.4	1.2																						★	●
	VCGX220530-LH	22	12.7	5.56	5.5	3.0																						★	●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

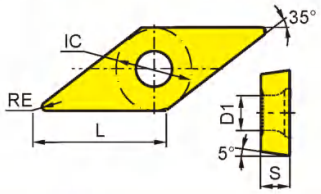

SVVCN KAPR:72°30'
Page A177


SVJCR/L KAPR:93°
A178


SVQCR/L KAPR:107°30'
A206


SVUCR/L KAPR:93°
A207

VB□□ (Positive inserts)



Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
SF	VBGT110302-SF	11	6.35	3.18	2.8	0.2						○														○	○		
	VBGT110304-SF	11	6.35	3.18	2.8	0.4						○														○	○		
For extra finishing																													
EF	VBMT110302-EF	11	6.35	3.18	2.8	0.2						○		●	★				★	○									
	VBMT110304-EF	11	6.35	3.18	2.8	0.4						○		●	★				★	○									
	VBMT110308-EF	11	6.35	3.18	2.8	0.8						○		●	★				○	○									
	VBMT160404-EF	16.5	9.525	4.76	4.4	0.4						○		●	★				★	●									
For finishing	VBMT160408-EF	16.5	9.525	4.76	4.4	0.8						○		●	★				○	●									
XF	VBMT110202-XF	11	6.35	2.38	2.8	0.2	★	★																					
	VBMT110204-XF	11	6.35	2.38	2.8	0.4	★	★																					
	VBMT110302-XF	11	6.35	3.18	2.8	0.2	★	★																					
	VBMT110304-XF	11	6.35	3.18	2.8	0.4	★	★																					
For finishing	VBMT160404-XF	16.5	9.525	4.76	4.4	0.4	★	★																					
	VBMT160408-XF	16.5	9.525	4.76	4.4	0.8	★	★																					
HF	VBMT110202-HF	11	6.35	2.38	2.8	0.2								●															
	VBMT110204-HF	11	6.35	2.38	2.8	0.4								○												○				
	VBMT110208-HF	11	6.35	2.38	2.8	0.8								○															
For finishing																													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

SVJBR/L KAPR:93°



Page A174

SVABR/L KAPR:90°



A175

SVVBN KAPR:72°30'



A176

SVQBR/L KAPR:107°30'



A208

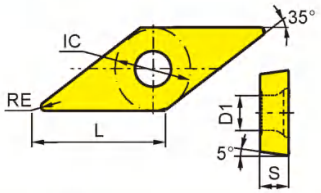
SVUBR/L KAPR:93°



A209

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

VB□□ (Positive inserts)



Good working condition Normal working condition Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YB9315	YB9320	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
NF	VBET160404-NF	16.5	9.525	4.76	4.4	0.4						●	★										★							
	VBET160408-NF	16.5	9.525	4.76	4.4	0.8						●	★																	
For finishing																														
NGF	VBET160404-NGF	16.5	9.525	4.76	4.4	0.4						○	●			○														
	VBET160408-NGF	16.5	9.525	4.76	4.4	0.8						○	●			○														
For finishing	VBET160412-NGF	16.5	9.525	4.76	4.4	1.2						○	●			○														
AHF	VBMT160402-AHF	16.5	9.525	4.76	4.4	0.2										★	★													
	VBMT160404-AHF	16.5	9.525	4.76	4.4	0.4										★	★													
For finishing	VBMT160408-AHF	16.5	9.525	4.76	4.4	0.8										★	★													
EM	VBMT110304-EM	11	6.35	3.18	2.8	0.4								●	★					○		★								
	VBMT110308-EM	11	6.35	3.18	2.8	0.8								●	★					○		★								
For semi-finishing																														
XM	VBMT160404-XM	16.5	9.525	4.76	4.4	0.4	★	★																						
	VBMT160408-XM	16.5	9.525	4.76	4.4	0.8	★	★																						
For semi-finishing	VBMT160412-XM	16.5	9.525	4.76	4.4	1.2	★	★																						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


SVJBR/L KAPR:93°
Page A174

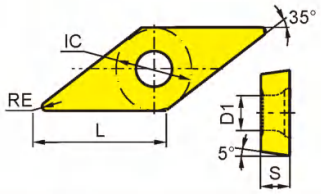

SVABR/L KAPR:90°
A175


SVVBN KAPR:72°30'
A176


SVQBR/L KAPR:107°30'
A208


SVUBR/L KAPR:93°
A209

VB□□ (Positive inserts)



Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
HM	VBMT160404-HM	16.5	9.525	4.76	4.4	0.4			★	★				●							●				●					○
	VBMT160408-HM	16.5	9.525	4.76	4.4	0.8			★	★				●							●				●	●				
For semi-finishing	VBMT160412-HM	16.5	9.525	4.76	4.4	1.2								○							○					○				○
HR	VBMT160404-HR	16.5	9.525	4.76	4.4	0.4			★	○																				
	VBMT160408-HR	16.5	9.525	4.76	4.4	0.8			○	○																○				
For roughing	VBMT160412-HR	16.5	9.525	4.76	4.4	1.2			○	○																				
	VBGT160408-HR	16.5	9.525	4.76	4.4	0.8			○	○																				
SNR	VBMT160408-SNR	16.5	9.525	4.76	4.4	0.8						○	●			○							★							
	VBMT160412-SNR	16.5	9.525	4.76	4.4	1.2						○	●			○							★							
For roughing																														

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool


SVJBR/L KAPR:93°
Page A174


SVABR/L KAPR:90°
A175

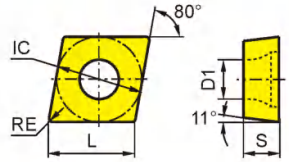

SVVBN KAPR:72°30'
A176


SVQBR/L KAPR:107°30'
A208


SVUBR/L KAPR:93°
A209

Insert code key A48-A49
Grade selection reference A21/A38-A45
Chipbreaker selection reference A24-A37
Recommended cutting parameters A222-A224

CP□□ (Positive inserts)



Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
SF	CPGT060202-SF	6.4	6.35	2.38	2.8	0.2						○															○			
	CPGT060204-SF	6.4	6.35	2.38	2.8	0.4						○															○			
	CPGT09T304-SF	9.7	9.525	3.97	4.4	0.4						○															○	○		
For extra finishing																														

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

SCLPR/L
KAPR:95°



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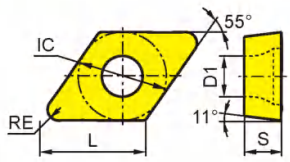
DP□□ (Positive inserts)



Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
SF	DPGT070202-SF	7.8	6.35	2.38	2.8	0.2						○															○	○		
	DPGT070204-SF	7.8	6.35	2.38	2.8	0.4						○															○			
	DPGT070208-SF	7.8	6.35	2.38	2.8	0.8						○																		
	DPGT11T304-SF	11.6	9.525	3.97	4.4	0.4						○															○			
For extra finishing	DPGT11T308-SF	11.6	9.525	3.97	4.4	0.8						○																		

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

SDQPR/L
KAPR:107°30'



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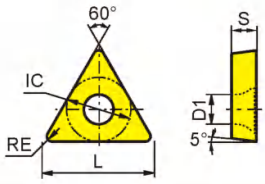
SDUPR/L
KAPR:93°



A212

TB□□ (Positive inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

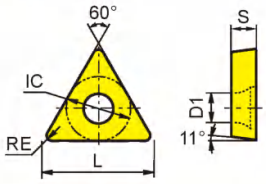
Workpiece material

P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
 For extra finishing	**TBGH060102L**	6.4	3.97	1.59	2.2	0.2						★															★			
	TBGH060104L	6.4	3.97	1.59	2.2	0.4						★																		

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

TP□□ (Positive inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition ☹

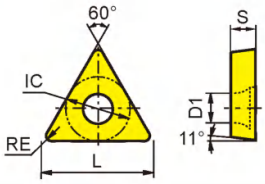
Workpiece material

P	Steel	😊😐😊😐☹😊 😐😐 ☹😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐☹ ☹
N	Non-ferrous metal	😐☹
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
 For extra finishing	**TPGH090202L**	9.6	5.56	2.38	2.8	0.2						●															○			
	TPGH090204L	9.6	5.56	2.38	2.8	0.4						●															●			
	TPGH110302L	11	6.35	3.18	3.18	0.2						○															●			
	TPGH110304L	11	6.35	3.18	3.18	0.4						●															●			

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

TP□□ (Positive inserts)

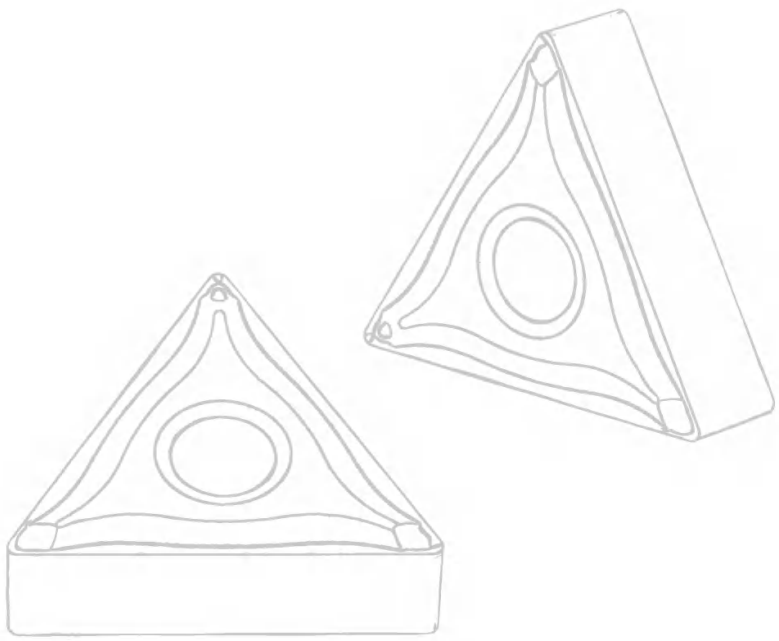


Good working condition 😊 Normal working condition 😐 Bad working condition 😞

Workpiece material		
P	Steel	😊😐😊😐😞😊 😐😐 😞😊 😊😊
M	Stainless steel	😊 😐😐 😊😊😐😐 😊😊
K	Cast iron	😊😐😞 😞
N	Non-ferrous metal	😐😞
S	Heat resistant alloy, Ti alloy	😊😊 😊 😊 😊

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide															Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC103	YBC203	YBC152	YBC252	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBH053	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YNG151	YNG151C	YD101	YD201
SF  For extra finishing	TPGT090202-SF	9.6	5.56	2.38	2.5	0.2						○															○		
	TPGT090204-SF	9.6	5.56	2.38	2.5	0.4						○															○	★		
	TPGT090208-SF	9.6	5.56	2.38	2.5	0.8						○															○			
	TPGT110302-SF	11	6.35	3.18	2.8	0.2						○															○			
	TPGT110304-SF	11	6.35	3.18	2.8	0.4						○															○	○		
	TPGT110308-SF	11	6.35	3.18	2.8	0.8						○																○		

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



Applicable tool

STUPR/L
KAPR:93°



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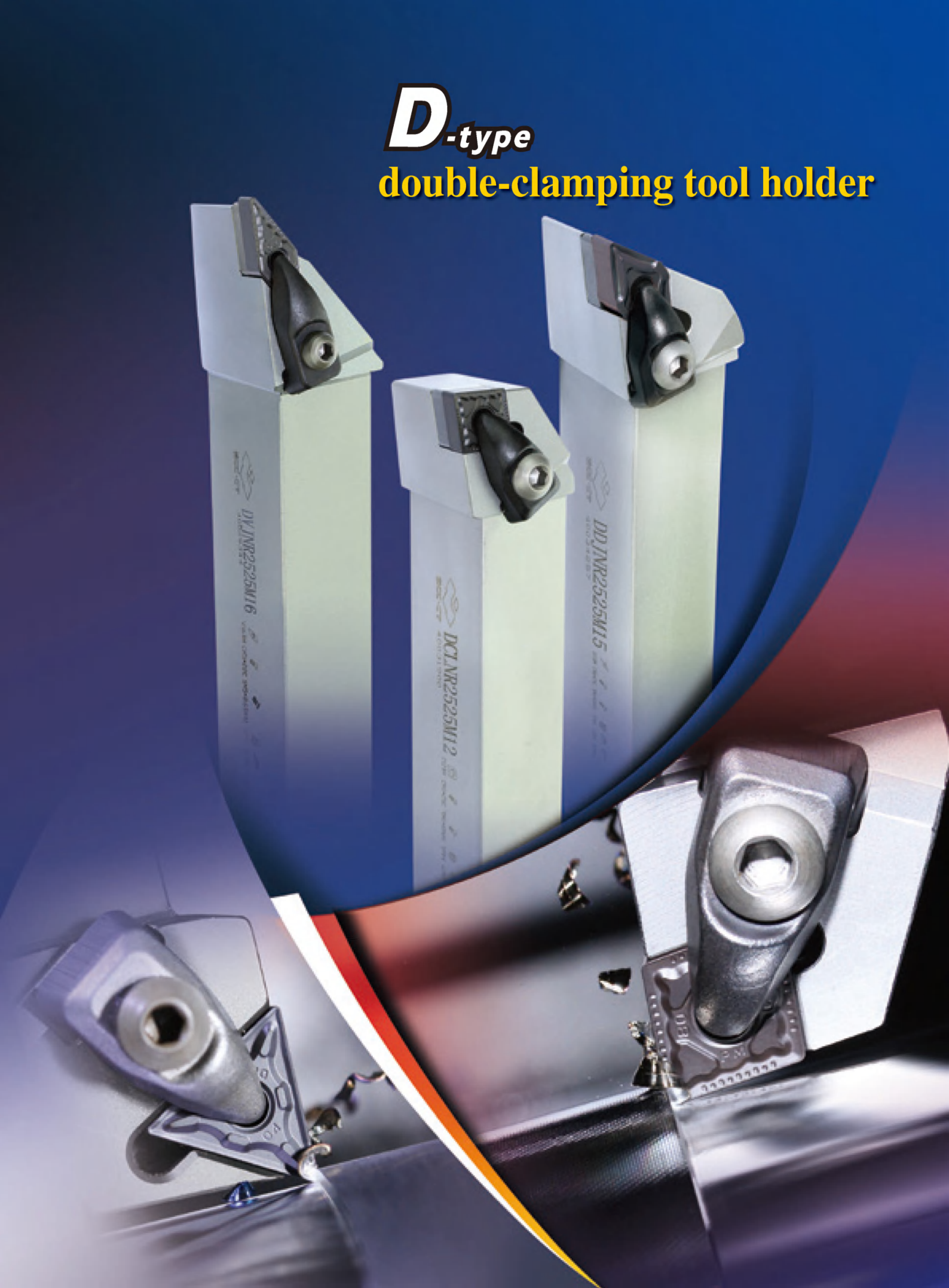
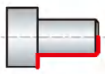
D-type
double-clamping tool holder

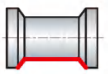


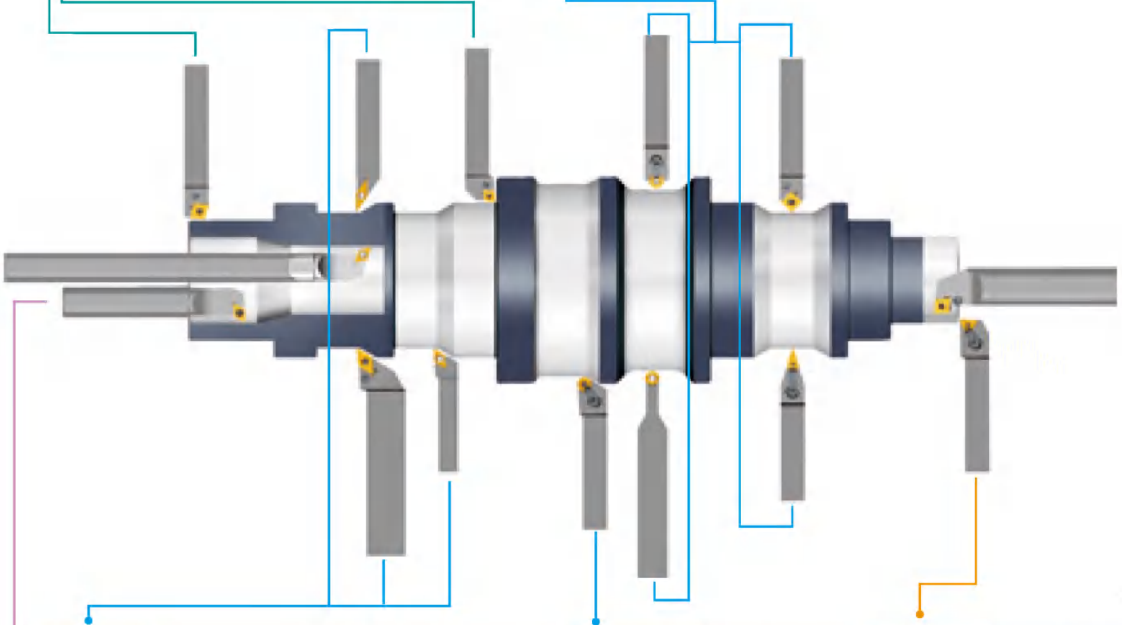
Applications sketch map of turning tools

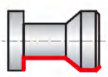
External and internal turning

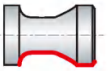
External turning	Tool holder type						
	PCBNR/L□□	PSBNR/L□□	PSSNR/L□□	PTGNR/L□□	PTTNR/L□□	MCBNR/L□□	MSBNR/L□□
	MSRNR/L□□	MTGNR/L□□	MTJNR/L□□	MTJNR/L□□-Z	SCACR/L□□	SSBCR/L□□	SSSCR/L□□
	STACR/L□□	STGCR/L□□	DTJNR/L□□	DSBNR/L□□			

External and end surface turning	Tool holder type	
	PCLNR/L□□	PWLNR/L□□
	MCLNR/L□□	MWLNR/L□□
	SCLCR/L□□	DCLNR/L□□
	DWLNR/L□□	

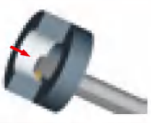
Profile turning	Tool holder type			
	PDPNN□□	PSDNN□□	MDPNN□□	MSDNN□□
	MVVNN□□	SDNCN□□	SVVBN□□	SVVCN□□
	SSDCN□□	SRDCN□□	DVVNN□□	



Profile turning	Tool holder type		
	PDJNR/L□□	MDJNR/L□□	MVJNR/L□□
	SDACR/L□□	SDJCR/L□□	SVABR/L□□
	SVJBR/L□□	SVJCR/L□□	
	DDJNR/L□□	DVJCR/L□□	

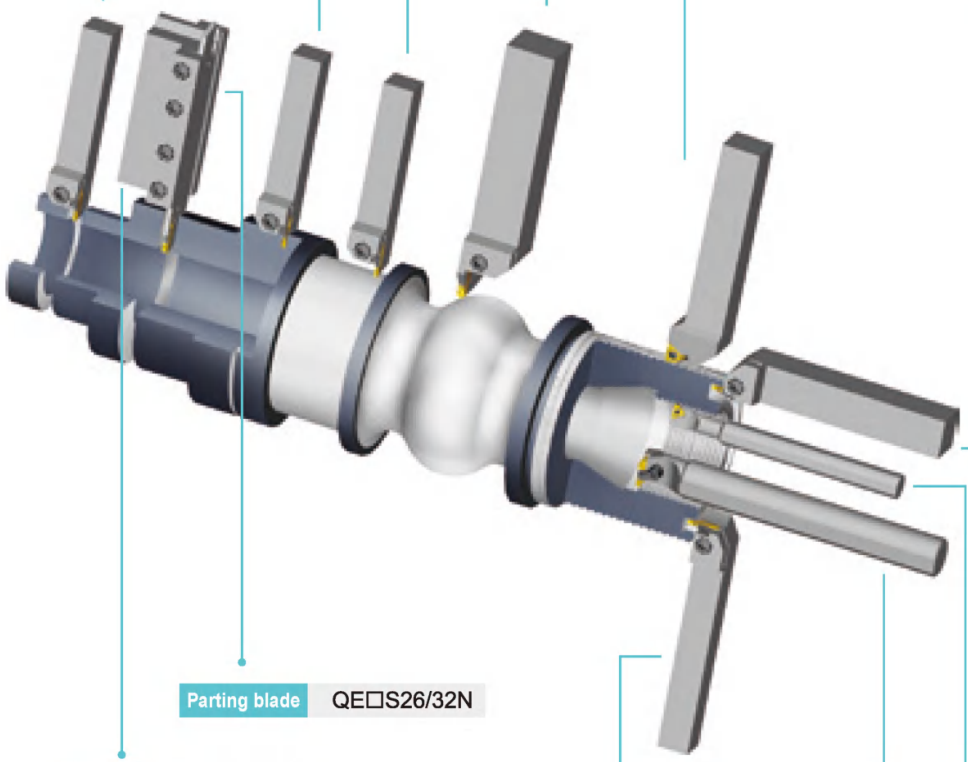
Profile turning	Tool holder type
	SRGCR/L□□

End surface turning	Tool holder type	
	PSKNR/L□□	PTFNR/L□□
	MSKNR/L□□	MTFNR/L□□
	SSKCR/L□□	STFCR/L□□

Tool holders for internal turning (Steel tool shank)						
						
	S□-PSKNR/L□	S□-PCLNR/L□	S□-PDPNR/L□	S□-PDUNR/L□	S□-SDQCR/L□	S□-SDZCR/L□
	S□-PTFNR/L□	S□-PWLNR/L□		S□-SDUCR/L□	S□-SDQPR/L□	
	S□-SCFCR□	S□-SCLCR/L□		S□-SDUNR/L□	S□-SVQBR/L□	
	S□-SSKCR/L□	S□-SCLPR/L□		S□-SDUPR/L□	S□-SVQCR/L□	
	S□-STFCR/L□			S□-SVUBR/L□		
	S□-STUPR/L□			S□-SVUCR/L□		

Tool holders for internal turning (Cemented carbide tool shank)				
				
	C□-STUPR/L□	C□-SCLPR/L□	C□-SDUPR/L□ C□-SVUCR/L□	C□-SDQPR/L□ C□-SVQCR/L□

Parting, grooving and threading tools



External threading tools	ZSER/L□
End surface grooving, turning	QF□D□□R/L□-□H
	GFD□□R/L
Parting blade	QE□S26/32N
Parting blade holder	QZS□26/32
Internal threading tools	ZSIR/L□

External parting, grooving, turning and profiling	QE□D□R/L□	the Little Squirrel series
	GQCR/L□	
	QZQ□R/L□	
	QZS□R/L□	
	GED□□R/L	
Precise grooving and turning	QECD□R/L025	the Little Squirrel series
External recess and profiling	QX□D□R/L□-45	the Little Squirrel series
External grooving for hard-to-machine materials	QE□S□R/L□-□N	the Little Squirrel series

Internal grooving, turning	C□-Q□DR/L□	the Little Squirrel series
	S□□□-QC□□R/L□	
	C□-QZSR/L□	
	GID□□R/L	
End surface grooving, turning	QF□D□R/L□-□L	

How to select external turning tools

Explanation of external turning tools detailed table

- Listed according to clamping types.

Approach angle of tools

Tools type
The first 4 letters in the type description stands for tool shape and application

Inserts type

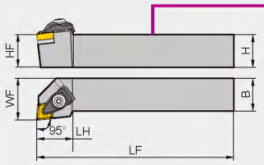
Specification chart

Application chart
The arrow shows suitable applications such as external turning, profiling and end turning, etc.

Corresponding tool holders of insert CN□□ D-type clamping

DCLNR/L
KAPR:95°







Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Shim screw	Spring
		R	L	H	B	LF	HF	WF	LH						
DCLNR/L	1616H09	▲	△	16	16	100	16	21	24	CM5×22C	C09BM	WH30L	C1RA	SM5×8.65XA1	SPR6
	2020K09	▲	△	20	20	125	20	25	24						
	2525M09	▲	△	25	25	150	25	32	24						
	2020K12	▲	▲	20	20	125	20	25	28	CM6×25C	C12BM	WH40L	C2RA	SM6×10XA1	SPR4
	2525M12	▲	▲	25	25	150	25	32	28						
	3225P12	▲	▲	32	25	170	32	32	28						

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	XF A52	XM A54	DR Double-side A56	HDR A58	TC A58
	DF A52	PM A53	DR Single-side A57	HPR A58	Without chipbreaker A59
	SF A52	DM A54	ER Double-side A57		
	EF A52	EM A55	ER Single-side A57		
	ADF A53	EG A55	SNR Double-side A57		
	NF A53	EH A55	LR Single-side A56		
		NM A55			
Tool holder type	DCLNR/L□□H/K/M09	CN□□0903□□	CN□□0903□□		
	DCLNR/L□□K/M/P12	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□

Products specification
Including product description, stock (left and right hand), basic dimensions and applicable spare parts.

Applicable inserts
Including applications of inserts, reference page, insert shape and corresponding tool holders.



TURNING A

External turning tools

External turning tools overview A128-A131

External turning tools code key A132-A133

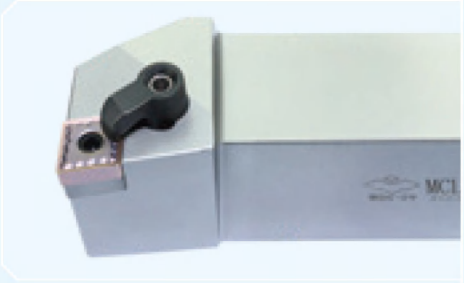
Detailed table of external turning tools A136-A187

External turning tool holders by D type clamping A136-A141

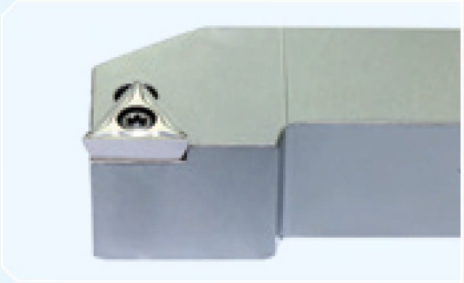
External turning tool holders by P type clamping A142-A153

External turning tool holders by M type clamping A154-A168

External turning tool holders by S type clamping A169-A187





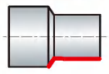
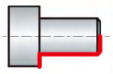
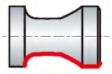
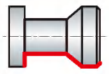
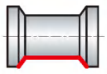
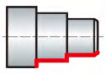


External turning tools overview

Clamping system	Tool type	Approach angle(KAPR°)	Turning type: External turning	Turning type: End surface turning	Turning type: External and end surface turning	Turning type: Profile turning	Turning type: Profile turning	Turning type: Profile turning	Applicable workpiece shape: Short, Thick	Applicable workpiece shape: Thin, Long	Page
D	DCLNR/L	95			☺				☺		A136
	DDJNR/L	93					☺		☺	☺	A137
	DSBNR/L	75	☺						☺		A138
	DTGNR/L	91	☺						☺	☺	A139
	DVVNN	72.5						☺	☺		A140
	DVJNR/L	93					☺		☺	☺	A140
	DWLNR/L	95			☺				☺		A141
P	PCBNR/L	75	☺						☺		A142
	PCLNR/L	95			☺				☺		A143
	PDJNR/L	93					☺		☺	☺	A144
	PDPNN	62.5						☺	☺		A145
	PSBNR/L	75	☺						☺		A146
	PSDNN	45						☺	☺		A147
	PSKNR/L	75		☺					☺		A148
	PSSNR/L	45	☺						☺		A149
	PTFNR/L	91		☺					☺	☺	A150

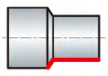
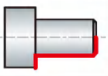
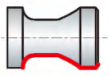
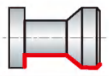
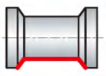
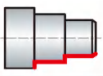
☺ Recommended ☺ Available

External turning tools overview

Clamping system	Tool type	Approach angle(KAPR°)	Turning type						Applicable workpiece shape		Page
			External turning	End surface turning	External and end surface turning	Profile turning	Profile turning	Profile turning	Short, Thick	Thin, Long	
											
P	PTTNR/L 	60	☺						☺		A151
P	PTGNR/L 	90	☺						☺	☺	A152
P	PWLNR/L 	95			☺				☺		A153
M	MCBNR/L 	75	☺						☺		A154
M	MCLNR/L 	95			☺				☺		A155
M	MDJNR/L 	93					☺		☺	☺	A156
M	MDPNN 	62.5						☺	☺		A157
M	MSBNR/L 	75	☺						☺		A158
M	MSRNR/L 	75	☺						☺		A159
M	MSKNR/L 	75		☺					☺		A160
M	MSDNN 	45						☺	☺		A161
M	MTGNR/L 	90	☺						☺	☺	A162
M	MTJNR/L 	93	☺						☺		A163
M	MTJNR/L-Z 	93		☺			☺		☺		A164
M	MTFNR/L 	91		☺					☺		A165

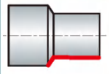
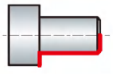
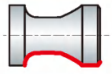
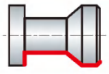
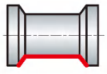
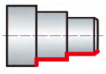
☺ Recommended ☺ Available

External turning tools overview

Clamping system	Tool type	Approach angle(KAPR°)	Turning type: External turning	End surface turning	External and end surface turning	Profile turning	Profile turning	Profile turning	Applicable workpiece shape: Short, Thick	Thin, Long	Page
											
M	MVVNN 	72.5						☺	☺		A166
M	MVJNR/L 	93					☺		☺	☺	A167
M	MWLNR/L 	95			☺				☺		A168
S	SCACR/L 	90	☺						☺	☺	A169
S	SCLCR/L 	95			☺				☺	☺	A170
S	SDACR/L 	90					☺		☺	☺	A171
S	SDJCR/L 	93					☺		☺	☺	A172
S	SDNCN 	62.5						☺	☺	☺	A173
S	SVJBR/L 	93					☺		☺	☺	A174
S	SVABR/L 	90					☺		☺	☺	A175
S	SVVBN 	72.5						☺	☺	☺	A176
S	SVVCN 	72.5						☺	☺	☺	A177
S	SVJCR/L 	93					☺		☺	☺	A178
S	SSBCR/L 	75	☺						☺		A179
S	SSDCN 	45						☺	☺		A180

☺ Recommended ☺ Available

External turning tools overview

Clamping system	Tool type	Approach angle(KAPR°)	Turning type						Applicable workpiece shape		Page
			External turning	End surface turning	External and end surface turning	Profile turning	Profile turning	Profile turning	Short, Thick	Thin, Long	
											
S	SSKCR/L 	75		☺					☺		A181
	SSSCR/L 	45	☺						☺		A182
	STACR/L 	90	☺						☺	☺	A183
	STFCR/L 	91		☺					☺		A184
	STGCR/L 	91	☺						☺	☺	A185
	SRDCN 							☺	☺		A186
	SRGCR/L 					☺			☺		A187

☺ Recommended ☺ Available

External turning tools code key

Clamping system



P – Hole clamping



M-Top and hole clamping



S – Screw on



C – Top clamping



D – double clamping

Insert shape



C



D



R



S



T

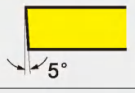


V



W

Clearance angle of insert



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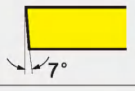

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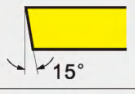
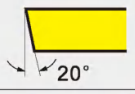
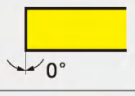


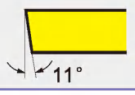
D



E

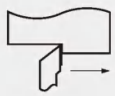


N

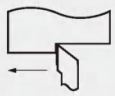


P

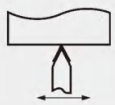
Cutting direction



L - Left-hand



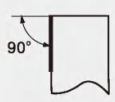
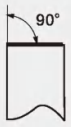
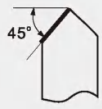
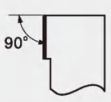
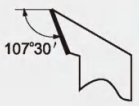
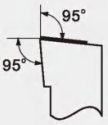
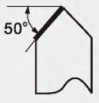
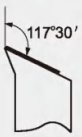
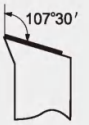
R - Right-hand



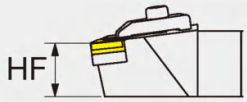
N Right and left hand



Tool holder style and approach angle

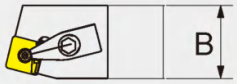
A	B	C	D	E	F	G	H
							
J	**K**	**L**	**M**	**N**	**O**	**P**	**Q**
							
R	**S**	**T**	**U**	**V**	**W**	**X**	
							

Nose height (mm)



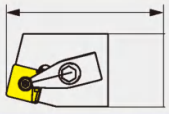
Code	Height
12	12
16	16
20	20
25	25
32	32
40	40
50	50

Width of tool holder (mm)



Code	Width
12	12
16	16
20	20
25	25
32	32
40	40
50	50

Length of tool holder (mm)

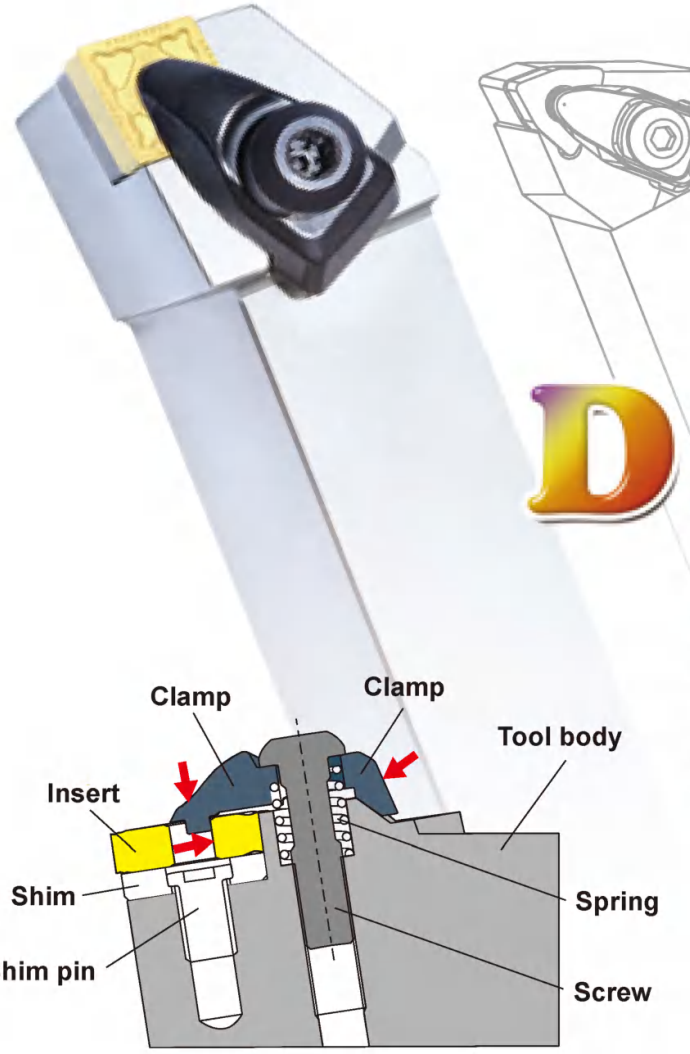


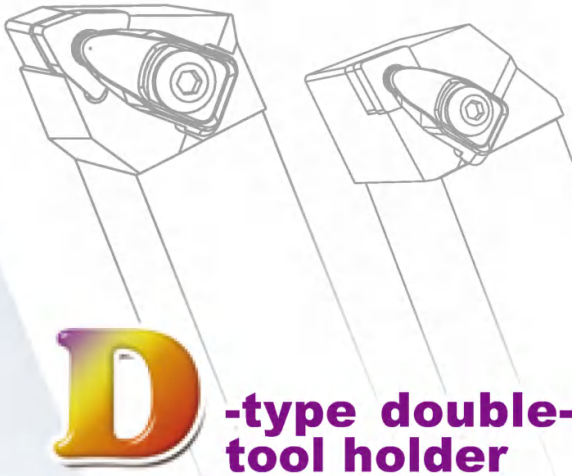
Code	Length
E	70
F	80
H	100
K	125
M	150
P	170
Q	180
R	200
S	250
T	300

25 25 M 12

Length of cutting edge

Inserts shape	C	D	R	S	T	V	W
							
Inscribed circle (mm)	Length of cutting edge(mm)						
5.556	---	---	---	---	09	---	---
6.350	06	07	---	---	11	---	---
9.525	09	11	09	09	16	16	06
12.700	12	15	12	12	22	22	08
15.875	16	19	15	15	27	---	---
19.050	19	---	19	19	33	---	---
25.400	25	---	25	25	44	---	---
32.000	---	---	32	---	---	---	---



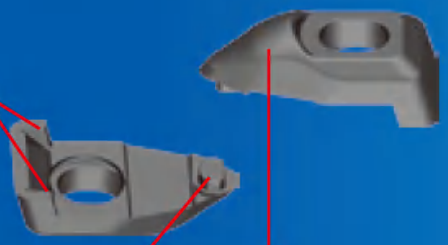


D-type double-clamping tool holder

With newly developed double-clamping structure, D-type turning tools have high clamping rigidity and high positioning accuracy, achieving easy and secure clamping of inserts. It is the best choice for the clamping of straight hole negative inserts.

Uniquely clamp

The clamp and the inner wall of insert hole make an arc contact. The stable and evenly distributed clamping force ensures more secure clamping.



lug boss on both ends and double-locating make more insert clamp secure.

Arc locating surface makes large contact area and the force is evenly distributed.

Simple and compact structure effectively prevents chip blocking while ensuring high clamping rigidity.

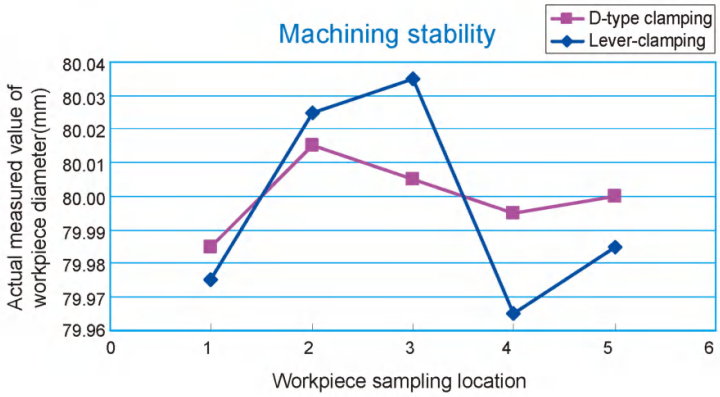
Convenient secure clamping device



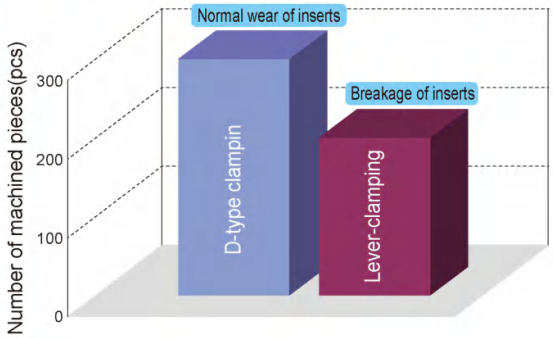
Slots in the tool body match perfectly with the clamp, realizing simple and easy clamping.

Compared with lever-clamping:

① Accurate locating ensures more stable machining accuracy.



② High clamping rigidity effectively improves resistance to breakage of insert.



Compared with similar products of company A:

① Locating surface contact: (checking the contact location of clamp by dyeing)

Force evenly distributed, firm clamping, high locating accuracy.



ZCC-CT

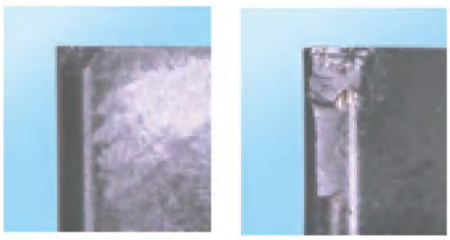


Similar product of company A

② Effect on tool life:

Tool holder: DCLNL3225P12
Insert: YBC252/CNMG120408-DR
Cutting material: 45# steel
Cutting parameters: V_c=250m/min
a_p=2mm
f=0.6mm/r

After 60 minutes of cutting



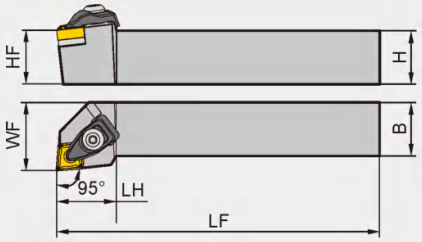
ZCC-CT

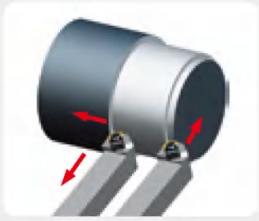
Similar product of company A

Corresponding tool holders of insert CN□□ D-type clamping

DCLNR/L
KAPR:95°







Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Shim screw	Spring
		R	L	H	B	LF	HF	WF	LH						
DCLNR/L	**1616H09**	▲	△	16	16	100	16	21	24	CM5×22C	C09BM	WH30L	C1RA	SM5×8.65XA1	SPR6
	2020K09	▲	△	20	20	125	20	25	24						
	2525M09	▲	△	25	25	150	25	32	24						
	2020K12	▲	▲	20	20	125	20	25	28	CM6×25C	C12BM	WH40L	C2RA	SM6×10XA1	SPR4
	2525M12	▲	▲	25	25	150	25	32	28						
	3225P12	▲	▲	32	25	170	32	32	28						

▲Stock available △Make-to-order

Applicable inserts

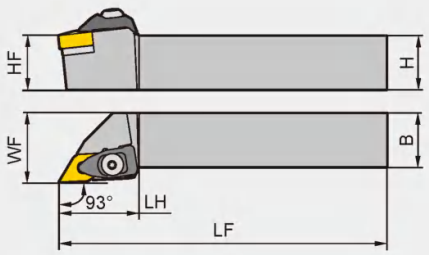
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A52	**XM**  A54	**DR** Double-side  A56	**HDR**  A58	**TC**  A58
	DF  A52	**PM**  A53	**DR** Single-side  A57	**HPR**  A58	Without chipbreaker  A59
	SF  A52	**DM**  A54	**ER** Double-side  A57		
	EF  A52	**EM**  A55	**ER** Single-side  A57		
	ADF  A53	**EG**  A55	**SNR** Double-side  A57		
	NF  A53	**EH**  A55	**LR** Single-side  A56		
		NM  A55			

Tool holder type						
	DCLNR/L□□H/K/M09	CN□□0903□□	CN□□0903□□			
	DCLNR/L□□K/M/P12	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□

Corresponding tool holders of insert DN□□ D-type clamping

DDJNR/L
KAPR:93°







Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Shim screw	Spring
		R	L	H	B	LF	HF	WF	LH						
DDJNR/L	1616H11	△	△	16	16	100	16	20	30	CM5×22C	D11BM	WH30L	C1RA	SM5×8.65XA1	SPR6
	2020K11	▲	△	20	20	125	20	25	30						
	2525M11	▲	△	25	25	150	25	32	30						
	3225P11	△	△	32	25	170	32	32	30						
	2020K15	▲	▲	20	20	125	20	25	35	CM6×25C	D15BM	WH40L	C2RA	SM6×10XA1	SPR4
	2525M15	▲	▲	25	25	150	25	32	35						
	3232P15	▲	▲	32	32	170	32	40	35						

▲Stock available △Make-to-order

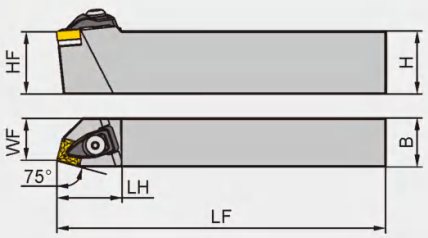
Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	XF A60	XM A63	DR Double-side A65	HDR A66	TC A66
	DF A60	PM A62	DR Single-side A65		Without chipbreaker A67
	SF A60	DM A63	ER Double-side A65		
	EF A61	EM A64	ER Single-side A66		
	ADF A61	EG A64	SNR Double-side A66		
	NF A61	NM A64	LR Single-side A65		
	NGF A62				
Tool holder type DDJNR/L□□H/K/M/P11	DN□□1104□□	DN□□1104□□			DN□□1104□□
DDJNR/L□□K/M/P15	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□

Corresponding tool holders of insert SN□□ D-type clamping

DSBNR/L
KAPR:75°







Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Shim screw	Spring
		R	L	H	B	LF	HF	WF	LH						
DSBNR/L	**1616H09**	▲	△	16	16	100	16	13	28	CM5×22C	S09BM	WH30L	C1RA	SM5×8.65XA1	SPR6
	2020K12	▲	▲	20	20	125	20	17	34	CM6×25C	S12BM	WH40L	C2RA	SM6×10XA1	SPR4
	2525M12	▲	▲	25	25	150	25	22	34						
	3225P12	▲	▲	32	25	170	32	22	34						
	3232P15	▲	▲	32	32	170	32	27	41	CM6×25C	S15BM	WH40L	C3RA	SM6×10XA2	SPR4

▲Stock available △Make-to-order

Applicable inserts

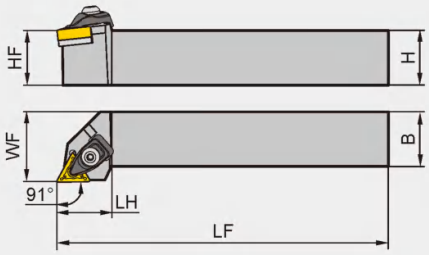
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A68	**XM**  A70	**DR** Double-side  A73	**HDR**  A75	**TC**  A76
	DF  A68	**PM**  A70	**DR** Single-side  A74	**HPR**  A76	Without chipbreaker  A77
	EF  A68	**DM**  A71	**ER** Double-side  A74		
	ADF  A69	**EM**  A71	**ER** Single-side  A75		
	SF  A69	**EG**  A72	**SNR** Double-side  A75		
		NM  A72	**LR** Single-side  A72		

Tool holder type						
	DSBNR/L□□H09	SN□□0903□□	SN□□0903□□			SN□□0903□□
	DSBNR/L□□K/M/P12	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
	DSBNR/L□□P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□

Corresponding tool holders of insert TN□□ D-type clamping

DTGNR/L
KAPR:91°







Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Shim screw	Spring
		R	L	H	B	LF	HF	WF	LH						
DTGNR/L	**1616H16**	△	△	16	16	100	16	22	25	CM5×22C	T16BM	WH30L	C1RA	SM5×8.65XA1	SPR6
	2020K16	▲	▲	20	20	125	20	25	25						
	2525M16	▲	▲	25	25	150	25	32	25						

▲Stock available △Make-to-order

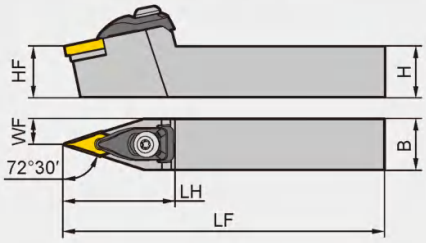
Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF** A78	**XM** A80	**DR** Double-side A82	**HDR** A84	**TC** A84
	DF A78	**PM** A80	**DR** Single-side A83		Without chipbreaker A84
	SF A78	**DM** A81	**ER** Double-side A83		
	EF A79	**EM** A81	**SNR** Double-side A83		
	ES A79	**EG** A81	**LR** Single-side A83		
	ADF A79	**EH** A82			
Tool holder type **DTGNR/L□□H/K/M16**	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□

Corresponding tool holders of insert VN□□ D-type clamping

DVVNN
KAPR:72°30'





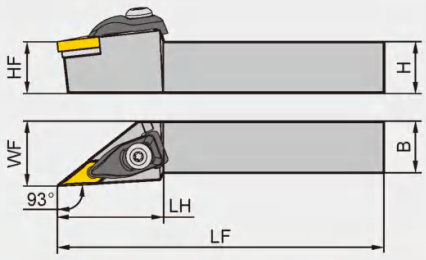


Type		Stock	Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Shim screw	Spring
			H	B	LF	HF	WF	LH						
DVVNN	2020K16	△	20	20	125	20	10	44	CM5×22C	V16BM	WH30L	C6RA	SM5×8.65XA1	SPR6
	2525M16	▲	25	25	150	25	12.5	44						

▲Stock available △Make-to-order

DVJNR/L
KAPR:93°







Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Shim screw	Spring
		R	L	H	B	LF	HF	WF	LH						
DVJNR/L	2020K16	▲	▲	20	20	125	20	25	41	CM5×22C	V16BM	WH30L	C6RA	SM5×8.65XA1	SPR6
	2525M16	▲	▲	25	25	150	25	32	41						

▲Stock available △Make-to-order

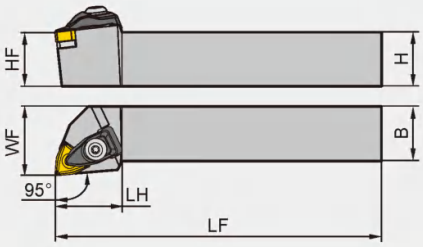
Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For cast iron machining
Inserts shape	XF A85	XM A86	SNR A87	TC A87
	DF A85	PM A86		
	EF A85	DM A86		
	ADF A85	EM A87		
	SF A86	EG A87		
	NF A85	NM A87		
	NGF A86			
Tool holder type DVVNN□□K/M16	VN□□1604□□	VN□□1604□□	VN□□1604□□	VN□□1604□□
Tool holder type DVJNR/L□□K/M16	VN□□1604□□	VN□□1604□□	VN□□1604□□	VN□□1604□□

Corresponding tool holders of insert WN□□ D-type clamping

DWLNR/L
KAPR:95°







Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Shim screw	Spring
		R	L	H	B	LF	HF	WF	LH						
DWLNR/L	1616H06	▲	△	16	16	100	16	25	24	CM5×22C	W06BM	WH30L	C1RA	SM5×8.65XA1	SPR6
	2020K06	▲	▲	20	20	125	20	25	24						
	2525M06	▲	▲	25	25	150	25	32	24						
	2020K08	▲	▲	20	20	125	20	25	31	CM6×25C	W08BM	WH40L	C2RA	SM6×10XA1	SPR4
	2525M08	▲	▲	25	25	150	25	32	31						
	3225P08	△	△	32	25	170	32	32	31						

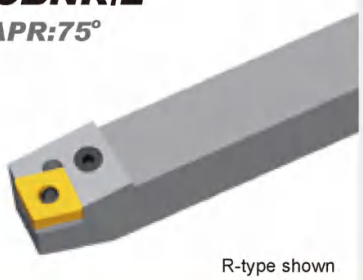
▲Stock available △Make-to-order

Applicable inserts

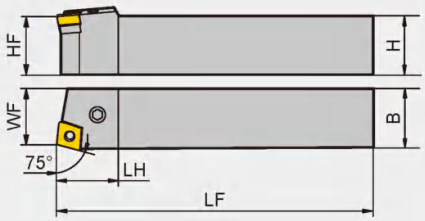
Application	For finishing	For semi-finishing	For roughing	For cast iron machining
Inserts shape	XF A88	XM A90	DR Double-side A92	TC A93
	DF A88	PM A90	SNR Double-side A92	Without chipbreaker A93
	SF A88	DM A91		
	EF A89	EM A91		
	ES A89	EG A91		
	ADF A89	EH A92		
	NF A89	NM A92		
Tool holder type DWLNR/L□□H/K/M06	WN□□0604□□	WN□□0604□□	WN□□0604□□	WN□□0604□□
Tool holder type DWLNR/L□□K/M/P08	WN□□0804□□	WN□□0804□□	WN□□0804□□	WN□□0804□□

Corresponding tool holders of insert CN□□ P-type clamping

PCBNR/L
KAPR:75°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	H	B	LF	HF	WF	LH					
PCBNR/L	2020K12	▲	▲	20	20	125	20	17	27	LEM8×21	C12AP	WH30L	L4	SP4
	2525M12	▲	▲	25	25	150	25	22	27					
	3232P12	▲	▲	32	32	170	32	27	33					
	2525M16	▲	▲	25	25	150	25	22	33	LEM8×25	C16AP	WH30L	L5	SP5
	3232P16	▲	▲	32	32	170	32	27	33					
	4040R16	▲	▲	40	40	200	40	35	38					
	3232P19	▲	▲	32	32	170	32	27	38	LEM10×27	C19AP	WH40L	L6	SP6
	4040R19	▲	▲	40	40	200	40	35	40					
	4040S2507	▲	▲	40	40	250	40	35	50	LEM12×36A	C25AP-07	WH50L	L8	SP8
	4040S2509	▲	▲	40	40	250	40	35	50		C25AP			

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	XF A52	XM A54	DR Double-side A56	HDR A58	TC A58
	DF A52	PM A53	DR Single-side A57	HPR A58	Without chipbreaker A59
	SF A52	DM A54	ER Double-side A57		
	EF A52	EM A55	ER Single-side A57		
	ADF A53	EG A55	SNR Double-side A57		
	NF A53	EH A55	LR Single-side A56		
		NM A55			

Tool holder type	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
PCBNR/L□□K/M/P12	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□
PCBNR/L□□M/P/R16	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□
PCBNR/L□□P/R19		CN□□1906□□	CN□□1906□□	CN□□1906□□	CN□□1906□□
PCBNR/L□□S2507			CN□□2507□□		
PCBNR/L□□S2509			CN□□2509□□		

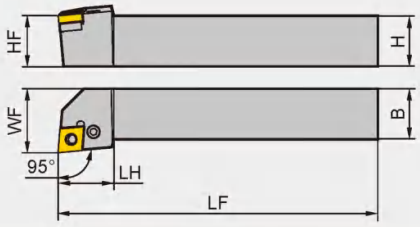
Corresponding tool holders of insert CN□□ P-type clamping

PCLNR/L

KAPR:95°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	H	B	LF	HF	WF	LH					
PCLNR/L	2020K12	▲	▲	20	20	125	20	25	28	LEM8×21	C12AP	WH30L	L4	SP4
	2525M12	▲	▲	25	25	150	25	32	33					
	3225P12	△	△	32	25	170	32	32	33					
	3232P12	▲	▲	32	32	170	32	40	33					
	2525M16	▲	▲	25	25	150	25	32	33	LEM8×25	C16AP	WH30L	L5	SP5
	3225P16	△	△	32	25	170	32	32	33					
	3232P16	▲	▲	32	32	170	32	40	33					
	4040R16	△	△	40	40	200	40	50	38					
	3232P19	▲	▲	32	32	170	32	40	38	LEM10×27	C19AP	WH40L	L6	SP6
	4040R19	▲	▲	40	40	200	40	50	38					
	4040S2507	▲	▲	40	40	250	40	50	49	LEM12×36A	C25AP-07	WH50L	L8	SP8
	4040S2509	▲	▲	40	40	250	40	50	49		C25AP			

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	XF A52	XM A54	DR Double-side A56	HDR A58	TC A58
	DF A52	PM A53	DR Single-side A57	HPR A58	Without chipbreaker A59
	SF A52	DM A54	ER Double-side A57		
	EF A52	EM A55	ER Single-side A57		
	ADF A53	EG A55	SNR Double-side A57		
	NF A53	EH A55	LR Single-side A56		
		NM A55			

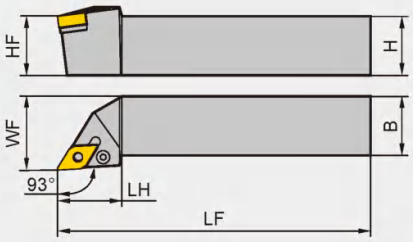
Tool holder type	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
PCBNR/L□□K/M/P12	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□
PCBNR/L□□M/P/R16	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□
PCBNR/L□□P/R19		CN□□1906□□	CN□□1906□□	CN□□1906□□	CN□□1906□□
PCBNR/L□□S2507			CN□□2507□□		
PCBNR/L□□S2509			CN□□2509□□		

Corresponding tool holders of insert DN□□ P-type clamping

PDJNR/L
KAPR:93°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	H	B	LF	HF	WF	LH					
PDJNR/L	**1616H11**	▲	▲	16	16	100	16	20	25	LEM6×13.4A	D11AP	WH25L	L3	SP3
	2020K11	▲	▲	20	20	125	20	25	25					
	2525M11	▲	▲	25	25	150	25	32	30					
	2020K15	▲	▲	20	20	125	20	25	35	LEM8×21	D15AP	WH30L	L4B	SP4
	2525M15	▲	▲	25	25	150	25	32	35					
	3232P15	▲	▲	32	32	170	32	40	35					
	2020K15-3	▲	△	20	20	125	20	25	35	LEM8×21	D15AP	WH30L	L4	SP4
	2525M15-3	▲	▲	25	25	150	25	32	35					
	3232P15-3	▲	△	32	32	170	32	40	35					

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A60	**XM**  A63	**DR** Double-side  A65	**HDR**  A66	**TC**  A66
	DF  A60	**PM**  A62	**DR** Single-side  A65		Without chipbreaker  A67
	SF  A60	**DM**  A63	**ER** Double-side  A65		
	EF  A61	**EM**  A64	**ER** Single-side  A66		
	ADF  A61	**EG**  A64	**SNR** Double-side  A66		
	NF  A61	**NM**  A64	**LR** Single-side  A65		
	NGF  A62				

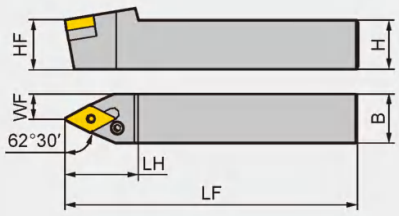
Tool holder type						
	PDJNR/L□□H/K/M11	DN□□1104□□	DN□□1104□□			DN□□1104□□
	PDJNR/L□□K/M/P15	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□
	PDJNR/L□□K/M/P15-3	DN□□1504□□	DN□□1504□□			DN□□1504□□

Corresponding tool holders of insert DN□□ P-type clamping

PDPNN
KAPR:62°30'



R-type shown





Type		Stock	Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
			H	B	LF	HF	WF	LH					
PDPNN	**2020K15**	▲	20	20	125	20	10	38	LEM8×21	D15AP	WH30L	L4B	SP4
	2525M15	▲	25	25	150	25	12.5	38					
	3232P15	▲	32	32	170	32	16	38					
	2020K15-3	▲	20	20	125	20	10	38	LEM8×21	D15AP	WH30L	L4	SP4
	2525M15-3	▲	25	25	150	25	12.5	38					
	3232P15-3	▲	32	32	170	32	16	38					

▲Stock available △Make-to-order

Applicable inserts

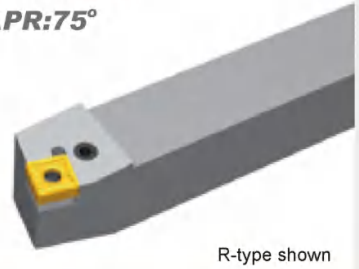
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF** A60	**XM** A63	**DR** Double-side A65	**HDR** A66	**TC** A66
	DF A60	**PM** A62	**DR** Single-side A65		Without chipbreaker A67
	SF A60	**DM** A63	**ER** Double-side A65		
	EF A61	**EM** A64	**ER** Single-side A66		
	ADF A61	**EG** A64	**SNR** Double-side A66		
	NF A61	**NM** A64	**LR** Single-side A65		
	NGF A62				

Tool holder type						
	PDJNR/L□□H/K/M11	DN□□1104□□	DN□□1104□□			DN□□1104□□
	PDJNR/L□□K/M/P15	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□
	PDJNR/L□□K/M/P15-3	DN□□1504□□	DN□□1504□□			DN□□1504□□

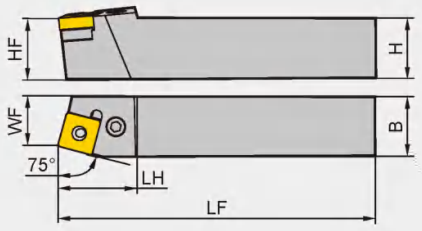
Corresponding tool holders of insert SN□□ P-type clamping

PSBNR/L

KAPR:75°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	H	B	LF	HF	WF	LH					
PSBNR/L	1616H09	▲	▲	16	16	100	16	13	21	LEM6×13.4A	S09AP	WH25L	L3	SP10
	2020K09	▲	▲	20	20	125	20	17	21					
	2020K12	▲	▲	20	20	125	20	17	28	LEM8×21	S12AP	WH30L	L4	SP4
	2525M12	▲	▲	25	25	150	25	22	28					
	3225P12	▲	△	32	25	170	32	22	28					
	3232P12	▲	▲	32	32	170	32	27	28					
	2525M15	▲	▲	25	25	150	25	22	35	LEM8×25	S15AP	WH30L	L5	SP5
	3232P15	▲	▲	32	32	170	32	27	35					
	3232P19	▲	▲	32	32	170	32	27	40	LEM10×27	S19AP	WH40L	L6	SP6
	4040R19	▲	▲	40	40	200	40	35	40					
	4040S2507	▲	▲	40	40	250	40	35	48	LEM12×36A	S25AP	WH50L	L8	SP8
	4040S2509	▲	▲	40	40	250	40	35	48		S25AP-09			

▲Stock available △Make-to-order

Applicable inserts

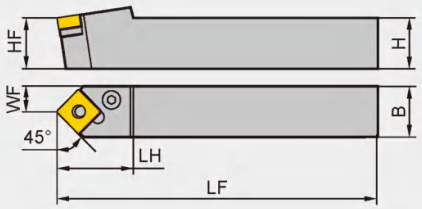
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	XF A68	XM A70	DR Double-side A73	HDR A75	TC A76
	DF A68	PM A70	DR Single-side A74	HPR A76	Without chipbreaker A77
	EF A68	DM A71	ER Double-side A74		
	ADF A69	EM A71	ER Single-side A75		
	SF A69	EG A72	SNR Double-side A75		
		NM A72	LR Single-side A72		

Tool holder type						
PSBNR/L□□H/K09	SN□□0903□□	SN□□0903□□			SN□□0903□□
PSBNR/L□□K/M/P12	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
PSBNR/L□□M/P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□
PSBNR/L□□P/R19		SN□□1906□□	SN□□1906□□	SN□□1906□□	SN□□1906□□
PSBNR/L□□S2507			SN□□2507□□	SN□□2507□□	
PSBNR/L□□S2509			SN□□2509□□	SN□□2509□□	

Corresponding tool holders of insert SN□□ P-type clamping

PSDNN
KAPR:45°







Type		Stock	Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
			H	B	LF	HF	WF	LH					
PSDNN	**2020K12**	▲	20	20	125	20	10	30	LEM8×21	S12AP	WH30L	L4	SP4
	2525M12	▲	25	25	150	25	12.5	30					
	3232P12	▲	32	32	170	32	16	35					
	2525M15	▲	25	25	150	25	12.5	35	LEM8×25	S15AP	WH30L	L5	SP5
	3232P15	▲	32	32	170	32	16	40					
	3232P19	▲	32	32	170	32	16	40	LEM10×27	S19AP	WH40L	L6	SP6
	4040R19	▲	40	40	200	40	20	40					

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A68	**XM**  A70	**DR** Double-side  A73	**HDR**  A75	**TC**  A76
	DF  A68	**PM**  A70	**DR** Single-side  A74	**HPR**  A76	Without chipbreaker  A77
	EF  A68	**DM**  A71	**ER** Double-side  A74		
	ADF  A69	**EM**  A71	**ER** Single-side  A75		
	SF  A69	**EG**  A72	**SNR** Double-side  A75		
		NM  A72	**LR** Single-side  A72		

Tool holder type						
	PSDNN□□K/M/P12	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
	PSDNN□□M/P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□
	PSDNN□□P/R19		SN□□1906□□	SN□□1906□□	SN□□1906□□	SN□□1906□□

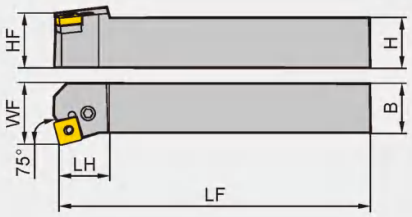
Corresponding tool holders of insert SN□□ P-type clamping

PSKNR/L

KAPR:75°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	H	B	LF	HF	WF	LH					
PSKNR/L	**1616H09**	▲	▲	16	16	100	16	20	17	LEM6×13.4A	S09AP	WH25L	L3	SP10
	2020K09	▲	△	20	20	125	20	25	20					
	2020K12	▲	▲	20	20	125	20	25	26	LEM8×21	S12AP	WH30L	L4	SP4
	2525M12	▲	▲	25	25	150	25	32	26					
	3232P12	▲	▲	32	32	170	32	40	30					
	2525M15	▲	▲	25	25	150	25	32	32	LEM8×25	S15AP	WH30L	L5	SP5
	3232P15	▲	▲	32	32	170	32	40	32					
	3232P19	▲	▲	32	32	170	32	40	36	LEM10×27	S19AP	WH40L	L6	SP6
	4040R19	▲	▲	40	40	200	40	50	40					

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A68	**XM**  A70	**DR** Double-side  A73	**HDR**  A75	**TC**  A76
	DF  A68	**PM**  A70	**DR** Single-side  A74	**HPR**  A76	Without chipbreaker  A77
	EF  A68	**DM**  A71	**ER** Double-side  A74		
	ADF  A69	**EM**  A71	**ER** Single-side  A75		
	SF  A69	**EG**  A72	**SNR** Double-side  A75		
		NM  A72	**LR** Single-side  A72		

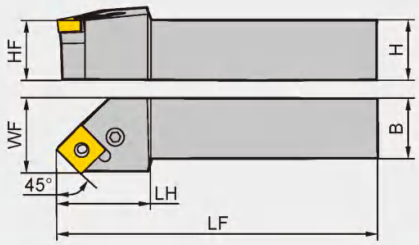
Tool holder type						
	PSKNR/L□□H/K09	SN□□0903□□	SN□□0903□□			SN□□0903□□
	PSKNR/L□□K/M/P12	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
	PSKNR/L□□M/P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□
	PSKNR/L□□P/R19		SN□□1906□□	SN□□1906□□	SN□□1906□□	SN□□1906□□

Corresponding tool holders of insert SN□□ P-type clamping

PSSNR/L
KAPR:45°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	H	B	LF	HF	WF	LH					
PSSNR/L	**1616H09**	▲	▲	16	16	100	16	20	25	LEM6×13.4A	S09AP	WH25L	L3	SP10
	2020K09	△	△	20	20	125	20	25	25					
	2020K12	▲	▲	20	20	125	20	25	30	LEM8×21	S12AP	WH30L	L4	SP4
	2525M12	▲	▲	25	25	150	25	32	30					
	3232P12	▲	▲	32	32	170	32	40	40					
	2525M15	▲	▲	25	25	150	25	32	35	LEM8×25	S15AP	WH30L	L5	SP5
	3232P15	▲	▲	32	32	170	32	40	40					
	3232P19	▲	▲	32	32	170	32	40	40	LEM10×27	S19AP	WH40L	L6	SP6
	4040R19	▲	▲	40	40	200	40	50	50					
	4040S2507	▲	▲	40	40	250	40	50	50	LEM12×36A	S25AP	WH50L	L8	SP8
	4040S2509	▲	▲	40	40	250	40	50	50		S25AP-09			

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A68	**XM**  A70	**DR** Double-side  A73	**HDR**  A75	**TC**  A76
	DF  A68	**PM**  A70	**DR** Single-side  A74	**HPR**  A76	Without chipbreaker  A77
	EF  A68	**DM**  A71	**ER** Double-side  A74		
	ADF  A69	**EM**  A71	**ER** Single-side  A75		
	SF  A69	**EG**  A72	**SNR** Double-side  A75		
		NM  A72	**LR** Single-side  A72		

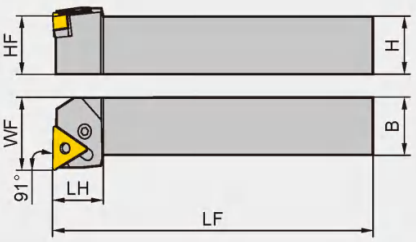
Tool holder type						
	PSSNR/L□□H/K09	SN□□0903□□	SN□□0903□□	SN□□0903□□		SN□□0903□□
	PSSNR/L□□K/M/P12	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
	PSSNR/L□□M/P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□
	PSSNR/L□□P/R19		SN□□1906□□	SN□□1906□□	SN□□1906□□	SN□□1906□□
	PSSNR/L□□S2507			SN□□2507□□	SN□□2507□□	
	PSSNR/L□□S2509			SN□□2509□□	SN□□2509□□	

Corresponding tool holders of insert TN□□ P-type clamping

PTFNR/L
KAPR:91°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	H	B	LF	HF	WF	LH					
PTFNR/L	**1616H16**	△	▲	16	16	100	16	20	20	LEM6×13.4A	T16AP	WH25L	L3	SP3
	2020K16	▲	▲	20	20	125	20	25	20					
	2525M16	▲	▲	25	25	150	25	32	22					
	2525M22	▲	▲	25	25	150	25	32	25	LEM8×21	T22AP	WH30L	L4	SP4
	3232P22	▲	▲	32	32	170	32	40	30					
	3232P27	▲	▲	32	32	170	32	40	34	LEM8×25	T27AP	WH30L	L5	SP5
	4040S27	▲	▲	40	40	250	40	50	34					

▲Stock available △Make-to-order

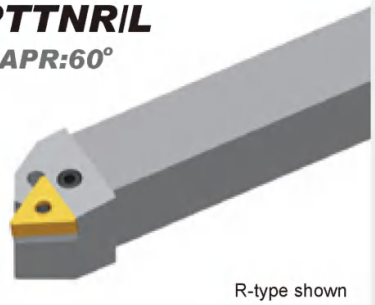
Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A78	**XM**  A80	**DR** Double-side  A82	**HDR**  A84	**TC**  A84
	DF  A78	**PM**  A80	**DR** Single-side  A83		Without chipbreaker  A84
	SF  A78	**DM**  A81	**ER** Double-side  A83		
	EF  A79	**EM**  A81	**SNR** Double-side  A83		
	ES  A79	**EG**  A81	**LR** Single-side  A83		
	ADF  A79	**EH**  A82			

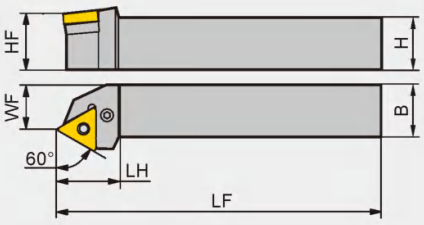
Tool holder type						
	PTFNR/L□□H/K/M16	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□
	PTFNR/L□□M/P22	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□
	PTFNR/L□□P/S27			TN□□2706□□	TN□□2706□□	TN□□2706□□

Corresponding tool holders of insert TN□□ P-type clamping

PTTNR/L
KAPR:60°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	H	B	LF	HF	WF	LH					
PTTNR/L	**1616H16**	▲	▲	16	16	100	16	13	25	LEM6×17	T16AP	WH25L	L3	SP3
	2020K16	▲	▲	20	20	125	20	17	25					
	2525M16	△	△	25	25	150	25	22	25					
	2525M22	▲	▲	25	25	150	25	22	32	LEM8×21	T22AP	WH30L	L4	SP4

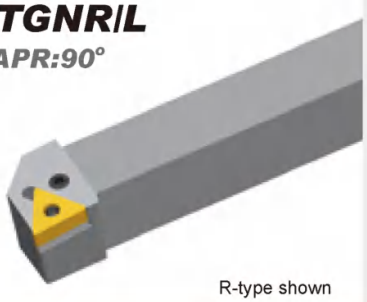
▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF** A78	**XM** A80	**DR** Double-side A82	**HDR** A84	**TC** A84
	DF A78	**PM** A80	**DR** Single-side A83		Without chipbreaker A84
	SF A78	**DM** A81	**ER** Double-side A83		
	EF A79	**EM** A81	**SNR** Double-side A83		
	ES A79	**EG** A81	**LR** Single-side A83		
	ADF A79	**EH** A82			
Tool holder type **PTTNR/L□□H/K/M16**	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□
PTTNR/L□□M22	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□

Corresponding tool holders of insert TN□□ P-type clamping

PTGNR/L
KAPR:90°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	H	B	LF	HF	WF	LH					
PTGNR/L	**1616H16**	▲	▲	16	16	100	16	20	20	LEM6×13.4A	T16AP	WH25L	L3	SP3
	2020K16	▲	▲	20	20	125	20	25	20					
	2525M16	▲	▲	25	25	150	25	32	20					
	3232P16	▲	▲	32	32	170	32	40	20					
	2525M22	▲	▲	25	25	150	25	32	30	LEM8×21	T22AP	WH30L	L4	SP4
	3232P22	▲	▲	32	32	170	32	40	30					
	3232P27	▲	▲	32	32	170	32	40	33	LEM8×25	T27AP	WH30L	L5	SP5
	4040S27	▲	▲	40	40	250	40	50	33					

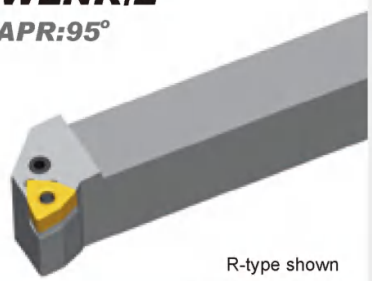
▲Stock available △Make-to-order

Applicable inserts

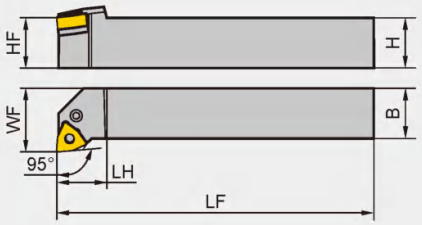
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A78	**XM**  A80	**DR** Double-side  A82	**HDR**  A84	**TC**  A84
	DF  A78	**PM**  A80	**DR** Single-side  A83		Without chipbreaker  A84
	SF  A78	**DM**  A81	**ER** Double-side  A83		
	EF  A79	**EM**  A81	**SNR** Double-side  A83		
	ES  A79	**EG**  A81	**LR** Single-side  A83		
	ADF  A79	**EH**  A82			
Tool holder type **PTGNR/L□□H/K/M/P16**	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□
PTGNR/L□□M/P22	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□
PTGNR/L□□P/S27			TN□□2706□□	TN□□2706□□	TN□□2706□□

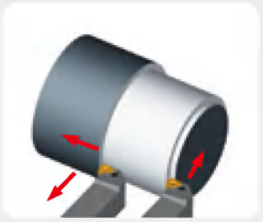
Corresponding tool holders of insert WN□□ P-type clamping

PWLNR/L
KAPR:95°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	H	B	LF	HF	WF	LH					
PWLNR/L	**1616H06**	▲	▲	16	16	100	16	20	20	LEM6×13.4A	W06AP	WH25L	L3	SP3
	2020K06	▲	▲	20	20	125	20	25	20					
	2525M06	▲	▲	25	25	150	25	32	25					
	2020K08	▲	▲	20	20	125	20	25	28	LEM8×21	W08AP	WH30L	L4	SP4
	2525M08	▲	▲	25	25	150	25	32	28					
	3232P08	△	△	32	32	170	32	40	28					

▲Stock available △Make-to-order

Applicable inserts

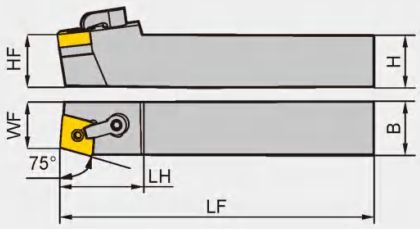
Application	For finishing	For semi-finishing	For roughing	For cast iron machining
Inserts shape	**XF**  A88	**XM**  A90	**DR** Double-side  A92	**TC**  A93
	DF  A88	**PM**  A90	**SNR** Double-side  A92	Without chipbreaker  A93
	SF  A88	**DM**  A91		
	EF  A89	**EM**  A91		
	ES  A89	**EG**  A91		
	ADF  A89	**EH**  A92		
	NF  A89	**NM**  A92		
Tool holder type **PWLNR/L□□H/K/M06**	WN□□0604□□	WN□□0604□□	WN□□0604□□	WN□□0604□□
PWLNR/L□□K/M/P08	WN□□0804□□	WN□□0804□□	WN□□0804□□	WN□□0804□□

Corresponding tool holders of insert CN□□ M-type clamping

MCBNR/L
KAPR:75°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Pin
		R	L	H	B	LF	HF	WF	LH					
MCBNR/L	**1616H12**	△	△	16	16	100	16	13	32	DM6×25	C12BM	WH30L	C1RD	TM6×17
	2020K12	▲	▲	20	20	125	20	17	32					
	2525M12	▲	▲	25	25	150	25	22	32	DM6×30				
	3232P12	▲	▲	32	32	170	32	27	32	DM6×30				
	2525M16	▲	▲	25	25	150	25	22	40		C16BM		C2RD	TM8×21
	3232P16	▲	▲	32	32	170	32	27	40	DM6×30		WH30L		
	4040R16	△	△	40	40	200	40	35	40					
	3232P19	▲	▲	32	32	170	32	27	40	DM8×30X	C19BM	WH40L	C5RD	TM10×21
	4040R19	▲	▲	40	40	200	40	35	40					

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A52	**XM**  A54	**DR** Double-side  A56	**HDR**  A58	**TC**  A58
	DF  A52	**PM**  A53	**DR** Single-side  A57	**HPR**  A58	Without chipbreaker  A59
	SF  A52	**DM**  A54	**ER** Double-side  A57		
	EF  A52	**EM**  A55	**ER** Single-side  A57		
	ADF  A53	**EG**  A55	**SNR** Double-side  A57		
	NF  A53	**EH**  A55	**LR** Single-side  A56		
		NM  A55			

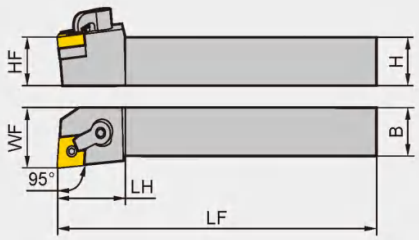
Tool holder type						
	MCBNR/L□□H/K/M/P12	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□
	MCBNR/L□□M/P/R16	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□
	MCBNR/L□□P/R19		CN□□1906□□	CN□□1906□□	CN□□1906□□	CN□□1906□□

Corresponding tool holders of insert CN□□ M-type clamping

MCLNR/L
KAPR:95°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Pin
		R	L	H	B	LF	HF	WF	LH					
MCLNR/L	1616H12	△	△	16	16	100	16	20	32	DM6×25	C12BM	WH30L	C1RD	TM6×17
	2020K12	▲	▲	20	20	125	20	25	32					
	2525M12	▲	▲	25	25	150	25	32	32	DM6×30				
	3225M12	△	△	32	25	150	32	32	32	DM6×30				
	3232P12	▲	▲	32	32	170	32	40	32					
	2525M16	▲	▲	25	25	150	25	32	38	DM6×30	C16BM	WH30L	C2RD	TM8×21
	3225M16	△	△	32	25	150	32	32	38	DM6×30				
	3232P16	▲	▲	32	32	170	32	40	38					
	4040R16	△	△	40	40	200	40	50	45					
	3232P19	▲	▲	32	32	170	32	40	45	DM8×30X	C19BM	WH40L	C5RD	TM10×21
	4040R19	▲	▲	40	40	200	40	50	45					

▲Stock available △Make-to-order

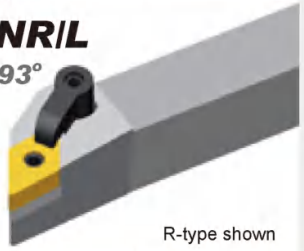
Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	XF A52	XM A54	DR Double-side A56	HDR A58	TC A58
	DF A52	PM A53	DR Single-side A57	HPR A58	Without chipbreaker A59
	SF A52	DM A54	ER Double-side A57		
	EF A52	EM A55	ER Single-side A57		
	ADF A53	EG A55	SNR Double-side A57		
	NF A53	EH A55	LR Single-side A56		
		NM A55			

Tool holder type						
	MCBNR/L□□H/K/M/P12	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□
	MCBNR/L□□M/P/R16	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□
	MCBNR/L□□P/R19		CN□□1906□□	CN□□1906□□	CN□□1906□□	CN□□1906□□

Corresponding tool holders of insert DN□□ M-type clamping

MDJNR/L
KAPR:93°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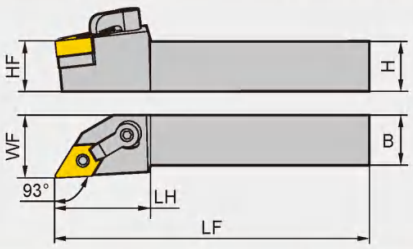




Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Pin
		R	L	H	B	LF	HF	WF	LH					
MDJNR/L	**1616H11**	△	△	16	16	100	16	20	32	DM6×25	D11BM	WH20L WH30L	C1RD	TM5×13
	2020K11	▲	▲	20	20	125	20	25	32					
	2525M11	▲	▲	25	25	150	25	32	32	DM6×30				
	3232P11	▲	▲	32	32	170	32	40	32	DM6×30				
	2020K15	▲	▲	20	20	125	20	25	38	DM6×25	D15BM	WH30L	C2RD	TM6×19
	2525M15	▲	▲	25	25	150	25	32	38	DM6×30				
	3225P15	▲	▲	32	25	170	32	32	38					
	3232P15	△	△	32	32	170	32	40	42	DM6×30				
	4040R15	△	△	40	40	200	40	50	45					
	2020K15-3	△	△	20	20	125	20	25	38	DM6×25				TM6×17
	2525M15-3	△	△	25	25	150	25	32	38	DM6×30				
	3225P15-3	△	△	32	25	170	32	32	38					
	3232P15-3	△	△	32	32	170	32	40	42	DM6×30				

▲Stock available △Make-to-order

Applicable inserts

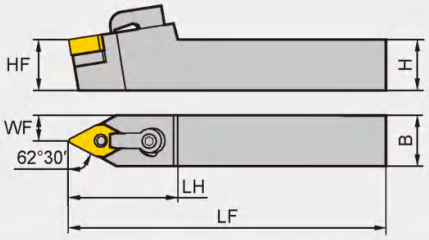
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A60	**XM**  A63	**DR** Double-side  A65	**HDR**  A66	**TC**  A66
	DF  A60	**PM**  A62	**DR** Single-side  A65		Without chipbreaker  A67
	SF  A60	**DM**  A63	**ER** Double-side  A65		
	EF  A61	**EM**  A64	**ER** Single-side  A66		
	ADF  A61	**EG**  A64	**SNR** Double-side  A66		
	NF  A61	**NM**  A64	**LR** Single-side  A65		
	NGF  A62				

Tool holder type						
	MDJNR/L□□H/K/M/P11	DN□□1104□□	DN□□1104□□			DN□□1104□□
	MDJNR/L□□K/M/P/R15	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□
	MDJNR/L□□K/M/P15-3	DN□□1504□□	DN□□1504□□	DN□□1504□□		DN□□1504□□

Corresponding tool holders of insert DN□□ M-type clamping

MDPNN
KAPR:62°30'







Type		Stock	Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Pin
			H	B	LF	HF	WF	LH					
MDPNN	**1616H11**	△	16	16	100	16	8	35	DM6×25	D11BM	WH20L WH30L	C1RD	TM5×13
	2020K11	▲	20	20	125	20	10	35					
	2525M11	▲	25	25	150	25	12.5	35	DM6×30				
	3232P11	▲	32	32	170	32	16	35	DM6×30				
	2020K15	▲	20	20	125	20	10	43	DM6×25	D15BM	WH30L	C2RD	TM6×19
	2525M15	▲	25	25	150	25	12.5	43	DM6×30				
	3225P15	▲	32	25	170	32	12.5	43	DM6×30				
	3232P15	△	32	32	170	32	16	43					
	4040R15	△	40	40	200	40	20	43					
	2020K15-3	△	20	20	125	20	10	43	DM6×25				TM6×17
	2525M15-3	△	25	25	150	25	12.5	43	DM6×30				
	3232R15-3	△	32	32	200	32	16	43	DM6×30				

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A60	**XM**  A63	**DR** Double-side  A65	**HDR**  A66	**TC**  A66
	DF  A60	**PM**  A62	**DR** Single-side  A65		Without chipbreaker  A67
	SF  A60	**DM**  A63	**ER** Double-side  A65		
	EF  A61	**EM**  A64	**ER** Single-side  A66		
	ADF  A61	**EG**  A64	**SNR** Double-side  A66		
	NF  A61	**NM**  A64	**LR** Single-side  A65		
	NGF  A62				

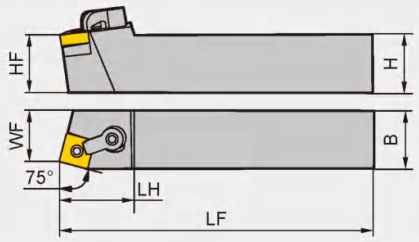
Tool holder type						
	MDPNN□□H/K/M/P11	DN□□1104□□	DN□□1104□□			DN□□1104□□
	MDPNN□□K/M/P/R15	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□
	MDPNN□□K/M/P15-3	DN□□1504□□	DN□□1504□□	DN□□1504□□		DN□□1504□□

Corresponding tool holders of insert SN□□ M-type clamping

MSBNR/L
KAPR:75°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Pin
		R	L	H	B	LF	HF	WF	LH					
MSBNR/L	**1616H12**	△	△	16	16	100	16	13	32	DM6×25	S12BM	WH30L	C1RD	TM6×17
	2020K12	▲	▲	20	20	125	20	17	32					
	2525M12	▲	▲	25	25	150	25	22	32	DM6×30				
	3225P12	▲	▲	32	25	170	32	22	32					
	3232P12	△	△	32	32	170	32	27	32	DM6×30				
	2525M15	▲	▲	25	25	150	25	22	38	DM6×30	S15BM	WH30L	C2RD	TM8×21
	3225P15	△	△	32	25	170	32	22	38					
	3232P15	▲	▲	32	32	170	32	29	38	DM6×30				
	3232P19	▲	▲	32	32	170	32	27	45	DM8×30X	S19BM	WH40L	C5RD	TM10×21
	4040R19	▲	▲	40	40	200	40	35	45					
	4040R2509	▲	▲	40	40	200	40	35	60	DM10×35X	S25BM	WH40L WH50L	C6RD	TM12×29
	4040S2509	▲	▲	40	40	250	40	35	60			WH40L WH50L		

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A68	**XM**  A70	**DR** Double-side  A73	**HDR**  A75	**TC**  A76
	DF  A68	**PM**  A70	**DR** Single-side  A74	**HPR**  A76	Without chipbreaker  A77
	EF  A68	**DM**  A71	**ER** Double-side  A74		
	ADF  A69	**EM**  A71	**ER** Single-side  A75		
	SF  A69	**EG**  A72	**SNR** Double-side  A75		
		NM  A72	**LR** Single-side  A72		

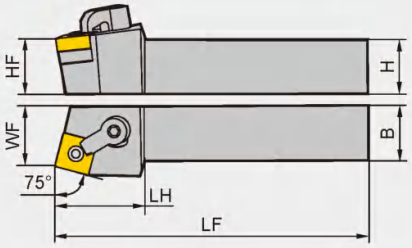
Tool holder type						
	MSBNR/L□□H/K/M/P12	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
	MSBNR/L□□M/P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□
	MSBNR/L□□P/R19		SN□□1906□□	SN□□1906□□	SN□□1906□□	SN□□1906□□
	MSBNR/L□□R/S2509			SN□□2509□□	SN□□2509□□	

Corresponding tool holders of insert SN□□ M-type clamping

MSRNR/L
KAPR:75°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Pin
		R	L	H	B	LF	HF	WF	LH					
MSRNR/L	**1616H12**	△	△	16	16	100	16	17	36	DM6×25	S12BM	WH30L	C1RD	TM6×17
	2020K12	▲	△	20	20	125	20	22	36					
	2525M12	▲	▲	25	25	150	25	27	36	DM6×30				
	3225P12	▲	▲	32	25	170	32	27	36	DM6×30				
	3232P12	△	△	32	32	170	32	35	36					
	2525M15	▲	▲	25	25	150	25	27	40	DM6×30	S15BM	WH30L	C2RD	TM8×21
	3225P15	△	△	32	25	170	32	27	40	DM6×30				
	3232P15	▲	▲	32	32	170	32	35	40					
	3232P19	▲	▲	32	32	170	32	35	45	DM8×30X	S19BM	WH40L	C5RD	TM10×21
	4040R2509	▲	▲	40	40	200	40	43	60	DM10×35X	S25BM	WH40L WH50L	C6RD	TM12×29
	4040S2509	▲	▲	40	40	250	40	43	60					

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A68	**XM**  A70	**DR** Double-side  A73	**HDR**  A75	**TC**  A76
	DF  A68	**PM**  A70	**DR** Single-side  A74	**HPR**  A76	Without chipbreaker  A77
	EF  A68	**DM**  A71	**ER** Double-side  A74		
	ADF  A69	**EM**  A71	**ER** Single-side  A75		
	SF  A69	**EG**  A72	**SNR** Double-side  A75		
		NM  A72	**LR** Single-side  A72		

Tool holder type						
	MSRNR/L□□H/K/M/P12	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
	MSRNR/L□□M/P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□
	MSRNR/L□□P19		SN□□1906□□	SN□□1906□□	SN□□1906□□	SN□□1906□□
	MSRNR/L□□R/S2509			SN□□2509□□	SN□□2509□□	

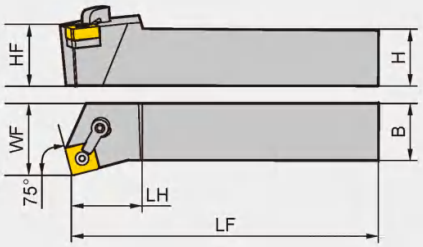
Corresponding tool holders of insert SN□□ M-type clamping

MSKNR/L

KAPR:75°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Pin
		R	L	H	B	LF	HF	WF	LH					
MSKNR/L	1616H12	△	△	16	16	100	16	20	32	DM6×20	S12BM	WH30L	C1RD	TM6×17
	2020K12	▲	△	20	20	125	20	25	32	DM6×25				
	2525M12	▲	▲	25	25	150	25	32	32	DM6×30				
	3225P12	▲	▲	32	25	170	32	32	32	DM6×30				
	3232P12	△	△	32	32	170	32	40	32					
	2525M15	▲	▲	25	25	150	25	32	35	DM6×30	S15BM	WH30L	C2RD	TM8×21
	3225P15	△	△	32	25	170	32	32	35	DM6×30				
	3232P15	▲	▲	32	32	170	32	40	38					
	3232P19	▲	▲	32	32	170	32	40	45	DM8×30X	S19BM	WH40L	C5RD	TM10×21
	4040R19	△	△	40	40	200	40	50	45					
	4040S2509	△	△	40	40	250	40	50	50	DM10×35X	S25BM	WH40L WH50L	C6RD	TM12×29

▲Stock available △Make-to-order

Applicable inserts

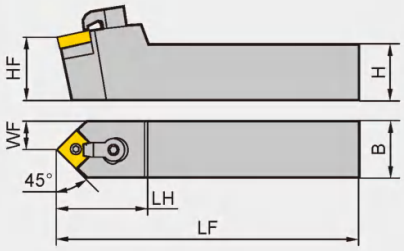
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	XF  A68	XM  A70	DR Double-side  A73	HDR  A75	TC  A76
	DF  A68	PM  A70	DR Single-side  A74	HPR  A76	Without chipbreaker  A77
	EF  A68	DM  A71	ER Double-side  A74		
	ADF  A69	EM  A71	ER Single-side  A75		
	SF  A69	EG  A72	SNR Double-side  A75		
		NM  A72	LR Single-side  A72		

Tool holder type						
	MSKNR/L□□H/K/M/P12	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
	MSKNR/L□□M/P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□
	MSKNR/L□□P/R19		SN□□1906□□	SN□□1906□□	SN□□1906□□	SN□□1906□□
	MSKNR/L□□S2509			SN□□2509□□	SN□□2509□□	

Corresponding tool holders of insert SN□□ M-type clamping

MSDNN
KAPR:45°







Type		Stock	Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Pin
			H	B	LF	HF	WF	LH					
MSDNN	**2020K12**	▲	20	20	125	20	10	35	DM6×25	S12BM	WH30L	C1RD	TM6×17
	2525M12	▲	25	25	150	25	12.5	35	DM6×30				
	3232P12	▲	32	32	170	32	16	35	DM6×30				
	2525M15	▲	25	25	150	25	12.5	42		S15BM	WH30L	C2RD	TM8×21
	3225P15	△	32	25	170	32	12.5	42					
	3232P15	▲	32	32	170	32	16	42					

▲Stock available △Make-to-order

Applicable inserts

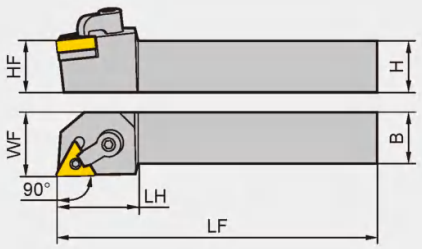
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	XF A68	XM A70	DR Double-side A73	HDR A75	TC A76
	DF A68	PM A70	DR Single-side A74	HPR A76	Without chipbreaker A77
	EF A68	DM A71	ER Double-side A74		
	ADF A69	EM A71	ER Single-side A75		
	SF A69	EG A72	SNR Double-side A75		
		NM A72	LR Single-side A72		
Tool holder type **MSDNN□□K/M/P12**	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
MSDNN□□M/P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□

Corresponding tool holders of insert TN□□ M-type clamping

MTGNR/L
KAPR:90°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Pin
		R	L	H	B	LF	HF	WF	LH					
MTGNR/L	**1616H16**	△	△	16	16	100	16	20	33	DM6×25	T16BM	WH20L WH30L	C1RD	TM5×13
	2020K16	▲	▲	20	20	125	20	25	33	DM6×25				
	2525M16	▲	▲	25	25	150	25	32	33	DM6×30				
	3225P16	▲	▲	32	25	170	32	32	33	DM6×30				
	3232P16	△	△	32	32	170	32	40	33					
	2525M22	▲	▲	25	25	150	25	32	35	DM6×30	T22BM	WH30L	C2RD	TM6×17
	3225P22	▲	▲	32	25	170	32	32	35	DM6×30				
	3232P22	△	△	32	32	170	32	40	40					

▲Stock available △Make-to-order

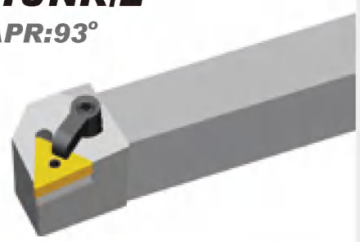
Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A78	**XM**  A80	**DR** Double-side  A82	**HDR**  A84	**TC**  A84
	DF  A78	**PM**  A80	**DR** Single-side  A83		Without chipbreaker  A84
	SF  A78	**DM**  A81	**ER** Double-side  A83		
	EF  A79	**EM**  A81	**SNR** Double-side  A83		
	ES  A79	**EG**  A81	**LR** Single-side  A83		
	ADF  A79	**EH**  A82			

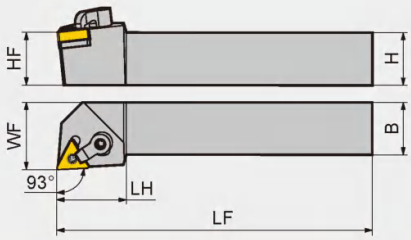
Tool holder type						
	MTGNR/L□□ H/K/M/P16	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□
	MTGNR/L□□M/P22	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□

Corresponding tool holders of insert TN□□ M-type clamping

MTJNR/L
KAPR:93°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Pin
		R	L	H	B	LF	HF	WF	LH					
MTJNR/L	2020K16	▲	▲	20	20	125	20	25	33	DM6×25	T16BM	WH20L WH30L	C1RD	TM5×13
	2525M16	▲	▲	25	25	150	25	32	33	DM6×30				
	3225P16	▲	▲	32	25	170	32	32	33					
	2525M22	▲	▲	25	25	150	25	32	35	DM6×30	T22BM	WH30L	C2RD	TM6×17
	3225P22	▲	▲	32	25	170	32	32	35					

▲Stock available △Make-to-order

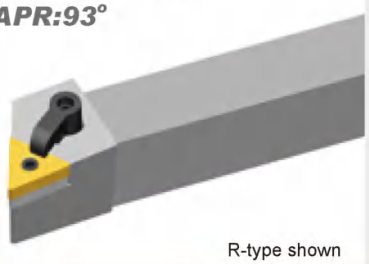
Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	XF  A78	XM  A80	DR Double-side  A82	HDR  A84	TC  A84
	DF  A78	PM  A80	DR Single-side  A83		Without chipbreaker  A84
	SF  A78	DM  A81	ER Double-side  A83		
	EF  A79	EM  A81	SNR Double-side  A83		
	ES  A79	EG  A81	LR Single-side  A83		
	ADF  A79	EH  A82			
Tool holder type MTJNR/L□□ K/M/P16	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□
MTJNR/L□□M/P22	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□

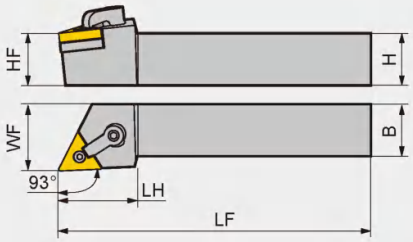
Corresponding tool holders of insert TN□□ M-type clamping

MTJNR/L-Z

KAPR:93°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Pin
		R	L	H	B	LF	HF	WF	LH					
MTJNR/L-Z	**1616H16**	△	△	16	16	100	16	20	32	DM6×25	T16BM	WH20L WH30L	C1RD	TM5×13
	2020K16	▲	▲	20	20	125	20	25	32	DM6×25				
	2525M16	▲	▲	25	25	150	25	32	32	DM6×30				
	3225P16	▲	▲	32	25	170	32	32	32	DM6×30				
	3232P16	△	△	32	32	170	32	40	32					
	2525M22	▲	▲	25	25	150	25	32	35	DM6×30	T22BM	WH30L	C2RD	TM6×17
	3225P22	▲	▲	32	25	170	32	32	35	DM6×30				
	3232P22	△	△	32	32	170	32	40	40					
	4040R22	△	△	40	40	200	40	50	40					

▲Stock available △Make-to-order

Applicable inserts

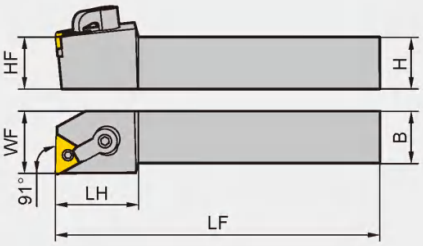
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A78	**XM**  A80	**DR** Double-side  A82	**HDR**  A84	**TC**  A84
	DF  A78	**PM**  A80	**DR** Single-side  A83		Without chipbreaker  A84
	SF  A78	**DM**  A81	**ER** Double-side  A83		
	EF  A79	**EM**  A81	**SNR** Double-side  A83		
	ES  A79	**EG**  A81	**LR** Single-side  A83		
	ADF  A79	**EH**  A82			
Tool holder type	**MTJNR/L-Z□□ H/K/M/P16**	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□
	MTJNR/L-Z□□M/P/R22	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□

Corresponding tool holders of insert TN□□ M-type clamping

MTFNR/L
KAPR:91°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Pin
		R	L	H	B	LF	HF	WF	LH					
MTFNR/L	**1616H16**	△	△	16	16	100	16	20	32	DM6×25	T16BM	WH20L WH30L	C1RD	TM5×13
	2020K16	▲	△	20	20	125	20	25	32	DM6×25				
	2525M16	▲	▲	25	25	150	25	32	32	DM6×30				
	3225P16	▲	△	32	25	170	32	32	32	DM6×30				
	3232P16	△	△	32	32	170	32	40	32					
	2525M22	▲	▲	25	25	150	25	32	36	DM6×30	T22BM	WH30L	C2RD	TM6×17
	3225P22	▲	△	32	25	170	32	32	36	DM6×30				
	3232P22	△	△	32	32	170	32	40	36					

▲Stock available △Make-to-order

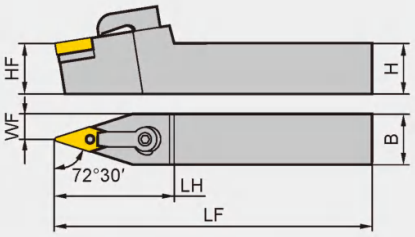
Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A78	**XM**  A80	**DR** Double-side  A82	**HDR**  A84	**TC**  A84
	DF  A78	**PM**  A80	**DR** Single-side  A83		Without chipbreaker  A84
	SF  A78	**DM**  A81	**ER** Double-side  A83		
	EF  A79	**EM**  A81	**SNR** Double-side  A83		
	ES  A79	**EG**  A81	**LR** Single-side  A83		
	ADF  A79	**EH**  A82			
Tool holder type	**MTFNR/L□□ H/K/M/P16**	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□
	MTFNR/L□□M/P22	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□

Corresponding tool holders of insert VN□□ M-type clamping

MVVNN
KAPR:72°30'







Type		Stock	Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Pin
			H	B	LF	HF	WF	LH					
MVVNN	**1616H16**	△	16	16	100	16	8	45	DM6×25	V16BM	WH20L WH30L	C3RD	TM5×13
	2020K16	▲	20	20	125	20	10	45	DM6×25				
	2525M16	▲	25	25	150	25	12.5	45	DM6×30				
	3225P16	▲	32	25	170	32	12.5	45	DM6×30				
	3232P16	▲	32	32	170	32	16	45					

▲Stock available △Make-to-order

Applicable inserts

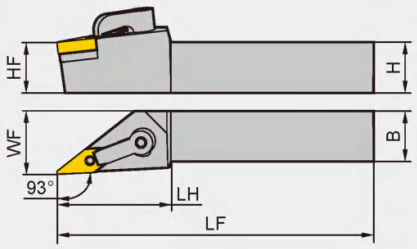
Application	For finishing	For semi-finishing	For roughing	For cast iron machining
Inserts shape	**XF**  A85	**XM**  A86	**SNR**  A87	**TC**  A87
	DF  A85	**PM**  A86		
	EF  A85	**DM**  A86		
	ADF  A85	**EM**  A87		
	SF  A86	**EG**  A87		
	NF  A85	**NM**  A87		
	NGF  A86			
Tool holder type **MVVNN□□ H/K/M/P16**	VN□□1604□□	VN□□1604□□	VN□□1604□□	VN□□1604□□

Corresponding tool holders of insert VN□□ M-type clamping

MVJNR/L
KAPR:93°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Pin
		R	L	H	B	LF	HF	WF	LH					
MVJNR/L	**1616K16**	△	△	16	16	125	16	20	45	DM6×25	V16BM	WH20L WH30L	C3RD	TM5×13
	2020K16	▲	▲	20	20	125	20	25	45	DM6×25				
	2525M16	▲	▲	25	25	150	25	32	45	DM6×30				
	3225P16	▲	▲	32	25	170	32	32	45	DM6×30				
	3232P16	▲	▲	32	32	170	32	40	45					
	4040P16	△	△	40	40	170	40	50	65					

▲Stock available △Make-to-order

Applicable inserts

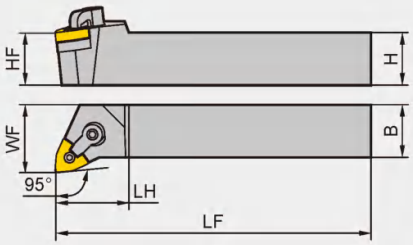
Application	For finishing	For semi-finishing	For roughing	For cast iron machining
Inserts shape	**XF**  A85	**XM**  A86	**SNR**  A87	**TC**  A87
	DF  A85	**PM**  A86		
	EF  A85	**DM**  A86		
	ADF  A85	**EM**  A87		
	SF  A86	**EG**  A87		
	NF  A85	**NM**  A87		
	NGF  A86			
Tool holder type **MVJNR/L□□ K/M/P16**	VN□□1604□□	VN□□1604□□	VN□□1604□□	VN□□1604□□

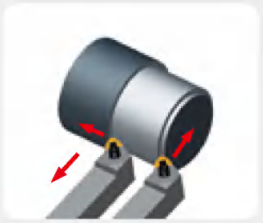
Corresponding tool holders of insert WN□□ M-type clamping

MWLNR/L
KAPR:95°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Pin
		R	L	H	B	LF	HF	WF	LH					
MWLNR/L	1616H06	△	△	16	16	100	16	20	28	DM6×25	W06BM	WH20L WH30L	C1RD	TM5×13
	2020K06	▲	▲	20	20	125	20	25	30	DM6×25				
	2525M06	▲	▲	25	25	150	25	32	30	DM6×30				
	1616H08	△	△	16	16	100	16	20	30	DM6×25	W08BM	WH30L	C1RD	TM6×17
	2020K08	▲	▲	20	20	125	20	25	30	DM6×25				
	2525M08	▲	▲	25	25	150	25	32	35	DM6×30				
	3525P08	▲	▲	32	25	170	32	32	35	DM6×30				
	3232P08	▲	▲	32	32	170	32	40	35					
	4040R08	△	△	40	40	200	40	50	35					

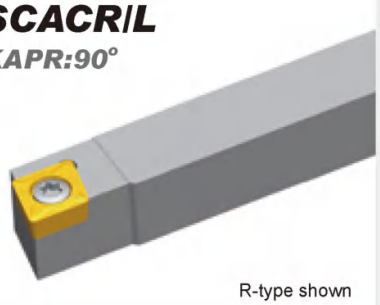
▲Stock available △Make-to-order

Applicable inserts

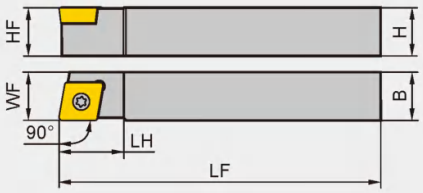
Application	For finishing	For semi-finishing	For roughing	For cast iron machining
Inserts shape	XF  A88	XM  A90	DR Double-side  A92	TC  A93
	DF  A88	PM  A90	SNR Double-side  A92	Without chipbreaker  A93
	SF  A88	DM  A91		
	EF  A89	EM  A91		
	ES  A89	EG  A91		
	ADF  A89	EH  A92		
	NF  A89	NM  A92		
Tool holder type MWLNR/L□□H/K/M06	WN□□0604□□	WN□□0604□□	WN□□0604□□	WN□□0604□□
MWLNR/L□□H/K/M/P/R08	WN□□0804□□	WN□□0804□□	WN□□0804□□	WN□□0804□□

Corresponding tool holders of insert CC□□ S-type clamping

SCACR/L
KAPR:90°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Wrench
		R	L	H	B	LF	HF	WF	LH		
SCACR/L	**0808F06**	△	△	8	8	80	8	8	16	I60M2.5×6.5	WT07IP
	1010H06	▲	△	10	10	100	10	10	16		
	1212H06	△	△	12	12	100	12	12	16		
	1212H09	▲	▲	12	12	100	12	12	16	I60M3.5×8	WT15IP
	1616H09	△	△	16	16	100	16	16	16		

▲Stock available △Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For cast iron machining	For Al machining
Inserts shape	**SF**  A95	**XF**  A95	**XM**  A96	**HR**  A98	**TC**  A98	**LH**  A99
		HF  A95	**HM**  A97			**LC**  A99
		EF  A96	**EF**  A97			
		AHF  A96	**EG**  A97			

Tool holder type							
	SCACR/L□□H/F06	CC□□0602□□	CC□□0602□□	CC□□0602□□	CC□□0602□□	CC□□0602□□	CCGX 0602□□
	SCACR/L□□H09	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CCGX 09T3□□

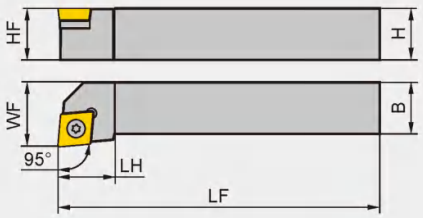
Corresponding tool holders of insert CC□□ S-type clamping

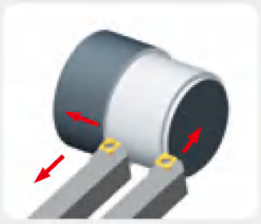
SCLCR/L

KAPR:95°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	H	B	LF	HF	WF	LH				
SCLCR/L	0808F06	▲	△	08	08	80	08	10	12	I60M2.5×6.5	---	---	WT07IP
	1010F06	▲	▲	10	10	80	10	12	12				
	1212H06	△	△	12	12	100	12	16	12				
	1616H06	△	△	16	16	100	16	20	16				
	1212H09	▲	▲	12	12	100	12	16	16	I60M3.5×8	---	---	WT15IP
	1616H09	▲	▲	16	16	100	16	20	16				
	2020K09	△	△	20	20	125	20	25	25				
	2525M09	△	△	25	25	150	25	32	25				
	2020K12	▲	▲	20	20	125	20	25	25	I60M4×11X	C12BS	SM6×10XA	WT15IP WH40L
	2525M12	▲	▲	25	25	150	25	32	25				
	3225M12	▲	▲	32	25	150	32	32	25				

▲Stock available △Make-to-order

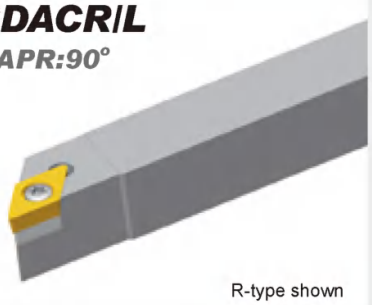
Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For cast iron machining	For Al machining
Inserts shape	SF  A95	XF  A95	XM  A96	HR  A98	TC  A98	LH  A99
		HF  A95	HM  A97			LC  A99
		EF  A96	EF  A97			
		AHF  A96	EG  A97			

Tool holder type							
	SCLCR/L□□H/F06	CC□□ 0602□□	CC□□ 0602□□	CC□□ 0602□□	CC□□ 0602□□	CC□□ 0602□□	CCGX 0602□□
	SCLCR/L□□H/K/M09	CC□□ 09T3□□	CC□□ 09T3□□	CC□□ 09T3□□	CC□□ 09T3□□	CC□□ 09T3□□	CCGX 09T3□□
	SCLCR/L□□K/M12		CC□□ 1204□□	CC□□ 1204□□	CC□□ 1204□□	CC□□ 1204□□	CCGX 1204□□

Corresponding tool holders of insert DC□□ S-type clamping

SDACR/L
KAPR:90°



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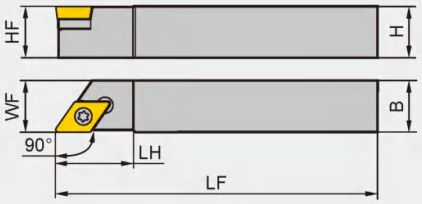




Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	H	B	LF	HF	WF	LH				
SDACR/L	**0808K07**	△	△	8	8	125	8	8	15	I60M2.5×6.5	---	---	WT07IP
	1010K07	△	△	10	10	125	10	10	15				
	1212K07	△	△	12	12	125	12	12	15				
	1212K11	△	△	12	12	125	12	12	24	I60M3.5×8	---	---	WT15IP
	1616K11	△	△	16	16	125	16	16	24	I60M3.5×12	D11BS	SM5×8.65XA	WT15IP WH35L
	2020K11	△	△	20	20	125	20	20	24				
	2525M11	△	△	25	25	150	25	25	24				

▲Stock available △Make-to-order

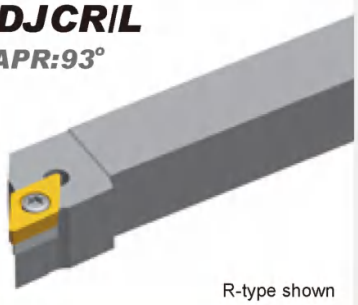
Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining
Inserts shape	**SF**  A100	**XF**  A100	**XM**  A101	**HR**  A102	**LH**  A103
		HF  A100	**HM**  A102		**LC**  A103
		EF  A101	**EM**  A102		
		AHF  A101			

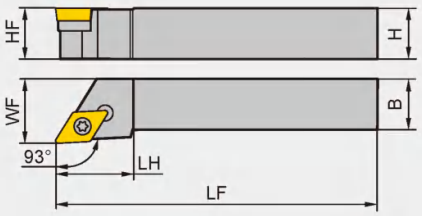
Tool holder type						
	SDACR/L□□K07	DC□□ 0702□□	DC□□ 0702□□	DC□□ 0702□□		DCGX 0702□□
	SDACR/L□□K/M11	DC□□ 11T3□□	DC□□ 11T3□□	DC□□ 11T3□□	DC□□ 11T3□□	DCGX 11T3□□

Corresponding tool holders of insert DC□□ S-type clamping

SDJCR/L
KAPR:93°



R-type shown

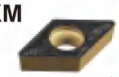




Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	H	B	LF	HF	WF	LH				
SDJCR/L	**0808F07**	△	△	8	8	80	8	10	15	I60M2.5×6.5	---	---	WT07IP
	1010F07	▲	△	10	10	80	10	12	15				
	1212H07	▲	▲	12	12	100	12	16	15				
	1414H07	△	△	14	14	100	14	18	15				
	1616H07	▲	▲	16	16	100	16	20	18				
	2020K07	△	△	20	20	125	20	25	24				
	2525M07	△	△	25	25	150	25	32	28				
	1212K11	△	△	12	12	125	12	16	22	I60M3.5×10	D11BS	SM5×7XA	WT15IP WH35L
	1616K11	▲	▲	16	16	125	16	20	22	I60M3.5×12		SM5×8.65XA	
	2020K11	▲	▲	20	20	125	20	25	24				
	2525M11	▲	▲	25	25	150	25	32	24				

▲Stock available △Make-to-order

Applicable inserts

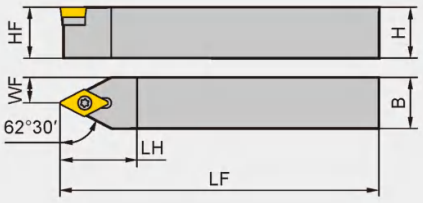
Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining
Inserts shape	**SF**  A100	**XF**  A100	**XM**  A101	**HR**  A102	**LH**  A103
		HF  A100	**HM**  A102		**LC**  A103
		EF  A101	**EM**  A102		
		AHF  A101			

Tool holder type						
	SDJCR/L□□F/H/K/M07	DC□□0702□□	DC□□ 0702□□	DC□□0702□□		DCGX 0702□□
	SDJCR/L□□K/M11	DC□□ 11T3□□	DC□□ 11T3□□	DC□□11T3□□	DC□□11T3□□	DCGX 11T3□□

Corresponding tool holders of insert DC□□ S-type clamping

SDNCN
KAPR:62°30'







Type		Stock	Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
			H	B	LF	HF	WF	LH				
SDNCN	**0808F07**	△	8	8	80	8	4	20	I60M2.5×6.5	---	---	WT07IP
	1010F07	▲	10	10	80	10	5	20				
	1212H07	▲	12	12	100	12	6	20				
	1616H07	△	16	16	100	16	8	20				
	2020K07	△	20	20	125	20	10	25				
	2525M07	△	25	25	150	25	12.5	30				
	1616K11	▲	16	16	125	16	8	30	I60M3.5×12	D11BS	SM5×8.65XA	WT15IP WH35L
	2020K11	▲	20	20	125	20	10	30				
	2525M11	▲	25	25	150	25	12.5	30				
	3225M11	△	32	25	150	32	12.5	30				
	3232P11	△	32	32	170	32	16	30				

▲Stock available △Make-to-order

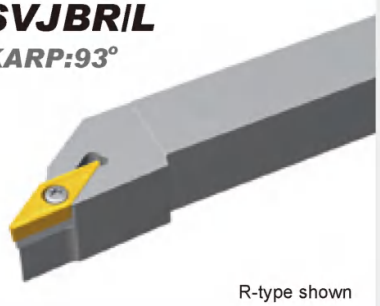
Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining
Inserts shape	**SF**  A100	**XF**  A100	**XM**  A101	**HR**  A102	**LH**  A103
		HF  A100	**HM**  A102		**LC**  A103
		EF  A101	**EM**  A102		
		AHF  A101			

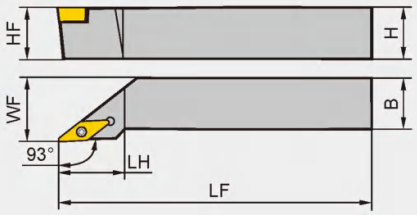
Tool holder type						
	SDNCN□□F/H/K/M07	DC□□0702□□	DC□□ 0702□□	DC□□0702□□		DCGX 0702□□
	SDNCN□□K/M/P11	DC□□ 11T3□□	DC□□ 11T3□□	DC□□11T3□□	DC□□11T3□□	DCGX 11T3□□

Corresponding tool holders of insert VB□□ S-type clamping

SVJBR/L
KARP:93°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	H	B	LF	HF	WF	LH				
SVJBR/L	**1212H11**	▲	▲	12	12	100	12	16	25	I60M2.5×6.5	---	---	WT07IP
	1616H11	▲	▲	16	16	100	16	20	27				
	2020K11	▲	▲	20	20	125	20	25	25				
	2525M11	▲	▲	25	25	150	25	32	30				
	1616H16	▲	▲	16	16	100	16	20	35	I60M3.5×12	V16BS	SM5×8.65XA	WT15IP WH35L
	2020K16	▲	▲	20	20	125	20	25	40				
	2525M16	▲	▲	25	25	150	25	32	40				

▲Stock available △Make-to-order

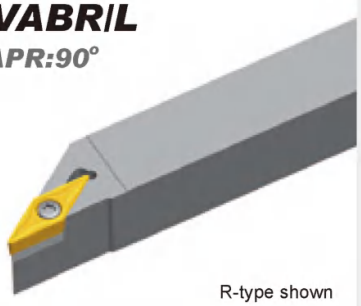
Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing
Inserts shape	**SF**  A117	**XF**  A117	**XM**  A118	**HR**  A119
		HF  A117	**HM**  A119	**SNR**  A119
		NF  A118	**EM**  A118	
		EF  A117		
		NGF  A118		
		AHF  A118		

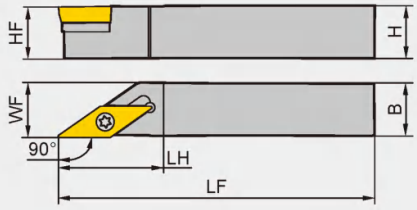
Tool holder type					
	SVJBR/L□□H/K/M11	VB□□1103□□	VB□□1103□□	VB□□1103□□	
	SVJBR/L□□H/K/M16		VB□□1604□□	VB□□1604□□	VB□□1604□□

Corresponding tool holders of insert VB□□ S-type clamping

SVABR/L
KAPR:90°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	H	B	LF	HF	WF	LH				
SVABR/L	**1010F11**	△	△	10	10	80	10	10	25	I60M2.5×6.5	---	---	WT07IP
	1616H16	△	△	16	16	100	16	16	32	I60M3.5×12	V16BS	SM5×8.65XA	WT15IP WH35L
	2020K16	△	△	20	20	125	20	20	32				
	2525M16	△	△	25	25	150	25	25	38				

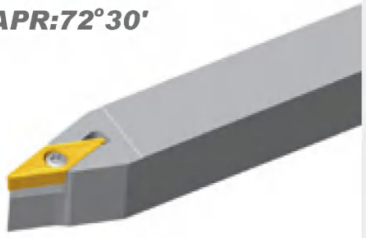
▲Stock available △Make-to-order

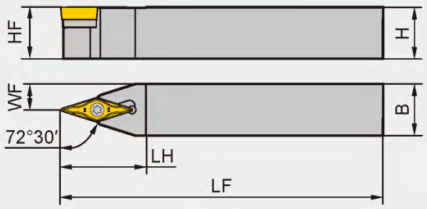
Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing
Inserts shape	**SF**  A117	**XF**  A117	**XM**  A118	**HR**  A119
		HF  A117	**HM**  A119	**SNR**  A119
		NF  A118	**EM**  A118	
		EF  A117		
		NGF  A118		
		AHF  A118		
Tool holder type **SVABR/L□□F11**	VB□□1103□□			
SVABR/L□□H/K/M16		VB□□1604□□	VB□□1604□□	VB□□1604□□

Corresponding tool holders of insert VB□□ S-type clamping

SVVBN
KAPR:72°30'







Type		Stock	Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
			H	B	LF	HF	WF	LH				
SVVBN	1212H11	▲	12	12	100	12	6	25	I60M2.5×6.5	---	---	WT07IP
	1616H11	▲	16	16	100	16	8	25				
	2020K11	▲	20	20	125	20	10	30				
	2525M11	△	25	25	150	25	12.5	35				
	1616H16	▲	16	16	100	16	8	35	I60M3.5×12	V16BS	SM5×8.65XA	WT15IP WH35L
	2020K16	▲	20	20	125	20	10	35				
	2525M16	▲	25	25	150	25	12.5	35				

▲Stock available △Make-to-order

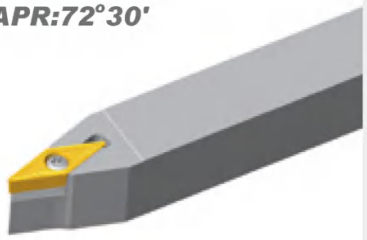
Applicable inserts

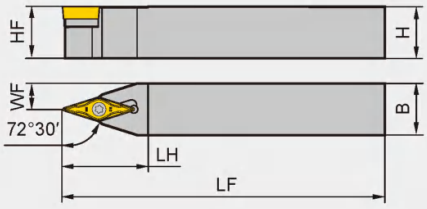
Application	For extra finishing	For finishing	For semi-finishing	For roughing
Inserts shape	SF  A117	XF  A117	XM  A118	HR  A119
		HF  A117	HM  A119	SNR  A119
		NF  A118	EM  A118	
		EF  A117		
		NGF  A118		
		AHF  A118		

Tool holder type					
	SVJBR/L□□H/K/M11	VB□□1103□□	VB□□1103□□	VB□□1103□□	
	SVJBR/L□□H/K/M16		VB□□1604□□	VB□□1604□□	VB□□1604□□

Corresponding tool holders of insert VC□□ S-type clamping

SVVCN
KAPR:72°30'







Type		Stock	Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
			H	B	LF	HF	WF	LH				
SVVCN	**1212H11**	▲	12	12	100	12	6	25	I60M2.5×6.5	---	---	WT07IP
	1616H11	▲	16	16	100	16	8	27				
	2020K11	▲	20	20	125	20	10	30				
	2525M11	△	25	25	150	25	12.5	38				
	1616H16	▲	16	16	100	16	8	33	I60M3.5×12	V16BSC	SM5×8.65XA	WT15IP WH35L
	2020K16	▲	20	20	125	20	10	33				
	2525M16	▲	25	25	150	25	12.5	38				

▲Stock available △Make-to-order

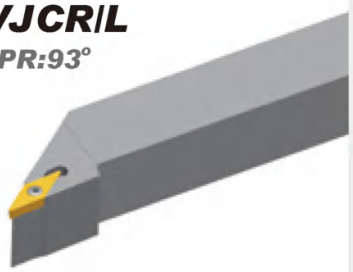
Applicable inserts

Application	For extra finishing	For finishing	For Al machining
Inserts shape	**SF**  A114	**XF**  A114	**LH**  A116
		NF  A114	**LC**  A116
		NGF  A114	
		AHF  A114	

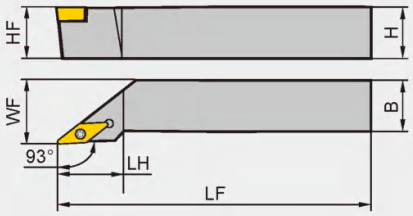
Tool holder type				
	SVVCN□□H/K/M11	VC□□1103□□	VC□□1103□□	VCGX1103□□
	SVVCN□□H/K/M16		VC□□1604□□	VCGX1604□□

Corresponding tool holders of insert VC□□ S-type clamping

SVJCR/L
KAPR:93°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	H	B	LF	HF	WF	LH				
SVJCR/L	**1212H11**	△	△	12	12	100	12	16	25	I60M2.5×6.5	---	---	WT07IP
	1616H11	▲	▲	16	16	100	16	20	27				
	2020K11	▲	▲	20	20	125	20	25	27				
	2525M11	▲	▲	25	25	150	25	32	27				
	1616H16	▲	▲	16	16	100	16	20	36	I60M3.5×12	V16BSC	SM5×8.65XA	WT15IP WH35L
	2020K16	▲	▲	20	20	125	20	25	41				
	2525M16	▲	▲	25	25	150	25	32	41				

▲Stock available △Make-to-order

Applicable inserts

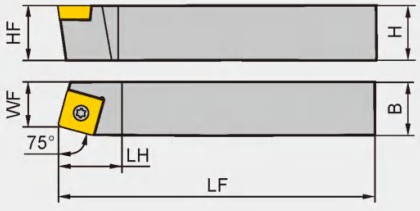
Application	For extra finishing	For finishing	For Al machining
Inserts shape	**SF**  A114	**XF**  A114	**LH**  A116
		NF  A114	**LC**  A116
		NGF  A114	
		AHF  A114	
Tool holder type **SVVCN□□H/K/M11**	VC□□1103□□	VC□□1103□□	VCGX1103□□
SVVCN□□H/K/M16		VC□□1604□□	VCGX1604□□

Corresponding tool holders of insert SC□□ S-type clamping

SSBCR/L
KAPR:75°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	H	B	LF	HF	WF	LH				
SSBCR/L	1212H09	▲	▲	12	12	100	12	9	16	I60M3.5×8	---	---	WT15IP
	1616H09	▲	▲	16	16	100	16	13	16	I60M3.5×12	S09BS	SM5×8.65XA	WT15IP WH35L
	2020K09	△	△	20	20	125	20	17	20				
	2525M09	△	△	25	25	150	25	22	20				
	2020K12	▲	▲	20	20	125	20	17	25	I60M4×11X	S12BS	SM6×10XA	WT15IP WH40L
	2525M12	△	△	25	25	150	25	22	25				

▲Stock available △Make-to-order

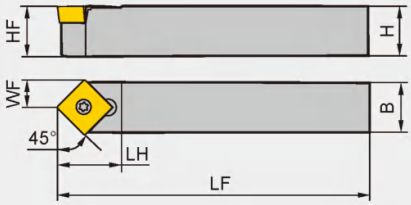
Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For Al machining
Inserts shape	XF  A106	XM  A107	HR  A108	LH  A108
	HF  A106	HM  A107		LC  A108
	EF  A106	EM  A107		
	AHF  A106			
Tool holder type SSBCR/L□□H/K/M09	SC□□09T3□□	SC□□09T3□□	SC□□09T3□□	SCGX09T3□□
SSBCR/L□□K/M12		SC□□1204□□	SC□□1204□□	SCGX1204□□

Corresponding tool holders of insert SC□□ S-type clamping

SSDCN
KAPR:45°







Type		Stock	Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
			H	B	LF	HF	WF	LH				
SSDCN	**1212H09**	▲	12	12	100	12	6	16	I60M3.5×8	---	---	WT15IP
	1616H09	▲	16	16	100	16	8	16	I60M3.5×12	S09BS	SM5×8.65XA	WT15IP WH35L
	2020K09	△	20	20	125	20	10	20				
	2525M09	△	25	25	150	25	12.5	20				
	2525M12	▲	25	25	150	25	12.5	24	I60M4×11X	S12BS	SM6×10XA	WT15IP WH40L

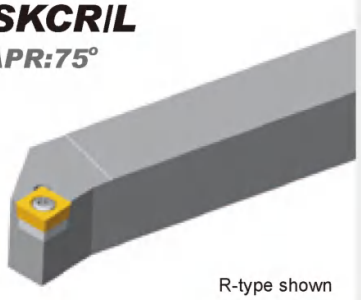
▲Stock available △Make-to-order

Applicable inserts

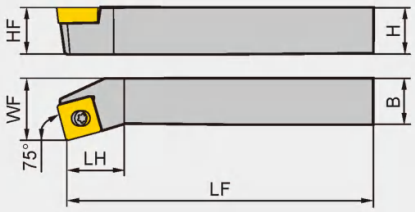
Application	For finishing	For semi-finishing	For roughing	For Al machining
Inserts shape	**XF**  A106	**XM**  A107	**HR**  A108	**LH**  A108
	HF  A106	**HM**  A107		**LC**  A108
	EF  A106	**EM**  A107		
	AHF  A106			
Tool holder type **SSDCN□□H/K/M09**	SC□□09T3□□	SC□□09T3□□	SC□□09T3□□	SCGX09T3□□
SSDCN□□M12		SC□□1204□□	SC□□1204□□	SCGX1204□□

Corresponding tool holders of insert SC□□ S-type clamping

SSKCR/L
KAPR:75°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	H	B	LF	HF	WF	LH				
SSKCR/L	**1212H09**	△	△	12	12	100	12	16	16	I60M3.5×8	---	---	WT15IP
	1616H09	▲	△	16	16	100	16	20	16	I60M3.5×12	S09BS	SM5×8.65XA	WT15IP WH35L
	2020K09	△	△	20	20	125	20	25	20				
	2525M09	△	△	25	25	150	25	32	20				
	2020K12	△	△	20	20	125	20	25	22	I60M4×11X	S12BS	SM6×10XA	WT15IP WH40L
	2525M12	△	△	25	25	150	25	32	22				

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For Al machining
Inserts shape	**XF**  A106	**XM**  A107	**HR**  A108	**LH**  A108
	HF  A106	**HM**  A107		**LC**  A108
	EF  A106	**EM**  A107		
	AHF  A106			

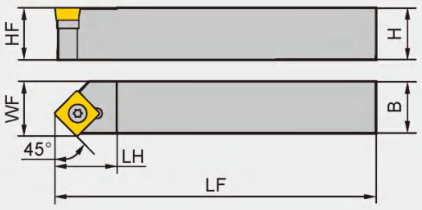
Tool holder type					
	SSKCR/L□□H/K/M09	SC□□09T3□□	SC□□09T3□□	SC□□09T3□□	SCGX09T3□□
	SSKCR/L□□K/M12		SC□□1204□□	SC□□1204□□	SCGX1204□□

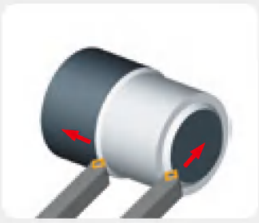
Corresponding tool holders of insert SC□□ S-type clamping

SSSCR/L
KAPR:45°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	H	B	LF	HF	WF	LH				
SSSCR/L	**1212H09**	△	△	12	12	100	12	13	16	I60M3.5×8	---	---	WT15IP
	1616H09	▲	▲	16	16	100	16	17	16	I60M3.5×12	S09BS	SM5×8.65XA	WT15IP WH35L
	2020K09	△	△	20	20	125	20	21	25				
	2525M09	△	△	25	25	150	25	26	25				
	2020K12	▲	▲	20	20	125	20	21	24	I60M4×11X	S12BS	SM6×10XA	WT15IP WH40L
	2525M12	△	△	25	25	150	25	26	28				

▲Stock available △Make-to-order

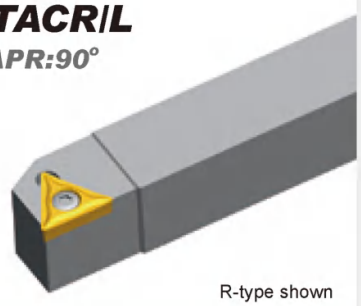
Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For Al machining
Inserts shape	**XF**  A106	**XM**  A107	**HR**  A108	**LH**  A108
	HF  A106	**HM**  A107		**LC**  A108
	EF  A106	**EM**  A107		
	AHF  A106			

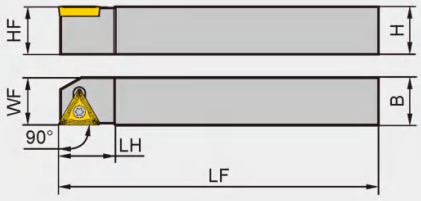
Tool holder type					
	SSSCR/L□□H/K/M09	SC□□09T3□□	SC□□09T3□□	SC□□09T3□□	SCGX09T3□□
	SSSCR/L□□K/M12		SC□□1204□□	SC□□1204□□	SCGX1204□□

Corresponding tool holders of insert TC□□ S-type clamping

STACR/L
KAPR:90°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Wrench	---	---
		R	L	H	B	LF	HF	WF	LH			---	---
STACR/L	**1010K11**	△	△	10	10	100	10	10	12	I60M2.5×6.5	WT07IP	---	---
	1212F11	△	△	12	12	80	12	12	14				
	1616K11	△	△	16	16	100	16	16	16				

▲Stock available △Make-to-order

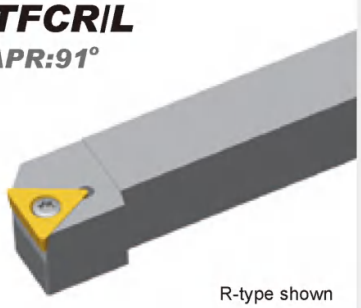
Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For Al machining
Inserts shape	**XF**  A109	**XM**  A111	**HR**  A112	**LH**  A113
	HF  A109	**HM**  A112		**LC**  A113
	EF  A109	**EM**  A111		
	AHF  A111	**EG**  A111		

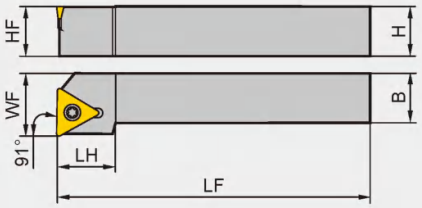
Tool holder type					
	STACR/L□□K/F11	TC□□1102□□	TC□□1102□□	TC□□1102□□	TCGX1102□□
	STFCR/L□□H/K/M11	TC□□1102□□	TC□□1102□□	TC□□1102□□	TCGX1102□□
	STFCR/L□□K/M16	TC□□16T3□□	TC□□16T3□□	TC□□16T3□□	TCGX16T3□□

Corresponding tool holders of insert TC□□ S-type clamping

STFCR/L
KAPR:91°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	H	B	LF	HF	WF	LH				
STFCR/L	**1212H11**	▲	▲	12	12	100	12	16	14	I60M2.5×6.5	---	---	WT07IP
	1616H11	▲	▲	16	16	100	16	20	14				
	2020K11	△	△	20	20	125	20	25	20				
	2525M11	△	△	25	25	150	25	32	20				
	1616K16	▲	▲	16	16	125	16	20	20	I60M3.5×12	T16BS	SM5×8.65XA	WT15IP WH35L
	2020K16	▲	▲	20	20	125	20	25	25				
	2525M16	△	△	25	25	150	25	32	25				

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For Al machining
Inserts shape	XF A109	XM A111	HR A112	LH A113
	HF A109	HM A112		LC A113
	EF A109	EM A111		
	AHF A111	EG A111		

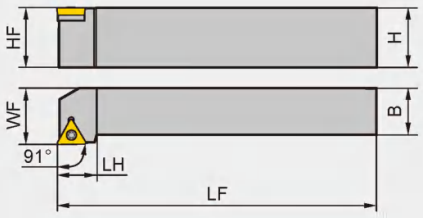
Tool holder type					
	STACR/L□□K/F11	TC□□1102□□	TC□□1102□□	TC□□1102□□	TCGX1102□□
	STFCR/L□□H/K/M11	TC□□1102□□	TC□□1102□□	TC□□1102□□	TCGX1102□□
	STFCR/L□□K/M16	TC□□16T3□□	TC□□16T3□□	TC□□16T3□□	TCGX16T3□□

Corresponding tool holders of insert TC□□ S-type clamping

STGCR/L
KAPR:91°



R-type shown





Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	H	B	LF	HF	WF	LH				
STGCR/L	**0808F09**	▲	△	08	08	80	8	10	12	I60M2.2×5.5	---	---	WT06IP
	1010F09	▲	▲	10	10	80	10	12	12				
	1212H09	△	△	12	12	100	12	16	12				
	1212H11	▲	▲	12	12	100	12	16	16	I60M2.5×6.5	---	---	WT07IP
	1616H11	▲	▲	16	16	100	16	20	20				
	2020K11	△	△	20	20	125	20	25	20				
	2525M11	△	△	25	25	150	25	32	20				
	1616K16	△	△	16	16	125	16	20	20	I60M3.5×12	T16BS	SM5×8.65XA	WT15IP WH35L
	2020K16	▲	▲	20	20	125	20	25	20				
	2525M16	▲	▲	25	25	150	25	32	20				

▲Stock available △Make-to-order

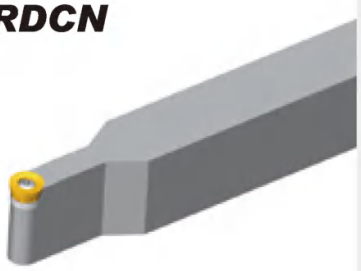
Applicable inserts

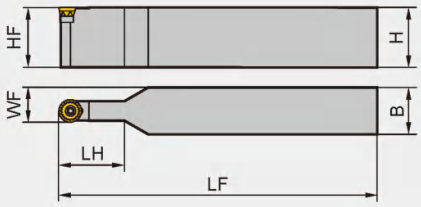
Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining
Inserts shape	**SF**  A109	**XF**  A109	**XM**  A111	**HR**  A112	**LH**  A113
		HF  A109	**HM**  A112		**LC**  A113
		EF  A109	**EM**  A111		
		AHF  A111	**EG**  A111		

Tool holder type						
	STGCR/L□□F/H09	TC□□0902□□	TC□□0902□□	TC□□0902□□	TC□□0902□□	TCGX0902□□
	STGCR/L□□H/K/M11		TC□□1102□□	TC□□1102□□	TC□□1102□□	TCGX1102□□
	STGCR/L□□K/M16		TC□□16T3□□	TC□□16T3□□	TC□□16T3□□	TCGX16T3□□

Corresponding tool holders of insert RC□□ S-type clamping

SRDCN







Type		Stock	Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
			H	B	LF	HF	WF	LH				
SRDCN	**1616H08**	△	16	16	100	16	12	16	I60M3×7	---	---	WT09IP
	2020K08	△	20	20	125	20	14	16				
	2525M08	△	25	25	150	25	16.5	16				
	2020K10	△	20	20	125	20	15	20	I60M3.5×10	---	---	WT15IP
	2525M10	▲	25	25	150	25	17.5	25				
	2525M12	▲	25	25	150	25	18.5	35	I60M3.5×12	R12BS	SM5×8.65XA	WT15IP WH35L
	3232P12	△	32	32	170	32	22	35				
	3225P16	▲	32	25	170	32	20.5	35	I60M4×15X	R16BS	SM6×10XA	WT15IP WH40L
	4040S16	△	40	40	250	40	28	40				

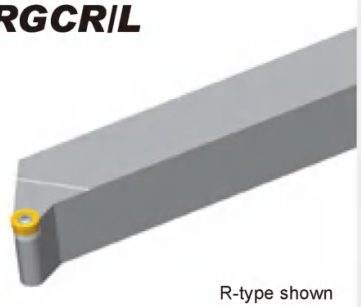
▲Stock available △Make-to-order

Applicable inserts

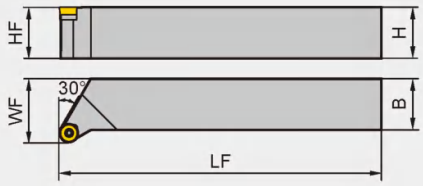
Application		For semi-finishing	For roughing	For Al machining
Inserts shape		 A104	 A104	LH  A104
Tool holder type	**SRDCN□□K/M/H08**	RCMT0803MO	RCMT0803MO	RCGX0803MO-LH
	SRDCN□□K/M10	RCMT10T3MO	RCMT10T3MO	
	SRDCN□□M/P12	RCMT1204MO	RCMT1204MO	
	SRDCN□□P/S16	RCMT1606MO	RCMT1606MO	

Corresponding tool holders of insert RC□□ S-type clamping

SRGCR/L



R-type shown





Type		Stock		Basic dimensions(mm)					Screw	Shim	Shim screw	Wrench
		R	L	H	B	LF	HF	WF				
SRGCR/L	**1616H08**	△	△	16	16	100	16	20	I60M3×7	---	---	WT09IP
	2020K08	△	△	20	20	125	20	25				
	2525M08	△	△	25	25	150	25	32				
	1616H10	△	△	16	16	100	16	20	I60M3.5×10	---	---	WT15IP
	2020K10	▲	▲	20	20	125	20	25				
	2525M10	▲	▲	25	25	150	25	32				
	2020K12	▲	△	20	20	125	20	27	I60M3.5×12	R12BS	SM5×8.65XA	WT15IP WH35L
	2525M12	▲	▲	25	25	150	25	32				
	3232P16	▲	△	32	32	170	32	40	I60M4×15X	R16BS	SM6×10XA	WT15IP WH40L

▲Stock available △Make-to-order

Applicable inserts

Application	For semi-finishing	For roughing	For Al machining
Inserts shape	 A104	 A104	LH  A104
Tool holder type **SRGCR/L□□H/K/M08**	RCMT0803MO	RCMT0803MO	RCGX0803MO-LH
SRGCR/L□□H/K/M10	RCMT10T3MO	RCMT10T3MO	
SRGCR/L□□K/M12	RCMT1204MO	RCMT1204MO	
SRGCR/L□□P16	RCMT1606MO	RCMT1606MO	

How to select internal turning tools

Explanation of internal turning tools detailed table

● Listed according to clamping types.

Approach angle of tools

Tools type
The first 4 letters in the type description stands for tool shape and applicatio.

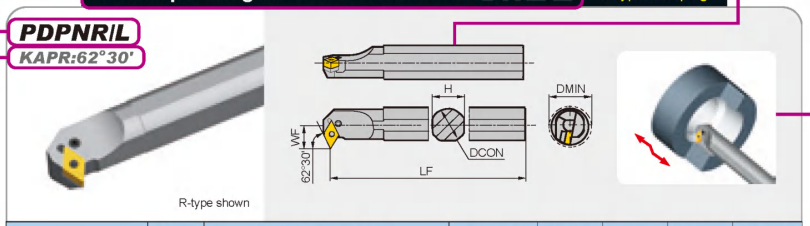
Insert type

Specification chart

Application chart
The arrow shows suitable applications such as internal turning, profiling and end turning, etc.

Corresponding tool holders of insert DN□□ P-type clamping

PDPNR/L
KAPR:62°30'



R-type shown

Type	Stock		Basic dimensions(mm)					Screw	Wrench	Lever	Shim	Shim pin
	R	L	DMIN	DCON	H	LF	WF					
S32T-PDPNR/L15-3	▲	▲	40	32	30	300	22	LEM8×21	WH30L	L4	D15AP	SP4
S40U-PDPNR/L15-3	▲	▲	50	40	38	350	27					
S32T-PDPNR/L15	△	△	40	32	30	300	22	LEM8×21	WH30L	L4B	D15AP	SP4
S40U-PDPNR/L15	△	△	50	40	38	350	27					

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	XF A60	XM A63	DR Double-side A65	HDR A66	TC A66
	DF A60	PM A62	DR Single-side A65		Without chipbreaker A67
	SF A60	DM A63	ER Double-side A65		
	EF A61	EM A64	ER Single-side A66		
	ADF A61	EG A64	SNR Double-side A66		
	NF A61	NM A64	LR Single-side A65		
	NGF A62				
Tool holder type □□-PDPNR/L15-3	DN□□1504□□	DN□□1504□□	DN□□1504□□		DN□□1504□□
□□-PDPNR/L15	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□

Tool holders with oil hole

Products specification
Including product description, stock (left and right hand), basic dimensions and applicable spare parts.

Applicable inserts
Including applications of inserts, reference page, insert shape and corresponding tool holders.



TURNING A

Internal turning tools

Internal turning tools overview A191

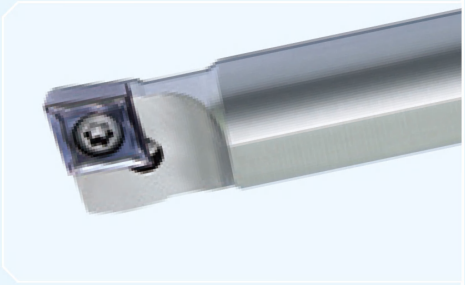
Internal turning tools code key A192-A193

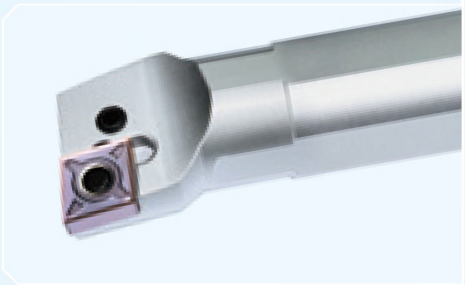
Detailed table of internal turning tools A194-A221

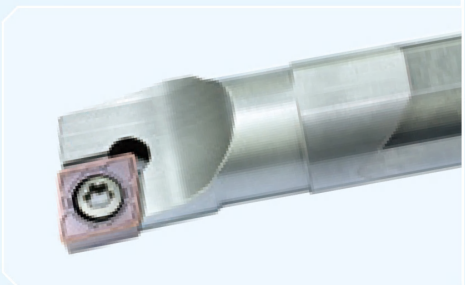
Internal turning tool holders by P-type clamping A194-A199

Internal turning tool holders by S-type clamping A200-A215

Damping internal turning tool holders and their features A216-A221

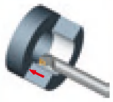
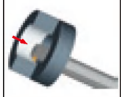






Internal turning tools



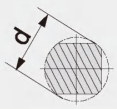
Name	Feature	62°30′	75°	90°	91°	93°	93°	93°	95°	107°30′
										
P-type internal turning tools	• The minimum machining diameter is 20mm. • Applicable inserts are economic negative inserts. • Hole clamping	PDPN  A195	PSKN  A197	PTFN  A198			PDUN  A196		PCLN  A194	
									PWLN  A199	
S-type internal turning tools	• The minimum machining diameter is 10mm. • Applicable inserts are 5°, 7° and 11° positive inserts. • Screw clamping.		SSKC  A204	SCFC  A214	STFC  A205	STUP  A213	SDUC  A202	SDZC  A203		SDQC  A201
							SDUP  A212		SCLC  A200	SDQP  A211
							SVUC  A207		 A215	SVQB  A208
							SVUB  A209		SCLP  A210	SVQC  A206
Damping internal turning tools	• The minimum diameter can be machined is 12mm. • Applicable inserts are 7°, 11°positive inserts. • Good Performance on reducing shake.					STUP  A220	SDUP  A219		SCLP  A217	SDQP  A218
							SVUC  A221			SVQC  A221

Internal turning tools code key

Type of tool holder

Code	Type
A	Steel tool holder with oil-hole
C	Cemented carbide tool holder
E	Cemented carbide tool holder with oil hole
S	Steel tool holder
X	Special inserts applied

Diameter of tool holder



Code	Diameter
08	08
10	10
16	16
20	20
25	25
32	32
40	40
50	50

Length of tool holder



Code	Length
H	100
K	125
M	150
N	160
Q	180
R	200
S	250
T	300
U	350
V	400

Clamping system



P-Hole clamping



M-Top and hole clamping

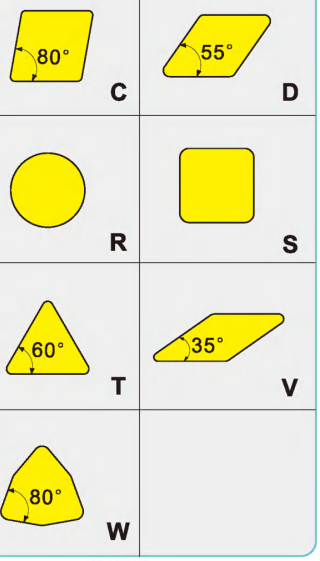


S-Screw on



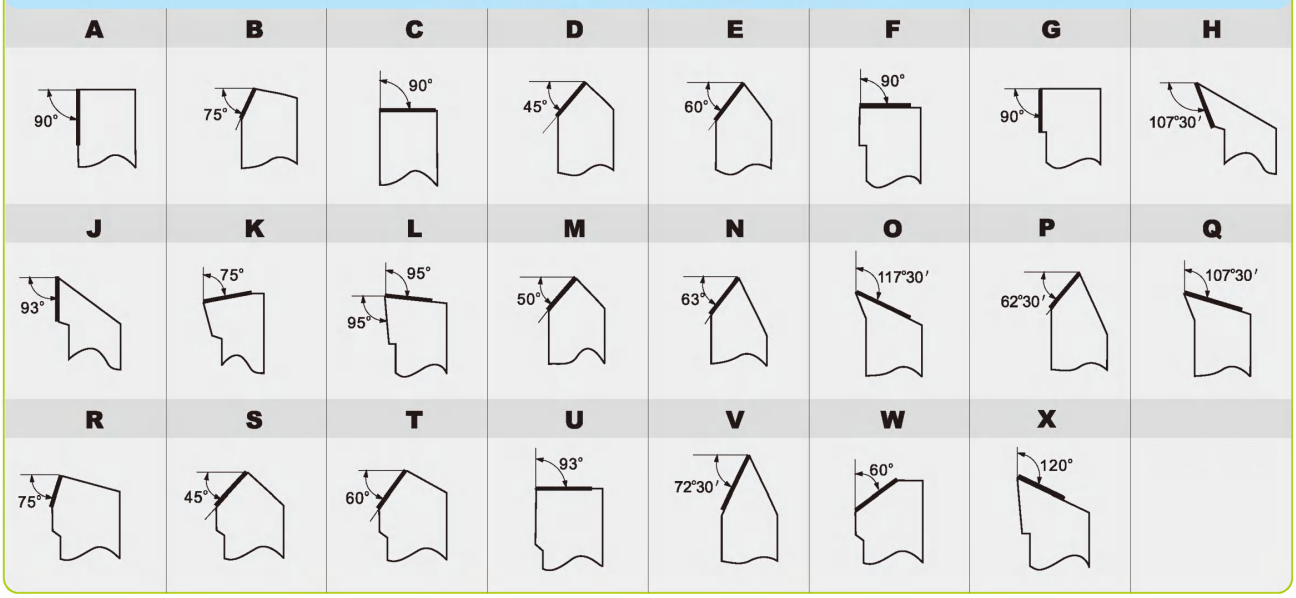
C-Top clamping

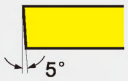
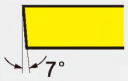
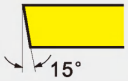
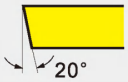
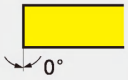
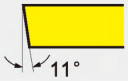
Inserts shape

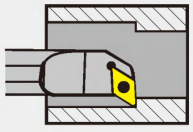
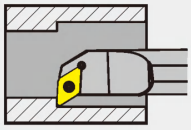


S 16 R - S D U

Tool holder style and approach angle



Clearance angle of insert	
	B
	C
	D
	E
	N
	P

Cutting direction	
	L - Left hand
	R - Right hand

Manufacture option	
D	Increase offset f size+1.0mm
E	Increase offset f size+2.0mm
R	Round shank
W	Wedge clamping
X	Back boring

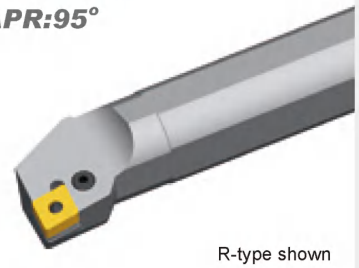


Length of cutting edge

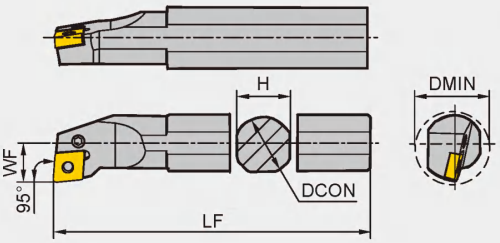
Inserts shape	C	D	R	S	T	V	W
							
Inscribed circle	Length of cutting edge(mm)						
5.556	---	---	---	---	09	---	---
6.350	06	07	---	---	11	---	---
9.525	09	11	09	09	16	16	06
12.700	12	15	12	12	22	22	08
15.875	16	19	15	15	27	---	---
19.050	19	---	19	19	33	---	---
25.400	25	---	25	25	44	---	---

Corresponding tool holders of insert CN□□ P-type clamping

PCLNR/L
KAPR:95°



R-type shown





Type	Stock		Basic dimensions(mm)					Screw	Wrench	Lever	Shim	Shim pin
	R	L	DMIN	DCON	H	LF	WF					
S16Q-PCLNR/L09	△	△	20	16	15	180	11	LEM5×9B	WT09P	L3C	---	---
S20R-PCLNR/L09	△	△	25	20	18	200	13	LEM5×9B				
S25S-PCLNR/L09	△	△	32	25	23	250	17	LEM5×9B				
S25S-PCLNR/L12	△	△	32	25	23	250	17	LEM6×13.4A	WH25L	L4A	---	---
S32T-PCLNR/L12	▲	▲	44	32	30	300	22	LEM8×21	WH30L	L4	C12APB	SP4
S40U-PCLNR/L12	▲	▲	54	40	38	350	27					
S50V-PCLNR/L12	▲	▲	63	50	47	400	35					
S50V-PCLNR/L16	△	△	63	50	48	400	31	LEM8×25	WH30L	L5	C16AP	SP5
S50S-PCLNR/L19	△	△	63	50	47	250	35	LEM10×27	WH40L	L6	C19AP	SP6
S50W-PCLNR/L19	▲	▲	63	50	47	450	35					

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	XF  A52	XM  A54	DR Double-side  A56	HDR  A58	TC  A58
	DF  A52	PM  A53	DR Single-side  A57	HPR  A58	Without chipbreaker  A59
	SF  A52	DM  A54	ER Double-side  A57		
	EF  A52	EM  A55	ER Single-side  A57		
	ADF  A53	EG  A55	SNR Double-side  A57		
	NF  A53	EH  A55	LR Single-side  A56		
		NM  A55			

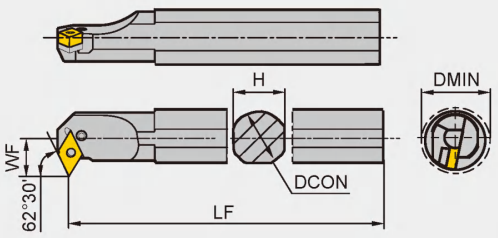
Tool holder type						
	□□-PCLNR/L09	CN□□0903□□	CN□□0903□□			
	□□-PCLNR/L12	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□
	□□-PCLNR/L16	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□
	□□-PCLNR/L19		CN□□1906□□	CN□□1906□□	CN□□1906□□	CN□□1906□□

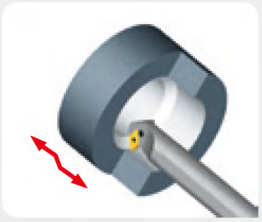
Corresponding tool holders of insert DN□□ P-type clamping

PDPNR/L
KAPR:62°30'



R-type shown





Type	Stock		Basic dimensions(mm)					Screw	Wrench	Lever	Shim	Shim pin
	R	L	DMIN	DCON	H	LF	WF					
S32T-PDPNR/L15-3	▲	▲	40	32	30	300	22	LEM8×21	WH30L	L4	D15AP	SP4
S40U-PDPNR/L15-3	▲	▲	50	40	38	350	27					
S32T-PDPNR/L15	△	△	40	32	30	300	22	LEM8×21	WH30L	L4B	D15AP	SP4
S40U-PDPNR/L15	△	△	50	40	38	350	27					

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A60	**XM**  A63	**DR** Double-side  A65	**HDR**  A66	**TC**  A66
	DF  A60	**PM**  A62	**DR** Single-side  A65		Without chipbreaker  A67
	SF  A60	**DM**  A63	**ER** Double-side  A65		
	EF  A61	**EM**  A64	**ER** Single-side  A66		
	ADF  A61	**EG**  A64	**SNR** Double-side  A66		
	NF  A61	**NM**  A64	**LR** Single-side  A65		
	NGF  A62				

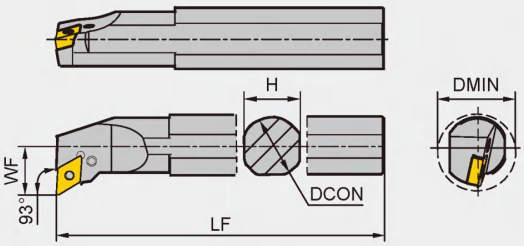
Tool holder type						
	□□-PDPNR/L15-3	DN□□1504□□	DN□□1504□□	DN□□1504□□		DN□□1504□□
	□□-PDPNR/L15	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□

Corresponding tool holders of insert DN□□ P-type clamping

PDUNR/L
KAPR:93°



R-type shown





Type	Stock		Basic dimensions(mm)					Screw	Wrench	Lever	Shim	Shim pin
	R	L	DMIN	DCON	H	LF	WF					
S20R-PDUNR/L11	△	△	25	20	19	200	13	LEM5×12B	WT09P	L3D	---	---
S25S-PDUNR/L11	△	△	32	25	23	250	17					
S32T-PDUNR/L15	△	△	40	32	30	300	22	LEM8×21	WH30L	L4B	D15AP	SP4
S32T-PDUNR/L15-3	△	△	40	32	30	300	22	LEM8×21	WH30L	L4	D15AP	SP4
S40U-PDUNR/L15	△	△	50	40	38	350	27	LEM8×21	WH30L	L4B	D15AP	SP4
S40U-PDUNR/L15-3	▲	▲	50	40	38	350	27	LEM8×21	WH30L	L4	D15AP	SP4

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A60	**XM**  A63	**DR** Double-side  A65	**HDR**  A66	**TC**  A66
	DF  A60	**PM**  A62	**DR** Single-side  A65		Without chipbreaker  A67
	SF  A60	**DM**  A63	**ER** Double-side  A65		
	EF  A61	**EM**  A64	**ER** Single-side  A66		
	ADF  A61	**EG**  A64	**SNR** Double-side  A66		
	NF  A61	**NM**  A64	**LR** Single-side  A65		
	NGF  A62				

Tool holder type						
	□□-PDUNR/L11	DN□□1104□□	DN□□1104□□			DN□□1104□□
	□□-PDUNR/L15-3	DN□□1504□□	DN□□1504□□	DN□□1504□□		DN□□1504□□
	□□-PDUNR/L15	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□

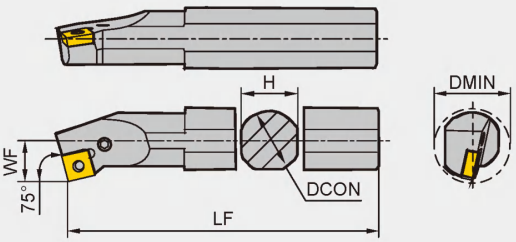
Corresponding tool holders of insert SN□□ P-type clamping

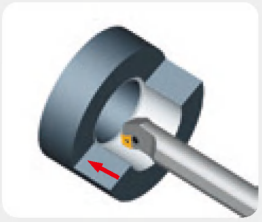
PSKNR/L

KAPR:75°



R-type shown





Type	Stock		Basic dimensions(mm)					Screw	Wrench	Lever	Shim	Shim pin
	R	L	DMIN	DCON	H	LF	WF					
S25S-PSKNR/L12	▲	▲	32	25	23	250	17	LEM6×13.4A	WH25L	L4A	---	---
S32T-PSKNR/L12	△	△	41	32	30	300	22	LEM8×21	WH30L	L4	S12APB	SP4
S40U-PSKNR/L12	△	△	50	40	38	350	27					

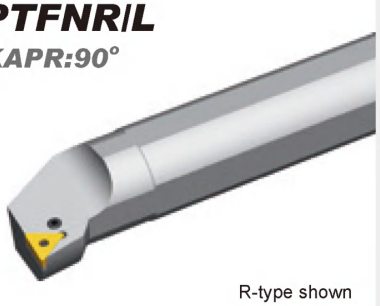
▲Stock available △Make-to-order

Applicable inserts

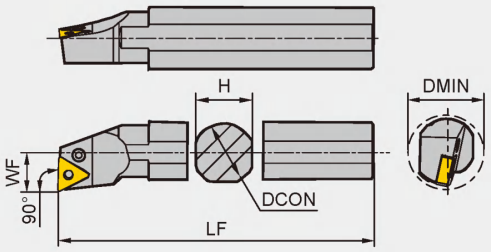
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF** A68	**XM** A70	**DR** Double-side A73	**HDR** A75	**TC** A76
	DF A68	**PM** A70	**DR** Single-side A74	**HPR** A76	Without chipbreaker A77
	EF A68	**DM** A71	**ER** Double-side A74		
	ADF A69	**EM** A71	**ER** Single-side A75		
	SF A69	**EG** A72	**SNR** Double-side A75		
		NM A72	**LR** Single-side A72		
Tool holder type **□□-PSKNR/L12**	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□

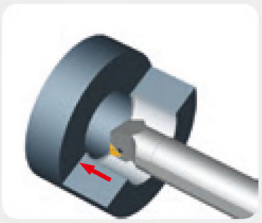
Corresponding tool holders of insert TN□□ P-type clamping

PTFNR/L
KAPR:90°



R-type shown





Type	Stock		Basic dimensions(mm)					Screw	Wrench	Lever	Shim	Shim pin
	R	L	DMIN	DCON	H	LF	WF					
S25S-PTFNR/L16	▲	▲	32	25	23	250	17	LEM5×12B	WT09P	L3B	---	---
S32T-PTFNR/L16	△	△	41	32	30	300	21	LEM6×17	WH25L	L3	T16APB	SP3
S40U-PTFNR/L16	△	△	50	40	38	350	26					

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	**XF**  A78	**XM**  A80	**DR** Double-side  A82	**HDR**  A84	**TC**  A84
	DF  A78	**PM**  A80	**DR** Single-side  A83		Without chipbreaker  A84
	SF  A78	**DM**  A81	**ER** Double-side  A83		
	EF  A79	**EM**  A81	**SNR** Double-side  A83		
	ES  A79	**EG**  A81	**LR** Single-side  A82		
	ADF  A79	**EH**  A82			
Tool holder type **□□-PTFNR/L16**	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□

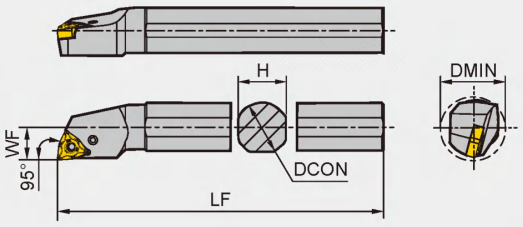
Corresponding tool holders of insert WN□□ P-type clamping

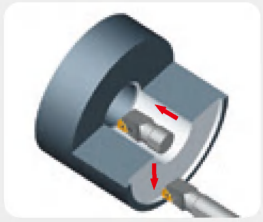
PWLNR/L

KAPR:95°



R-type shown





Type	Stock		Basic dimensions(mm)					Screw	Wrench	Lever	Shim	Shim pin
	R	L	DMIN	DCON	H	LF	WF					
S16R-PWLNR/L06	△	△	22	16	15	200	11	LEM5X12B	WT09P	L3B	---	---
S20R-PWLNR/L06	△	△	25	20	18	200	13			L3B		
S25S-PWLNR/L06	△	△	35	25	23	250	17					
S20R-PWLNR/L08	△	△	25	20	18	200	13	LEM6X13.4A	WH25L	L4A	---	---
S25S-PWLNR/L08	△	△	32	25	23	250	17					
S32T-PWLNR/L08	△	△	40	32	30	300	22	LEM8X21	WH30L	L4	W08AP	SP4

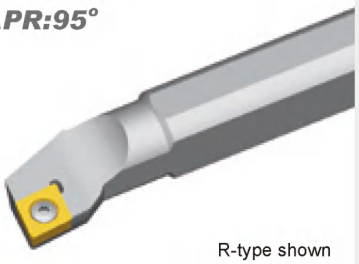
▲Stock available △Make-to-order

Applicable inserts

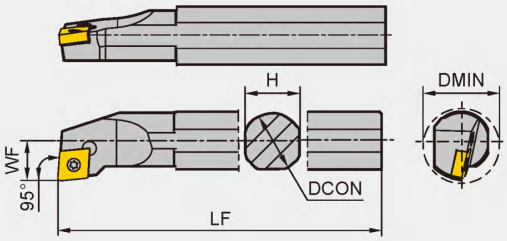
Application	For finishing	For semi-finishing	For roughing	For cast iron machining
Inserts shape	**XF**  A88	**XM**  A90	**DR** Double-side  A92	**TC**  A93
	DF  A88	**PM**  A90	**SNR** Double-side  A92	Without chipbreaker  A93
	SF  A88	**DM**  A91		
	EF  A89	**EM**  A91		
	ES  A89	**EG**  A91		
	ADF  A89	**EH**  A92		
	NF  A89	**NM**  A92		
Tool holder type □□-PWLNR/L06	WN□□0604□□	WN□□0604□□	WN□□0604□□	WN□□0604□□
□□-PWLNR/L08	WN□□0804□□	WN□□0804□□	WN□□0804□□	WN□□0804□□

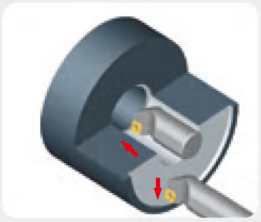
Corresponding tool holders of insert CC□□ S-type clamping

SCLCR/L
KAPR:95°



R-type shown





Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	DMIN	DCON	H	LF	WF				
S08K-SCLCR/L06	▲	▲	10	8	7.4	125	5	I60M2.5×5.5	WT07IP	---	---
S10K-SCLCR/L06	▲	▲	13	10	9	125	6				
S12M-SCLCR/L06	▲	▲	16	12	11	150	9	I60M2.5×6.5			
S12M-SCLCR/L09	▲	▲	16	12	11	150	9	I60M3.5×8	WT15IP	---	---
S14N-SCLCR/L09	△	△	18	14	13	160	9				
S16Q-SCLCR/L09	△	△	20	16	15	180	11				
S20R-SCLCR/L09	△	△	25	20	18	200	13	I60M3.5×8			
S25S-SCLCR/L09	△	△	32	25	23	250	17	I60M3.5×10	WT15IP	---	---
S20R-SCLCR/L12	△	△	25	20	19	200	12.5	I60M4×11X	WT15IP	---	---
S25S-SCLCR/L12	▲	▲	32	25	23	250	17	I60M4×11X	WT15IP	---	---
S32T-SCLCR/L12	△	△	40	32	30	300	22	I60M4×11X	WH40L WT15IP	C12BS	SM6×10XA
S40U-SCLCR/L12	△	△	50	40	37	350	27				

▲Stock available △Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For cast iron machining	For Al machining
Inserts shape	**SF**  A95	**XF**  A95	**XM**  A96	**HR**  A98	**TC**  A98	**LH**  A99
		HF  A95	**HM**  A97			**LC**  A99
		EF  A96	**EM**  A97			
		AHF  A96	**EG**  A97			

Tool holder type							
	□□-SCLCR/L06	CC□□0602□□	CC□□0602□□	CC□□0602□□	CC□□0602□□		CCGX0602□□
	□□-SCLCR/L09	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□		CC□□09T3□□	CCGX09T3□□
	□□-SCLCR/L12		CC□□1204□□	CC□□1204□□		CC□□1204□□	CCGX1204□□

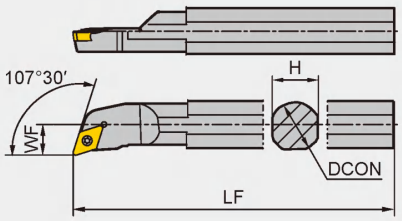
Corresponding tool holders of insert DC□□ S-type clamping

SDQCR/L

KAPR:107°30'



R-type shown





Type	Stock		Basic dimensions(mm)					Screw	Wrench	---	---
	R	L	DMIN	DCON	H	LF	WF			---	---
S10K-SDQCR/L07	▲	▲	13	10	9	125	7	I60M2.5×5.5	WT07IP	---	---
S12M-SDQCR/L07	▲	▲	16	12	11	150	9	I60M2.5×6.5			
S16Q-SDQCR/L07	△	△	20	16	15	180	11				
S20R-SDQCR/L11	△	△	25	20	18	200	13	I60M3.5×8	WT15IP	---	---
S25S-SDQCR/L11	△	△	32	25	23	250	17	I60M3.5×10			
S32T-SDQCR/L11	△	△	40	32	30	300	22	I60M3.5×8			
S40U-SDQCR/L11	△	△	50	40	37	350	27	I60M3.5×10			

▲Stock available △Make-to-order

Applicable inserts

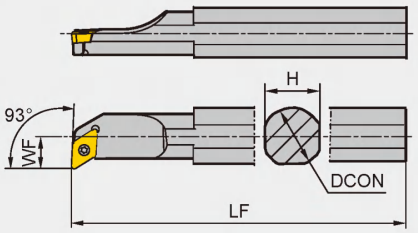
Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining
Inserts shape	**SF**  A100	**XF**  A100	**XM**  A101	**HR**  A102	**LH**  A103
		HF  A100	**HM**  A102		**LC**  A103
		EF  A101	**EM**  A102		
		AHF  A101			
Tool holder type □□-SDQCR/L07	DC□□0702□□	DC□□0702□□	DC□□0702□□		DCGX0702□□
Tool holder type □□-SDQCR/L11	DC□□11T3□□	DC□□11T3□□	DC□□11T3□□	DC□□11T3□□	DCGX11T3□□

Corresponding tool holders of insert DC□□ S-type clamping

SDUCR/L
KAPR:93°



R-type shown







Type	Stock		Basic dimensions(mm)					Screw	Wrench	---	---
	R	L	DMIN	DCON	H	LF	WF			---	---
S10K-SDUCR/L07	▲	▲	13	10	9	125	7	I60M2.5×5.5	WT07IP	---	---
S12M-SDUCR/L07	▲	▲	16	12	11	150	9	I60M2.5×6.5			
S16Q-SDUCR/L07	△	△	20	16	15	180	11				
S20R-SDUCR/L11	△	△	25	20	18	200	13	I60M3.5×8	WT15IP	---	---
S25S-SDUCR/L11	△	△	32	25	23	250	17	I60M3.5×10			
S32T-SDUCR/L11	△	△	40	32	30	300	22				
S40U-SDUCR/L11	△	△	50	40	37	350	27				

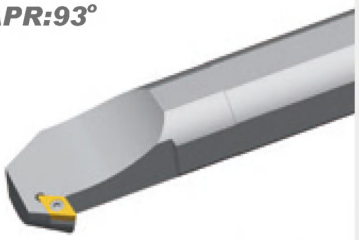
▲Stock available △Make-to-order

Applicable inserts

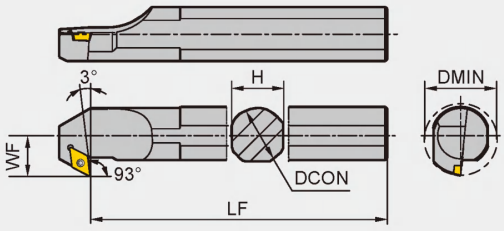
Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining
Inserts shape	**SF**  A100	**XF**  A100	**XM**  A101	**HR**  A102	**LH**  A103
		HF  A100	**HM**  A102		**LC**  A103
		EF  A101	**EM**  A102		
		AHF  A101			
Tool holder type **□□-SDUCR/L07**	DC□□0702□□	DC□□0702□□	DC□□0702□□		DCGX0702□□
□□-SDUCR/L11	DC□□11T3□□	DC□□11T3□□	DC□□11T3□□	DC□□11T3□□	DCGX11T3□□

Corresponding tool holders of insert DC□□ S-type clamping

SDZCR/L
KAPR:93°



R-type shown





Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	DMIN	DCON	H	LF	WF				
S25S-SDZCR/L11	△	△	32	25	23	250	17	I60M3.5×10	WT15IP	---	---
S32T-SDZCR/L11	△	△	40	32	30	300	22	I60M3.5×12	WT15IP WH35L	D11BS	SM5×8.65XA
S40U-SDZCR/L11	△	△	50	40	37	350	27				

▲Stock available △Make-to-order

Applicable inserts

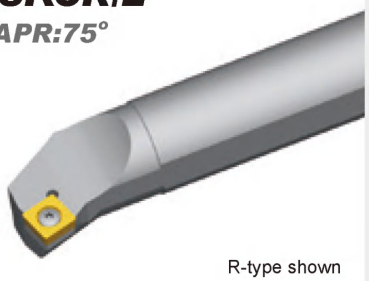
Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining
Inserts shape	**SF**  A100	**XF**  A100	**XM**  A101	**HR**  A102	**LH**  A103
		HF  A100	**HM**  A102		**LC**  A103
		EF  A101	**EM**  A102		
		AHF  A101			

Tool holder type	□□-SDZCR/L11	DC□□11T3□□	DC□□11T3□□	DC□□11T3□□	DC□□11T3□□	DCGX11T3□□

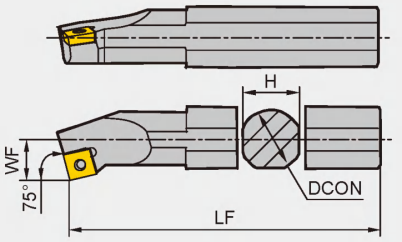
Corresponding tool holders of insert SC□□ S-type clamping

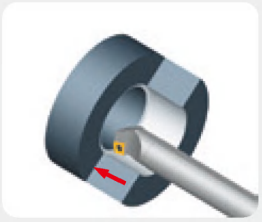
SSKCR/L

KAPR:75°



R-type shown





Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	DMIN	DCON	H	LF	WF				
S12M- SSKCR/L09	▲	△	16	12	11	150	9	I60M3.5×8	WT15IP	---	---
S16Q- SSKCR/L09	△	△	20	16	15	180	11				
S20R- SSKCR/L09	△	△	25	20	18	200	13				
S25S- SSKCR/L12	△	△	32	25	23	250	17	I60M4×11X	WT15IP	---	---
S32T- SSKCR/L12	△	△	40	32	30	300	22		WT15IP WH40L	S12BS	SM6×10XA

▲Stock available △Make-to-order

Applicable inserts

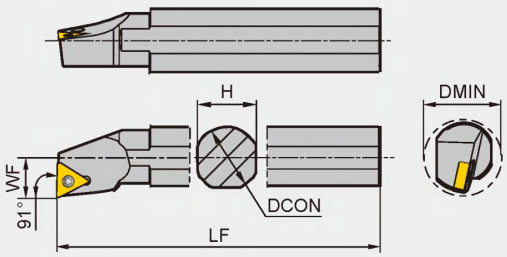
Application	For finishing	For semi-finishing	For roughing	For Al machining
Inserts shape	XF  A106	XM  A107	HR  A108	LH  A108
	HF  A106	HM  A107		LC  A108
	EF  A106	EM  A107		
	AHF  A106			
Tool holder type □□-SSKCR/L09	SC□□09T3□□	SC□□09T3□□	SC□□09T3□□	SCGX09T3□□
□□-SSKCR/L12		SC□□1204□□	SC□□1204□□	SCGX1204□□

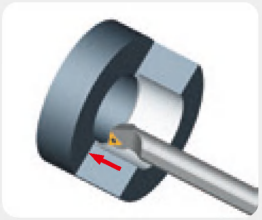
Corresponding tool holders of insert TC□□ S-type clamping

STFCR/L
KAPR:91°



R-type shown





Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	DMIN	DCON	H	LF	WF				
S12M-STFCR/L11	▲	▲	16	12	11	150	9	I60M2.5×6.5	WT07IP	---	---
S16Q-STFCR/L11	△	△	20	16	15	180	11				
S20R-STFCR/L11	△	△	25	20	18	200	13				
S25S-STFCR/L16	△	△	32	25	23	250	17	I60M3.5×10	WT15IP	---	---
S32T-STFCR/L16	△	△	40	32	30	300	22	I60M3.5×12	WT15IP WH35L	T16BS	SM5×8.65XA
S40U-STFCR/L16	△	△	50	40	37	350	27				

▲Stock available △Make-to-order

Applicable inserts

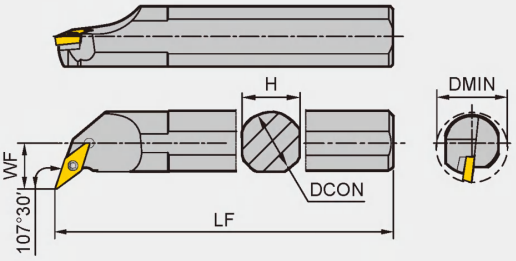
Application	For finishing	For semi-finishing	For roughing	For Al machining
Inserts shape	XF  A109	XM  A111	HR  A112	LH  A113
	HF  A109	HM  A112		LC  A113
	EF  A109	EM  A111		
	AHF  A111	EG  A111		
Tool holder type □□-STFCR/L11	TC□□1102□□	TC□□1102□□	TC□□1102□□	TCGX1102□□
□□-STFCR/L16	TC□□16T3□□	TC□□16T3□□	TC□□16T3□□	TCGX16T3□□

Corresponding tool holders of insert VC□□ S-type clamping

SVQCR/L
KAPR:107°30'



R-type shown





Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	DMIN	DCON	H	LF	WF				
S16Q-SVQCR/L11	▲	▲	22	16	15	180	13	I60M2.5×6.5	WT07IP	---	---
S20R-SVQCR/L16	△	△	27	20	18	200	14	I60M3.5×8	WT15IP	---	---
S25S-SVQCR/L16	△	△	35	25	23	250	20	I60M3.5×12	WT15IP WH35L	V16BS	SM5×8.65XA
S32T-SVQCR/L16	△	△	40	32	30	300	22				

▲Stock available △Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For Al machining
Inserts shape	**SF**  A114	**XF**  A114	**LH**  A116
		NF  A114	**LC**  A116
		AHF  A114	

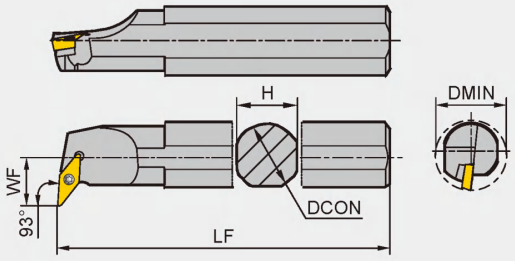
Tool holder type				
	□□-SVQCR/L11	VC□□1103□□	VC□□1103□□	VCGX1103□□
	□□-SVQCR/L16		VC□□1604□□	VCGX1604□□

Corresponding tool holders of insert VC□□ S-type clamping

SVUCR/L
KAPR:93°



R-type shown





Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	DMIN	DCON	H	LF	WF				
S16Q-SVUCR/L11	△	△	24	16	15	180	15	I60M2.5×6.5	WT07IP	---	---
S20R-SVUCR/L11	△	△	28	20	18	200	17			---	---
S25S-SVUCR/L16	△	△	33	25	23	250	19	I60M3.5×12	WT15IP	---	---
S32T-SVUCR/L16	△	△	40	32	30	300	22			---	---

▲Stock available △Make-to-order

Applicable inserts

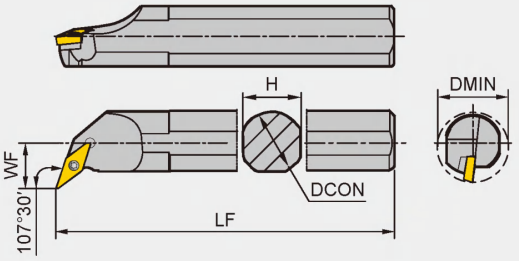
Application	For extra finishing	For finishing	For Al machining
Inserts shape	**SF**  A114	**XF**  A114	**LH**  A116
		NF  A114	**LC**  A116
		AHF  A114	
Tool holder type **□□-SVUCR/L11**	VC□□1103□□	VC□□1103□□	VCGX1103□□
□□-SVUCR/L16		VC□□1604□□	VCGX1604□□

Corresponding tool holders of insert VB□□ S-type clamping

SVQBR/L
KAPR:107°30'



R-type shown





Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	DMIN	DCON	H	LF	WF				
S20R-SVQBR/L16	△	△	27	20	18	200	14	I60M3.5×8	WT15IP	---	---
S25S-SVQBR/L16	△	△	35	25	23	250	20	I60M3.5×12	WT15IP WH35L	V16BS	SM5×8.65XA
S32T-SVQBR/L16	▲	▲	40	32	30	300	22				

▲Stock available △Make-to-order

Applicable inserts

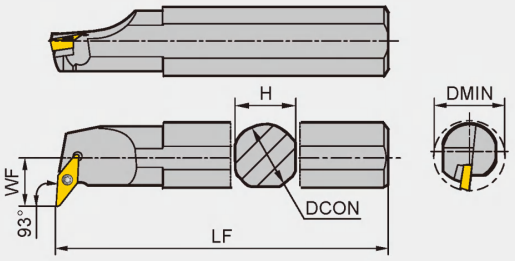
Application	For finishing	For semi-finishing	For roughing
Inserts shape	XF A117	XM A118	HR A119
	EF A117	HM A119	SNR A119
	NF A118	EM A118	
	NGF A118		
	AHF A118		
Tool holder type □□-SVQBR/L16	VB□□1604□□	VB□□1604□□	VB□□1604□□

Corresponding tool holders of insert VB□□ S-type clamping

SVUBR/L
KAPR:93°



R-type shown





Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	DMIN	DCON	H	LF	WF				
S25S- SVUBR/L16	△	△	33	25	23	250	18	I60M3.5×12	WT15IP	---	---
S32T-SVUBR/L16	△	△	40	32	30	300	22	I60M3.5×12	WT15IP WH35L	V16BS	SM5×8.65XA

※ Tool holder with cooling hole ▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing
Inserts shape	**XF**  A117	**XM**  A118	**HR**  A119
	EF  A117	**HM**  A119	**SNR**  A119
	NF  A118	**EM**  A118	
	NGF  A118		
	AHF  A118		
Tool holder type **□□-SVUBR/L16**	VB□□1604□□	VB□□1604□□	VB□□1604□□

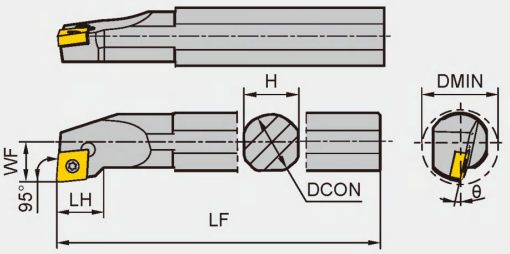
Corresponding tool holders of insert CP□□ S-type clamping

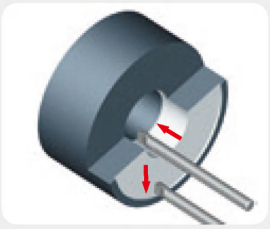
SCLPR/L

KAPR:95°



R-type shown





Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	DMIN	DCON	H	LF	WF	θ	LH			---	---
S10K-SCLPR/L06	▲	▲	12	10	9	125	6	-7°	17	I60M2.5×5.5	WT07IP	---	---
S12M-SCLPR/L06	▲	▲	16	12	11	150	8	-4°	20				
S16Q-SCLPR/L09	▲	▲	20	16	15	180	10	-4°	29	I60M3.5×8	WT15IP	---	---
S20R-SCLPR/L09	△	△	25	20	18	200	13	-4°	35				

▲Stock available △Make-to-order

Applicable inserts

Application		For extra finishing
Inserts shape		SF  A120
Tool holder type	□□-SCLPR/L06	CP□□0602□□
	□□-SCLPR/L09	CP□□09T3□□

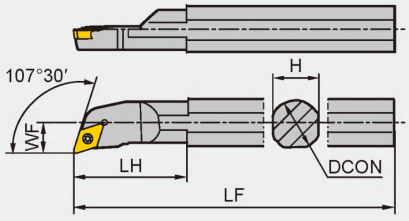
Corresponding tool holders of insert DP□□ S-type clamping

SDQPR/L

KAPR:107°30'



R-type shown





Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	DMIN	DCON	H	LF	WF	θ	LH			---	---
S10K-SDQPR/L07	△	△	13	10	9	125	7	-8°	20	I60M2.5×5.5	WT07IP	---	---
S12M-SDQPR/L07	▲	△	16	12	11	150	9	-8°	22				
S16Q-SDQPR/L07	▲	△	20	16	15	180	11	-6°	27	I60M2.5×6.5			
S16Q-SDQPR/L11	▲	△	20	16	15	180	11	-6°	32	I60M3.5×8	WT15IP	---	---
S20R-SDQPR/L11	△	△	25	20	18	200	13	-6°	33				

▲Stock available △Make-to-order

Applicable inserts

Application		For extra finishing
Inserts shape		SF  A120
Tool holder type	**□□-SDQPR/L07**	DP□□0702□□
	□□-SDQPR/L11	DP□□11T3□□



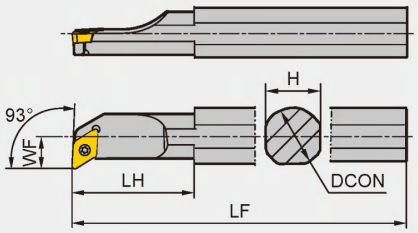
Corresponding tool holders of insert DP□□ S-type clamping

SDUPR/L

KAPR:93°



R-type shown







Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	DMIN	DCON	H	LF	WF	θ	LH			---	---
S10K-SDUPR/L07	▲	▲	15	10	9	125	9	-8°	18	I60M2.5×5.5	WT07IP	---	---
S12M-SDUPR/L07	▲	△	16	12	11	150	9	-8°	19				
S16Q-SDUPR/L07	△	△	20	16	15	180	11	-6°	25	I60M2.5×6.5			

▲Stock available △Make-to-order

Applicable inserts

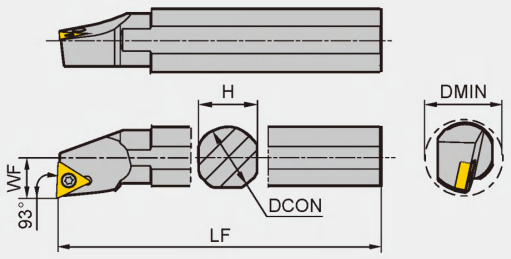
Application		For extra finishing
Inserts shape		**SF**  A120
Tool holder type	**□□-SDUPR/L07**	DP□□0702□□

Corresponding tool holders of insert TP□□ S-type clamping

STUPR/L
KAPR:93°



R-type shown



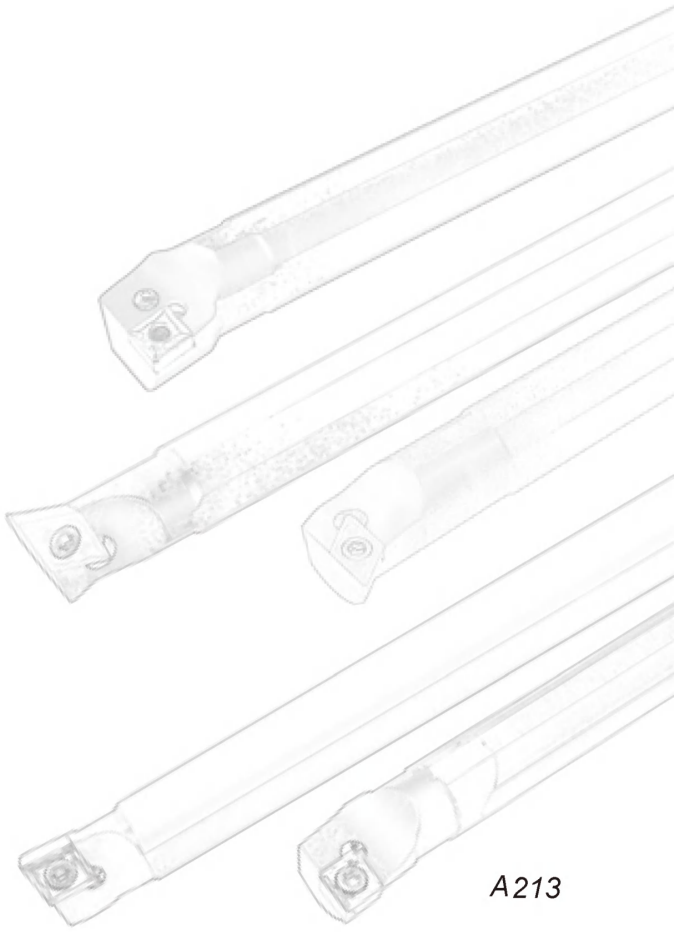


Type	Stock		Basic dimensions(mm)					Screw	Wrench	---	---
	R	L	DMIN	DCON	H	LF	WF			---	---
S10M-STUPR/L09	△	△	13	10	9.4	150	6	I60M2.2×5.5	WT07IP	---	---
S10M-STUPR/L11	△	△	13	10	9.4	150	6				
S12Q-STUPR/L11	△	△	16	12	11.4	180	7.5	I60M2.5×6.5	WT07IP	---	---
S16R-STUPR/L11	△	△	20	16	15	200	10				

▲Stock available △Make-to-order

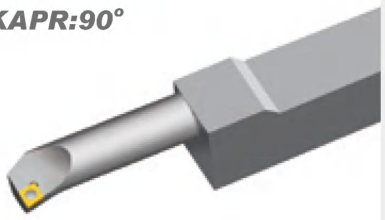
Applicable inserts

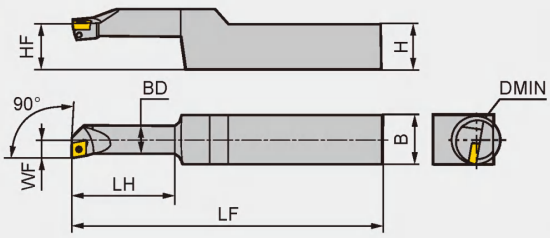
Application	For extra finishing
Inserts shape	**SF**  A122
Tool holder type **□□-STUPR/L09**	TP□□0902□□
Tool holder type **□□-STUPR/L11**	TP□□1103□□

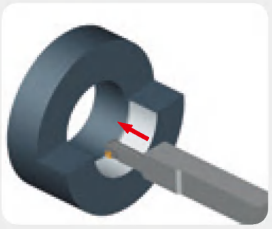


Corresponding tool holders of insert CC□□ S-type clamping

SCFCR/L
KAPR:90°







Type	Stock		Basic dimensions(mm)								Screw	Wrench	---	---
	R	L	DMIN	BD	LF	WF	H	HF	B	LH			---	---
S10M-SCFCR/L06S25	▲	▲	13	10	150	7	27	27	25	35	I60M2.5×5.5	WT07IP	---	---
S12P -SCFCR/L06S25	▲	▲	16	12	170	9	27	27	25	35	I60M2.5×6.5			
S16Q-SCFCR/L09S25	▲	▲	20	16	180	11	27	27	25	50	I60M3.5×8	WT15IP	---	---
S20R-SCFCR/L09S25	△	△	25	20	200	13	27	27	25	50				
S25R-SCFCR/L12S25	△	△	32	25	200	17	27	27	25	75	I60M5×13	WT20IP	---	---

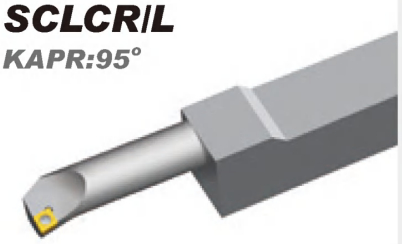
▲Stock available △Make-to-order

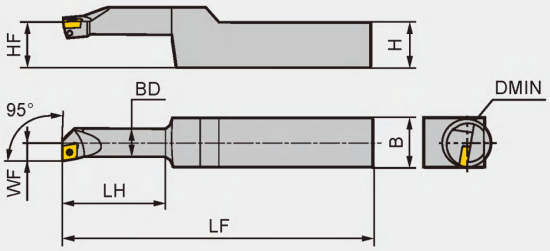
Applicable inserts

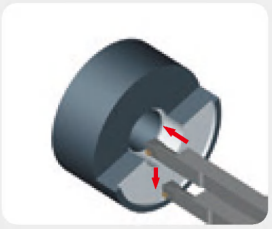
Application	For extra finishing	For finishing	For semi-finishing	For roughing	For cast iron machining	For Al machining
Inserts shape	SF  A95	XF  A95	XM  A96	HR  A98	TC  A98	LH  A99
		HF  A95	HM  A97			LC  A99
		EF  A96	EM  A97			
		AHF  A96	EG  A97			
Tool holder type □□-SCFCR/L06S25	CC□□0602□□	CC□□0602□□	CC□□0602□□	CC□□0602□□	CC□□0602□□	CCGX0602□□
□□-SCFCR/L09S25	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CCGX09T3□□
□□-SCFCR/L12S25		CC□□1204□□	CC□□1204□□	CC□□1204□□	CC□□1204□□	CCGX1204□□

Corresponding tool holders of insert CC□□ S-type clamping

SCLCR/L
KAPR:95°







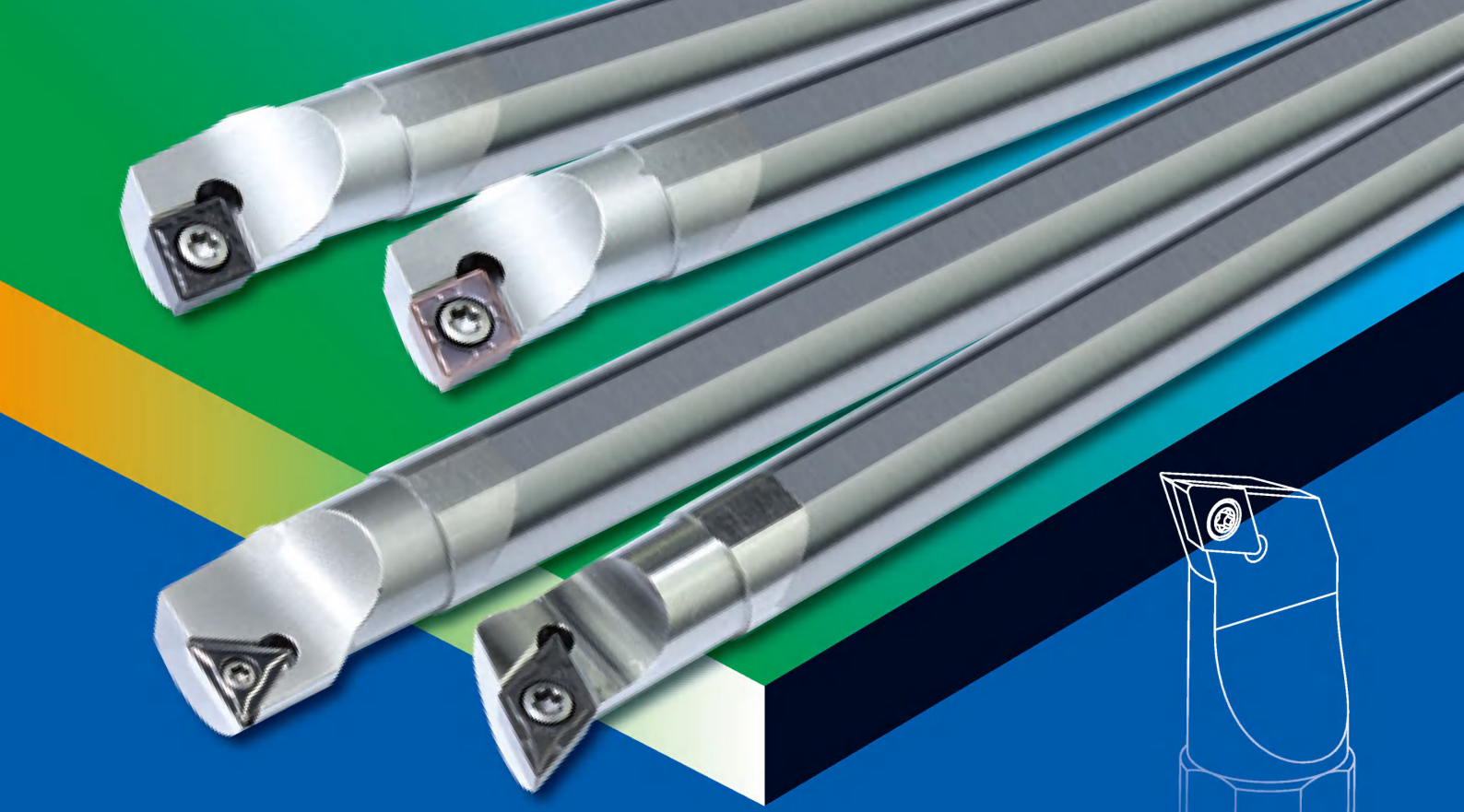
Type	Stock		Basic dimensions(mm)								Screw	Wrench	---	---
	R	L	DMIN	BD	LF	WF	H	HF	B	LH			---	---
S10M-SCLCR/L06S20	▲	▲	13	10	150	7	22	22	20	30	I60M2.5×5.5	WT07IP	---	---
S12P -SCLCR/L06S20	▲	▲	16	12	170	9	22	22	20	35				
S16Q-SCLCR/L09S20	▲	▲	20	16	180	11	22	22	20	40	I60M3.5×8	WT15IP	---	---
S20R-SCLCR/L09S20	△	△	25	20	200	13	22	22	20	45				

▲Stock available △Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For cast iron machining	For Al machining
Inserts shape	**SF**  A95	**XF**  A95	**XM**  A96	**HR**  A98	**TC**  A98	**LH**  A99
		HF  A95	**HM**  A97			**LC**  A99
		EF  A96	**EM**  A97			
		AHF  A96	**EG**  A97			

Tool holder type							
	□□-SCLCR/L06S20	CC□□0602□□	CC□□0602□□	CC□□0602□□	CC□□0602□□	CC□□0602□□	CCGX0602□□
	□□-SCLCR/L09S20	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CCGX09T3□□



Damping tool holders for internal turning

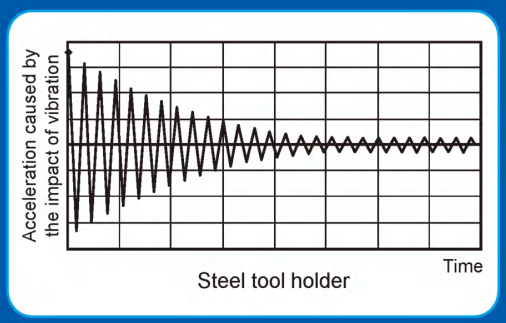
Technical features

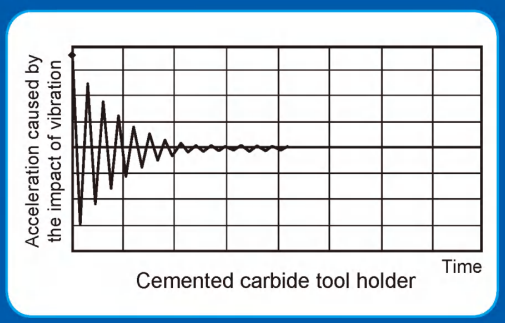
Increasing material rigidity of tool holder can reduce the amplitude, or obtain larger overhang under the condition of same systemic stability. Therefore, compared with steel tool holder, cemented carbide tool holder has better dampening effect, smaller amplitude and reaches convergence point sooner. As for machining under the condition of long overhang and easy vibration, they can exert excellent performance and achieve higher dimensional accuracy and surface quality.



Under the same machining condition

The maximum overhang of cemented carbide tool holder can reach L⩽6D, while the recommended maximum overhang of steel tool holder is L⩽3D.





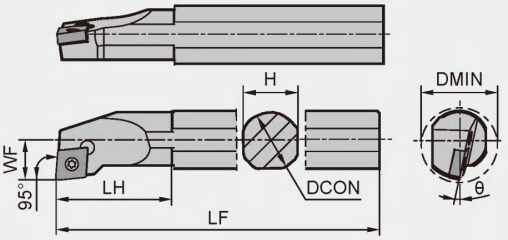
Corresponding tool holders of insert CP□□ (Damping tool holder) S-type clamping

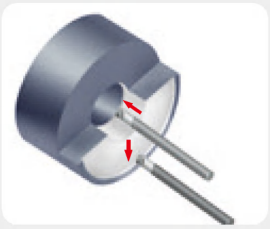
SCLPR/L

KAPR:95°



R-type shown





Type	Stock		Basic dimensions(mm)							Screw	Wrench	--	--
	R	L	DMIN	DCON	WF	LF	LH	H	θ			--	--
C10M-SCLPR/L06	▲	△	12	10	6	150	17	9	-7°	I60M2.5×5.5	WT07IP	--	--
C12Q-SCLPR/L06	△	△	16	12	8	180	20	11	-4°				
C16R-SCLPR/L09	▲	△	20	16	10	200	29	15	-4°	I60M3.5×8	WT15IP	--	--
C20S-SCLPR/L09	△	△	25	20	13	250	35	18	-4°				

▲Stock available △Make-to-order

Applicable inserts

Application	For extra finishing
Inserts shape	**SF**  A120
Tool holder type **□□-SCLPR/L06**	CP□□0602□□
Tool holder type **□□-SCLPR/L09**	CP□□09T3□□

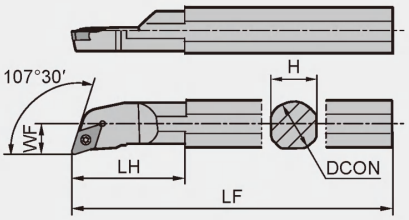
Corresponding tool holders of insert DP□□ (Damping tool holder) S-type clamping

SDQPR/L

KAPR:107°30'



R-type shown





Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	DMIN	DCON	WF	LF	LH	H	θ			---	---
C10M-SDQPR/L07	▲	△	13	10	7	150	20	9	-8°	I60M2.5×5.5	WT07IP	---	---
C12Q-SDQPR/L07	△	△	16	12	9	180	22	11	-8°				
C16R-SDQPR/L07	△	△	20	16	11	200	27	15	-6°	I60M2.5×6.5			
C16R-SDQPR/L11	△	△	20	16	11	200	32	15	-6°	I60M3.5×8	WT15IP	---	---
C20S-SDQPR/L11	▲	△	25	20	13	250	33	18	-6°				

▲Stock available △Make-to-order

Applicable inserts

Application		For extra finishing
Inserts shape		SF  A120
Tool holder type	□□-SDQPR/L07	DP□□0702□□
	□□-SDQPR/L11	DP□□11T3□□

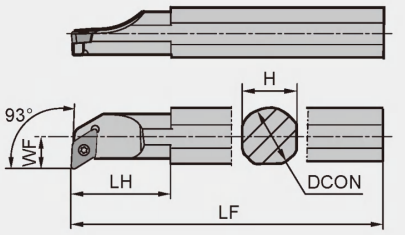
Corresponding tool holders of insert DP□□ (Damping tool holder) S-type clamping

SDUPR/L

KAPR:93°



R-type shown





Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	DMIN	DCON	WF	LF	LH	H	θ			---	---
C10M-SDUPR/L07	△	△	15	10	9	150	18	9	-8°	I60M2.5×5.5		---	---
C12Q-SDUPR/L07	△	△	16	12	9	180	19	11	-8°	I60M2.5×5.5	WT07IP	---	---
C16R-SDUPR/L07	△	△	20	16	11	200	25	15	-6°	I60M2.5×6.5		---	---

▲Stock available △Make-to-order

Applicable inserts

Application	For extra finishing
Inserts shape	SF  A120
Tool holder type □□-SDUPR/L07	DP□□0702□□

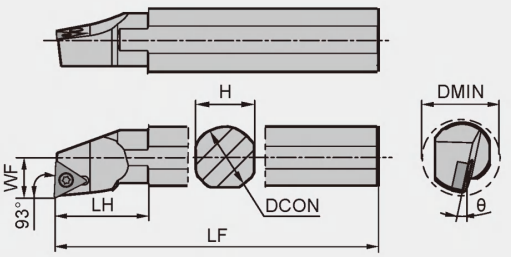
Corresponding tool holders of insert TP□□ (Damping tool holder) S-type clamping

STUPR/L

KAPR:93°



R-type shown





Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	DMIN	DCON	WF	LF	LH	H	θ			---	---
C10M-STUPR/L09	▲	△	12	10	6	150	20	9	-6°	I60M2.2×5.5	WT07IP	---	---
C12Q-STUPR/L09	▲	△	16	12	8	180	22	11	-4°				
C12Q-STUPR/L11	▲	△	16	12	8	180	25	11	-4°	I60M2.5×6.5	WT07IP	---	---
C16R-STUPR/L11	▲	△	20	16	10	200	27	15	-3°				

▲Stock available △Make-to-order

Applicable inserts

Application		For extra finishing
Inserts shape		SF  A122
Tool holder type	□□-STUPR/L09	TP□□0902□□
	□□-STUPR/L11	TP□□1103□□

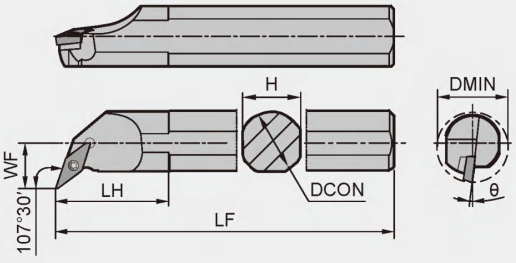


Corresponding tool holders of insert VC□□ (Damping tool holder) S-type clamping

SVQCR/L
KAPR:107°30'



R-type shown





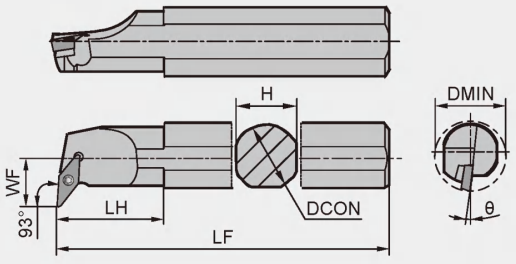
Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	DMIN	DCON	WF	LF	LH	H	θ			---	---
C16R-SVQCR/L11	△	△	22	16	13	200	28	15	-6°	I60M2.5×6.5	WT07IP	---	---
C20S-SVQCR/L11	△	△	26	20	15	250	32	18	-4°			---	---

▲Stock available △Make-to-order

SVUCR/L
KAPR:93°



R-type shown





Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	DMIN	DCON	WF	LF	LH	H	θ			---	---
C16R-SVUCR/L11	△	△	24	16	15	200	25	15	-6°	I60M2.5×6.5	WT07IP	---	---
C20S-SVUCR/L11	△	△	28	20	17	250	30	18	-4°			---	---

▲Stock available △Make-to-order

Applicable inserts

Application	For extra finishing	For Al machining
Inserts shape	SF  A114	LH  A116
		LC  A116
Tool holder type □□-SVQCR/L11	VC□□1103□□	VCGX1103□□
□□-SVUCR/L11	VC□□1103□□	VCGX1103□□

Table of recommended cutting parameters for general turning

ISO	Materials		Hardness HB	CVD Coating			PVD Coating			Cermet	Coated cermet
				YBC152	YBC252	YBC352	YBG102	YBG202	YBG302	YNG151	YNG151C
				Feed rate (mm/rev)							
				0.1-0.6	0.1-0.8	0.2-1.0	0.2-0.4	0.1-0.6	0.05-0.8	0.05-0.2	0.05-0.2
				Cutting speed (m/min)							
P	Carbon steel	C=0.15%	125	500-270	480-240	430-220	460-220	380-180	360-165	550-350	580-350
		C=0.35%	150	460-250	460-230	350-200	440-210	300-170	280-150	500-300	520-300
		C=0.60%	200	400-220	400-200	310-180	380-180	260-150	240-130	460-260	480-260
	Alloy steel	Anneal	180	400-180	400-200	250-150	380-180	200-120	180-100	410-240	430-240
		Hardened	275	280-150	260-140	200-120	240-120	140-90	120-70	300-180	320-180
		Hardened	300	260-150	240-120	180-110	220-100	125-80	100-60	250-170	270-170
		Hardened	350	230-120	220-120	160-100	200-100	110-75	90-55	230-150	250-150
	High alloy steel	Anneal	200	360-190	310-170	220-130	290-150	175-100	155-80	350-200	370-200
		Hardene	325	190-130	150-100	140-90	130-80	85-60	65-40	170-110	190-110
	Cast steel	Non-Alloy	180	280-160	250-140	190-130	230-125	135-95	115-75	260-170	280-170
		Low alloy	200	280-110	220-110	170-130	200-90	120-100	100-80	260-170	280-170
		High alloy	225	210-110	190-100	150-110	170-80	95-55	95-55	260-100	280-100

ISO	Materials		Hardness HB	CVD Coating			PVD Coating				Cermet	Coated cermet
				YBM153	YBM251	YBM253	YBM215	YBG202	YBG205	YBG302	YNG151	YNG151C
				Feed rate (mm/rev)								
				0.2-0.6	0.2-0.6	0.2-0.6	0.2-0.4	0.1-0.4	0.2-0.4	0.2-0.6	0.1-0.3	0.1-0.3
				Cutting speed (m/min)								
M	Stainless steel	Ferrite	180	280-180	250-140	260-140	290-190	300-190	290-190	250-150	330-220	350-210
		Austenite	260	250-150	200-110	210-110	240-160	250-160	240-160	220-120	250-150	270-140
		Martensite	330	200-140	210-130	220-130	250-170	260-170	250-170	210-120	270-170	290-160

Table of recommended cutting parameters for general turning

ISO	Materials		Hardness HB	CVD Coating			Cermet	Coated cermet	Nonmetallic ceramics
				YBD052	YBD102	YBD152	YNG151	YNG151C	CN3100
				Feed rate (mm/rev)					
				0.1-0.4	0.1-0.4	0.1-0.5	0.1-0.4	0.1-0.4	0.1-1.5
				Cutting speed (m/min)					
K	Malleable cast iron	Ferrolites	130	350-230	330-220	320-105	280-160	300-180	800-600
		Pearlyte	230	250-105	230-100	230-100	220-120	240-150	700-500
	Low grade cast iron		180	520-200	480-200	480-190	400-250	420-270	700-500
	High grade cast iron		260	230-120	220-115	210-100	360-240	380-260	800-600
	Ductile iron	Ferrolites	160	310-150	300-150	290-140	330-190	350-210	600-450
		Pearlyte	250	230-110	220-105	210-100	310-200	330-220	500-350

ISO	Materials		Hardness HB	PVD Coating					Cermet	CBN		PCD	Nonmetallic ceramics
				YBG102	YBG105	YBG202	YBS103	YBG212	YD101	YCB011	YCB012	YZB221	YCD011	CN3100
				Feed rate (mm/rev)										
				0.05-0.15	0.05-0.15	0.05-0.2	0.05-0.2	0.05-0.2	0.05-0.35	0.05-0.5	0.05-0.2	0.05-0.2	0.05-0.5	0.05-0.2
				Cutting speed (m/min)										
N	Aluminium alloy	Unheated	60						1750-800				<2500	
		Heat treatment	100						510-250				<2500	
	Cast aluminium alloy	Unheated	75						460-175				<2500	
		Heat treatment	90						300-110				<2500	
	Copper alloy	Lead alloy	110						610-205				630-65	
		Copper, red bronze	90						310-195				630-65	
		Copper, Lead-free copper, electrolytic copper	100						225-115				375-30	
S	Nickel-based alloy	Nickel-based alloy	40	90-30	90-40	90-30	90-20	90-30	70-20					150-260
H	Other material	Hard steel	45 HRC								350-225	350-225		
		Extra hard steel	50~60 HRC								250-135	250-135		
		Chilled cast iron	500							180-120				

Table of correctional cutting parameters of internal turning

Internal turning tools by P-type clamping

Workpiece material		Hardness HB	Machining category	L/D≤3		L/D=3-4 (Diameter of shank≥∅16mm)	
				Feed rate (mm/rev)	Cutting depth (mm)	Feed rate (mm/rev)	Cutting depth (mm)
P	Carbon steel, Alloy steel45#, 42CrMo	HB180—280	For semi-finishing	0.1-**0.25**-0.4	<5.0	0.1-**0.2**-0.3	<4.0
M	Carbon steel, Alloy steel 1Cr18Ni9Ti 0Cr18Ni9	≤HB220	For semi-finishing	0.1-**0.2**-0.3	<4.0	0.1-**0.15**-0.25	<3.0
K	Cast iron HT250	HB170—230	For semi-finishing	0.1-**0.25**-0.4	<5.0	0.1-**0.2**-0.3	<4.0

Internal turning tools by S-type clamping

Workpiece material		Hardness HB	Machining category	L/D≤3		L/D=4		L/D=5		L/D=6	
				Feed rate (mm/rev)	Cutting depth (mm)	Feed rate (mm/rev)	Cutting depth (mm)	Feed rate (mm/rev)	Cutting depth (mm)	Feed rate (mm/rev)	Cutting depth (mm)
P	Carbon steel, Alloy steel 45#, 42CrMo	HB180-280	For finishing	0.05-**0.1**-0.15	<0.2	0.05-**0.1**-0.15	<0.2				
			For semi-finishing	0.15-**0.25**-0.35	<3.0	0.1-**0.15**-0.2	<1.5				
M	Stainless steel 1Cr18Ni9Ti 0Cr18Ni9	≤HB220	For finishing	0.05-**0.1**-0.15	<0.2	0.05-**0.1**-0.15	<0.2				
			For semi-finishing	0.15-**0.2**-0.25	<2.0	0.1-**0.15**-0.2	<1.0				
N	Al alloy	---	For finishing	0.05-**0.1**-0.15	<0.2	0.05-**0.1**-0.15	<0.2	0.05-**0.1**-0.15	-0.15	0.05-**0.1**-0.15	<0.1
			For semi-finishing	0.05-**0.1**-0.15	<2.0	0.05-**0.1**-0.15	<1.5	0.05-**0.1**-0.15	-1.0	0.05-**0.1**-0.15	<1.0

Damping internal turning tools

Workpiece material		Machining conditions	Chipbreaker	Inserts material	Feed rate (mm/rev)	Cutting depth (mm)
P	Steel HB180-280	For finishing	SF	YNG151 YNG151C	0.05-**0.2**-0.35	0.05-**0.1-0.3**-0.5
M	Stainless steel ≤HB220				0.05-**0.2**-0.35	0.05-**0.1-0.3**-0.5
K	Cast iron HB170-230				0.05-**0.2**-0.35	0.05-**0.1-0.3**-0.5

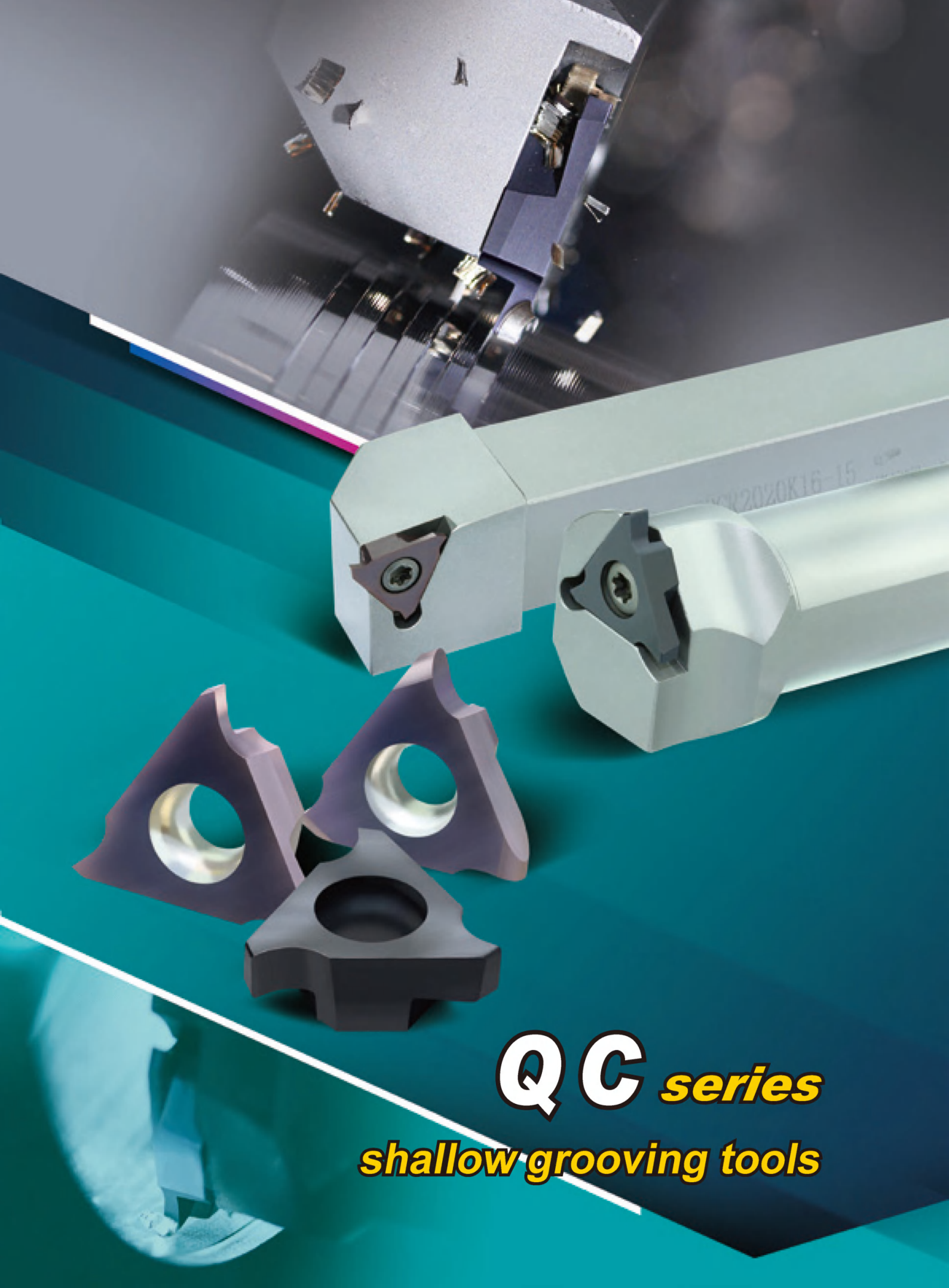
Blue words are recommended cutting parameters.

Frequent problems of turning and solutions

Common problem	Cause	Solutions	Tool material: Harder materials	Tool material: Tougher materials	Cutting conditions: Cutting speed	Cutting conditions: Feed rate	Cutting conditions: Cutting depth	Cutting conditions: Cutting liquid	Tool shape: Change chipbreaker of inserts	Tool shape: Rake angle	Tool shape: Nose radius	Tool shape: Approach angle	Tool shape: Cutting edge strength	Tool shape: Increase precision of inserts	Tool shape: Increase rigidity of tool holder	Machine clamping system: Clamping of tool holder and workpiece	Machine clamping system: Overhang of tool holder	Machine clamping system: Power, gap
Over abrasion on nose	Bad precision during machining	Abrasion intensified on flank	✓								↑							
		Unsuitable cutting conditions			↓	↑												
Surface precision deterioration	Bad surface quality	Abrasion intensified and cutting edge not sharp enough	✓		↓			✓		↑	↑		↓	✓				
		Cutting edge breakage		✓		↓	↓		✓		↑		↑			✓	✓	✓
		Unsuitable geometrical shape of cutting edge							✓		↑		↓	✓				
		Unsuitable cutting conditions			↑	↓	↓	✓										
		Vibration		✓	↑↓	↓	↓	✓	✓	↑	↓	↑	↓		✓	✓	✓	✓
		Built-up edge			↑	↑		✓	✓	↑			↓	✓				
Radiation	Effect of cutting heat	Unsuitable cutting conditions			↓	↓	↓											
		Unsuitable geometrical shape of cutting edge	✓						✓	↑			↓					
Bad precision of dimensions	Dimensions fluctuate during cutting	Insert tolerance												✓				
		Offset of workpiece or tools							✓	↑	↓	↑			✓	✓	✓	✓
Breakage	Abrasion on flank and rake face	Abrasion on clearance face	✓		↓				✓	↑	↑		↓					
		Abrasion on rake face	✓		↓	↓	↓		✓	↑		↓						
	Edge chipping	Vibration and impact		✓		↓	↓		✓			↓	↑		✓	✓	✓	✓
	Built-up edge	Unsuitable workpiece hardness for cutting conditions			↑	↑		✓	✓	↑			↓	✓				
	Thermal cracking	Hardness of workpiece material and tool material unsuitable for cutting conditions			↓	↓	↓	✓	✓	↑			↓					
	Cutting edge nose deformation	Occurring during intermittent machining with high feed rate	✓		↑	↓	↓	✓	✓	↑	↑	↓	↓					
	Tool life	Unsuitable materials and cutting conditions		✓		↓	↓		✓		↑	↓	↑		✓	✓	✓	✓
Chip controlling	Long, unbroken and snarled chips	Unsuitable cutting condition			↓	↑	↑	✓										
		Unsuitable geometry							✓		↓	↑						
	Too short and hard chips	Unsuitable cutting condition				↓	↓	✓										
		Unsuitable geometrical shape of cutting edge							✓		↑	↓						
Burr and knockdown flange	Steel and Al, burrs occurring	Unsuitable cutting condition			↑	↓		✓										
		Tool abrasion and unsuitable geometrical shape	✓						✓	↑	↓	↑	↓					
	Edge break out on cast iron	Unsuitable cutting conditions			↓	↑		✓										
		Tool abrasion and unsuitable geometrical shape	✓						✓	✓	↓	↓	↓					
	Heavy burr on soft steel	Unsuitable cutting condition				↓	↓											
		Tool abrasion and unsuitable geometrical shape	✓						✓	↑	↑		↑		✓	✓	✓	✓

Abrasion of tools and various damages

Tool damage type	Phenomenon	Cause	Solution
Flank wear	Cutting resistant force increasing Groove wear on flank	Tool material is too soft. Cutting speed is too high. Clearance angle is too small. Feed rate is too low.	◆Select tool materials with good wear resistance. ◆Reduce cutting speed. ◆Enlarge clearance angle. ◆Increase feed rate.
Rake face wear (Crater wear)	Bad chip controlling Surface quality deterioration	Tool material is too soft. Cutting speed is too hig. Feed rate is too high.	◆Select tool materials with good wear resistance. ◆Reduce cutting speed. ◆Reduce feed rate.
Cutting edge breakage	Occasional breakage Instability of tool life	Tool material is too hard. Feed rate is high. Cutting edge strength is not high enough. Rigidity of tool holder and tool bar is small.	◆Select tool materials with good toughness. ◆Reduce feed rate. ◆Increase land width (if rounding changes into chamfering). ◆Enlarge tool bar size.
Breakage	Cutting resistant force increasing Deterioration of surface roughness	Tool material is too hard. Feed rate is high. Cutting edge strength is not high enough. Rigidity of tool holder and tool bar is low.	◆Select tool materials with good toughness. ◆Reduce feed rate. ◆Increase land width (if rounding changes into chamfering). ◆Enlarge tool bar size.
Plastic deformation (Cutting edge collapse)	Workpiece dimensions change Nose abrasion	Tool material is too soft. Cutting speed is too high. Cutting depth and feed rate are too high. Cutting edge temperature is too high.	◆Select tool material with good wear resistance ◆Reduce cutting speed. ◆Reduce cutting depth and feed rate. ◆Select tool materials with good heat conductivity.
Built-up edge (Bonding)	Surface quality deterioration during finishing Cutting resistant force increasing	Cutting speed is low. Cutting edge is not sharp enough. Tool material is unsuitable.	◆Increase cutting speed. ◆Enlarge rake angle. ◆Select tool materials that are not easy to adhere together (coating, cermet, etc.)
Thermal cracking	Damage because of thermal circulation Normally occurring during intermittent machining	Premature edge failure due to thermal cracks. Tool material is too hard.	◆Adopt dry cutting. ◆Select tool materials with good toughness.
Chattering	burrs occurring Cutting resistant force increasing	Feed rate and cutting speed are too high.	◆Select tool materials with good wear resistance. ◆Sharpen cutting edge by enlarging rake angle. ◆Reduce cutting speed.
Flaking	Usually occurring when machining super hard materials, which is accompanied with vibration	Bonding occurs on cutting edge. Chip flow is obstructed.	◆Sharpen cutting edge by enlarging rake angle. ◆Enlarge chip pocket.



QC series

shallow grooving tools

How to select parting and grooving tools

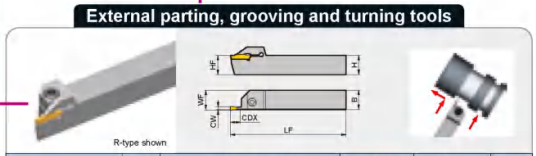
Structure of parting and grooving tools selection table

- Categorized as external machining, internal machining and profile machining.
- Concluded and separately listed according to product series (Little squirrel series and Supplementary series).

Dimensions

Application of external machining, internal machining and profile machining

External parting, grooving and turning tools

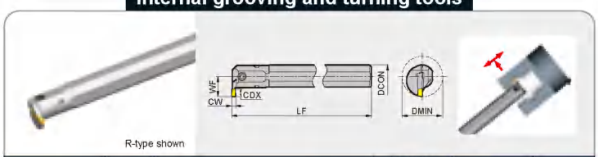


R-type shown

Type		Stock R	Stock L	Basic dimensions(mm) H×B	HF	LF	WF	CW	CDX min	Applicable inserts	Screw	Wrench
QEAD	1212R/L07	▲	▲	12×12	12	125	12.15	1.5	7	ZQAD015□□	GB70-85-M4×12	WH30L
	1212R/L12	▲	▲	12×12	12	125	12.15	1.5	12	ZQAD015□□		
	1616R/L07	▲	▲	16×16	16	125	16.15	1.5	7	ZQAD015□□	GB70-85-M5×16	WH40L
	1616R/L12	▲	▲	16×16	16	125	16.15	1.5	12	ZQAD015□□		
	2020R/L07	▲	▲	20×20	20	125	20.15	1.5	7	ZQAD015□□		
	2020R/L12	▲	▲	20×20	20	125	20.15	1.5	12	ZQAD015□□		
QEBD	1212R/L07	▲	▲	12×12	12	125	12.2	2	7	ZQBD02□□	GB70-85-M4×12	WH30L
	1212R/L10	▲	▲	12×12	12	125	12.2	2	10	ZQBD02□□		
	1212R/L14	▲	▲	12×12	12	125	12.2	2	14	ZQBD02□□		
	1616R/L07	▲	▲	16×16	16	125	16.2	2	7	ZQBD02□□	GB70-85-M5×16	WH40L
	1616R/L10	▲	▲	16×16	16	125	16.2	2	10	ZQBD02□□		
	1616R/L14	▲	▲	16×16	16	125	16.2	2	14	ZQBD02□□		
	2020R/L07	▲	▲	20×20	20	125	20.2	2	7	ZQBD02□□		
	2020R/L10	▲	▲	20×20	20	125	20.2	2	10	ZQBD02□□		
	2020R/L14	▲	▲	20×20	20	125	20.2	2	14	ZQBD02□□		
	2525R/L07	▲	▲	25×25	25	150	25.2	2	7	ZQBD02□□	GB70-85-M6×20	WH50L
	2525R/L10	▲	▲	25×25	25	150	25.2	2	10	ZQBD02□□		
	2525R/L14	▲	▲	25×25	25	150	25.2	2	14	ZQBD02□□		
QEED	1616R/L10	▲	▲	16×16	16	125	16.25	2.5	10	ZQED025□□	GB70-85-M5×20	WH40L
	1616R/L17	▲	▲	16×16	16	125	16.25	2.5	17	ZQED025□□		
	2020R/L10	▲	▲	20×20	20	125	20.25	2.5	10	ZQED025□□	GB70-85-M6×20	WH50L
	2020R/L17	▲	▲	20×20	20	125	20.25	2.5	17	ZQED025□□		
	2525R/L10	▲	▲	25×25	25	150	25.25	2.5	10	ZQED025□□		
	2525R/L17	▲	▲	25×25	25	150	25.25	2.5	17	ZQED025□□		
QEFD	1616R/L10	▲	▲	16×16	16	125	16.3	3	10	ZQFD03□□	GB70-85-M5×20	WH40L
	1616R/L17	▲	▲	16×16	16	125	16.3	3	17	ZQFD03□□		
	2020R/L10	▲	▲	20×20	20	125	20.3	3	10	ZQFD03□□	GB70-85-M6×20	WH50L
	2020R/L17	▲	▲	20×20	20	125	20.3	3	17	ZQFD03□□		
	2525R/L10	▲	▲	25×25	25	150	25.3	3	10	ZQFD03□□		
	2525R/L17	▲	▲	25×25	25	150	25.3	3	17	ZQFD03□□		
QEGD	2020R/L13	▲	▲	20×20	20	140	20.5	4	13	ZQGD04□□	GB70-85-M6×20	WH50L
	2020R/L22	▲	▲	20×20	20	140	20.5	4	22	ZQGD04□□		
	2525R/L13	▲	▲	25×25	25	150	25.5	4	13	ZQGD04□□		

▲Stock available △Make-to-order

Internal grooving and turning tools

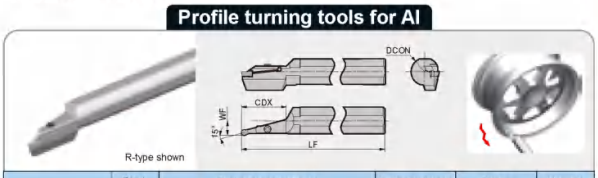


R-type shown

Type	Stock R	Stock L	Basic dimensions(mm) DCON	LF	WF	CW	CDX max	DMIN	Applicable inserts	Screw	Wrench
C20Q-QEDR/L05-27	▲	▲	20	180	15.2	2.5	5	27	ZTED025□□ ZRED025□□	GB70-85-M4×12	WH30L
C25R-QEDR/L07-33	▲	▲	25	200	20.3	2.5	7	33		GB70-85-M5×16	WH40L
C32S-QEDR/L09-42	▲	▲	32	250	25.3	2.5	9	42		GB70-85-M5×20	
C20Q-QFDR/L05-27	▲	▲	20	180	15.2	3	5	27	ZTFD03□□ ZRFD03□□	GB70-85-M4×12	WH30L
C25R-QFDR/L07-33	▲	▲	25	200	20.3	3	7	33		GB70-85-M5×16	WH40L
C32S-QFDR/L09-42	▲	▲	32	250	25.3	3	9	42		GB70-85-M5×20	
C25R-QGDR/L08-35	▲	▲	25	200	21.5	4	8	35	ZTGD04□□ ZRGD04□□	GB70-85-M5×16	WH40L
C32S-QGDR/L11-44	▲	▲	32	250	27.5	4	11	44		GB70-85-M6×20	WH50L
C40T-QGDR/L13-54	▲	▲	40	300	33.5	4	13	54		GB70-85-M6×20	
C25R-QHDR/L08-35	▲	▲	25	200	21.5	5	8	35	ZTHD05□□ ZRHD05□□	GB70-85-M5×16	WH40L
C32S-QHDR/L11-44	▲	▲	32	250	27.5	5	11	44		GB70-85-M6×20	WH50L
C40T-QHDR/L13-54	▲	▲	40	300	33.5	5	13	54		GB70-85-M6×20	
C25R-QKDR/L08-35	▲	▲	25	200	21.5	6	8	35	ZTKD06□□ ZRKD06□□	GB70-85-M5×16	WH40L
C32S-QKDR/L11-44	▲	▲	32	250	27.5	6	11	44		GB70-85-M6×20	WH50L
C40T-QKDR/L13-54	▲	▲	40	300	33.5	6	13	54		GB70-85-M6×20	

▲Stock available △Make-to-order

Profile turning tools for Al



R-type shown

Type	Stock R	Stock L	Basic dimensions(mm) DMIN (Minimum machining diameter)	DCON	WF	LF	CDX	Applicable inserts	Screw	Wrench
C40X-QLDR/L65-15A	▲	▲	160	40	21	320	65	ZRLD08-LH	GB70-85-M6×20	WH50L
C40X-QLDR/L80-15A	▲	△	160	40	21	320	80	ZRLD08-LH		
C40X-QKDR/L60-15A	△	△	160	40	20	320	60	ZRKD08-LH		
C40X-QKDR/L75-15A	△	△	160	40	20	320	75	ZRKD06-LH		

▲Stock available △Make-to-order

Specification of products
Including type, basic dimensions, applicable inserts and accessories.

Indicating the minimum machining diameter
The minimum machining diameter is very important for internal machining.



TURNING A

Parting and grooving tools

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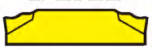
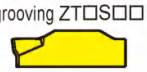
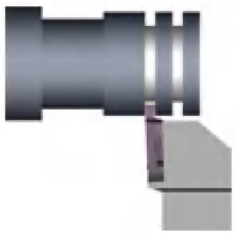
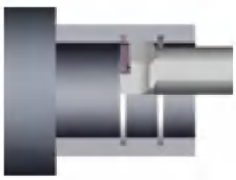
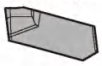
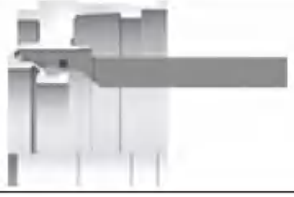
Parting and grooving tools overview

Machining application	Machining type		Applicable tools	Corresponding inserts	Tool features and parameters
External machining	Parting		Little squirrel series QZ□□+QE□□  A259	Parting inserts ZP□S□□ 	• Assemble structure of parting blade and holder; good rigidity; adjustable parting range. • The maximum parting diameter is 120mm.
			Little squirrel series QE□□R/L  A256-A257	ZP□D□□  ZP□S□ 	• Inserts have three-dimensional chipbreaker with low cutting force and good performance on chip-breaking. • The maximum parting diameter is 60mm.
			Supplementary series QZQ□□R/L  A282	ZQMX□□ 	• Cutting edge strength is suitable for bad machining conditions. • The maximum parting diameter is 70mm.
			G-series GED□□R/L  A269	Parting inserts G□MD□□□□-GM 	• The special design of compression screw hole structure is adopted to realize high clamping force; the screw itself can form self-locking to ensure more reliable compression force. • High clamping stability to ensure the safety and stability of grooving and transverse turning. • Applicable for a variety of grooving and profiling inserts.
	Grooving and turning		Little squirrel series QE□□R/L  A256-A257	Double cutting edges for parting ZT□D□□  Profile turning ZR□D□□  Single cutting edge for deep grooving ZT□S□□ 	• A single tool with multiple applications such as grooving, parting and profile turning, reducing tools categories needed. • A multifunctional tool when used with grooving inserts. Suitable for profile machining. • The maximum slot depth machinable is 30mm.
			G-series GED□□R/L  A269	Parting inserts G□MD□□□□-GM 	• Reinforced grooving tools. • The special design of compression screw hole structure is adopted to realize high clamping force; the screw itself can form self-locking to ensure more reliable compression force. • High clamping stability to ensure the safety and stability of grooving and transverse turning. • Applicable for a variety of grooving and profiling inserts.

Machining application	Machining type		Applicable tools	Corresponding inserts	Tool features and parameters
External machining	Precise grooving		Little squirrel series QECD  A257	Precise grooving ZT□D□□-EG  Edge width1.2~2.4mm	• Grinded insert used for precise grooving. • Edge width can be anything between 1.0-6.5mm, customized according to users' needs. • ZT□□D□□-EG inserts: When edge width is between 1.2-2.4mm, the maximum cutting depth is 2.5mm. When edge width is above 2.4-6.5mm, the maximum cutting depth is 22mm.
			Little squirrel series QE□□R/L  A256-A257	Precise grooving ZT□D□□-EG  Edge width2.4~6.5mm	
	Shallow grooving		QC series GQCR/L  A280	QC16/22□□□□ 	• Fine grinding of blades with high precision. • Sharp edges and high machining accuracy. • Three finely ground cutting edges for good economy. • For cutting shallow grooves, groove width 0.5-4.8mm. • Maximum depth of cut 4mm.
Internal machining	Grooving and turning		Little squirrel series C□□-Q□□R/L□  A268	Grooving, Turning ZT□D□□  Profile turning ZR□D□□ 	• By using inserts for grooving and profiling, one tool can be versatile, reducing the tool categories needed. • The maximum slot depth machinable is 13mm. • The minimum machining diameter is 27mm.
			G-series GID□□R/L  A278	Grooving inserts G□MD□□□□-GM 	• The minimum machining diameter is 20mm. • Maximum depth of cut 11mm. • Applicable for a variety of grooving and profiling inserts.
	Shallow grooving		QC series S□□□-QC□□R/L□  A280	QC11/16/22□□□□ 	• Fine grinding of blades with high precision. • Machining groove width 0.5-4.8mm. • Minimum machining diameter 16mm. • Maximum depth of cut 4mm.

Parting and grooving tools overview

Machining application	Machining type		Applicable tools	Corresponding inserts	Tool features and parameters
End surface machining	Grooving and turning		G-series GFD□□R/L  A274-A275	Grooving inserts G□MD□□□□-GM 	• Achieve end face machining with a diameter of 28mm. • The insert positioning structure is scientifically designed, and the first cutting range is reasonably planned to ensure that the tool body has high strength. • High-strength cutter body rounded face for more precise tool selection. • Grooving diameter range 28-600mm. • Applicable for a variety of grooving and profiling inserts.
			Little squirrel series QF□□□□H  A262-A265	Grooving, Turning ZT□D□□ Profile turning ZR□D□□ 	• By using inserts for grooving and profiling, one tool can be versatile, reducing the tool categories needed. • Grooving diameter is 48-400mm. • Grooving depth is 10-30mm.
			Little squirrel series QF□□□□L  A266-A267	Grooving, Turning ZT□D□□  Profile turning ZR□D□□ 	• 90°holder, top clamping. • By using inserts for grooving and profiling, one tool can be versatile, reducing the tool categories needed. • Grooving diameter is 48~400mm. • Grooving depth is 10~30mm.
Recess machining	Recess machining		Little squirrel series QX□□D□□□  A258	Grooving, Turning ZT□D□□  Profile turning ZR□D□□ 	• The unique tool for recess machining. • Complete range of specifications, able to achieve various recess machining.
Al profiling	Inner wall and surface machining		Little squirrel series C40X□□  A268	Little squirrel series ZR□□-LH 	• The unique tool for profiling of Al material. • Cutting edge is designed to combine sharpness and strength, suitable for continuous and intermittent turning. • Used for external, surface and inner wall machining of Al wheel hub.
Tools for aviation and aerospace industries	External machining		Little squirrel series QE□S□□N  A258	Little squirrel series ZIGQ□□  Little squirrel series ZIMF□□ 	• V-type locating, top clamping, precise locating, safe clamping. • Normal square-ended inserts and precise square-ended inserts are suitable for adhesive. materials hard to machine such as Ni-base high-temperature alloy, Ti alloy and stainless steel, etc.
	Non-standard Tools		Non-standard tools to match workpiece	Select and manufacture as required	• Tailor made solutions for machining various parts to satisfy your requirements.

G-series
high-efficiency parting & grooving inserts

High precision inserts:

Edge width 2-4mm, the tolerance of edge width reach ±0.03mm;
Edge width 5-6mm, the tolerance of edge width reach ± 0.04mm;
High consistency of inserts, realizing high-precisionmachining.

Better clamping stability:

- The new inserts clamping design achieves higher clamping force and better processing;
- Anti-vibration design, excellent surface finish.



Strengthen the pressing position of the toolholder to ensure the clamping force of the inserts

Reinforced structure design of cutter body position



Wider processing range:



The minimum cutting diameter of the end face can reach ϕ 28mm

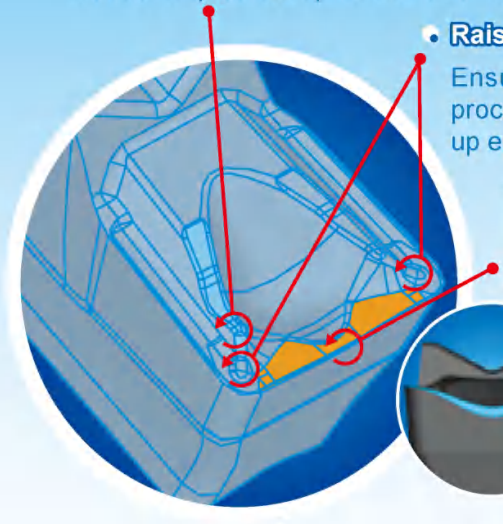


The minimum processing diameter of the inner hole can reach ϕ20mm

*GIMD / GRMD type inserts can't be installed on little squirrel series parting and grooving holders.

Good chip treatment -GM chipbreaker

- **Bevel design:**
  Control chip curled upward and removal.
- **Raised top:**
  Ensure the chips curled and broken during processing and inhibit the generation of built-up edge.





- **The variable rake angle design of the rake face ensures the sharpness and strength of the insert edge.**

- **Curved cutting edge structure design, self-centering processing, can meet various processing conditions such as low and high feed, continuous and intermittent etc., strong versatility.**

G-series



Supercrystalline Nano Coating

YB9120

Add tough alloy elements to TiAlN coating to obtain high toughness TiAlN-based ceramic coating;
Achieve synergistic improvement of coating wear resistance, toughness and high-temperature service performance, grooving and parting PVD coating grades, can meet the processing requirements of P, M, K materials such as parting, grooving, profiling, etc., to achieve long life and safety efficient processing.



YBC103

A new generation of CVD-coated grades, comprehensively improved the performance of insert edge strength, wear resistance and high temperature oxidation resistance, suitable for efficient processing of various steel materials.

Application case

●Chip curled stably:

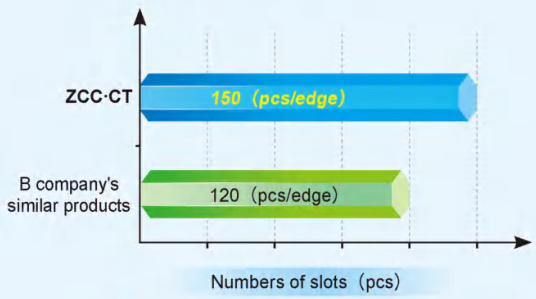
Machined material: Stainless steel/45#
Cutting parameters: Vc = 150m/min, f = 0.15mm/r
Inserts: GTMD304-GM/YB9120



Under the same working conditions, our company's GTMD series grooving inserts have better chip breaking performance, which can reduce the downtime for chip removal.

●Excellent performance on machining:

Machined material: Cast iron
Cutting parameters: Vc=180m/min, f=0.15mm/r
Inserts: GTMD304-GM/YBC103



Under the same working conditions, our companys GIMD series inserts have better wear resistance, tool life is longer.

Little squirrel series

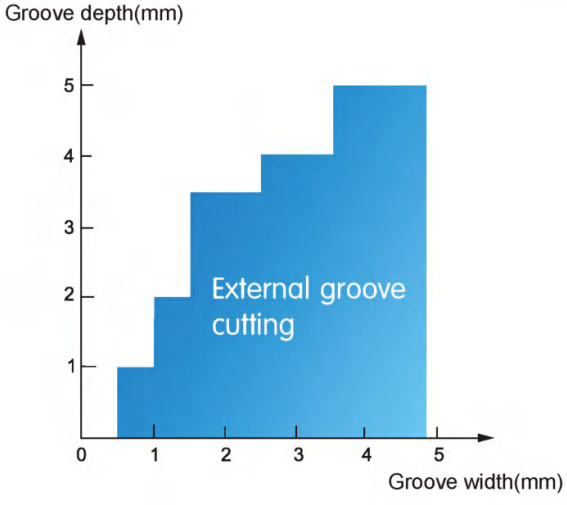


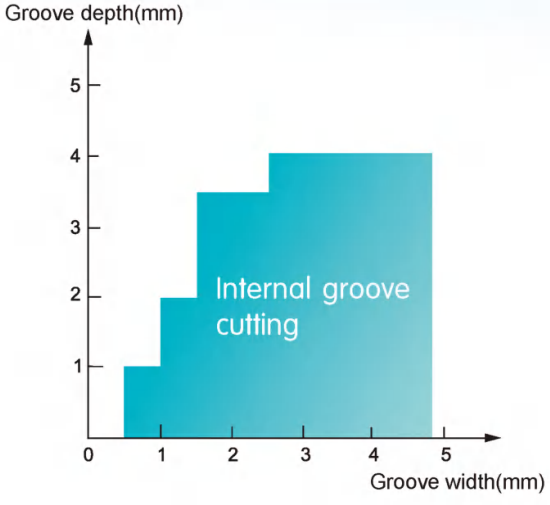
QC series shallow grooving tools

Machine industry shallow groove processing tool

Widely used for shallow groove machining of shaft and ring parts in machinery industry

Shallow groove series tool grooving range





Little-Squirrel Series

Profile turning inserts for parting of aviation titanium alloy, super alloy

-NF

Single-headed precision profile turning inserts

Sharp edge, small cutting force, good surface quality;
Indexing accuracy reaches ±0.025mm, safe and stable clamping;
Mainly applied in finishing of super alloy, titanium alloy.



-NM

Precision profile turning inserts

Sharp edge, small cutting force, good surface quality;
Indexing accuracy reaches ±0.025mm;
Highly economical, two edges available;
Compatible with little squirrel tool holder, suitable for small depth profile finishing and semi-finishing of super alloy and titanium alloy.





-SM

Single-headed groove turning inserts

Straight edge, excellent surface quality;
Sharp edge, smaller cutting force;
Good chip breaking;
Mainly used for rough machining of super alloy and titanium alloy.



-MM

Straight edge groove turning inserts

High edge strength, sharp edge;
Highly economical, two edges available, compatible with little squirrel tool holder;
With special grades, suitable for roughing with small cutting depths of super alloy and titanium alloy.



Case

Insert: YBG105/ZIMF604N-SM
Hardness of workpiece material: GH4169(HB380)
Cutting data: Vc=45m/min, f=0.2mm/r
Coolant: Water



Products of company A



YBG105/ZIMF604N-SM

Conclusion: Under the same conditions, chip breaking performance is better and the stop time to remove long winding chips is reduced.

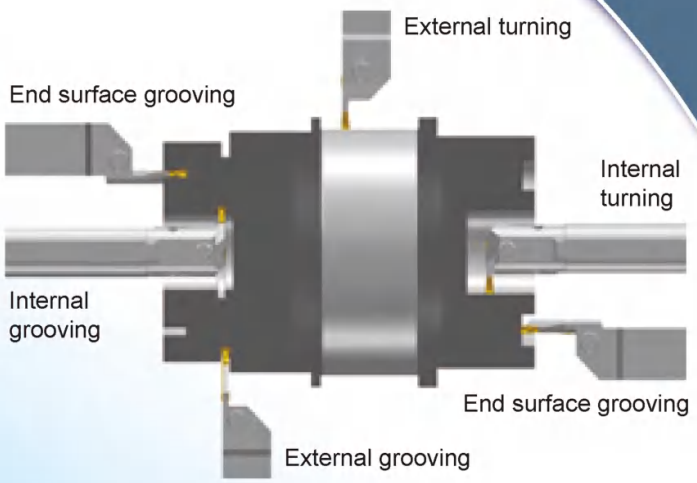
-MG Chipbreaker

Customized -MG chipbreaker series

Suitable for parting ,grooving, profile turning and turning, etc. Easy machining and unobstructed chip flow lead to improved surface quality.

Human-centered design realizes various application of one single insert, reducing number of tools needed

The insert with same edge width can fit on corresponding tool holders to satisfy the requirements of external, internal and end face grooving or turning by using minimum numbers of inserts and tool holders, effectively reducing cost of tool storage and management.





The cutting force is reduced by 20%, and the vibration is diminished.

Unique and professional structure design of parting inserts

- A special flank structure is designed to reduce cutting resistant force by 20% and diminish vibration, which improves the surface quality.
- A special edge design requires less rigidity of machine. It can be used on low power machines.



Little squirrel series

-EG

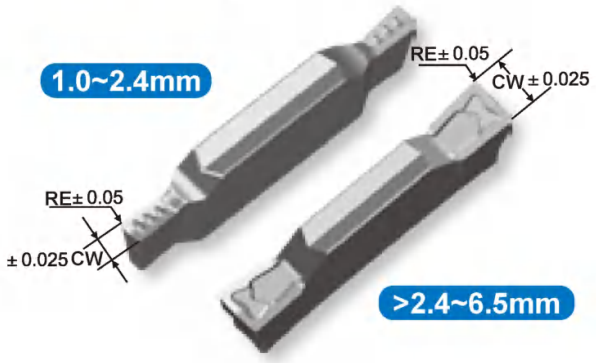
Precision grooving and profile turning inserts

Special chipbreaker design, suitable for precise grooving of low-carbon steel, stainless steel, adhesive materials and non-ferrous metal.

The tolerance of the edge width CW of precise grooving and profiling inserts can reach ±0.025. Inserts can also be mounted on the corresponding specifications of original tool series.

-EG Precision grooving inserts

The edge width can be anything between 1.0-6.5mm according to your requirements.



The width of the Little Squirrel series precise grooving inserts can be anything between 1.0mm to 6.5mm, which means products with any edge width or nose radius can be provided according to customers' requirements. The inserts are mainly used for precise grooving, such as sealing slot and locating slot, etc.

-EG Precision profile turning inserts



The Little Squirrel series precise profiling and turning inserts are mainly used for precise grooving and profiling.



-LC/-LH



Profile turning inserts for Al

The special chipbreaker for aluminum profiling is designed to combine sharpness and strength of the cutting edge, effectively reducing the friction between chips and the rake face. The inserts are suitable for continuous and intermittent profiling of Al alloy.

Suitable for various machining of Al wheel boss periphery, surface and inner wall, etc.

Little squirrel series parting, grooving and profiling inserts code key

Insert applications

ZP ➤ Parting **ZT** ➤ Grooving and turning
ZR ➤ Profiling

Code of locating slot

Code of locating slot	A	B	E	F	G	H	K	L
Corresponding edge width of inserts	1.5	2.0	2.5	3.0	4.0	5.0	6.0	8.0

Code of cutting edge number

S ➤ Single cutting edge **D** ➤ Double cutting edge

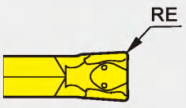
ZP G D 04 04 - M G

Cutting edge width



015=1.5mm
02=2.0mm
025=2.5mm
03=3.0mm
04=4.0mm
05=5.0mm
06=6.0mm
08=8.0mm

Nose radius



02=0.2mm
03=0.3mm
04=0.4mm
08=0.8mm

Tolerance class

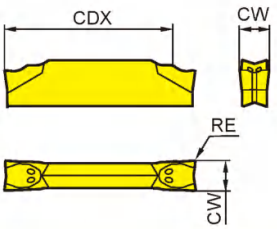
M ➤ M-level tolerance
E ➤ E-level tolerance

Chipbreaker code

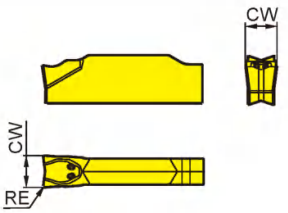
G ➤ Curve edges universal chipbreaker, suitable for machining various materials
M ➤ linear edges universal chipbreaker, suitable for machining various materials
F ➤ Special chipbreaker

Parting inserts


Double edges




Single edge

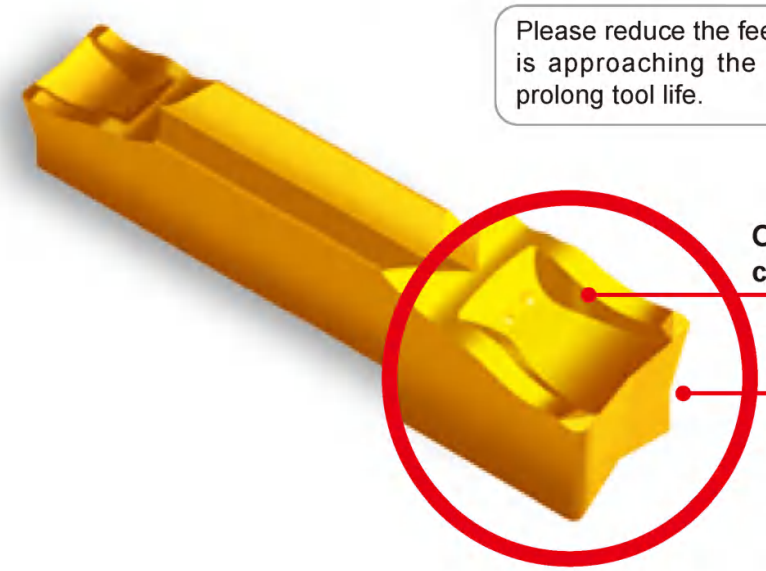


Type		Basic dimensions(mm)			Grade				
					CVD Coating		PVD Coating		Cemented carbide
		$CW^{+0.1}_{0}$	$RE_{\pm 0.1}$	Cutting depth CDX_{max}	YBC151	YBC251	YBG202	YBG302	YD101
Double edges	**ZPAD01502-MG**	1.5	0.2	12		○	★	○	
	ZPBD0202-MG	2.0	0.2	14		○	★	○	
	ZPED02502-MG	2.5	0.2	17		○	★	★	
	ZPFD0302-MG	3.0	0.2	17		○	★	○	
	ZPGD0402-MG	4.0	0.2	22		○	★	○	
	ZPHD0503-MG	5.0	0.3	22		○	★	○	
	ZPKD0604-MG	6.0	0.4	22		○	★	○	
Single edge	**ZPES02502-MG**	2.5	0.2			○	★	★	
	ZPFS0302-MG	3.0	0.2			○	★	○	
	ZPGS0402-MG	4.0	0.2			○	★	○	
	ZPHS0503-MG	5.0	0.3			○	★	○	
	ZPKS0604-MG	6.0	0.4			○	★	○	

Single edge tool for cutter plate only

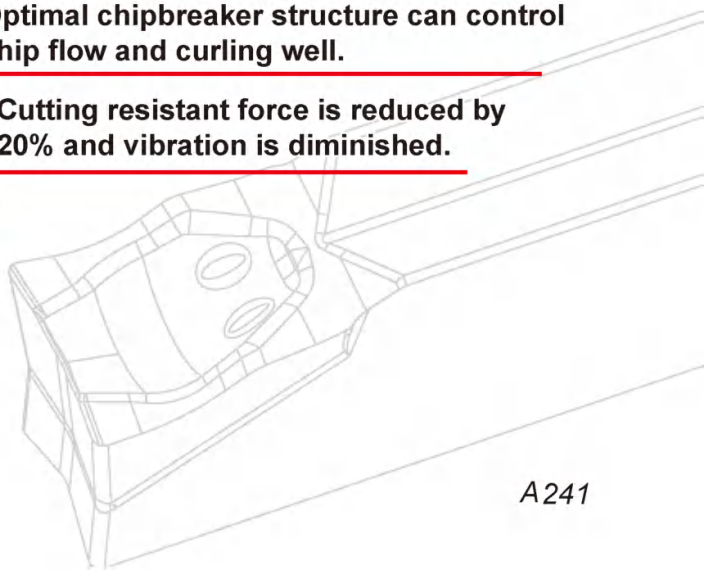
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Please reduce the feed speed by 30% when the insert is approaching the centre of workpiece. This can prolong tool life.



Optimal chipbreaker structure can control chip flow and curling well.

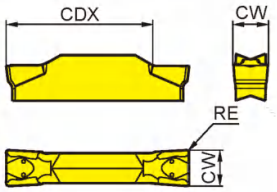
Cutting resistant force is reduced by 20% and vibration is diminished.



Grooving and turning inserts

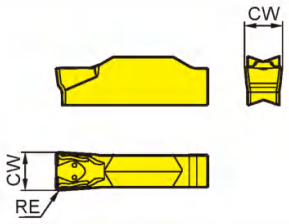


Double edges





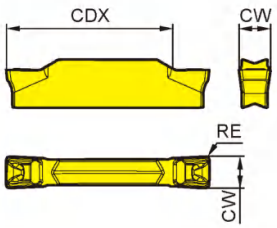
Single edge



Type		Basic dimensions(mm)			Grade					
					CVD Coating		PVD Coating			Cemented carbide
		$CW^{+0.1}_{0}$	$RE_{\pm 0.1}$	Cutting depth CDX_{max}	YBC151	YBC251	YBG202	YBG205	YBG302	YD101
Double edges	ZTED02503-MG	2.5	0.3	17	○	○	●	★	★	
	ZTFD0303-MG	3.0	0.3	17	○	○	●	★	★	
	ZTGD0404-MG	4.0	0.4	22	●	○	●	★	★	
	ZTHD0504-MG	5.0	0.4	22		○	●	★	★	
	ZTKD0608-MG	6.0	0.8	22		○	●	★	★	
Single edge	ZTHS0504-MG	5.0	0.4			○	○	★	○	
	ZTKS0608-MG	6.0	0.8			○	○	★	○	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order





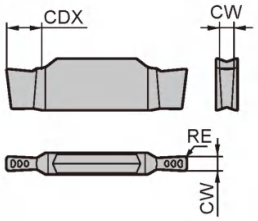
Type		Basic dimensions(mm)			Grade					
					CVD Coating		PVD Coating			Cemented carbide
		CW	$RE_{\pm 0.1}$	Cutting depth CDX_{max}	YBC151	YBC251	YBG202	YBG205	YBG302	YD101
Double edges	ZTAD01502-MM	1.5±0.03	0.2	12	○	○	●	★	○	
	ZTBD02002-MM	2.0±0.03	0.2	14	○	○	●	★	○	
	ZTED02503-MM	2.5±0.03	0.3	17	○	○	●	★	○	
	ZTFD0303-MM	3.0±0.03	0.3	17	○	○	●	★	○	
	ZTGD0404-MM	4.0±0.04	0.4	22	○	○	●	★	○	
	ZTHD0504-MM	5.0±0.04	0.4	22	○	○	●	★	○	
	ZTKD0608-MM	6.0±0.04	0.8	22	○	○	●	★	○	
	ZTLD0808-MM	8.0±0.05	0.8	28	○	○	●	★	○	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Precise grooving and turning inserts

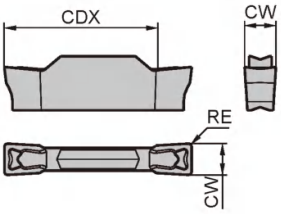


1.0~2.4mm series





>2.4~6.5mm series



Type		Type			Grade					
					CVD Coating		PVD Coating			Cemented carbide
		$CW_{\pm 0.025}$	$RE^{(2)}_{\pm 0.05}$	Cutting depth CDX_{max}	YBC151	YBC251	YBG202	YBG205	YBG302	YD101
Double edges	**ZTCD□□□□□□$^{(1)}$-EG**	1.0~1.6	See note. (2)	2.6	○	○	○	★	○	
		1.6~2.4		3.4						
	ZTED□□□□□□-EG	2.4~3.0		17	○	○	○	★	○	
	ZTFD□□□□□□-EG	3.0~3.8		17	○	○	○	★	○	
	ZTGD□□□□□□-EG	3.8~4.8		22	○	○	○	★	○	
	ZTHD□□□□□□-EG	4.8~5.8		22	○	○	○	★	○	
	ZTKD□□□□□□-EG	5.8~6.5		22	○	○	○	★	○	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

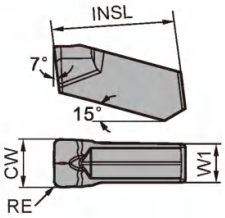
Note: (1) □ The code here in the description is determined by edge width and nose radius requested by customers. For example, when the customer requires an edge width of 3.5mm and a nose radius of 0.3mm, the description of the insert would be ZTFD03503-EG.

(2) The nose radius range is 0.2≤R≤0.5 on request.



Single-head grooving and turning inserts for semi-finishing and roughing difficult-to-machine materials



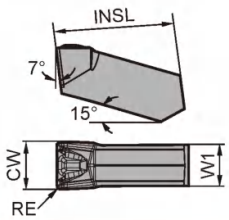


Type	Basic dimensions(mm)				Grade				
					PVD Coating				Cemented carbide
	CW±0.05	RE±0.1	W1	INSL	YBG102	YBG202	YBG205	YBS103	YD101
ZIMF304N-NM	3	0.4	2.4	15.3	★	○	★	●	○
ZIMF406N-NM	4	0.6	3.2	15.3	★	○	★	●	○
ZIMF506N-NM	5	0.6	4.0	15.3	★	○	★	○	○
ZIMF608N-NM	6	0.8	4.0	15.3	★	○	★	○	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Single-head grooving and turning inserts for semi-finishing and roughing difficult-to-machine materials



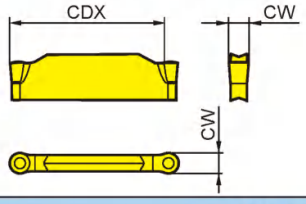


Type	Basic dimensions(mm)				Grade				
					PVD Coating				Cemented carbide
	CW±0.05	RE±0.1	W1	INSL	YBG105	YBG212	YBG205	YBS103	YD101
ZIMF304N-SM	3	0.4	2.4	15.3	★	★		●	○
ZIMF404N-SM	4	0.4	3.2	15.3	★	★		○	○
ZIMF504N-SM	5	0.4	4.0	15.3	★	★		○	○
ZIMF604N-SM	6	0.4	5.1	15.3	★	★		○	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Profiling inserts



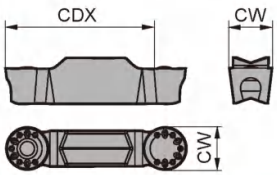


Type		Basic dimensions(mm)		Grade					
				CVD Coating		PVD Coating			Cemented carbide
		$CW^{+0.1}_{0}$	Cutting depth CDX_{max}	YBC151	YBC251	YBG202	YBG205	YBG302	YD101
Double edges	**ZRED025-MG**	2.5	17.5		○	●	★	★	
	ZRFD03-MG	3.0	17		○	●	★	★	
	ZRGD04-MG	4.0	21		○	●	★	★	
	ZRHD05-MG	5.0	20		○	○	★	★	
	ZRKD06-MG	6.0	19		○	●	★	★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Profiling inserts



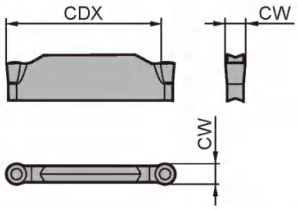


Type		Basic dimensions(mm)		Grade						
				CVD Coating		PVD Coating				Cemented carbide
		$CW^{\pm 0.25}_{0}$	Cutting depth CDX_{max}	YBC151	YBC251	YBG105	YBG212	YBG302	YBS103	YD101
Double edges	**ZRFD03-NM**	3	17			★	★		●	
	ZRGD04-NM	4	21			★	★		●	
	ZRHD05-NM	5	20			★	★		○	
	ZRKD06-NM	6	19			★	★		○	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Precision profiling inserts



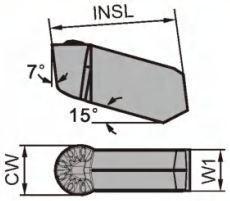


Type		Basic dimensions(mm)		Grade				
				CVD Coating		PVD Coating		Cemented carbide
		$CW^{\pm 0.025}$	Cutting depth CDX_{max}	YBC151	YBC251	YBG202	YBG302	YD101
Double edges	**ZRFD03- EG**	3.0	17		○		○	
	ZRGD04- EG	4.0	21		○		○	
	ZRHD05-EG	5.0	20		○		○	
	ZRKD06-EG	6.0	19		○		○	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Single-head inserts for profiling difficult-to-machine materials



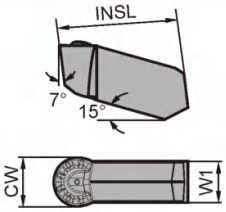


Type	Basic dimensions(mm)			Grade			
				PVD Coating			Cemented carbide
	CW±0.025	W1	INSL	YBG102	YBG202	YBS103	YD101
ZIGQ3N-NM	3	2.4	15.3	★	○	●	○
ZIGQ4N-NM	4	3.2	15.3	★	○	●	○
ZIGQ5N-NM	5	4.0	15.3	★	○	○	○
ZIGQ6N-NM	6	5.0	15.3	★	○	○	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Single-head inserts for profiling difficult-to-machine materials



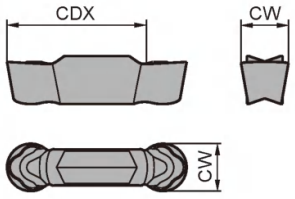


Type	Basic dimensions(mm)			Grade			
				PVD Coating			Cemented carbide
	CW±0.025	W1	INSL	YBG105	YBG212	YBS103	YD101
ZIGQ3N-NF	3	2.4	15.3	★	★	●	
ZIGQ4N-NF	4	3.2	15.3	★	★	○	
ZIGQ5N-NF	5	4.0	15.3	★	★	○	
ZIGQ6N-NF	6	5.0	15.3	★	★	○	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Profiling inserts for Al



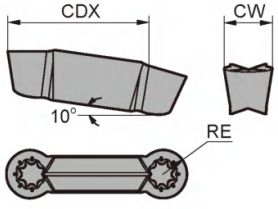


Type	Basic dimensions(mm)		Grade
			Cemented carbide
	CW±0.02	Cutting depth CDXmax	YD101
ZRKD06-LH	6.0	19	★
ZRLD08-LH	8.0	22	★

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Profiling inserts for Al



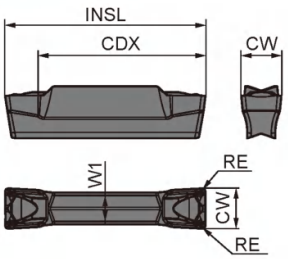


Type	Basic dimensions(mm)			Grade
				Cemented carbide
	CW±0.02	RE	Cutting depth CDXmax	YD101
ZILD08-LC	8.0	4.0	22	●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

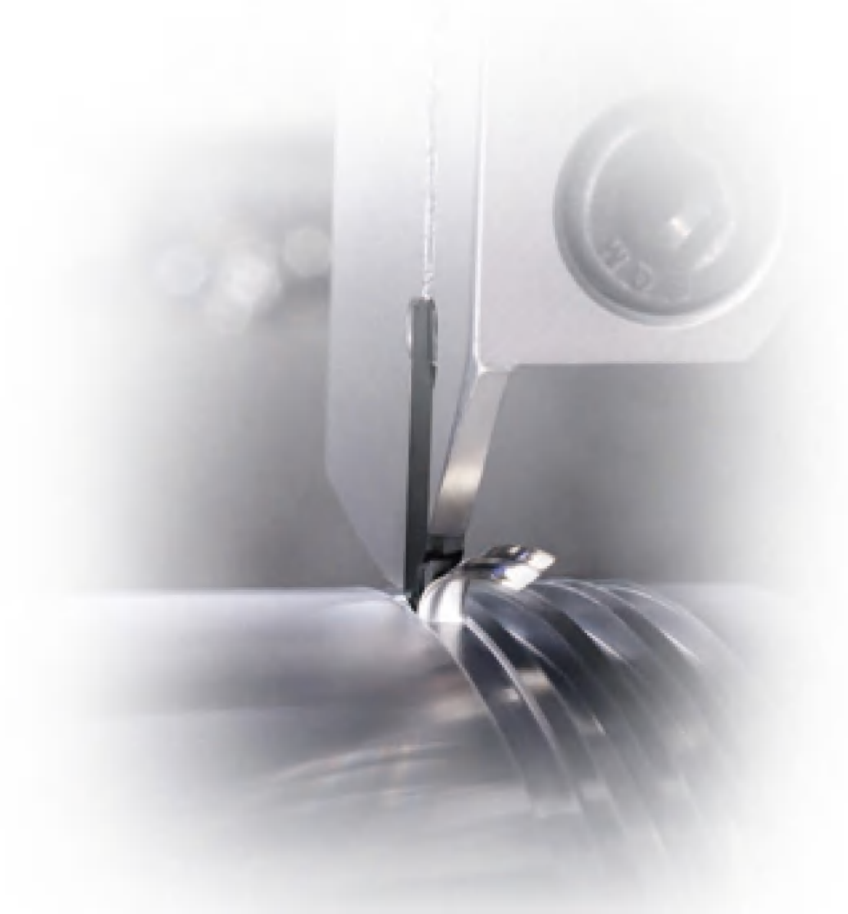
Grooving and turning inserts





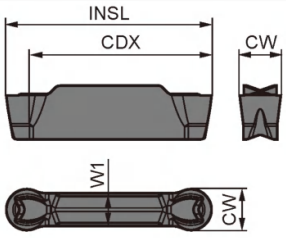
Type	Basic dimensions(mm)					Grade	
						CVD Coating	PVD Coating
	CW	W1	INSL	CDX	RE	YBC103	YB9120
GTMD2502-GM	2.5	2	17	14	0.2	●	●
GTMD302-GM	3.0	2.3	17	14	0.2	●	●
GTMD304-GM	3.0	2.3	17	14	0.4	●	●
GTMD402-GM	4.0	3.2	20	17	0.2	●	●
GTMD404-GM	4.0	3.2	20	17	0.4	●	●
GTMD504-GM	5.0	4.2	20	17	0.4	●	●
GTMD508-GM	5.0	4.2	20	17	0.8	●	●
GTMD604-GM	6.0	5.2	20	17	0.4	●	●
GTMD608-GM	6.0	5.2	20	17	0.8	●	●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



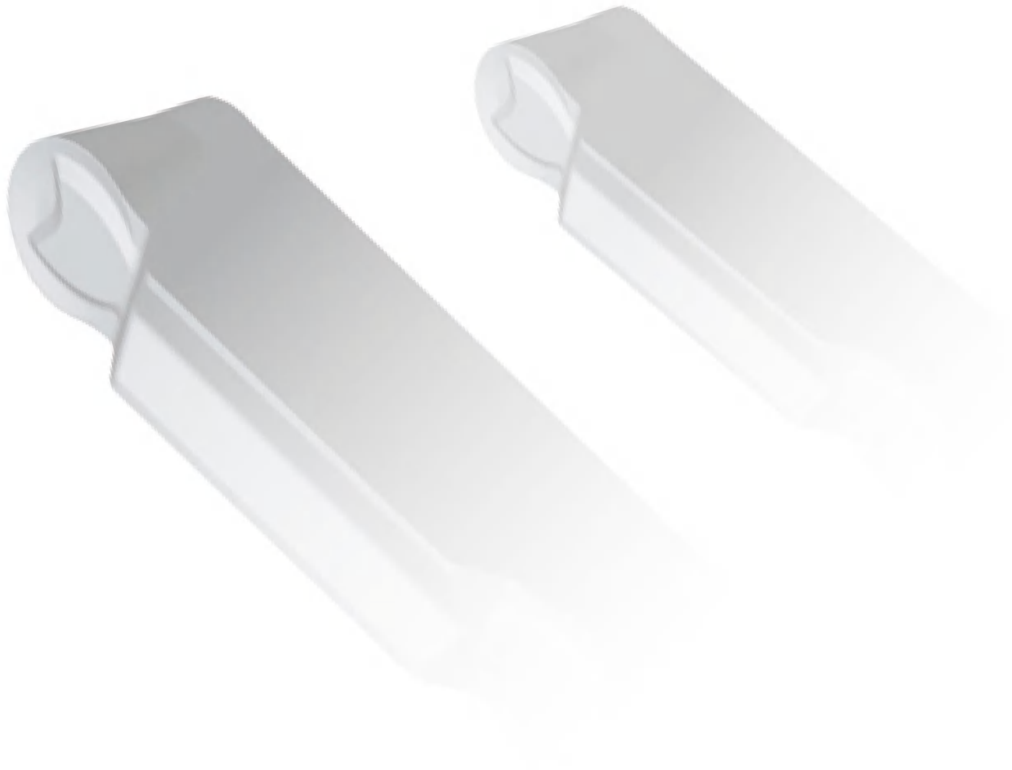
Profiling inserts





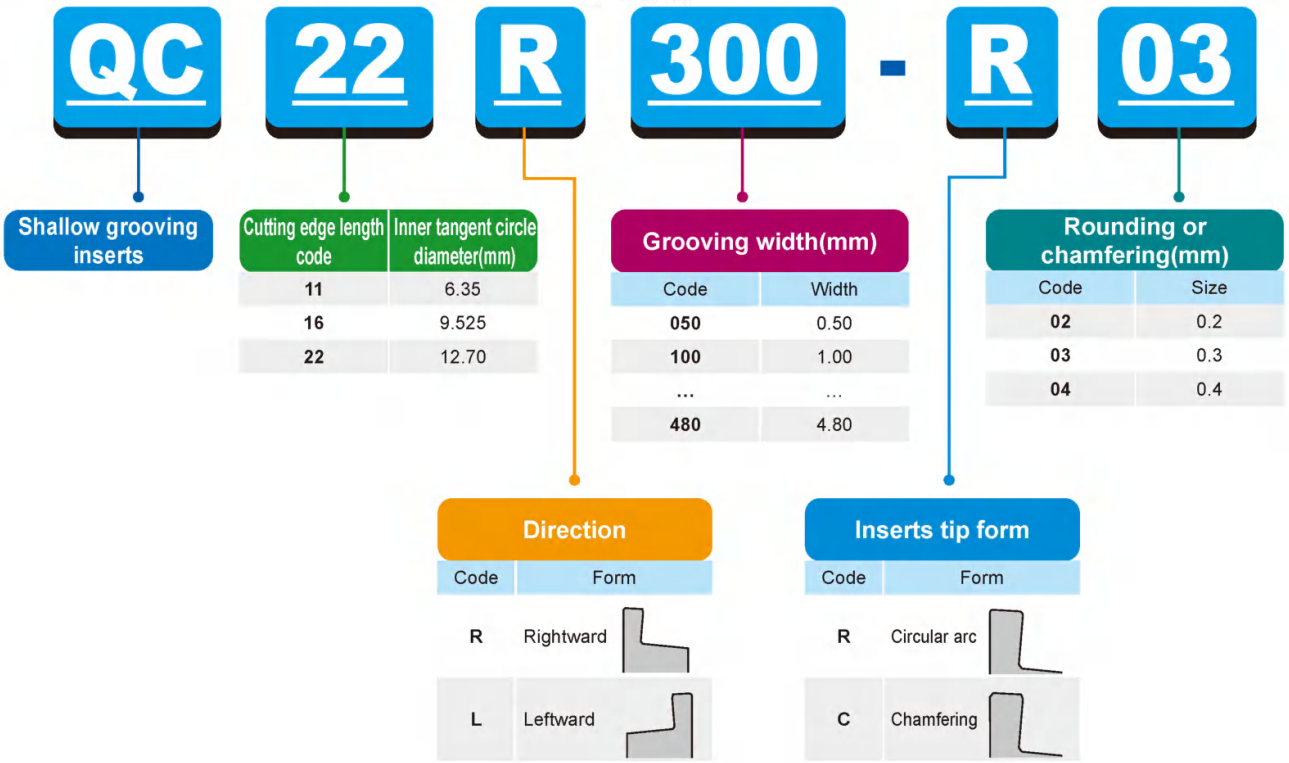
Type	Basic dimensions(mm)					Grade	
						CVD Coating	PVD Coating
	CW	W1	INSL	CDX	RE	YBC103	YB9120
GRMD315-GM	3.0	2.3	17	14	1.5	●	●
GRMD420-GM	4.0	3.2	20	17	2.0	●	●
GRMD525-GM	5.0	4.2	20	17	2.5	●	●
GRMD630-GM	6.0	5.2	20	17	3.0	●	●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



QC series shallow grooving inserts code key

● Square head shallow grooving inserts



Shallow grooving inserts

Cutting edge length code	Inner tangent circle diameter(mm)
11	6.35
16	9.525
22	12.70

Grooving width(mm)	
Code	Width
050	0.50
100	1.00
...	...
480	4.80

Rounding or chamfering(mm)	
Code	Size
02	0.2
03	0.3
04	0.4

Direction

Code	Form
R	Rightward
L	Leftward

Inserts tip form

Code	Form
R	Circular arc
C	Chamfering

● Round head shallow grooving inserts



Shallow grooving inserts

Cutting edge length code	Inner tangent circle diameter(mm)
11	6.35
16	9.525
22	12.70

Direction

R	Rightward
L	Leftward

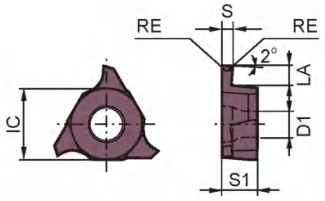
Grooving width(mm)	
Code	Width
050	0.50
100	1.00
...	...
480	4.80

Head form: round head

Square head shallow grooving inserts



R-type shown



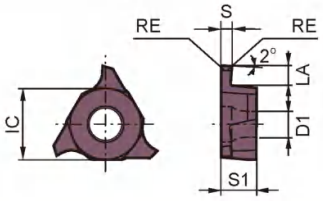
Type		Basic dimensions(mm)						Grade	
								PVD Coating	
		$S_{\pm 0.025}$	LA	RE	IC	S1	D1	YBG202	YBG205
QC11R/L	120-R02	1.20	1.50	0.2	6.35	3.18	2.8	○	○
	125-R02	1.25	1.50	0.2	6.35	3.18	2.8	○	○
	145-R02	1.45	1.50	0.2	6.35	3.18	2.8	○	○
	150-R02	1.50	1.50	0.2	6.35	3.18	2.8	○	○
	200-R02	2.00	2.00	0.2	6.35	3.18	2.8	○	○
	225-R02	2.25	2.00	0.2	6.35	3.18	2.8	○	○
QC16R/L	110-R01	1.10	2.00	0.1	9.525	3.18	4.4	○	○
	125-R02	1.25	2.00	0.2	9.525	3.18	4.4	○	○
	145-R02	1.45	2.00	0.2	9.525	3.18	4.4	○	○
	150-R02	1.50	2.00	0.2	9.525	3.18	4.4	○	★
	175-R02	1.75	2.00	0.2	9.525	3.18	4.4	○	○
	185-R02	1.85	2.50	0.2	9.525	3.18	4.4	○	○
	200-R02	2.00	2.50	0.2	9.525	3.18	4.4	○	★
	250-R02	2.50	2.50	0.2	9.525	3.18	4.4	○	★
	300-R02	3.00	3.00	0.2	9.525	3.18	4.4	○	★
QC22R/L	125-R02	1.25	2.00	0.2	12.70	4.76	5.5	○	○
	145-R02	1.45	2.00	0.2	12.70	4.76	5.5	○	○
	150-R02	1.50	3.50	0.2	12.70	4.76	5.5	○	★
	175-R02	1.75	3.50	0.2	12.70	4.76	5.5	○	○
	185-R02	1.85	3.50	0.2	12.70	4.76	5.5	○	○
	200-R02	2.00	3.50	0.2	12.70	4.76	5.5	○	★
	230-R02	2.30	3.50	0.2	12.70	4.76	5.5	○	○
	250-R03	2.50	4.00	0.3	12.70	4.76	5.5	○	★
	265-R03	2.65	4.00	0.3	12.70	4.76	5.5	○	○
	280-R03	2.80	4.00	0.3	12.70	4.76	5.5	○	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Square head shallow grooving inserts



R-type shown

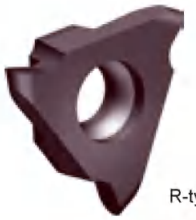


Type		Basic dimensions(mm)						Grade	
								PVD Coating	
		S±0.025	LA	RE	IC	S1	D1	YBG202	YBG205
QC22R/L	300-R03	3.00	4.00	0.3	12.70	4.76	5.5	○	★
	320-R03	3.20	4.00	0.3	12.70	4.76	5.5	○	○
	330-R03	3.30	4.00	0.3	12.70	4.76	5.5	○	○
	350-R03	3.50	5.00	0.3	12.70	4.76	5.5	○	★
	400-R04	4.00	5.00	0.4	12.70	4.76	5.5	○	★
	430-R04	4.30	5.00	0.4	12.70	4.76	5.5	○	○
	450-R04	4.50	5.00	0.4	12.70	4.76	5.5	○	○
	480-R04	4.80	5.00	0.4	12.70	5.06	5.5	○	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Example of special specification customization:
1. Custom-made insert width of 1.6mm, the tip form of the arc form, arc radius of 0.3mm right blade, IC value of 12.7mm, then the custom-made insert model is QC22R160-R03.
2. Customized edge width range: QC11: 0.50~3.0mm; QC16: 0.50~3.0mm; QC22: 1.0~4.8mm.

Round head shallow grooving inserts



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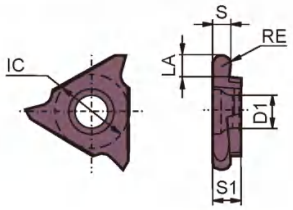


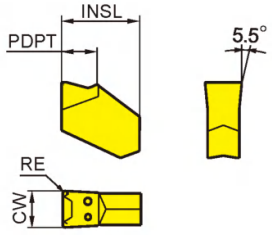
Type		Basic dimensions(mm)						Grade	
								PVD Coating	
		S±0.025	LA	RE	IC	S1	D1	YBG202	YBG205
QC16R/L	200R	2.00	2.50	1.00	12.70	3.18	4.4	○	○
	300R	3.00	2.50	1.50	12.70	3.18	4.4	○	○
QC22R/L	100R	1.00	2.00	0.50	12.70	4.76	5.5	○	○
	150R	1.50	3.50	0.75	12.70	4.76	5.5	○	○
	200R	2.00	3.50	1.00	12.70	4.76	5.5	○	○
	250R	2.50	4.00	1.25	12.70	4.76	5.5	○	○
	300R	3.00	4.00	1.50	12.70	4.76	5.5	○	○
	400R	4.00	5.00	2.00	12.70	4.76	5.5	○	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Example of special specification customization:
Custom-made inserts width of 1.6mm, the tip form of the arc form, the arc radius of 0.8mm right insert, then the custom-made insert model is QC22R160R.

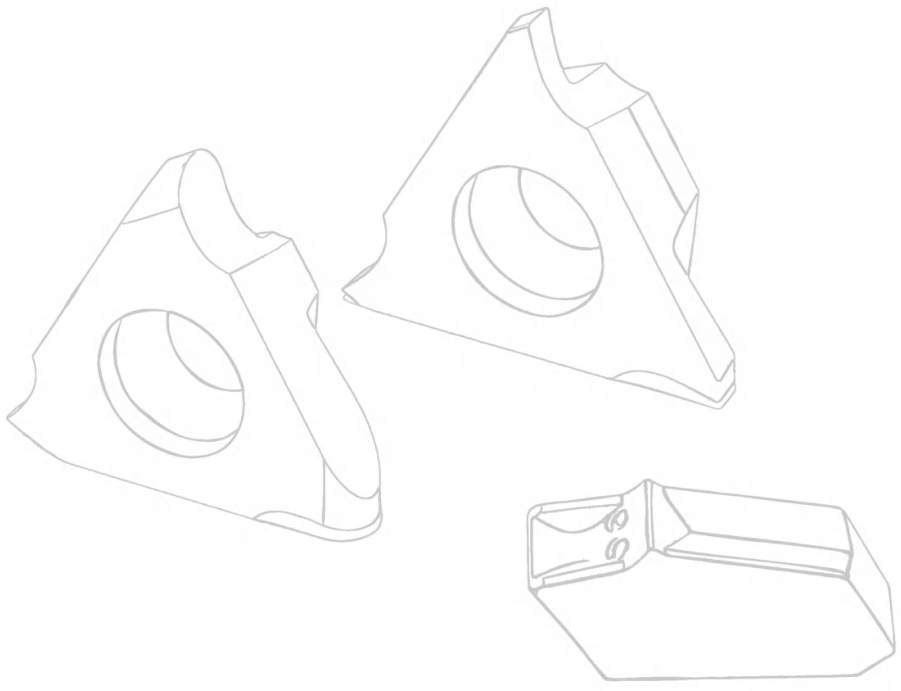
ZQMX series





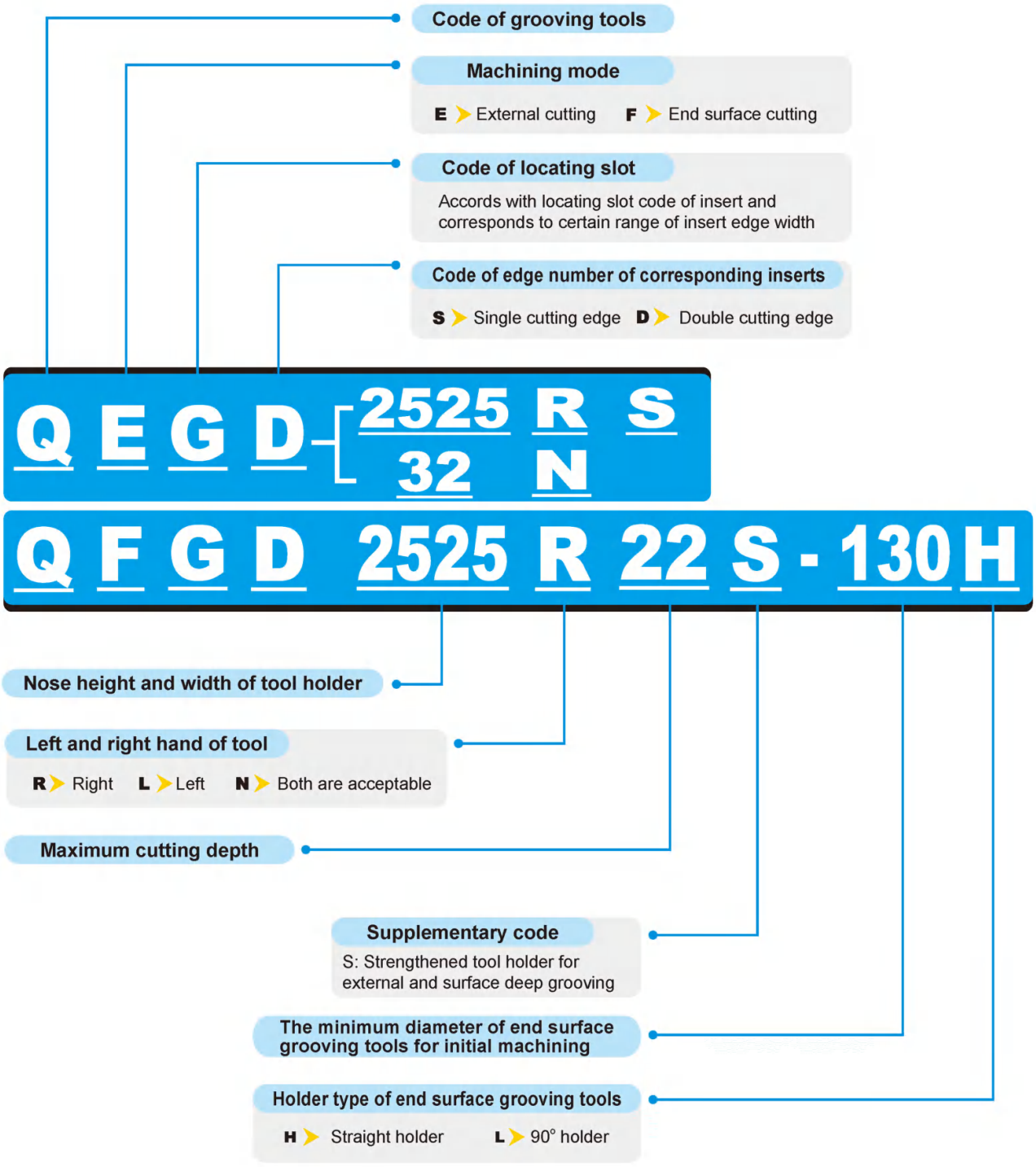
Type	Basic dimensions(mm)				Grade		
					CVD Coating	Cemented carbide	
	PDPT	CW	RE	INSL	YBC251	YC40	YD201
ZQMX3N11-1E	4.4	3.125	0.3	11	●	●	●
ZQMX4N11-1E	4.95	4.125	0.3	11	●	●	●
ZQMX5N11-1E	5.0	5.125	0.3	11	●	●	●
ZQMX6N11-1E	5.28	6.4	0.3	11	●	●	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

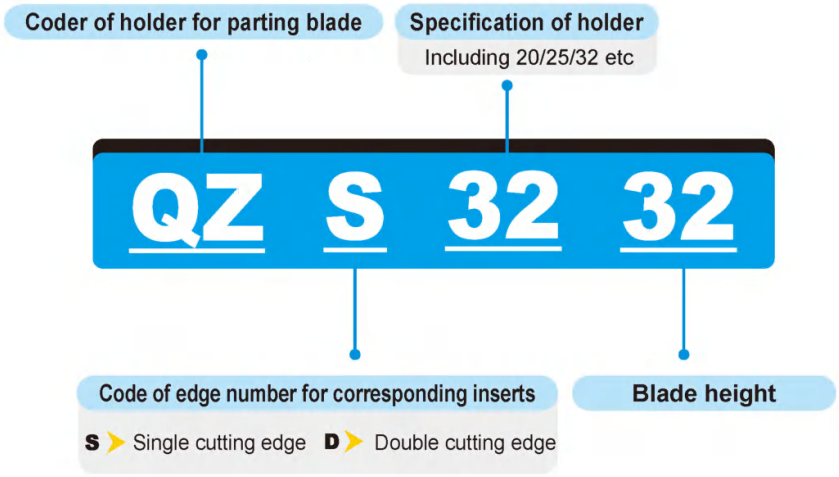


Little squirrel series parting and grooving tools code key

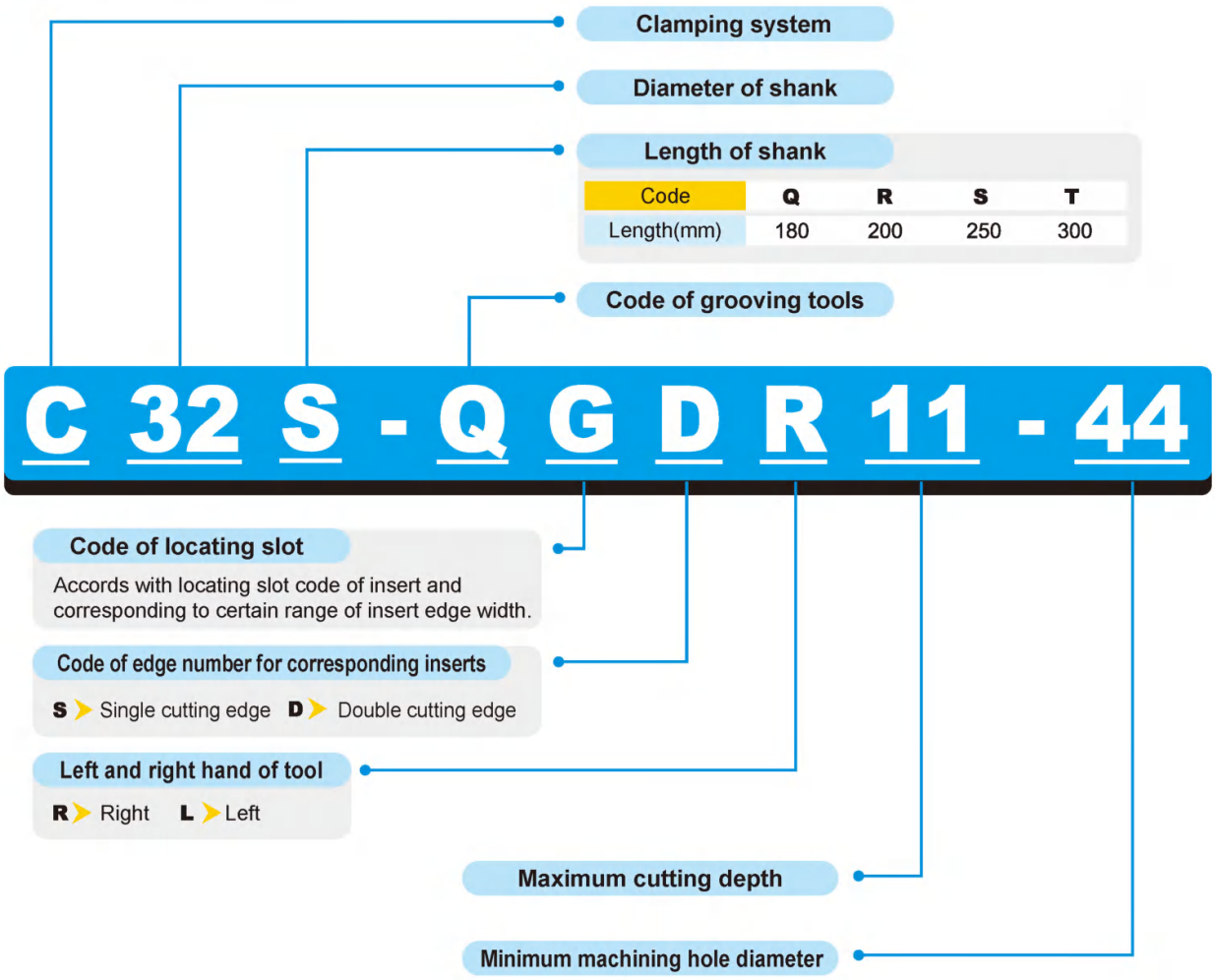
● External and surface turning



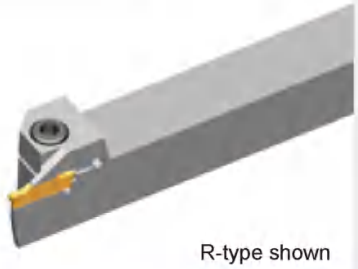
● Holder for parting blade



● Internal machining



External parting, grooving and turning tools



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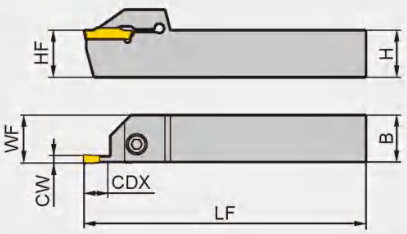
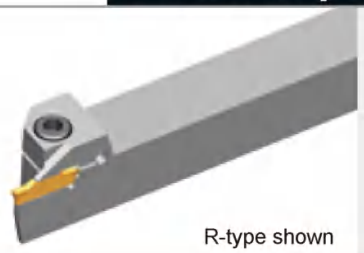




Type		Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
		R	L	H×B	HF	LF	WF	CW	CDX max			
QEAD	**1212R/L07**	▲	▲	12×12	12	125	12.15	1.5	7	ZOAD015OO	GB70-85-M4×12	WH30L
	1212R/L12	▲	▲	12×12	12	125	12.15	1.5	12	ZOAD015OO		
	1616R/L07	▲	▲	16×16	16	125	16.15	1.5	7	ZOAD015OO	GB70-85-M5×16	WH40L
	1616R/L12	▲	▲	16×16	16	125	16.15	1.5	12	ZOAD015OO		
	2020R/L07	▲	▲	20×20	20	125	20.15	1.5	7	ZOAD015OO		
	2020R/L12	▲	▲	20×20	20	125	20.15	1.5	12	ZOAD015OO		
QEBD	**1212R/L07**	▲	▲	12×12	12	125	12.2	2	7	ZOBD02OO	GB70-85-M4×12	WH30L
	1212R/L10	▲	▲	12×12	12	125	12.2	2	10	ZOBD02OO		
	1212R/L14	▲	▲	12×12	12	125	12.2	2	14	ZOBD02OO		
	1616R/L07	▲	▲	16×16	16	125	16.2	2	7	ZOBD02OO	GB70-85-M5×16	WH40L
	1616R/L10	▲	▲	16×16	16	125	16.2	2	10	ZOBD02OO		
	1616R/L14	▲	▲	16×16	16	125	16.2	2	14	ZOBD02OO		
	2020R/L07	▲	▲	20×20	20	125	20.2	2	7	ZOBD02OO		
	2020R/L10	▲	▲	20×20	20	125	20.2	2	10	ZOBD02OO		
	2020R/L14	▲	▲	20×20	20	125	20.2	2	14	ZOBD02OO		
	2525R/L07	▲	▲	25×25	25	150	25.2	2	7	ZOBD02OO	GB70-85-M6×20	WH50L
	2525R/L10	▲	▲	25×25	25	150	25.2	2	10	ZOBD02OO		
	2525R/L14	▲	▲	25×25	25	150	25.2	2	14	ZOBD02OO		
QEED	**1616R/L10**	▲	▲	16×16	16	125	16.25	2.5	10	ZOED025OO	GB70-85-M5×20	WH40L
	1616R/L17	▲	▲	16×16	16	125	16.25	2.5	17	ZOED025OO		
	2020R/L10	▲	▲	20×20	20	125	20.25	2.5	10	ZOED025OO	GB70-85-M6×20	WH50L
	2020R/L17	▲	▲	20×20	20	125	20.25	2.5	17	ZOED025OO		
	2525R/L10	▲	▲	25×25	25	150	25.25	2.5	10	ZOED025OO		
	2525R/L17	▲	▲	25×25	25	150	25.25	2.5	17	ZOED025OO		
QEFD	**1616R/L10**	▲	▲	16×16	16	125	16.3	3	10	ZOFD03OO	GB70-85-M5×20	WH40L
	1616R/L17	▲	▲	16×16	16	125	16.3	3	17	ZOFD03OO		
	2020R/L10	▲	▲	20×20	20	125	20.3	3	10	ZOFD03OO	GB70-85-M6×20	WH50L
	2020R/L17	▲	▲	20×20	20	125	20.3	3	17	ZOFD03OO		
	2525R/L10	▲	▲	25×25	25	150	25.3	3	10	ZOFD03OO		
	2525R/L17	▲	▲	25×25	25	150	25.3	3	17	ZOFD03OO		
QEGD	**2020R/L13**	▲	▲	20×20	20	140	20.5	4	13	ZOGD04OO	GB70-85-M6×20	WH50L
	2020R/L22	▲	▲	20×20	20	140	20.5	4	22	ZOGD04OO		
	2525R/L13	▲	▲	25×25	25	150	25.5	4	13	ZOGD04OO		

▲Stock available △Make-to-order

External parting, grooving and turning tools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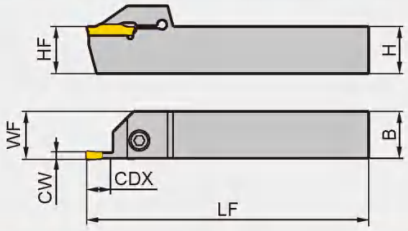
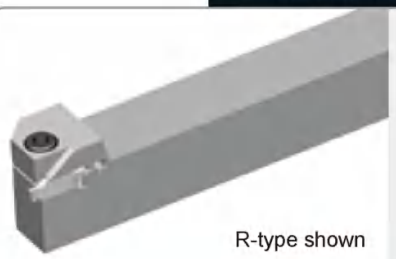




Type		Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
		R	L	H×B	HF	LF	WF	CW	CDX max			
QEGD	**2525R/L22**	▲	▲	25×25	25	150	25.5	4	22	ZOGD04OO	GB70-85-M6×20	WH50L
	3232R/L13	▲	▲	32×32	32	170	32.5	4	13	ZOGD04OO		
	3232R/L22	▲	▲	32×32	32	170	32.5	4	22	ZOGD04OO		
QEHD	**2525R/L13**	▲	▲	25×25	25	150	25.5	5	13	ZOHD05OO	GB70-85-M6×20	WH50L
	2525R/L22	▲	▲	25×25	25	150	25.5	5	22	ZOHD05OO		
QEHS	**2525N30**	▲	▲	25×25	25	150	15	5	30	ZOHS05OO		
QEHD	**3232R/L13**	▲	▲	32×32	32	170	32.5	5	13	ZOHD05OO		
	3232R/L22	▲	▲	32×32	32	170	32.5	5	22	ZOHD05OO		
QEHS	**3232N30**	▲	▲	32×32	32	170	18.5	5	30	ZOHS05OO		
QEKD	**2525R/L13**	▲	▲	25×25	25	150	25.6	6	13	ZOKD06OO	GB70-85-M6×20	WH50L
	2525R/L22	▲	▲	25×25	25	150	25.6	6	22	ZOKD06OO		
QEKS	**2525N30**	▲	▲	25×25	25	150	15.5	6	30	ZOKS06OO		
QEKD	**3232R/L13**	▲	▲	32×32	32	170	32.6	6	13	ZOKD06OO		
	3232R/L22	▲	▲	32×32	32	170	32.6	6	22	ZOKD06OO		
QEKS	**3232N30**	▲	▲	32×32	32	170	19	6	30	ZOKS06OO		
QELD	**2525R/L16**	▲	▲	25×25	25	150	26	8	16	ZTLD0808-MM	GB70-85-M6×20	WH50L
	2525R/L25	▲	▲	25×25	25	150	26	8	25	ZTLD0808-MM	GB70-85-M6×20	WH50L
	3232R/L28	▲	▲	32×32	32	170	33	8	28	ZTLD0808-MM	GB70-85-M8×30	WH60L

▲Stock available △Make-to-order

Precision grooving and turning tools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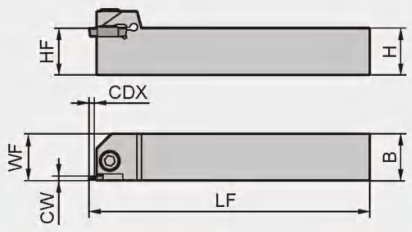
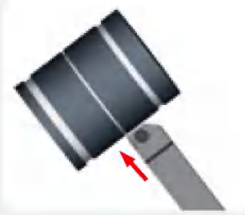
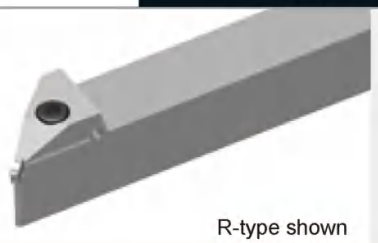




Type		Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
		R	L	H×B	HF	LF	WF	CW	CDX max			
QECD	**1616R/L025**	△	△	16×16	26	125	14.75	1.0~2.4	2.5	ZTCDOOOOOO-EG	GB70-85-M5×20	WH40L
	2020R/L025	▲	△	20×20	20	125	18.75				GB70-85-M6×20	WH50L
	2525R/L025	▲	△	25×25	25	150	23.75					

▲Stock available △Make-to-order

External recess and profiling tools



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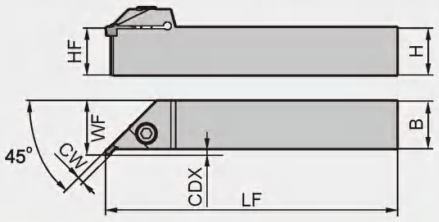
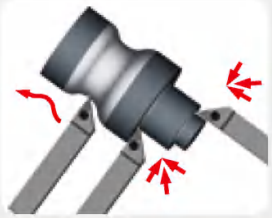
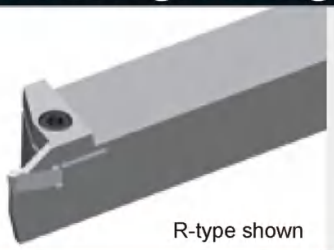




Type		Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
		R	L	H×B	HF	LF	WF	CW	CDX max			
QXFD	**2020R/L03-45**	△	△	20×20	20	125	23	3.0	3.0	ZR(T)FD03-□□	GB70-85-M6×20	WH50L
	2525R/L03-45	△	△	25×25	25	150	28					
	3232R/L03-45	△	△	32×32	32	170	35					
QXGD	**2020R/L03-45**	△	△	20×20	20	125	23	4.0	3.0	ZR(T)GD04-□□		
	2525R/L03-45	△	△	25×25	25	150	28					
	3232R/L03-45	△	△	32×32	32	170	35					
QXHD	**2020R/L04-45**	△	△	20×20	20	125	24	5.0	4.0	ZR(T)HD05-□□		
	2525R/L04-45	△	△	25×25	25	150	29					
	3232R/L04-45	△	△	32×32	32	170	36					
QXKD	**2020R/L04-45**	△	△	20×20	20	125	24	6.0	4.0	ZR(T)KD06-□□		
	2525R/L04-45	△	△	25×25	25	150	29					
	3232R/L04-45	△	△	32×32	32	170	36					

▲Stock available △Make-to-order

External grooving tools for difficult-to-machine materials



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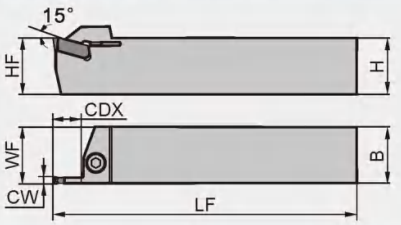


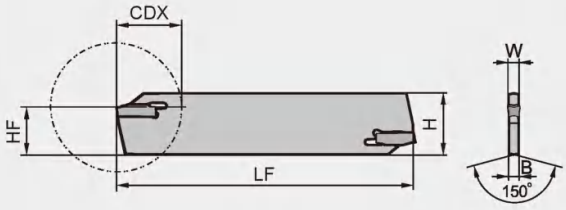


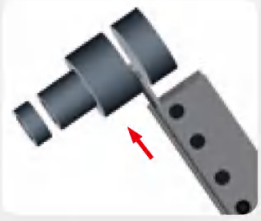
Type		Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
		R	L	H×B	HF	LF	WF	CW	CDX max			
QEFS	**2525R/L12-3N**	△	△	25×25	25	150	25.3	3	12	ZIGQ3N-□□ ZIMF304N-□□	GB70-85-M6×20	WH50L
	3232R/L22-3N	△	△	32×32	32	170	32.3	3	22			
QEGS	**2525R/L12-4N**	△	△	25×25	25	150	25.3	4	12	ZIGQ4N-□□ ZIMF40□N-□□		
	3232R/L22-4N	△	△	32×32	32	170	32.3	4	22			
QEHS	**2525R/L12-5N**	△	△	25×25	25	150	25.4	5	12	ZIGQ5N-□□ ZIMF50□N-□□		
	3232R/L22-5N	△	△	32×32	32	170	32.4	5	22			
QEKS	**2525R/L12-6N**	△	△	25×25	25	150	25.4	6	12	ZIGQ6N-□□ ZIMF60□N-□□		
	3232R/L22-6N	△	△	32×32	32	170	32.4	6	22			

▲Stock available △Make-to-order

Blade for external parting





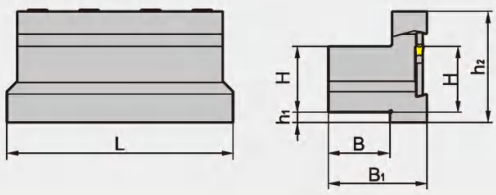


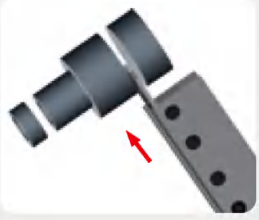
Type	Stock	Basic dimensions(mm)						Applicable inserts	Wrench
		LF	H	HF	B	W	CDX		
QEES26N	▲	110	26	19	2	2.5	60	ZPES02502-MG	W50RL
QEFS26N	▲	110	26	19	2.4	3	60	ZPFS0302-MG	
QEGS26N	▲	110	26	19	3.2	4	70	ZPGS0402-MG	
QEHS26N	▲	110	26	19	4	5	70	ZPHS0503-MG	
QEKS26N	▲	110	26	19	5	6	70	ZPKS0604-MG	
QEES32N	▲	150	32	24.6	2	2.5	100	ZPES02502-MG	
QEFS32N	▲	150	32	24.6	2.4	3	100	ZPFS0302-MG	
QEGS32N	▲	150	32	24.6	3.2	4	120	ZPGS0402-MG	
QEHS32N	▲	150	32	24.6	4	5	120	ZPHS0503-MG	
QEKS32N	▲	150	32	24.6	5	6	120	ZPKS0604-MG	

▲Stock available △Make-to-order

Holder for blade of external parting







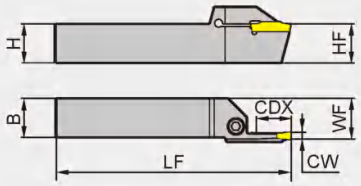
Type	Stock	Basic dimensions(mm)						Clamp	Screw	Wrench
		L	H	h_1	h_2	B	B_1			
QZS2026	▲	86	20	10	46.6	19	38	QZC26	GB70-85-M6×20	WH50L
QZS2526	▲	86	25	5	46.6	23	42	QZC26		
QZS3226	▲	86	30	3	51.6	30	48	QZC26		
QZS2032	▲	110	20	13	50	19	38	QZC32		
QZS2532	▲	110	25	8	50	23	42	QZC32		
QZS3232	▲	110	32	5	54	30	48	QZC32		

▲Stock available △Make-to-order

End surface grooving and turning tools



L-type shown





Diameter range of entering



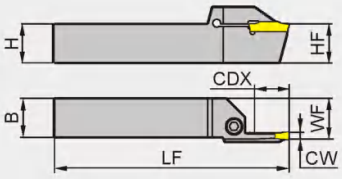
Type		Stock		Basic dimensions(mm)							Applicable inserts	Screw	Wrench
		R	L	H×B	HF	LF	WF	CW	CDX max	ØD (min-max)			
QFFD	**2020R/L7-48H**	▲	▲	20×20	20	150	21	3	7	48-66	ZT(R)FD03□□-□□	GB70-85-M6×20	WH50L
	2020R/L10-48H	▲	▲	20×20	20	150	21	3	10	48-66			
	2020R/L7-60H	△	△	20×20	20	150	21	3	7	60-80			
	2020R/L10-60H	△	△	20×20	20	150	21	3	10	60-80			
	2020R/L7-74H	△	△	20×20	20	150	21	3	7	74-110			
	2020R/L10-74H	△	▲	20×20	20	150	21	3	10	74-110			
	2020R/L7-100H	△	△	20×20	20	150	21	3	7	100-150			
	2020R/L10-100H	△	△	20×20	20	150	21	3	10	100-150			
	2525R/L10-48H	▲	▲	25×25	25	150	26	3	10	48-66			
	2525R/L17-48H	▲	▲	25×25	25	150	26	3	17	48-66			
	2525R/L10-60H	▲	▲	25×25	25	150	26	3	10	60-80			
	2525R/L17-60H	▲	▲	25×25	25	150	26	3	17	60-80			
	2525R/L10-74H	▲	▲	25×25	25	150	26	3	10	74-110			
	2525R/L17-74H	▲	▲	25×25	25	150	26	3	17	74-110			
	2525R/L10-100H	▲	▲	25×25	25	150	26	3	10	100-150			
	2525R/L10-150H	△	△	25×25	25	150	26	3	10	150-260			
	2525R/L17-100H	▲	▲	25×25	25	150	26	3	17	100-150			
	2525R/L17-100H	△	△	25×25	25	150	26	3	17	150-260			
QFGD	**2020R/L10-52H**	△	△	20×20	20	150	21	4	10	52-72	ZT(R)GD04□□-□□		
	2020R/L15-52H	△	△	20×20	20	150	21	4	15	52-72			
	2020R/L10-64H	△	▲	20×20	20	150	21	4	10	64-100			
	2020R/L15-64H	△	△	20×20	20	150	21	4	15	64-100			
	2020R/L10-90H	△	△	20×20	20	150	21	4	10	90-140			
	2020R/L15-90H	△	△	20×20	20	150	21	4	15	90-140			
	2020R/L10-130H	△	△	20×20	20	150	21	4	10	130-230			
	2020R/L15-130H	△	△	20×20	20	150	21	4	15	130-230			
	2525R/L13-52H	▲	▲	25×25	25	150	26	4	13	52-72			
	2525R/L22-52H	▲	▲	25×25	25	150	26	4	22	52-72			
	2525R/L13-64H	▲	▲	25×25	25	150	26	4	13	64-100			
	2525R/L22-64H	▲	▲	25×25	25	150	26	4	22	64-100			
	2525R/L13-90H	▲	▲	25×25	25	150	26	4	13	90-140			
	2525R/L22-90H	▲	▲	25×25	25	150	26	4	22	90-140			
	2525R/L13-130H	▲	▲	25×25	25	150	26	4	13	130-230			
	2525R/L22-130H	▲	▲	25×25	25	150	26	4	22	130-230			
	2525R/L13-220H	△	△	25×25	25	150	26	4	13	220-600			
	2525R/L22-220H	△	△	25×25	25	150	26	4	22	220-600			

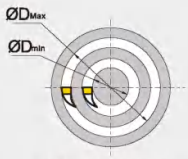
▲Stock available △Make-to-order

End surface grooving and turning tools



L-type shown





Diameter range of entering



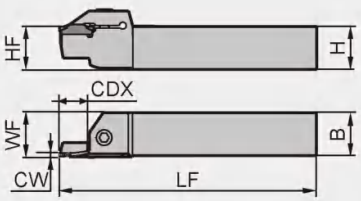
Type		Stock		Basic dimensions(mm)							Applicable inserts	Screw	Wrench
		R	L	H×B	HF	LF	WF	CW	CDX max	ØD (min-max)			
QFHD	**2525R/L13-58H**	▲	▲	25×25	25	150	26	5	13	58-96	ZT(R)HD05□□-□□	GB70-85-M6×20	WH50L
	2525R/L22-58H	▲	▲	25×25	25	150	26	5	22	58-96			
	2525R/L13-86H	△	▲	25×25	25	150	26	5	13	86-140			
	2525R/L22-86H	▲	▲	25×25	25	150	26	5	22	86-140			
	2525R/L13-130H	▲	▲	25×25	25	150	26	5	13	130-200			
	2525R/L22-130H	▲	▲	25×25	25	150	26	5	22	130-200			
	2525R/L13-185H	▲	▲	25×25	25	150	26	5	13	185-400			
	2525R/L13-260H	△	△	25×25	25	150	26	5	13	260-1000			
	2525R/L22-185H	▲	▲	25×25	25	150	26	5	22	185-400			
	2525R/L22-260H	△	△	25×25	25	150	26	5	22	260-1000			
QFHS	**2525R/L30-185H**	△	△	25×25	25	150	26	5	30	185-400	ZTHS0504-MG		
QFKD	**2525R/L13-60H**	▲	▲	25×25	25	150	26	6	13	60-100	ZT(R)KD06□□-□□	GB70-85-M6×20	WH50L
	2525R/L22-60H	▲	▲	25×25	25	150	26	6	22	60-100			
	2525R/L13-88H	△	▲	25×25	25	150	26	6	13	88-180			
	2525R/L22-88H	▲	▲	25×25	25	150	26	6	22	88-180			
	2525R/L13-160H	▲	▲	25×25	25	150	26	6	13	160-400			
	2525R/L13-280H	△	△	25×25	25	150	26	6	13	280-1200			
	2525R/L22-160H	▲	▲	25×25	25	150	26	6	22	160-400			
	2525R/L22-280H	△	△	25×25	25	150	26	6	22	280-1200			
QFKS	**2525R/L30-160H**	△	△	25×25	25	150	26	6	30	160-400	ZTKS0608-MG		
QFLD	**2525R/L25-75H**	▲	▲	25×25	25	150	27	8	25	75-150	ZTLD0808-MM	GB70-85-M6×20	WH50L
	2525R/L25-140H	▲	▲	25×25	25	150	27	8	25	140-400	ZTLD0808-MM	GB70-85-M6×20	WH50L
	3232R/L28-140H	▲	▲	32×32	32	170	30	8	28	140-400	ZTLD0808-MM	GB70-85-M8×30	WH60L

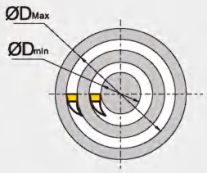
▲Stock available △Make-to-order

End surface grooving and turning tools



RR-type shown





Diameter range of entering

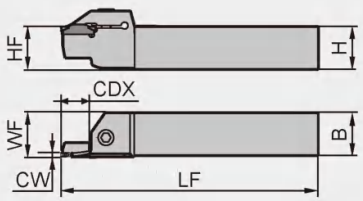


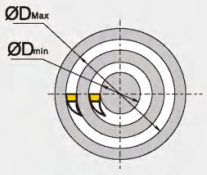
Type		Stock	Basic dimensions(mm)							Applicable inserts	Screw	Wrench
			H×B	HF	LF	WF	CW	CDX max	ØD (min-max)			
QFFD	**2020RR7-48H**	△	20×20	20	150	21	3	7	48-66	ZT(R)FD03□□-□□	GB70-85-M6×20	WH50L
	2020RR10-48H	△	20×20	20	150	21	3	10	48-66			
	2020RR7-60H	△	20×20	20	150	21	3	7	60-80			
	2020RR10-60H	△	20×20	20	150	21	3	10	60-80			
	2020RR7-74H	△	20×20	20	150	21	3	7	74-110			
	2020RR10-74H	△	20×20	20	150	21	3	10	74-110			
	2020RR7-100H	△	20×20	20	150	21	3	7	100-150			
	2020RR10-100H	△	20×20	20	150	21	3	10	100-150			
	2525RR10-48H	△	25×25	25	150	26	3	10	48-66			
	2525RR17-48H	△	25×25	25	150	26	3	17	48-66			
	2525RR10-60H	△	25×25	25	150	26	3	10	60-80			
	2525RR17-60H	△	25×25	25	150	26	3	17	60-80			
	2525RR10-74H	△	25×25	25	150	26	3	10	74-110			
	2525RR17-74H	△	25×25	25	150	26	3	17	74-110			
	2525RR10-100H	△	25×25	25	150	26	3	10	100-150			
	2525RR17-100H	△	25×25	25	150	26	3	17	100-150			
QFGD	**2020RR10-52H**	△	20×20	20	150	21	4	10	52-72	ZT(R)GD04□□-□□		
	2020RR15-52H	△	20×20	20	150	26	4	15	52-72			
	2020RR10-64H	△	20×20	20	150	21	4	10	64-100			
	2020RR15-64H	△	20×20	20	150	26	4	15	64-100			
	2020RR10-90H	△	20×20	20	150	21	4	10	90-140			
	2020RR15-90H	△	20×20	20	150	26	4	15	90-140			
	2020RR10-130H	△	20×20	20	150	21	4	10	130-230			
	2020RR15-130H	△	20×20	20	150	26	4	15	130-230			
	2525RR13-52H	△	25×25	25	150	21	4	13	52-72			
	2525RR22-52H	△	25×25	25	150	26	4	22	52-72			
	2525RR13-64H	△	25×25	25	150	21	4	13	64-100			
	2525RR22-64H	△	25×25	25	150	26	4	22	64-100			
	2525RR13-90H	△	25×25	25	150	21	4	13	90-140			
	2525RR22-90H	△	25×25	25	150	26	4	22	90-140			
	2525RR13-130H	△	25×25	25	150	21	4	13	130-230			
	2525RR22-130H	△	25×25	25	150	26	4	22	130-230			

▲Stock available △Make-to-order

End surface grooving and turning tools


RR-type shown





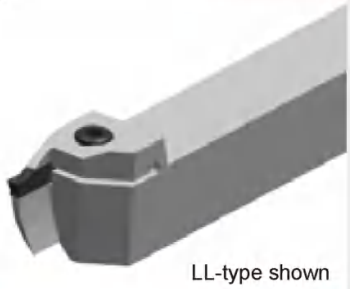
Diameter range of entering



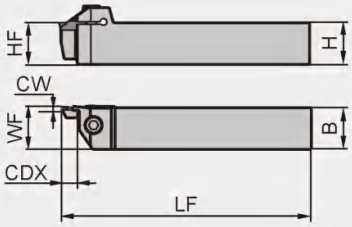
Type		Stock	Basic dimensions(mm)							Applicable inserts	Screw	Wrench
			H×B	HF	LF	WF	CW	CDX max	ØD (min-max)			
QFHD	**2525RR13-58H**	△	25×25	25	150	26	5	13	58-96	ZT(R)HD05□□-□□	GB70-85-M6×20	WH50L
	2525RR22-58H	△	25×25	25	150	26	5	22	58-96			
	2525RR13-86H	△	25×25	25	150	26	5	13	86-140			
	2525RR22-86H	△	25×25	25	150	26	5	22	86-140			
	2525RR13-130H	△	25×25	25	150	26	5	13	130-200			
	2525RR22-130H	△	25×25	25	150	26	5	22	130-200			
	2525RR13-185H	△	25×25	25	150	26	5	13	185-400			
	2525RR22-185H	△	25×25	25	150	26	5	22	185-400			
QFHS	**2525RR30-185H**	△	25×25	25	150	26	5	30	185-400	ZTHS0504-MG		
QFKD	**2525RR13-60H**	△	25×25	25	150	26	6	13	60-100	ZT(R)KD06□□-□□	GB70-85-M6×20	WH50L
	2525RR22-60H	△	25×25	25	150	26	6	22	60-100			
	2525RR13-88H	△	25×25	25	150	26	6	13	88-180			
	2525RR22-88H	△	25×25	25	150	26	6	22	88-180			
	2525RR13-160H	△	25×25	25	150	26	6	13	160-400			
	2525RR22-160H	△	25×25	25	150	26	6	22	160-400			
QFKS	**2525RR30-160H**	△	25×25	25	150	26	6	30	160-400	ZTKS0608-MG		

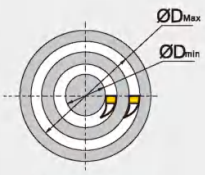
▲Stock available △Make-to-order

End surface grooving and turning tools



LL-type shown





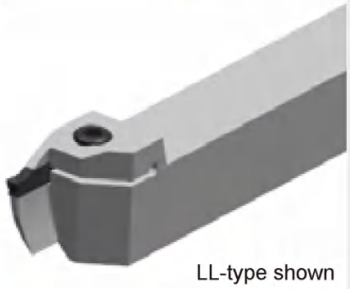
Diameter range of entering



Type		Stock	Basic dimensions(mm)							Applicable inserts	Screw	Wrench
			H×B	HF	LF	WF	CW	CDX max	ØD (min-max)			
QFFD	**2020LL7-48H**	△	20×20	20	150	21	3	7	48-66	ZT(R)FD03□□-□□	GB70-85-M6×20	WH50L
	2020LL10-48H	△	20×20	20	150	21	3	10	48-66			
	2020LL7-60H	△	20×20	20	150	21	3	7	60-80			
	2020LL10-60H	△	20×20	20	150	21	3	10	60-80			
	2020LL7-74H	△	20×20	20	150	21	3	7	74-110			
	2020LL10-74H	△	20×20	20	150	21	3	10	74-110			
	2020LL7-100H	△	20×20	20	150	21	3	7	100-150			
	2020LL10-100H	△	20×20	20	150	21	3	10	100-150			
	2525LL10-48H	△	25×25	25	150	26	3	10	48-66			
	2525LL17-48H	△	25×25	25	150	26	3	17	48-66			
	2525LL10-60H	△	25×25	25	150	26	3	10	60-80			
	2525LL17-60H	△	25×25	25	150	26	3	17	60-80			
	2525LL10-74H	△	25×25	25	150	26	3	10	74-110			
	2525LL17-74H	△	25×25	25	150	26	3	17	74-110			
	2525LL10-100H	△	25×25	25	150	26	3	10	100-150			
	2525LL17-100H	△	25×25	25	150	26	3	17	100-150			
QFGD	**2020LL10-52H**	△	20×20	20	150	21	4	10	52-72	ZT(R)GD04□□-□□		
	2020LL15-52H	△	20×20	20	150	26	4	15	52-72			
	2020LL10-64H	△	20×20	20	150	21	4	10	64-100			
	2020LL15-64H	△	20×20	20	150	26	4	15	64-100			
	2020LL10-90H	△	20×20	20	150	21	4	10	90-140			
	2020LL15-90H	△	20×20	20	150	26	4	15	90-140			
	2020LL10-130H	△	20×20	20	150	21	4	10	130-230			
	2020LL15-130H	△	20×20	20	150	26	4	15	130-230			
	2525LL13-52H	△	25×25	25	150	21	4	13	52-72			
	2525LL22-52H	△	25×25	25	150	26	4	22	52-72			
	2525LL13-64H	△	25×25	25	150	21	4	13	64-100			
	2525LL22-64H	△	25×25	25	150	26	4	22	64-100			
	2525LL13-90H	△	25×25	25	150	21	4	13	90-140			
	2525LL22-90H	△	25×25	25	150	26	4	22	90-140			
	2525LL13-130H	△	25×25	25	150	21	4	13	130-230			
	2525LL22-130H	△	25×25	25	150	26	4	22	130-230			

▲Stock available △Make-to-order

End surface grooving and turning tools



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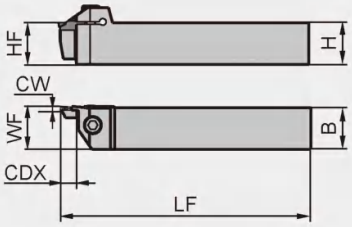
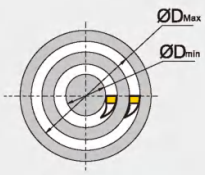




Diameter range of entering



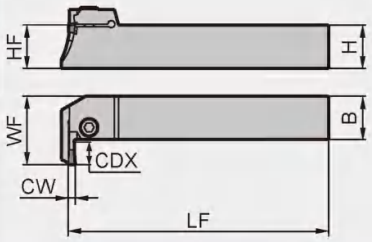
Type		Stock	Basic dimensions(mm)							Applicable inserts	Screw	Wrench
			H×B	HF	LF	WF	CW	CDX max	ØD (min-max)			
QFHD	**2525LL13-58H**	△	25×25	25	150	26	5	13	58-96	ZT(R)HD05□□-□□	GB70-85-M6×20	WH50L
	2525LL22-58H	△	25×25	25	150	26	5	22	58-96			
	2525LL13-86H	△	25×25	25	150	26	5	13	86-140			
	2525LL22-86H	△	25×25	25	150	26	5	22	86-140			
	2525LL13-130H	△	25×25	25	150	26	5	13	130-200			
	2525LL22-130H	△	25×25	25	150	26	5	22	130-200			
	2525LL13-185H	△	25×25	25	150	26	5	13	185-400			
	2525LL22-185H	△	25×25	25	150	26	5	22	185-400			
QFHS	**2525LL30-185H**	△	25×25	25	150	26	5	30	185-400	ZTHS0504-MG		
QFKD	**2525LL13-60H**	△	25×25	25	150	26	6	13	60-100	ZT(R)KD06□□-□□	GB70-85-M6×20	WH50L
	2525LL22-60H	△	25×25	25	150	26	6	22	60-100			
	2525LL13-88H	△	25×25	25	150	26	6	13	88-180			
	2525LL22-88H	△	25×25	25	150	26	6	22	88-180			
	2525LL13-160H	△	25×25	25	150	26	6	13	160-400			
	2525LL22-160H	△	25×25	25	150	26	6	22	160-400			
QFKS	**2525LL30-160H**	△	25×25	25	150	26	6	30	160-400	ZTKS0608-MG		

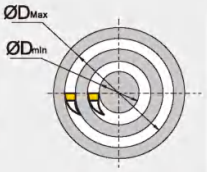
▲Stock available △Make-to-order

L type tools for surface grooving and turning



R-type shown





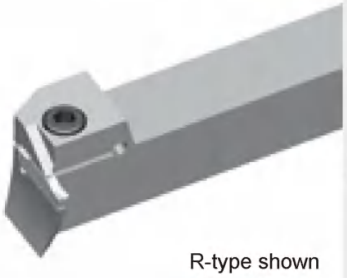
Diameter range of entering



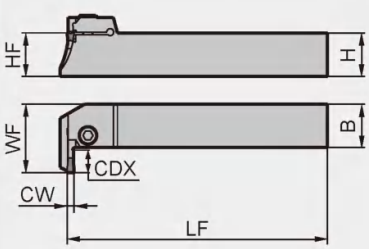
Type		Stock		Basic dimensions(mm)							Applicable inserts	Screw	Wrench
		R	L	H×B	HF	LF	WF	CW	CDX max	ØD (min-max)			
QFFD	**2020R/L7-48L**	△	△	20×20	20	150	28.5	3	7	48-66	ZT(R)FD03□□-□□	GB70-85-M6×20	WH50L
	2020R/L10-48L	△	△	20×20	20	150	31.5	3	10	48-66			
	2020R/L7-60L	△	△	20×20	20	150	28.5	3	7	60-80			
	2020R/L10-60L	△	△	20×20	20	150	31.5	3	10	60-80			
	2020R/L7-74L	△	△	20×20	20	150	28.5	3	7	74-110			
	2020R/L10-74L	△	△	20×20	20	150	31.5	3	10	74-110			
	2020R/L7-100L	△	△	20×20	20	150	28.5	3	7	100-150			
	2020R/L10-100L	△	△	20×20	20	150	31.5	3	10	100-150			
	2525R/L10-48L	▲	▲	25×25	25	150	36.5	3	10	48-66			
	2525R/L17-48L	△	△	25×25	25	150	43.5	3	17	48-66			
	2525R/L10-60L	▲	▲	25×25	25	150	36.5	3	10	60-80			
	2525R/L17-60L	△	△	25×25	25	150	43.5	3	17	60-80			
	2525R/L10-74L	▲	▲	25×25	25	150	36.5	3	10	74-110			
	2525R/L17-74L	△	△	25×25	25	150	43.5	3	17	74-110			
	2525R/L10-100L	▲	▲	25×25	25	150	36.5	3	10	100-150			
	2525R/L17-100L	△	△	25×25	25	150	43.5	3	17	100-150			
QFGD	**2020R/L10-52L**	△	△	20×20	20	150	31.5	4	10	52-72	ZT(R)GD04□□-□□		
	2020R/L15-52L	△	△	20×20	20	150	36.5	4	15	52-72			
	2020R/L10-64L	△	△	20×20	20	150	31.5	4	10	64-100			
	2020R/L15-64L	△	△	20×20	20	150	36.5	4	15	64-100			
	2020R/L10-90L	△	△	20×20	20	150	31.5	4	10	90-140			
	2020R/L15-90L	△	△	20×20	20	150	36.5	4	15	90-140			
	2020R/L10-130L	△	△	20×20	20	150	31.5	4	10	130-230			
	2020R/L15-130L	△	△	20×20	20	150	36.5	4	15	130-230			
	2525R/L13-52L	▲	△	25×25	25	150	39.5	4	13	52-72			
	2525R/L22-52L	△	△	25×25	25	150	48.5	4	22	52-72			
	2525R/L13-64L	△	△	25×25	25	150	39.5	4	13	64-100			
	2525R/L22-64L	△	△	25×25	25	150	48.5	4	22	64-100			
	2525R/L13-90L	△	△	25×25	25	150	39.5	4	13	90-140			
	2525R/L22-90L	▲	△	25×25	25	150	48.5	4	22	90-140			
	2525R/L13-130L	△	△	25×25	25	150	39.5	4	13	130-230			
	2525R/L22-130L	▲	▲	25×25	25	150	48.5	4	22	130-230			

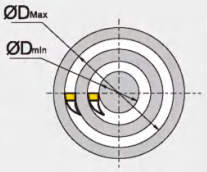
▲Stock available △Make-to-order

L type tools for surface grooving and turning



R-type shown





Diameter range of entering



Type		Stock		Basic dimensions(mm)							Applicable inserts	Screw	Wrench
		R	L	H×B	HF	LF	WF	CW	CDX max	ØD (min-max)			
QFHD	**2525R/L13-58L**	△	△	25×25	25	150	39.5	5	13	58-96	ZT(R)HD05□□-□□	GB70-85-M6×20	WH50L
	2525R/L22-58L	△	△	25×25	25	150	48.5	5	22	58-96			
	2525R/L13-86L	△	△	25×25	25	150	39.5	5	13	86-140			
	2525R/L22-86L	△	△	25×25	25	150	48.5	5	22	86-140			
	2525R/L13-130L	△	△	25×25	25	150	39.5	5	13	130-200			
	2525R/L22-130L	△	△	25×25	25	150	48.5	5	22	130-200			
	2525R/L13-185L	△	△	25×25	25	150	39.5	5	13	185-400			
	2525R/L22-185L	▲	△	25×25	25	150	48.5	5	22	185-400			
QFHS	**2525R/L30-185L**	△	△	25×25	25	150	56.5	5	30	185-400	ZTHS0504-MG		
QFKD	**2525R/L13-60L**	▲	▲	25×25	25	150	39.5	6	13	60-100	ZT(R)KD06□□-□□	GB70-85-M6×20	WH50L
	2525R/L22-60L	▲	▲	25×25	25	150	48.5	6	22	60-100			
	2525R/L13-88L	△	▲	25×25	25	150	39.5	6	13	88-180			
	2525R/L22-88L	▲	▲	25×25	25	150	48.5	6	22	88-180			

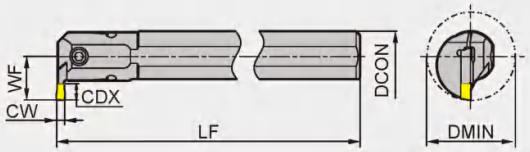
▲Stock available △Make-to-order



Internal grooving and turning tools



R-type shown





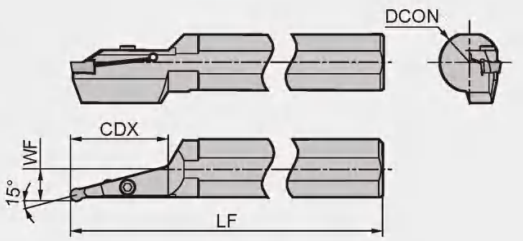
Type	Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
	R	L	DCON	LF	WF	CW	CDX max	DMIN			
C20Q-QEDR/L05-27	▲	▲	20	180	15.2	2.5	5	27	ZTED025□□ ZRED025□□	GB70-85-M4×12	WH30L
C25R-QEDR/L07-33	▲	▲	25	200	20.3	2.5	7	33		GB70-85-M5×16	WH40L
C32S-QEDR/L09-42	▲	▲	32	250	25.3	2.5	9	42		GB70-85-M5×20	
C20Q-QFDR/L05-27	▲	▲	20	180	15.2	3	5	27	ZTFD03□□ ZRFD03□□	GB70-85-M4×12	WH30L
C25R-QFDR/L07-33	▲	▲	25	200	20.3	3	7	33		GB70-85-M5×16	WH40L
C32S-QFDR/L09-42	▲	▲	32	250	25.3	3	9	42		GB70-85-M5×20	
C25R-QGDR/L08-35	▲	▲	25	200	21.5	4	8	35	ZTGD04□□ ZRGD04□□	GB70-85-M5×16	WH40L
C32S-QGDR/L11-44	▲	▲	32	250	27.5	4	11	44		GB70-85-M6×20	WH50L
C40T-QGDR/L13-54	▲	▲	40	300	33.5	4	13	54		GB70-85-M6×20	
C25R-QHDR/L08-35	▲	▲	25	200	21.5	5	8	35	ZTHD05□□ ZRHD05□□	GB70-85-M5×16	WH40L
C32S-QHDR/L11-44	▲	▲	32	250	27.5	5	11	44		GB70-85-M6×20	WH50L
C40T-QHDR/L13-54	▲	▲	40	300	33.5	5	13	54		GB70-85-M6×20	
C25R-QKDR/L08-35	▲	▲	25	200	21.5	6	8	35	ZTKD06□□ ZRKD06□□	GB70-85-M5×16	WH40L
C32S-QKDR/L11-44	▲	▲	32	250	27.5	6	11	44		GB70-85-M6×20	WH50L
C40T-QKDR/L13-54	▲	▲	40	300	33.5	6	13	54		GB70-85-M6×20	

▲Stock available △Make-to-order

Profile turning tools for Al



R-type shown





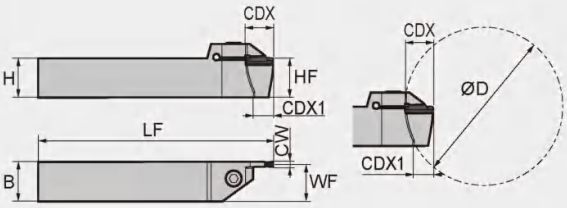
Type	Stock		Basic dimensions(mm)					Applicable inserts	Screw	Wrench
	R	L	DMIN (Minimum machining diameter)	DCON	WF	LF	CDX			
C40X-QLDR/L65-15A	▲	▲	160	40	21	320	65	ZRLD08-LH	GB70-85-M6×20	WH50L
C40X-QLDR/L80-15A	▲	△	160	40	21	320	80	ZRLD08-LH		
C40X-QKDR/L60-15A	△	△	160	40	20	320	60	ZRKD06-LH		
C40X-QKDR/L75-15A	△	△	160	40	20	320	75	ZRKD06-LH		

▲Stock available △Make-to-order

External parting, grooving and turning tools



L-type shown





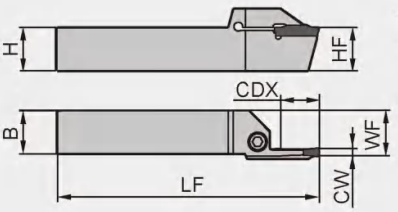
Type	Stock		Basic dimensions(mm)							Applicable inserts	Screw	Wrench
	R	L	H×B	LF	WF	CW	CDX	ØD	CDX			
GED1616R/L08-2.5	▲	▲	16×16	125	16.3	2.5	8	∞	8	G□MD25□□-□□	GB70-85-M5×16	WH40L
GED1616R/L14-2.5	▲	▲	16×16	125	16.3	2.5	14	60	11			
GED2020R/L08-2.5	▲	▲	20×20	125	20.3	2.5	8	∞	8		GB70-85-M6×20	WH50L
GED2020R/L14-2.5	▲	▲	20×20	125	20.3	2.5	14	100	11			
GED2525R/L08-2.5	▲	▲	25×25	150	25.3	2.5	8	∞	8			
GED2525R/L14-2.5	▲	▲	25×25	150	25.3	2.5	14	100	11			
GED1616R/L08-3	▲	▲	16×16	125	16.45	3	8	∞	8	G□MD3□□-□□	GB70-85-M5×16	WH40L
GED1616R/L14-3	▲	▲	16×16	125	16.45	3	14	60	11			
GED2020R/L08-3	▲	▲	20×20	125	20.45	3	8	∞	8		GB70-85-M6×20	WH50L
GED2020R/L14-3	▲	▲	20×20	125	20.45	3	14	100	11			
GED2525R/L08-3	▲	▲	25×25	150	25.45	3	8	∞	8			
GED2525R/L14-3	▲	▲	25×25	150	25.45	3	14	100	11			
GED2020R/L10-4	▲	▲	20×20	125	20.5	4	10	∞	10	G□MD4□□-□□	GB70-85-M6×20	WH50L
GED2020R/L17-4	▲	▲	20×20	125	20.5	4	17	100	14			
GED2525R/L10-4	▲	▲	25×25	150	25.5	4	10	∞	10			
GED2525R/L17-4	▲	▲	25×25	150	25.5	4	17	100	14			
GED3232R/L10-4	▲	▲	32×32	170	32.5	4	10	∞	10		GB70-85-M8×20	WH60L
GED3232R/L17-4	▲	▲	32×32	170	32.5	4	17	∞	17			
GED2525R/L10-5	▲	▲	25×25	150	25.5	5	10	∞	10	G□MD5□□-□□	GB70-85-M6×20	WH50L
GED2525R/L17-5	▲	▲	25×25	150	25.5	5	17	100	14			
GED3232R/L10-5	▲	▲	32×32	170	32.5	5	10	∞	10		GB70-85-M8×20	WH60L
GED3232R/L17-5	▲	▲	32×32	170	32.5	5	17	∞	17			
GED2525R/L10-6	▲	▲	25×25	150	25.5	6	10	∞	10	G□MD6□□-□□	GB70-85-M6×20	WH50L
GED2525R/L17-6	▲	▲	25×25	150	25.5	6	17	100	14			
GED3232R/L10-6	▲	▲	32×32	170	32.5	6	10	∞	10		GB70-85-M8×20	WH60L
GED3232R/L17-6	▲	▲	32×32	170	32.5	6	17	∞	17			

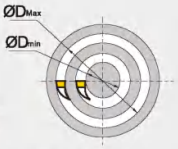
▲Stock available △Make-to-order

End surface grooving and turning tools



L-type shown





Diameter range of entering



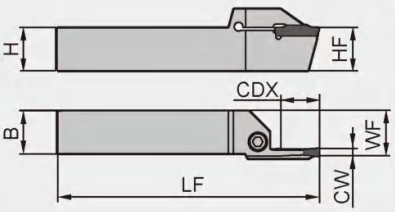
Type	Stock		Basic dimensions(mm)							Applicable inserts	Screw	Wrench
	R	L	H×B	HF	LF	WF	CW	CDXmax	ØD (min-max)			
GFD2020R/L08-28H-3	△	△	20×20	20	150	21	3	8	28-35	GMD3--	GB70-85-M6×20	WH50L
GFD2020R/L08-34H-3	△	△	20×20	20	150	21	3	8	34-45			
GFD2020R/L08-44H-3	△	△	20×20	20	150	21	3	8	44-60			
GFD2020R/L14-58H-3	△	△	20×20	20	150	21	3	14	58-80			
GFD2020R/L14-78H-3	△	△	20×20	20	150	21	3	14	78-130			
GFD2020R/L14-126H-3	△	△	20×20	20	150	21	3	14	126-230			
GFD2525R/L08-28H-3	▲	▲	25×25	25	150	26	3	8	28-35			
GFD2525R/L08-34H-3	▲	▲	25×25	25	150	26	3	8	34-45			
GFD2525R/L08-44H-3	▲	▲	25×25	25	150	26	3	8	44-60			
GFD2525R/L14-58H-3	▲	▲	25×25	25	150	26	3	14	58-80			
GFD2525R/L14-78H-3	▲	▲	25×25	25	150	26	3	14	78-130			
GFD2525R/L14-126H-3	▲	▲	25×25	25	150	26	3	14	126-230			
GFD2020R/L10-28H-4	△	△	20×20	20	150	21	4	10	28-35	GMD4--		
GFD2020R/L10-34H-4	△	△	20×20	20	150	21	4	10	34-45			
GFD2020R/L10-44H-4	△	△	20×20	20	150	21	4	10	44-60			
GFD2020R/L17-58H-4	△	△	20×20	20	150	21	4	17	58-80			
GFD2020R/L17-78H-4	△	△	20×20	20	150	21	4	17	78-130			
GFD2020R/L17-126H-4	△	△	20×20	20	150	21	4	17	126-230			
GFD2525R/L10-28H-4	▲	▲	25×25	25	150	26	4	10	28-35			
GFD2525R/L10-34H-4	▲	▲	25×25	25	150	26	4	10	34-45			
GFD2525R/L10-44H-4	▲	▲	25×25	25	150	26	4	10	44-60			
GFD2525R/L17-58H-4	▲	▲	25×25	25	150	26	4	17	58-80			
GFD2525R/L17-78H-4	▲	▲	25×25	25	150	26	4	17	78-130			
GFD2525R/L17-126H-4	▲	▲	25×25	25	150	26	4	17	126-230			
GFD2525R/L17-200H-4	▲	▲	25×25	25	150	26	4	17	200-480			

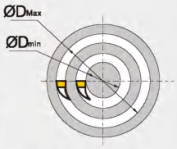
▲Stock available △Make-to-order

End surface grooving and turning tools



L-type shown





Diameter range of entering



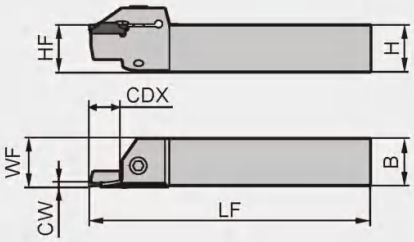
Type	Stock		Basic dimensions(mm)							Applicable inserts	Screw	Wrench
	R	L	H×B	HF	LF	WF	CW	CDX_{max}	ØD (min-max)			
GFD2020R/L10-35H-5	△	△	20×20	20	150	21	5	10	35-45	G□MD5□□-□□	GB70-85-M6×20	WH50L
GFD2020R/L10-44H-5	△	△	20×20	20	150	21	5	10	44-58			
GFD2020R/L17-56H-5	△	△	20×20	20	150	21	5	17	56-86			
GFD2020R/L17-84H-5	△	△	20×20	20	150	21	5	17	84-158			
GFD2020R/L17-156H-5	△	△	20×20	20	150	21	5	17	156-500			
GFD2525R/L10-35H-5	▲	▲	25×25	25	150	26	5	10	35-45			
GFD2525R/L10-44H-5	▲	▲	25×25	25	150	26	5	10	44-58			
GFD2525R/L17-56H-5	▲	▲	25×25	25	150	26	5	17	56-86			
GFD2525R/L17-84H-5	▲	▲	25×25	25	150	26	5	17	84-158			
GFD2525R/L17-156H-5	▲	▲	25×25	25	150	26	5	17	156-500			
GFD2020R/L10-35H-6	△	△	20×20	20	150	21	6	10	35-50	G□MD6□□-□□		
GFD2020R/L17-48H-6	△	△	20×20	20	150	21	6	17	48-80			
GFD2020R/L17-78H-6	△	△	20×20	20	150	21	6	17	78-168			
GFD2020R/L17-160H-6	△	△	20×20	20	150	21	6	17	160-660			
GFD2525R/L10-35H-6	▲	▲	25×25	25	150	26	6	10	35-50			
GFD2525R/L17-48H-6	▲	▲	25×25	25	150	26	6	17	48-80			
GFD2525R/L17-78H-6	▲	▲	25×25	25	150	26	6	17	78-168			
GFD2525R/L17-160H-6	▲	▲	25×25	25	150	26	6	17	160-660			

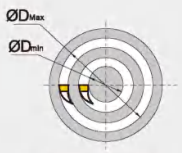
▲Stock available △Make-to-order

End surface grooving and turning tools



RR-type shown





Diameter range of entering



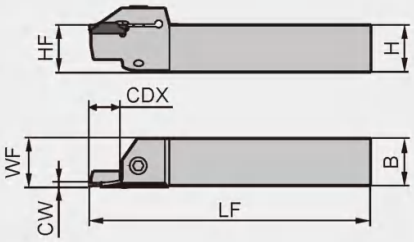
Type	Stock	Basic dimensions(mm)							Applicable inserts	Screw	Wrench
		H×B	HF	LF	WF	CW	CDXmax	ØD (min-max)			
GFD2020RR08-28H-3	△	20×20	20	150	21	3	8	28-35	GMD3--	GB70-85-M6x20	WH50L
GFD2020RR08-34H-3	△	20×20	20	150	21	3	8	34-45			
GFD2020RR08-44H-3	△	20×20	20	150	21	3	8	44-60			
GFD2020RR14-58H-3	△	20×20	20	150	21	3	14	58-80			
GFD2020RR14-78H-3	△	20×20	20	150	21	3	14	78-130			
GFD2020RR14-126H-3	△	20×20	20	150	21	3	14	126-230			
GFD2525RR08-28H-3	△	25×25	25	150	26	3	8	28-35			
GFD2525RR08-34H-3	△	25×25	25	150	26	3	8	34-45			
GFD2525RR08-44H-3	△	25×25	25	150	26	3	8	44-60			
GFD2525RR14-58H-3	△	25×25	25	150	26	3	14	58-80			
GFD2525RR14-78H-3	△	25×25	25	150	26	3	14	78-130			
GFD2525RR14-126H-3	△	25×25	25	150	26	3	14	126-230			
GFD2020RR10-28H-4	△	20×20	20	150	21	4	10	28-35	GMD4--		
GFD2020RR10-34H-4	△	20×20	20	150	21	4	10	34-45			
GFD2020RR10-44H-4	△	20×20	20	150	21	4	10	44-60			
GFD2020RR17-58H-4	△	20×20	20	150	21	4	17	58-80			
GFD2020RR17-78H-4	△	20×20	20	150	21	4	17	78-130			
GFD2020RR17-126H-4	△	20×20	20	150	21	4	17	126-230			
GFD2525RR10-28H-4	△	25×25	25	150	26	4	10	28-35			
GFD2525RR10-34H-4	△	25×25	25	150	26	4	10	34-45			
GFD2525RR10-44H-4	△	25×25	25	150	26	4	10	44-60			
GFD2525RR17-58H-4	△	25×25	25	150	26	4	17	58-80			
GFD2525RR17-78H-4	△	25×25	25	150	26	4	17	78-130			
GFD2525RR17-126H-4	△	25×25	25	150	26	4	17	126-230			
GFD2525RR17-200H-4	△	25×25	25	150	26	4	17	200-480			

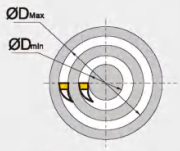
▲Stock available △Make-to-order

End surface grooving and turning tools



RR-type shown





Diameter range of entering



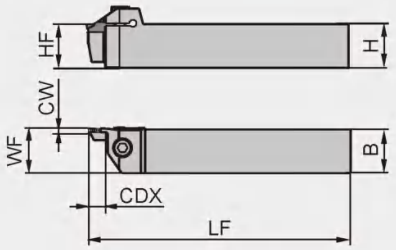
Type	Stock	Basic dimensions(mm)							Applicable inserts	Screw	Wrench
		H×B	HF	LF	WF	CW	CDX_{max}	ØD (min-max)			
GFD2020RR10-35H-5	△	20×20	20	150	21	5	10	35-45	G□MD5□□-□□	GB70-85-M6x20	WH50L
GFD2020RR10-44H-5	△	20×20	20	150	21	5	10	44-58			
GFD2020RR17-56H-5	△	20×20	20	150	21	5	17	56-86			
GFD2020RR17-84H-5	△	20×20	20	150	21	5	17	84-158			
GFD2020RR17-156H-5	△	20×20	20	150	21	5	17	156-500			
GFD2525RR10-35H-5	△	25×25	25	150	26	5	10	35-45			
GFD2525RR10-44H-5	△	25×25	25	150	26	5	10	44-58			
GFD2525RR17-56H-5	△	25×25	25	150	26	5	17	56-86			
GFD2525RR17-84H-5	△	25×25	25	150	26	5	17	84-158			
GFD2525RR17-156H-5	△	25×25	25	150	26	5	17	156-500			
GFD2020RR10-35H-6	△	20×20	20	150	21	6	10	35-50	G□MD6□□-□□		
GFD2020RR17-48H-6	△	20×20	20	150	21	6	17	48-80			
GFD2020RR17-78H-6	△	20×20	20	150	21	6	17	78-168			
GFD2020RR17-160H-6	△	20×20	20	150	21	6	17	160-660			
GFD2525RR10-35H-6	△	25×25	25	150	26	6	10	35-50			
GFD2525RR17-48H-6	△	25×25	25	150	26	6	17	48-80			
GFD2525RR17-78H-6	△	25×25	25	150	26	6	17	78-168			
GFD2525RR17-160H-6	△	25×25	25	150	26	6	17	160-660			

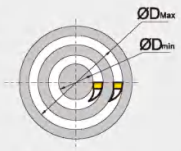
▲Stock available △Make-to-order

End surface grooving and turning tools



LL-type shown





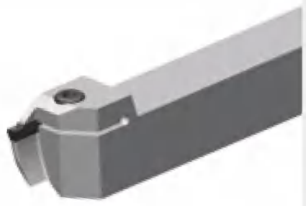
Diameter range of entering



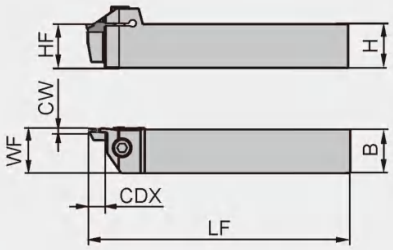
Type	Stock	Basic dimensions(mm)							Applicable inserts	Screw	Wrench
		H×B	HF	LF	WF	CW	CDXmax	ØD (min-max)			
GFD2020LL08-28H-3	△	20×20	20	150	21	3	8	28-35	GDMD3DD-DD	GB70-85-M6x20	WH50L
GFD2020LL08-34H-3	△	20×20	20	150	21	3	8	34-45			
GFD2020LL08-44H-3	△	20×20	20	150	21	3	8	44-60			
GFD2020LL14-58H-3	△	20×20	20	150	21	3	14	58-80			
GFD2020LL14-78H-3	△	20×20	20	150	21	3	14	78-130			
GFD2020LL14-126H-3	△	20×20	20	150	21	3	14	126-230			
GFD2525LL08-28H-3	△	25×25	25	150	26	3	8	28-35			
GFD2525LL08-34H-3	△	25×25	25	150	26	3	8	34-45			
GFD2525LL08-44H-3	△	25×25	25	150	26	3	8	44-60			
GFD2525LL14-58H-3	△	25×25	25	150	26	3	14	58-80			
GFD2525LL14-78H-3	△	25×25	25	150	26	3	14	78-130			
GFD2525LL14-126H-3	△	25×25	25	150	26	3	14	126-230			
GFD2020LL10-28H-4	△	20×20	20	150	21	4	10	28-35	GDMD4DD-DD		
GFD2020LL10-34H-4	△	20×20	20	150	21	4	10	34-45			
GFD2020LL10-44H-4	△	20×20	20	150	21	4	10	44-60			
GFD2020LL17-58H-4	△	20×20	20	150	21	4	17	58-80			
GFD2020LL17-78H-4	△	20×20	20	150	21	4	17	78-130			
GFD2020LL17-126H-4	△	20×20	20	150	21	4	17	126-230			
GFD2525LL10-28H-4	△	25×25	25	150	26	4	10	28-35			
GFD2525LL10-34H-4	△	25×25	25	150	26	4	10	34-45			
GFD2525LL10-44H-4	△	25×25	25	150	26	4	10	44-60			
GFD2525LL17-58H-4	△	25×25	25	150	26	4	17	58-80			
GFD2525LL17-78H-4	△	25×25	25	150	26	4	17	78-130			
GFD2525LL17-126H-4	△	25×25	25	150	26	4	17	126-230			
GFD2525LL17-200H-4	△	25×25	25	150	26	4	17	200-480			

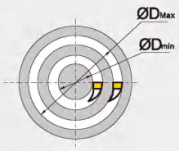
▲Stock available △Make-to-order

End surface grooving and turning tools



LL-type shown





Diameter range of entering



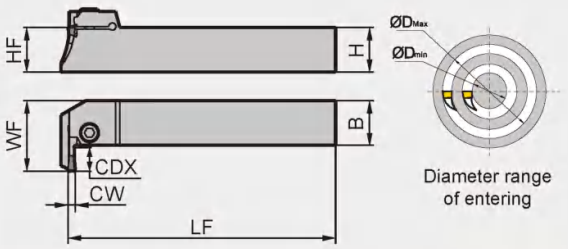
Type	Stock	Basic dimensions(mm)							Applicable inserts	Screw	Wrench
		H×B	HF	LF	WF	CW	CDX_{max}	ØD (min-max)			
GFD2020LL10-35H-5	△	20×20	20	150	21	5	10	35-45	G□MD5□□-□□	GB70-85-M6x20	WH50L
GFD2020LL10-44H-5	△	20×20	20	150	21	5	10	44-58			
GFD2020LL17-56H-5	△	20×20	20	150	21	5	17	56-86			
GFD2020LL17-84H-5	△	20×20	20	150	21	5	17	84-158			
GFD2020LL17-156H-5	△	20×20	20	150	21	5	17	156-500			
GFD2525LL10-35H-5	△	25×25	25	150	26	5	10	35-45			
GFD2525LL10-44H-5	△	25×25	25	150	26	5	10	44-58			
GFD2525LL17-56H-5	△	25×25	25	150	26	5	17	56-86			
GFD2525LL17-84H-5	△	25×25	25	150	26	5	17	84-158			
GFD2525LL17-156H-5	△	25×25	25	150	26	5	17	156-500			
GFD2020LL10-35H-6	△	20×20	20	150	21	6	10	35-50	G□MD6□□-□□		
GFD2020LL17-48H-6	△	20×20	20	150	21	6	17	48-80			
GFD2020LL17-78H-6	△	20×20	20	150	21	6	17	78-168			
GFD2020LL17-160H-6	△	20×20	20	150	21	6	17	160-660			
GFD2525LL10-35H-6	△	25×25	25	150	26	6	10	35-50			
GFD2525LL17-48H-6	△	25×25	25	150	26	6	17	48-80			
GFD2525LL17-78H-6	△	25×25	25	150	26	6	17	78-168			
GFD2525LL17-160H-6	△	25×25	25	150	26	6	17	160-660			

▲Stock available △Make-to-order

L type tools for surface grooving and turning



R-type shown





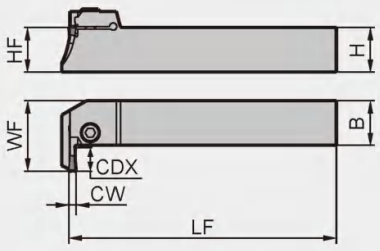
Type	Stock		Basic dimensions(mm)							Applicable inserts	Screw	Wrench
	R	L	H×B	HF	LF	WF	CW	CDXmax	ØD (min-max)			
GFD2020R/L08-28L-3	△	△	20×20	20	150	29	3	8	28-35	G□MD3□□-□□	GB70-85-M6×20	WH50L
GFD2020R/L08-34L-3	△	△	20×20	20	150	29	3	8	34-45			
GFD2020R/L08-44L-3	△	△	20×20	20	150	29	3	8	44-60			
GFD2020R/L14-58L-3	△	△	20×20	20	150	35	3	14	58-80			
GFD2020R/L14-78L-3	△	△	20×20	20	150	35	3	14	78-130			
GFD2020R/L14-126L-3	△	△	20×20	20	150	35	3	14	126-230			
GFD2525R/L08-28L-3	△	△	25×25	25	150	34	3	8	28-35			
GFD2525R/L08-34L-3	△	△	25×25	25	150	34	3	8	34-45			
GFD2525R/L08-44L-3	△	△	25×25	25	150	34	3	8	44-60			
GFD2525R/L14-58L-3	△	△	25×25	25	150	40	3	14	58-80			
GFD2525R/L14-78L-3	△	△	25×25	25	150	40	3	14	78-130			
GFD2525R/L14-126L-3	△	△	25×25	25	150	40	3	14	126-230			
GFD2020R/L10-28L-4	△	△	20×20	20	150	31	4	10	28-35	G□MD4□□-□□		
GFD2020R/L10-34L-4	△	△	20×20	20	150	31	4	10	34-45			
GFD2020R/L10-44L-4	△	△	20×20	20	150	31	4	10	44-60			
GFD2020R/L17-58L-4	△	△	20×20	20	150	38	4	17	58-80			
GFD2020R/L17-78L-4	△	△	20×20	20	150	38	4	17	78-130			
GFD2020R/L17-126L-4	△	△	20×20	20	150	38	4	17	126-230			
GFD2525R/L10-28L-4	△	△	25×25	25	150	36	4	10	28-35			
GFD2525R/L10-34L-4	△	△	25×25	25	150	36	4	10	34-45			
GFD2525R/L10-44L-4	△	△	25×25	25	150	36	4	10	44-60			
GFD2525R/L17-58L-4	△	△	25×25	25	150	43	4	17	58-80			
GFD2525R/L17-78L-4	△	△	25×25	25	150	43	4	17	78-130			
GFD2525R/L17-126L-4	△	△	25×25	25	150	43	4	17	126-230			
GFD2525R/L17-200L-4	△	△	25×25	25	150	43	4	17	200-480			

▲Stock available △Make-to-order

L type tools for surface grooving and turning



R-type shown





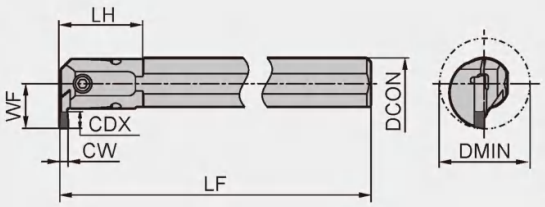
Type	Stock		Basic dimensions(mm)							Applicable inserts	Screw	Wrench
	R	L	H×B	HF	LF	WF	CW	CDX_{max}	ØD (min-max)			
GFD2020R/L10-35L-5	△	△	20×20	20	150	31	5	10	35-45	G□MD5□□-□□	GB70-85-M6×20	WH50L
GFD2020R/L10-44L-5	△	△	20×20	20	150	31	5	10	44-58			
GFD2020R/L17-56L-5	△	△	20×20	20	150	38	5	17	56-86			
GFD2020R/L17-84L-5	△	△	20×20	20	150	38	5	17	84-158			
GFD2020R/L17-156L-5	△	△	20×20	20	150	38	5	17	156-500			
GFD2525R/L10-35L-5	△	△	25×25	25	150	36	5	10	35-45			
GFD2525R/L10-44L-5	△	△	25×25	25	150	43	5	10	44-58			
GFD2525R/L17-56L-5	△	△	25×25	25	150	43	5	17	56-86			
GFD2525R/L17-84L-5	△	△	25×25	25	150	43	5	17	84-158			
GFD2525R/L17-156L-5	△	△	25×25	25	150	43	5	17	156-500			
GFD2020R/L10-35L-6	△	△	20×20	20	150	31	6	10	35-50	G□MD6□□-□□		
GFD2020R/L17-48L-6	△	△	20×20	20	150	38	6	17	48-80			
GFD2020R/L17-78L-6	△	△	20×20	20	150	38	6	17	78-168			
GFD2020R/L17-160L-6	△	△	20×20	20	150	38	6	17	160-660			
GFD2525R/L10-35L-6	△	△	25×25	25	150	36	6	10	35-50			
GFD2525R/L17-48L-6	△	△	25×25	25	150	43	6	17	48-80			
GFD2525R/L17-78L-6	△	△	25×25	25	150	43	6	17	78-168			
GFD2525R/L17-160L-6	△	△	25×25	25	150	43	6	17	160-660			

▲Stock available △Make-to-order

Internal grooving and turning tools



R-type shown





Type	Stock		Basic dimensions(mm)							Applicable inserts	Screw	Wrench
	R	L	CW	DMIN	DCON	LF	LH	WF	CDX			
GID2016R/L04-2.5	▲	▲	2.5	20	16	150	25	12	4	GOMD25OO-OO	I60M5×13	WT20IP
GID2520R/L05-2.5	▲	▲	2.5	25	20	180	30	15	5		GB70-85-M4×12	WH30L
GID3225R/L07-2.5	▲	▲	2.5	32	25	200	40	19.5	7		GB70-85-M5×12	WH40L
GID2016R/L05-3	▲	▲	3.0	20	16	150	25	12	5	GOMD3OO-OO	I60M5×13	WT20IP
GID2520R/L06-3	▲	▲	3.0	25	20	180	30	16	6		GB70-85-M4×12	WH30L
GID3225R/L08-3	▲	▲	3.0	32	25	200	40	20.5	8		GB70-85-M5×12	WH40L
GID2520R/L06-4	▲	▲	4.0	25	20	180	30	16	6	GOMD4OO-OO	GB70-85-M4×12	WH30L
GID3225R/L08-4	▲	▲	4.0	32	25	200	40	20.5	8		GB70-85-M5×12	WH40L
GID4032R/L11-4	▲	▲	4.0	40	32	250	50	27	11		GB70-85-M6×14	WH50L
GID3225R/L08-5	▲	▲	5.0	32	25	200	40	20.5	8	GOMD5OO-OO	GB70-85-M5×12	WH40L
GID4032R/L11-5	▲	▲	5.0	40	32	250	50	27	11		GB70-85-M6×14	WH50L
GID3225R/L08-6	▲	▲	6.0	32	25	200	40	20.5	8	GOMD6OO-OO	GB70-85-M5×12	WH40L
GID4032R/L11-6	▲	▲	6.0	40	32	250	50	27	11		GB70-85-M6×14	WH50L

▲Stock available △Make-to-order

QC series shallow grooving tools code key

● External shallow grooving tools

Cutting direction	
R	Rightward
L	Leftward

Inserts tip height(mm)	
Code	Height
16	16
20	20
25	25

Applicable insert width range(mm)	
15	0.5≤S<1.8(QC16□□□) 1.0≤S<2.3(QC22□□□)
25	1.8≤S<3.0(QC16□□□) 2.3≤S<3.3(QC22□□□)
35	3.3≤S≤4.8

GQC R 20 20 K 22 - 15

External shallow grooving tools

Toolholder shank width(mm)	
Code	Width
16	16
20	20
25	25

Toolholder shank length(mm)	
Code	Length
K	125
M	150

Cutting edge length code	Inner tangent circle diameter(mm)
11	6.35
16	9.525
22	12.70

● Internal shallow grooving tools

Toolholder type	
Code	Type
S	Steel shank
C	Carbide shank
A	Steel shank + internal cooling

Toolholder shank length(mm)	
Code	Length
H	100
K	125
M	150

Cutting edge length code	Inner tangent circle diameter(mm)
11	6.35
16	9.525
22	12.70

Cutting direction	
R	Rightward
L	Leftward

S 20 K - QC 16 15 R 25

Shank diameter(mm)	
Code	Diameter
16	16
20	20
25	25

Shallow grooving

Applicable insert width range(mm)	
15	0.5≤S<1.8(QC11□□□ / QC16□□□) 1.0≤S<2.3(QC22□□□)
25	1.8≤S<3.0(QC11□□□ / QC16□□□) 2.3≤S<3.3(QC22□□□)
35	3.3≤S≤4.8

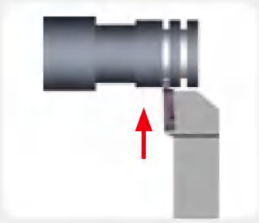
Minimum processing diameter(mm)	
Code	Diameter
16	16
20	20
25	25
35	35

External shallow grooving tools



R-type shown. The right (R) holder is fitted with a right (R) insert, and the left (L) holder is fitted with a left (L) insert.





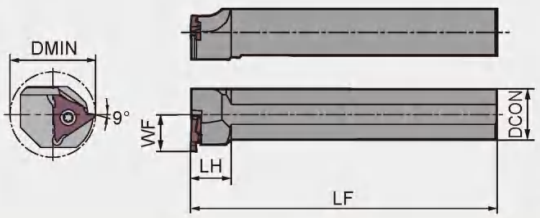
Type		Stock	Basic dimensions(mm)						Width (mm)	Applicable inserts	Screw	Wrench
			H	HF	B	WF	LH	LF				
GQCR/L	1616K16-15	▲	16	16	16	21	25.5	125	1.1-1.8	QC16R/L 110~180	I60M3.5×10	WT15IP
	2020K16-15	▲	20	20	20	25		125				
	2525M16-15	▲	25	25	25	30		150				
	1616K16-25	▲	16	16	16	21		125	1.8-3.0	QC16R/L 180~300		
	2020K16-25	▲	20	20	20	25		125				
	2525M16-25	▲	25	25	25	30		150				
	2020K22-15	▲	20	20	20	25		125	1.0-2.3	QC22R/L 100~230	I60M5×13	WT20IP
	2525M22-15	▲	25	25	25	30		150				
	2020K22-25	▲	20	20	20	25		125	2.3-3.3	QC22R/L 230~330		
	2525M22-25	▲	25	25	25	30		150				
	2020K22-35	▲	20	20	20	25		125	3.3-4.8	QC22R/L 330~480		
	2525M22-35	▲	25	25	25	30		150				

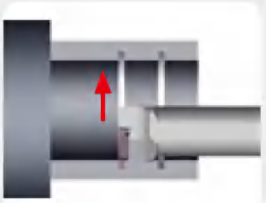
▲Stock available △Make-to-order

Internal shallow grooving tools



L-type shown. The right (R) holder is fitted with a right (R) insert, and the left (L) holder is fitted with a left (L) insert.



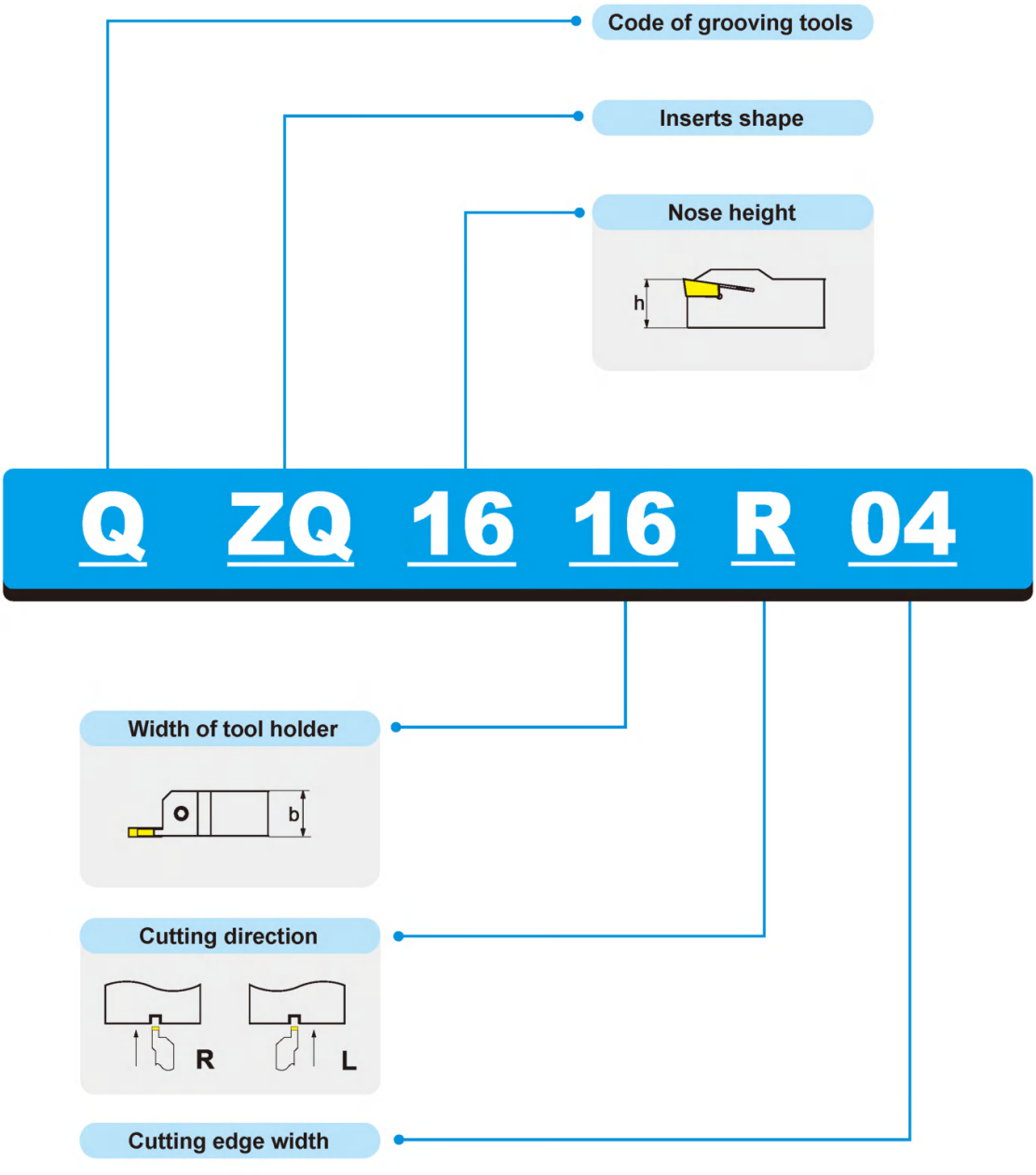


Type	Stock	Basic dimensions(mm)					Width (mm)	Applicable inserts	Screw	Wrench
		DMIN	DCON	WF	LH	LF				
S20K-QC1115R/L 16	▲	16	20	11.1	40	125	1.2-1.8	QC11R/L 120~180	I60M2.5×6.5	WT07IP
S20K-QC1125R/L 16	▲	16	20	11.1	40	125	1.8-3.0	QC11R/L180~300		
S16H-QC1115R/L 20	▲	21	16	11.5	12	100	1.2-1.8	QC11R/L 120~180		
S16H-QC1125R/L 20	▲	21	16	11.5	12	100	1.8-3.0	QC11R/L180~300		
S20M-QC1615R/L 25	▲	26	20	12.5	15	150	1.1-1.8	QC16R/L110~180	I60M3.5×10	WT15IP
S20M-QC1625R/L 25	▲			12.5			1.8-3.0	QC16R/L180~300		
S25M-QC2215R/L 35	▲	35	25	18.2			1.0-2.3	QC22R/L100~230	I60M5×13	WT20IP
S25M-QC2225R/L 35	▲			18.2	20		2.3-3.3	QC22R/L230~330		
S25M-QC2235R/L 35	▲			18.2	20		3.3-4.8	QC22R/L 330~480		

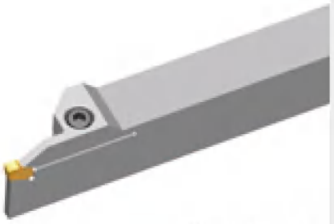
▲Stock available △Make-to-order

Parting and grooving tools code key

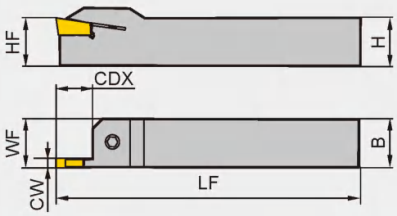
● External grooving



External parting and grooving tools: QZQ series



R-type shown



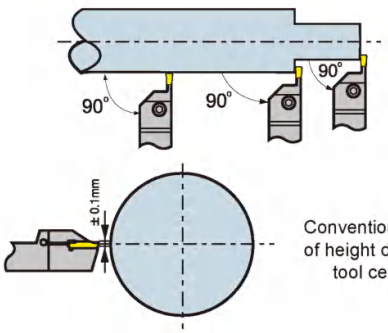


Type		Stock		Basic dimensions(mm)							Applicable inserts	Screw	Wrench
		R	L	H	HF	B	LF	WF	CW	CDX max			
QZQ	1616R/L03	▲	▲	16	16	16	100	16.4	3	16	ZQMX3N11-IE	GB70-85-M5×16	WH40L
	1616R/L04	▲	▲	16	16	16	100	16.4	4	18	ZQMX4N11-IE		
	2020R/L03	▲	▲	20	20	20	125	20.4	3	20	ZQMX3N11-IE	GB70-85-M6×20	WH50L
	2020R/L04	▲	▲	20	20	20	125	20.4	4	20	ZQMX4N11-IE		
	2525R/L03	▲	▲	25	25	25	150	25.4	3	20	ZQMX3N11-IE		
	2525R/L04	▲	▲	25	25	25	150	25.4	4	20	ZQMX4N11-IE		
	2525R/L05	▲	▲	25	25	25	150	25.4	5	25	ZQMX5N11-IE		
	2525R/L06	▲	▲	25	25	25	150	25.7	6	32	ZQMX6N11-IE		
	3225R/L03	▲	▲	32	32	25	170	25.4	3	25	ZQMX3N11-IE		
	3225R/L04	▲	▲	32	32	25	170	25.4	4	25	ZQMX4N11-IE		
	3225R/L05	▲	▲	32	32	25	170	25.4	5	25	ZQMX5N11-IE		
	3225R/L06	▲	▲	32	32	25	170	25.7	6	35	ZQMX6N11-IE		

▲Stock available △Make-to-order

Center height control of parting and grooving tools

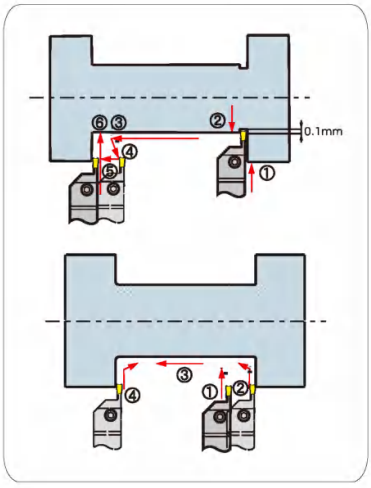
- No matter which parting or grooving tools you select, the ideal surface quality is only achieved by ensuring that insert is vertical from the center line of workpiece, which can also effectively reduce vibration during machining.
- The height tolerance between insert edge bottom and the center height of workpiece should be remained in ±0.1mm, especially for lever parting and grooving workpieces with small diameter. This can improve tool life, reduce cutting resistant force, and diminish burrs.



Conventional diagram of height difference of tool center line

Parting

- When the insert is approaching the center of workpiece, the feed speed should be reduced by 30%, which is good for improving life and surface quality.
- As long as conditions allow, try to shorten the overhang of tools as much as possible to ensure good stability.

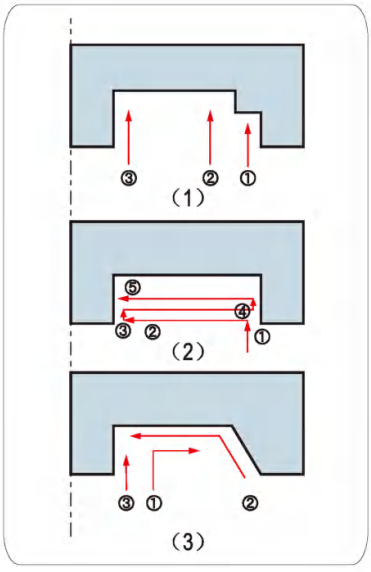


External grooving, turning and profiling

- In-feed sequence: When cutting depth>0.5mm, radial in-feed (Max. cutting depth can be 0.75×insert edge width S) → radial out-feed about 0.1mm → axial in-feed →flank out-feed → axial in-feed → radial machining to required depth.
- When finishing, adopt the sequence shown in the diagram. It can reduce vibration caused by the friction between tools and chips.

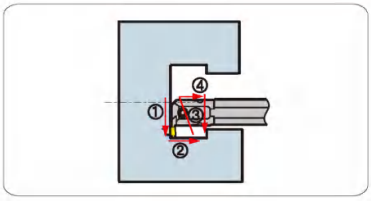
Surface grooving and turning

- Finishing (Multi-slot cutting)
  Cut inwards from Max. diameter. Inserts offset to inward flange when retracting, as is shown in diagram (1).
- Recess turning
  Axial turning depth should not exceed 0.75×S (cutting edge width).
  If slot width is larger than slot depth, it is recommended to adopt recess turning, as is shown in diagram (2).
  If slot depth is larger than slot depth, it is recommended to adopt multi-slot cutting.
- Finish machining
  First finish bottom and external diameter fringe, then finish the internal diameter to required size, as is shown in diagram (3).



Internal grooving and turning

- To facilitate chip flow, always feed along the direction of moving from the deepest in the hole to outside.



Recommended cutting parameters for parting and grooving

Insert size	Recommended feed rate(mm/r)					
Insert width(mm)	Parting	Grooving	Grooving(-MM)	Turning	Turning(-MM)	Profiling
2.5	0.05-0.15	0.05-0.15	0.05-0.2	0.05-0.15	0.05-0.2	0.05-0.15
3	0.05-0.15	0.05-0.15	0.05-0.2	0.07-0.15	0.07-0.2	0.1-0.2
4	0.05-0.2	0.05-0.2	0.05-0.25	0.07-0.25	0.07-0.3	0.1-0.2
5	0.07-0.2	0.07-0.22	0.07-0.25	0.1-0.25	0.1-0.3	0.15-0.3
6	0.1-0.3	0.07-0.25	0.07-0.3	0.1-0.3	0.1-0.35	0.15-0.3
8			0.1-0.4		0.15-0.45	

Workpiece material		Hardness	YBG302	YBG202 YBG205	YBG105	YBG212	YBC151	YBC251	YBS103	YD101	YD201	YBG102	YC10	YC40
P	Carbon steel	125≤HB≤170	120-260	150-280			140-280	150-280					130-280	110-260
	Low alloy steel	180≤HB≤275	80-175	110-200			100-240	110-200					90-200	70-175
	High alloy steel	180≤HB≤325	80-160	110-190			100-220	110-190					90-190	70-160
	Cast steel	180≤HB≤250	75-140	100-170			80-160	100-170					80-170	60-140
M	Ferrite, Martensite	200≤HB≤300	70-170	100-200				100-200					80-200	60-170
	Austenite	180≤HB≤300	80-200	110-220				110-220					90-220	70-200
K	Malleable cast iron	130≤HB≤230	100-200	130-220							90-160			
	Grey cast iron	180≤HB≤220	90-170	120-200							80-140			
	Nodular cast iron	160≤HB≤250	80-150	110-180							60-140			
N	Al alloy	--								200-400				
S	Super alloy	≤400			40-70	20-50			30-80	20-50		30-60		

The cutting parameters recommended are suitable for wet machining.
Advice: For internal machining and endface machining, the cutting speed should be reduced by 30%-40%.

●Recommended cutting parameters for QC series shallow groove tools

Processed material	Recommended insert material (cutting speed m/min)		A: Tool feed for grooving(mm/r)				
	PVD Coating		B: Tool feed for horizontal processing(mm/r)				
	YBG202	YBG205	C: Depth of cut for horizontal processing(mm)				
			QC**R/L050-120	QC**R/L125-225	QC**R/L230-325	QC**R/L330-400	QC**R/L400-480
Carbon Steel	80-180	80-180	A: 0.03-0.08	A: 0.04-0.09	A: 0.05-0.1	A: 0.05-0.12	A: 0.05-0.12
			Non-horizontal processing	B: 0.04-0.09	B: 0.05-0.1	B: 0.05-0.1	B: 0.05-1
			Non-horizontal processing	C: 0.3(MAX)	C: 0.5(MAX)	C: 0.5(MAX)	C: 0.8(MAX)
Alloy Steel	80-160	80-160	A: 0.03-0.07	A: 0.04-0.08	A: 0.05-0.09	A: 0.05-0.1	A: 0.05-0.1
			Non-horizontal processing	B: 0.04-0.08	B: 0.05-0.09	B: 0.05-0.1	B: 0.05-1
			Non-horizontal processing	C: 0.3(MAX)	C: 0.5(MAX)	C: 0.5(MAX)	C: 0.5(MAX)
Stainless Steel	60-130	60-130	A: 0.03-0.07	A: 0.04-0.08	A: 0.05-0.09	A: 0.05-0.1	A: 0.05-0.1
			Non-horizontal processing	B: 0.04-0.08	B: 0.05-0.09	B: 0.05-0.1	B: 0.05-1
			Non-horizontal processing	C: 0.3(MAX)	C: 0.5(MAX)	C: 0.5(MAX)	C: 0.5(MAX)

The cutting parameters above are applicable to external grooving. When machining internal grooves, please reduce the cutting speed and feed by 10%.



Threading insert

Fully ground high precision inserts realize high quality, high precision threading for a variety of materials e.g. steel, stainless steel, difficult-to-machine materials.

How to select threading tools

Structure of threading tools selected table

- Categorized as external threading and internal threading according to machining type.
- Separately listed out according to series.

Dimensions of product

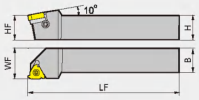
Indicating external threading or internal threading

Threading insert type
Including type, standard, tolerance class

Diagram of thread pitch

External threading tools





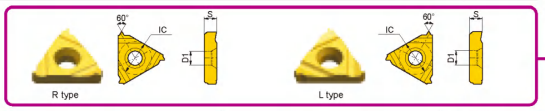
Type		Stock	Basic dimensions(mm)					Applicable inserts	Inserts screw	Shim	Shim screw	Wrench
			H	HF	B	LF	WF					
ZSER	1616H16	▲	16	16	16	100	20	Z16ER□□□□	I60 M3.5X12TT	MT16-□□MN	SM4X8C	WT10IP
	2020K16	▲	20	20	20	125	25					
	2525M16	▲	25	25	25	150	32					
	3225P16	▲	32	32	25	170	32					
	3232P16	▲	32	32	32	170	40					
	2525M22	▲	25	25	25	150	32	Z22ER□□□□	I60 M4X15X	MT22-□□MN	SM5X8.5	WT15IP
	3225P22	▲	32	32	25	170	32					
	3232P22	▲	32	32	32	170	40					
	4040S22	△	40	40	40	250	50					
ZSEL	1616H16	▲	16	16	16	100	20	Z16EL□□□□	I60 M3.5X12TT	MT16-□□MN	SM4X8C	WT10IP
	2020K16	▲	20	20	20	125	25					
	2525M16	▲	25	25	25	150	32					
	3225P16	▲	32	32	25	170	32					
	3232P16	▲	32	32	32	170	40					
	2525M22	▲	25	25	25	150	32	Z22EL□□□□	I60 M4X15X	MT22-□□MN	SM5X8.5	WT15IP
	3225P22	▲	32	32	25	170	32					
	3232P22	▲	32	32	32	170	40					
	4040S22	△	40	40	40	250	50					

▲Stock available △Make-to-order

ISO metric thread (with end)

ISO 965-1980 DIN 13
GB/T 197-2003 Tolerance class: 6g/6H





	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch	S	IC	D1	YBG203	YBG205
External thread	Z16ER0.5ISO	Z16EL0.5ISO	0.50	3.52	9.525	4.0	★	○
	Z16ER0.75ISO	Z16EL0.75ISO	0.75	3.52	9.525	4.0	★	○
	Z16ER1.0ISO	Z16EL1.0ISO	1.00	3.52	9.525	4.0	★	○
	Z16ER1.25ISO	Z16EL1.25ISO	1.25	3.52	9.525	4.0	★	○
	Z16ER1.5ISO	Z16EL1.5ISO	1.50	3.52	9.525	4.0	★	○
	Z16ER1.75ISO	Z16EL1.75ISO	1.75	3.52	9.525	4.0	★	○
	Z16ER2.0ISO	Z16EL2.0ISO	2.00	3.52	9.525	4.0	★	○
	Z16ER2.5ISO	Z16EL2.5ISO	2.50	3.52	9.525	4.0	★	○
	Z16ER3.0ISO	Z16EL3.0ISO	3.00	3.52	9.525	4.0	★	○
	Z22ER3.5ISO	Z22EL3.5ISO	3.50	4.65	12.7	5.0	★	○
	Z22ER4.0ISO	Z22EL4.0ISO	4.00	4.65	12.7	5.0	★	○
	Z22ER4.5ISO	Z22EL4.5ISO	4.50	4.65	12.7	5.0	★	○
	Z22ER5.0ISO	Z22EL5.0ISO	5.00	4.65	12.7	5.0	★	○
	Z22ER5.5ISO	Z22EL5.5ISO	5.50	4.65	12.7	5.0	★	○
	Z22ER6.0ISO	Z22EL6.0ISO	6.00	4.65	12.7	5.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Product specification
Including type (right hand and left hand), basic dimensions, applicable inserts, spare parts

Product specification
Including type (right hand and left hand), basic dimensions, stock

Dimension diagram of insert



TURNING A

Threading tools

Threading tools overview A288-A291

Introduction on threading insert grade and chipbreaker A292

Threading inserts A293-A306

Threading inserts code key A293
ISO metric thread A294-A295
General pitch thread A296
Whitworth thread A297
Unified thread A298
British taper pipe thread A299
American taper pipe thread A300
ISO metric thread(PP chipbreaker) A301
General pitch thread(PP chipbreaker) A302
Whitworth thread(PP chipbreaker) A303
Unified thread(PP chipbreaker) A304
British taper pipe thread(PP chipbreaker) A305
American taper pipe thread(PP chipbreaker) A306

Threading tools A307-A309

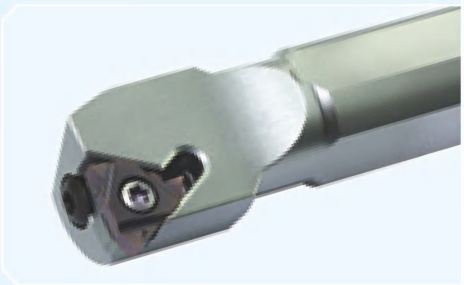
Threading tools code key A307
External threading tools A308
Internal threading tools A309

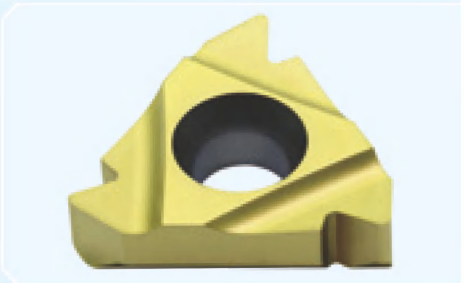
Thick threading inserts A310-A320

Thick threading inserts code key A310
ISO metric thread A311-A312
General pitch thread A313
Whitworth thread A314
Unified thread A315
British taper pipe thread A316
American taper pipe thread A317
Thick threading insert tools code key A318
External threading tools A319
Internal threading tools A320

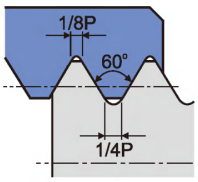
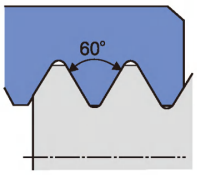
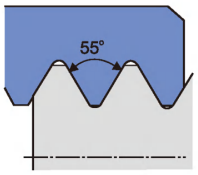
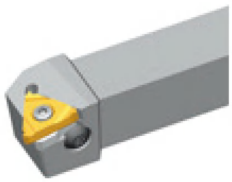
Application information for threading A321-A331

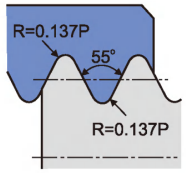
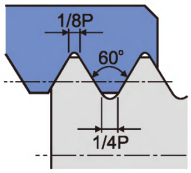
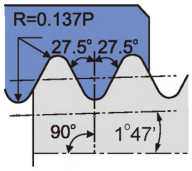
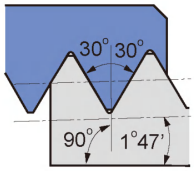




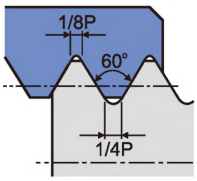
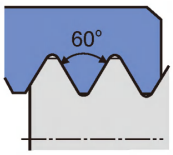
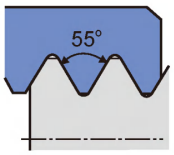
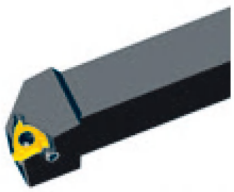


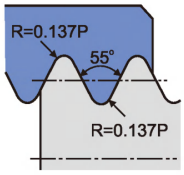
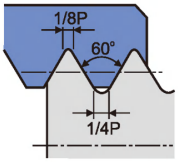
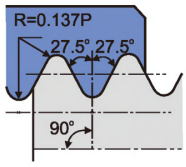
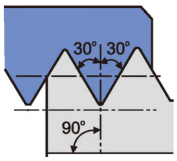
Threading tools overview

Applications		For general use					
Legend of thread profile							
Thread name		ISO metric thread With end		General pitch thread Without end		General pitch thread Without end	
Thread profile		**ISO**		**60**		**55**	
Picture of insert (length: 11, 16, 22mm)		R style shown  A294 A301		R style shown  A296 A302		R style shown  A396 A302	
Pitch / Tool holder	Dimensions (mm) (H×W×L) (Dia×L×Min. dia)	Pitch/mm		Pitch/mm (pitch/Inch)		Pitch/mm (pitch/Inch)	
External thread	 R-type shown A308	16×16×100 20×20×125 25×25×150 32×25×170 32×32×170 40×40×250	0.5~6.0	1.0~3.0	0.5~5.0 (5~48)	0.5~5.0 (5~48)	0.5~5.0 (5~48)	0.5~5.0 (5~48)
Internal thread	 R-type shown A309	16×125×12 16×150×16 16×150×20 20×150×25 20×180×25 25×150×32 32×200×40 32×250×40 40×300×50 50×350×63	0.5~6.0	1.0~3.0	0.5~5.0 (5~48)	0.5~5.0 (5~48)	0.5~5.0 (5~48)	0.5~5.0 (5~48)

For general use		For aerospace industry		Heater, gas and water pipe thread		For gas and water faucet and pipe connection	
							
Whitworth thread		Unified thread (American standard threads)		British taper pipe thread		American taper pipe thread	
W		**UN**		**BSPT**		**NPT**	
R style shown		R style shown		R style shown		R style shown	
							
A297	A303	A298	A304	A299	A305	A300	A306
Pitch/mm (pitch/Inch)		Pitch/mm (pitch/Inch)		Pitch/mm (pitch/Inch)		Pitch/mm (pitch/Inch)	
8~19	11~19	8~24	12~16	11~28	11~19	8~27	11.5~18
8~19	11~19	8~24	12~16	11~28	11~19	8~27	11.5~18

Threading tools overview

Applications		For general use		
Legend of thread profile				
Thread name		ISO metric thread With end	General pitch thread Without end	General pitch thread Without end
Thread profile		**GM**	**60**	**55**
Picture of insert (length: 11, 16, 22mm)		R style shown  A311	R style shown  A313	R style shown  A313
Tool holder \ Pitch	Dimensions (mm) (H×W×L) (Dia×L×Min. dia)	Pitch/mm	Pitch/mm (pitch/Inch)	Pitch/mm (pitch/Inch)
External thread	 R-type shown A319	16×16×100 20×20×125 25×25×150 32×25×170 32×32×170 40×40×250	0.5~6.0	0.5~5.0 (5~48)	0.5~5.0 (5~48)
Internal thread	 R-type shown A320	16×125×12 16×150×16 16×150×20 20×150×25 20×180×25 25×150×32 32×200×40 32×250×40 40×300×50 50×350×63	0.5~6.0	0.5~5.0 (5~48)	0.5~5.0 (5~48)

For general use	For aerospace industry	Heater, gas and water pipe thread	For gas and water faucet and pipe connection
			
Whitworth thread	Unified thread (American standard threads)	British taper pipe thread	American taper pipe thread
W	**UN**	**BSPT**	**NPT**
R style shown  A314	R style shown  A315	R style shown  A316	R style shown  A317
Pitch/mm (pitch/Inch)	Pitch/mm (pitch/Inch)	Pitch/mm (pitch/Inch)	Pitch/mm (pitch/Inch)
8~16	8~20	11~28	8~27
8~16	8~20	11~28	8~27

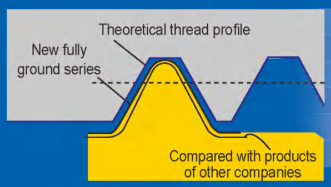
YBG203

New nano coating grade

suitable for threading in a variety of materials

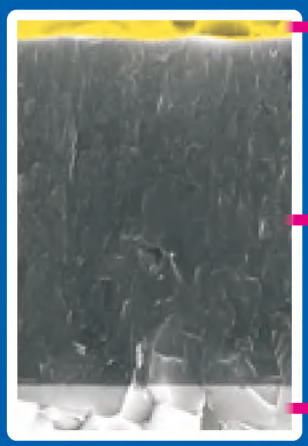


- **Specially treated edge for superior surface quality**
- **Sharp nose with small cutting resistance and superior performance**
- **Full ground inserts with high dimensional precision for high quality threading**



Thread type	Grade of tolerance
ISO metric thread	6g/6H
Whitworth thread W	Medium Class A
British taper pipe thread	Standard BSPT
Unified thread	2A/2B
American taper pipe thread	Standard NPT

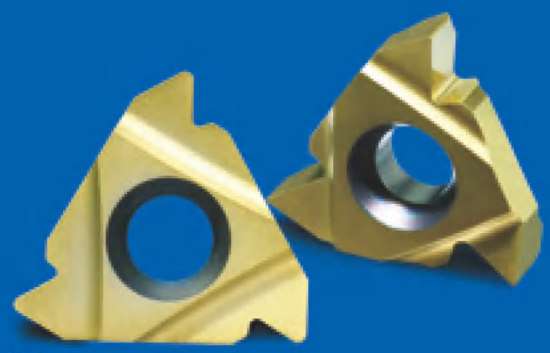
- **New nano coating grade specially designed for threading with longer insert life**



Advanced surface treatment techniques effectively reduce friction and allows for better wear observation.

Advanced TiAlN substrate nano coating, in combination with proper coating ingredients, improves the mechanical and thermal properties of coating.

Further optimizing coating structre, improving coating stress, enhancing bond strength of coating and substrate.



Case:

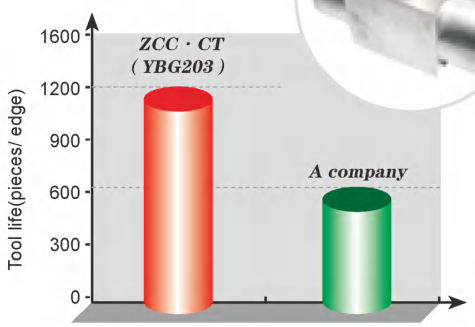
Workpiece material: 42CrMo(HB260)

Insert: Z16ER2.0ISO/YBG203

Thread pitch: p=2.0mm

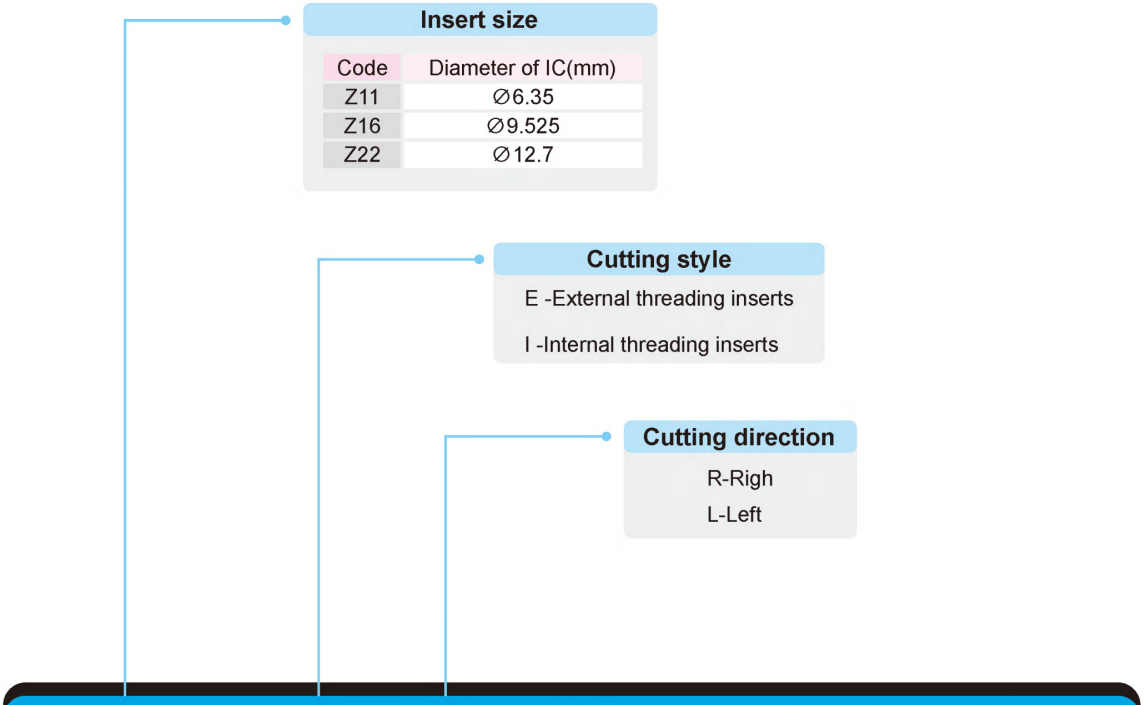
Cutting data: Vc=120 m/min





84% tool life improvement of ZCC·CT product than that of company A under the same cutting condition.

Threading inserts code key



Insert size

Code	Diameter of IC(mm)
Z11	∅6.35
Z16	∅9.525
Z22	∅12.7

Cutting style

E -External threading inserts

I -Internal threading inserts

Cutting direction

R-Righ

L-Left

Thread pitch

Full profile (Range of Thread pitch is indicated by numbers).

mm	TPI
0.5-6.0	48-5

V profile (Range of Thread pitch is indicated by letters).

	mm	TPI
A	0.5-1.5	48-16
AG	0.5-3.0	48-8
G	1.75-3.0	14-8
N	3.5-5.0	7-5

Thread specification	Range of thread pitch
ISO metric thread	0.5-6.0
General pitch thread	0.5-5.0
Whitworth thread W	8-19
British taper pipe thread	11-28
Unified thread	8-24
American taper pipe thread	8-27

Thread profile

ISO—ISO metric 60° thread

60—60° general pitch thread

55—55° general pitch thread

W—Whitworth thread

UN—Unified thread(American standard threads)

BSPT—British taper pipe thread

NPT—American taper pipe thread

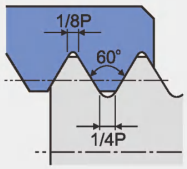
Chip breaker

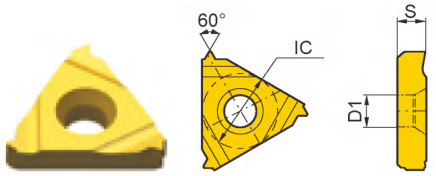
□-fully ground edge insert

PP –3-Dimensional chip-breaking insert

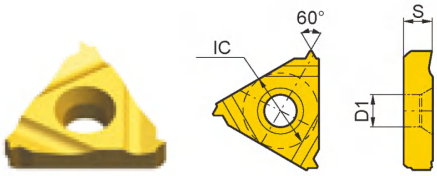
ISO metric thread (with end)

ISO 965-1980 DIN 13
GB/T 197-2003 Tolerance class: 6g/6H





R type



L type

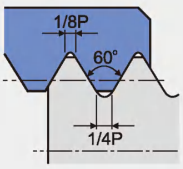
	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch	S	IC	D1	YBG203	YBG205
External thread	**Z16ER0.5ISO**	**Z16EL0.5ISO**	0.50	3.52	9.525	4.0	★	○
	Z16ER0.75ISO	**Z16EL0.75ISO**	0.75	3.52	9.525	4.0	★	○
	Z16ER1.0ISO	**Z16EL1.0ISO**	1.00	3.52	9.525	4.0	★	○
	Z16ER1.25ISO	**Z16EL1.25ISO**	1.25	3.52	9.525	4.0	★	○
	Z16ER1.5ISO	**Z16EL1.5ISO**	1.50	3.52	9.525	4.0	★	○
	Z16ER1.75ISO	**Z16EL1.75ISO**	1.75	3.52	9.525	4.0	★	○
	Z16ER2.0ISO	**Z16EL2.0ISO**	2.00	3.52	9.525	4.0	★	○
	Z16ER2.5ISO	**Z16EL2.5ISO**	2.50	3.52	9.525	4.0	★	○
	Z16ER3.0ISO	**Z16EL3.0ISO**	3.00	3.52	9.525	4.0	★	○
	Z22ER3.5ISO	**Z22EL3.5ISO**	3.50	4.65	12.7	5.0	★	○
	Z22ER4.0ISO	**Z22EL4.0ISO**	4.00	4.65	12.7	5.0	★	○
	Z22ER4.5ISO	**Z22EL4.5ISO**	4.50	4.65	12.7	5.0	★	○
	Z22ER5.0ISO	**Z22EL5.0ISO**	5.00	4.65	12.7	5.0	★	○
	Z22ER5.5ISO	**Z22EL5.5ISO**	5.50	4.65	12.7	5.0	★	○
	Z22ER6.0ISO	**Z22EL6.0ISO**	6.00	4.65	12.7	5.0	★	○

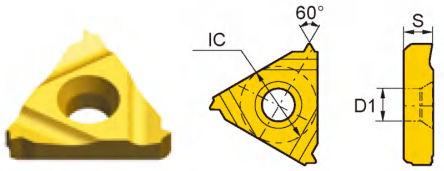
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



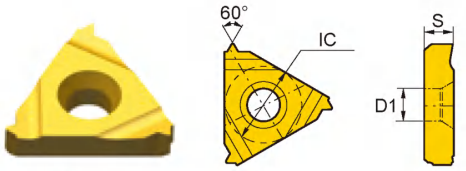
ISO metric thread (with end)

ISO 965-1980 DIN 13
GB/T 197-2003 Tolerance class: 6g/6H





R type

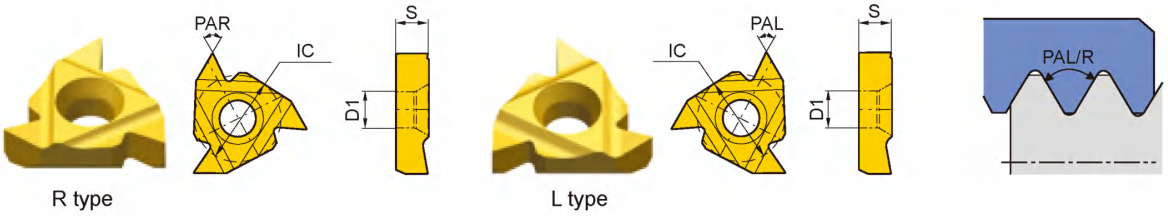


L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch	S	IC	D1	YBG203	YBG205
Internal thread	**Z11IR0.5ISO**	**Z11IL0.5ISO**	0.50	3.05	6.35	3.2	★	○
	Z11IR0.75ISO	**Z11IL0.75ISO**	0.75	3.05	6.35	3.2	★	○
	Z11IR1.0ISO	**Z11IL1.0ISO**	1.00	3.05	6.35	3.2	★	○
	Z11IR1.25ISO	**Z11IL1.25ISO**	1.25	3.05	6.35	3.2	★	○
	Z11IR1.5ISO	**Z11IL1.5ISO**	1.50	3.05	6.35	3.2	★	○
	Z11IR1.75ISO	**Z11IL1.75ISO**	1.75	3.05	6.35	3.2	★	○
	Z11IR2.0ISO	**Z11IL2.0ISO**	2.00	3.05	6.35	3.2	★	○
	Z16IR0.5ISO	**Z16IL0.5ISO**	0.50	3.52	9.525	4.0	★	○
	Z16IR0.75ISO	**Z16IL0.75ISO**	0.75	3.52	9.525	4.0	★	○
	Z16IR1.0ISO	**Z16IL1.0ISO**	1.00	3.52	9.525	4.0	★	○
	Z16IR1.25ISO	**Z16IL1.25ISO**	1.25	3.52	9.525	4.0	★	○
	Z16IR1.5ISO	**Z16IL1.5ISO**	1.50	3.52	9.525	4.0	★	○
	Z16IR1.75ISO	**Z16IL1.75ISO**	1.75	3.52	9.525	4.0	★	○
	Z16IR2.0ISO	**Z16IL2.0ISO**	2.00	3.52	9.525	4.0	★	○
	Z16IR2.5ISO	**Z16IL2.5ISO**	2.50	3.52	9.525	4.0	★	○
	Z16IR3.0ISO	**Z16IL3.0ISO**	3.00	3.52	9.525	4.0	★	○
	Z22IR3.5ISO	**Z22IL3.5ISO**	3.50	4.65	12.7	5.0	★	○
	Z22IR4.0ISO	**Z22IL4.0ISO**	4.00	4.65	12.7	5.0	★	○
	Z22IR4.5ISO	**Z22IL4.5ISO**	4.50	4.65	12.7	5.0	★	○
	Z22IR5.0ISO	**Z22IL5.0ISO**	5.00	4.65	12.7	5.0	★	○
	Z22IR5.5ISO	**Z22IL5.5ISO**	5.50	4.65	12.7	5.0	★	○
	Z22IR6.0ISO	**Z22IL6.0ISO**	6.00	4.65	12.7	5.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

General pitch thread (without end)



R type L type

		Type		Basic dimensions(mm)					Recommended coating grade	
		The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	IC	D1	PAL/R	YBG203	YBG205
External thread	55°	**Z16ERA55**	**Z16ELA55**	0.5-1.5(48-16)	3.52	9.525	4.0	55°	★	○
		Z16ERG55	**Z16ELG55**	1.75-3.0(14-8)	3.52	9.525	4.0	55°	★	○
		Z16ERAG55	**Z16ELAG55**	0.5-3.0(48-8)	3.52	9.525	4.0	55°	★	○
		Z22ERN55	**Z22ELN55**	3.5-5.0(7-5)	4.65	12.7	5.0	55°	★	○
	60°	**Z16ERA60**	**Z16ELA60**	0.5-1.5(48-16)	3.52	9.525	4.0	60°	★	○
		Z16ERG60	**Z16ELG60**	1.75-3.0(14-8)	3.52	9.525	4.0	60°	★	○
		Z16ERAG60	**Z16ELAG60**	0.5-3.0(48-8)	3.52	9.525	4.0	60°	★	○
		Z22ERN60	**Z22ELN60**	3.5-5.0(7-5)	4.65	12.7	5.0	60°	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



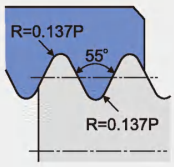
R type L type

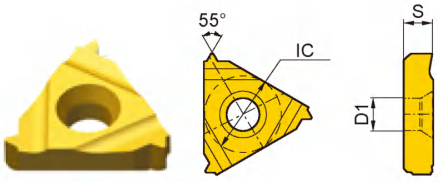
		Type		Basic dimensions(mm)					Recommended coating grade	
		The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	IC	D1	PAL/R	YBG203	YBG205
Internal thread	55°	**Z11IRA55**	**Z11ILA55**	0.5-1.5(48-16)	3.05	6.35	3.2	55°	★	○
		Z16IRA55	**Z16ILA55**	0.5-1.5(48-16)	3.52	9.525	4.0	55°	★	○
		Z16IRG55	**Z16ILG55**	1.75-3.0(14-8)	3.52	9.525	4.0	55°	★	○
		Z16IRAG55	**Z16ILAG55**	0.5-3.0(48-8)	3.52	9.525	4.0	55°	★	○
		Z22IRN55	**Z22ILN55**	3.5-5.0(7-5)	4.65	12.7	5.0	55°	★	○
	60°	**Z11IRA60**	**Z11ILA60**	0.5-1.5(48-16)	3.05	6.35	3.2	60°	★	○
		Z16IRA60	**Z16ILA60**	0.5-1.5(48-16)	3.52	9.525	4.0	60°	★	○
		Z16IRG60	**Z16ILG60**	1.75-3.0(14-8)	3.52	9.525	4.0	60°	★	○
		Z16IRAG60	**Z16ILAG60**	0.5-3.0(48-8)	3.52	9.525	4.0	60°	★	○
		Z22IRN60	**Z22ILN60**	3.5-5.0(7-5)	4.65	12.7	5.0	60°	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

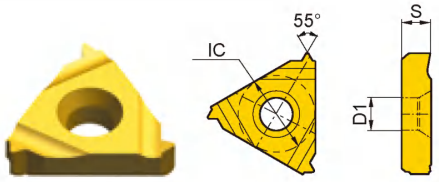
Whitworth thread (with end)

ISO 228/1:1982,
DIN 259, B.S.84:1956
Tolerance class: Medium class A





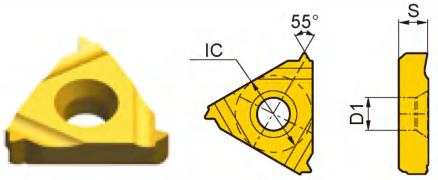
R type



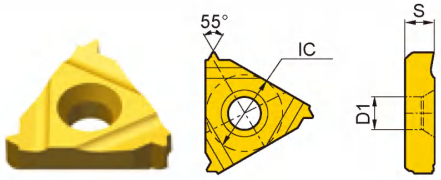
L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YBG203	YBG205
External thread	**Z16ER8W**	**Z16EL8W**	8	3.52	9.525	4.0	★	○
	Z16ER9W	**Z16EL9W**	9	3.52	9.525	4.0	★	○
	Z16ER10W	**Z16EL10W**	10	3.52	9.525	4.0	★	○
	Z16ER11W	**Z16EL11W**	11	3.52	9.525	4.0	★	○
	Z16ER12W	**Z16EL12W**	12	3.52	9.525	4.0	★	○
	Z16ER14W	**Z16EL14W**	14	3.52	9.525	4.0	★	○
	Z16ER16W	**Z16EL16W**	16	3.52	9.525	4.0	★	○
	Z16ER18W	**Z16EL18W**	18	3.52	9.525	4.0	★	○
	Z16ER19W	**Z16EL19W**	19	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



R type



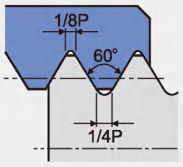
L type

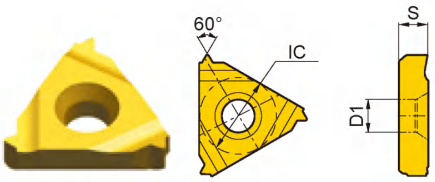
	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YBG203	YBG205
Internal thread	**Z16IR8W**	**Z16IL8W**	8	3.52	9.525	4.0	★	○
	Z16IR9W	**Z16IL9W**	9	3.52	9.525	4.0	★	○
	Z16IR10W	**Z16IL10W**	10	3.52	9.525	4.0	★	○
	Z16IR11W	**Z16IL11W**	11	3.52	9.525	4.0	★	○
	Z16IR12W	**Z16IL12W**	12	3.52	9.525	4.0	★	○
	Z16IR14W	**Z16IL14W**	14	3.52	9.525	4.0	★	○
	Z16IR16W	**Z16IL16W**	16	3.52	9.525	4.0	★	○
	Z16IR18W	**Z16IL18W**	18	3.52	9.525	4.0	★	○
	Z16IR19W	**Z16IL19W**	19	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

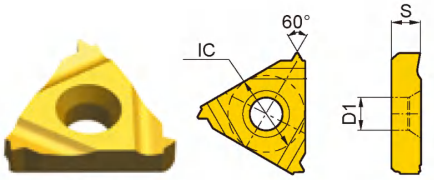
Unified thread (with end)

ASME B1.1-1989
Tolerance class: 2A/2B





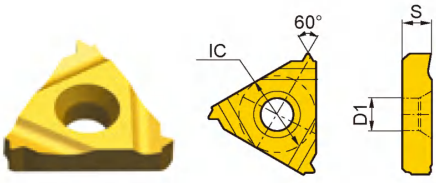
R type



L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YBG203	YBG205
External thread	**Z16ER8UN**	**Z16EL8UN**	8	3.52	9.525	4.0	★	○
	Z16ER10UN	**Z16EL10UN**	10	3.52	9.525	4.0	★	○
	Z16ER12UN	**Z16EL12UN**	12	3.52	9.525	4.0	★	○
	Z16ER14UN	**Z16EL14UN**	14	3.52	9.525	4.0	★	○
	Z16ER16UN	**Z16EL16UN**	16	3.52	9.525	4.0	★	○
	Z16ER18UN	**Z16EL18UN**	18	3.52	9.525	4.0	★	○
	Z16ER20UN	**Z16EL20UN**	20	3.52	9.525	4.0	★	○
	Z16ER24UN	**Z16EL24UN**	24	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



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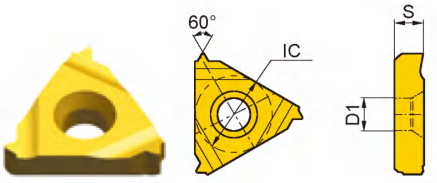


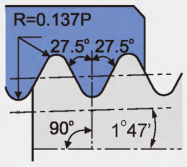
L type

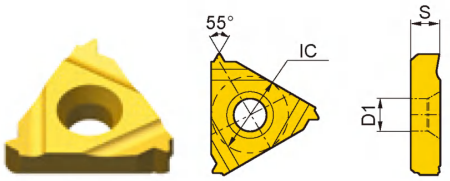
	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YBG203	YBG205
Internal thread	**Z16IR8UN**	**Z16IL8UN**	8	3.52	9.525	4.0	★	○
	Z16IR10UN	**Z16IL10UN**	10	3.52	9.525	4.0	★	○
	Z16IR12UN	**Z16IL12UN**	12	3.52	9.525	4.0	★	○
	Z16IR14UN	**Z16IL14UN**	14	3.52	9.525	4.0	★	○
	Z16IR16UN	**Z16IL16UN**	16	3.52	9.525	4.0	★	○
	Z16IR18UN	**Z16IL18UN**	18	3.52	9.525	4.0	★	○
	Z16IR20UN	**Z16IL20UN**	20	3.52	9.525	4.0	★	○
	Z16IR24UN	**Z16IL24UN**	24	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

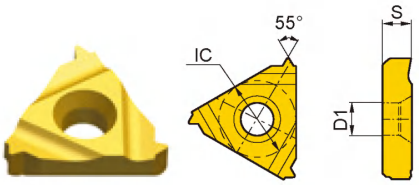
British taper pipe thread (with end)

ISO 7/1:1994
B.S.21:1985
Standard BSPT





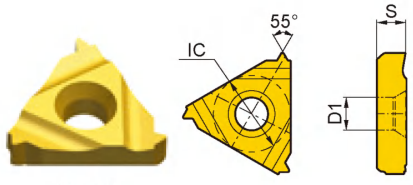
R type



L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YBG203	YBG205
External thread	**Z16ER11BSPT**	**Z16EL11BSPT**	11	3.52	9.525	4.0	★	○
	Z16ER14BSPT	**Z16EL14BSPT**	14	3.52	9.525	4.0	★	○
	Z16ER19BSPT	**Z16EL19BSPT**	19	3.52	9.525	4.0	★	○
	Z16ER28BSPT	**Z16EL28BSPT**	28	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



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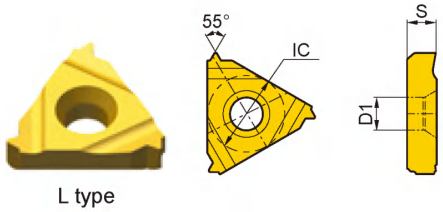


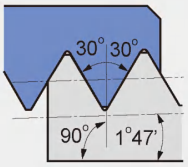
L type

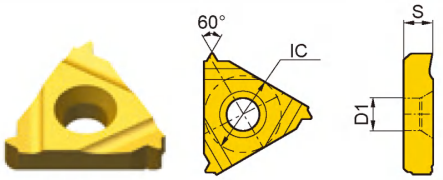
	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YBG203	YBG205
Internal thread	**Z16IR11BSPT**	**Z16IL11BSPT**	11	3.52	9.525	4.0	★	○
	Z16IR14BSPT	**Z16IL14BSPT**	14	3.52	9.525	4.0	★	○
	Z16IR19BSPT	**Z16IL19BSPT**	19	3.52	9.525	4.0	★	○
	Z16IR28BSPT	**Z16IL28BSPT**	28	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

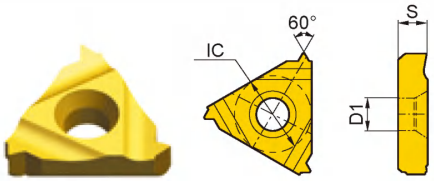
American taper pipe thread (with end)

ASME B1.20.1-1983
Standard NPT





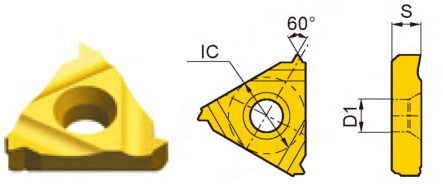
R type



L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YBG203	YBG205
External thread	**Z16ER8NPT**	**Z16EL8NPT**	8	3.52	9.525	4.0	★	○
	Z16ER11.5NPT	**Z16EL11.5NPT**	11.5	3.52	9.525	4.0	★	○
	Z16ER14NPT	**Z16EL14NPT**	14	3.52	9.525	4.0	★	○
	Z16ER18NPT	**Z16EL18NPT**	18	3.52	9.525	4.0	★	○
	Z16ER27NPT	**Z16EL27NPT**	27	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



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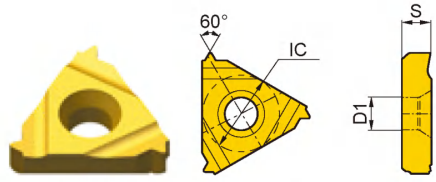


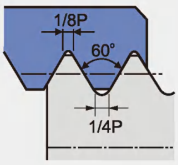
L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YBG203	YBG205
Internal thread	**Z16IR8NPT**	**Z16IL8NPT**	8	3.52	9.525	4.0	★	○
	Z16IR11.5NPT	**Z16IL11.5NPT**	11.5	3.52	9.525	4.0	★	○
	Z16IR14NPT	**Z16IL14NPT**	14	3.52	9.525	4.0	★	○
	Z16IR18NPT	**Z16IL18NPT**	18	3.52	9.525	4.0	★	○
	Z16IR27NPT	**Z16IL27NPT**	27	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

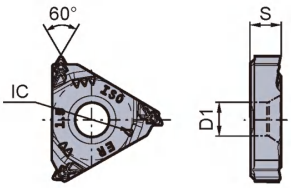
ISO metric thread (with end) PP chipbreaker

ISO 965-1980, DIN 13, GB/T 197-2003
Tolerance class: 6g/6H





R type

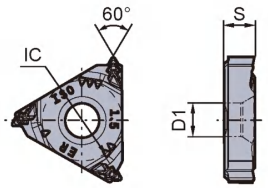


	Type	Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	Pitch	S	IC	D1	YB9120	YBG205
External thread	**Z16ER1.0ISOPP**	1.00	3.52	9.525	4.0	★	○
	Z16ER1.25ISOPP	1.25	3.52	9.525	4.0	★	○
	Z16ER1.5ISOPP	1.50	3.52	9.525	4.0	★	○
	Z16ER1.75ISOPP	1.75	3.52	9.525	4.0	★	○
	Z16ER2.0ISOPP	2.00	3.52	9.525	4.0	★	○
	Z16ER2.5ISOPP	2.50	3.52	9.525	4.0	★	○
	Z16ER3.0ISOPP	3.00	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



R type



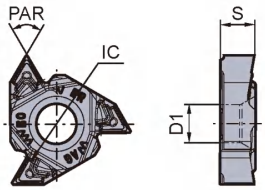
	Type	Basic dimensions(mm)				Recommended coating grade		
	The right hand tools	Pitch	S	IC	D1	YBG205H	YB9120	YBG205
Internal thread	**Z11IR1.0ISOPP**	1.00	3.05	6.35	3.2	○	★	○
	Z11IR1.25ISOPP	1.25	3.05	6.35	3.2	○	★	○
	Z11IR1.5ISOPP	1.50	3.05	6.35	3.2	○	★	○
	Z16IR1.0ISOPP	1.00	3.52	9.525	4.0		★	○
	Z16IR1.25ISOPP	1.25	3.52	9.525	4.0		★	○
	Z16IR1.5ISOPP	1.50	3.52	9.525	4.0		★	○
	Z16IR1.75ISOPP	1.75	3.52	9.525	4.0		★	○
	Z16IR2.0ISOPP	2.00	3.52	9.525	4.0		★	○
	Z16IR2.5ISOPP	2.50	3.52	9.525	4.0		★	○
	Z16IR3.0ISOPP	3.00	3.52	9.525	4.0		★	○

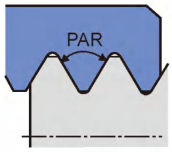
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

General pitch thread (without end) PP chipbreaker



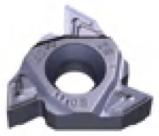
R type



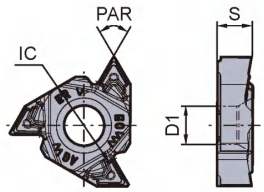


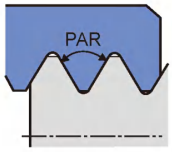
	Type		Basic dimensions(mm)					Recommended coating grade	
		The right hand tools	Pitch/mm (pitch/Inch)	S	IC	D1	PAR	YB9120	YBG205
External thread	55°	**Z16ERA55PP**	0.5-1.5(48-16)	3.52	9.525	4.0	55°	★	○
		Z16ERG55PP	1.75-3.0(14-8)	3.52	9.525	4.0	55°	★	○
		Z16ERAG55PP	0.5-0.3(48-8)	3.52	9.525	4.0	55°	★	○
		Z22ERN55PP	3.5-5.0(7-5)	4.65	12.7	5.0	55°	★	○
	60°	**Z16ERA60PP**	0.5-1.5(48-16)	3.52	9.525	4.0	60°	★	○
		Z16ERG60PP	1.75-3.0(14-8)	3.52	9.525	4.0	60°	★	○
		Z16ERAG60PP	0.5-0.3(48-8)	3.52	9.525	4.0	60°	★	○
		Z22ERN60PP	3.5-5.0(7-5)	4.65	12.7	5.0	60°	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



R type



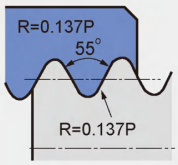


	Type		Basic dimensions(mm)					Recommended coating grade		
		The right hand tools	Pitch/mm (pitch/Inch)	S	IC	D1	PAR	YBG205H	YB9120	YBG205
Internal thread	55°	**Z11IRA55PP**	0.5-1.5(48-16)	3.05	6.35	3.2	55°	○	★	○
		Z16IRA55PP	0.5-1.5(48-16)	3.52	9.525	4.0	55°		★	○
		Z16IRG55PP	1.75-3.0(14-8)	3.52	9.525	4.0	55°		★	○
		Z16IRAG55PP	0.5-3.0(48-8)	3.52	9.525	4.0	55°		★	○
		Z22IRN55PP	3.5-5.0(7-5)	4.65	12.7	5.0	55°		★	○
	60°	**Z11IRA60PP**	0.5-1.5(48-16)	3.05	6.35	3.2	60°	○	★	○
		Z16IRA60PP	0.5-1.5(48-16)	3.52	9.525	4.0	60°		★	○
		Z16IRG60PP	1.75-3.0(14-8)	3.52	9.525	4.0	60°		★	○
		Z16IRAG60PP	0.5-3.0(48-8)	3.52	9.525	4.0	60°		★	○
		Z22IRN60PP	3.5-5.0(7-5)	4.65	12.7	5.0	60°		★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

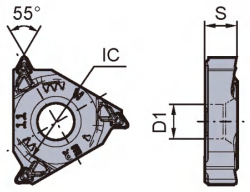
Whitworth thread (with end) PP chipbreaker

ISO 228/1:1982, DIN 259, B.S.84:1956
Tolerance class: Medium class A





R type

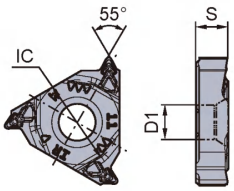


	Type	Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YB9120	YBG205
External thread	**Z16ER11WPP**	11	3.52	9.525	4.0	★	○
	Z16ER14WPP	14	3.52	9.525	4.0	★	○
	Z16ER19WPP	19	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



R type

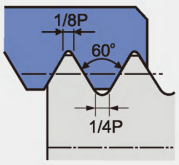


	Type	Basic dimensions(mm)				Recommended coating grade		
	The right hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YBG205H	YB9120	YBG205
Internal thread	**Z11IR14WPP**	14	3.05	6.35	3.2	○	★	
	Z16IR11WPP	11	3.52	9.525	4.0		★	○
	Z16IR14WPP	14	3.52	9.525	4.0		★	○
	Z16IR19WPP	19	3.52	9.525	4.0		★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

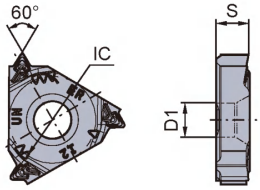
Unified thread (with end) PP chipbreaker

ASME B1.1-1989
Tolerance class: 2A/2B





R type

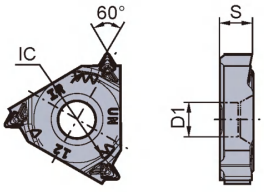


	Type	Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YB9120	YBG205
External thread	**Z16ER12UNPP**	12	3.52	9.525	4.0	★	○
	Z16ER14UNPP	14	3.52	9.525	4.0	★	○
	Z16ER16UNPP	16	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



R type

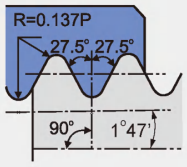


	Type	Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YB9120	YBG205
Internal thread	**Z16IR12UNPP**	12	3.52	9.525	4.0	★	○
	Z16IR14UNPP	14	3.52	9.525	4.0	★	○
	Z16IR16UNPP	16	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

British taper pipe thread (with end) PP chipbreaker

ISO 7/1: 1994, B.S.21:1985
Standard BSPT





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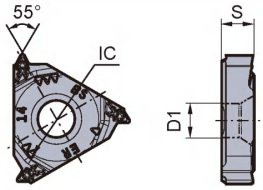
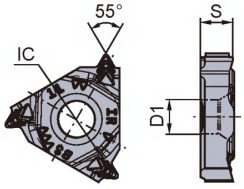


	Type	Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YB9120	YBG205
External thread	**Z16ER11BSPTPP**	11	3.52	9.525	4.0	★	○
	Z16ER14BSPTPP	14	3.52	9.525	4.0	★	○
	Z16ER19BSPTPP	19	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



R type

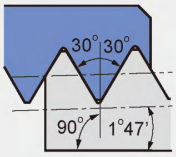


	Type	Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YB9120	YBG205
Internal thread	**Z16IR11BSPTPP**	11	3.52	9.525	4.0	★	○
	Z16IR14BSPTPP	14	3.52	9.525	4.0	★	○
	Z16IR19BSPTPP	19	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

American taper pipe thread (with end) PP chipbreaker

ASME B1.20.1-1983
Standard NPT





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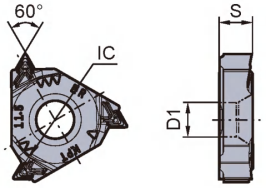
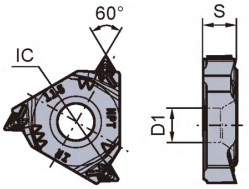


	Type	Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YB9120	YBG205
External thread	**Z16ER11.5NPTPP**	11.5	3.52	9.525	4.0	★	○
	Z16ER14NPTPP	14	3.52	9.525	4.0	★	○
	Z16ER18NPTPP	18	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



R type



	Type	Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	Pitch/mm (pitch/Inch)	S(mm)	IC(mm)	D1(mm)	YB9120	YBG205
Internal thread	**Z16IR11.5NPTPP**	11.5	3.52	9.525	4.0	★	○
	Z16IR14NPTPP	14	3.52	9.525	4.0	★	○
	Z16IR18NPTPP	18	3.52	9.525	4.0	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

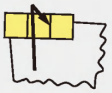
Threading tools code key

Clamping system

Top clamping — ZC



Screw clamping — ZS



Thread type

I ➤ Internal thread

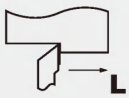
E ➤ External thread

Cutting direction

Right hand — R



Left hand — L



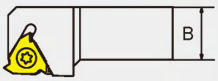
ZS E R 20 20 K 16 (C)

Nose height (mm)



Note: 00 for round tool holder.
Only to integer, for example: h=8mm is labeled as 08.

Shank width (mm)



Note: Diameter for round tool holder
for example: b=8mm is labeled as 08.

Tool length (mm)

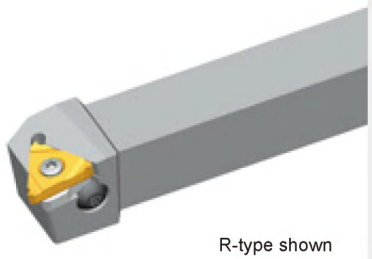
Code	H	K	M	P	Q	R	S	T	U
Length	100	125	150	170	180	200	250	300	350

Insert size (mm)

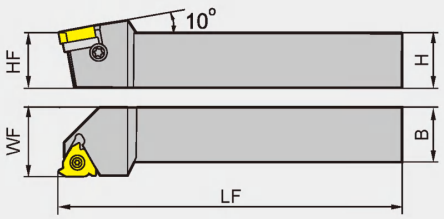
Code	11	16	22
Triangle side length	11	16	22
Inscribed circle	6.35	9.525	12.70

C—Inner-cooling

External threading tools



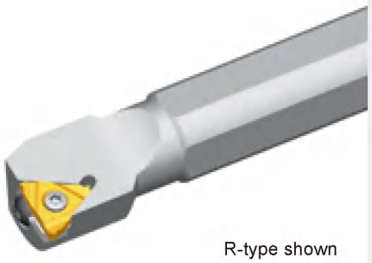
R-type shown



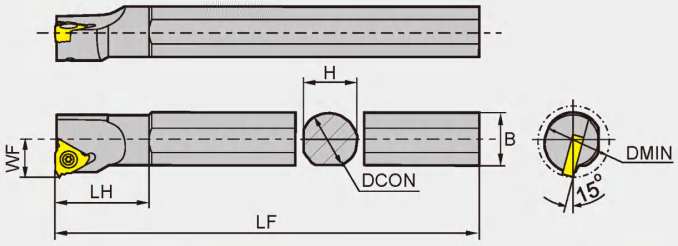
Type		Stock	Basic dimensions(mm)					Applicable inserts	Inserts screw	Shim	Shim screw	Wrench
			H	HF	B	LF	WF					
ZSER	1616H16	▲	16	16	16	100	20	Z16ER□□□□	I60 M3.5×12TT	MT16-□□MN	SM4×8C	WT10IP
	2020K16	▲	20	20	20	125	25					
	2525M16	▲	25	25	25	150	32					
	3225P16	▲	32	32	25	170	32					
	3232P16	▲	32	32	32	170	40					
	2525M22	▲	25	25	25	150	32	Z22ER□□□□	I60 M4×15X	MT22-□□MN	SM5×8.5	WT15IP
	3225P22	▲	32	32	25	170	32					
	3232P22	▲	32	32	32	170	40					
	4040S22	△	40	40	40	250	50					
ZSEL	1616H16	▲	16	16	16	100	20	Z16EL□□□□	I60 M3.5×12TT	MT16-□□MN	SM4×8C	WT10IP
	2020K16	▲	20	20	20	125	25					
	2525M16	▲	25	25	25	150	32					
	3225P16	▲	32	32	25	170	32					
	3232P16	▲	32	32	32	170	40					
	2525M22	▲	25	25	25	150	32	Z22EL□□□□	I60 M4×15X	MT22-□□MN	SM5×8.5	WT15IP
	3225P22	▲	32	32	25	170	32					
	3232P22	▲	32	32	32	170	40					
	4040S22	△	40	40	40	250	50					

▲Stock available △Make-to-order

Internal threading tools



R-type shown



Type		Stock	Basic dimensions(mm)							Applicable inserts	Inserts screw	Shim	Shim screw	Wrench
			DCON	LF	B	DMIN	WF	H	LH					
ZSIR	0016K11	▲	16	125	15.5	12	10	15	20.9	Z11IR□□□□	I60 M2.5×6.5T	---	---	WT08IP
	0016M11	▲	16	150	16	16	10.5	15	25.9					
	0016M16	▲	16	150	15.5	20	12	15	27	Z16IR□□□□	I60 M3.5×08TT	---	---	WT10IP
	0020M16	▲	20	150	19	25	14	18	28.7		I60 M3.5×12TT	MT16-□□MN	SM4×8C	
	0020Q16	▲	20	180	19	25	14	18	34					
	0025M16	▲	25	150	24	32	17	23	28.8					
	0032R16	▲	32	200	31	40	22	30	30.9					
	0032S16	▲	32	250	31	40	22	30	30.9					
	0040T16	▲	40	300	38.5	50	27	37	31.5					
	0050U16	▲	50	350	48.5	63	35	49	40.2					
	0020Q22	▲	20	180	19	25	15	18	35	Z22IR□□□□	I60 M5×13.2	---	---	WT15IP
	0025R22	▲	25	200	24	32	19	23	39		I60 M4×15X	MT22-□□MN	SM5×8.5	
	0032S22	▲	32	250	31	40	22	30	36.4					
	0040T22	▲	40	300	38.5	50	27	37	37.2					
	0050U22	▲	50	350	48.5	63	35	47	42.6					
ZSIL	0016K11	▲	16	125	15.5	12	10	15	20.9	Z11IL□□□□	I60 M2.5×6.5T	---	---	WT08IP
	0016M11	▲	16	150	16	16	10.5	15	25.9					
	0016M16	▲	16	150	16	20	12	15	27	Z16IL□□□□	I60 M3.5×08TT	---	---	WT10IP
	0020M16	▲	20	150	19	25	14	18	28.7		I60 M3.5×12	MT16-□□MN	SM4×8C	
	0020Q16	▲	20	180	19	25	14	18	34					
	0025M16	▲	25	150	24	32	17	23	28.8					
	0032R16	▲	32	200	31	40	22	30	30.9					
	0032S16	▲	32	250	31	40	22	30	30.9					
	0040T16	▲	40	300	38.5	50	27	37	31.5					
	0050U16	▲	50	350	48.5	63	35	49	40.2					
	0020Q22	▲	20	180	19	25	15	18	35	Z22IL□□□□	I60 M5×13.2	---	---	WT15IP
	0025R22	▲	25	200	24	32	19	23	39		I60 M4×15X	MT22-□□MN	SM5×8.5	
	0032S22	▲	32	250	31	40	22	30	36.4					
	0040T22	▲	40	300	38.5	50	27	37	37.2					
	0050U22	▲	50	350	48.5	63	35	47	42.6					

▲Stock available △Make-to-order

Thick threading inserts code key

Cutting direction

R ➤ Righ L ➤ Left

Insert



T Others Z

Insert size

22 ➤ Diameter of IC ø12.7
16 ➤ Diameter of IC ø9.525
11 ➤ Diameter of IC ø6.35

Number of cutting edge pitch

01 ➤ Number of pitch per cutting edge

Cutting style

W ➤ External threading insert
N ➤ Internal threading insert

R T 22. 01 W- 4.50 GM

Thread pitch

full profile(range of Thread pitch is indicated by numbers)

mm	TPI
0.35-0.9	72-2

V profile (range of Thread pitch is indicated by numbers)

letter	mm	TPI
A	0.5-1.5	48-16
AG	0.5-3.0	48-8
G	1.75-3.0	14-8
N	3.5-5.0	7-5
Q	5.5-6.0	41/2-4

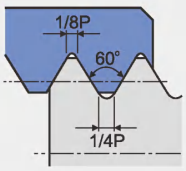
Thread profile

GM—ISO metric 60°thread
60—60° general pitch thread
55—55° general pitch thread
W—Whitworth thread
UN—Unified thread
BSPT—British taper pipe thread
NPT—American taper pipe thread



ISO metric thread (with end)

ISO 965-1980 DIN 13
GB/T 197-2003 Tolerance class: 6g/6H





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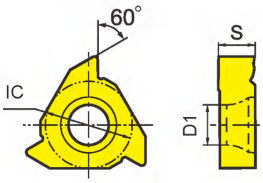
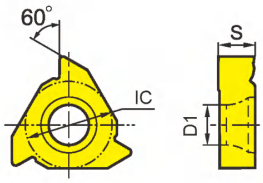




L type



	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch	S	IC	D1	YBG201	
							R	L
External thread	RT16.01W-0.50GM	LT16.01W-0.50GM	0.50	3.97	9.525	4.4	○	○
	RT16.01W-0.75GM	LT16.01W-0.75GM	0.75	3.97	9.525	4.4	○	○
	RT16.01W-1.00GM	LT16.01W-1.00GM	1.00	3.97	9.525	4.4	○	○
	RT16.01W-1.25GM	LT16.01W-1.25GM	1.25	3.97	9.525	4.4	★	○
	RT16.01W-1.50GM	LT16.01W-1.50GM	1.50	3.97	9.525	4.4	★	★
	RT16.01W-1.75GM	LT16.01W-1.75GM	1.75	3.97	9.525	4.4	★	○
	RT16.01W-2.00GM	LT16.01W-2.00GM	2.00	3.97	9.525	4.4	★	★
	RT16.01W-2.50GM	LT16.01W-2.50GM	2.50	3.97	9.525	4.4	★	○
	RT16.01W-3.00GM	LT16.01W-3.00GM	3.00	3.97	9.525	4.4	★	○
	RT22.01W-3.50GM	LT22.01W-3.50GM	3.50	5.56	12.7	5.5	★	○
	RT22.01W-4.00GM	LT22.01W-4.00GM	4.00	5.56	12.7	5.5	★	○
	RT22.01W-4.50GM	LT22.01W-4.50GM	4.50	5.56	12.7	5.5	★	○
	RT22.01W-5.00GM	LT22.01W-5.00GM	5.00	5.56	12.7	5.5	★	○
	RT22.01W-5.50GM	LT22.01W-5.50GM	5.50	5.56	12.7	5.5	○	○
	RT22.01W-6.00GM	LT22.01W-6.00GM	6.00	5.56	12.7	5.5	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



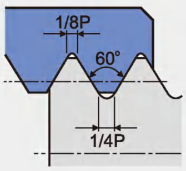






ISO metric thread (with end)

ISO 965-1980 DIN 13
GB/T 197-2003 Tolerance class: 6g/6H





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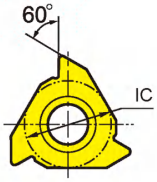



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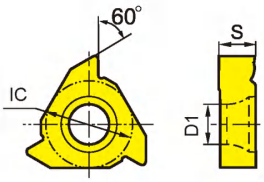
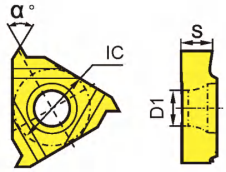


	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch	S	IC	D1	YBG201	
							R	L
Internal thread	RT11.01N-0.50GM	LT11.01N-0.50GM	0.50	3.18	6.35	2.8	○	○
	RT11.01N-0.75GM	LT11.01N-0.75GM	0.75	3.18	6.35	2.8	○	○
	RT11.01N-1.00GM	LT11.01N-1.00GM	1.00	3.18	6.35	2.8	○	○
	RT11.01N-1.25GM	LT11.01N-1.25GM	1.25	3.18	6.35	2.8	○	○
	RT11.01N-1.50GM	LT11.01N-1.50GM	1.50	3.18	6.35	2.8	★	○
	RT11.01N-1.75GM	LT11.01N-1.75GM	1.75	3.18	6.35	2.8	○	○
	RT11.01N-2.00GM	LT11.01N-2.00GM	2.00	3.18	6.35	2.8	★	○
	RT16.01N-0.50GM	LT16.01N-0.50GM	0.50	3.97	9.525	4.4	○	○
	RT16.01N-0.75GM	LT16.01N-0.75GM	0.75	3.97	9.525	4.4	○	○
	RT16.01N-1.00GM	LT16.01N-1.00GM	1.00	3.97	9.525	4.4	★	○
	RT16.01N-1.25GM	LT16.01N-1.25GM	1.25	3.97	9.525	4.4	○	○
	RT16.01N-1.50GM	LT16.01N-1.50GM	1.50	3.97	9.525	4.4	★	★
	RT16.01N-1.75GM	LT16.01N-1.75GM	1.75	3.97	9.525	4.4	○	○
	RT16.01N-2.00GM	LT16.01N-2.00GM	2.00	3.97	9.525	4.4	★	★
	RT16.01N-2.50GM	LT16.01N-2.50GM	2.50	3.97	9.525	4.4	★	★
	RT16.01N-3.00GM	LT16.01N-3.00GM	3.00	3.97	9.525	4.4	★	★
	RT22.01N-3.50GM	LT22.01N-3.50GM	3.50	5.56	12.7	5.5	○	○
	RT22.01N-4.00GM	LT22.01N-4.00GM	4.00	5.56	12.7	5.5	★	○
	RT22.01N-4.50GM	LT22.01N-4.50GM	4.50	5.56	12.7	5.5	○	○
	RT22.01N-5.00GM	LT22.01N-5.00GM	5.00	5.56	12.7	5.5	★	○
	RT22.01N-5.50GM	LT22.01N-5.50GM	5.50	5.56	12.7	5.5	○	○
	RT22.01N-6.00GM	LT22.01N-6.00GM	6.00	5.56	12.7	5.5	★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

General pitch thread (without end)


R type

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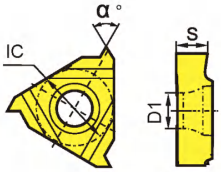
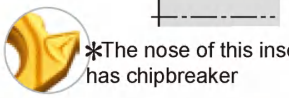


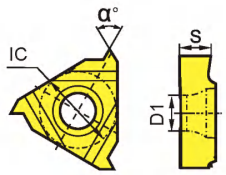


✻The nose of this insert has chipbreaker

		Type		Basic dimensions(mm)					Recommended coating grade	
		The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	IC	D1	α°	YBG201 R	YBG201 L
External thread	60°	RT16.01W-A60	LT16.01W-A60	0.5-1.5(48-16)	3.97	9.525	4.4	60°	★	○
		RT16.01W-G60	LT16.01W-G60	1.75-3.0(14-8)	3.97	9.525	4.4	60°	○	○
		RT16.01W-G60P*	LT16.01W-G60P*	1.75-3.0(14-8)	3.97	9.525	4.4	60°	★	○
		RT16.01W-AG60	LT16.01W-AG60	0.5-3.0(48-8)	3.97	9.525	4.4	60°	★	○
		RT22.01W-N60P*	LT22.01W-N60P*	3.5-5.0(7-5)	5.56	12.7	5.5	60°	○	○
	55°	RT16.01W-A55	LT16.01W-A55	0.5-1.5(48-16)	3.97	9.525	4.4	55°	○	○
		RT16.01W-G55	LT16.01W-G55	1.75-3.0(14-8)	3.97	9.525	4.4	55°	○	○
		RT16.01W-G55P*	LT16.01W-G55P*	1.75-3.0(14-8)	3.97	9.525	4.4	55°	★	★
		RT16.01W-AG55	LT16.01W-AG55	0.5-3.0(48-8)	3.97	9.525	4.4	55°	★	○
		RT22.01W-N55P*	LT22.01W-N55P*	3.5-5.0(7-5)	5.56	12.7	5.5	55°	○	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order


R type

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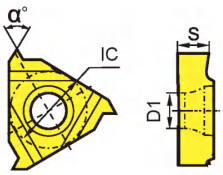
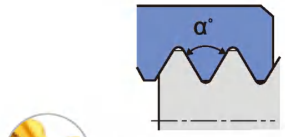




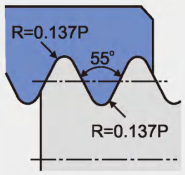
✻The nose of this insert has chipbreaker

		Type		Basic dimensions(mm)					Recommended coating grade	
		The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	IC	D1	α°	YBG201 R	YBG201 L
Internal thread	60°	RT16.01N-A60	LT16.01N-A60	0.5-1.5 (48-16)	3.97	9.525	4.4	60°	○	○
		RT16.01N-G60	LT16.01N-G60	1.75-3.0(14-8)	3.97	9.525	4.4	60°	○	○
		RT16.01N-G60P*	LT16.01N-G60P*	1.75-3.0(14-8)	3.97	9.525	4.4	60°	★	○
		RT16.01N-AG60	LT16.01N-AG60	0.5-3.0 (48-8)	3.97	9.525	4.4	60°	★	○
		RT22.01N-N60P*	LT22.01N-N60P*	3.5-5.0 (7-5)	5.56	12.7	5.5	60°	○	○
	55°	RT16.01N-A55	LT16.01N-A55	0.5-1.5(48-16)	3.97	9.525	4.4	55°	○	○
		RT16.01N-G55	LT16.01N-G55	1.75-3.0(14-8)	3.97	9.525	4.4	55°	○	○
		RT16.01N-G55P*	LT16.01N-G55P*	1.75-3.0(14-8)	3.97	9.525	4.4	55°	★	○
		RT16.01N-AG55	LT16.01N-AG55	0.5-3.0(48-8)	3.97	9.525	4.4	55°	★	○
		RT22.01N-N55P*	LT22.01N-N55P*	3.5-5.0(7-5)	5.56	12.7	5.5	55°	○	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Whitworth thread (with end)

ISO 228/1:1982,
DIN 259, B.S.84:1956
Tolerance class: Medium class A





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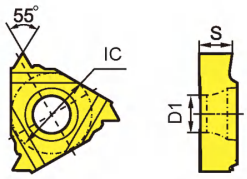



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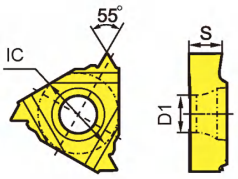
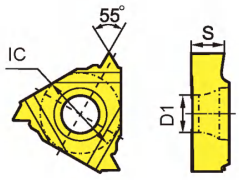


	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	IC	D1	YBG201	
							R	L
External thread	RT16.01W-8W	LT16.01W-8W	8	3.97	9.525	4.4	○	○
	RT16.01W-9W	LT16.01W-9W	9	3.97	9.525	4.4	○	○
	RT16.01W-10W	LT16.01W-10W	10	3.97	9.525	4.4	○	○
	RT16.01W-11W	LT16.01W-11W	11	3.97	9.525	4.4	○	○
	RT16.01W-12W	LT16.01W-12W	12	3.97	9.525	4.4	○	○
	RT16.01W-14W	LT16.01W-14W	14	3.97	9.525	4.4	○	○
	RT16.01W-16W	LT16.01W-16W	16	3.97	9.525	4.4	○	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



R type





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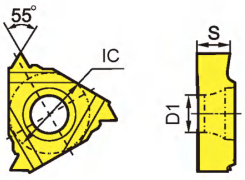
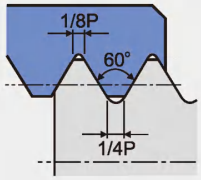


	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	IC	D1	YBG201	
							R	L
Internal thread	RT16.01N-8W	LT16.01N-8W	8	3.97	9.525	4.4	○	○
	RT16.01N-9W	LT16.01N-9W	9	3.97	9.525	4.4	○	○
	RT16.01N-10W	LT16.01N-10W	10	3.97	9.525	4.4	○	○
	RT16.01N-11W	LT16.01N-11W	11	3.97	9.525	4.4	○	○
	RT16.01N-12W	LT16.01N-12W	12	3.97	9.525	4.4	○	○
	RT16.01N-14W	LT16.01N-14W	14	3.97	9.525	4.4	○	○
	RT16.01N-16W	LT16.01N-16W	16	3.97	9.525	4.4	○	○

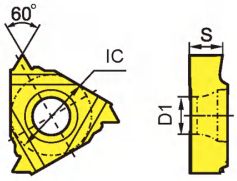
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Unified thread (with end)

ASME B1.1-1989
Tolerance class: 2A/2B




R type

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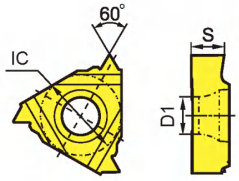
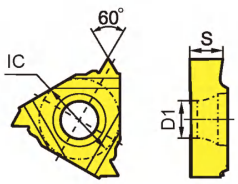


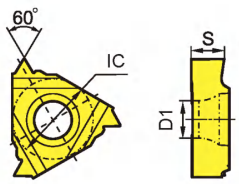
	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	IC	D1	YBG201	
							R	L
External thread	**RT16.01W-8UN**	**LT16.01W-8UN**	8	3.97	9.525	4.4	○	○
	RT16.01W-10UN	**LT16.01W-10UN**	10	3.97	9.525	4.4	○	○
	RT16.01W-12UN	**LT16.01W-12UN**	12	3.97	9.525	4.4	○	○
	RT16.01W-14UN	**LT16.01W-14UN**	14	3.97	9.525	4.4	○	○
	RT16.01W-16UN	**LT16.01W-16UN**	16	3.97	9.525	4.4	○	○
	RT16.01W-18UN	**LT16.01W-18UN**	18	3.97	9.525	4.4	○	○
	RT16.01W-20UN	**LT16.01W-20UN**	20	3.97	9.525	4.4	○	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order


R type




L type

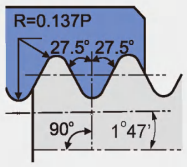


	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	IC	D1	YBG201	
							R	L
Internal thread	**RT16.01N-8UN**	**LT16.01N-8UN**	8	3.97	9.525	4.4	○	○
	RT16.01N-10UN	**LT16.01N-10UN**	10	3.97	9.525	4.4	○	○
	RT16.01N-12UN	**LT16.01N-12UN**	12	3.97	9.525	4.4	○	○
	RT16.01N-14UN	**LT16.01N-14UN**	14	3.97	9.525	4.4	○	○
	RT16.01N-16UN	**LT16.01N-16UN**	16	3.97	9.525	4.4	○	○
	RT16.01N-18UN	**LT16.01N-18UN**	18	3.97	9.525	4.4	○	○
	RT16.01N-20UN	**LT16.01N-20UN**	20	3.97	9.525	4.4	○	○
	RT16.01N-24UN	**LT16.01N-24UN**	24	3.97	9.525	4.4	○	○

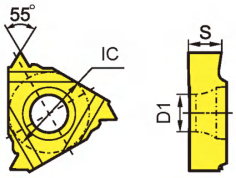
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

British taper pipe thread (with end)

ISO 7/1: 1994
B.S.21: 1985
Standard BSPT

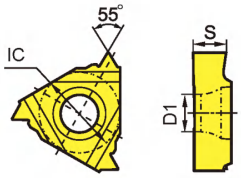






R type



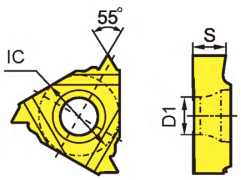


L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	IC	D1	YBG201	
							R	L
External thread	RT16.01W-11 BSPT	LT16.01W-11 BSPT	11	3.97	9.525	4.4	○	○
	RT16.01W-14 BSPT	LT16.01W-14 BSPT	14	3.97	9.525	4.4	○	○
	RT16.01W-19 BSPT	LT16.01W-19 BSPT	19	3.97	9.525	4.4	○	○
	RT16.01W-28 BSPT	LT16.01W-28 BSPT	28	3.97	9.525	4.4	○	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order





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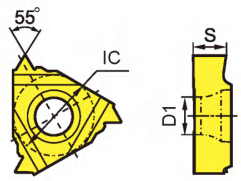


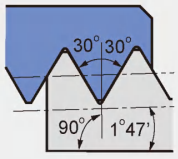
L type

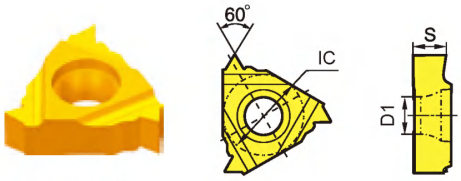
	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	IC	D1	YBG201	
							R	L
Internal thread	RT16.01N-11 BSPT	LT16.01N-11 BSPT	11	3.97	9.525	4.4	○	○
	RT16.01N-14 BSPT	LT16.01N-14 BSPT	14	3.97	9.525	4.4	○	○
	RT16.01N-19 BSPT	LT16.01N-19 BSPT	19	3.97	9.525	4.4	○	○
	RT16.01N-28 BSPT	LT16.01N-28 BSPT	28	3.97	9.525	4.4	○	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

American taper pipe thread (with end)

ASME B1.20.1-1983
Standard NPT





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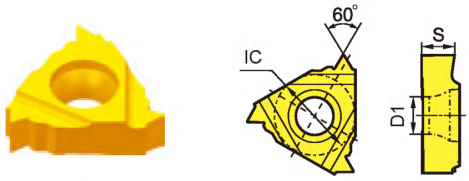
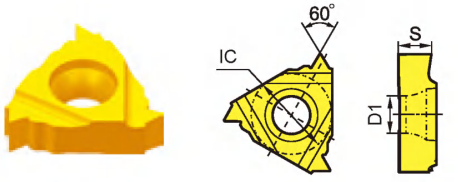


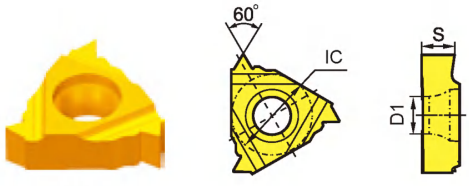
L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	IC	D1	YBG201	
							R	L
External thread	RT16.01W-8NPT	LT16.01W-8NPT	8	3.97	9.525	4.4	○	○
	RT16.01W-11.5 NPT	LT16.01W-11.5NPT	11.5	3.97	9.525	4.4	○	○
	RT16.01W-14NPT	LT16.01W-14NPT	14	3.97	9.525	4.4	○	○
	RT16.01W-18NPT	LT16.01W-18NPT	18	3.97	9.525	4.4	○	○
	RT16.01W-27NPT	LT16.01W-27NPT	27	3.97	9.525	4.4	○	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



R type



L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	IC	D1	YBG201	
							R	L
Internal thread	RT16.01N-8NPT	LT16.01N-8NPT	8	3.97	9.525	4.4	○	○
	RT16.01N-11.5NPT	LT16.01N-11.5NPT	11.5	3.97	9.525	4.4	○	○
	RT16.01N-14NPT	LT16.01N-14NPT	14	3.97	9.525	4.4	○	○
	RT16.01N-18NPT	LT16.01N-18NPT	18	3.97	9.525	4.4	○	○
	RT16.01N-27NPT	LT16.01N-27NPT	27	3.97	9.525	4.4	○	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

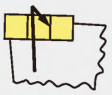
Thick threading insert tools code key

Clamping system

Top clamping — C



Screw clamping — S



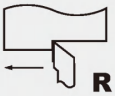
Thread type

N ➤ Internal thread

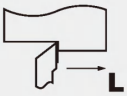
W ➤ External thread

Cutting direction

Right hand — R



Left hand — L



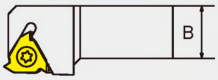
S	W	R	20	20	K	16

Nose height (mm)



Note: 00 for round tool holder.
Only to integer, for example: h=8mm is labeled as 08.

Shank width (mm)



Note: Diameter for round tool holder
for example: b=8mm is labeled as 08.

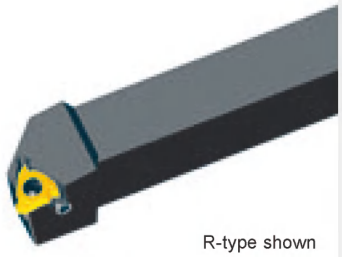
Tool length (mm)

Code	H	K	M	P	Q	R	S	T	U
Length	100	125	150	170	180	200	250	300	350

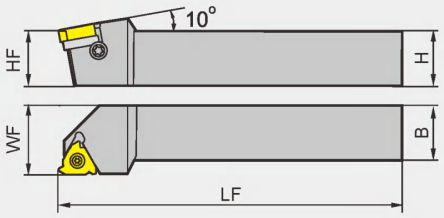
Insert size (mm)

Code	11	16	22
Triangle side length	11	16	22
Diameter of IC	6.35	9.525	12.70

External threading tools



R-type shown



Type		Stock	Basic dimensions(mm)					Applicable inserts	Inserts screw	Shim	Shim screw	Wrench
			H	HF	B	LF	WF					
SWR	1616H16	▲	16	16	16	100	20	RT16.01W-□□□□	I60M3.5×12	MT16-□□M	SM4×8C	WT15IP
	2020K16	▲	20	20	20	125	25					
	2525M16	▲	25	25	25	150	32					
	3225P16	▲	32	32	25	170	32					
	3232P16	▲	32	32	32	170	40					
	2525M22	▲	25	25	25	150	32	RT22.01W-□□□□	I60M5×17	MT22-□□M	SM4×8C	WT15IP WT20IP
	3225P22	▲	32	32	25	170	32					
	3232P22	▲	32	32	32	170	40					
	4040S22	△	40	40	40	250	50					
SWL	1616H16	▲	16	16	16	100	20	LT16.01W-□□□□	I60M3.5×12	MT16-□□M	SM4×8C	WT15IP
	2020K16	▲	20	20	20	125	25					
	2525M16	▲	25	25	25	150	32					
	3225P16	▲	32	32	25	170	32					
	3232P16	▲	32	32	32	170	40					
	2525M22	▲	25	25	25	150	32	LT22.01W-□□□□	I60M5×17	MT22-□□M	SM4×8C	WT15IP WT20IP
	3225P22	▲	32	32	25	170	32					
	3232P22	▲	32	32	32	170	40					
	4040S22	△	40	40	40	250	50					

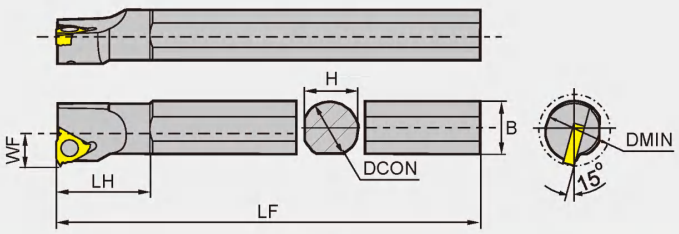
▲Stock available △Make-to-order



Internal threading tools



R-type shown



Type		Stock	Basic dimensions(mm)							Applicable inserts	Inserts screw	Shim	Shim screw	Wrench
			DCON	LF	B	DMIN	WF	H	LH					
SNR	0016K11	▲	16	125	16	12	10	15	20.9	RT11.01N-□□□□	I60 M2.5×6.5	---	---	WT07IP
	0016M11	▲	16	150	15.5	16	10.5	15	25.9					
	0016M16	▲	16	150	15.5	20	12	15	27	RT16.01N-□□□□	I60 M3.5×8	---	---	WT15IP
	0020M16	▲	20	150	19	25	14	18	28.7		I60 M3.5×12	MT16-□□M	SM4×8C	WT15IP
	0020Q16	▲	20	180	19	25	14	18	34					
	0025M16	▲	25	150	24	32	17	23	28.8					
	0032R16	▲	32	200	31	40	22	30	30.9					
	0032S16	▲	32	250	31	40	22	30	30.9					
	0040T16	▲	40	300	38.5	50	27	37	31.5					
	0050U16	▲	50	350	49.5	63	35	49	40.2					
	0020Q22	▲	20	180	21.5	25	15	18	35	RT22.01N-□□□□	I60 M5×10			WT20IP
	0025R22	▲	25	200	24	32	19	23	39		I60 M5×17	MT22-□□M	SM4×8C	WT15IP WT20IP
	0032S22	▲	32	250	31	40	22	30	36.4					
	0040T22	▲	40	300	38.5	50	27	37	37.2					
	0050U22	▲	50	350	48.5	63	35	47	42.6					
SNL	0016K11	▲	16	125	16	12	10	15	20.9	LT11.01N-□□□□	I60 M2.5×6.5	---	---	WT07IP
	0016M11	▲	16	150	15.5	16	10.5	15	25.9					
	0016M16	▲	16	150	15.5	20	12	15	27	LT16.01N-□□□□	I60 M3.5×8	---	---	WT15IP
	0020M16	▲	20	150	19	25	14	18	28.7		I60 M3.5×12	MT16-□□M	SM4×8C	WT15IP
	0020Q16	▲	20	180	19	25	14	18	34					
	0025M16	▲	25	150	24	32	17	23	28.8					
	0032R16	▲	32	200	31	40	22	30	30.9					
	0032S16	▲	32	250	31	40	22	30	30.9					
	0040T16	▲	40	300	38.5	50	27	37	31.5					
	0050U16	▲	50	350	49.5	63	35	49	40.2					
	0020Q22	▲	20	180	21.5	25	15	18	35	LT22.01N-□□□□	I60 M5×10	---	---	WT20IP
	0025R22	▲	25	200	24	32	19	23	39		I60 M5×17	MT22-□□M	SM4×8C	WT15IP WT20IP
	0032S22	▲	32	250	31	40	22	30	36.4					
	0040T22	▲	40	300	38.5	50	27	37	37.2					
	0050U22	▲	50	350	48.5	63	35	47	42.6					

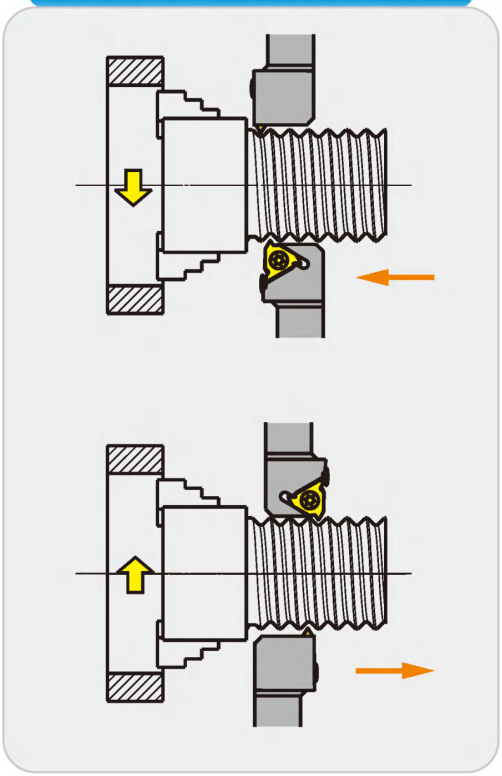
▲Stock available △Make-to-order

Please follow the steps to get the best threading result:

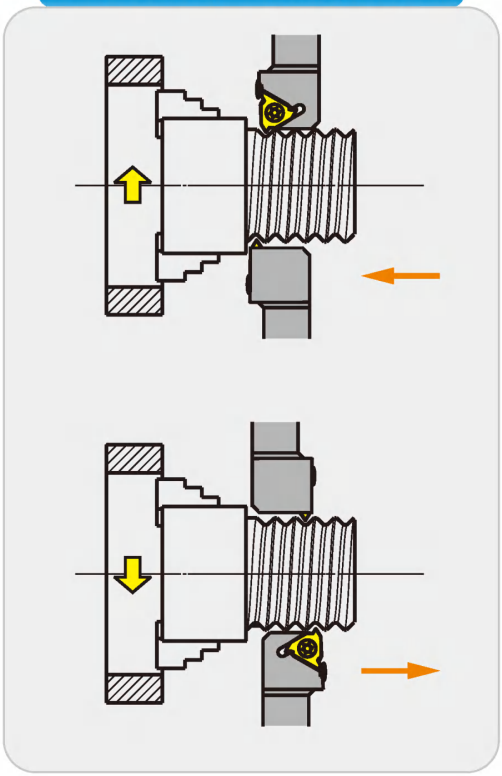
1. Select proper thread machining method.
2. Define helical angle and select shim.
3. Select proper insert and tool holder size.
4. By checking reference table of standard threading programs, select feasible cutting parameters.
5. Select feed way.

Machining method of threading tools

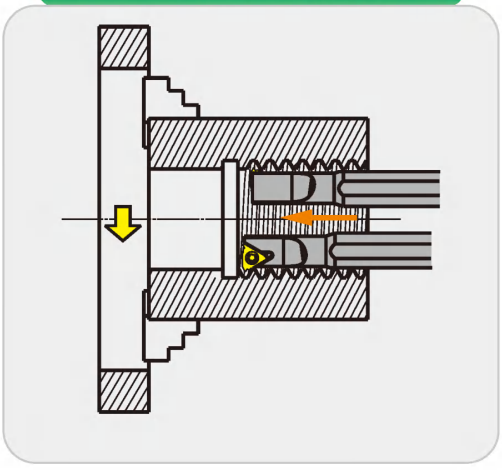
External threading machining (Right thread)



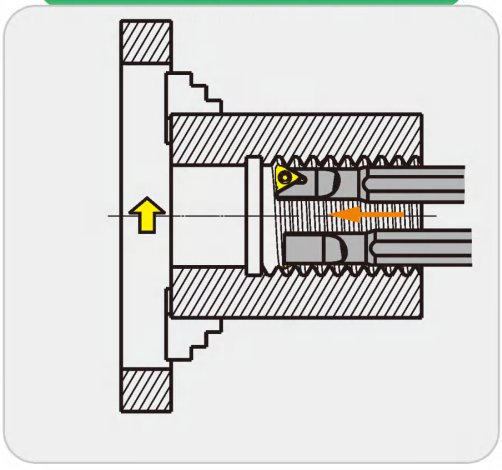
External threading machining (Left thread)



Internal threading machining (Right thread)



Internal threading machining (Left thread)



Decide helical angle and select shim

The clearance angle of threading inserts is actually along the edge (flank). This has significant effect on heat diffusion, spread of abrasion as well as tool life, security and pitch quality. The clearance angle of threading pitch on clearance face is determined by thread helical angle. These two angles are similar to each other to some extent. If inclined angle of insert is different from the helical angle, then the clearance angle won't be the same either.
The helical angle of pitch has to be the same with the inclined angle of insert to prevent over wearing on the clearance face which could affect tool life. the helical angle is calculated as below:

$$e = \arctan \frac{p}{d_2 \times \pi}$$

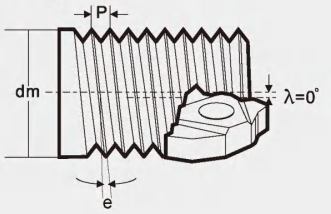
P= Pitch
d_2= pitch diameter
The most common inclined angle is 1°.
MT standard shim and its inclined angle is also 1°.
Calculation of clearance angle:
Clearance angle is calculated as below:

$$\beta = \arctan (\tan\theta \times \tan\alpha)$$

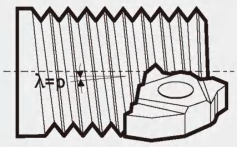
2θ=Thread profile angle
α=The rake angle of external standard threading tools is 10°; the rake angle of internal standard threading tools is 15°.

The shim has to be changed when helical angle of thread is ≤ clearance angle of tool, which could cause intervene on insert flank.
Please change the shim to adjust the difference between helical angle of thread and inclined angle of shim to be within 2°~0°.

e= Helical angle



λ = Inclined angle



Please refer to the table below for actual value:

Thread profile angle 2θ	β	
	External thread	Internal thread
60°	5.8°	8.79°
55°	5.24°	7.94°
30°	2.7°	4.1°
29°	2.6°	3.96°

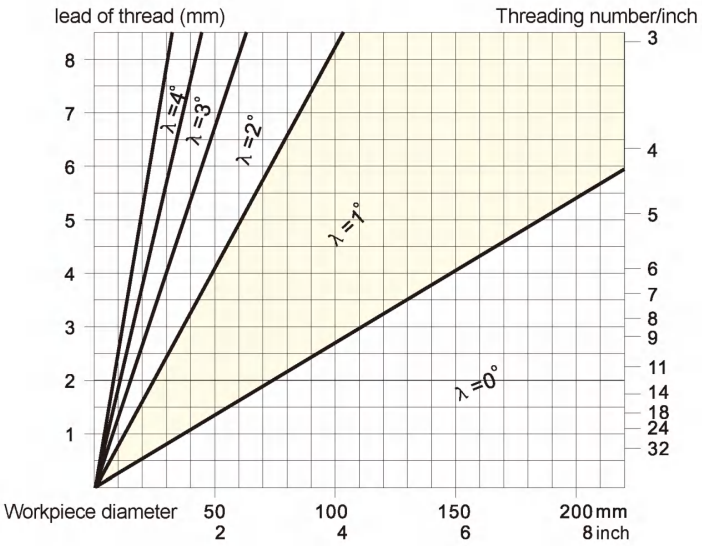
For example: when P=1.5, d2=24mm,
helical angle1.14°-(2°~0°)=inclined angle (-0.86°~1.14°)
it is feasible to use standard shim 1°.

Shim specification table is as follows:

Screw pitch range	Insert dimensions	Inclined angle	Shim
0.5-3.0	16	0	MT16-00MN
		1	MT16-01MN
		2	MT16-02MN
		3	MT16-03MN
3.5-6.0	22	0	MT22-00MN
		1	MT22-01MN
		2	MT22-02MN
		3	MT22-03MN

Note: the standard angle of shim for our threading tools is 1°.
((MT16-01MN or MT22-01MN)

Select shim:



Select proper inserts and size of tool holder (Please refer to detailed table of threading tools and inserts)

Parameter table for threading program under different standards

Table of recommended in-feed for metric ISO external threading

Screw pitch (mm)	0.5	0.75	1	1.25	1.5	1.75	2	2.5	3	3.5	4	4.5	5	5.5	6
Total in-feed (mm)	0.38	0.53	0.68	0.85	1.02	1.16	1.33	1.67	1.98	2.3	2.61	2.93	3.25	3.56	3.88
Number of passes	4	4	5	6	7	8	9	11	12	13	14	14	15	16	17
Sequence of threading tool pass	Radial feed/pass units: mm														
1	0.12	0.18	0.2	0.2	0.23	0.24	0.26	0.26	0.26	0.3	0.33	0.35	0.38	0.4	0.4
2	0.1	0.15	0.15	0.18	0.19	0.2	0.22	0.23	0.24	0.28	0.3	0.32	0.35	0.38	0.38
3	0.09	0.12	0.14	0.15	0.17	0.18	0.18	0.21	0.22	0.25	0.28	0.3	0.32	0.35	0.36
4	0.07	0.08	0.11	0.13	0.13	0.14	0.15	0.18	0.2	0.22	0.25	0.28	0.3	0.32	0.34
5			0.08	0.11	0.12	0.12	0.13	0.15	0.18	0.2	0.22	0.26	0.28	0.3	0.32
6				0.08	0.1	0.1	0.12	0.12	0.17	0.2	0.2	0.25	0.25	0.28	0.3
7					0.08	0.1	0.1	0.12	0.16	0.18	0.18	0.22	0.22	0.25	0.28
8						0.08	0.09	0.12	0.15	0.15	0.18	0.2	0.2	0.22	0.25
9							0.08	0.1	0.12	0.12	0.15	0.18	0.2	0.2	0.22
10								0.1	0.1	0.12	0.12	0.15	0.18	0.18	0.2
11								0.08	0.1	0.1	0.12	0.12	0.15	0.15	0.18
12									0.08	0.1	0.1	0.12	0.12	0.13	0.15
13										0.08	0.1	0.1	0.12	0.12	0.12
14											0.08	0.08	0.1	0.1	0.12
15													0.08	0.1	0.1
16														0.08	0.08
17															0.08

Application information for threading

Table of recommended in-feed for metric ISO internal threading

Screw pitch (mm)	0.5	0.75	1	1.25	1.5	1.75	2	2.5	3	3.5	4	4.5	5	5.5	6
Total in-feed (mm)	0.35	0.48	0.66	0.83	0.97	1.14	1.27	1.58	1.8	2.15	2.44	2.73	3.02	3.31	3.6
Number of passes	4	4	5	6	7	8	9	11	12	13	14	14	15	16	17
Sequence of threading tool pass	Radial feed/pass units: mm														
1	0.11	0.15	0.18	0.2	0.22	0.22	0.24	0.25	0.25	0.26	0.26	0.28	0.28	0.3	0.3
2	0.09	0.13	0.15	0.18	0.18	0.18	0.2	0.22	0.23	0.25	0.25	0.26	0.28	0.3	0.3
3	0.08	0.12	0.14	0.15	0.16	0.16	0.18	0.2	0.2	0.23	0.24	0.25	0.26	0.28	0.28
4	0.07	0.08	0.11	0.12	0.13	0.15	0.15	0.18	0.18	0.21	0.22	0.25	0.26	0.28	0.28
5			0.08	0.1	0.11	0.13	0.12	0.15	0.16	0.2	0.2	0.24	0.25	0.26	0.26
6				0.08	0.09	0.12	0.12	0.12	0.15	0.18	0.2	0.22	0.23	0.25	0.25
7					0.08	0.1	0.1	0.12	0.15	0.16	0.18	0.2	0.21	0.23	0.25
8						0.08	0.08	0.1	0.12	0.14	0.18	0.2	0.2	0.23	0.23
9							0.08	0.1	0.1	0.12	0.16	0.18	0.2	0.2	0.23
10								0.07	0.1	0.12	0.15	0.18	0.18	0.2	0.21
11								0.07	0.08	0.1	0.12	0.15	0.18	0.18	0.2
12									0.08	0.1	0.1	0.13	0.15	0.15	0.2
13										0.08	0.1	0.11	0.15	0.15	0.18
14											0.08	0.08	0.11	0.12	0.15
15													0.08	0.1	0.12
16														0.08	0.08
17															0.08

Table of recommended in-feed for American unified standard external threading

Screw pitch（mm）	24	20	18	16	14	12	10	8
Total in-feed（mm）	0.72	0.85	0.92	1.06	1.2	1.39	1.67	2.07
Number of passes	5	6	6	7	8	9	10	12
Sequence of threading tool pass	Radial feed/pass units：mm							
1	0.2	0.2	0.22	0.23	0.24	0.24	0.25	0.25
2	0.18	0.18	0.2	0.2	0.21	0.22	0.23	0.23
3	0.15	0.16	0.16	0.18	0.18	0.2	0.21	0.23
4	0.11	0.13	0.14	0.15	0.15	0.18	0.2	0.2
5	0.08	0.1	0.12	0.12	0.13	0.15	0.18	0.2
6		0.08	0.08	0.1	0.11	0.13	0.15	0.18
7				0.08	0.1	0.11	0.15	0.18
8					0.08	0.08	0.12	0.15
9						0.08	0.1	0.15
10							0.08	0.12
11								0.1
12								0.08

Table of recommended in-feed for American unified standard internal threading

Screw oitch	24	20	18	16	14	12	10	8
Total in-feed（mm）	0.71	0.83	0.92	1.03	1.16	1.29	1.53	1.9
Number of passes	5	6	6	7	8	9	10	12
Sequence of threading tool pass	Radial feed/pass units：mm							
1	0.19	0.2	0.22	0.23	0.24	0.24	0.25	0.25
2	0.17	0.18	0.2	0.2	0.2	0.2	0.23	0.23
3	0.15	0.15	0.17	0.17	0.18	0.18	0.2	0.23
4	0.12	0.12	0.14	0.14	0.15	0.15	0.18	0.2
5	0.08	0.1	0.11	0.12	0.12	0.12	0.15	0.18
6		0.08	0.08	0.1	0.1	0.12	0.13	0.15
7				0.07	0.1	0.1	0.11	0.15
8					0.07	0.1	0.11	0.12
9						0.08	0.1	0.12
10							0.07	0.1
11								0.1
12								0.07

Table of recommended in-feed for Whitworth internal and external threading

Screw oitch	28	20	19	18	16	14	12	11	10	9	8
Total in-feed（mm）	0.66	0.88	0.91	0.99	1.09	1.25	1.42	1.58	1.71	1.9	2.13
Number of passes	5	6	6	7	8	8	8	9	10	11	12
Order to follow in threading operation	Radial feed/pass units：mm										
1	0.18	0.2	0.2	0.2	0.2	0.22	0.23	0.24	0.24	0.23	0.23
2	0.15	0.18	0.18	0.18	0.18	0.2	0.21	0.22	0.22	0.22	0.22
3	0.14	0.16	0.17	0.15	0.16	0.2	0.21	0.2	0.2	0.21	0.22
4	0.11	0.14	0.15	0.15	0.15	0.18	0.2	0.2	0.2	0.2	0.21
5	0.08	0.12	0.13	0.13	0.12	0.15	0.2	0.18	0.18	0.2	0.2
6		0.08	0.08	0.1	0.12	0.12	0.16	0.18	0.16	0.18	0.2
7				0.08	0.08	0.1	0.12	0.15	0.15	0.15	0.18
8					0.08	0.08	0.09	0.12	0.15	0.15	0.16
9								0.09	0.12	0.13	0.15
10									0.09	0.13	0.15
11										0.1	0.12
12											0.09

Table of recommended in-feed for NPT internal and external threading

Screw oitch	27	18	14	11.5	8
Total in-feed（mm）	0.77	1.14	1.46	1.77	2.54
Number of passes	6	8	10	12	14
Sequence of threading tool pass	Radial feed/pass units：mm				
1	0.19	0.22	0.24	0.24	0.24
2	0.16	0.2	0.22	0.22	0.24
3	0.14	0.18	0.2	0.2	0.23
4	0.11	0.15	0.15	0.18	0.22
5	0.09	0.12	0.15	0.15	0.22
6	0.08	0.1	0.12	0.15	0.2
7		0.1	0.12	0.13	0.2
8		0.07	0.1	0.13	0.18
9			0.08	0.11	0.16
10			0.08	0.1	0.16
11				0.08	0.15
12				0.08	0.12
13					0.12
14					0.1

Table of recommended in-feed for BSPT internal and external threading with wiper edge

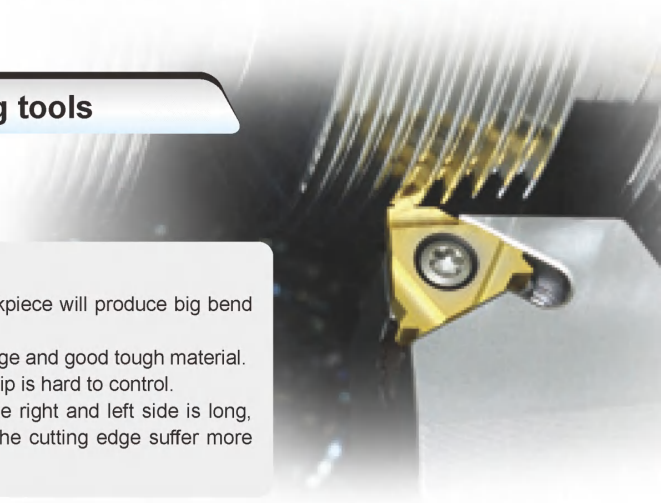
Screw oitch	28	19	14	11
Total in-feed（mm）	0.66	0.94	1.25	1.56
Number of passes	5	6	8	10
Order to follow in threading operation	Radial feed/pcs units： mm			
1	0.18	0.22	0.22	0.22
2	0.15	0.2	0.2	0.2
3	0.14	0.18	0.18	0.2
4	0.11	0.15	0.16	0.18
5	0.08	0.11	0.15	0.15
6		0.08	0.15	0.15
7			0.11	0.13
8			0.08	0.13
9				0.11
10				0.09

Table of recommended cutting parameters

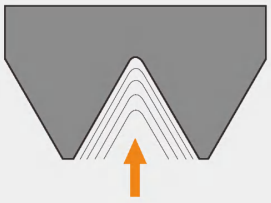
ISO	Material			Unit cutting force Kc0.4 N/mm²	Hardness HB	Grade: YBG201 YBG202 YBG203 YBG205 — Cutting speed(m/min)
P	Carbon steel	C=0.15%		1900	125	150-175
		C=0.35%		2100	150	140-155
		C=0.60%		2250	200	130-145
	Alloy steel	Anneal		2100	180	110-130
		Hardened		2600	275	80-100
		Hardened		2700	300	70-90
		Hardened		2850	350	60-80
	High alloy steel	Anneal		2600	200	90-115
		Hardened		3900	325	70-90
	Cast steel	Non-alloy		2000	180	180-210
		low alloy		2500	200	90-115
		High alloy		2700	225	90-115
		Martensite steel 12%Mn		3600	250	40-50
M	Stainless steel	Austenite		2450	180	110-130
		Martensite/Ferrite		2300	200	130-170
K	Malleable cast iron	Ferrite		1100	130	110-140
		Pearlite		1100	230	85-105
	Gray cast iron	Low tensile-strength		1100	180	110-140
		High tensile-strength		1500	260	90-115
	Nodular cast iron	Ferrite		1100	160	110-130
		Pearlite		1800	250	80-100
N	Al alloy	Non-aging treatment		500	60	1300-1450
		Aging treatment		800	100	450-500
	Cast aluminum alloy	Non-aging treatment		750	75	430-470
		Aging treatment		900	90	250-290
S	Super alloy	Iron base	Anneal	3000	200	35-50
			Aging	3050	280	25-35
		Ni- or Co-base	Anneal	3500	250	15-25
			Aging	4150	350	10-20
			Casting	4150	320	10-15
H	Hardened steel	Hardened steel		4500	HRC55	40-50

Note: •The values in the above table are range values. High values in the range could be considered in actual cutting. When trying new cutting speed, please check the cutting edge condition before operation.
•In stainless steel threading, high cutting speed should be used to prevent built-up edge.
•The cutting parameters should be reduced when cutting small pitch thread and when using tools with small nose radius.
•When cutting thread by tools with small nose radius, such as NPT standard thread, it is advisable to use tools with big nose radius first to rough, so as to improve the life of tools with small nose radius.

In-feed way of threading tools



Radial in-feed



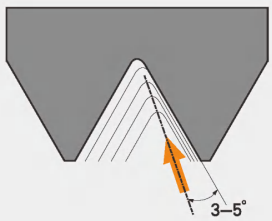
- Easy operating, high general.
- V-shape chip caused by long chip steel workpiece will produce big bend stress on cutting edge.
- It requires low cutting depth, sharp cutting edge and good tough material.
- Big quantity of heat when cutting ,V-shape chip is hard to control.
- Because the interface of cutting chips on the right and left side is long, so it is easy to cause vibration and make the cutting edge suffer more overloading.

Flank in-feed



- Cutting edge suffer small bend stress, stable estate, it is easy for chips formation in deep cutting depth.
- There are enough space to leave chips flow when flank in-feed.
- Big abrasion on right flank.

Modified flank in-feed



- Right Cutting Edge also engage on cutting depth to a certain extent, it can reduce the abrasion on right side of clearance face.
- Cutting edge suffer small bend stress, stable estate, it is easy for chips formation in deep cutting depth.
- Good Cutting Performance.

Alternate flank in-feed



- Cutting edge trade off when machining, equality abrasion on left and right side of clearance face on cutting edge, it can improve the life of tools.
- Chips are flowing from both of right and left side, good chips flowing.
- Recommend using in big screw-pitch thread cutting.

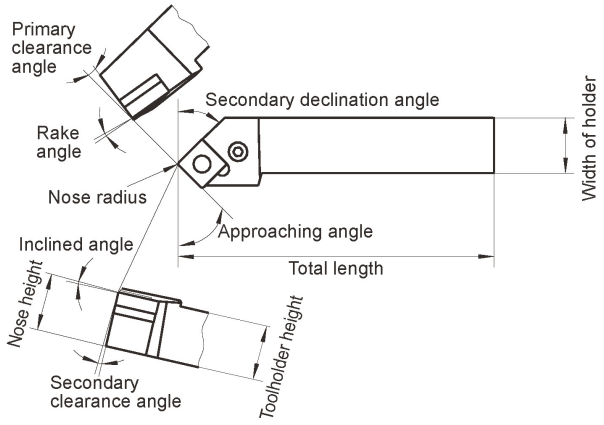
Recommend adopting flank in-feed or alternate flank in-feed under allowable range of machining equipment or programmer, it can eliminate the machining vibration effectively, and it has enough space discharge the chips between pitch. Cutting edge suffer a small stress, machining stable, it likes the general turning process when machining thread, good chip control without chip tangling.

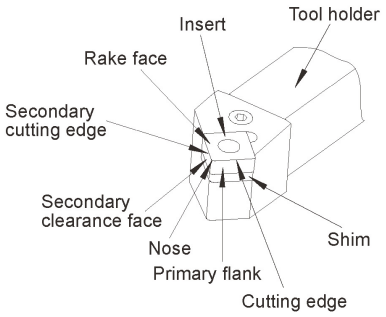
Common problems in threading and solutions

Problem	Cause	Solutions
Wear on clearance face	Cutting speed too high.	Reduce cutting speed.
	Low cutting depth, friction and wear.	Reduce frequency of feed and friction of cutting edge.
	Inserts are over the center line.	Adopt correct center height.
Asymmetric wear on right and left cutting edge	The inclined angle of insert is different from the helical angle of thread.	Change to proper shim to get correct inclined angle.
	Flank in-feed is not correct.	Change the way of flank in-feed.
Breakage	Cutting speed too low.	Increase cutting speed.
	Cutting force too high.	Increase frequency of feed and reduce Max in-feed.
	Unstable clamping.	Check if workpiece vibrates. Reduce overhang of tool. Verify clamping of workpiece and tool.
	Chip tangling.	Increase the pressure of cooling liquid to blow away chips.
Plastic deformation	High cutting speed, high temperature on cutting area.	Reduce cutting speed. Increase feed frequency and reduce Max cutting depth.
	Insufficient cooling fluid.	Increase cooling fluid supply.
Low thread surface quality	Cutting speed too low. The insert is over the center line. Chips are not under control.	Increase cutting speed. Adjust centre height. Change the operation way of tools to well control chips.
Incorrect profile	Incorrect center height.	Adjust centre height.
	Pitch on machine is not correct.	Adjust machine.
Shallow profile	Cutting speed set wrong.	Adjust cutting depth.
Surface damage	Chip involved in or touched the machined surface.	Change to flank in-feed to control chip flow direction.
Built-up edge	Temperature of cutting edge is too low. Usually occur when machining stainless steel and low carbon steel.	Increase cutting speed as well as pressure and concentration of cooling fluid. Choose inserts with good toughness.
Crack on surface	Cutting force too high.	Reduce the cutting depth of each feed.
Vibration	Incorrect clamping of workpiece or tool.	Verify clamping of workpiece and tool. Minimize overhang of tool.
	Incorrect cutting parameters.	Increase cutting speed or reduce it substantially.
	Incorrect tool clamping.	Adjust center height.

The functions of each part of turning tools

1 The names of each part of turning tools





2 Effects of rake angle

Larger rake angle makes cutting edge sharper, reduces resistant forces of chip flow, diminishes friction and prevent deformation, leading to smaller cutting forces and cutting power, lower cutting temperature, less abrasion and higher surface quality. However, too large rake angle would reduce the rigidity and strength of tool. Heat can't be diffused easily. Serious breakage and abrasion on tool would occur, reducing tool life. Please choose rake angle according to machining conditions.

Value selection	Situations
Small rake angle	●When machining brittle and hard materials ●When roughing and intermittent cutting
Big rake angle	●When machining plastic or soft materials ●When finishing

3 Effects of clearance angle

The main function of clearance angle is to reduce the friction between the clearance face of tool and the surface of workpiece. When the rake angle is fixed, larger clearance angle can increase the sharpness of cutting edge, reduce cutting forces and friction, and then achieve higher surface quality. However, if clearance angle is too large, the strength of cutting edge would decrease. Also, heat can't be diffused easily and serious abrasion would occur, reducing tool life.

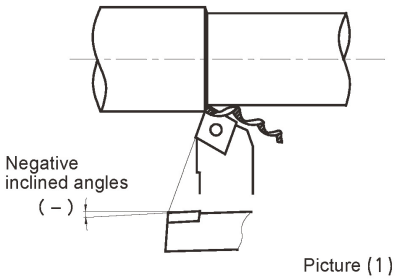
The principle of choosing clearance angle: Choose small clearance angle if friction is not serious.

Value Selection	Situations
Small clearance angle	●In order to increase nose strength when roughing ●When machining brittle and hard materials
Large clearance angle	●In order to reduce friction when finishing ●When machining materials easy to be hardened

4 Effects of inclined angle

Positive or negative inclined angle determines the direction of chip flow, and also affects the strength and impact resistance of insert nose.

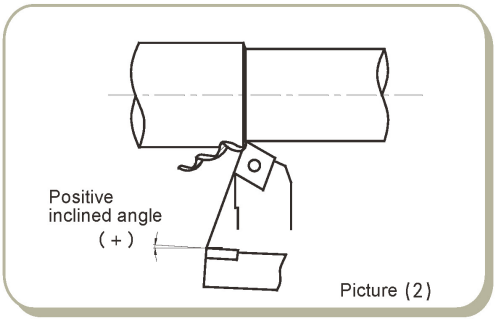
◆As diagram (1) shows, when the inclined angle is negative, namely nose is in the lowest point as apposed to the bottom of tool, chips flow to the machined surface of workpiece.



Picture (1)

◆ As diagram (2) shows, when inclined angle is positive, namely the nose is in the highest point as apposed to the bottom of the tool, chips flow to the areas of workpiece surface that haven't been machined.

◆ The change of inclined angle also affects insert nose strength and impact resistance. When the inclined angle is negative, the nose is in the lowest point of cutting edge. When the cutting edge enters the workpiece, the contacting point is on the cutting edge or rake face, protecting the nose from impact and increase the strength of the nose. Normally, negative inclined angle should be chosen for tools with big rake angle. This can not only increase nose strength, but also prevent the impact of entry.

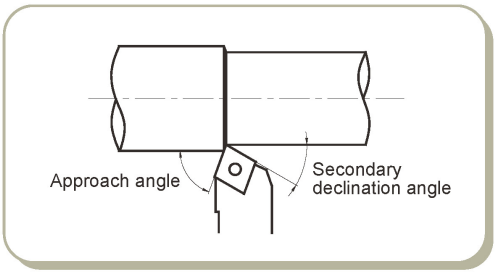


Picture (2)

5 Effects of approach angle

Reduced approaching angle increases the strength of tools and enable heat to diffuse easily, improving surface quality. This is because when the approach angle is small, cutting edge width is large, and then the unit width of cutting edge bears less cutting force. Meanwhile, tool life can be improved.

Normally, select 90°approach angle for turning of slender and step shaft; select 45° approach angle for external turning, end surface machining and chamfering. When approach angle is larger, radial force is reduced, cutting is stable, cutting thickness is increased, and chip breaking is excellent.



Value selection	Situations
Small approach angle	For those materials with high intensity, high hardness and hardened layer on the surface
Big approach angle	When rigidity of the machine is not enough

6 Effects of secondary declination angle

Minor angle is the main angle that can affect surface quality, and it can also affect tool strength. If the approach angle is too small, the friction between the secondary flank and machined surface of workpiece will increase, causing vibration.

The principle of selecting minor angle: Select small minor angle when roughing or when the friction is unaffected and there is no vibration. Select large minor angle when finishing.

7 Nose radius

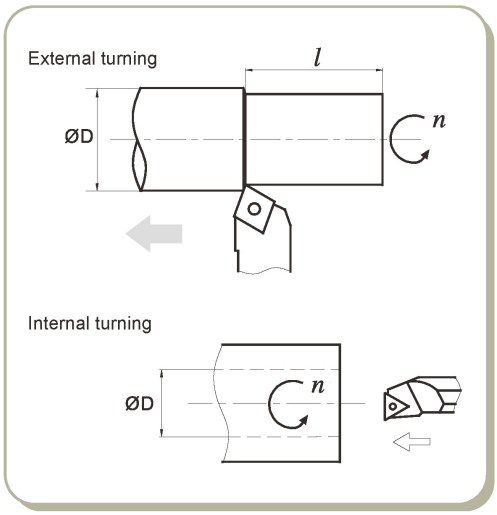
Nose radius significantly affects nose strength and surface quality.

Large nose radius means higher cutting edge strength, and the abrasion on the rake face and clearance face can be reduced to some extent. However, if the nose radius is too large, radial force will increase, and vibration is easy to occur, affecting machining precision and surface quality.

Value selection	Situations
Small nose radius	●Finishing at small cutting depth ●Machining parts such as slender shaft ●When the rigidity of the machine is not enough
Large nose radius	●When roughing ●When machining hard materials (intermittent cutting) ●When the rigidity of the machine is not enough

Calculation method of turning parameters

1 Calculation of cutting speed



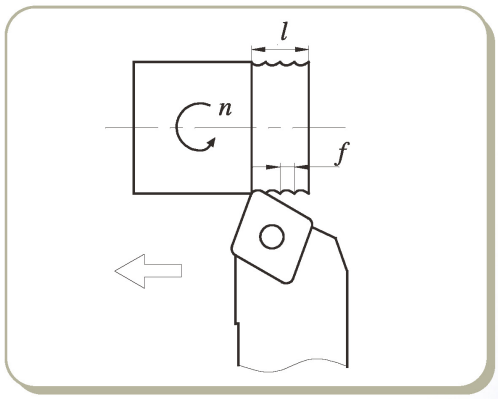
$$Vc=\frac{\pi\times D\times n}{1000}\ (m/min)$$

In the formula: Vc: Cutting speed (m/min)
n: Rotating speed of spindle (rev/min)
D: Diameter of workpiece (mm)

For example: When the rotating speed is 280rev/min and the diameter of workpiece is 150mm, the cutting speed should be:

$$Vc=\frac{\pi\times D\times n}{1000}\ (m/min)\ =132(m/min)$$

2 Calculation of feed rate



$$f=\frac{l}{n}\ (mm/rev)$$

In the formula: f: Feed rate per rotation (mm/rev)
l: Cutting length per minute (mm/min)
n: Rotating speed of spindle (rev/min)

For example: When the rotating speed of main axle is 500rev/min, and the cutting length per minute is 100mm/min, the feed rate per rotation should be:

$$f=\frac{l}{n}=\frac{100}{500}=0.2(mm/rev)$$



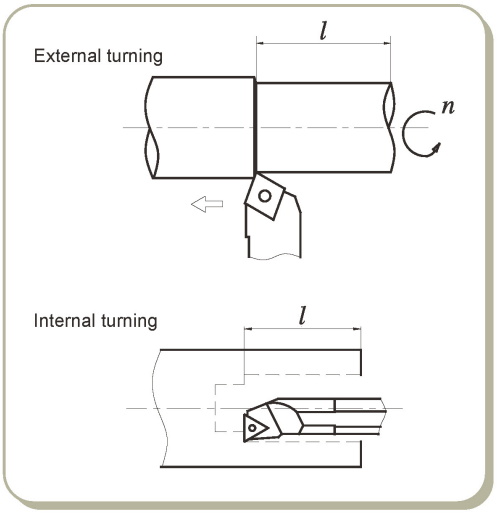
3 Cutting time calculation of external and internal turning

$$T=\frac{l}{f\times n}\ (min)$$

In the formula: T: Cutting time (min)
l: Length of machined areas (mm)
f: Feed rate (mm/rev)
n: Rotating speed of main axle (rev/min)

For example: When the rotating speed of main axle is 250rev/min, and the feed rate is 0.2mm/rev, the time needed for a cutting length of 150mm should be:

$$T=\frac{l}{f\times n}=\frac{150}{0.2\times 250}=3(min)$$

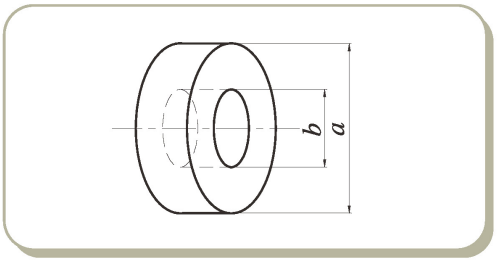


4 Time calculation for end surface turning (constant linear speed)

$$T=\frac{\pi\times(a^2-b^2)}{4000\times Vc\times f}\ (min)$$

In the formula: T: Cutting time (min)
Vc: Cutting speed (m/min)
f: Feed rate (mm/rev)

For end surface without hole, b=0, the formula is still valid.



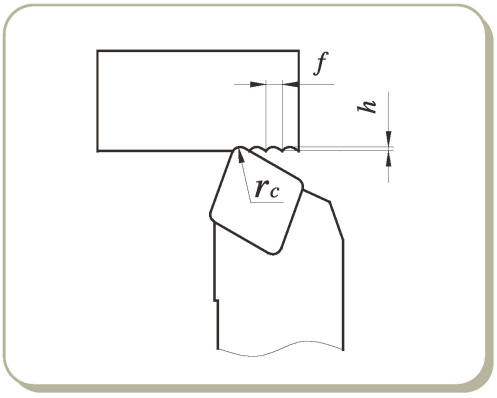
5 Theoretical value calculation of machined surface roughness

$$R=\frac{f^2}{8r_c}\times 1000\ (\mu m)$$

In the formula: R: Theoretical roughness value of machined surface
f: Feed rate (mm/rev)
rc: Nose radius (mm)

For example: When the feed rate is 0.2mm/rev, and the nose radius is 0.4mm, the theoretical roughness value of machined surface should be:

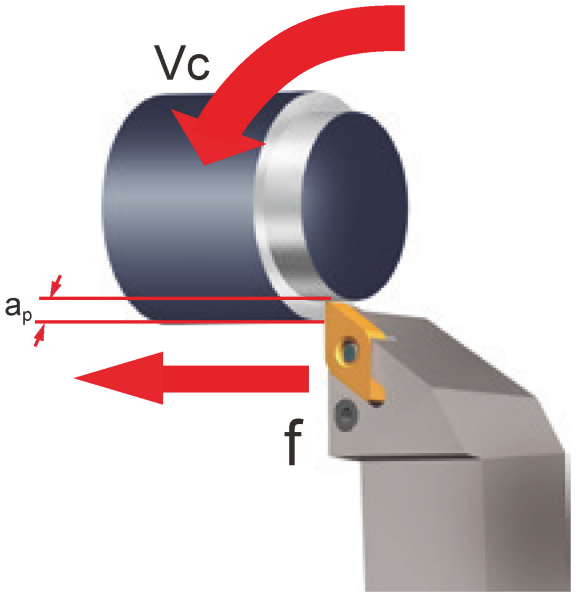
$$R=\frac{f^2}{8r_c}\times 1000=\frac{0.2^2}{8\times 0.4}\times 1000=12.5(\mu m)$$



Effect of three main turning parameters on machining

Effects of three main parameters

Normally, short machining time, long tool life and high machining precision are expected in machining, so the material quality, hardness, and shape of the workpiece, and properties of machine should be fully considered, and then we can select suitable tools and adopt high-efficiency cutting parameters, namely three parameters.



Cutting speed (Vc)

When the workpiece is rotating on the machine, the number of its rotation per minute is defined as Rotating speed of main axle (n). Because of its rotation, the cutting speed measured on the contacting point of diameter is defined as linear speed, m/min. Normally, linear speed is considered to measure the effect of cutting speed on machining.

Effect of cutting speed

Cutting speed has significant effect on tool life. When the cutting speed is increased, cutting temperature will increase and tool life will be shortened. Cutting speed varies according to the different types and hardness of workpiece. The below conclusions are reached after many cutting experiments:

(1) Normally tool life would be reduced to half when the cutting speed is increased by 20%. Tool life would be 20% of the original life if the cutting speed is raised by 50%.

(2) Low speed (20-40m/min) cutting could easily cause vibration and shorten tool life.

Feed rate (fn)

Feed rate is defined as the moving distance of tool after workpiece rotates for one circle, measured by mm/rotation.

Effect of feed rate

Feed rate is a key factor that determines surface quality. Meanwhile it also affect the range of chip forming and the thickness of chips during machining.

In term of the effect on tool life, small feed rate leads to serious abrasion on clearance face, greatly reducing tool life.

Cutting depth (ap)

Cutting depth is defined as the difference between machined surface and unmachined surface, measured by mm. It is half the difference value between the original diameter and machined diameter.

Effect of cutting depth

Cutting depth should be determined by the machining allowance and shape of workpiece, power and rigidity of machine, and tool rigidity.

The change of cutting depth has little effect on tool life. If the cutting depth is too low, the cutting nose only scrapes the hardened layer on the workpiece surface, reducing tool life. When there is hardened oxide layer on workpiece surface, higher cutting depth should be adopted within the possible range of machine's power to avoid cutting nose just cutting the hardened layer of workpiece.

Comparison table for turning insert chipbreaker

Negative inserts

ISO	Machining range	ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	SECO	MITSUBISHI	SUMITOMO	KENNAMETAL	DIJET	HITACHI	TUNGALOY	KYOCERA	VALANTTE
P	For extra finishing		QF LC	HU	FA FX	FP5	FF1 FF2	PK※ FH, FY FP, FS	FB FA, FL	FF		FE	01※, TF, ZF 11	DP※, GP, PP ,VF, XP XP-T, XF	F1
	For finishing	DF XF	PF XF	HF	FG FM	MP3, FV5 NF3, NF4	MF2	LP, C SA, SH	FE, SU, LU, SX, SE	LF, FN	PF, UR UA, UT	BE, CE B, BH	NS, 27 TSF, AS, TQ	HQ, CQ PQ	F2(2B), F5(5C)
	For finishing (Soft steel)	SF		HF	FC			SY					17	XQ, XS	
	For finishing (Wiper)		WL WF	HW	WS	NF	W-MF2	SW	LUW SEW	FW			AFW, ASW FW, SW	WF WP, WQ	
	For semi-finishing	DM PM XM	PM QM XM	HA HC HM	PC FT MT SM MP	MF3 MV5	MF3 MF5 M3 M5	MP MA MH	GU UG UX GE	P MN	PG UB	CT AB AY AE AH	NM, ZM TM, DM 37, AM 33, 38	PG, CJ, GS, PS HS, PT	F3, F4(8A), M2(2C), M3 M4, M5(5B), M6, M7, 55, M8
	For semi-finishing(Wiper)		WMX WM		WT	NM	W-M6 W-M3 W-MF5	MW	GUW	MW RW				WE	
	For light roughing	LR(Single-side) DR(Double-side)	PR, HM XMR		RT	NM6, RP5 NM9, RP7	MR7 MR6	RP GH	MU, MX ME, UZ	RN RP	UD, GG	Y, RE	TH	RH, GT	
	For heavy roughing	HDR HPR	QR PR HR MR	HR HH	RX, HD HY, HT RT, RH HZ, EH	NR6 NRF NRR	R5, R56 R4, R6 R7, PR9 R57, RR6 R8	HM, HL HZ, HX HV, HR	MP, HG HP, HU HW, HF	MR, RM RH	UC	TE, UE HX, HE H	TU, TRS TUS	PX	R3, R4, R6(9A) R7(9B), R9(9C)

※ Periphery grinding type

Comparison table for turning insert chipbreaker

Negative inserts

ISO	Machining range	ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	SECO	MITSUBISHI	SUMITOMO	KENNAMETAL	DIJET	HITACHI	TUNGALOY	KYOCERA	VALANTTE
M	For finishing	EF	MF	HA	SF	NF4, FM5	MF1	SH, LM	SU, EF	FP, LF※		MP, AB BH	SS	MQ GU	F1, F2(2B), F5(5C)
	For semi-finishing	EM	MM, QM XM, K	HS	ML, EM MM, VF	MM5 RM5 NM4	MF4	MS, ES GM, MM MA	EX, EG UP, GU HM	MP	SF, SG SZ	DE PV SE AH	SF, SA, SM, S	MS, MU SU, HU, ST, TK	F3, F4(8A), M2(2C), M3 M4, M5(5B), M6, M7, 55, M8
	For roughing	ER	MR	GS, HM	MT	NR4 NR5	M5, MR7 RR6	GH, HZ RM, HL	EM, MU MP	UP RP		AE	TH, SH		R3, R4, R6(9A) R7(9B), R9(9C)
K	For finishing	PM	KF			MK5	MF2, M3 MF5, M4	VA AH		FN		VA, AH	CF	KQ	F2(2B)
	For Semi-Finishing	PM	KM	Through chip-breaker, HM	MC	RK5 NM5	M5	V AE	UZ, GZ UX	RP, UN	PG	V, AE	CM	KG, C	M5(5B), M6, M8
	For roughing	Without chip-breaker	KR KRR	GR, HR GH	KT	RK7		RE			GG	RE		KH, GC	R3, R4, R7(9B)
S	For finishing	NF/NGF	SF SGF※		EA	NF4, NFT MS3	MF5, MF1 MF4	FJ※, LS MJ, MJ※	EF, SU※	FS, LF※ MS			HRF	MQ	F5(5C), M2(2C)
	For semi-finishing	NM	NGP※, SM			NMT, NMS	M1	MS	EG, EX SU※, UP	NGP※ UP, P		VI	HRM, SA HMM	SQ, MS MU, TK	M4, M5(5B), M7, 55
	For roughing	SNR	SR SMR		ET	NRS NRT	MR3 MR4	GJ RS	MU	RP				SG SX	

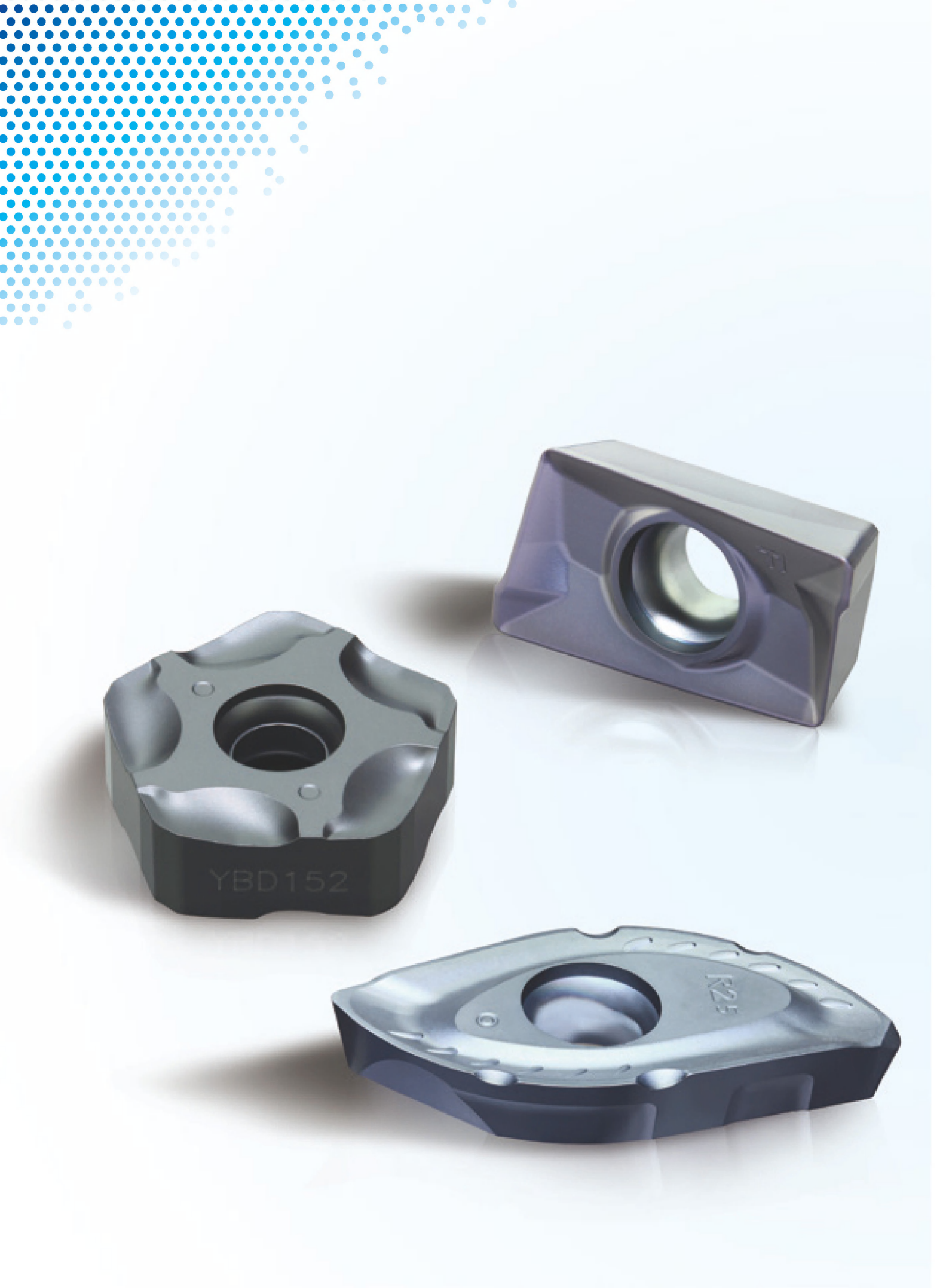
※ Periphery grinding type

Comparison table for turning insert chipbreaker

Positive inserts

ISO	Machining range	ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	SECO	MITSUBISHI	SUMITOMO	KENNAMETAL	DIJET	HITACHI	TUNGALOY	KYOCERA	VALANTTE
P	For finishing	SF, HF XF	PF, UF XF	HFP	FA, FG FX	PF4 FP4	FF1 F1	FV, SV FP, LP	FP, LU SU, SK	11, UF LF, FP		JQ	PF, PSF PS, PSS	GP, XP VF, PP	PF4 JQ, JZ
	For finishing (Wiper)		WF			PF2※ PF, PF5※	W-F1	SW	LUW SDW	FW				WP	
	For semi-finishing	HM, XM	UM, XM PM, PR XR	HMP C25	MT, PC	PS5 PM5 FP6	F2 MF2, M5	MV, MP	MU	MF, MP	FT	JE	PM 23, 24	HQ, XQ GK MF※	PM2 PM4
	For semi-finishing (Wiper)		WM		WT	PM	W-F2 W-M3	MW		MW					
M	For finishing	EF	MF	HFP		FM4	F1, F2	FM, LM	FC※, SI※ LU, SU	MF		MP	PF, PSF PS, PSS	CF※, CK※ GQ※, GF※ MQ, SK	1A, 2A
	For semi-finishing	EM	MM	HMP C25		MM4 RM4		MM	MU	MP			PM	HQ GK	PM2 PM4
K	For semi-finishing	HM, HR without chip-breaker	KF KM KR	HMP C25		FK6	F1 M3, M5	MK Without chip-breaker	MU Without chip-breaker	Without chip-breaker			CM Without chip-breaker	Without chip-breaker※	PM2 PM4
S	For finishing/ For semi-finishing	NGF						FS※, LS※ FJ※, FS-P※ LS-P※	SL※	LF※ HP※				MQ	PM2, 1A 2A
N	For general turning	LH	AL	TA AK MA	FL	PM2, FN2 MN2	AL※	AZ※	AG	HP※	ALU ACB ASF		AL※	AH※	1L, 1A 2A

※ Periphery grinding type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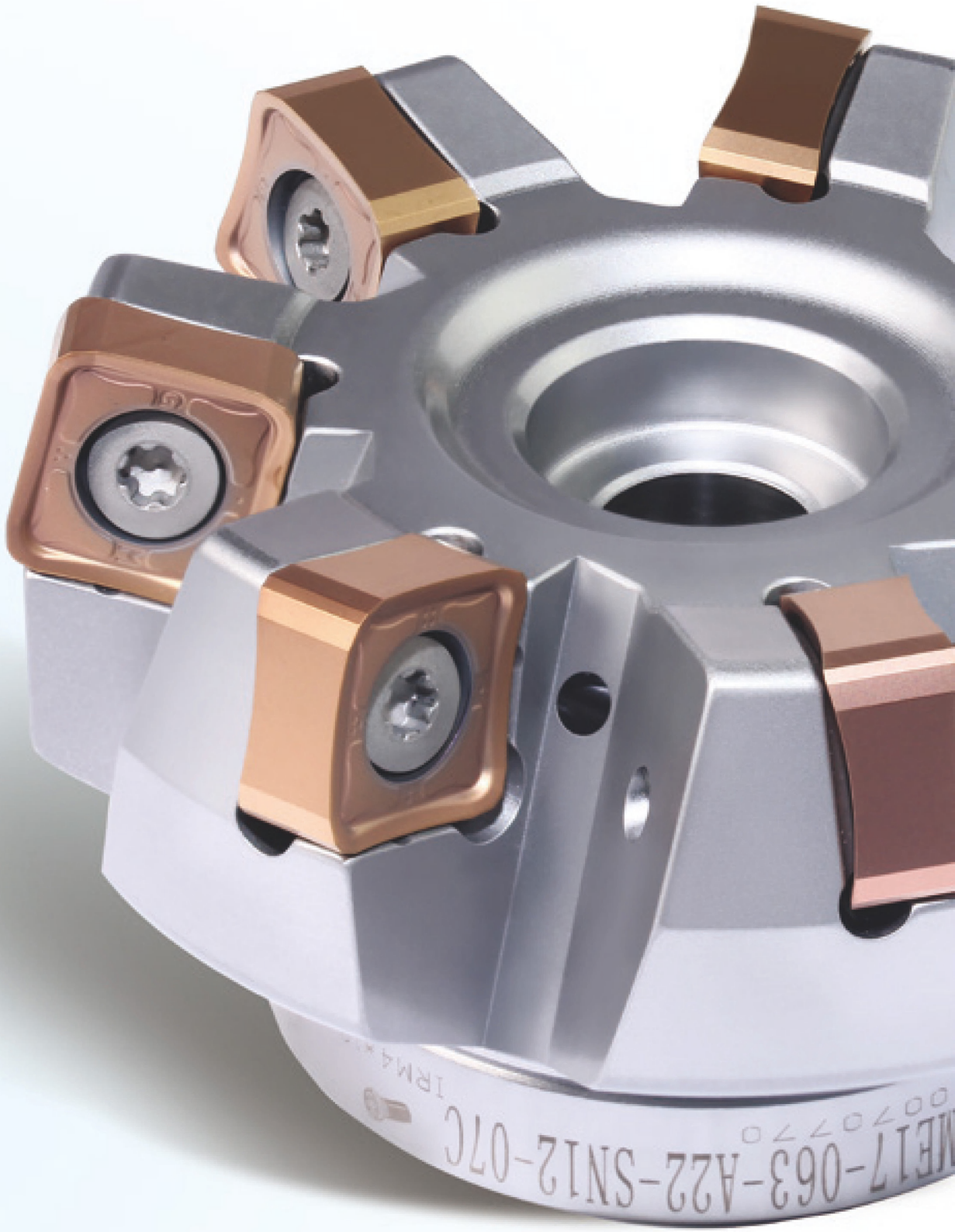


Milling Tools

Indexable milling tools

FMA11 series

With Outstanding Economy and High Performance

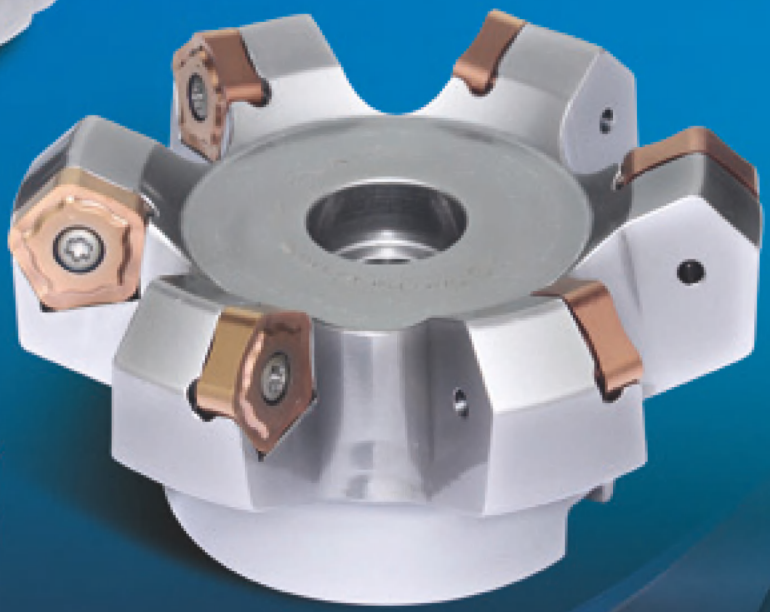


FMA12 series

High Performance Face Milling with 16 Edges for Outstanding Economy Milling





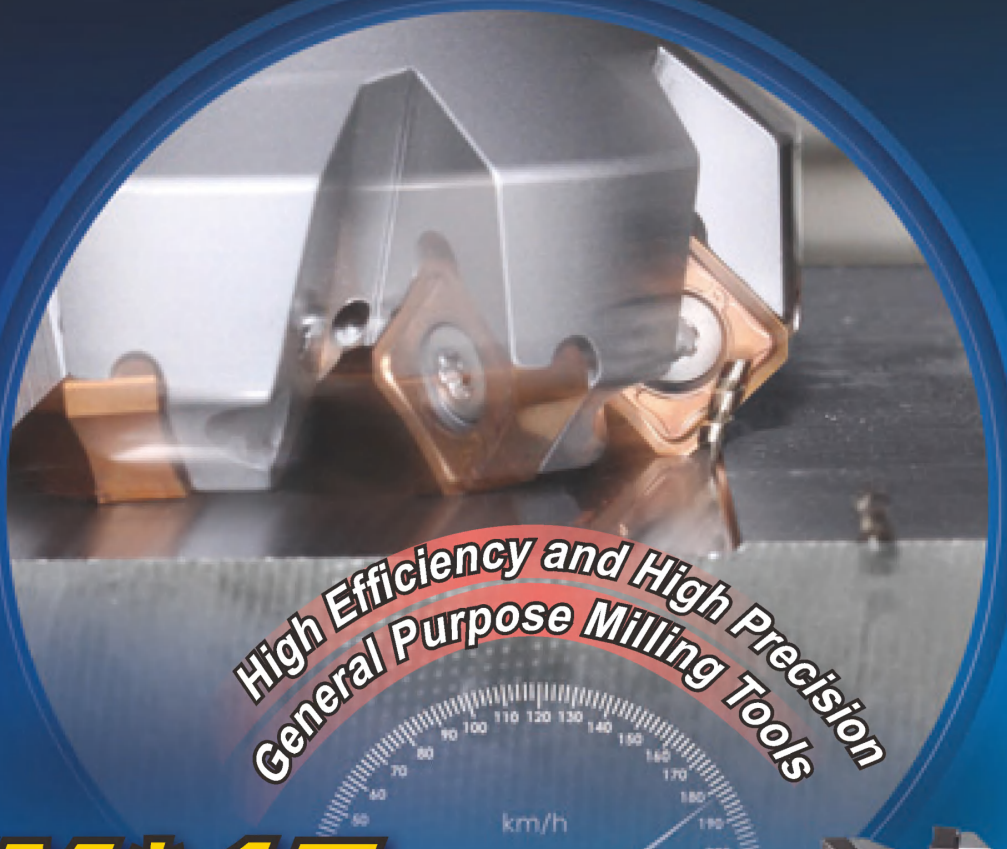




FMA14 series







High Efficiency and High Precision
General Purpose Milling Tools

FM*17 series









New Generation of the Tangential Milling Tools

EMP09 series

EMP13 Series

Achieve High-quality 90° Square Shoulder Processing



Milling

B

Indexable Milling Tools B1-B276

Indexable milling tools B3-B229

Indexable milling inserts B230-B270

Technical information B271-B276

Solid Carbide End Mills B277-B680

Solid carbide end mills B277-B646

Technical information B647-B651

Interchangeable modular end mills B654-B680






New champion in milling YBC302
Black Diamond Series Grade

How to choose the right indexable milling tools

■ Classification of milling tools

According to types of machining operation

Applicable machining operations
For face milling, chamfering, shoulder milling etc.

Product series

Type of machining

Workpiece materials

Approach angle

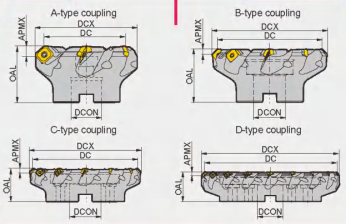
Structure and coupling size

Inserts specification
Insert shape, type, dimensions, grade, stock, etc.

Face milling tools | KAPR:45°

FMA01 P M K N S





Face milling | Chamfering

Specification of tools

Type		Stock R	Stock L	Basic dimensions(mm) DC	DCX	DCON	OAL	APMX	Number of teeth Z	Type of coupling	Weight (kg)
FMA01 Coarse pitch	-050-A22-SE12-04	▲	△	50	61	22	40	6	4	A	0.3
	-063-A22-SE12-05	▲	△	63	74	22	40	6	5	A	0.5
	-080-A27-SE12-06	▲	△	80	91	27	50	6	6	A	1.2
	-100-B32-SE12-07	▲	△	100	107	32	50	6	7	B	1.52
	-125-B40-SE12-08	▲	△	125	136	40	63	6	8	B	2.6
	-160-B40-SE12-07	▲	△	160	174	40	63	6	7	B	4.548
	-160-B40-SE12-10	▲	△	160	170	40	63	6	10	B	4.92
	-200-C60-SE12-08	▲	△	200	214	60	63	6	8	C	6.175
	-200-C60-SE12-12	▲	△	200	210	60	63	6	12	C	7.6
	-250-C60-SE12-10	▲	△	250	264	60	63	6	10	C	12.596
	-250-C60-SE12-14	▲	△	250	260	60	63	6	14	C	13.5
	-315-D60-SE12-18	▲	△	315	325	60	70	6	18	D	20.8
	-100-B32-SE18-04	▲	△	100	120	32	63	10.4	4	B	2.22
	-125-B40-SE18-05	▲	△	125	145	40	63	10.4	5	B	3.15
	-160-B40-SE18-06	▲	△	160	180	40	63	10.4	6	B	5.01
	-200-C60-SE18-08	▲	△	200	220	60	63	10.4	8	C	6.9
	-250-C60-SE18-10	▲	△	250	270	60	63	10.4	10	C	13.1
	-315-D60-SE18-12	▲	△	315	335	60	80	10.4	12	D	24.5

▲Stock available △Make-to-order

Spare parts

Diameter DC	Insert	Insert screw	Shim	Shim screw	Wrench	Wrench
Ø50-Ø315	SEET12□□-	I60M3.5×12	S13BS	SM5×7XA	WT15IS	WH35L
Ø100-Ø315	SEET18□□-	I60M5×17	S18BS	SM8×9XA	WT20IT	WH50L



Tools code key B26–B27 | Grade selection guide B19–B23 | Technical data B271–B276

Spare parts

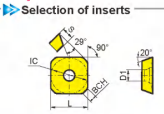
Tools specification
Tool shape, dimensions, stock, etc

Tool shape

Assembly of tools and spare parts

Tools code key, reference to grade selection, technical data

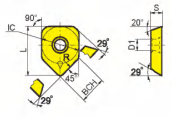
Selection of inserts

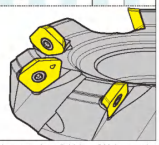


Good working condition | Normal working condition | Bad working condition

Workpiece material: P Steel; M Stainless steel; K Cast iron; N Non-ferrous metal; S Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm) L	IC	S	D1	BCH	R	CVD Coating YBC302	YBM253	YBD152	YBD203	YBD252	PVD Coating YBG105	YBG202	YBG205	YBB320	YBG302	YBS203	YBS303	Cermet YNG151	YNG151C	Cemented carbide YD101	YD201
	SEET12T3-DF	13.4	13.4	3.97	4.1	2.55	--	★							★		○	○					
	SEET12T3-CF	13.4	13.4	3.97	4.1	2.55	--			○				★	★		○						
	SEET12T3-EF	13.4	13.4	3.97	4.1	2.55	--								★		○	○	○				
	SEET12T3-DM	13.4	13.4	3.97	4.1	2.55	--	★							★		★	○	○				
	SEET18T6-DM	18.0	18.0	6.1	5.5	1.5	--	○	○														
	SEET12T3-CM	13.4	13.4	3.97	4.1	2.55	--			★					★		○						
	SEET12T3-EM	13.4	13.4	3.97	4.1	2.55	--								★		★	○	○				
	SEET18T6-EM	18.0	18.0	6.1	5.5	1.5	--	○								○							
	SEET12T3-DR	13.4	13.4	3.97	4.1	2.55	--	★							★		★						
	SEET12T3-CR	13.4	13.4	3.97	4.1	2.55	--			★					★		★						
	SEET12T3-LH	13.4	13.4	3.97	4.1	2.55	--															○	★
	SEET12T3-W	17.82	13.4	3.97	4.1	9.46	500	★	★					★	★					★			
	SEET18T6-W	24.78	18.0	6.1	5.5	11.0	500							★	○								





★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

How to choose indexable milling inserts

■ Detailed information for indexable milling inserts

Listed according to insert shape

Select insert grade according to workpiece material and working condition. Prior to selecting grade, please refer to the working condition suitable for the workpiece material.

😊 Good working condition: machine works well and stably. There are high requirements for dimensional precision of components and quality surface.

😐 Normal working condition: machine works normally. There are certain requirements for dimensional precision of components and surface quality.

☹ Bad working condition: machine works with bad stability. There are high requirements for high metal removal rate.

Insert shape and size

Insert shape

Insert grade

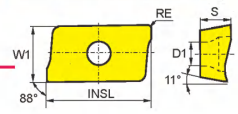
Insert shape

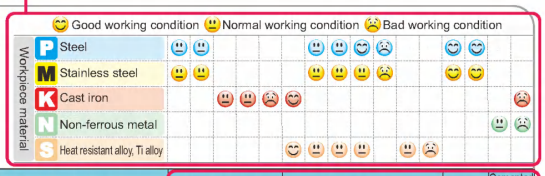
Insert dimension

Stock condition

Insert type

APKT□□





Insert shape	Type	Basic dimensions(mm)					CVD Coating				PVD Coating						Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YBG320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	APKT11T304-APL	12.24	6.6	3.6	2.8	0.4									★				○			
	APKT11T308-APL	12.24	6.6	3.6	2.8	0.8	★	★	★						★			○				
	APKT160408-APL	17.877	9.33	5.76	4.4	0.8	★	★	★						★			○				
	APKT160420-APL	17.877	9.33	5.76	4.4	2.0									★							
	APKT070204-APM	7.32	4.34	2.38	2	0.4		●	●						★							
	APKT11T304-APM	12.24	6.6	3.6	2.8	0.4		●							★							
	APKT11T308-APM	12.24	6.6	3.6	2.8	0.8		●	●						★		●	●				
	APKT11T312-APM	12.24	6.6	3.6	2.8	1.2			●						★							
	APKT11T316-APM	12.24	6.6	3.6	2.8	1.6									★							
	APKT11T320-APM	12.24	6.6	3.6	2.8	2.0		●							★							
	APKT160408-APM	17.877	9.33	5.76	4.4	0.8		●	●						★		●	●				
	APKT160416-APM	17.877	9.33	5.76	4.4	1.6		●	●						★		●					
	APKT160420-APM	17.877	9.33	5.76	4.4	2.0			●						★							
	APKT160424-APM	17.877	9.33	5.76	4.4	2.4									★							
	APKT160430-APM	17.877	9.33	5.76	4.4	3.0									★							
	APKT070204-APF	7.32	4.34	2.38	2	0.4	●	●							★							
	APKT11T304-APF	12.24	6.6	3.6	2.8	0.4	●	●							★							
	APKT11T308-APF	12.24	6.6	3.6	2.8	0.8	●	●							★		●	●				
	APKT160408-APF	17.877	9.33	5.76	4.4	0.8	●								★		●	●				
	APKT11T304-ALH	12.24	6.6	3.6	2.8	0.4															★	★
	APKT11T308-ALH	12.24	6.6	3.6	2.8	0.8															★	○
	APKT160408-ALH	17.877	9.33	5.76	4.4	0.8															★	★

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



MILLING B

Indexable Milling Tools

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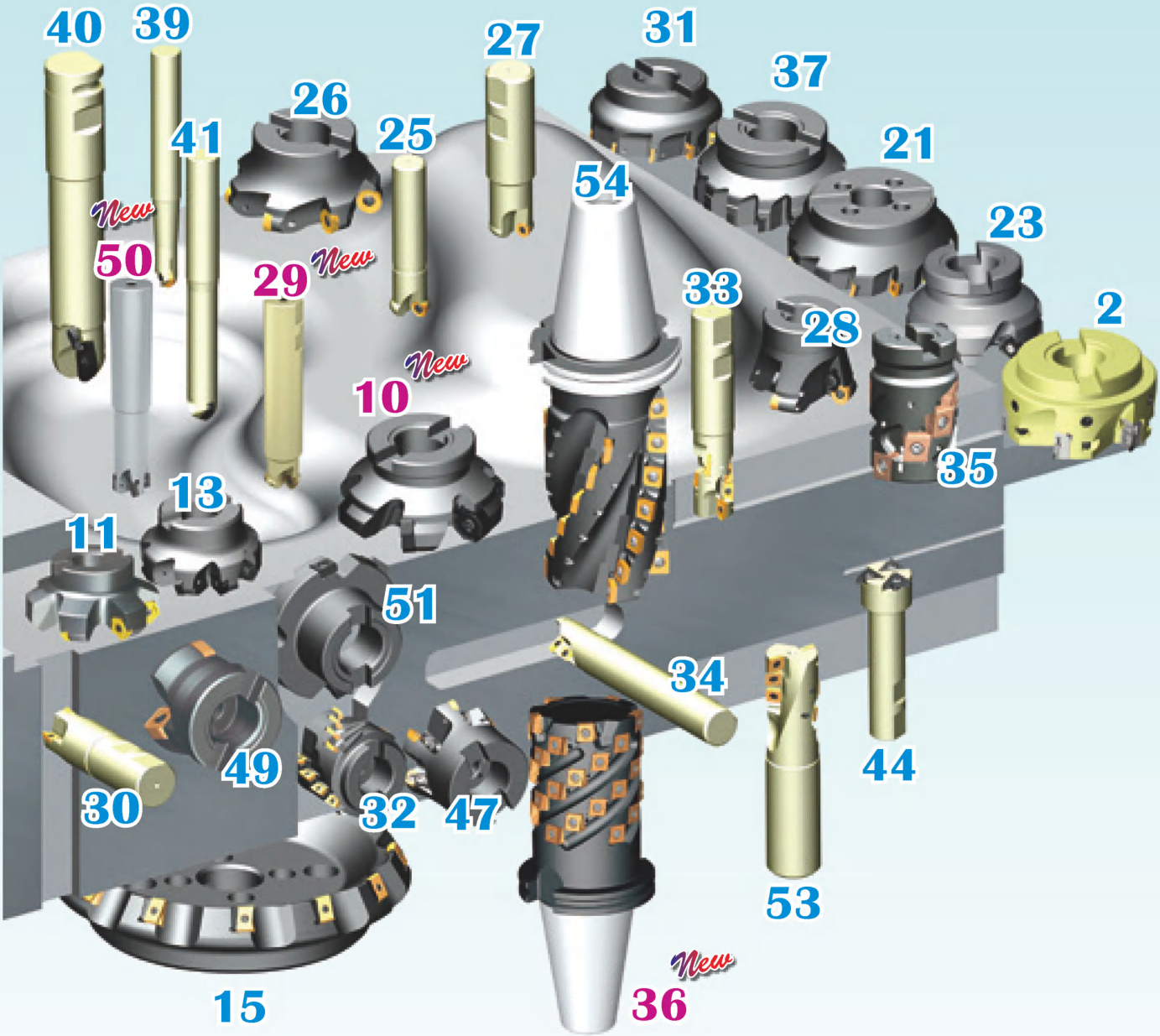

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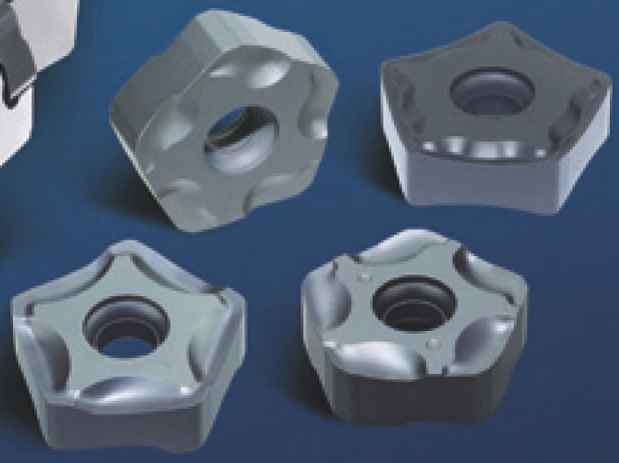
Whirlwind

FMD02

Milling Tools Series





Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
High-speed high-precision milling tools	**AMA01**  B29	KAPR=45° a_{pmax}=6.6	SEHT12T3AFFN-AL	High-speed, high-precision milling of aluminum alloy and cast iron	• Tool diameter Ø50-Ø500 • High-strength, lightweight aluminum alloy tool body • Unique tool clamping design • Elastic runout adjustment structure, high-pressure internal cooling, combined with high-precision cutting inserts, to achieve high-precision, efficient, and stable processing of various materials
		KAPR=45° a_{pmax}=2.0	SEHT12T308AFFN-CBN		
		KAPR=45° a_{pmax}=2.5	SEHT12T308AFFN-PCD		
	AMP01  B31	KAPR=90° a_{pmax}=12	APHT12T304PPFR-AL		
		KAPR=90° a_{pmax}=1.0	APHT12T304-W		
		KAPR=90° a_{pmax}=2.0	APHT12T304PPFR-CBN		
		KAPR=90° a_{pmax}=3.0	APHT12T304PPFR-PCD		
Face milling tools	**FMA01**  B33-34	KAPR=45° a_{pmax}=6.0	SEET12T3-DF/DM/DR SEET12T3-CF/CM/CR SEET12T3-EF/EM SEET12T3-LH/W	Face milling of steel, alloy steel, stainless steel, cast iron, aluminum alloy, and high-temperature alloys	• Tool diameter Ø50-Ø315 • Large lead angle design for quicker cutting • Compatible with a variety of slot inserts, widely applicable • Compatible with wipers to improve surface quality
		KAPR=45° a_{pmax}=10.4	SEET18T6-DM/EM/W		
	FMA03  B38	KAPR=45° a_{pmax}=5.5	SE□□1203A□□□□	Face milling of steel, stainless steel, and cast iron	• Tool diameter Ø80-Ø315 • Large lead angle design for quicker cutting • Block compression structure, good vibration resistance
		KAPR=45° a_{pmax}=7.5	SE□□1504A□□□□		
	FMA04 New  B41	KAPR=45° a_{pmax}=3.5	OFKT05T3-DF/DM OFKT05T3-LH	Face milling of steel, alloy steel, stainless steel, cast iron, aluminum alloy, and high-temperature alloys	• Tool diameter Ø50-Ø160 • 8-flute high-economic milling cutter • High precision with screw compression
	 B44	KAPR=45° a_{pmax}=4.0	ODHT060508-GL/GM/GH/LH ODMT060512-GM	Face milling of steel, alloy steel, stainless steel, cast iron, aluminum alloy, and high-temperature alloys	• Tool diameter Ø50-Ø160 • 8-flute high-economic milling cutter • High precision with screw compression
	FMA07  B48	KAPR=45° a_{pmax}=4.0	ONHU060408-PF/PM/W	Common face milling of steel and cast iron	• Tool diameter Ø25-Ø50 • 16-flute high-economic milling cutter
	 B47	KAPR=45° a_{pmax}=5.0	ONHU08T508-PF/PM/W	Common face milling of steel and cast iron	• Tool diameter Ø50-Ø315 • 16-flute high-economic milling cutter

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Face milling tools	**FMA08** New  B51	KAPR=45° a_{pmax}=1.0	ONHU060408-CM XEEC120904	Precision face milling of cast iron components	• Tool diameter Ø100-Ø315 • Precision face milling cutter with adjustable dedicated wipers for strong operability • Double-sided 16-flute inserts, economically efficient, compatible with FMA07 series • Preferred tool for broad surface precision machining of K-class materials
	FMA11  B54-55	KAPR=45° a_{pmax}=5.5 KAPR=45° a_{pmax}=7.0 KAPR=45° a_{pmax}=9.0	SNEG1205ANR-GM/HGR/GR/W SNEG1506ANR-GM/HGR/GR/W SNEG1907ANR-HGR/GR	Face milling of steel, alloy steel, stainless steel, cast iron, and high-temperature alloys	• Tool diameter Ø63-Ø315 • Double-sided slot milling inserts with 8 cutting edges, economically efficient • Large lead angle design for inserts, unique chipbreaker structure, low power consumption during machining • Double-negative structure and ultra-thick inserts ensure higher tool safety and excellent impact resistance, suitable for deep cutting operations • Inserts have wiper edges, excellent machining performance
	FMA12 New  B59-60	KAPR=45° a_{pmax}=4.0 KAPR=45° a_{pmax}=5.5	ONHU0604□□ANN-GL/GM/GH ONMU0604□□-GH/GM ONMU09□□□□-GM/GH ONHU09□□□□ANN-GM/GH/GL	Face milling of steel, alloy steel, stainless steel, cast iron, and high-temperature alloys	• Tool diameter Ø50-Ø315 • Unique 3D spiral insert design with 16 cutting edges • Double-negative structure of the tool body, combined with the spiral insert design, achieves a positive axial lead angle, reducing cutting forces and aiding chip evacuation
	FMA14  B63	KAPR=45° a_{pmax}=5.5	PNEG110512-GL PNEG110530-GM PNEG110530-GH	Common face milling of steel, stainless steel, and cast iron	• Tool diameter Ø50-Ø315 • 10-flute high-economic milling cutter • 45° entering angle balance design • Strong vibration resistance ensures good machining surface quality
	FMA17 New  B65	KAPR=45° a_{pmax}=6.5	SNGX1205ANN-GL/GM/GH/LH/W SNMX1205ANN-GM SNMX120512-GL/GM/GH	Face milling of steel, alloy steel, stainless steel, cast iron, aluminum alloy, and high-temperature alloys	• Tool diameter Ø50-Ø400 • Double-sided slot milling inserts with 8 cutting edges, economically efficient • Left and right use the same inserts, with the cutter divided into sparse and dense teeth. • Inserts have wiper edges, high machining surface quality • Various chipbreakers with different coating materials, widely applicable
	FMD02  B68-69	KAPR=67° a_{pmax}=5.0 KAPR=67° a_{pmax}=7.5 KAPR=67° a_{pmax}=6.5	PNEG110512R/L-CF/CM/CR PNEG110512R/L-PF/PM/PR PNEG110512-KH/KM/KL	Common face milling of steel and cast iron	• Tool diameter Ø50-Ø315 • 10-flute high-economic milling cutter
	 B73	KAPR=55° a_{pmax}=6.0	HNEX090512-DF/DM HNEX090512-DR	Common face milling of cast iron	• Tool diameter Ø80-Ø315 • 12-flute high-economic milling cutter • Block compression structure, convenient for tool insert installation and removal

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Face milling tools	**FMD03**  B75	KAPR=60° a_{pmax}=12.0	LNKT2007DN-ZR	Steel, alloy steel, stainless steel, cast iron heavy face milling	• Tool diameter Ø125-Ø400 • Double-positive lead angle design, effectively reduces cutting forces • Insert mounting, suitable for heavy-duty machining with large cutting depths • Simple and convenient clamping form
		KAPR=60° a_{pmax}=17.0	LNKT2510-ZR		
	FME02  B77	KAPR=75° a_{pmax}=6.0	SPKW1204EDFR SPKW1204EDSR SPKT1204EDR	Common face milling of steel, alloy steel, and cast iron	• Tool diameter Ø50-Ø125 • 75° entering angle general face milling cutter • Compatible with different chipbreaker inserts, widely applicable
	FME03  B79	KAPR=75° a_{pmax}=6.0	SP□N1203(1504)ED□□ SP□R1203(1504)ED□□ SPEX1203□□-1	Common face milling of steel, alloy steel, and cast iron	• Tool diameter Ø80-Ø315 • 75° entering angle general face milling cutter • Block compression structure, convenient for tool insert installation and removal
		KAPR=75° a_{pmax}=8.0	SP□N1504ED□□ SP□R1504ED□□ SPEX1504□□-1		
	FME04  B83	KAPR=75° a_{pmax}=12.0	LNKT1506EN-ZR	Steel, alloy steel heavy face milling	• Tool diameter Ø125-Ø315 • Double-positive lead angle design, effectively reduces cutting forces • Insert mounting, suitable for heavy-duty machining with large cutting depths • Simple and convenient clamping form
	FME17 New  B85	KAPR=75° a_{pmax}=8.0	SNGX1205ENN-GL/GM/GH/W SNMX120512-GL/GM/GH	Steel, alloy steel, stainless steel, cast iron, high-temperature alloy face milling	• Tool diameter Ø50-Ø400 • Double-sided slot milling inserts, 8 cutting edges, economically efficient • Left and right use the same inserts, with the cutter divided into sparse and dense teeth. • Inserts have wiper edges, high machining surface quality • Various chipbreakers with different coating materials • Widely applicable
	FMP01  B87	KAPR=90° a_{pmax}=18.0	TPKN2204PD□ TPKN2204PDF□ TPKN2204PDT□ TPMR2204PDS□	Face milling of steel, alloy steel, cast iron	• Tool diameter Ø80-Ø315 • 90° entering angle, suitable for square shoulder milling • Block structure for faster tool insert installation and removal
	FMP02  B89	KAPR=90° a_{pmax}=6.7	SEET09T308PER-APF/APM/APR	Face milling of steel, alloy steel, stainless steel, cast iron, aluminum alloy, and high-temperature alloy	• Tool diameter Ø40-Ø315 • 90° entering angle, suitable for square shoulder milling • Sparse teeth, dense teeth, ultra-dense teeth design • Edge precision ground inserts, high workpiece surface quality • Correct chipbreaker and grade matching, suitable for finishing, semi-finishing , and roughing
		KAPR=90° a_{pmax}=10.8	SEET120308PER-APF/APM/APR SEET120308-LH		
	FMP03  B94	KAPR=90° a_{pmax}=13.0	LNKT1506EN-ZR	Steel, alloy steel heavy face milling	• Tool diameter Ø125-Ø315 • Double-positive lead angle design, effectively reduces cutting forces • Insert mounting, suitable for heavy-duty machining with large cutting depths • Simple and convenient clamping form
		KAPR=90° a_{pmax}=17.0	LNKT2007DN-ZR		
		KAPR=90° a_{pmax}=22.0	LNKT2510-ZR		

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Face milling tools	**FMP12**  B97	KAPR=90° a_{pmax}=5.7	WNHU0604□□PNR-GM WNMU060408PNN-GM	Steel, alloy steel, stainless steel, cast iron, aluminum alloy, and high-temperature alloy face milling	• Tool diameter Ø50-Ø315 • 90° entering angle can be used for shoulder milling, face milling, slot milling, etc.; 6-flute double-sided groove milling cutter, equipped with wiper edge, suitable for high-feed processing; tool body with double negative angles, combined with unique insert structure to achieve double positive tool angle, reducing cutting force
		KAPR=90° a_{pmax}=7.7	WNHU0806□□PNR-GM WNMU080608PNN-GM WNHU080616PNR-LH		
	 B98	KAPR=90° a_{pmax}=5.7	WNHU0604□□PNR-GM		• Tool diameter Ø25-Ø50 • 90° entering angle can be used for shoulder milling, face milling, slot milling, etc.; 6-flute double-sided groove milling cutter, equipped with wiper edge, suitable for high-feed processing; tool body with double negative angles, combined with unique insert structure to achieve double positive tool angle, reducing cutting force
	FMP17 New  B100-101	KAPR=88° a_{pmax}=10.5	SNGX1205PNN-GL/GM/GH/W SNMX120512-GL/GM/GH SNCU120420-W4	Steel, alloy steel, stainless steel, cast iron, and high-temperature alloy face milling.	• Tool diameter Ø50-Ø400 • 88° entering angle, strong tool functionality • Double-sided groove milling cutter, 8 cutting edges, good economy • Left and right use the same inserts, with the cutter divided into sparse and dense teeth. • Multiple groove types combined with various coating materials, widely used
	FMR01  B103	a_{pmax}=5.0	RCKT10T3MO-DM	Steel, alloy steel, stainless steel, cast iron, and difficult-to-machine material type profile milling	• Tool diameter Ø25-Ø50 • R-type inserts have extremely strong cutting edges • Suitable for surface machining of molds • Economical milling cutter with screw clamping
		a_{pmax}=6.0	RCKT1204MO-DM/DR/ER/NM		
	FMR02  B105	a_{pmax}=6.0	RCKT1204MO-DM/DR/ER/NM	Steel, alloy steel, stainless steel, cast iron, hardened steel, and difficult-to-machine materials, profile milling, face milling	• Tool diameter Ø50-Ø160 • R-type inserts have extremely strong cutting edges • Suitable for surface machining of molds • Economical milling cutter with screw tightening
		a_{pmax}=8.0	RCKT1606MO-DM/DR/ER/NM		
		a_{pmax}=10.0	RCKT2006MO-DR/ER		
	FMR03  B108	a_{pmax}=4.0	RDKW0803MO	Steel, alloy steel, stainless steel, cast iron, and difficult-to-machine material type profile milling	• Tool diameter Ø16-Ø50 • R-type inserts have extremely strong cutting edges • Suitable for surface machining of molds • Economical milling cutter with screw tightening
		a_{pmax}=5.0	RDKW10T3MO		
		a_{pmax}=6.0	RDKW1204MO		
	FMR04  B109	a_{pmax}=6.0	RDKW1204MO	Steel, alloy steel, stainless steel, cast iron profile milling, face milling	• Tool diameter Ø50-Ø160 • R-type inserts have extremely strong cutting edges • Suitable for surface machining of molds
		a_{pmax}=8.0	RDKW1605MO		
		a_{pmax}=10.0	RDKW2006MO		
	FMR11 New  B112	a_{pmax}=5.0	R□MW10T3MO-H R□MT10T3MO-M R□MT10T3MO-MM	Steel, alloy steel, stainless steel, cast iron, hardened steel and difficult-to-machine materials, cavity copy milling, face milling	• Tool diameter Ø20-Ø40 • Insert anti-rotation structure designed for stable processing • A wide range of groove options to handle various material processing • Screw compression, can be indexed 8 times, excellent economy
		a_{pmax}=6.0	R□MW1204MO-H R□MT1204MO-M R□MT1204MO-MM		
	 B113	a_{pmax}=5.0	R□MW10T3MO-H R□MT10T3MO-M R□MT10T3MO-MM		• Tool diameter Ø40-Ø80 • Insert anti-rotation structure designed for stable processing • A wide range of groove options to handle various material processing • Screw compression, can be indexed 8 times, excellent economy
		a_{pmax}=6.0	R□MW1204MO-H R□MT1204MO-M R□MT1204MO-MM		

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Square shoulder milling tools	**EMP01**  B116-118	KAPR=90° a_{pmax}=6.0	APKT070204-APF/APM	Steel, alloy steel, stainless steel, difficult-to-machine materials, cast iron, aluminum alloy multi-functional milling	• Two interface forms of straight shank and end mill shank, tool diameter Ø10-Ø63 • 90° entering angle, suitable for shoulder milling, slot milling, ramp milling, etc • With wipers, also suitable for flat milling • The insert is a 3D helical edge, with low cutting resistance
		KAPR=90° a_{pmax}=10.5	APKT11T3□□-APF/APM APKT11T3□□-ALH		
		KAPR=90° a_{pmax}=15.5	APKT160408- APF/APM APKT160408-ALH		
	EMP02  B119	KAPR=90° a_{pmax}=11.5	APKT11T3□□-APF/APM/APL APKT11T3□□-ALH	Steel, alloy steel, stainless steel, difficult-to-machine materials, cast iron, and aluminum alloy face milling	• Tool diameter Ø50-Ø160 • 90° entering angle, suitable for shoulder milling • Equipped with wipers, also suitable for flat milling • The insert is a 3D helical edge, with low cutting resistance
		KAPR=90° a_{pmax}=15.5	APKT160408-APF/APM/APL APKT160408-ALH		
	EMP03  B120	KAPR=90° a_{pmax}=39.0	APKT11T3□□-APF/APM/APL APKT11T3□□-ALH	Steel, alloy steel, stainless steel, cast iron, aluminum alloy, difficult-to-machine materials, and deep milling processing	• Tool diameter Ø50-Ø100 • Spiral vertical milling cutter with positive spiral angle, good chip removal • Used for side milling and slotting • With dense teeth structure for high processing efficiency
			APKT16-APF/APM/APL		
	EMP04  B121	KAPR=90° a_{pmax}=29.4~58.0	APKT11T3□□-APF/APM APKT11T3□□-ALH	Steel, alloy steel, stainless steel, cast iron, aluminum alloy, difficult-to-machine materials, and deep milling processing	• Tool diameter Ø20-Ø40 • Spiral vertical milling cutter with positive spiral angle, good chip removal • Used for side milling and slotting • With dense teeth structure for high processing efficiency
	EMP05  B127  B128	KAPR=90° a_{pmax}=20~40	ADKT□□-GM	Drilling, milling, and multi-functional processing of steel, alloy steel, stainless steel, cast iron materials	• Tool diameter Ø16-Ø50 • Tool functions include drilling, slotting, shoulder milling • Slot milling, and ramp milling
	EMP09  B135	KAPR=90° a_{pmax}=8.0	LNKT0804□□PNR-GM/GL LNMT080404PNR-GM	Shoulder and face milling of steel, alloy steel, stainless steel, and cast iron	• Tool diameter Ø25-Ø40 • Two interface forms: straight shank and end mill shank • 90° entering angle, suitable for shoulder milling, slot milling, etc. Vertical installation of the insert, able to withstand greater cutting force
		KAPR=90° a_{pmax}=11.5	LNKT1206□□PNR-GM/GL LNMT120608PNR-GM		
	 B136-137	KAPR=90° a_{pmax}=8.0	LNKT0804□□PNR-GM/GL LNMT080404PNR-GM	Face milling of steel, alloy steel, stainless steel, cast iron	• Tool diameter Ø40-Ø125 • 90° entering angle, suitable for shoulder milling, face milling vertical installation of the insert, good tool rigidity
		KAPR=90° a_{pmax}=11.5	LNKT1206□□PNR-GM/GL LNMT120608PNR-GM		
		KAPR=90° a_{pmax}=15	LNKT1607□□PNR-GM/GL LNMT160708PNR-GM		
	 B138	KAPR=90° a_{pmax}=33~63	LNKT1206□□PNR-GM/GL LNMT120608PNR-GM	Deep milling of steel, alloy steel, stainless steel, cast iron	• Tool diameter Ø40-Ø80 • Used for side milling and slotting • Spiral cutting edge design, swift cutting
	 B139	KAPR=90° a_{pmax}=30~53	LNKT0804□□PNR-GM/GL LNMT080404PNR-GM		• Tool diameter Ø25-Ø32 • High tip strength, sharp cutting • Used for side milling and slotting • Vertical installation of the insert, able to withstand greater cutting force
			LNKT1206□□PNR-GM/GL LNMT120608PNR-GM		

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Square shoulder milling tools	**EMP09 BT** New  B140	KAPR=90° a_{pmax}=63~125	LNKT1206□□PNR-GM/GL LNMT120608PNR-GM	Deep milling of steel, alloy steel, stainless steel, cast iron	• Tool diameter Ø50-Ø80 • 90° entering angle, suitable for shoulder milling, face milling, slot milling, etc • Spiral cutting edge design, large rake angle, quick and smooth chip removal • Vertical installation of the insert, good tool rigidity, more stable processing
	EMP09 JT New  B140	KAPR=90° a_{pmax}=85~125			
	EMP13  B145	KAPR=90° a_{pmax}=11.2	AN□X1105□□PNR-GM/LH	Steel, alloy steel, cast iron, aluminum alloy multifunctional processing	• Tool diameter Ø25-Ø160 • Thickened insert design, combined with a double negative structure body, greatly enhances impact resistance while achieving double positive cutting angles and reducing cutting resistance • Reasonably designed, high-precision controlled cutting edge, capable of achieving high-quality 90° shoulder processing
	 B146	KAPR=90° a_{pmax}=14.5	AN□X1506□□PNR-GM/LH		
	 B147	KAPR=90° a_{pmax}=43~64	AN□X1105□□PNR-GM/LH AN□X1506□□PNR-GM/LH		
	 B147	KAPR=90° a_{pmax}=43~53			
Profile milling tools	**BMR01**  B150	Refer to tool specifications for cutting depth details	ZDET□□CYR□□ ZPNT2204CYR□□ SPMT060304 SDMT□□	Steel, alloy steel, stainless steel, cast iron profile milling	• Tool diameter Ø20-Ø63 • Best suited for roughing of large molds • Arc edge with three-edge insert, economical
	BMR02  B152		ROHX□□	Steel, alloy steel, stainless steel, cast iron profile milling	• Tool diameter Ø12-Ø20 • Used for profile finishing • High precision and stable installation • Double-ended insert, economical
	BMR03  B154		XPHT□□R□□- GM	Steel, alloy steel, stainless steel, cast iron profile milling	• Tool diameter Ø16-Ø50 • Best suited for roughing of molds • Utilizes 3D complex groove insert, high arc accuracy • High rigidity cutter body
	 B155				
	 B156				
	 B157				

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Profile milling tools	**BMR04**  B167  B168	Refer to tool specifications for cutting depth details	ZOHX□□	Steel, alloy steel, stainless steel, cast iron profile milling	• Tool diameter Ø12-Ø32 • High precision tool, used for profile finishing • Two groove types, suitable for different working conditions • High installation precision, good stability
Side and face milling tools	**SMP01**  B175  B176		XSEQ12□□	Steel, alloy steel, stainless steel, cast iron slot milling	• Tool diameter Ø63-Ø250 • Available in both key and core shaft connections • Slot width series: 4, 5, 6, 7, 8mm
	SMP03  B178  B179		MPHT□□	Steel, alloy steel, stainless steel, cast iron slot milling	• Tool diameter Ø80-Ø200 • Available in both key and core shaft connections • Slot width series: 8, 10, 12, 16, 18, 20mm
	SMP05  B182		QC16L□□ QC22L□□	Steel, alloy steel, stainless steel, cast iron grooving	• Tool diameter Ø25-Ø44
	SMP08 New  B184-185  B186-187		LNET10□□□□-GM LNET12□□□□-GM	Steel, alloy steel, stainless steel, cast iron slot milling	• Tool diameter Ø63-Ø250 • The positioning structure of the cutter body is optimized and the positioning is reliable. The insert adopts a vertical mounting structure, which has excellent impact resistance and makes cutting faster • The size of the tool tip arc can be customized according to different cutting widths and diameters. The optimized design of the tool body is matched with a high-precision insert to process the groove bottom surface with good quality and high precision • Tool diameter Ø63-Ø250 • Optimized design of cutter body positioning structure, reliable positioning • The insert adopts a vertical structure, which has excellent impact resistance and makes cutting faster • The size of the tool tip arc can be customized according to different cutting widths and diameters • The optimized design of the cutter body is matched with a high-precision insert to process the groove bottom with good surface quality and high precision

Indexable milling tools overview

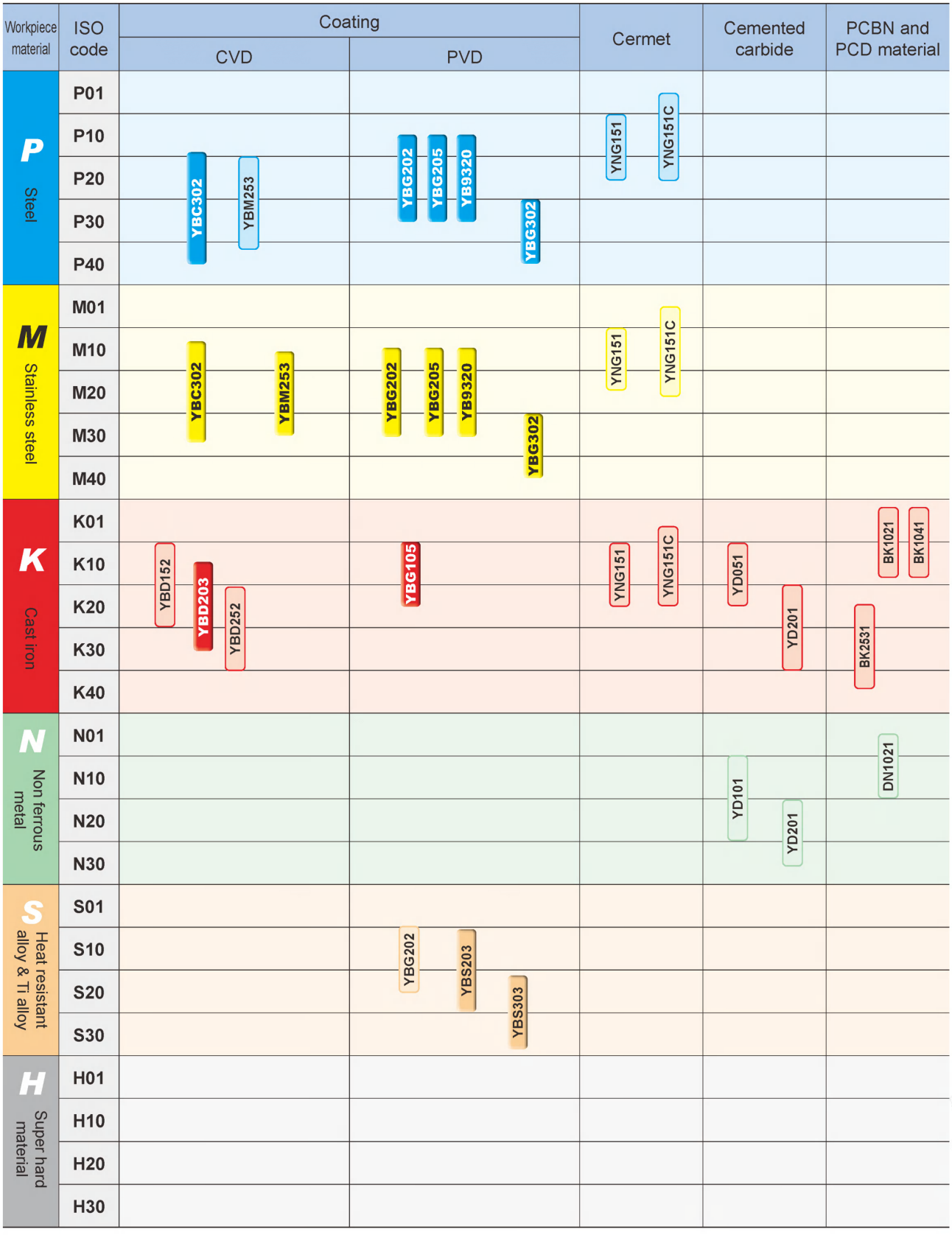
Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Side and face milling tools	**SMP09** New  B189-190  B191-192	Refer to tool specifications for cutting depth details	LNGX1005□□-GM LNGX1407□□-GM	Steel, alloy steel, stainless steel, cast iron slot milling	• Tool diameter Ø80-Ø250 • Optimized design for tool body positioning, reliable positioning • Insert adopts vertical installation structure, excellent impact resistance, with a large front angle design, effectively reducing cutting forces, ensuring swift cutting • Tools and inserts can be customized to meet various width and arc size groove processing needs
					• Tool diameter Ø80-Ø315 • Optimized design for tool body positioning, reliable positioning • Insert adopts vertical installation structure, excellent impact resistance, with a large front angle design, effectively reducing cutting forces, ensuring swift cutting • Tools and inserts can be customized to meet various width and arc size groove processing needs
Special milling(high feed) tools	**XMR01**  B194  B195  B198  B199		SDMT□□-DM/PM/NM	profile milling and face milling for steel, alloy steel, stainless steel, cast iron, and difficult-to-machine materials	• Tool diameter Ø20-Ø160 • Available in straight shank and collet chuck interfaces • Effectively dissipates radial cutting forces, enabling high feed cutting • Suitable for plunge milling operations • Double clamping for secure and reliable operation
			WPGT□□ZSR WPGT□□ZSR-PM	profile milling and face milling for steel, alloy steel, stainless steel, and cast iron materials	• Tool diameter Ø20-Ø160 • Available in straight shank and collet chuck interfaces • Effectively dissipates radial cutting forces, enabling high feed cutting • Double clamping for secure and reliable operation
	XMR03  B206		SNGU□□-GM	Cavity milling and face milling for steel, alloy steel, and stainless steel materials	• Tool diameter Ø50-Ø125 • Eight cutting edges on both faces, offering good economy • Large lead angle design reduces cutting resistance, providing good versatility • Excellent overall impact resistance of the tool • Strong anti-vibration capability ensures stable machining
	XMR12 New  B208  B209		ENMX120608-GM ENMX1206XR-GM ENMX1206R□-GM	Cavity milling and face milling of steel and alloy steel materials	• Tool Diameter Ø16-Ø63 • Three interface forms: straight handle, sleeve type and interchangeable type • The type of the assembly insert determines the function of the tool, enabling square shoulders, large feeds, profiling, etc • The insert adopts double-sided chipbreaker design and is extremely economical

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Boring and milling tools	**XMP01**  B215	KAPR=90° a_{pmax}=18~36	CNE121006A/B	Flat milling, side milling, slot milling, and hole milling for steel, alloy steel, and cast iron	• Tool diameter Ø80-Ø400 • 90° entering angle, with insert vertical installation structure, axial and radial cutting widths adjustable as required. Open chip groove design ensures smooth chip removal. Large bottom insert width, strong ability for spiral interpolation milling. Both types of groove insert are interchangeable, suitable for different machining conditions
T-slot milling tools	**TMP01**  B217	KAPR=90° a_{pmax}=9~28	MPHT□□	T-slot machining on cast iron workbenches	• Tool diameter Ø21-Ø60 • Machining nominal sizes of T-slots 12, 14, 18, 22, 28, 36 • Uses 86° diamond-shaped positive angle insert
Helical end mills	**HMP01**  B219	KAPR=90° a_{pmax}=55	APKT150412-PM/KM SPMT120408-PM/KM	Deep milling for steel, alloy steel, and cast iron	• Tool diameter Ø40, Ø80 • Uneven teeth pitch structure reduces vibration • Integral structure provides good rigidity; interchangeable head structure offers good economy
	 B220	KAPR=90° a_{pmax}=74~144			
	HMP01 EC  B221	KAPR=90° a_{pmax}=74~144			
Chamfering tools	**CMZ01**  B224	KAPR=30°	SPMT120408	Chamfering for steel, alloy steel, stainless steel, and cast iron	• Tool diameters Ø12, Ø25, Ø32, Ø36 • Also capable of small flat milling operations
	CMA01  B225	KAPR=45°		Chamfering for steel, alloy steel, stainless steel, and cast iron	• Tool diameters Ø12, Ø25, Ø32, Ø36 • Also capable of small flat milling operations
	CMD01  B226	KAPR=60°			

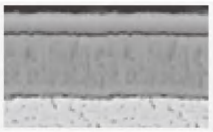
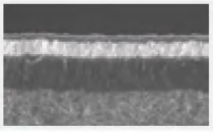
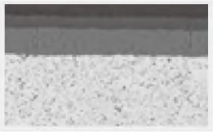

Profile Milling Tool
Series

Milling insert grades overview

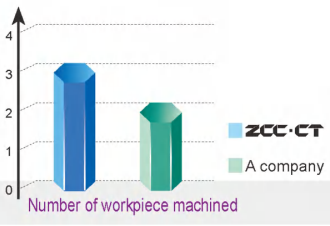
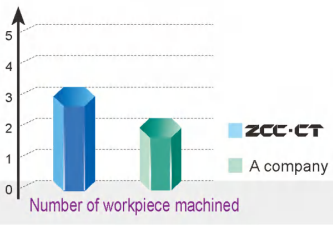
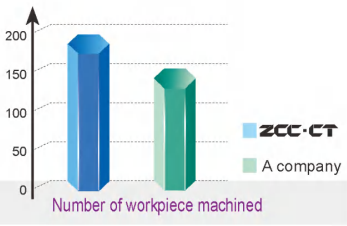


Grade classification for milling inserts

Coated Cemented Carbide CVD

Grade	Coating structure	Micro-structure	ISO applied range	Application field
YBC302	Combination of high toughness and high strength substrate with TiCN, thin Al_2O_3, and TiN coatings		P15~35 M10~30	Suitable for rough milling and semi-finish milling of P and M class materials with hardness up to HRC45
YBM253	Combination of high toughness gradient alloy substrate with TiCN and ultrafine Al_2O_3 coatings		M10~30	Suitable for semi-finish milling and rough milling of P and M class materials
YBD152	Excellent combination of high wear-resistant substrate with TiCN and thick Al_2O_3 coatings		K05~25	Suitable for semi-finish milling and finish milling of K class materials
YBD203	Substrate with good toughness and wear resistance combined with high toughness and high strength TiCN and Al_2O_3 coatings		K10~30	Suitable for general milling of K class materials such as ductile iron and malleable iron
YBD252	Substrate with high toughness combined with TiCN and thick Al_2O_3 coatings		K15~35	Suitable for rough milling and semi-finish milling of K class materials

Application case

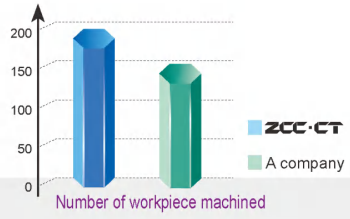
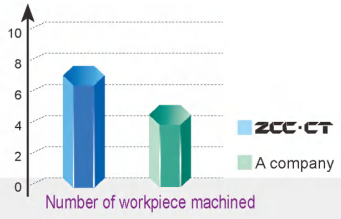
Component shape			
Machine and cooling	CNC gantry milling machine, wet processing	Vertical machining center, dry processing	Horizontal machining center, dry processing
Workpiece material and hardness	Cast stainless steel HB220-260	Forging steel No. 45 HB240-270	HT250 HB220
Type of machining	Milling flat surfaces	Milling flat surfaces	Milling flat surfaces
Applicable tool	FMA04-160-C40-OD06-10	FMA01-125-B40-SE12-08	FMP02-100-B32-SE12-07
Applicable insert	YBM253/ODHT060512-GM	YBC302/SEET12T3-DR	YBD252/SEET120308PER-APM
Cutting parameters	Vc=120m/min, fz=0.15mm/z, a_p=2mm	Vc=212m/min, fz=0.2mm/z, a_p=3mm	Vc=160m/min, fz=0.2mm/z, a_p=1.5mm
Application results			

Grade classification for milling inserts

Coated Cemented Carbide PVD

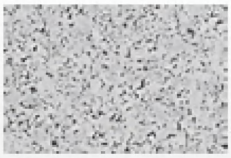
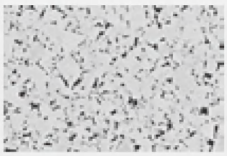
Grade	Coating structure	ISO applied range	Application field
YBG105	Fine-grain alloy substrate + nano coating	K05~K20	Suitable for precision milling and semi-finish milling of K class materials
YBG202	Substrate with excellent deformation resistance + nano coating	P10~30 M10~30 S05~20	A highly versatile PVD grade, widely applicable to semi-finish milling of P, M, and S class materials
YBG205	Ultrafine carbide substrate + nano coating	P10~30 M10~30	Suitable for precision milling and semi-finish milling of P and M class materials
YBG302	Substrate with good toughness and strength + nano coating	P25~40 M25~40	Suitable for rough milling of P and M class materials
YB9320	High-toughness substrate + TiAlN-based nano-multilayer coating	P10~30 M10~30	A highly versatile PVD grade, suitable for precision and semi-finish milling of P and M materials
YBS203	Substrate material with excellent deformation resistance + nano coating	S10~20	A general grade for S-class machining, suitable for milling S-class difficult-to-machine materials
YBS303	Substrate with good toughness and strength + nano coating	S20~30	Suitable for milling titanium alloy materials
YBH053	Ultrafine carbide substrate + TiAlN-based nano-multilayer coating	H05~20	Suitable for precision milling of H-class hardened materials

Application case

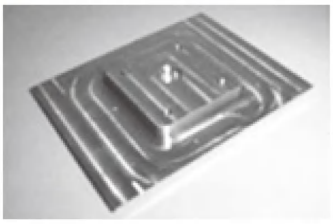
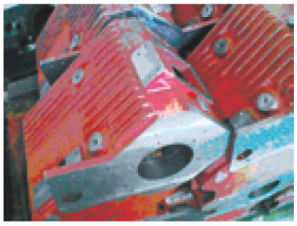
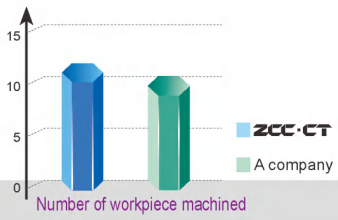
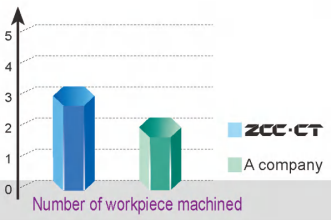
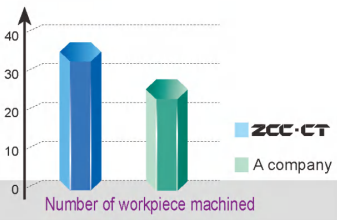
Component shape		
Machine and cooling	Machining center, dry cutting	Gantry milling machine, dry cutting
Workpiece material and hardness	Ductile cast iron HB 220	7CrSiMoV HRC25
Type of machining	Milling flat surfaces	Milling cavity
Applicable tool	EMP02-050-A22-AP11-06	BMR03-050-MT5-M
Applicable insert	YBG105/APKT11T308-APM	YBG302/XPHT50R2507- GM
Cutting parameters	Vc=235m/min, fz=0.15mm/z, a_p=1~3mm	Vc=120m/min, fz=0.25mm/z, a_p=8mm
Application results		

Grade classification for milling inserts

Cemented Carbide

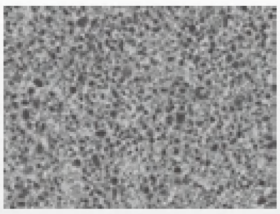
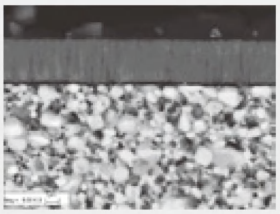
Grade	Coating structure	ISO applied range	Application field
YD101		N05~25	Suitable for finish milling and semi-finish milling of N-class materials
YD201		K15~35 N15~30	Suitable for semi-finish milling and rough milling of K-class materials, as well as rough milling of N-class materials

Application case

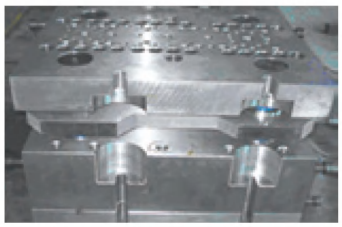
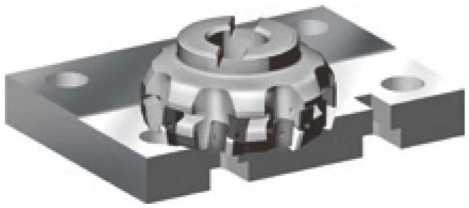
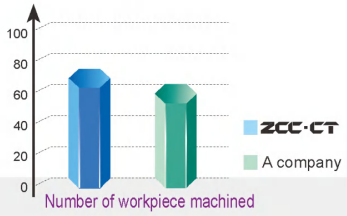
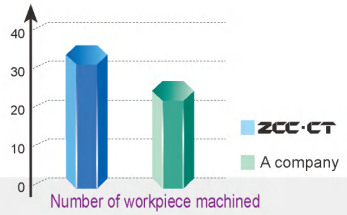
Component shape			
Machine and cooling	Vertical machining center, wet processing	Gantry milling machine, wet processing	Gantry milling machine, dry cutting
Workpiece material and hardness	Aluminum alloy HB100	40CrMnMo HB240	HT250 HB220
Type of machining	Milling flat surfaces	Milling flat surfaces	Milling flat surfaces
Applicable tool	FMA01-100-B32-SE12-07	FMP01-100-B32-TP22-06	FME03-160-B40-SP15-10
Applicable insert	YD101/SEET12T3-LH	YD201/TPKN2204PDR	YD201/SPKN1504EDTR
Cutting parameters	Vc=300-350m/min, a_p=1~2mm, fz=0.2mm/z	Vc=170m/min, a_p=5~7mm fz=0.3mm/z	Vc=100-130m/min, a_p=7mm, fz=0.35mm/z
Application results			

Grade classification for milling inserts

Cermet

Grade	Coating structure	ISO applied range	Application field
YNG151		P05~20 M05~20 K05~20	Widely used in finish milling of P, M, and K-class materials
YNG151C		P01~20 M01~20 K01~20	Widely used in finish milling of P, M, and K-class materials

Application case

Component shape		
Machine and cooling	Machining center, dry cutting	Machining center, dry cutting
Workpiece material and hardness	Grade 45 steel HB 170~220	NAK80 HRC42~48
Type of machining	Finish milling flat surfaces	Finish milling flat surfaces
Applicable tool	FMA03-160-B40-SE12-08	FME03-160-B40-SP12-10
Applicable insert	YNG151/SEEN1203AFTN	YNG151C/SPEN1203EDER
Cutting parameters	Vc=400m/min, fz=0.1mm/z, a_p=0.3mm	Vc=420m/min, fz=0.12mm/z, a_p=0.35mm
Application results		



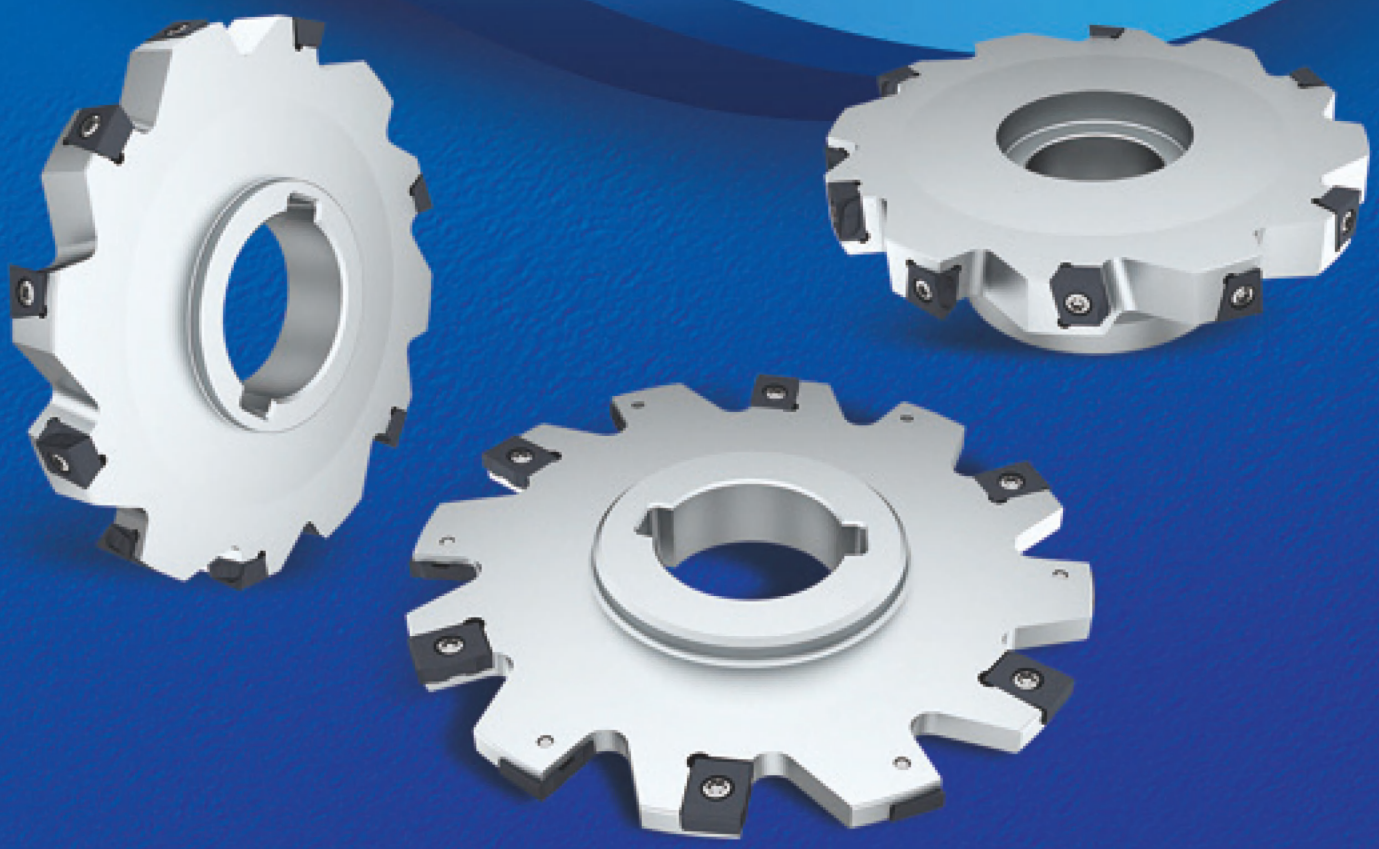
SMP05

Slot Milling Tools



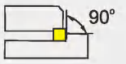
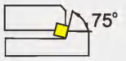
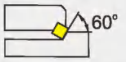
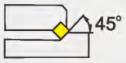
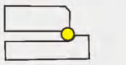
Side and Face Milling Tools

SMP08
SMP09



Indexable milling tools code key

Cutter type	
FM	Face milling
EM	Square shoulder milling
HM	Helical end milling
SM	Side and face milling
BM	Profile milling
CM	Chamfer milling
XM	Special milling
TM	T-slot milling
AM	Aluminum alloy high speed milling

Approach angle		
P	90°	
E	75°	
D	60°	
A	45°	
R		

Series code

Cutting diameter ØD

Side and face milling tool: diameter X cutting edge width

Coupling structurebe (see below)

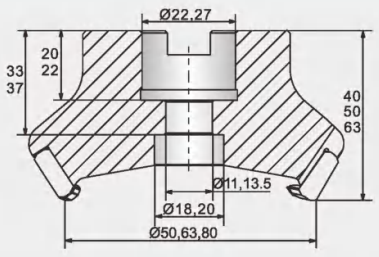
A	A-type coupling	XP	Weldon shank
B	B-type coupling	G	Straight shank
C	C-type coupling	MW	Morse adapter with a conical hole and without a flat tail
D	D-type coupling		

Coupling size(mm) (see below)

FM E 03 - 100 - B 32

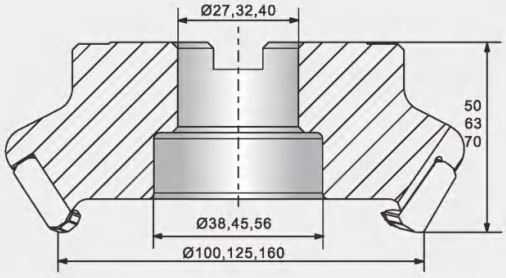
Coupling structure of arbor

A-type coupling



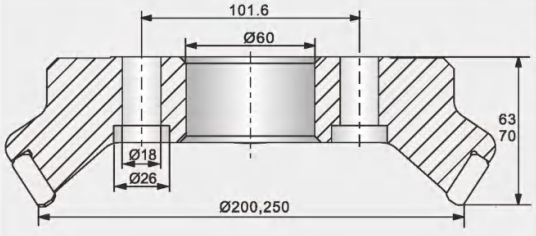
Ø50- Ø80 arbor face milling cutter as per GB5342-96

B-type coupling



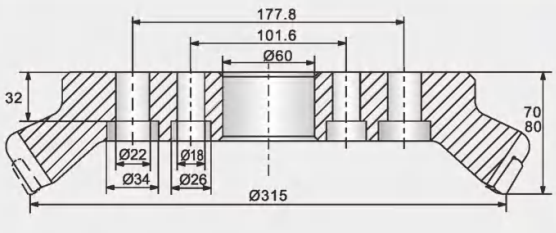
Ø100- Ø160 arbor face milling cutter as per GB5342-96

C-type coupling



Ø200- Ø250 arbor face milling cutter as per GB5342-96

D-type coupling



D≥Ø315 arbor face milling cutter as per GB5342-96

For coupling methods of Weldon shank, straight shank and Morse taper shank, etc., see technical information of tooling systems.

Insert shape	
80° C	55° D
R	S
60° T	L
H	O

Insert clearance angle	
N	0°
B	5°
C	7°
P	11°
D	15°
E	20°
F	25°

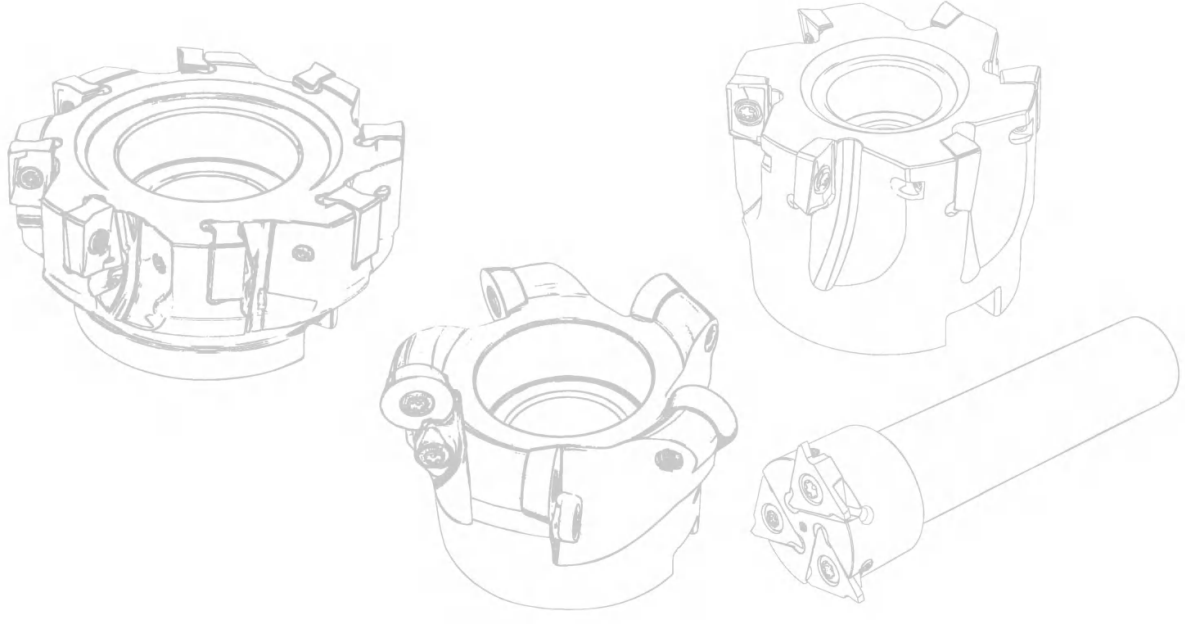
Length of cutting edge						
Diameter of insert's inscribed circle	Insert shape					
	C	D	R	S	T	L
5.556	—	—	—	—	09	—
6.350	06	07	—	—	11	—
9.525	09	11	09	09	16	—
12.700	12	15	12	12	22	—
15.875	16	19	15	15	27	—
19.050	19	—	19	19	33	—
25.400	25	—	25	25	44	2

-SP12-06LC

Number of teeth
(number of flute in the case of helical end mills)

Cutting direction
(R: Right L: Left R style as the default)

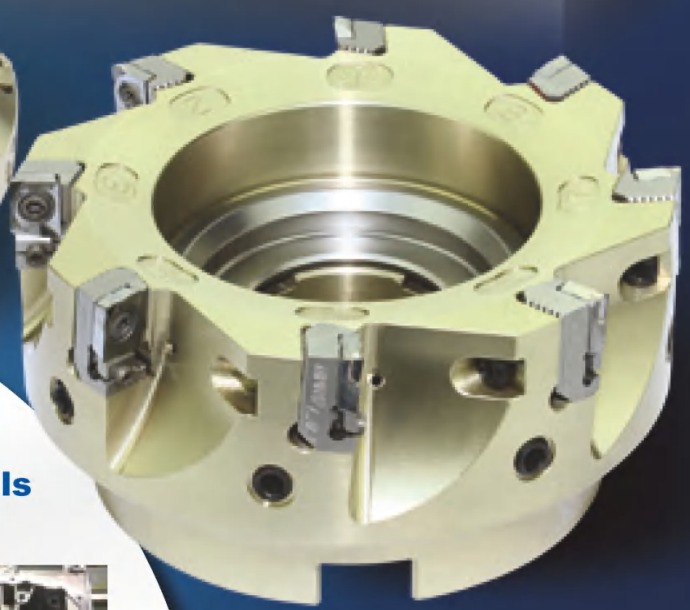
Internal cooling structure



AMA01
AMP01 Series

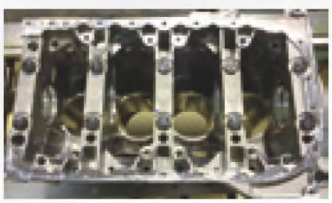
High-speed and High-precision Miiling Tools





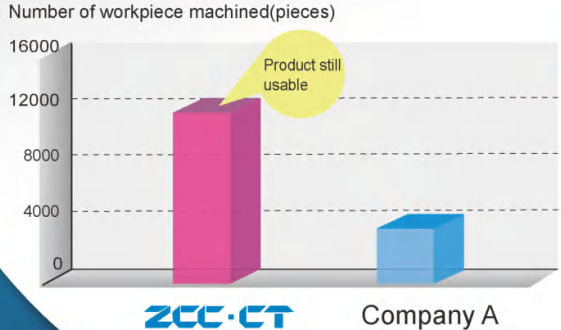
Machining case of AMP01 series high-speed high-precision milling tools

Area of machining: Bottom surface of cylinder housing
Machine: Machining center
Coolant: Internal
Workpiece material: Aluminum alloy（HB 110）
Operation: Face milling
Cutting data: n= 11141r/min, fz=0.1mm/z





●Comparison of tool life



Results:

ZCC·CT: 12000 pcs (Still usable)

Product of company A: 3500 pcs

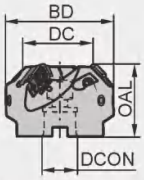
High-speed and high-precision miiling tools

KAPR:45° Face milling Chamfering

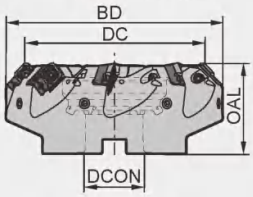
AMA01 N K H



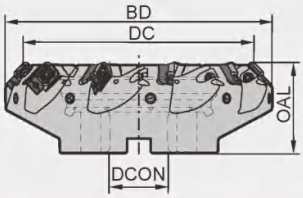
A-type coupling



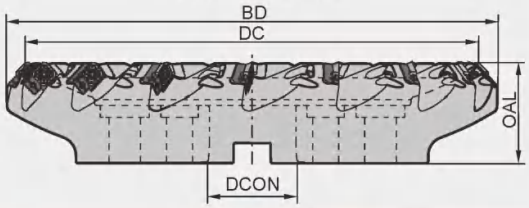
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	BD	DCON	OAL			
AMA01	-050-A22-SE12-03C	▲	△	50	64	22	40	3	A	0.17
	-063-A27-SE12-04C	▲	△	63	77	27	40	4	A	0.27
	-080-A27-SE12-05C	▲	△	80	94	27	50	5	A	0.49
	-100-A32-SE12-06C	▲	△	100	114	32	50	6	A	0.84
	-125-B40-SE12-08C	▲	△	125	139	40	63	8	B	1.20
	-160-B40-SE12-10C	▲	△	160	173	40	63	10	B	2.11
	-160-C40-SE12-10C	▲	△	160	173	40	63	10	C	2.15
	-200-C60-SE12-12C	▲	△	200	213	60	63	12	C	3.36
	-250-C60-SE12-14C	▲	△	250	263	60	63	14	C	4.96
	-315-D60-SE12-16	▲	△	315	328	60	80	16	D	8.68
	-400-D60-SE12-18	△	△	400	413	60	80	18	D	10.1
	-500-D60-SE12-20	△	△	500	513	60	80	20	D	14.3

▲Stock available △Make-to-order

Cutter with a diameter of 250mm or more have no internal cooling, and cutter with a diameter of 200mm or more have no dynamic balance. Type A and Type B connectors are equipped with internal cooling screws.

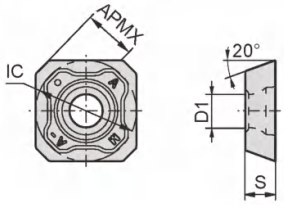
Spare parts

Diameter DC	Locator screw	Balancing screw	Adjusting screw	Insert screw	Locator	Wrench	Wrench
Ø50	M4×12-TP	M8×8(GB77-85)	I20M3×10X	I60M4×8.4	AMA0101	WT15IP	WT09P
Ø63							
Ø80		M8×12(GB77-85)			AMA0102	WT15IS	
Ø100-Ø160							
Ø200		--					
Ø250-Ø500		--			AMA0103		



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



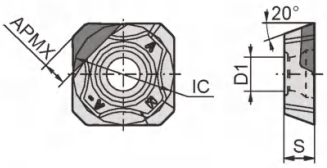
Good working condition Normal working condition Bad working condition

Workpiece material					
H	High hardness materials			😐	
K	Cast iron		😊		☹
N	Non-ferrous metal	😐			😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN		Cemented carbide
		IC	S	D1	APMX	YCD011	YCB011	YCB012	YD201
	SEHT12T3AFFN-AL	12.7	3.97	4.4	6.6				★

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material					
H	High hardness materials			😐	
K	Cast iron		😊		☹
N	Non-ferrous metal	😐			😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN		Cemented carbide
		IC	S	D1	APMX	YCD011	YCB011	YCB012	YD201
	SEHT12T308AFFN-PCD	12.7	3.97	4.4	2.5	★			
	SEHT12T308AFFN-CBN	12.7	3.97	4.4	2		○	○	

CBN insert edge can be treated as per machining requirements

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Insert material	Cutting parameters	
			V(m/min)	f_z(mm/z)
N	Aluminum alloy (Si content≤12%)	YCD011	1500(800-3000)	0.1(0.08-0.3)
		YD201	600(300-1000)	0.15(0.05-0.3)
K	Cast iron	YCB011	800(500-1200)	0.2(0.1-0.5)
H	Hardened steel	YCB012	150(100-500)	0.15(0.1-0.5)

High-speed and high-precision miiling tools

KAPR:90°

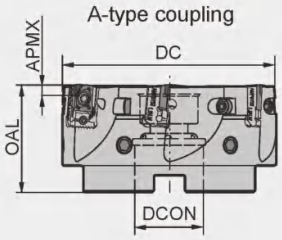

Face milling

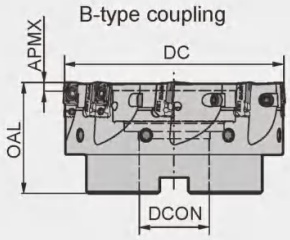

Chamfering

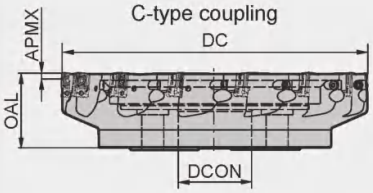
AMP01 N K H

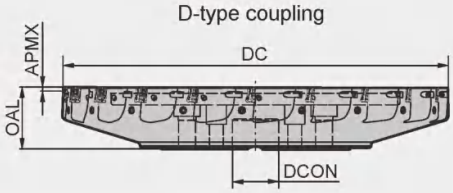


Close even pitch









Specification of tools

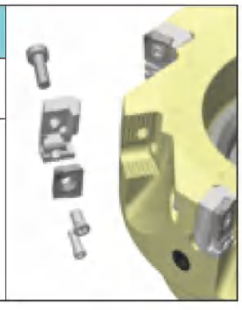
Type		Stock		Basic dimensions(mm)			Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCON	OAL			
AMP01	**-050-A22-AP12-03C**	▲	△	50	22	40	3	A	0.17
	-063-A27-AP12-05C	▲	△	63	27	40	5	A	0.27
	-080-A27-AP12-06C	▲	△	80	27	50	6	A	0.49
	-100-A32-AP12-06C	▲	△	100	32	50	6	A	0.84
	-125-B40-AP12-08C	▲	△	125	40	63	8	B	1.20
	-160-B40-AP12-10C	▲	△	160	40	63	10	B	2.11
	-160-C40-AP12-10C	▲	△	160	40	63	10	C	2.15
	-200-C40-AP12-12C	▲	△	200	60	63	12	C	3.36
	-250-C60-AP12-14C	▲	△	250	60	63	14	C	4.96
	-315-D60-AP12-16	▲	△	315	60	80	16	D	8.68
	-400-D60-AP12-18	△	△	400	60	80	18	D	10.1
	-500-D60-AP12-20	△	△	500	60	80	20	D	14.3

▲Stock available △Make-to-order

Cutter with a diameter of 250mm or more have no internal cooling, and cutter with a diameter of 200mm or more have no dynamic balance. Type A and Type B connectors are equipped with internal cooling screws.

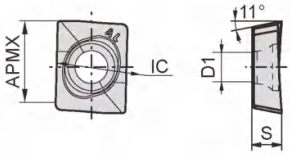
Spare parts

Diameter DC	Locator screw	Balancing screw	Adjusting screw	Insert screw	Locator	Wrench	Wrench
Ø50-Ø63	M4×12-TP	M8×8(GB77-85)	I20M3×10X	I60M4×8.4	AMP0101	WT15IP	WT09P
Ø80-Ø160		M8×12(GB77-85)			AMP0102	WT15IS	
Ø200		--					
Ø250-Ø500		--			AMP0103		



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



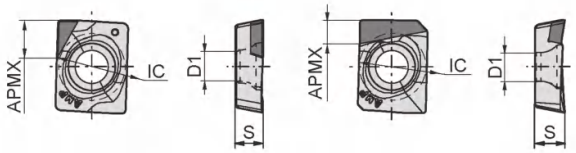
Good working condition 😊 Normal working condition 😐 Bad working condition

Workpiece material					
H	High hardness materials			😐	
K	Cast iron		😊		☹
N	Non-ferrous metal	😐			😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN		Cemented carbide
		IC	S	D1	APMX	YCD011	YCB011	YCB012	YD201
	**APHT12T304PPFR-AL**	12.7	3.97	4.4	12				★

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts



Good working condition 😊 Normal working condition 😐 Bad working condition

Workpiece material					
H	High hardness materials			😐	
K	Cast iron		😊		☹
N	Non-ferrous metal	😐			😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN		Cemented carbide
		IC	S	D1	APMX	YCD011	YCB011	YCB012	YD201
	**APHT12T304PPFR-PCD**	12.7	3.97	4.4	3	★			
	**APHT12T304PPFR-CBN**	12.7	3.97	4.4	2		○	○	
	**APHT12T304-W**	12.7	3.97	4.4	1	★	★	★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Insert material	Cutting parameters	
			V(m/min)	f_z(mm/z)
N	Aluminum alloy (Si content≤12%)	YCD011	1500(800-3000)	0.1(0.08-0.3)
		YD201	600(300-1000)	0.15(0.05-0.3)
K	Cast iron	YCB011	800(500-1200)	0.2(0.1-0.5)
H	Hardened steel	YCB012	150(100-500)	0.15(0.1-0.5)

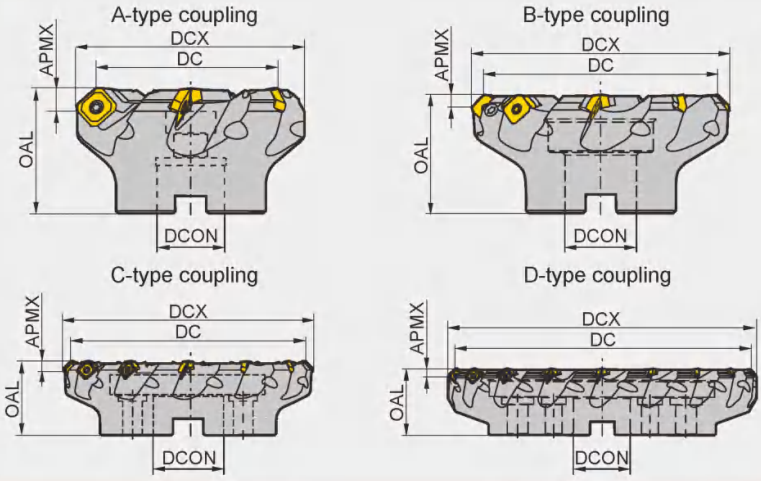
Face milling tools

KAPR:45°



FMA01 P M K N S





Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCX	DCON	OAL	APMX			
FMA01 Coarse pitch	**-050-A22-SE12-04**	▲	△	50	61	22	40	6	4	A	0.3
	-063-A22-SE12-05	▲	△	63	74	22	40	6	5	A	0.5
	-080-A27-SE12-06	▲	△	80	91	27	50	6	6	A	1.2
	-100-B32-SE12-07	▲	△	100	107	32	50	6	7	B	1.52
	-125-B40-SE12-08	▲	△	125	136	40	63	6	8	B	2.6
	-160-B40-SE12-07	▲	△	160	174	40	63	6	7	B	4.548
	-160-B40-SE12-10	▲	△	160	170	40	63	6	10	B	4.92
	-200-C60-SE12-08	▲	△	200	214	60	63	6	8	C	6.175
	-200-C60-SE12-12	▲	△	200	210	60	63	6	12	C	7.6
	-250-C60-SE12-10	▲	△	250	264	60	63	6	10	C	12.596
	-250-C60-SE12-14	▲	△	250	260	60	63	6	14	C	13.5
	-315-D60-SE12-18	▲	△	315	325	60	70	6	18	D	20.8
	-100-B32-SE18-04	▲	△	100	120	32	63	10.4	4	B	2.22
	-125-B40-SE18-05	▲	△	125	145	40	63	10.4	5	B	3.15
	-160-B40-SE18-06	▲	△	160	180	40	63	10.4	6	B	5.01
	-200-C60-SE18-08	▲	△	200	220	60	63	10.4	8	C	6.9
	-250-C60-SE18-10	▲	△	250	270	60	63	10.4	10	C	13.1
	-315-D60-SE18-12	▲	△	315	335	60	80	10.4	12	D	24.5

▲Stock available △Make-to-order

Spare parts

Diameter DC	Insert	Insert screw	Shim	Shim screw	Wrench	Wrench
Ø50-Ø315	SEET12□□-	I60M3.5×12	S13BS	SM5×7XA	WT15IS	WH35L
Ø100-Ø315	SEET18□□-	I60M5×17	S18BS	SM8×9XA	WT20IT	WH50L



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Face milling tools

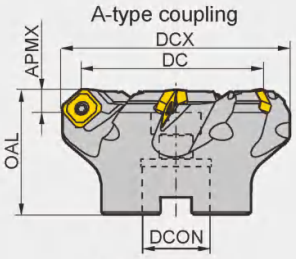
KAPR:45°

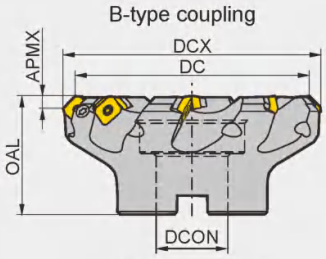

Face milling

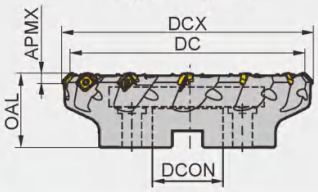

Chamfering

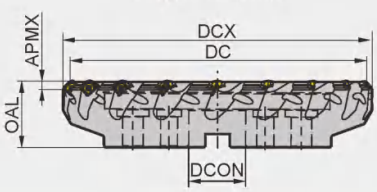
FMA01 P M K N S











Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCX	DCON	OAL	APMX			
FMA01 Close pitch	**-050-A22-SE12-05**	▲	△	50	63	22	40	6.0	5	A	0.427
	-063-A22-SE12-06	▲	△	63	74	22	40	6.0	6	A	0.771
	-080-A27-SE12-08	▲	△	80	93	27	50	6.0	8	A	1.37
	-100-B32-SE12-10	▲	△	100	114	32	50	6.0	10	B	1.755
	-125-B40-SE12-12	▲	△	125	136	40	63	6.0	12	B	3.666
	-160-B40-SE12-16	▲	△	160	174	40	63	6.0	16	B	5.21
	-200-C60-SE12-20	▲	△	200	214	60	63	6.0	20	C	9.32
	-250-C60-SE12-24	▲	△	250	264	60	63	6.0	24	C	15.892
	-100-B32-SE18-06	▲	△	100	114	32	63	10.4	6	B	2.98
	-125-B40-SE18-07	▲	△	125	144	40	63	10.4	7	B	3.803
	-200-C60-SE18-12	▲	△	200	220	60	63	10.4	12	C	7.191
	-250-C60-SE18-14	▲	△	250	265	60	63	10.4	14	C	14.9

▲Stock available △Make-to-order

Spare parts

Diameter DC	Insert	Insert screw	Shim	Shim screw	Wrench	Wrench
						
Ø50-Ø315	SEET12□□-	I60M3.5×12	S13BS	SM5×7XA	WT15IS	WH35L
Ø100-Ø315	SEET18□□-	I60M5×17	S18BS	SM8×9XA	WT20IT	WH50L



Tools code key B26–B27
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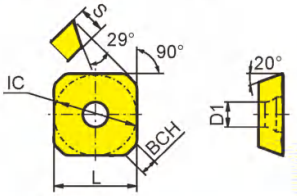
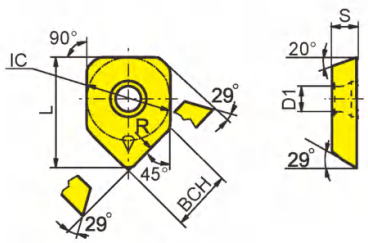
Selection of inserts

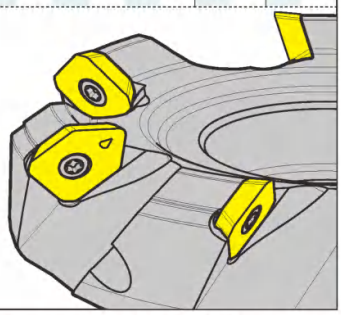


Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😃 😃 — — — 😃 😃 😊 ☹ — — 😊 😊 — —
M	Stainless steel	😃 😃 — — — 😃 😃 😃 ☹ — — 😊 😊 — —
K	Cast iron	— — 😃 😃 ☹ 😊 — — — — — — — — ☹
N	Non-ferrous metal	— — — — — — — — — — — — — 😃 ☹
S	Heat resistant alloy, Ti alloy	— — — — — 😊 😃 😃 😃 — — 😃 ☹ — —

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	BCH	R	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SEET12T3-DF	13.4	13.4	3.97	4.1	2.55	--	★							★		○	○	○				
	SEET12T3-CF	13.4	13.4	3.97	4.1	2.55	--			○			★		★		○						
	SEET12T3-EF	13.4	13.4	3.97	4.1	2.55	--								★		○	○	○				
	SEET12T3-DM	13.4	13.4	3.97	4.1	2.55	--	★							★		★	○	○				
	SEET18T6-DM	18.0	18.0	6.1	5.5	1.5	--	○	○														
	SEET12T3-CM	13.4	13.4	3.97	4.1	2.55	--			★					★		○						
	SEET12T3-EM	13.4	13.4	3.97	4.1	2.55	--								★		★	○	○				
	SEET18T6-EM	18.0	18.0	6.1	5.5	1.5	--		○							○							
	SEET12T3-DR	13.4	13.4	3.97	4.1	2.55	--	★							★		★						
	SEET12T3-CR	13.4	13.4	3.97	4.1	2.55	--			★					★		★						
	SEET12T3-LH	13.4	13.4	3.97	4.1	2.55	--															○	★
	SEET12T3-W	17.82	13.4	3.97	4.1	9.46	500	★		★			★		★					★			
	SEET18T6-W	24.78	18.0	6.1	5.5	11.0	500						★		○								





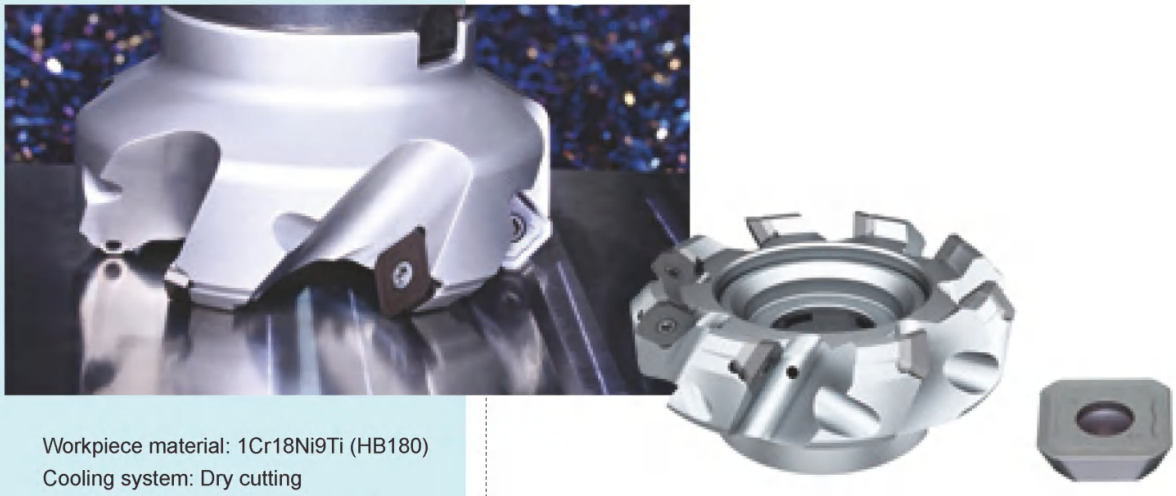
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				V(m/min)	f(mm/z)		
					-DF	-DM	-DR
P	Low-carbon steel, Soft steel	≤180	YBM253 YBC302	270(220-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG205 YB9320	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG302 YBM253	230(170-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
	High-carbon steel, Alloy steel	180-280	YBM253 YBC302	240 (200-320)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG205 YB9320	240 (180-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG302 YBM253	220 (150-330)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
	Alloy tool steel	280-350	YBM253 YBC302	220 (180-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG205 YB9320	220 (170-340)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG302 YBM253	190 (130-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
M					-EF	-EM	
	Stainless steel	≤270	YBM252	150 (120-240)	0.15(0.1-0.2)	0.2 (0.1-0.3)	
			YBG205 YB9320	160 (110-270)	0.15(0.1-0.2)	0.2 (0.1-0.3)	
			YBG302	140 (100-250)	0.15(0.1-0.2)	0.2 (0.1-0.3)	
K					-CF	-CM	-CR
	Cast iron	180-250	YBG105	210 (120-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBD152	240 (180-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
N					-LH		
	Al alloy steel	--	YD101	300-	0.25 (0.1-0.4)		
			YD201	300-			
S					-EF	-EM	
	High-temperature alloy	≤400	YBG105	50(20-60)	0.1 (0.1-0.2)	0.15 (0.1-0.3)	

Case for FMA01



Workpiece material: 1Cr18Ni9Ti (HB180)
Cooling system: Dry cutting
Machine: Vertical machining center
Cutting parameters: Vc=160m/min
a_p=1mm
fz=0.2mm/z
a_e=60mm

Tool type：FMA01-080-A27-SE12-06

Insert type/grade：SEET12T3-EM/YBG302

Surface roughness of workpiece:

ZCC-CT：Ra1.2

Similar overseas products：Ra1.6



● Comparison of insert abrasion

	ZCC-CT	Similar overseas products
17'30"		
29'30"		
33'30"		

Face milling tools

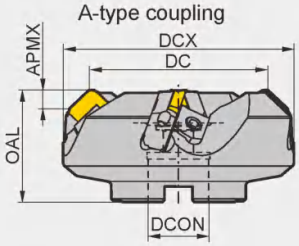
KAPR:45°

Face milling Chamfering

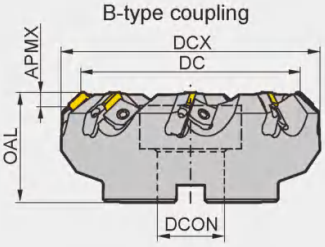
FMA03 P M K



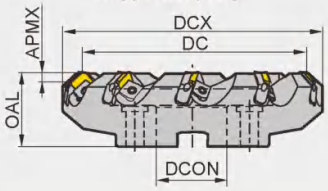
A-type coupling



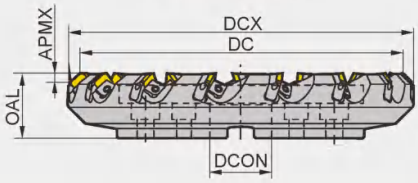
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCX	DCON	OAL	APMX			
FMA03	-080-A27-SE12-04	▲	△	80	103	27	50	5.5	4	A	1.8
	-100-B32-SE12-05	▲	△	100	122	32	50	5.5	5	B	2.4
	-125-B40-SE12-06	▲	△	125	147	40	63	5.5	6	B	4.4
	-160-B40-SE12-08	▲	△	160	181	40	63	5.5	8	B	6.4
	-200-C60-SE12-10	▲	△	200	221	60	63	5.5	10	C	8.5
	-250-C60-SE12-12	▲	△	250	270	60	63	5.5	12	C	14.1
	-315-D60-SE12-15	△	△	315	353	60	63	5.5	15	D	22.2
	-080-A27-SE15-04	▲	△	80	103	27	50	7.5	4	A	1.7
	-100-B32-SE15-05	▲	△	100	122	32	50	7.5	5	B	2.3
	-125-B40-SE15-06	▲	△	125	147	40	63	7.5	6	B	4.2
	-160-B40-SE15-08	▲	△	160	181	40	63	7.5	8	B	6.1
	-200-C60-SE15-10	▲	△	200	221	60	63	7.5	10	C	8.3
	-250-C60-SE15-12	▲	△	250	270	60	63	7.5	12	C	13.6
	-315-D60-SE15-15	▲	△	315	353	60	63	7.5	15	D	21.8

▲Stock available △Make-to-order

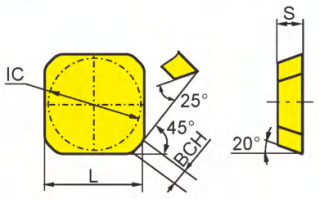
Spare parts

Diameter DC	Inserts	Locator	Wedge	Wedge screw	Locator screw	Wrench
Ø80-Ø315	SE12	LSE12R/L	W05R/L	DM8×21X	LOM5×15.1	WT20T WH40T
Ø80-Ø315	SE15	LSE15R/L	W01R/L			



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts

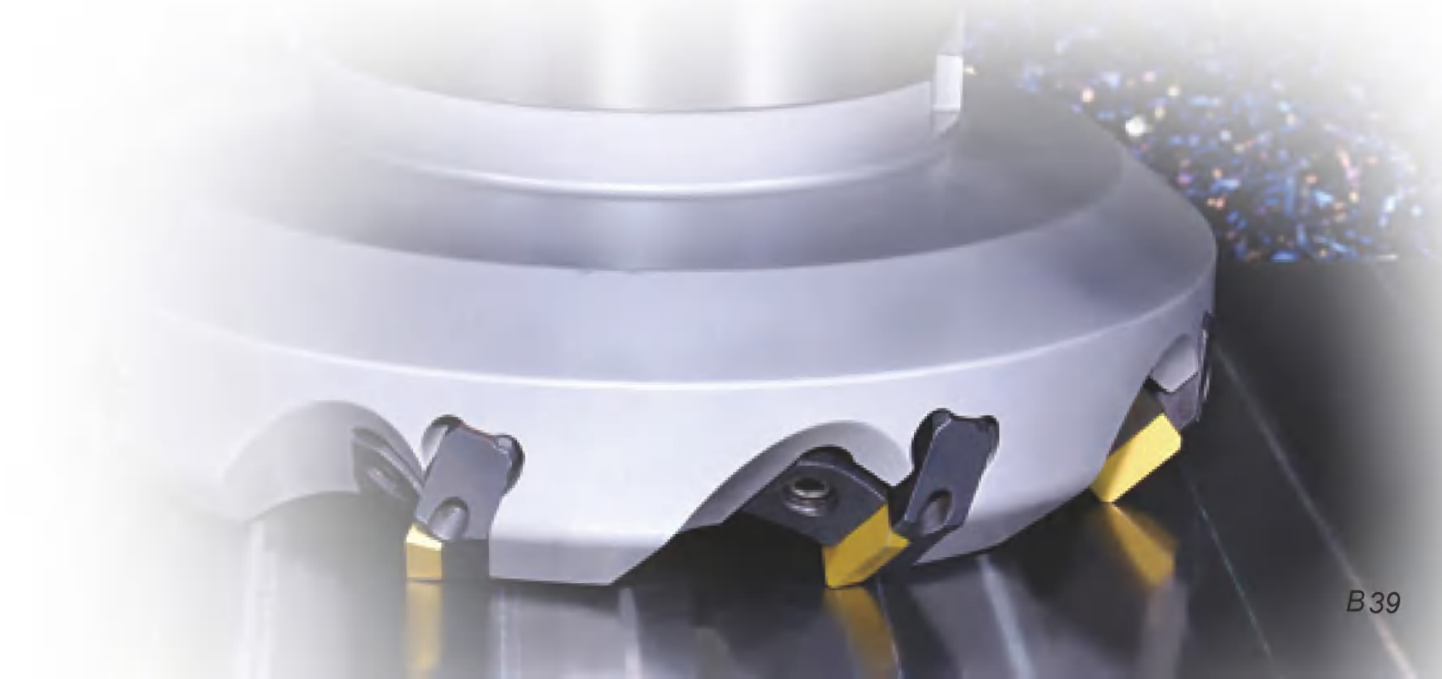


Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😃 😃 · · · · 😃 😃 😊 ☹ · · 😊 😊 · ·
M	Stainless steel	😃 😃 · · · · 😃 😃 😃 ☹ · · 😊 😊 · ·
K	Cast iron	· · 😃 😃 ☹ 😊 · · · · · · · · · ☹
N	Non-ferrous metal	· · · · · · · · · · · · · · 😃 ☹
S	Heat resistant alloy, Ti alloy	· · · · · 😊 😃 😃 😃 · 😃 ☹ · · · ·

Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BCH	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SEEN1203AFTN	12.7	12.7	3.18	1.8							○						●			
	SEKN1203AFFN	12.7	12.7	3.18	1.8						★										
	SEKN1203AFN	12.7	12.7	3.18	1.8	●						○									
	SEKN1203AFTN	12.7	12.7	3.18	1.8	★	★	●				★	★					●			
	SEMR1203AN-M	12.7	12.7	3.3	-								●								
	SEKR1203AN-M	12.7	12.7	3.3	-								●								
	SEKN1504AFN	15.875	15.875	4.76	1.6	●	●														
	SEKN1504AFTN	15.875	15.875	4.76	1.6	★	★							★	●						
	SEMR1504AN-M	15.875	15.875	4.9	-								●								
	SEKR1504AN-M	15.875	15.875	4.9	-								●								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(mm/z)
P	Low-carbon steel, Soft steel	≤180	YNG151	430 (340-500)	0.2 (0.1-0.4)
			YBM253 YBC302	270 (220-350)	0.2 (0.1-0.4)
			YBM253	220 (180-300)	0.25 (0.15-0.3)
			YBG202 YBG302	270 (200-360)	0.2 (0.1-0.3)
	High-carbon steel, Alloy steel	180-280	YNG151	400 (320-480)	0.2 (0.1-0.4)
			YBM253 YBC302	240 (200-320)	0.2 (0.1-0.4)
			YBM253	200 (160-280)	0.25 (0.15-0.3)
			YBG202 YBG302	240 (180-350)	0.2 (0.1-0.3)
	Alloy tool steel	280-350	YNG151	350 (300-450)	0.2 (0.1-0.4)
			YBM253 YBC302	220 (180-300)	0.2 (0.1-0.4)
			YBM253	180 (150-250)	0.25 (0.15-0.3)
			YBG202 YBG302	220 (170-340)	0.2 (0.1-0.3)
M	Stainless steel	≤270	YNG151	220 (160-280)	0.2 (0.1-0.4)
			YBM253	130 (100-220)	0.2 (0.1-0.4)
			YBG202 YBG302	140 (100-250)	0.2 (0.1-0.3)
K	Cast iron	180-250	YBG105	210 (120-300)	0.2 (0.1-0.3)
			YBD252	200 (150-250)	0.2 (0.1-0.4)
			YD201	100 (80-160)	0.25 (0.1-0.4)

Face milling tools

KAPR:45°


Face milling

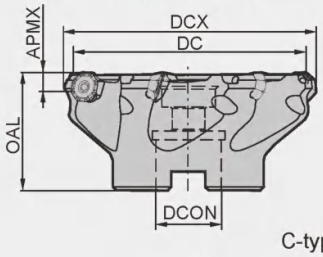

Chamfering

FMA04 P M K N

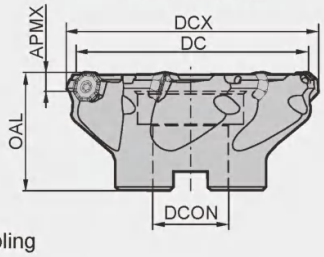


Screw clamping

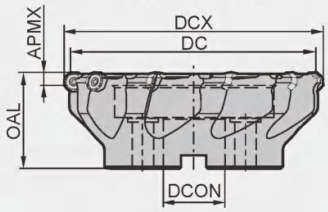
A-type coupling



B-type coupling



C-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCX	DCON	OAL	APMX			
FMA04	**-050-A22-OF05-04**	▲	△	50	56	22	40	3.5	4	A	0.3
	-050-A22-OF05-05	△	△	50	56	22	40	3.5	5	A	0.4
	-063-A22-OF05-05	▲	△	63	69	22	40	3.5	5	A	0.5
	-080-A27-OF05-06	▲	△	80	86	27	50	3.5	6	A	0.8
	-100-B32-OF05-07	▲	△	100	106	32	50	3.5	7	B	1.2
	-125-B40-OF05-08	▲	△	125	130	40	63	3.5	8	B	2.7
	-160-B40-OF05-10	▲	△	160	165	40	63	3.5	10	B	5.1
	-160-C40-OF05-10	△	△	160	165	40	63	3.5	10	C	4.1

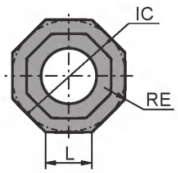
▲Stock available △Make-to-order

Spare parts

Diameter DC	Insert screw	Wrench	
			
Ø50- Ø63	I60M4×8.4	WT15IS	
Ø80 -Ø160	I60M4×10		

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😃 😃
M	Stainless steel	😃 😃
K	Cast iron	😃 😃 ☹ 😊
N	Non-ferrous metal	
S	Heat resistant alloy, Ti alloy	😊 😃 😃 😃 😃 ☹

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**OFKT05T3-DF**	5.26	12.7	3.97	4.4	0.5						○	★									
	**OFKT05T3-DM**	5.26	12.7	3.97	4.4	0.5						★	★		★	★						
	**OFKT05T3-LH**	5.26	12.7	3.97	4.4	0.5															○	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters		
				V(m/min)	f(mm/z)	
					-DF	-DM
P	Low-carbon steel, Soft steel	≤180	YBM253	270 (220-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBG202	270 (200-360)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBG302 YB9320	230 (170-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
	High-carbon steel, Alloy steel	180-280	YBM253	240 (200-320)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG202	240 (180-350)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG302 YB9320	220 (150-330)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
	Alloy tool steel	280-350	YBM253	220 (180-300)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG202	220 (170-340)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG302 YB9320	190 (130-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
M	Stainless steel	≤270	YBG202	160 (110-270)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG302 YB9320	140 (100-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBM253	150 (120-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
K	Cast iron	180-250	YBG105	210 (120-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
N					-LH	
	Al alloy steel	-	YD101	300-	0.15 (0.05-0.3)	

Case for FMA04

Workpiece material: 42CrMo (HB280)

Cooling system: Dry cutting

Cutting machine tools: vertical machining center

Tool: FMA04-100-B32-OF05-07

Insert: OFKT05T3-DM/YBG202

Cutting parameters: V_c=180m/min, a_p=1mm, fz=0.2mm/z, a_e=60mm



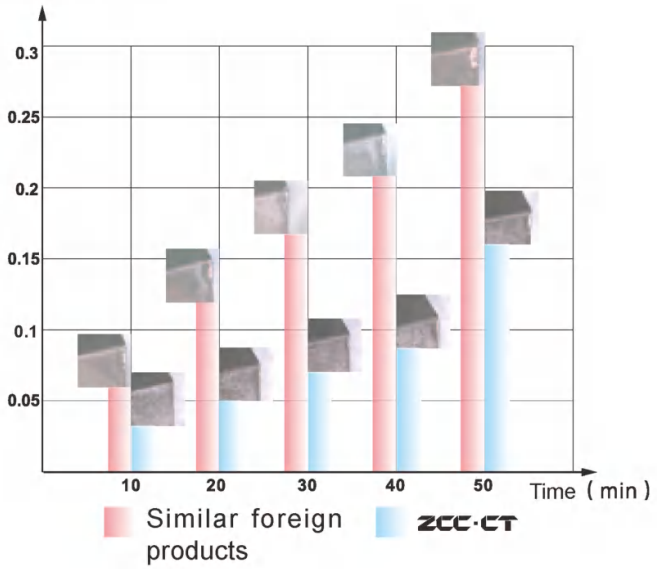
Surface roughness of workpiece being processed:

ZCC-CT: Ra1.2

Similar foreign products: Ra1.6

Insert wear comparison

Flank wear VB(mm)



Face milling tools

KAPR:45°


Face milling

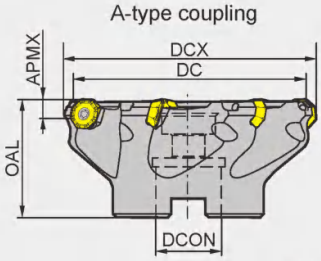

Chamfering

FMA04 P M K N S

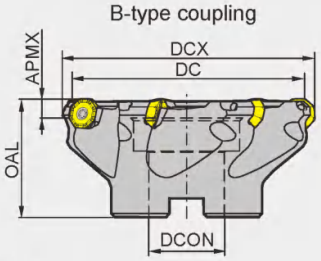


Screw clamping

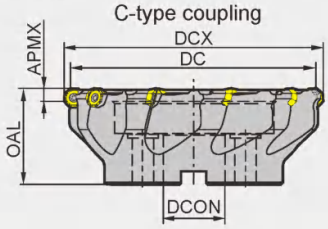
A-type coupling



B-type coupling



C-type coupling



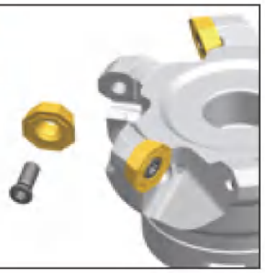
Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCX	DCON	OAL	APMX			
FMA04 Coarse pitch	**-050-A22-OD06-04C**	▲	△	50	60	22	40	4	4	A	0.284
	-063-A22-OD06-05C	▲	△	63	73	22	40	4	5	A	0.409
	-080-A27-OD06-06C	▲	△	80	90	27	50	4	6	A	1.017
	-100-A32-OD06-07C	▲	△	100	110	32	50	4	7	A	1.536
	-125-B40-OD06-08	▲	△	125	135	40	63	4	8	B	2.931
	-160-C40-OD06-10	▲	△	160	170	40	63	4	10	C	3.838
Close pitch	**-050-A22-OD06-05C**	▲	△	50	60	22	40	4	5	A	0.298
	-063-A22-OD06-06C	▲	△	63	73	22	40	4	6	A	0.425
	-080-A27-OD06-07C	▲	△	80	90	27	50	4	7	A	1.025
	-100-A32-OD06-09C	▲	△	100	110	32	50	4	9	A	1.521
	-125-B40-OD06-10	▲	△	125	135	40	63	4	10	B	2.919
	-160-C40-OD06-12	▲	△	160	170	40	63	4	12	C	3.825

▲Stock available △Make-to-order

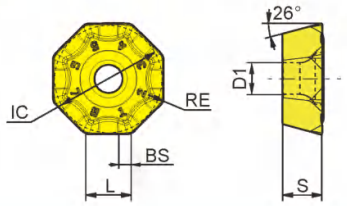
Spare parts

Diameter DC	Insert screw	Wrench
Ø50-Ø63	I60M5×13	WT20IP
Ø80-Ø125		WT20IS
Ø160		WT20IT



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material																							
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊								
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊								
K	Cast iron			😐	😐	☹	😊																☹
N	Non-ferrous metal																					😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐			😐	☹									

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	RE	BS	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**ODHT060508-GL**	6.5	15.875	5.56	5.4	0.8	1.6		●	●					●	●							
	**ODHT060508-GM**	6.5	15.875	5.56	5.4	0.8	1.6		●	●					●	●			●				
	**ODMT060512-GM**	6.5	15.875	5.56	5.4	1.2	--		●	●					●	●			●				
	**ODHT060508-GH**	6.5	15.875	5.56	5.4	0.8	1.6		●	●					●	●							
	**ODHT060508-LH**	6.5	15.875	5.56	5.4	0.8	1.6															●	●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				V(m/min)	f(mm/z)		
					-GL	-GM	-GH
P	Low-carbon steel, Soft steel	≤180	YBM253	270(220-350)	0.15 (0.1-0.2)	0.25 (0.15-0.35)	0.3 (0.15-0.4)
			YBG205	270(200-360)			
			YB9320	270(200-360)			
	High-carbon steel, Alloy steel	180-280	YBM253	240(200-320)	0.15 (0.1-0.2)	0.15 (0.1-0.3)	0.25 (0.15-0.4)
			YBG205	240(180-350)			
			YB9320	240(180-350)			
	Alloy tool steel	280-350	YBM253	220(180-200)	0.15 (0.1-0.2)	0.15 (0.1-0.3)	0.25 (0.15-0.4)
			YBG205	220(170-340)			
			YB9320	220(170-340)			
M	Stainless steel	≤270	YBM253	230(180-300)	0.15 (0.1-0.2)	0.15 (0.1-0.3)	0.25 (0.15-0.4)
			YBG205	150(120-250)			
			YB9320	150(120-250)			
K	Cast iron	180-250	YBD152	200(150-250)	0.15 (0.1-0.2)	0.25 (0.15-0.35)	0.3 (0.15-0.4)
S	High-temperature alloy	≤400	YBS303	100(60-120)	--	0.15 (0.1-0.25)	--
N					-LH		
	Aluminium alloy	--	YD101	300-	0.15 (0.05-0.3)		
			YD201				

HURRICANE

FMA07 Millling Tool Series

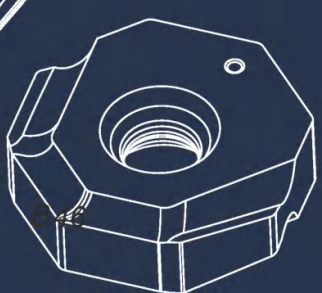
New Generation of High Economy Milling Tools



16 cutting edges high economy

⑧×2=16 edges





- Double negative rake angle structure, both axial and radial direction, super thick insert with outstanding toughness.
- Has good wiper capability, especially under the high feed rate, the wiper effect is better in comparison with similar tools.
- The unique hole design makes the insert clamp more secured.
- Tool diameters from 25 to 315mm and 3 geometries available, -PF, -PM and -W (wiper).

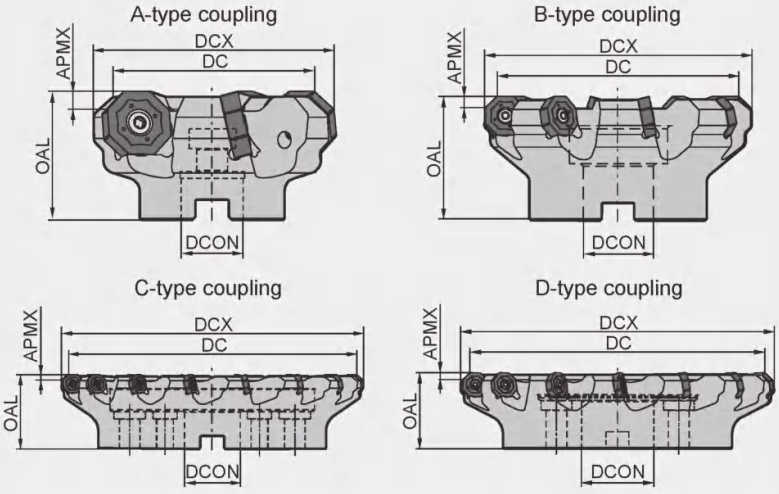
Face milling tools

KAPR:45°

Face milling

FMA07 P M K





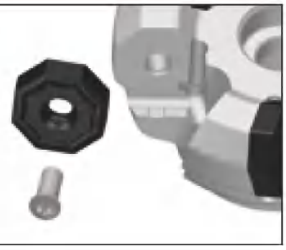
Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCX	DCON	OAL	APMX			
FMA07	**-050-A22-ON06-05**	▲	△	50	62	22	40	4	5	A	0.3
	-063-A22-ON06-06	▲	△	63	75	22	40	4	6	A	0.5
	-080-B27-ON06-07	▲	△	80	92	27	50	4	7	B	1.0
	-100-B32-ON06-08	▲	△	100	112	32	63	4	8	B	1.9
	-125-B40-ON06-09	▲	△	125	137	40	63	4	9	B	3.5
	-160-C40-ON06-11	▲	△	160	172	40	63	4	11	C	4.3
	-200-C60-ON06-13	▲	△	200	212	60	63	4	13	C	6.4
	-250-C60-ON06-15	▲	△	250	262	60	63	4	15	C	13.4
	-315-D60-ON06-17	▲	△	315	327	60	80	4	17	D	21.9
	-063-A22-ON08-05	▲	△	63	78	22	40	5	5	A	0.5
	-080-B27-ON08-06	▲	△	80	95	27	50	5	6	B	0.9
	-100-B32-ON08-07	▲	△	100	115	32	50	5	7	B	1.8
	-125-B40-ON08-08	▲	△	125	140	40	63	5	8	B	3.1
	-160-C40-ON08-10	▲	△	160	175	40	63	5	10	C	4.1
	-200-C60-ON08-12	▲	△	200	215	60	63	5	12	C	6.1
	-250-C60-ON08-14	▲	△	250	265	60	63	5	14	C	12.0
	-315-D60-ON08-16	▲	△	315	330	60	80	5	16	D	21.0

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Insert screw	Wrench	
				
Ø50 -Ø315	ONHU06□□□□-PF/PM	I60M4×10	--	WT15IS
Ø63 -Ø315	ONHU08□□□□-PF/PM/W	I60M5×13	WT20IT	--



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

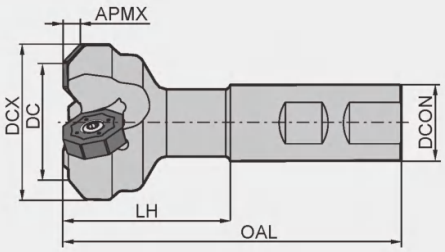
Face milling tools

KAPR:45°

Face milling Chamfering

FMA07 P M K





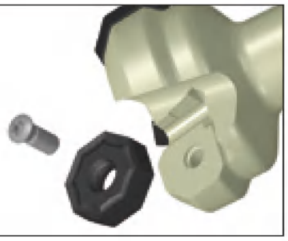
Specification of tools

Type		Stock		Basic dimensions(mm)						Number of teeth Z	Weight (kg)
		R	L	DC	DCX	DCON	OAL	LH	APMX		
FMA07	-025-XP20-ON06-02	▲	△	25	37	20	95	45	4	2	0.2
	-040-XP25-ON06-03	▲	△	40	52	25	106	50	4	3	0.4
	-032-XP25-ON08-02	▲	△	32	47	25	111	55	5	2	0.4
	-040-XP25-ON08-03	▲	△	40	55	25	111	55	5	3	0.5
	-050-XP25-ON08-04	▲	△	50	65	25	111	55	5	4	0.6

▲Stock available △Make-to-order

Spare parts

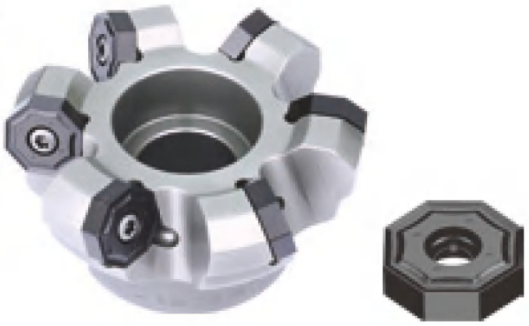
Diameter DC	Inserts	Insert screw	Wrench	
				
Ø25 -Ø40	ONHU06□□□□-PF/PM	I60M4×10	--	WT15IS
Ø32 -Ø50	ONHU08□□□□-PF/PM	I60M5×13	WT20IT	--



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Case for FMA07

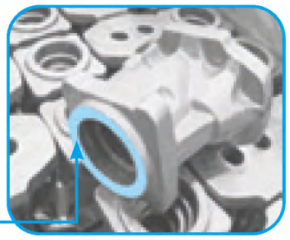




Tool type: FMA07-100-B32-ON08-07

Insert type/grade: ONHU08T508-PM/YBD152

Part: Gear pump body
Workpiece material: HT400
Hardness: HRC22
Cooling system: Dry cutting
Machine: Vertical machining center
Cutting parameters: V_c=267m/min
a_p=1.5mm
f_z=0.42mm/z
a_e=80mm
Milling style: Down milling
Area of machining: End surface





●Comparison of insert abrasion

Abrasion on rake face



ZCC·CT



similar product of company A

Abrasion on clearance face

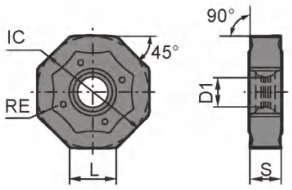


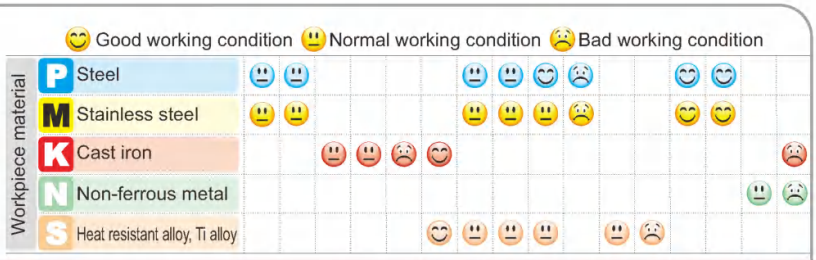
ZCC·CT



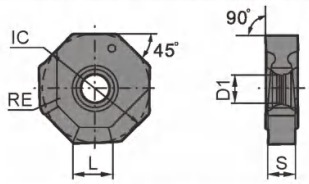
similar product of company A

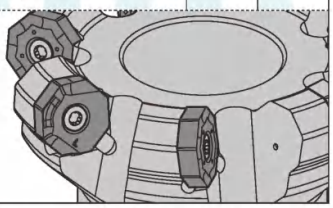
Selection of inserts





Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ONHU060408-PF	6.58	15.875	4.76	4.4	0.83	★		★				★									
	ONHU08T508-PF	8.37	20.2	5.77	5.3	0.83	★		★				★									
	ONHU060408-PM	6.58	15.875	4.76	4.4	0.83	★	★	★													
	ONHU08T508-PM	8.37	20.2	5.79	5.3	0.83	★	★	★													
	ONHU08T508-W	6.9	20.5	6.00	5.3	0.80						★		★								





★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				V_c(m/min)	f_z(mm/z)	a_{pmax}(mm)	
						ONHU06□□□□-PF/PM	ONHU08□□□□-PF/PM
P	Low-carbon steel, Soft steel	⩽180	YBG105 YBM253 YBG202 YBC302 YBG205	270 (220-350)	0.2 (0.1-0.4)	4	5
P	High-carbon steel, Alloy steel	180-280	YBG105 YBM253 YBG202 YBC302 YBG205	260 (200-320)	0.2 (0.1-0.4)	4	5
P	Alloy tool steel	280-350	YBG105 YBM253 YBG202 YBC302 YBG205	240 (180-300)	0.2 (0.1-0.4)	4	5
M	Stainless steel	⩽270	YBM253 YBG205	230(180-300)	0.2(0.1-0.3)	4	5
K	Cast iron	180-250	YBD152	270 (150-300)	0.4 (0.1-0.5)	4	5

Note: The recommended feed rate per tooth for inserts with wiper fz⩽0.25mm/z.

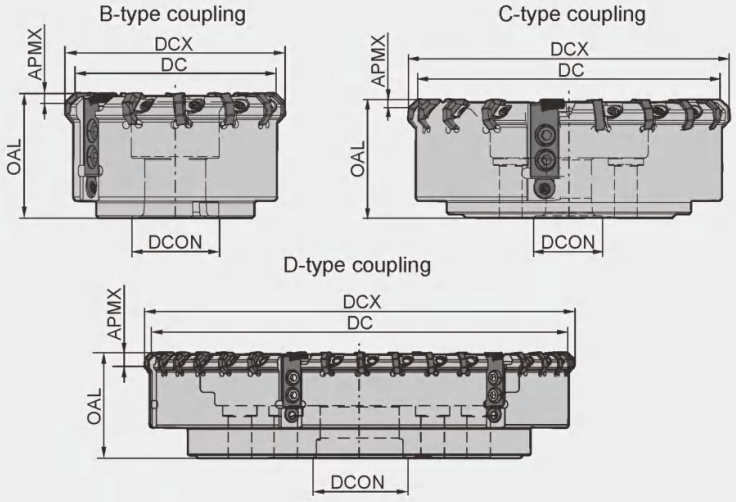
Face milling tools

KAPR:45°

Face milling

FMA08 K



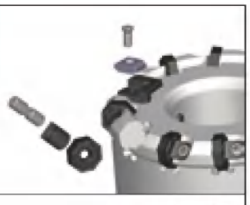


Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCX	DCON	OAL	APMX			
FMA08	**-100-B32-ON06-12W2**	▲	100	111.1	32	63	1.0	10+2	B	3
	-125-B40-ON06-15W3	▲	125	136.1	40	63	1.0	12+3	B	4.5
	-160-C40-ON06-18W3	▲	160	171.1	40	63	1.0	15+3	C	6.8
	-200-C60-ON06-24W4	▲	200	211.1	60	63	1.0	20+4	C	10.3
	-250-C60-ON06-30W5	▲	250	261.1	60	63	1.0	25+5	C	15.1
	-315-D60-ON06-36W6	▲	315	326.1	60	80	1.0	30+6	D	27.2

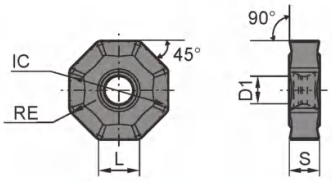
▲Stock available △Make-to-order

Spare parts

Diameter DC	Insert	Briquette	Screw	Wrench	Clamp	Clamp screw	Adjustment blocks	
								
Ø100-Ø315	ONHU060408-CM XEEC120904	W18N	DM6×20A	WT15IT WH50L	LOCATOR-XEEC12	M6×18(GB70-85)	ADJ01	

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



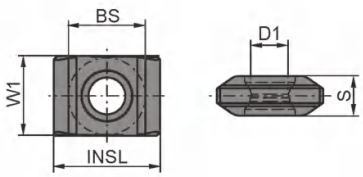
Good working condition / Normal working condition / Bad working condition

Workpiece material																
P Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K Cast iron			😐	😐	☹	😊										☹
N Non-ferrous metal															😐	☹
S Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**ONHU060408-CM**	6.58	15.875	4.76	4.4	0.8			●			●			●							

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts



Good working condition / Normal working condition / Bad working condition

Workpiece material																
P Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K Cast iron			😐	😐	☹	😊										☹
N Non-ferrous metal															😐	☹
S Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	BS	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**XEEC120904**	12.7	9.525	4.76	4.4	7.3			●			●										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V_c(m/min)	f_z(mm/z)
K	Cast iron	180-250	YBD152 YBG105	250 (150-300)	0.06-0.25

Note: The recommended feed per tooth of the Wiper insert is fz≤0.25mm/z.

FMA11 KAPR:45° Series

With Outstanding Economy and High Performance



4 × 2=8 edge

Cutter body with PVD coating for superior corrosion and heat resistance resulting in longer service life.



Comprehensive upgrading of -GM geometry, good chip breaking performance, large rake angle, reduced cutting force.



New -HGR geometry, high edge strength, excellent breakage resistance.



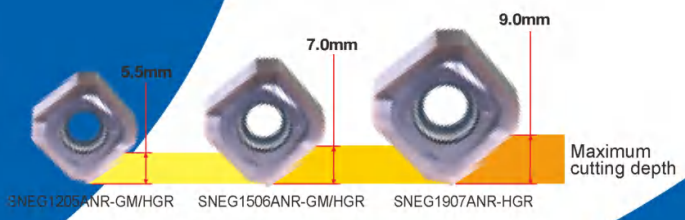
Insert with wiper, smoother surface roughness.

Complete range of insert specifications and geometries, for different cutting depths and different machining demands.



Double negative structure, excellent impact resistance.

Optimized design of pitch and chip pocket, for unobstructed chip flow, and higher cutting efficiency.



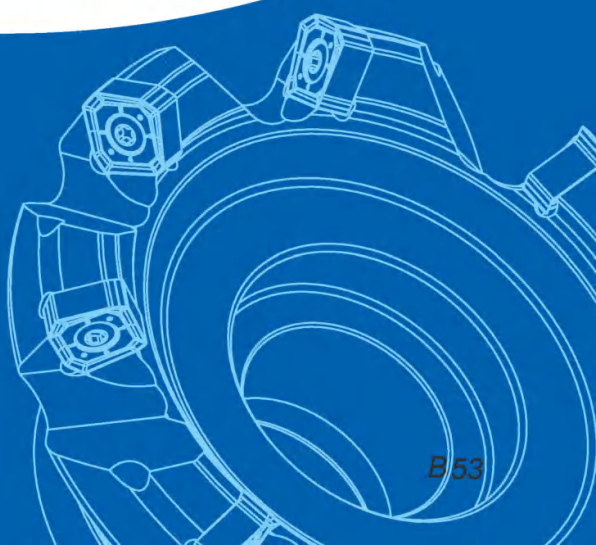


-W special wiper geometry, wiper designed with large arc to improve surface quality the workpiece.

Large effective wiper length, more suitable for semi-finishing/finishing of large-diameter cutter heads.







Face milling tools

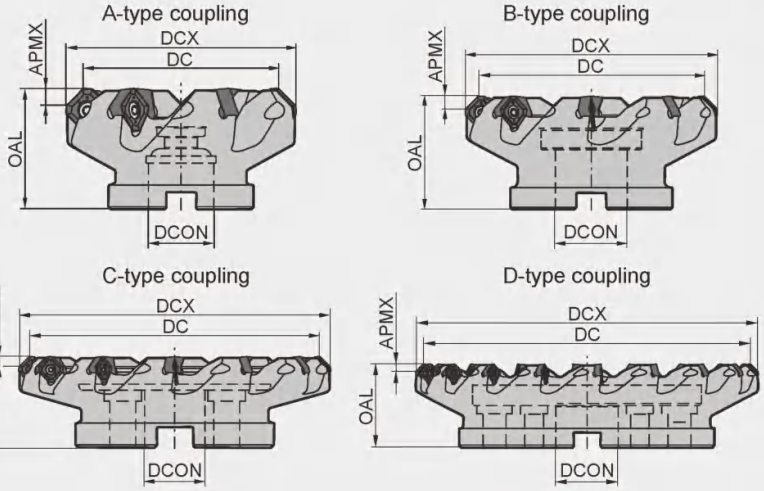
KAPR:45°


Face milling


Chamfering

FMA11 P K S





Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCX	DCON	OAL	APMX			
FMA11 Coarse pitch	**-063-A22-SN12-05C**	▲	63	75.2	22	40	5.5	5	A	0.55
	-080-A27-SN12-06C	▲	80	92.2	27	50	5.5	6	A	1.14
	-100-B32-SN12-07	▲	100	112.2	32	50	5.5	7	B	1.42
	-125-B40-SN12-08	▲	125	137.2	40	63	5.5	8	B	2.86
	-160-C40-SN12-10	▲	160	172.2	40	63	5.5	10	C	4.06
	-063-A22-SN15-05C	▲	63	78.4	22	40	7.0	5	A	0.56
	-080-A27-SN15-06C	▲	80	95.4	27	50	7.0	6	A	1.06
	-100-B32-SN15-07	▲	100	115.4	32	50	7.0	7	B	1.47
	-125-B40-SN15-08	▲	125	140.4	40	63	7.0	8	B	2.70
	-160-C40-SN15-10	▲	160	175.4	40	63	7.0	10	C	3.92
	-200-C60-SN15-12	▲	200	215.4	60	63	7.0	12	C	5.46
	-250-C60-SN15-14	▲	250	265.4	60	63	7.0	14	C	11.26
	-315-D60-SN15-18	▲	315	330.4	60	80	7.0	18	D	20.00
	-125-B40-SN19-07	▲	125	144.4	40	63	9.0	7	B	3.00
	-160-C40-SN19-09	▲	160	179.4	40	63	9.0	9	C	4.25
	-200-C60-SN19-11	▲	200	219.4	60	63	9.0	11	C	6.18
	-250-C60-SN19-13	▲	250	269.4	60	63	9.0	13	C	11.55
	-315-D60-SN19-16	▲	315	334.4	60	80	9.0	16	D	20.90

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Insert screw	Wrench	
				
Ø63 -Ø160	SNEG1205ANR-GM/HGR/W	I60M3.5×10	--	WT15IS
Ø63 -Ø315	SNEG1506ANR-GM/HGR/W	I60M5×13	WT20IT	--
Ø125 -Ø315	SNEG1907ANR-HGR	I43M6×16	WT25IT	--



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

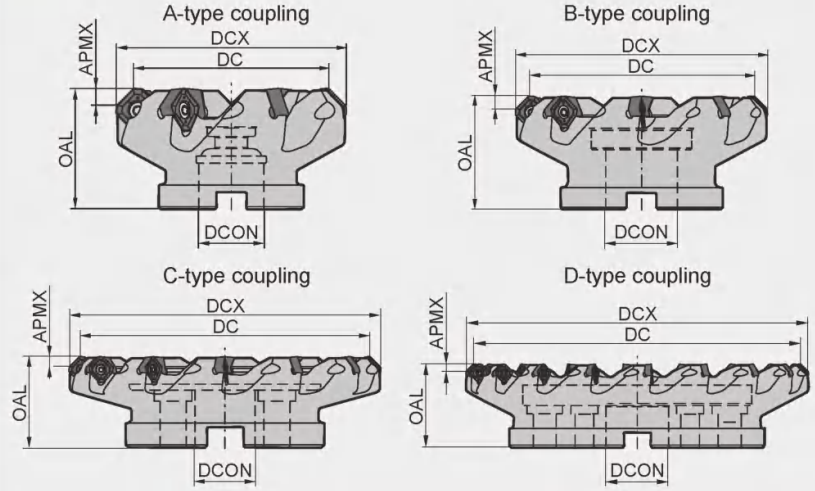
Face milling tools

KAPR:45°

Face milling Chamfering

FMA11 P K S





Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCX	DCON	OAL	APMX			
FMA11 Close pitch	**-063-A22-SN12-06C**	▲	63	74.2	22	40	5.5	6	A	0.58
	-080-A27-SN12-08C	▲	80	91.9	27	50	5.5	8	A	1.16
	-100-B32-SN12-10C	▲	100	111.2	32	50	5.5	10	B	1.71
	-125-B40-SN12-12C	▲	125	136.2	40	63	5.5	12	B	3.29
	-160-C40-SN12-15	▲	160	171.6	40	63	5.5	15	C	4.40
	-063-A22-SN15-06C	▲	63	78.3	22	40	7.0	6	A	0.56
	-080-A27-SN15-07C	▲	80	95.3	27	50	7.0	7	A	1.05
	-100-B32-SN15-08C	▲	100	115.3	32	50	7.0	8	B	1.67
	-100-B32-SN15-09C	▲	100	115.3	32	50	7.0	9	B	1.67
	-125-B40-SN15-10C	▲	125	140.3	40	63	7.0	10	B	3.10
	-160-C40-SN15-12	▲	160	175.3	40	63	7.0	12	C	4.20
	-160-C40-SN15-13	▲	160	175.3	40	63	7.0	13	C	4.14
	-200-C60-SN15-15	▲	200	215.3	60	63	7.0	15	C	5.84
	-250-C60-SN15-18	▲	250	265.3	60	63	7.0	18	C	11.68
	-315-D60-SN15-22	▲	315	330.3	60	80	7.0	22	D	20.59

▲Stock available △Make-to-order

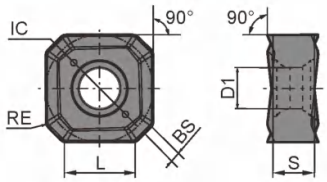
Spare parts

Diameter DC	Inserts	Insert screw	Wrench	
Ø63 -Ø160	SNEG1205ANR-GM/HGR/W	I60M3.5×10	--	WT15IS
Ø63 -Ø315	SNEG1506ANR-GM/HGR/W	I60M5×13	WT20IT	--
Ø125 -Ø315	SNEG1907ANR-HGR	I43M6×16	WT25IT	--



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

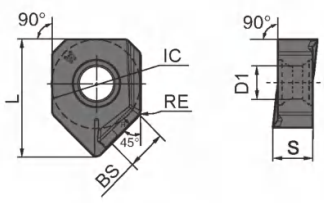
Selection of inserts

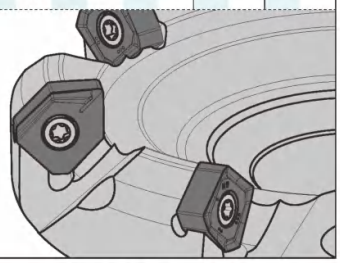


😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material																	
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BS	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SNEG1205ANR-GM	7.6	12.0	4.76	1.05	4.6	0.6	★	★	★	○				★	★		○	○				
	SNEG1506ANR-GM	9.4	15.0	5.54	1.30	5.5	0.9	★	★	★	○				★	★		○	○				
	SNEG1205ANR-GR	7.6	12.0	4.76	1.05	4.6	0.6	★	★	★					★				●				
	SNEG1506ANR-GR	9.4	15.0	5.54	1.30	5.5	0.9	★	★	★					★				●				
	SNEG1907ANR-GR	12.1	19.0	7.0	1.67	7.2	1.0	★	★	★		★			★								
	SNEG1205ANR-HGR	7.6	12.0	4.76	1.05	4.6	0.8	★	★	★	○	○			★	★							
	SNEG1506ANR-HGR	9.4	15.0	5.54	1.30	5.5	0.9	★	★	★	○	○			★	★							
	SNEG1907ANR-HGR	12.1	19.0	7.0	1.67	7.2	1.0	★	★	★		○			★	★							
	SNEG1205ANR-W	15.9	12.0	4.76	4.07	4.6	0.6								●								
	SNEG1506ANR-W	19.9	15.0	5.54	4.97	5.5	0.9								●								





★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

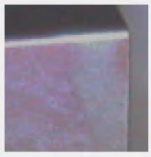
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters		
				V(m/min)	f(mm/z)	a_{pmax}(mm)
P	Low-carbon steel, Soft steel	≤180	YBM253 YBC302 YBG205 YB9320	270 (220-350)	0.2 (0.1-0.4)	5.5(SN12) 7.0(SN15) 9.0(SN19)
P	High-carbon steel, Alloy steel	180-280	YBM253 YBC302 YBG205 YB9320	260 (200-320)	0.2 (0.1-0.4)	
P	Alloy tool steel	280-350	YBM253 YBC302 YBG205 YB9320	240 (180-300)	0.2 (0.1-0.4)	
K	Cast iron	180-250	YBD152	270 (150-300)	0.3(0.1-0.5)	
K			YBD252	200 (150-250)	0.4 (0.2-0.6)	
S	Hard-to-cut material	≤400	YBS203 YBS303	100 (60-120)	0.15 (0.08-0.3)	

Case for FMA11

Workpiece material: NAK80
Operation: Face milling
Tool: FMA11-125-B40-SN12-08
Insert: SNEG1205ANR-HGR/YBG205
Cutting parameters: Vc=200m/min, fz=0.2mm/z, Ap=2mm, Ae=50mm

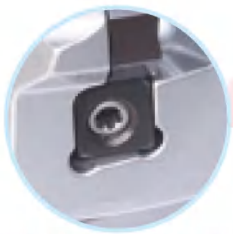
●Tool Life Comparison

	Product of company A	-HGR / YBG205
Test Group 1		
Life	22 minutes	35 minutes wear 0.02mm
Test Group 1		
Life	27 minutes	35 minutes wear 0.01mm



FMA12 KAPR:45° Series

High Performance Face Milling with 16 Edges for Outstanding Economy



Adjustment screw of wiper insert

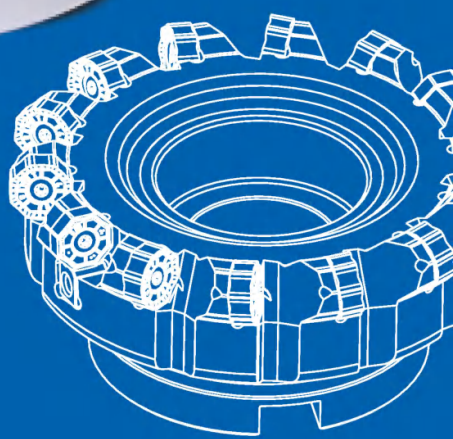
The wiper insert of the finishing cutter can be finely adjusted in the axial direction and is used in processing situations with high surface quality requirements.





Unique 3-dimentional edge

The double negative structure of the cutter body, with the spiral insert cutting edge, realizes the positive axial forward angle, reduces the cutting force and is conducive to chip removal.



Face milling tools

KAPR:45°

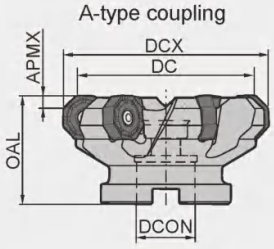

Face milling


Chamfering

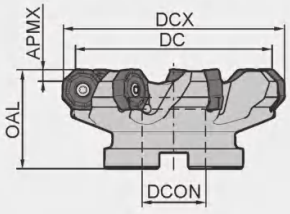
FMA12 P M K S



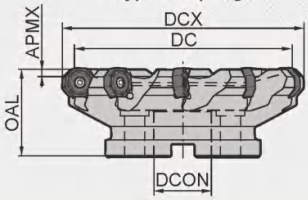
A-type coupling



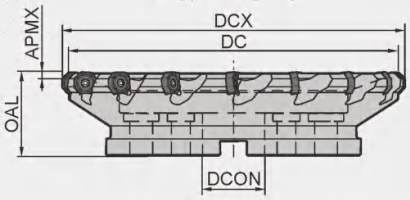
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCX	DCON	OAL	APMX			
FMA12 Coarse pitch	**-050-A22-ON06-04C**	▲	50	59	22	40	4	4	A	0.309
	-063-A27-ON06-05C	▲	63	72	27	50	4	5	A	0.645
	-080-A27-ON06-07C	▲	80	90	27	50	4	7	A	1.071
	-100-A32-ON06-08C	▲	100	110	32	50	4	8	A	1.599
	-125-B40-ON06-10	▲	125	135	40	63	4	10	B	3.114
	-160-C40-ON06-12	▲	160	170	40	63	4	12	C	4.504
	-200-C60-ON06-18	▲	200	210	60	63	4	18	C	6.35
	-250-C60-ON06-20	▲	250	260	60	63	4	20	C	12.47
	-315-D60-ON06-22	▲	315	325	60	80	4	22	D	21.25
	-400-D60-ON06-28	△	400	410	60	80	4	28	D	39.78
	-063-A22-ON09-04C	▲	63	76	22	50	5.5	4	A	0.7
	-080-A27-ON09-05C	▲	80	93	27	50	5.5	5	A	1.1
	-100-A32-ON09-06C	▲	100	113	32	50	5.5	6	A	1.6
	-125-B40-ON09-08	▲	125	138	40	63	5.5	8	B	3.1
	-160-C40-ON09-10	▲	160	173	40	63	5.5	10	C	3.982
	-200-C60-ON09-12	▲	200	303	60	63	5.5	12	C	4.987
	-250-C60-ON09-16	▲	250	260	60	63	5.5	16	C	11.89
	-315-D60-ON09-20	▲	315	325	60	80	5.5	20	D	20.97
	-400-D60-ON09-24	△	400	410	60	80	5.5	24	D	38.69

▲Stock available △Make-to-order

Face milling tools

KAPR:45°

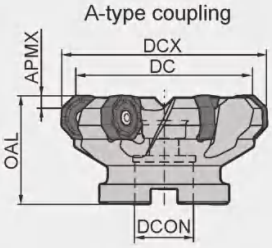

Face milling


Chamfering

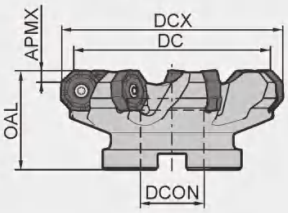
FMA12 P M K S



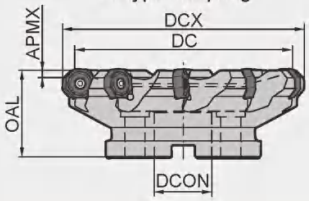
A-type coupling



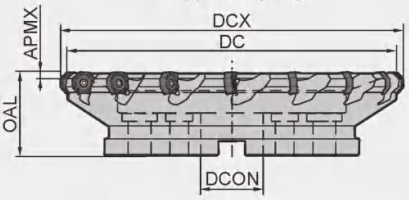
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCX	DCON	OAL	APMX			
FMA12 Coarse pitch	**-050-A22-ON06-05C**	▲	△	50	59	22	40	4	5	A	0.352
	-063-A27-ON06-07C	▲	△	63	72	27	50	4	7	A	0.695
	-080-A27-ON06-09C	▲	△	80	90	27	50	4	9	A	1.098
	-100-A32-ON06-11C	▲	△	100	110	32	50	4	11	A	1.616
	-125-B40-ON06-14	▲	△	125	135	40	63	4	14	B	3.151
	-160-C40-ON06-18	▲	△	160	170	40	63	4	18	C	4.568
	-063-A22-ON09-06C	▲	△	63	76	22	50	5.5	6	A	0.84
	-080-A27-ON09-07C	▲	△	80	93	27	50	5.5	7	A	1.24
	-100-A32-ON09-10C	▲	△	100	113	32	50	5.5	10	A	1.809
	-125-B40-ON09-12C	▲	△	125	138	40	63	5.5	12	B	3.648
	-160-C40-ON09-15	▲	△	160	173	40	63	5.5	15	C	4.303
	-200-C60-ON09-18	▲	△	200	303	60	63	5.5	18	C	5.754
Finishing	**-125-B40-ON06-14W2**	▲		125	138	40	63	4	12+2	B	3.626
	-160-B40-ON06-18W3	▲		160	173	40	63	4	15+3	B	4.787
	-200-C60-ON06-24W4	▲		200	303	60	63	4	20+4	C	6.231

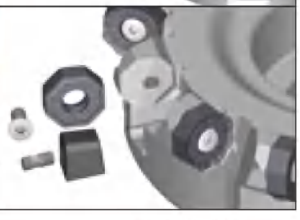
▲Stock available △Make-to-order

Spare parts

Diameter DC	Insert	Insert screw	Wrench
			
Ø50-Ø63	ONMU06□□□□-GM/GH ONHU06□□□□ANN-GM/GH/GL	IRM4×10	WT15IP
Ø80-Ø125			WT15IS
Ø160			WT15IT
Ø63-Ø125	ONMU09□□□□-GM/GH ONHU09□□□□ANN-GM/GH/GL	IRM5×13	WT20IS
Ø160-Ø400			WT20IT

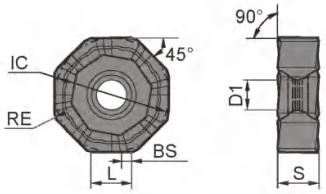


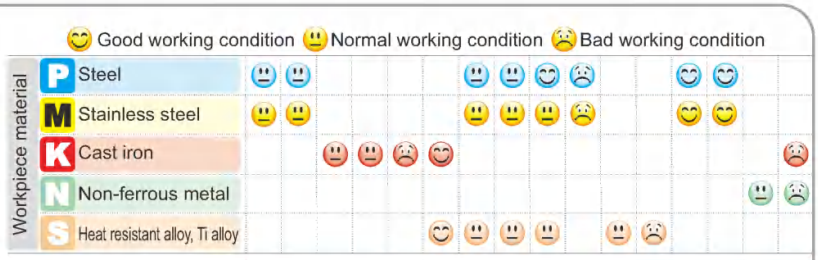
Finishing cutterhead diameter DC	Insert	Insert screw	Adjustment block	Insert screw	Wrench
					
Ø125	ONMU06□□□□-GM/GH ONHU06□□□□ANN-GM/GH/GL ONHU0604AN-W	DM6×20A	ADJ-M6×1.0A	IRM4×10	WT15IS
Ø160-Ø200					WT15IT



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts





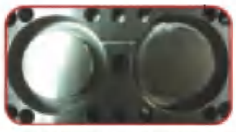
Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	RE	BS	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ONHU060404ANN-GL	6.15	15.875	5.54	6	0.4	1.2		●	●					●	●			●				
	ONHU09T508ANN-GL	8.0	20.2	5.8	7	0.8	1.2		●	●					●	●			●				
	ONHU060408ANN-GM	6.15	15.875	5.54	6	0.8	1		●	●					●	●			●				
	ONMU060408-GM	6.15	15.875	5.54	6	0.8	-		●	●					●	●							
	ONHU09T508ANN-GM	8.0	20.2	5.8	7	0.8	1.2		●	●					●	●			●				
	ONMU09T512-GM	8.0	20.2	5.8	7	1.2	-		●	●					●	●							
	ONMU060408-GH	6.15	15.875	5.54	6	0.8	-		●	●					●	●			●				
	ONHU060408ANN-GH	6.15	15.875	5.54	6	0.8	1		●	●					●	●			●				
	ONHU09T508ANN-GH	8.0	20.2	5.8	7	0.8	1.2		●	●					●	●			●				
	ONMU09T512-GH	8.0	20.2	5.8	7	1.2	-		●	●					●	●							
	ONHU0604AN-W	6.15	15.875	4.97	6	0.8	-						●										

●Inserts are suitable for both left and right cuts ★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

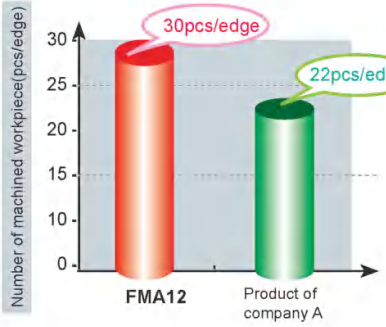
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters						a_{pmax}(mm)
				-GL		-GM		-GH		
				Vc(m/min)	f_z(mm/z)	Vc(m/min)	f_z(mm/z)	Vc(m/min)	f_z(mm/z)	
P	Low carbon steel	≤180	YBM253 YBG205 YB9320	270(220-350)	0.2(0.1-0.3)	270(220-350)	0.2(0.1-0.4)	270(220-350)	0.3(0.2-0.5)	4.0(0N06) 5.5(0N09)
	Alloy steel	180-350	YBM253 YBG205 YB9320	240(180-320)	0.15(0.1-0.3)	240(180-300)	0.2(0.1-0.4)	240(180-300)	0.3(0.2-0.5)	
M	Stainless steel	≤270	YBM253 YBG205 YB9320	230 (180-300) 160 (110-270)	0.15 (0.1-0.3)	160(110-270)	0.15(0.1-0.3)	160(110-270)	0.2(0.1-0.3)	
K	Cast iron	180-260	YBD152	270(150-300)	0.2(0.1-0.3)	270(150-300)	0.3(0.1-0.4)	270(150-300)	0.4(0.2-0.5)	
S	Hard-to-cut material	≤400	YBS303	100(60-120)	0.15 (0.08-0.3)	100(60-120)	0.15(0.1-0.25)	100(60-120)	--	

Case for FMA12



Workpiece: Elevator brake
Workpiece material: Alloy steel(HB190-240)
Machining location: Panel
Tool: FMA12-160-C40-ON09-10
Insert: ONHU09T508ANN-GM/YB9320
Cutting data: V_c=300m/min, f_z=0.25mm/z, a_p=3.5mm, a_e=120mm
System of cooling: External

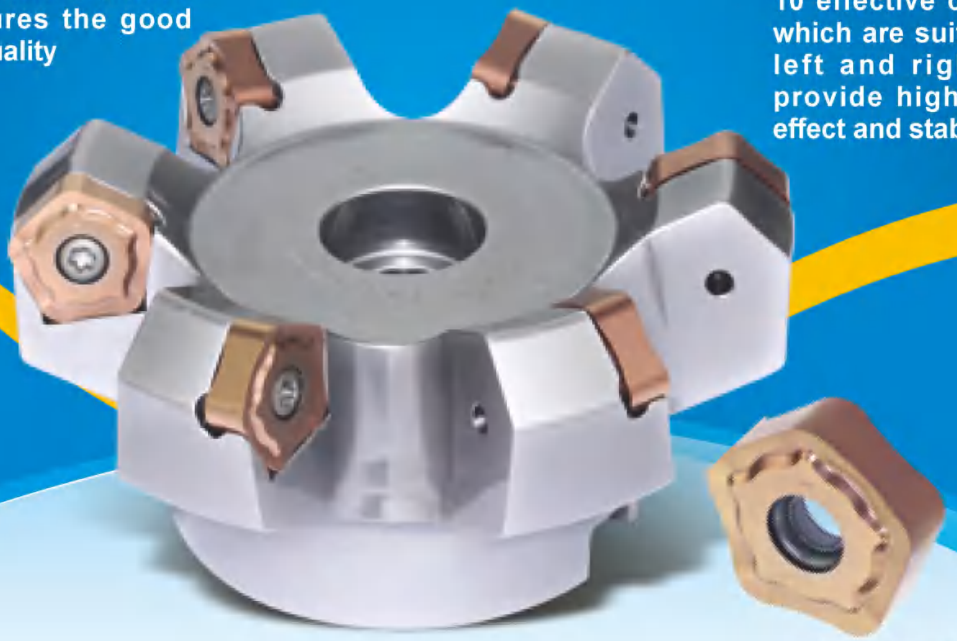


Tool Life comparison
Being compared to the similar product of company A, our FMA12 has longer cutting tool life.

FMA14

The General Milling Tool with High-efficiency Multiple Cutting Edges

- The balanced design with 45 clearance angle to achieve low cutting resistance for high-effective machining
- The upgraded new design of the chipbreaker which is suitable for different machining of steel and nodular cast iron
- The great anti-vibration tool ensures the good surface quality
- The pentagon design with 10 effective cutting edges which are suitable for both left and right cut, also provide high economical effect and stability



The helical cutting edge design could reduce cutting resistance to achieve light cut

The optimized chipbreaker design ensures the strength which significantly reduces the cutting edge breakage risk.

The abundant chipbreaker series could deal with different machining condition

-GL: Emphasis on stable machining

Suitable for low cutting forces and the insufficient machine load situation

-GM: First choice for P material machining

The large radius cutting edge with optimized cutting edge design

-GH: Emphasis on anti-breakage machining

The high strength of the cutting edge significantly control the breakage risks

To combine with new grade YB9320 to achieve long tool life and stable machining

-GH/-GM/-GL



⑤×2=10edge



Face milling tools

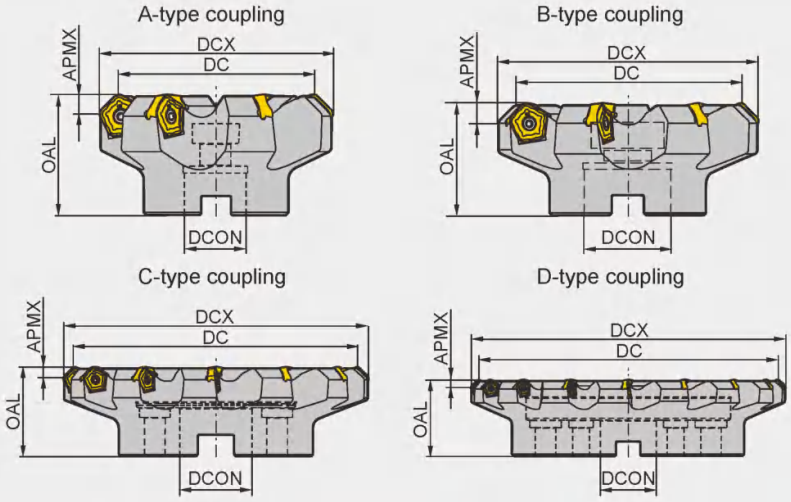
KAPR:45°


Face milling


Chamfering

FMA14 P M K





Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCX	OAL	DCON	APMX			
FMA14 Coarse pitch	**-050-A22-PN11-04**	▲	50	66.7	50	22	5.5	4	A	0.571
	-063-A22-PN11-05	▲	63	79.7	50	22	5.5	5	A	0.77
	-080-A27-PN11-06	▲	80	96.7	50	27	5.5	6	A	1.09
	-100-B32-PN11-07	▲	100	116.7	50	32	5.5	7	B	1.48
	-125-B40-PN11-08	▲	125	141.7	63	40	5.5	8	B	3.39
	-160-B40-PN11-10	▲	160	176.7	63	40	5.5	10	B	5.93
	-200-C60-PN11-12	▲	200	216.7	63	60	5.5	12	C	6.28
	-250-C60-PN11-14	▲	250	266.7	63	60	5.5	14	C	11.84
	-315-D60-PN11-16	▲	315	331.7	80	60	5.5	16	D	19.8
Close pitch	**-050-A22-PN11-05**	▲	50	66.7	50	22	5.5	5	A	0.6
	-063-A22-PN11-06	▲	63	79.7	50	22	5.5	6	A	0.9
	-080-A27-PN11-08	▲	80	96.7	50	27	5.5	8	A	1.2
	-100-B32-PN11-10	▲	100	116.7	50	32	5.5	10	B	1.9
	-125-B40-PN11-12	▲	125	141.7	63	40	5.5	12	B	3.5
	-160-B40-PN11-14	▲	160	176.7	63	40	5.5	14	B	6.4
	-200-C60-PN11-16	▲	200	216.7	63	60	5.5	16	C	8.5
	-250-C60-PN11-18	▲	250	266.7	63	60	5.5	18	C	18.0
	-315-D60-PN11-26	▲	315	331.7	80	60	5.5	26	D	24.5

▲Stock available △Make-to-order

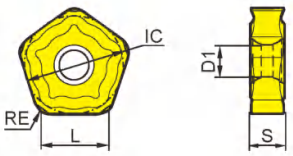
Spare parts

Diameter DC	Insert	Insert screw	Wrench
			
Ø50-Ø63	PNEG1105□□-GL/GM/GH	I60M4×10	WT15IP
Ø80-Ø125			WT15IS
Ø160-Ø315			WT15IT



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	PNEG110512-GL	7.5	15.875	5.56	4.64	1.2	●							●	★							
	PNEG110530-GM	7.5	15.875	5.56	4.64	3.0	●							●	★							
	PNEG110530-GH	7.5	15.875	5.56	4.64	3.0	●							●	★							

●Inserts are suitable for both left and right cuts ★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

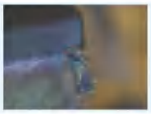
ISO	Workpiece material	Hardness HB	Insert grade	Cutting parameters						ap_{max}
				-GL		-GM		-GH		
				V(m/min)	Fz(mm/z)	V(m/min)	Fz(mm/z)	V(m/min)	Fz(mm/z)	
P	Low-carbon steel	≤HB180	YB9320 YBG205 YBM253	100~250	0.1~0.4	100~250	0.15~0.5	100~230	0.2~0.6	5.5mm
P	High-carbon steel	180-280	YB9320 YBG205 YBM253	100~230	0.1~0.4	100~230	0.15~0.5	100~230	0.2~0.6	5.5mm
P	Alloy steel	180-280	YB9320 YBG205 YBM253	100~220	0.1~0.3	100~220	0.15~0.4	100~220	0.2~0.5	5.5mm
P	Tool steel	280-350	YB9320 YBG205 YBM253	100~220	0.1~0.3	100~220	0.15~0.5	100~220	0.2~0.5	5.5mm
M	Stainless steel	≤270	YB9320 YBG205 YBM253	90~180	0.1~0.4	90-180	0.1~0.3	90~180	0.2~0.6	5.5mm
K	Cast iron, Ductile iron, High nickel cast iron	180-250	YB9320 YBG205	100~260	0.1~0.3	100-240	0.15~0.4	100-240	0.2~0.5	5.5mm

Case for FMA14

Workpiece material: 42CrMo
Tool: FMA14-125-B40-PN11-08
Insert: PNEG110530-GM/YB9320
Cutting data: Vc=140m/min, fz=0.4mm/z, ap=2mm, ae=72mm
Machine: 3-axis machining center
Cooling system: Dry cutting

Result:Our FMA14 not only has obvious better tool life than the similar product from Company A, but also have better performance on anti-breakage and wear-resistance.

Comparison of insert abrasion

	PNEG110530-GM	similar product of company A
Time	135min	65min
Abrasion on clearance face		
Abrasion on rake face		

Face milling tools

KAPR:45°

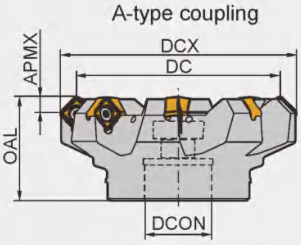

Face milling


Chamfering

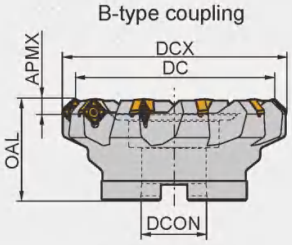
FMA17 K S



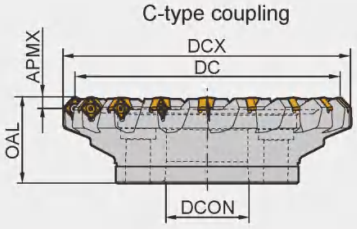
A-type coupling



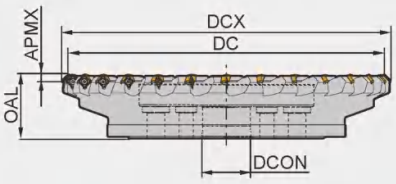
B-type coupling



C-type coupling



D-type coupling



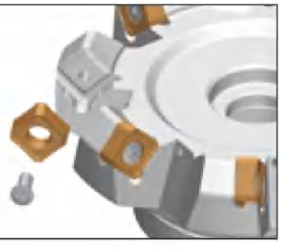
Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCX	OAL	DCON	APMX			
FMA17 Coarse pitch	**-050-A22-SN12-04C**	▲	△	50	65	22	40	6.5	4	A	0.384
	-063-A22-SN12-06C	▲	△	63	78	22	40	6.5	6	A	0.717
	-080-A27-SN12-07C	▲	△	80	95	27	50	6.5	7	A	1.085
	-100-A32-SN12-08	▲	△	100	115	32	50	6.5	8	A	1.558
	-125-B40-SN12-10	▲	△	125	140	40	63	6.5	10	B	3.012
	-160-C40-SN12-12	▲	△	160	175	40	63	6.5	12	C	4.358
	-200-C60-SN12-18	▲	△	200	215	60	63	6.5	18	C	6.337
	-250-C60-SN12-20	▲	△	250	265	60	63	6.5	20	C	12.360
	-315-D60-SN12-22	▲	△	315	330	60	80	6.5	22	D	21.224
	-400-D60-SN12-28	▲	△	400	415	60	80	6.5	28	D	39.535
Close pitch	**-050-A22-SN12-06C**	▲	△	50	65	22	40	6.5	6	A	0.381
	-063-A22-SN12-08C	▲	△	63	78	22	40	6.5	8	A	0.717
	-080-A27-SN12-10C	▲	△	80	95	27	50	6.5	10	A	1.105
	-100-A32-SN12-12C	▲	△	100	115	32	50	6.5	12	A	1.656
	-125-B40-SN12-16	▲	△	125	140	40	63	6.5	16	B	3.103
	-160-C40-SN12-20	▲	△	160	175	40	63	6.5	20	C	4.600
	-200-C60-SN12-24	▲	△	200	215	60	63	6.5	24	C	6.569

▲Stock available △Make-to-order

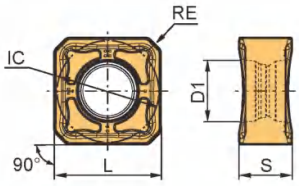
Spare parts

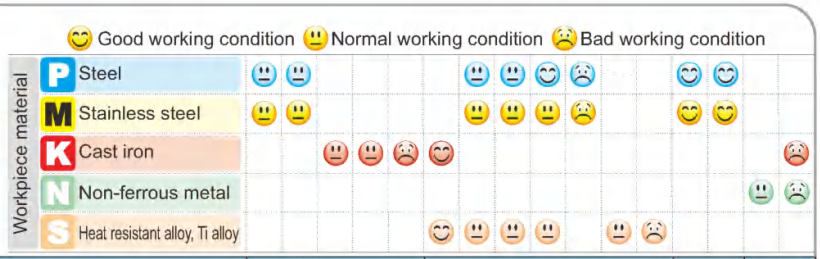
Diameter DC	Insert	Insert screw	Wrench
Ø50-Ø63	SNGX1205□□□□-GL/GM/GH/LH/W	IRM4×10	WT15IP
Ø80-Ø160			WT15IS
Ø200-Ø400			WT15IT



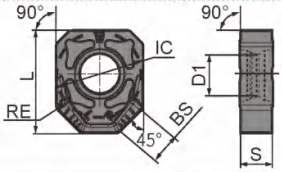
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

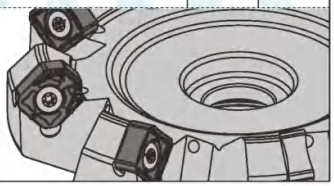
Selection of inserts





Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BS	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SNGX1205ANN-GL	12.7	12.7	6.5	-	5.9	0.8		●	●						★							
	SNMX120512-GL	12.7	12.7	6.5	-	5.9	1.2		●	●						★							
	SNGX1205ANN-GM	12.7	12.7	6.5	-	5.9	0.8		●	●						★			●				
	SNMX1205ANN-GM	12.7	12.7	6.5	-	5.9	0.8		●	●						★			●				
	SNMX120512-GM	12.7	12.7	6.5	-	5.9	1.2		●	●						★			●				
	SNGX1205ANN-GH	12.7	12.7	6.5	-	5.9	0.8		●	●						★							
	SNMX120512-GH	12.7	12.7	6.5	-	5.9	1.2		●	●						★							
	SNGX1205ANN-LH	12.7	12.7	6.5	-	5.9	0.8																●
	SNGX1205ANN-W	15	12.7	4.8	4.32	5.9	1.2						●										





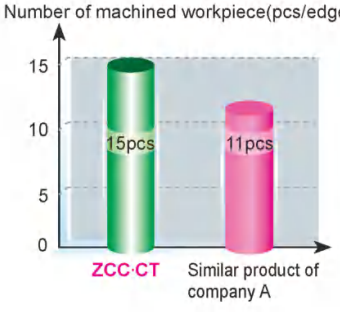
●Inserts are suitable for both left and right cuts ★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

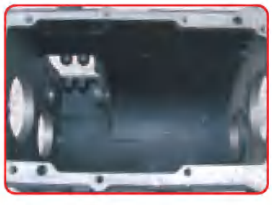
Recommended cutting parameters

ISO	Workpiece material	Hardness HB	Insert grade	Cutting parameters				
				Vc(m/min)	f_z(mm/z)			
					-GM	-GL	-GH	-LH
P	Low-carbon steel, Soft steel	≤180	YBM253 YB9320	270(220-350)	0.2(0.1-0.4)	0.15(0.1-0.3)	0.3(0.2-0.5)	--
P	High-carbon steel, Alloy steel	180-280	YBM253 YB9320	260(220-320)	0.2(0.1-0.4)	0.15(0.1-0.3)	0.3(0.2-0.5)	--
P	Alloy tool steel	280-350	YBM253 YB9320	240(180-300)	0.2(0.1-0.4)	0.15(0.1-0.3)	0.3(0.2-0.5)	--
M	Stainless steel	≤270	YBM253 YB9320	160(110-270)	0.15(0.1-0.3)	0.1(0.08-0.2)	0.2(0.1-0.3)	--
K	Cast iron, Ductile iron, High nickel cast iron	180-250	YBD152	270(150-300)	0.3(0.1-0.4)	0.2(0.1-0.3)	0.4(0.2-0.5)	--
S	Difficult-to-machine materials	≤400	YBS303	100(60-120)	0.15(0.1-0.25)	--	--	--
N	Aluminium alloy	--	YD201	300-				0.15 (0.05-0.3)

Case for FMA17

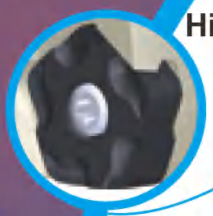
Workpiece: Gear box housing
The material of workpiece: HT250(HB220)
Tool: FMA17-160-C40-SN12-12
Insert: SNGX1205ANN-GM/YBD152
Cutting parameter: Vc=160m/min, fz=0.15mm/z, ap=2mm, ae=100mm
Type of cooling: External cooling





Whirlwind FMD02 Milling Tools Series

The optimized design of the acute angle clamping method has good self-locking performance and high clamping precision which provides enough resisting power to ensure the stability of the machining.

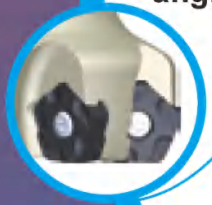


High strength screw clamping



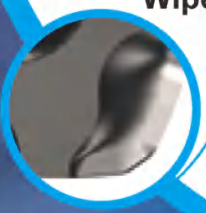
67° approach angle

The open flute and large rake angle design could satisfy the machining requirement of different machine load.



Wiper

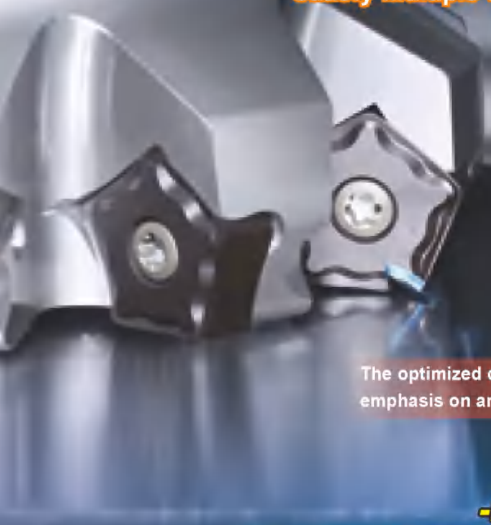
The inserts with wiper design which helps to achieve the stable surface quality under different feed rate.



Each insert has 10 cutting edges

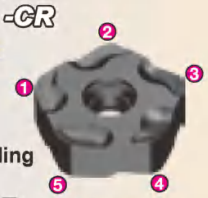


The good economical effect and abundant chipbreaker selections could satisfy multiple working conditions.





General face milling for steel and cast iron.
-CF -CM -CR
5×2=10edge



General face milling for cast iron
-PF -PM -PR
5×2=10edge

New chipbreaker for cast iron
-KH -KM -KL

-KH

The optimized cutting edge design emphasis on anti-breakage machining



-KM

General machining chipbreaker. The first choice for cast iron machining



-KL

Emphasizing low cutting force machining to prevent vibration and control burrs to ensure the surface quality.



The helical cutting design with chamfered double-rake angle which can perfectly match different cutting depth requirement.

The high economical inserts with 10 cutting edges could be suitable for both left and right cuts with a high performance-to-cost ratio.

The optimized cutting edge design with high strength of cutting edges and outstanding wear resistance performance greatly increases the tool life.

The low cutting forces design could effectively control the vibration. The combination of the FMD02 could achieve high-performance cast iron machining.

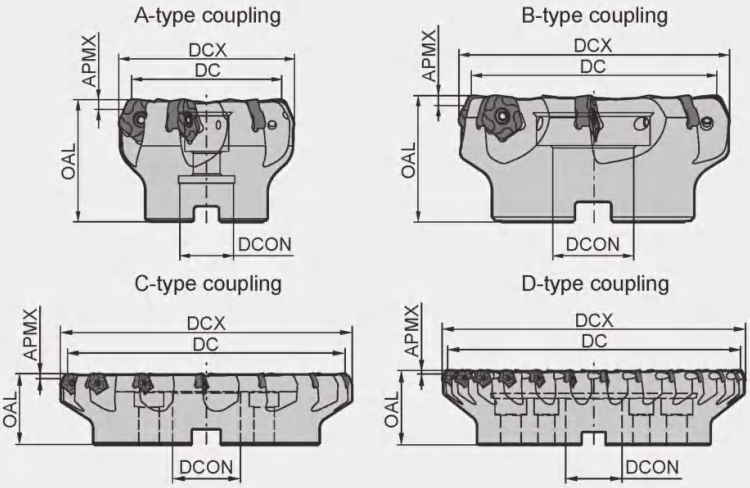
Face milling tools

KAPR:67°

Face milling

FMD02 P K





Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCX	DCON	OAL	APMX			
FMD02 Coarse pitch (unequal pitch)	**-050-A22-PN11-04**	▲	△	50	60.1	22	50	5/6.5/7.5	4	A	0.6
	-063-A22-PN11-05	▲	△	63	73.1	22	50	5/6.5/7.5	5	A	0.8
	-080-A27-PN11-06	▲	△	80	90.1	27	50	5/6.5/7.5	6	A	1.1
	-100-B32-PN11-07	▲	△	100	110.1	32	50	5/6.5/7.5	7	B	1.8
	-125-B40-PN11-08	▲	△	125	135.1	40	63	5/6.5/7.5	8	B	2.9
	-160-B40-PN11-10	▲	△	160	170.1	40	63	5/6.5/7.5	10	B	5.6
	-200-C60-PN11-12	▲	△	200	210.1	60	63	5/6.5/7.5	12	C	7.9
	-250-C60-PN11-14	▲	△	250	260.1	60	63	5/6.5/7.5	14	C	13.4
Close pitch	**-050-A22-PN11-05**	▲	△	50	60.1	22	50	5/6.5/7.5	5	A	0.6
	-063-A22-PN11-06	▲	△	63	73.1	22	50	5/6.5/7.5	6	A	0.9
	-080-A27-PN11-08	▲	△	80	90.1	27	50	5/6.5/7.5	8	A	1.2
	-100-B32-PN11-10	▲	△	100	110.1	32	50	5/6.5/7.5	10	B	1.9
	-125-B40-PN11-12	▲	△	125	135.1	40	63	5/6.5/7.5	12	B	3.2
	-160-B40-PN11-14	▲	△	160	170.1	40	63	5/6.5/7.5	14	B	6.4
	-200-C60-PN11-16	▲	△	200	210.1	60	63	5/6.5/7.5	16	C	8.5
	-250-C60-PN11-18	▲	△	250	260.1	60	63	5/6.5/7.5	18	C	18.0
	-315-D60-PN11-26	▲	△	315	325.1	60	80	5/6.5/7.5	26	D	24.5

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Insert screw	Wrench
			
Ø50 -Ø315	PNEG110512□-CF/CM/CR	I60M4×10	WT15IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Face milling tools

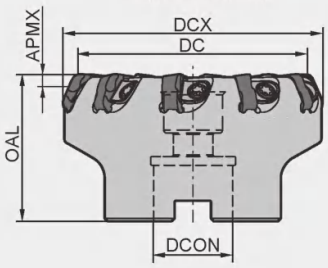
KAPR:67°

Face milling

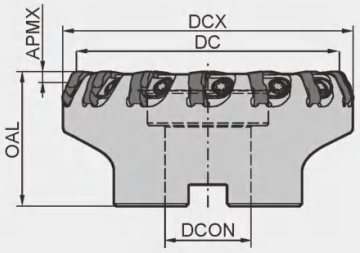
FMD02 P K



A-type coupling



B-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCX	DCON	OAL	APMX			
FMD02 Extra close pitch	**-080-A27-PN11-10**	▲	△	80	90.1	27	50	5/6.5/7.5	10	A	1.3
	-100-B32-PN11-14	▲	△	100	110.1	32	50	5/6.5/7.5	14	B	1.6
	-125-B40-PN11-18	▲	△	125	135.1	40	63	5/6.5/7.5	18	B	3.2
	-160-B40-PN11-22	▲	△	160	170.1	40	63	5/6.5/7.5	22	B	5.8
	-200-C60-PN11-28	▲	△	200	210.1	60	63	5/6.5/7.5	28	C	9.7
	-250-C60-PN11-36	▲	△	250	260.1	60	63	5/6.5/7.5	36	C	19.8

▲Stock available △Make-to-order



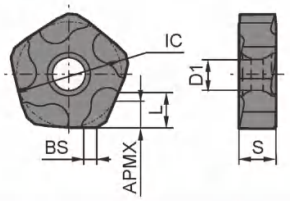
Spare parts

Diameter DC	Inserts	Wedge	Screw	Wrench
				
Ø80 -Ø160	PNEG110512□-PF/PM/PR	W18N	DM6×20A	WT15IT



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



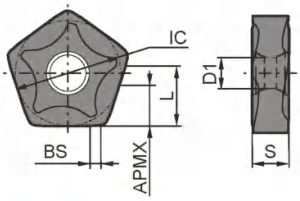
Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	
M	Stainless steel	
K	Cast iron	
N	Non-ferrous metal	
S	Heat resistant alloy, Ti alloy	

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	BS	APMX	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	PNEG110512R-CF	5.4	15.875	5.56	4.64	1.6	5			●													
	PNEG110512L-CF	5.4	15.875	5.56	4.64	1.6	5			●													
	PNEG110512R-CM	5.4	15.875	5.56	4.64	1.6	5			●													
	PNEG110512L-CM	5.4	15.875	5.56	4.64	1.6	5			●													
	PNEG110512R-CR	5.4	15.875	5.56	4.64	1.6	5			●													
	PNEG110512L-CR	5.4	15.875	5.56	4.64	1.6	5			●													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts



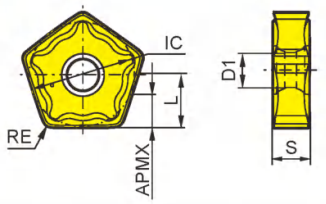
Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	
M	Stainless steel	
K	Cast iron	
N	Non-ferrous metal	
S	Heat resistant alloy, Ti alloy	

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	BS	APMX	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	PNEG110512R-PF	7.5	15.875	5.56	4.64	1.4	7.5	★	●														
	PNEG110512L-PF	7.5	15.875	5.56	4.64	1.4	7.5	★	●														
	PNEG110512R-PM	7.5	15.875	5.56	4.64	1.4	7.5	★	●														
	PNEG110512L-PM	7.5	15.875	5.56	4.64	1.4	7.5	★	●														
	PNEG110512R-PR	7.5	15.875	5.56	4.64	1.4	7.5	★	●														
	PNEG110512L-PR	7.5	15.875	5.56	4.64	1.4	7.5	★	●														

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😐 😐 😐 😐 😊 ☹ 😊 😊
M	Stainless steel	😐 😐 😐 😐 😐 ☹ 😊 😊
K	Cast iron	😐 😐 ☹ 😊 ☹
N	Non-ferrous metal	😐 ☹
S	Heat resistant alloy, Ti alloy	😊 😐 😐 😐 😐 ☹

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	RE	APMX	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	PNEG110512-KL	6.5	15.875	5.56	4.64	1.2	6.5			●		●											
	PNEG110512-KM	6.5	15.875	5.56	4.64	1.2	6.5			●		●											
	PNEG110512-KH	6.5	15.875	5.56	4.64	1.2	6.5			●		●											

•Inserts are suitable for both left and right cuts

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

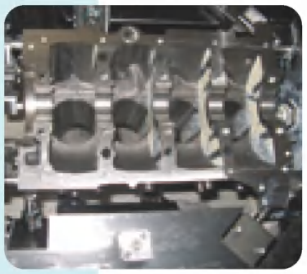
Workpiece material		Hardness HB	Insert grade	Cutting parameters				
				V(m/min)	f_z(mm/z)			a_{pmax}(mm)
					-PF	-PM	-PR	
P	Low-carbon steel, Soft steel	≤180	YBM253 YBC302	270 (220-350)	0.15 (0.1-0.2)	0.2(0.1-0.3)	0.3(0.2-0.4)	7.5
P	High-carbon steel, Alloy steel	180-280	YBM253 YBC302	260 (200-320)	0.15 (0.1-0.2)	0.2(0.1-0.3)	0.3(0.2-0.4)	7.5
P	Alloy tool steel	280-350	YBM253 YBC302	240 (180-300)	0.15 (0.1-0.2)	0.2(0.1-0.3)	0.3(0.2-0.4)	7.5
K	Cast iron	180-250			-CF	-CM	-CR	5.0
K	Cast iron	180-250	YBD152	270 (150-300)	0.15(0.1-0.2)	0.2(0.1-0.3)	0.3(0.2-0.4)	5.0
K	Grey cast iron	180~250			-KL	-KM	-KH	6.5
K	Grey cast iron	180~250	YBD152	270 (150~300)	0.25(0.1~0.4)	0.3(0.2~0.5)	0.4(0.2~0.6)	6.5
K	Grey cast iron	180~250	YBD252	240 (150~280)	0.25(0.2~0.4)	0.3(0.2~0.5)	0.4(0.2~0.6)	6.5

Case for FMD02

Application case

ZCC-CT

Cutting parameters:
D=100mm, a_p=3~5mm,
Vc=243m/min, f_z=0.15mm/z,
T=145~155 piece



similar product of company A

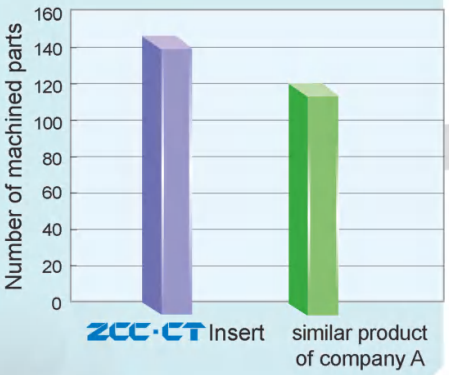
Cutting parameters:
D=100mm, a_p=3~5mm,
Vc=243m/min, f_z=0.12mm/z,
T=120~133 piece



Tool type: FMD02-100-B32-PN11-10

Insert type/grade: PNEG110512R-CR/YBD152

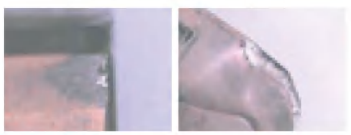
(The inserts without clearance angle to have a total of 10 cutting edges)



● Comparison of insert abrasion



ZCC-CT insert after 80 minutes machining

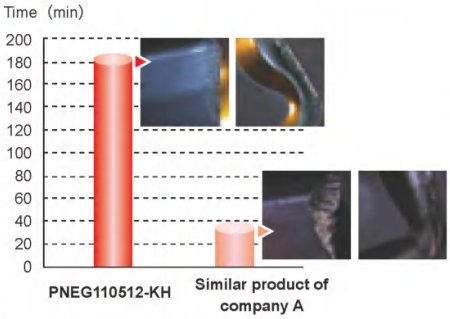


Insert of company A after 48 minutes machining



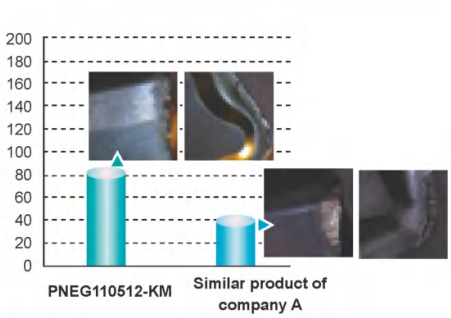
Application case

Workpiece material	Grey cast iron 250	Insert	PNEG110512-KM/YBD152 PNEG110512-KH/YBD252
Tool type	FMD02-125-B40-PN11-08	Cutting method	single pitch dry cut



Abrasion comparision

Cutting parameters: Vc=240m/min, fz=0.3mm/z, Ap=3mm, Ae=70mm



Abrasion comparision

Cutting parameters: Vc=300m/min, fz=0.2mm/z, Ap=2mm, Ae=70mm

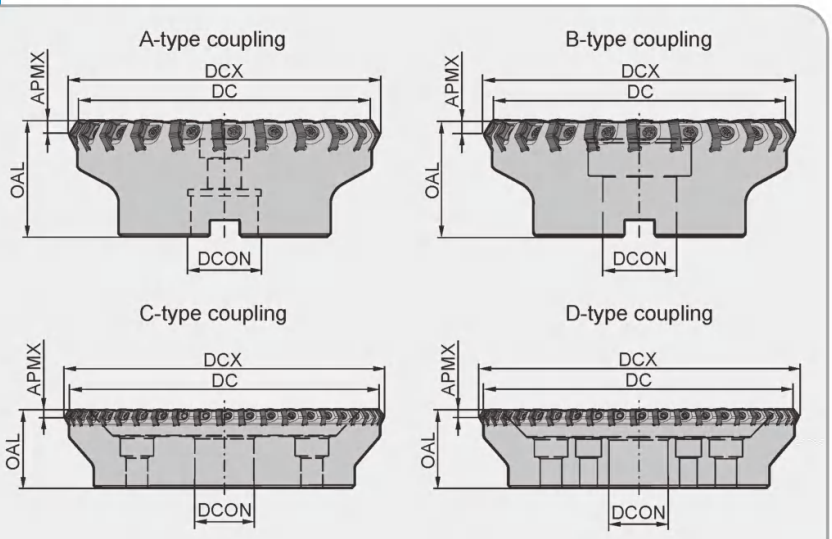
Face milling tools

KAPR:55°


Face milling

FMD02 K





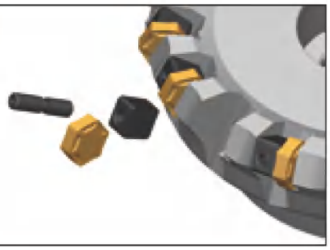
Specification of tools

Type		Stock		Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCON	OAL	APMX			
FMD02	**-080-A27-HN09-10**	▲	△	80	27	50	6	10	A	1.1
	-100-B32-HN09-14	▲	△	100	32	63	6	14	B	2.6
	-125-B40-HN09-18	▲	△	125	40	70	6	18	B	3.7
	-160-B40-HN09-22	▲	△	160	40	63	6	22	B	5.6
	-200-C60-HN09-28	▲	△	200	60	63	6	28	C	6.3
	-250-C60-HN09-36	▲	△	250	60	63	6	36	C	10.3
	-315-D60-HN09-44	▲	△	315	60	63	6	44	D	21.7

▲Stock available △Make-to-order

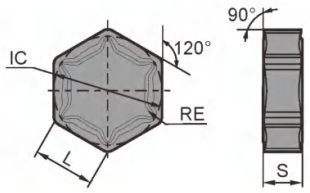
Spare parts

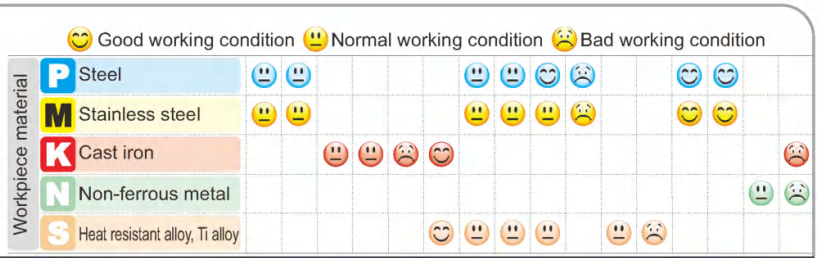
Diameter DC	Wedge	Wedge screw	Wrench
			
Ø80-Ø315	W18N	DM6×20A	WT15IT



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts





Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**HNEX090512-DF**	9.16	15.875	5.56	1.2			★													
	**HNEX090512-DM**	9.16	15.875	5.56	1.2			★													
	**HNEX090512-DR**	9.16	15.875	5.56	1.2			○		★											

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker selection for FMD02 milling inserts

Classification \ Function	For finishing	For semi-finishing	For roughing
K	-DF	-DM	-DR

Recommended cutting parameters

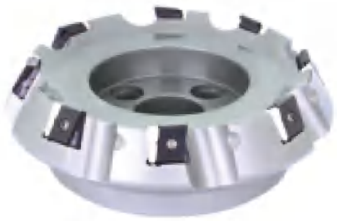
Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				V(m/min)	f(mm/z)		
					-DF	-DM	-DR
K	Cast iron	180-250	YBD152	180 (110-250)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.5)
			YBD252	130 (110-200)	0.2(0.1-0.2)	0.25 (0.1-0.3)	0.3(0.2-0.5)

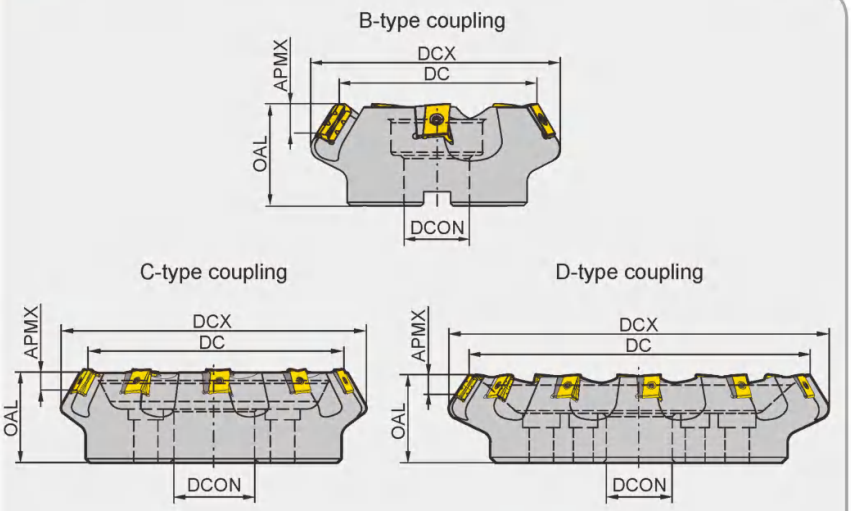
Face milling tools

KAPR:60°


Face milling

FMD03 P M K





Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCX	DCON	OAL	APMX			
FMD03	-125-B40-LN20-06	▲	△	125	153	40	63	12	6	B	4.5
	-160-C40-LN20-08	▲	△	160	187	40	63	12	8	C	6.9
	-200-C60-LN20-10	▲	△	200	227	60	70	12	10	C	10.5
	-250-C60-LN20-12	▲	△	250	276	60	70	12	12	C	13.4
	-315-D60-LN20-15	▲	△	315	339	60	80	12	15	D	26.2
	-125-B40-LN25-05	▲	△	125	154	40	63	17	5	B	4.5
	-160-C40-LN25-06	▲	△	160	189	40	63	17	6	C	6.9
	-200-C60-LN25-08	▲	△	200	229	60	70	17	8	C	10.5
	-250-C60-LN25-10	▲	△	250	278	60	70	17	10	C	16.7
	-315-D60-LN25-12	▲	△	315	346	60	80	17	12	D	27.3
	-400-D60-LN25-16	▲	△	400	427	60	80	17	16	D	47.1

▲Stock available △Make-to-order

Spare parts

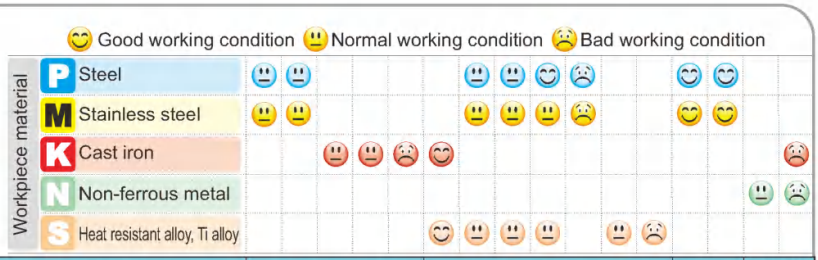
Inserts	Shim	Shim screw	Insert screw	Wrench	
LNKT2007DN-ZR	LLN20R-ZR	I60M3×7	I60M4×15	WT15IS	WT10IS
LNKT2510-ZR	LLN25R-ZR	I60M3.5×10.4	I60M5×17	WT20IT	WT15IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts





Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	LNKT2007DN-ZR	20	17	7.94	4.6		○	○							★						
	LNKT2510-ZR	25	18	9.525	5.5		○			○					★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(mm/z)
P	Low-carbon steel, Soft steel	⩽180	YBG302	180 (150-300)	0.5 (0.2-0.8)
			YBM253	180 (150-300)	0.5 (0.2-0.8)
	High-carbon steel, Alloy steel	180-280	YBG302	150 (120-280)	0.5 (0.2-0.8)
			YBM253	140 (120-280)	0.5 (0.2-0.8)
	Alloy tool steel	280-350	YBG302	120 (80-250)	0.45 (0.2-0.6)
			YBM253	100 (80-250)	0.45 (0.2-0.6)
M	Stainless steel	⩽270	YBG302	120 (80-200)	0.45 (0.2-0.6)
			YBM253	100 (80-200)	0.45 (0.2-0.6)
K	Cast iron	180-250	YBD152	220 (150-300)	0.5 (0.2-0.8)
			YBD252	210 (150-300)	0.5 (0.2-0.8)
			YBG302	200 (150-300)	0.5 (0.2-0.8)

Note: Cutting parameters can be adjusted according to the Max. power of machine.

Case for FMD03

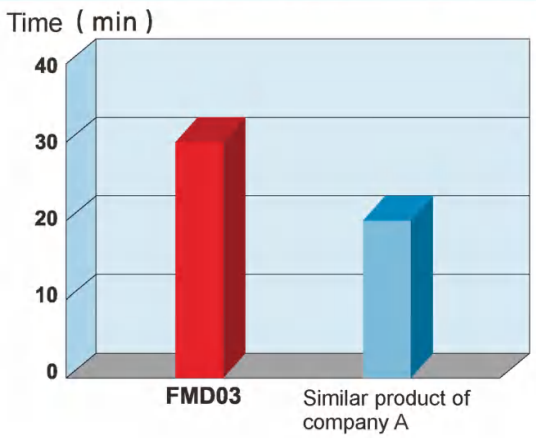
Workpiece material: ASTM A743 CA-6NM(HB200)
Cooling system: Dry cutting
Machine: NC floor type boring and milling machine,
spindle power⩾30KW
Cutting parameters:
Vc=120m/min
a_p=12mm
f_z=0.55mm/z
a_e=230mm





Tool type: FMD03-315-D60-LN25-12
Insert type/grade: LNKT2510-ZR/YBG302

● Comparison of machining time



Face milling tools

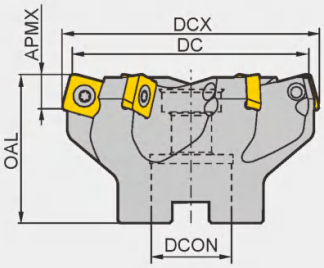
KAPR:75°

Face milling

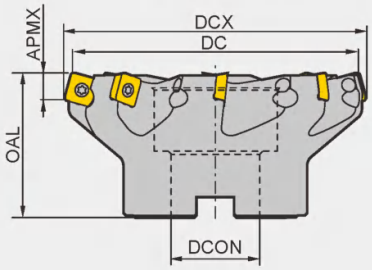
FME02 P M K



A-type coupling



B-type coupling



Specification of tools

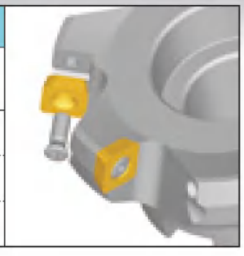
Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCX	DCON	OAL	APMX			
FME02	-050-A22-SP12-04	△	50	54	22	40	6	4	A	0.3
	-063-A22-SP12-05	△	63	66	22	50	6	5	A	0.6
	-080-A27-SP12-06	△	80	83	27	50	6	6	A	0.9
	-100-B32-SP12-07	△	100	103	32	50	6	7	B	1.4
	-125-B40-SP12-08	△	125	128	40	63	6	8	B	2.5

▲Stock available △Make-to-order



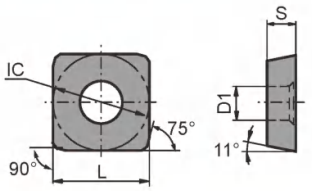
Spare parts

Diameter DC	Insert screw	Wrench
		
Ø50-Ø125	I60M5×13.2	WT20IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material																					
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**SPKW1204EDFR**	12.7	12.7	4.76	5.56							○									
	SPKW1204EDSR	12.7	12.7	4.76	5.56							○									
	**SPKT1204EDR**	12.7	12.7	4.76	5.56							★									

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Cutting edge treatment selection for FME02 milling inserts

Classification \ Function	For finishing	For semi-finishing	For roughing
P	EDFR	EDR	EDSR
M	EDFR	EDR	
K	EDFR	EDR	

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(mm/z)
P	Low-carbon steel, Soft steel	≤180	YBG202	270(200-360)	0.2 (0.1-0.3)
	High-carbon steel, Alloy steel	180-280	YBG202	240 (180-350)	0.2 (0.1-0.3)
	Alloy tool steel	280-350	YBG202	220 (170-340)	0.2 (0.1-0.3)
M	Stainless steel	≤270	YBG202	160 (110-270)	0.2 (0.1-0.3)
K	Cast iron	180-250	YBG202	160 (120-200)	0.2 (0.1-0.3)

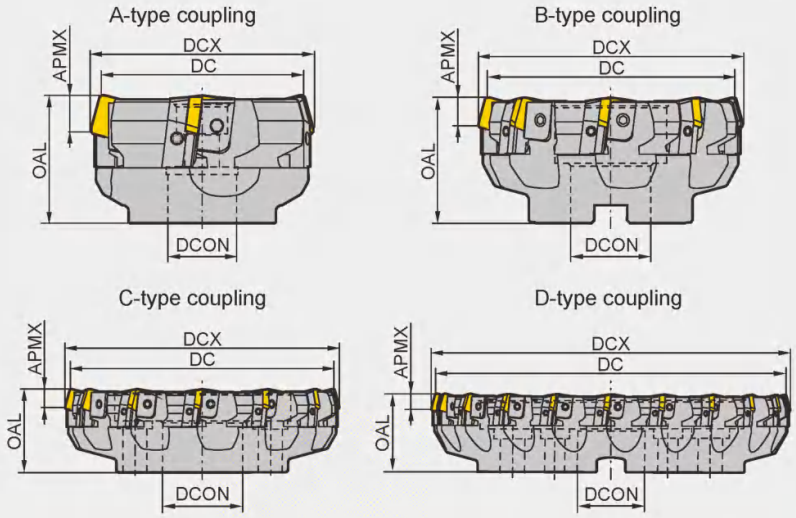
Face milling tools

KAPR:75°

Face milling

FME03 P M K





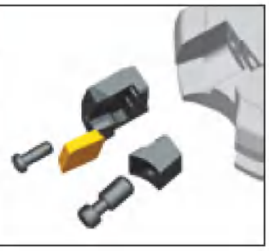
Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCX	DCON	OAL	APMX			
FME03	-080-A27-SP12-04	▲	△	80	84	27	50	6	4	A	1.1
	-100-B32-SP12-06	▲	△	100	104	32	50	6	6	B	1.9
	-125-B40-SP12-08	▲	△	125	129	40	63	6	8	B	3.5
	-160-B40-SP12-10	▲	△	160	164	40	63	6	10	B	5.7
	-200-C60-SP12-12	▲	△	200	203	60	63	6	12	C	8.2
	-250-C60-SP12-16	▲	△	250	253	60	63	6	16	C	13.8
	-315-D60-SP12-20	▲	△	315	318	60	70	6	20	D	23.5
	-080-A27-SP15-04	▲	△	80	84	27	50	8	4	A	1.0
	-100-B27-SP15-06	▲	△	100	104	27	50	8	6	B	1.8
	-125-B40-SP15-08	▲	▲	125	129	40	63	8	8	B	3.3
	-160-B40-SP15-10	▲	▲	160	164	40	63	8	10	B	5.4
	-200-C60-SP15-12	▲	▲	200	204	60	63	8	12	C	7.9
	-250-C60-SP15-16	▲	▲	250	253	60	63	8	16	C	13.6
	-315-D60-SP15-20	▲	▲	315	318	60	70	8	20	D	23.1

▲Stock available △Make-to-order

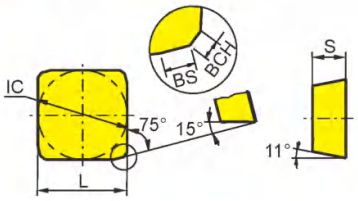
Spare parts

Diameter DC	Inserts	Locator	Wedge	Wedge Screw	Locator screw	Wrench
Ø80-Ø100	SP12	LSP12R/L	W04R/L	WM8×17	LOM5×15.1	WT20T WT25T
Ø125-Ø315				WM8×22		
Ø80-Ø315	SP15	LSP15R/L	W04R/L	WM8×22		



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



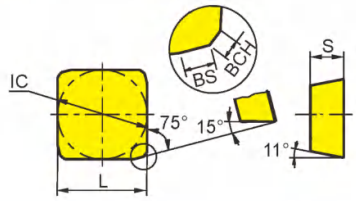
Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😃 😃 — — — 😃 😃 😊 ☹ — — 😊 😊 — —
M	Stainless steel	😃 😃 — — — 😃 😃 😃 ☹ — — 😊 😊 — —
K	Cast iron	— — 😃 😃 ☹ 😊 — — — — — — — — ☹
N	Non-ferrous metal	— — — — — — — — — — — — — — 😃 ☹
S	Heat resistant alloy, Ti alloy	— — — — — 😊 😃 😃 😃 — — 😃 ☹ — — —

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BCH	BS	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SPKN1203EDER	12.7	12.7	3.18	1	1.4							○									
	SPKN1203EDEL	12.7	12.7	3.18	1	1.4							○									
	SPKN1203EDFR	12.7	12.7	3.18	1	1.4						★	○									●
	SPKN1203EDFL	12.7	12.7	3.18	1	1.4						○	○									○
	SPKN1203EDSKR	12.7	12.7	3.18	1	1.4										○						
	SPKN1203EDSKL	12.7	12.7	3.18	1	1.4										○						
	SPKN1203EDTKR	12.7	12.7	3.18	1	1.4							○			★						○
	SPKN1203EDTKL	12.7	12.7	3.18	1	1.4							○			○						○
	SPKN1203EDS31R	12.7	12.7	3.18	1	1.4										○						
	SPKN1203EDS31L	12.7	12.7	3.18	1	1.4										○						
	SPKN1203EDT31R	12.7	12.7	3.18	1	1.4							○			★						○
	SPKN1203EDT31L	12.7	12.7	3.18	1	1.4							○			○						○
	SPKR1203EDR-GM	12.7	12.7	3.18	1	1.4							★			★						●
	SPKR1203EDL-GM	12.7	12.7	3.18	1	1.4							★			★						●
	SPMR1203EDSR-M	12.7	12.7	3.18	-	1.3	●	★	●													
	SPMR1203EDSL-M	12.7	12.7	3.18	-	1.3	●	★	●													
	SPKN1504EDER	15.875	15.875	4.76	1	1.4							○									
	SPKN1504EDEL	15.875	15.875	4.76	1	1.4							○									
	SPKN1504EDFR	15.875	15.875	4.76	1	1.4						○	○									○
	SPKN1504EDFL	15.875	15.875	4.76	1	1.4						○	○									○
	SPKN1504EDSKR	15.875	15.875	4.76	1	1.4										○						
	SPKN1504EDSKL	15.875	15.875	4.76	1	1.4										○						
	SPKN1504EDTKR	15.875	15.875	4.76	1	1.4							★			○						●
	SPKN1504EDTKL	15.875	15.875	4.76	1	1.4							○			○						●
	SPKN1504EDS32R	15.875	15.875	4.76	1	1.4										○						
	SPKN1504EDS32L	15.875	15.875	4.76	1	1.4										○						
	SPKN1504EDT32R	15.875	15.875	4.76	1	1.4							★			○						●
	SPKN1504EDT32L	15.875	15.875	4.76	1	1.4							○			○						●

Ordering guide: **SPKN1203EDT3 1 R** chamfering angle 20° , chamfering width 0.15mm. For other edge shapes, see inserts code key standard.

Selection of inserts



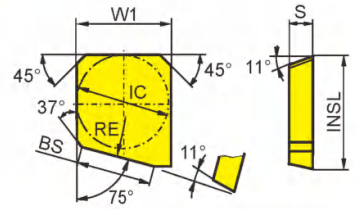
Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😐 😐 — — — 😐 😐 😊 ☹ — — 😊 😊 — —
M	Stainless steel	😐 😐 — — — 😐 😐 😐 ☹ — — 😊 😊 — —
K	Cast iron	— — 😐 😐 ☹ 😊 — — — — — — — — ☹
N	Non-ferrous metal	— — — — — — — — — — — — — — 😐 ☹
S	Heat resistant alloy, Ti alloy	— — — — — 😊 😐 😐 😐 — 😐 ☹ — — — —

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BCH	BS	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SPKR1504EDR-GM	15.875	15.875	4.76	1	1.4							★			★						●
	SPKR1504EDL-GM	15.875	15.875	4.76	1	1.4							★			★						●
	SPMR1504ESR-M	15.875	15.875	4.76	-	1.2	●	★	●													
	SPMR1504ESL-M	15.875	15.875	4.76	-	1.2	●	★	●													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😐 😐 — — — 😐 😐 😊 ☹ — — 😊 😊 — —
M	Stainless steel	😐 😐 — — — 😐 😐 😐 ☹ — — 😊 😊 — —
K	Cast iron	— — 😐 😐 ☹ 😊 — — — — — — — — ☹
N	Non-ferrous metal	— — — — — — — — — — — — — — 😐 ☹
S	Heat resistant alloy, Ti alloy	— — — — — 😊 😐 😐 😐 — 😐 ☹ — — — —

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	IC	W1	S	BS	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
inserts with wiper 	SPEX1203EDL-1	15	12.7	12.7	3.18	10	500																●
	SPEX1203EDR-1	15	12.7	12.7	3.18	10	500																●
	SPEX1504EDL-1	18.2	15.875	15.875	4.76	10	500																●
	SPEX1504EDR-1	18.2	15.875	15.875	4.76	10	500																●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Cutting edge treatment selection for FME03 milling inserts

Treatment of cutting edge	Recommended selection
SP□□EDER/L	Honing edge is suitable for semi-finish and finish machining of steel and stainless steel.
SP□□EDFR/L	Sharp cutting edge is suitable for finish machining of cast iron materials.
SP□□EDSKR/L **SP□□EDS□□R/L**	After chamfering and honing, the edge has strong anti-breakage capability, suitable for rough machining of steel parts under poor working conditions.
SP□□EDTKR/L **SP□□EDT□□R/L**	The Chamfered edge is suitable for semi-finishing and finishing machining of steel, stainless steel and cast iron materials.
SP□□EDR/L-GM	3D chipbreaker can reduce cutting force, reinforce the capability of chip control, and improve insert life. It is widely applied in semi-finish machining of steel, stainless steel and cast iron materials.

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(mm/z)
P	Low-carbon steel, Soft steel	≤180	YBG202	270(200-360)	0.2 (0.1-0.4)
			YBG302	230 (170-350)	0.24 (0.1-0.3)
			YBM253 YBC302	270(220-350)	0.2 (0.1-0.4)
			YBM253	220 (180-300)	0.25 (0.15-0.3)
	High-carbon steel, Alloy steel	180-280	YBG202	240 (180-350)	0.2 (0.1-0.3)
			YBG302	220 (150-330)	0.24 (0.1-0.3)
			YBM253 YBC302	240 (200-320)	0.2 (0.1-0.4)
			YBM253	200 (160-280)	0.25 (0.15-0.3)
	Alloy tool steel	280-350	YBG202	220 (170-340)	0.2 (0.1-0.3)
			YBG302	190 (130-300)	0.24 (0.1-0.3)
			YBM253 YBC302	220 (180-300)	0.2 (0.1-0.4)
			YBM253	180 (150-250)	0.25 (0.15-0.3)
M	Stainless steel	≤270	YBG202	160 (110-270)	0.2 (0.1-0.3)
			YBG302	140 (100-250)	0.24 (0.1-0.3)
			YBM253	140 (100-240)	0.25 (0.15-0.3)
K	Cast iron	180-250	YBG105	210 (120-300)	0.12 (0.08-0.3)
			YBG302	160 (120-200)	0.2 (0.1-0.3)
			YD201	100 (80-160)	0.24 (0.15-0.4)



Face milling tools

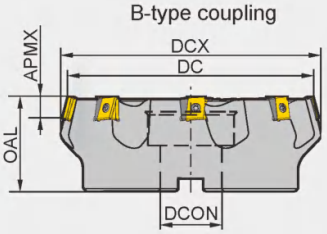
KAPR:75°

Face milling

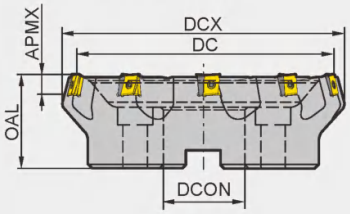
FME04 P M K



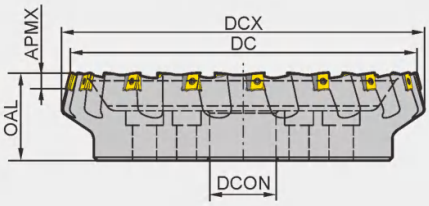
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCX	DCON	OAL	APMX			
FME04	-125-B40-LN15-06	▲	△	125	137	40	63	12	6	B	3.8
	-160-B40-LN15-08	▲	△	160	170	40	63	12	8	B	6.6
	-200-C60-LN15-10	▲	△	200	208	60	70	12	10	C	9.6
	-250-C60-LN15-12	▲	△	250	257	60	70	12	12	C	13.4
	-315-D60-LN15-16	▲	△	315	328	60	80	12	16	D	25.2

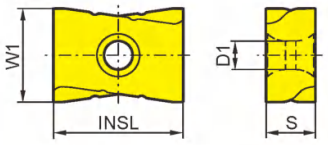
▲Stock available △Make-to-order

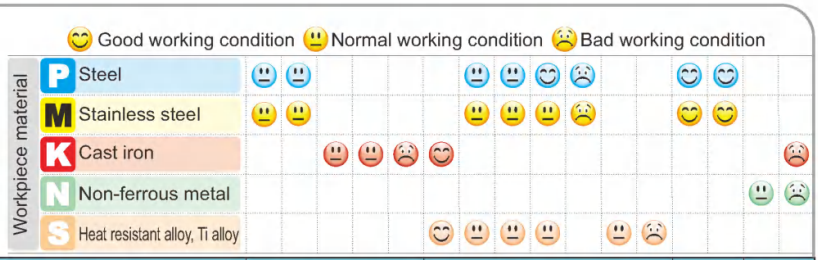
Spare parts

Diameter DC	Shim	Shim screw	Insert screw	Wrench	
					
Ø125-Ø315	LLN15-ZR	I60M3×7	I60M4×12	WT15IS, WT09IS	

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts





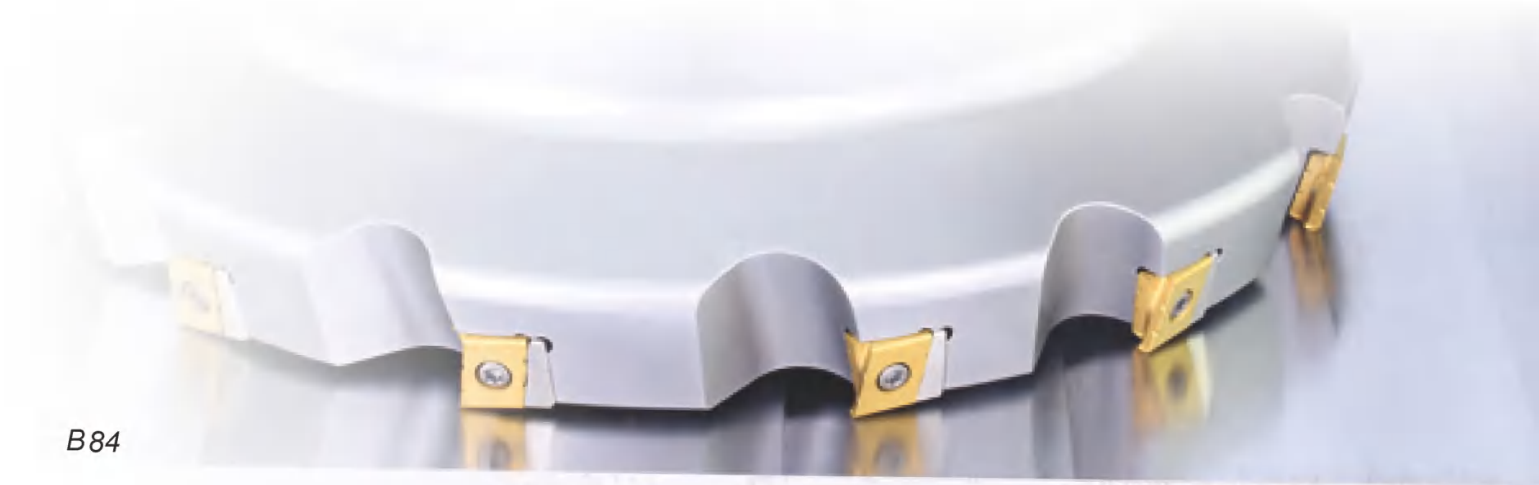
Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INLS	W1	S	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**LNKT1506EN-ZR**	15.875	14	6.35	4.6		○	○							★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V_c(m/min)	f_z(mm/z)
P	Low-carbon steel, Soft steel	≤180	YBG302	180 (150-300)	0.5 (0.2-0.8)
			YBM253	180 (150-300)	0.5 (0.2-0.8)
	High-carbon steel, Alloy steel	180-280	YBG302	150 (120-280)	0.5 (0.2-0.8)
			YBM253	140 (120-280)	0.5 (0.2-0.8)
	Alloy tool steel	280-350	YBG302	120 (80-250)	0.45 (0.2-0.6)
			YBM253	100 (80-250)	0.45 (0.2-0.6)
M	Stainless steel	≤270	YBG302	120 (80-200)	0.45 (0.2-0.6)
			YBM253	100 (80-200)	0.45 (0.2-0.6)
K	Cast iron	180-250	YBD152	220 (150-300)	0.5 (0.2-0.8)
			YBG302	200 (150-300)	0.5 (0.2-0.8)

Note: Cutting parameters can be adjusted according to the Max. power of machine.



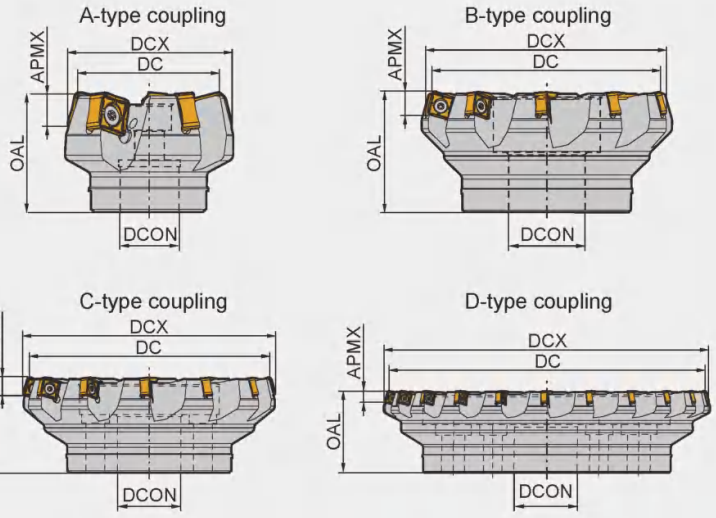
Face milling tools

KAPR:75°

Face milling

FME17 P M K S





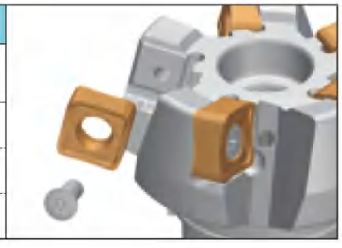
Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCX	OAL	DCON	APMX			
FME17 Coarse pitch	**-050-A22-SN12-04C**	▲	△	50	60	22	40	8.0	4	A	0.361
	-063-A22-SN12-05C	▲	△	63	73	22	40	8.0	5	A	0.520
	-080-A27-SN12-06C	▲	△	80	90	27	50	8.0	6	A	1.101
	-100-A32-SN12-08C	▲	△	100	110	32	50	8.0	8	A	1.663
	-125-B40-SN12-10	▲	△	125	135	40	63	8.0	10	B	3.099
	-160-C40-SN12-12	▲	△	160	170	40	63	8.0	12	C	4.535
	-200-C60-SN12-14	▲	△	200	210	60	63	8.0	14	C	6.450
	-250-C60-SN12-18	▲	△	250	260	60	63	8.0	18	C	12.980
	-315-D60-SN12-22	▲	△	315	325	60	80	8.0	22	D	21.932
	-400-D60-SN12-28	△	△	400	410	60	80	8.0	28	D	41.555
Close pitch	**-050-A22-SN12-05C**	▲	△	50	60	22	40	8.0	5	A	0.337
	-063-A22-SN12-07C	▲	△	63	73	22	40	8.0	7	A	0.530
	-080-A27-SN12-09C	▲	△	80	90	27	50	8.0	9	A	1.112
	-100-A32-SN12-11C	▲	△	100	110	32	50	8.0	11	A	1.577
	-125-B40-SN12-14	▲	△	125	135	40	63	8.0	14	B	3.145
	-160-C40-SN12-18	▲	△	160	170	40	63	8.0	18	C	4.647
	-200-C60-SN12-22	▲	△	200	210	60	63	8.0	22	C	6.552

▲Stock available △Make-to-order

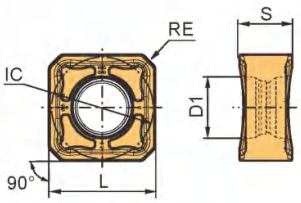
Spare parts

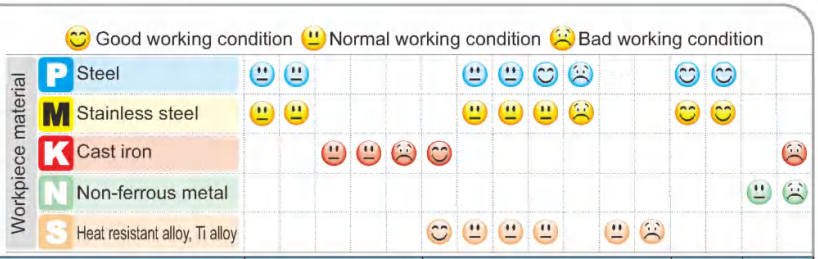
Diameter DC	Insert	Insert screw	Wrench
Ø50-Ø63	SN□X1205□□□-GL/GM/GH/W	IRM4×10	WT15IP
Ø80-Ø125			WT15IS
Ø160-Ø400			WT15IT



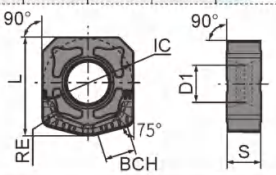
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

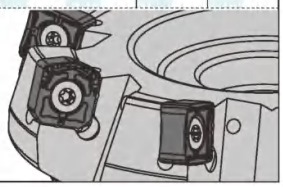
Selection of inserts





Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BCH	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SNGX1205ENN-GL	12.7	12.7	6.5	-	5.9	0.8		●	●						★							
	SNMX120512-GL	12.7	12.7	6.5	-	5.9	1.2		●	●						★							
	SNGX1205ENN-GM	12.7	12.7	6.5	-	5.9	0.8		●	●						★			●				
	SNMX120512-GM	12.7	12.7	6.5	-	5.9	1.2		●	●						★			●				
	SNGX1205ENN-GH	12.7	12.7	6.5	-	5.9	0.8		●	●						★							
	SNMX120512-GH	12.7	12.7	6.5	-	5.9	1.2		●	●						★							
	SNGX1205ENN-W	13.7	12.7	4.8	4.69	5.9	1.2						●										





●Inserts are suitable for both left and right cuts ★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

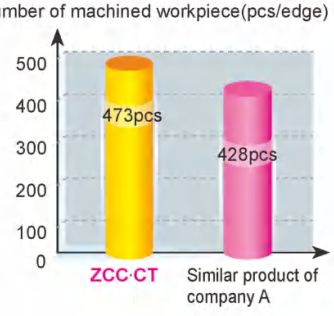
Recommended cutting parameters

ISO	Workpiece material	Hardness HB	Insert grade	Cutting parameters			
				Vc(m/min)	f_z(mm/z)		
					-GL	-GM	-GH
P	Low-carbon steel, Soft steel	⩽180	YBM253 YB9320	270(220-350)	0.15(0.1-0.3)	0.2(0.1-0.4)	0.3(0.2-0.5)
	High-carbon steel, Alloy steel	180-280	YBM253 YB9320	260(220-320)	0.15(0.1-0.3)	0.2(0.1-0.4)	0.3(0.2-0.5)
	Alloy tool steel	280-350	YBM253 YB9320	240(180-300)	0.15(0.1-0.3)	0.2(0.1-0.4)	0.3(0.2-0.5)
M	Stainless steel	⩽270	YBM253 YB9320	160(110-270)	0.1(0.08-0.2)	0.15(0.1-0.3)	0.2(0.1-0.3)
K	Cast iron, Ductile iron, High nickel cast iron	180-250	YBD152	270(150-300)	0.2(0.1-0.3)	0.3(0.1-0.4)	0.4(0.2-0.5)
S	Difficult-to-machine materials	⩽400	YBS303	100(60-120)	--	0.15(0.1-0.25)	--

Case for FME17

Workpiece: Transmission
The material of workpiece: 40Cr(HRC25-40)
Processing part: Upper face
Tool: FME17-125-B40-SN12-10
Insert: SNGX1205ENN-GM/YB9320
Cutting parameter: Vc=255m/min, fz=0.08mm/z, ap=5mm, ae=75mm
Type of cooling: External cooling





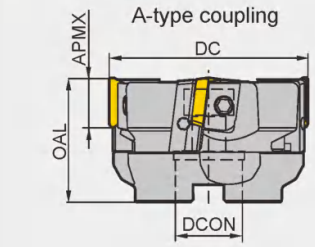
Face milling tools

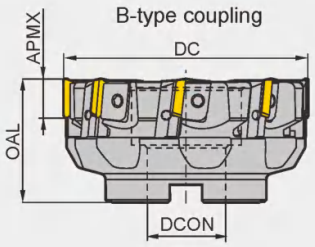
KAPR:90°

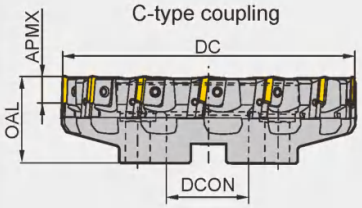
Face milling | Step shoulder milling

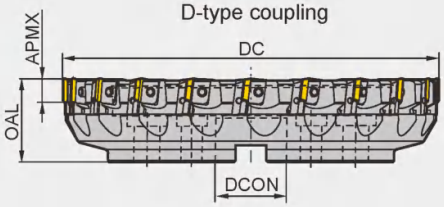
FMP01 P M K











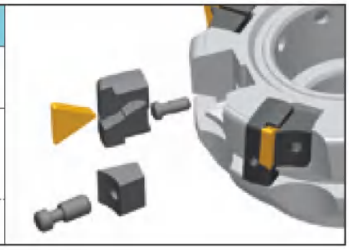
Specification of tools

Type		Stock		Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCX	OAL	APMX			
FMP01	-080-A27-TP22-04	▲	△	80	27	50	18	4	A	1.2
	-100-B32-TP22-06	▲	△	100	32	50	18	6	B	1.7
	-125-B40-TP22-08	▲	△	125	40	63	18	8	B	3.2
	-160-B40-TP22-10	▲	△	160	40	63	18	10	B	5.1
	-200-C60-TP22-12	▲	△	200	60	63	18	12	C	7.4
	-250-C60-TP22-16	▲	△	250	60	63	18	16	C	12.3
	-315-D60-TP22-20	▲	△	315	60	70	18	20	D	21.9

▲Stock available △Make-to-order

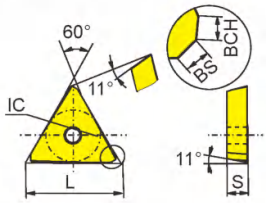
Spare parts

Diameter DC	Locator	Wedge	Wedge Screw	Locator screw	Wrench
Ø80-Ø100	LTP4R1/L1	W04R/L	WM8×17	LOM5×15.1	WT20T WT25T
Ø125-Ø315	LTP4R/L		WM8×22		

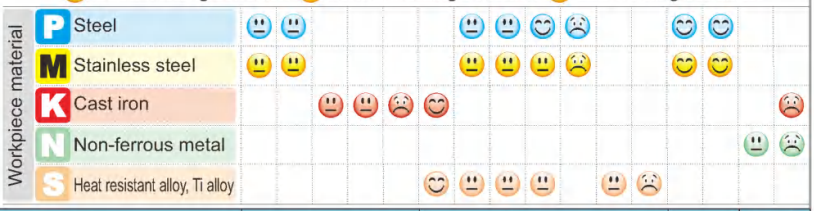


Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



Good working condition Normal working condition Bad working condition



Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BCH	BS	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	TPKN2204PDFR	22	12.7	4.76	1.4	0.7						●										
	TPKN2204PDFL	22	12.7	4.76	1.4	0.7						●										
	TPKN2204PDR	22	12.7	4.76	1.4	0.7	●	●				●	★	●		●						
	TPKN2204PDL	22	12.7	4.76	1.4	0.7	●							●								
	TPKN2204PDTR	22	12.7	4.76	1.4	0.7	●															
	TPKN2204PDTL	22	12.7	4.76	1.4	0.7	●															
	TPMR2204PDSL	22	12.7	4.76	1.4	0.7	○	○														
	TPMR2204PDSR	22	12.7	4.76	1.4	0.7	○	○														

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(mm/z)
P	Low-carbon steel, Soft steel	≤180	YBC302	270 (220-350)	0.2 (0.1-0.4)
			YBM253	220 (180-300)	0.2 (0.08-0.3)
			YBG202	270 (200-360)	0.2 (0.1-0.3)
	High-carbon steel, Alloy steel	180—280	YBC302	240 (200-320)	0.2 (0.1-0.4)
			YBM253	200 (160-280)	0.2 (0.08-0.3)
			YBG202	240 (180-350)	0.2 (0.1-0.3)
	Alloy tool steel	280—350	YBC302	220 (180-300)	0.2 (0.1-0.4)
			YBM253	180 (150-250)	0.2 (0.08-0.3)
			YBG202	220 (170-340)	0.2 (0.1-0.3)
M	Stainless steel	≤270	YBM253	140 (100-240)	0.2 (0.08-0.3)
			YBG202	140 (100-250)	0.2 (0.1-0.3)
K	Cast iron	180—250	YBG105	210 (120-300)	0.2 (0.1-0.3)
			YBG302	160 (120-200)	0.35 (0.10-0.4)
			YD201	100 (80-160)	0.24 (0.15-0.4)

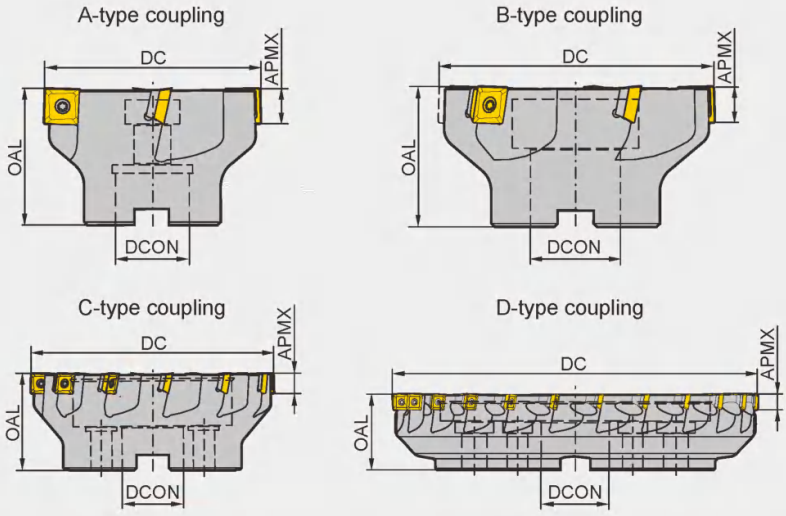
Face milling tools

KAPR:90°



FMP02 P M K





Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	OAL	APMX			
FMP02 Coarse pitch	**-040-A16-SE09-04**	▲	40	16	40	6.7	4	A	0.2
	-050-A22-SE09-05	▲	50	22	40	6.7	5	A	0.3
	-063-A22-SE09-06	▲	63	22	40	6.7	6	A	0.5
	-080-A27-SE09-08	▲	80	27	50	6.7	8	A	0.9
	-100-B32-SE09-08	▲	100	32	50	6.7	8	B	1.7
	-125-B40-SE09-12	▲	125	40	63	6.7	12	B	2.6
	-050-A22-SE12-03	▲	50	22	40	10.8	3	A	0.3
	-063-A22-SE12-04	▲	63	22	40	10.8	4	A	0.4
	-080-A27-SE12-04	▲	80	27	50	10.8	4	A	0.9
	-100-B32-SE12-05	▲	100	32	50	10.8	5	B	1.2
	-125-B40-SE12-06	▲	125	40	63	10.8	6	B	3.1
	-160-C40-SE12-08	▲	160	40	63	10.8	8	C	4.1
	-200-C60-SE12-10	▲	200	60	63	10.8	10	C	5.718
	-250-C60-SE12-12	▲	250	60	63	10.8	12	C	11.1

▲Stock available △Make-to-order

Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	OAL	APMX			
FMP02 Close pitch	**-040-A16-SE09-06**	▲	40	16	40	6.7	6	A	0.22
	-050-A22-SE09-07	▲	50	22	40	6.7	7	A	0.313
	-063-A22-SE09-08	▲	63	22	40	6.7	8	A	0.479
	-080-A27-SE09-10	▲	80	27	50	6.7	10	A	1.079
	-100-B32-SE09-10	▲	100	32	50	6.7	10	B	1.7
	-050-A22-SE12-04	▲	50	22	40	10.8	4	A	0.3
	-063-A22-SE12-05	▲	63	22	40	10.8	5	A	0.4
	-080-A27-SE12-06	▲	80	27	50	10.8	6	A	0.8
	-100-B32-SE12-07	▲	100	32	50	10.8	7	B	1.2
	-125-B40-SE12-08	▲	125	40	63	10.8	8	B	3.0
	-160-C40-SE12-12	▲	160	40	63	10.8	12	C	3.9
Extra close pitch	**-050-A22-SE12-05**	▲	50	22	40	10.8	5	A	0.2
	-063-A22-SE12-06	▲	63	22	40	10.8	6	A	0.4
	-080-A27-SE12-08	▲	80	27	50	10.8	8	A	0.8
	-100-B32-SE12-10	▲	100	32	50	10.8	10	B	1.2
	-125-B40-SE12-12	▲	125	40	63	10.8	12	B	2.9
	-160-C40-SE12-15	▲	160	40	63	10.8	15	C	4.061
	-200-C60-SE12-16	▲	200	60	63	10.8	16	C	6.1
	-250-C60-SE12-18	▲	250	60	63	10.8	18	C	10.9
	-315-D60-SE12-24	▲	315	60	63	10.8	24	D	21.6

▲Stock available △Make-to-order

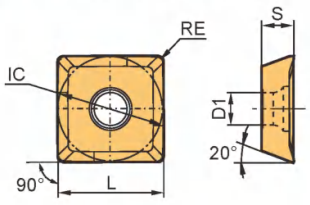
Spare parts

Diameter DC	Inserts	Shim	Insert screw	Shim screw	Wrench	Wrench
Ø50-Ø125	SE09	--	I60M3×7	--	WT09IS	--
Ø50	SE12	--	I60M3.5×10	--	WT15IS	--
Ø63-Ø315		S12BSX	I60M3.5×12	SM5×7×A		WH35L



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SEET09T308PER-APF	9.525	9.525	4.01	3.3	0.8			★				●		★							
	SEET120308PER-APF	13.308	13.308	4.04	4.1	0.8			★				●		★							
	SEET09T308PER-APM	9.525	9.525	4.01	3.3	0.8			★				●		★							
	SEET120308PER-APM	13.308	13.308	4.04	4.1	0.8			★				●		★							
	SEET09T308PER-APR	9.525	9.525	4.01	3.3	0.8			★				●		★							
	SEET120308PER-APR	13.308	13.308	4.04	4.1	0.8			★				●		★							
	SEET120308-LH	13.3	13.3	4.05	4.1	0.8															★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker selection for FMP02 milling inserts

Function / Classification	For finishing	For semi-finishing	For roughing
P	-APF 	-APM 	-APR 
M			
K			
N	Non-ferrous metals		
	-LH 		

Features of FMP02 Milling Tool Series



- Inserts designed with new geometries and coated grades for optimized high efficiency machining in different working conditions.
- Unique geometric design resulting in true 90° square shoulder cutting.



- Upgraded insert structure, greatly improves tool life.
- Large positive rake angle resulting in easier cutting with less tool pressure.



- Screw down clamping resulting in better chip evacuation.

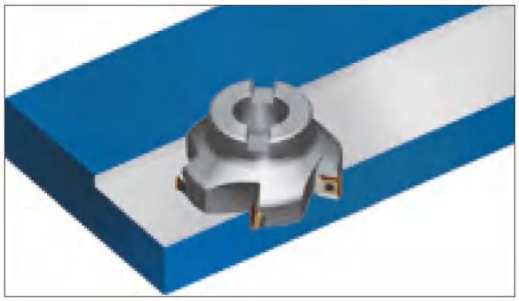
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				V(m/min)	f(mm/z)		
					-APF	-APM	-APR
P	Cutting parameters	≤180	YBG202	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YB9320	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
	High-carbon steel, Alloy steel	180-280	YBM253	240 (200-320)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG202	240 (180-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YB9320	240 (180-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
	Alloy tool steel	280-350	YBM253	220 (180-300)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG202	220 (170-340)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YB9320	220 (170-340)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
M	Stainless steel	≤270	YBM253	150 (120-240)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG202	160 (110-270)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YB9320	160 (110-270)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
K	Cast iron	180-250	YBG202	160 (120-200)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBD152	270 (150-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)

Case for FMP02

Workpiece material: 45#
Hardness: 175-190（HB）
Cooling: Air cooling
Tool: FMP02-100-B32-SE12-10
Insert: SEET120308PER-APM（YB9320）
Data:
Data 1: Vc=200m/min, fz=0.15mm/z, Ap=7mm, Ae=5mm
Data 2: Vc=200m/min, fz=0.25mm/z, Ap=7mm, Ae=5mm





SEET120308PER-APM inserts tests

Chipbreaker	Data 1: Vc=200m/min, fz=0.15mm/z Ap=7mm, Ae=5mm		Data 2: Vc=200m/min, fz=0.25mm/z Ap=7mm, Ae=5mm	
	Runout value	Surface machined	Runout value	Surface machined
-APM	0.006		0.006	
Products of company A	0.012		0.012	
Products of company B	0.013		0.015	



-APM



Product of company B

Results:
Comparing with competitors, SEET120308PER-APM inserts can get better surface quality and longer tool life.

Face milling tools

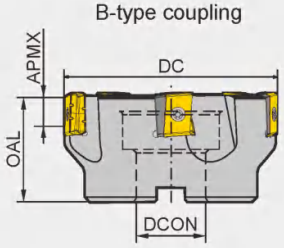
KAPR:90°

Face milling | Step shoulder milling

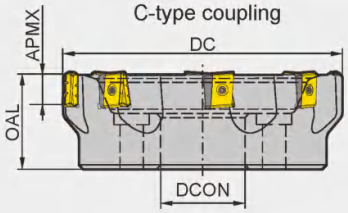
FMP03 P M K



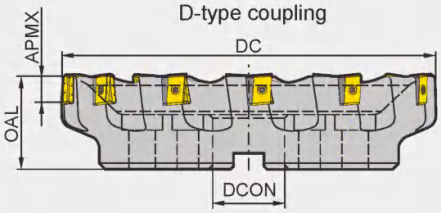
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCON	OAL	APMX			
FMP03	-125-B40-LN15-06	▲	△	125	40	63	13	6	B	3.2
	-160-C40-LN15-08	▲	△	160	40	63	13	8	C	5.1
	-200-C60-LN15-10	▲	△	200	60	70	13	10	C	7.5
	-250-C60-LN15-12	▲	△	250	60	70	13	12	C	12.2
	-315-D60-LN15-16	▲	△	315	60	80	13	16	D	23.7
	-125-B40-LN20-06	▲	△	125	40	63	17	6	B	3.3
	-160-C40-LN20-08	▲	△	160	40	63	17	8	C	5.3
	-200-C60-LN20-10	▲	△	200	60	70	17	10	C	8.8
	-250-C60-LN20-12	▲	△	250	60	70	17	12	C	14.0
	-315-D60-LN20-15	▲	△	315	60	80	17	15	D	23.9
	-125-B40-LN25-05	▲	△	125	40	63	22	5	B	3.3
	-160-C40-LN25-06	▲	△	160	40	63	22	6	C	5.1
	-200-C60-LN25-08	▲	△	200	60	70	22	8	C	8.9
	-250-C60-LN25-10	▲	△	250	60	70	22	10	C	12.0
	-315-D60-LN25-12	▲	△	315	60	80	22	12	D	21.9

▲Stock available △Make-to-order

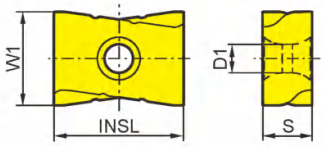
Spare parts

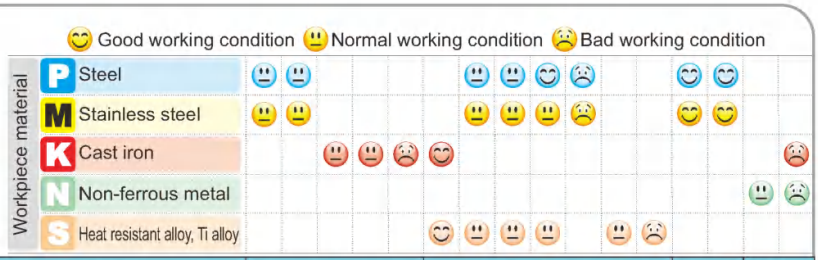
Insert	Shim	Shim screw	Insert screw	Wrench	
					
LNKT1506EN-ZR	LLN15-ZR	I60M3×7	I60M4×12	WT15IS	WT09IS
LNKT2007DN-ZR	LLN20R-ZR	I60M3×7	I60M4×15	WT15IS	WT09IS
LNKT2510-ZR	LLN25R-ZR	I60M3.5×10.4	I60M5×17	WT20IT	WT15IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts





Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	LNKT1506EN-ZR	15.875	14	6.35	4.6		○	○							★						
	LNKT2007DN-ZR	20	17	7.94	4.6		○	○							★						
	LNKT2510-ZR	25	18	9.525	5.5					○					★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(mm/z)
P	Low-carbon steel, Soft steel	≤180	YBG302	180 (150-300)	0.5 (0.2-0.8)
			YBM253	180 (150-300)	0.5 (0.2-0.8)
	High-carbon steel, Alloy steel	180-280	YBG302	150 (120-280)	0.5 (0.2-0.8)
			YBM253	140 (120-280)	0.5 (0.2-0.8)
	Alloy tool steel	280-350	YBG302	120 (80-250)	0.45 (0.2-0.6)
			YBM253	100 (80-250)	0.45 (0.2-0.6)
M	Stainless steel	≤270	YBG302	120 (80-200)	0.45 (0.2-0.6)
			YBM253	100 (80-200)	0.45 (0.2-0.6)
K	Cast iron	180-250	YBD152	220 (150-300)	0.5 (0.2-0.8)
			YBD252	210 (150-300)	0.5 (0.2-0.8)
			YBG302	200 (150-300)	0.5 (0.2-0.8)

Note: Cutting parameters can be adjusted according to the Max. power of machine.

Case for FMP03



Tool type: FMP03-200-C60-LN25-08

Insert type/grade: LNKT2510-ZR/YBG302

The tool operates easily and fast at high cutting depth with good chip breaking performance. Cutting efficiency is doubled, and tool life increases to 1-2 times that of the original.

Workpiece material: 45#
Hardness(HB): 190
Cooling system: Dry cutting
Cutting parameters: Vc=130m/min, a_p=12mm, f_z=0.5mm/z
a_e=140mm



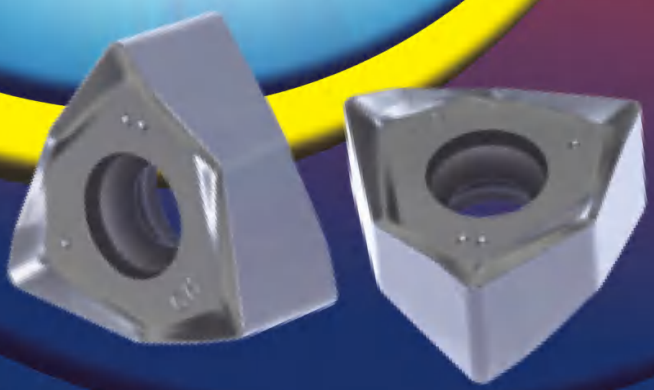
FMP12

Milling Tool Series

KAPR:90°



- Double negative angle of the cutter, combined with unique insert structure, to achieve double positive tool angle, which is beneficial to reducing cutting force;
- 6-flute cutting double-sided slot milling inserts, enabling high-quality 90° square shoulder milling, face milling and slot milling;
- Insert with wiper enables large feed and better surface finish.



Application case

Tool specification: FMP12-080-A27-WN08-05C

Insert specification/grade: WNHU080608PNR-GM/YBD152

Part Name: Turbine Housing

Workpiece material: QT450

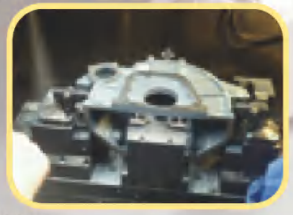
Hardness: HB230-280

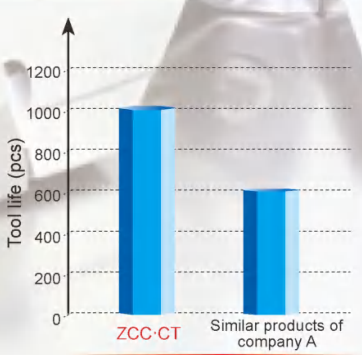
Cooling: Dry cutting

Machine: Vertical machining center

Cutting data: Vc=260m/min, ap=1.0mm, z=0.1mm/z, ae=30mm

Milling style: Down milling Area of machining: End surface





Comparison of tool life

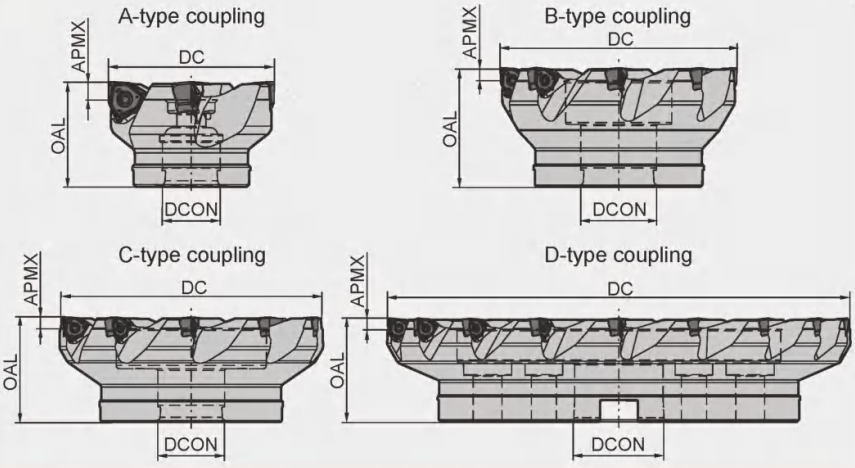
Face milling tools

KAPR:90°



FMP12 P K N





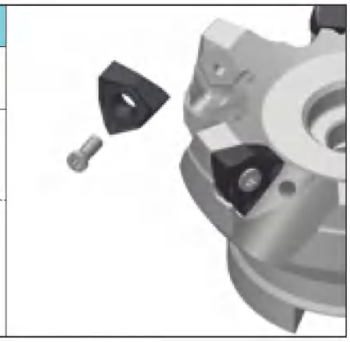
Specification of tools

Type		Stock		Basic dimensions(mm)				Number of teeth Z	Type of coupling
		R	L	DC	DCON	OAL	APMX		
FMP12	-050-A22-WN06-05C	▲	△	50	22	40	5.7	5	A
	-063-A22-WN06-06C	▲	△	63	22	40	5.7	6	A
	-080-A27-WN06-07C	▲	△	80	27	50	5.7	7	A
	-100-B32-WN06-09	▲	△	100	32	50	5.7	9	B
	-125-B40-WN06-11	▲	△	125	40	63	5.7	11	B
	-160-C40-WN06-14	▲	△	160	40	63	5.7	14	C
	-063-A22-WN08-04C	▲	△	63	22	40	7.7	4	A
	-080-A27-WN08-05C	▲	△	80	27	50	7.7	5	A
	-100-B32-WN08-06	▲	△	100	32	50	7.7	6	B
	-125-B40-WN08-08	▲	△	125	40	63	7.7	8	B
	-160-C40-WN08-10	▲	△	160	40	63	7.7	10	C
	-200-C60-WN08-12	▲	△	200	60	63	7.7	12	C
	-250-C60-WN08-14	▲	△	250	60	63	7.7	14	C
	-315-D60-WN08-18	▲	△	315	60	70	7.7	18	D

▲Stock available △Make-to-order

Spare parts

Diameter DC	Insert	Insert screw	Wrench
			
Ø50 -Ø63	WN□U06	I60M3×9	WT09IS
Ø80 -Ø160			
Ø63	WN□U08	I60M4×10	WT15IS
Ø80 -Ø125			
Ø160 -Ø315			



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

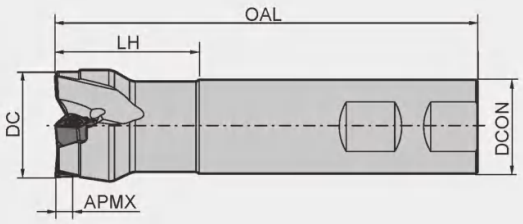
Face milling tools

KAPR:90°



FMP12 P K N





Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling
			DC	DCON	OAL	LH	APMX		
FMP12	-025-XP25-WN06-02C	▲	25	25	100	30	5.7	2	XP
	-032-XP25-WN06-03C	▲	32	25	120	40	5.7	3	XP
	-040-XP32-WN06-04C	▲	40	32	140	40	5.7	4	XP
	-050-XP40-WN06-05C	▲	50	40	169	40	5.7	5	XP

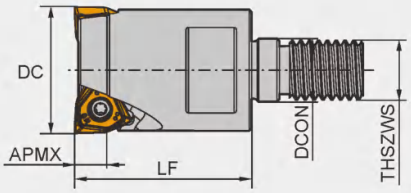
▲Stock available △Make-to-order



QCH-*WN*M*Series

P M K N S





Specification of tools

Type		Stock	Basic dimensions(mm)					Applicable inserts	Number of teeth Z	Weight (kg)
			DC	DCON	LF	APMX	THSZWS			
QCH	-25-WN06-M12-02	▲	25	12.5	35	5.7	12	WN□U0604□□PN□-□□	2	0.12
	-32-WN06-M16-03	▲	32	17	45	5.7	16		3	0.23
	-40-WN06-M16-04	▲	40	17	45	5.7	16		4	0.26

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Insert screw	Wrench
Ø25-Ø50	WN□U06	I60M3×9	WT09IP

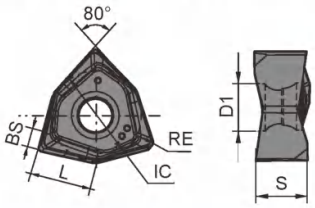


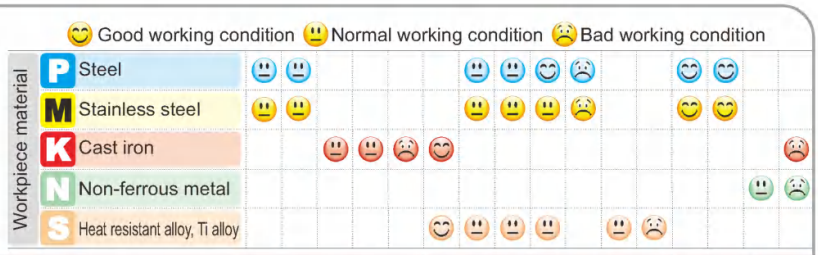
Diameter DC	Insert	Insert screw	Wrench
Ø25-Ø40	WN□U06	I60M3×9	WT09IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts





Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	BS	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	WNHU060404PNR-GM	5.7	9.525	4.0	3.5	1.35	0.4		★	★					★	★							
	WNHU060408PNR-GM	5.7	9.525	4.0	3.5	1.35	0.8		★	★					★	★							
	WNHU080608PNR-GM	7.7	12.7	5.4	4.4	1.6	0.8		★	★					★	★							
	WNHU080612PNR-GM	7.7	12.7	5.4	4.4	1.6	1.2		★	★					★	★							
	WNHU080616PNR-GM	7.7	12.7	5.4	4.4	1.6	1.6		★	★					★	★							
	WNMU060408PNN-GM	5.7	9.525	4.0	3.5	1.35	0.8		★	★					★	★							
	WNMU080608PNN-GM	7.7	12.7	5.4	4.4	1.6	0.8		★	★					★	★							
	WNHU080608PNR-LH	7.7	12.7	5.4	4.4	1.6	0.8															★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters		
				V(m/min)	f(mm/z)	ap_{max}(mm)
P	Low-carbon steel, Soft steel	≤180	YBM253 YBG205 YB9320	280(220-360)	0.2 (0.1-0.4)	5.7(WN06) 7.7(WN08)
P	High-carbon steel, Alloy steel	180-280	YBM253 YBG205 YB9320	260 (200-340)	0.2 (0.1-0.4)	
P	Alloy tool steel	280-350	YBM253 YBG205 YB9320	240 (180-320)	0.2(0.1-0.4)	
M	Stainless steel	≤270	YBM253 YBG205 YB9320	160 (110-220)	0.15(0.1-0.3)	
K	Cast iron	180-250	YBD152	280 (150-320)	0.2(0.1-0.4)	
N	Aluminium alloy	--	YD101	300-	0.25(0.1-0.4)	

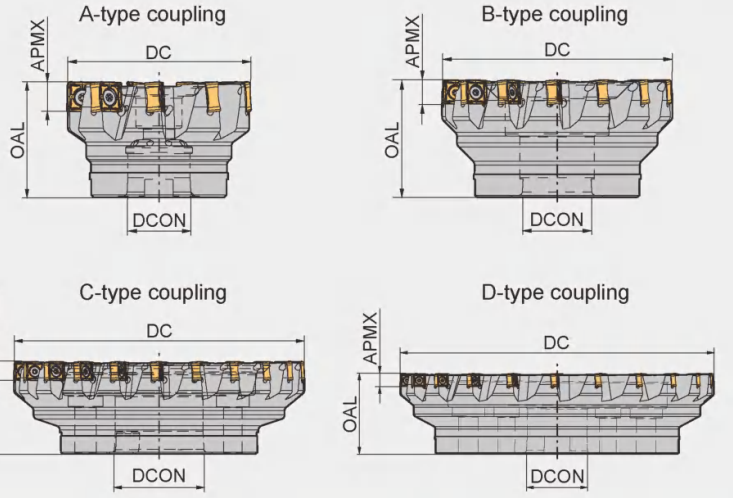
Face milling tools

KAPR:88°



FMP17 P M K S





Specification of tools

Type		Stock		Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCON	OAL	APMX			
FMP17 Coarse pitch	**-050-A22-SN12-04C**	▲	△	50	22	40	10.5	4	A	0.296
	-063-A22-SN12-05C	▲	△	63	22	40	10.5	5	A	0.462
	-080-A27-SN12-07C	▲	△	80	27	50	10.5	7	A	1.000
	-100-A32-SN12-08	▲	△	100	32	50	10.5	8	A	1.577
	-125-B40-SN12-10	▲	△	125	40	63	10.5	10	B	3.043
	-160-C40-SN12-12	▲	△	160	40	63	10.5	12	C	4.344
	-200-C60-SN12-14	▲	△	200	60	63	10.5	14	C	6.552
	-250-C60-SN12-18	▲	△	250	60	63	10.5	18	C	13.025
	-315-D60-SN12-22	▲	△	315	60	80	10.5	22	D	21.935
	-400-D60-SN12-28	▲	△	400	60	80	10.5	28	D	41.661

▲Stock available △Make-to-order

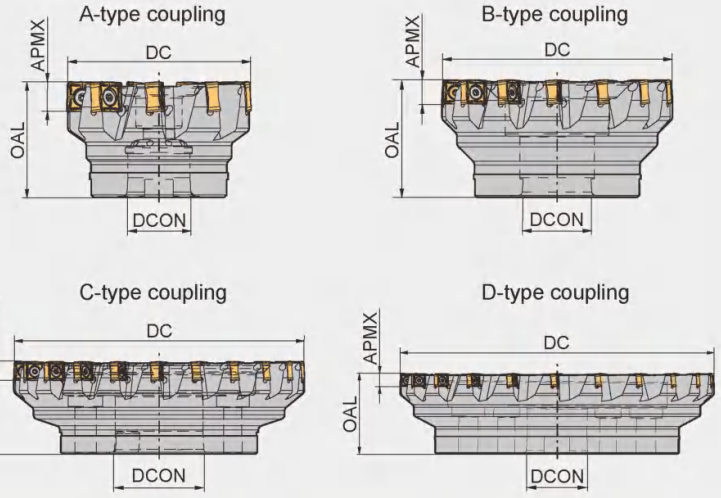
Face milling tools

KAPR:88°



FMP17 P M K S





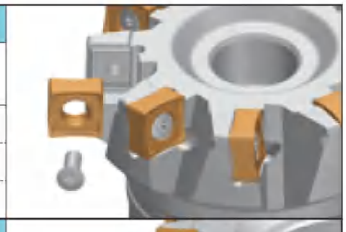
Specification of tools

Type		Stock		Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCON	OAL	APMX			
FMP17 Close pitch	**-050-A22-SN12-05C**	▲	△	50	22	40	10.5	5	A	0.288
	-063-A22-SN12-07C	▲	△	63	22	40	10.5	7	A	0.466
	-080-A27-SN12-09C	▲	△	80	27	50	10.5	9	A	1.020
	-100-A32-SN12-11C	▲	△	100	32	50	10.5	11	A	1.592
	-125-B40-SN12-14	▲	△	125	40	63	10.5	14	B	3.033
	-160-C40-SN12-18	▲	△	160	40	63	10.5	18	C	4.431
	-200-C60-SN12-22	▲	△	200	60	63	10.5	22	C	6.711
Finishing cutterhead	**-125-B40-SN12-14W2**	▲		125	40	63	10.5	12+2	B	2.996
	-160-C40-SN12-18W3	▲		160	40	63	10.5	15+3	C	4.667
	-200-C60-SN12-24W4	▲		200	60	63	10.5	20+4	C	8.949

▲Stock available △Make-to-order

Spare parts

Diameter DC	Insert	Insert screw	Wrench
			
Ø50-Ø63	SNGX□□PNN-GH/GL/GM SNMX□□□-GH/GL/GM	IRM4×10	WT15IP
Ø80-Ø125			WT15IS
Ø160-Ø400			WT15IT

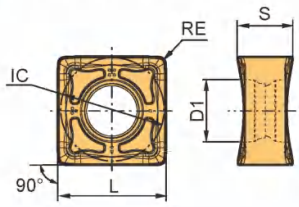


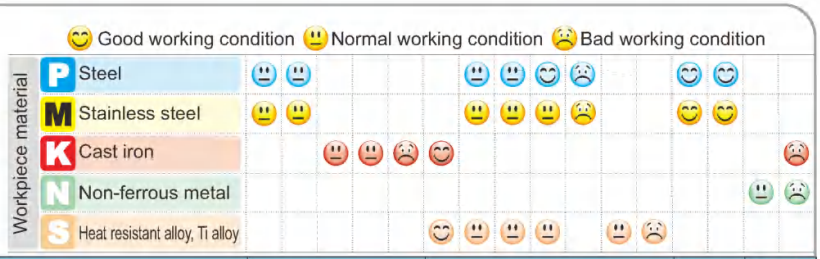
Finishing cutterhead diameter DC	Insert	Insert screw	Wedge screw	Adjustment block	Wrench
					
Ø125-Ø200	SNG□□XPNN-GH/GL/GM SNMX□□□-GH/GL/GM SNCU120420-W4	IRM4×10	DM6×20A	ADJ-M6×1.0A	WT15IT

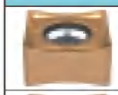


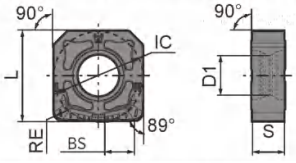
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

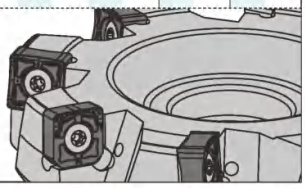
Selection of inserts





Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BS	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SNGX1205PNN-GL	12.7	12.7	6.5	-	5.9	0.8		●	●						○	★						
	SNMX120512-GL	12.7	12.7	6.5	-	5.9	1.2		●	●						○	★						
	SNGX1205PNN-GM	12.7	12.7	6.5	-	5.9	0.8		●	●						○	★		●				
	SNMX120512-GM	12.7	12.7	6.5	-	5.9	1.2		●	●						○	★		●				
	SNGX1205PNN-GH	12.7	12.7	6.5	-	5.9	0.8		●	●						○	★						
	SNMX120512-GH	12.7	12.7	6.5	-	5.9	1.2		●	●						○	★						
	SNCU120420-W4	12.7	12.7	4.8	-	5.9	2.0						●										
	SNGX1205PNN-W	12.86	12.7	4.8	4.26	5.9	1.2									●							





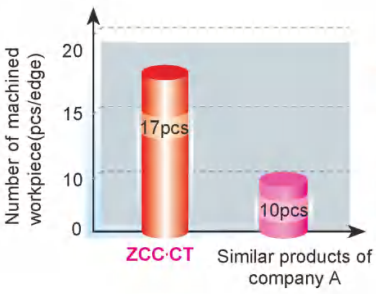
- Inserts can be mounted left or right. ★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order
- The W4 wiper inserts for adjustable tool holders.
- The W wiper inserts can be mounted directly on the cutting teeth.

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				Vc(m/min)	f_z(mm/z)		
					-GL	-GM	-GH
P	Low-carbon steel, Soft steel	≤180	YBM253 YB9320	270(220-350)	0.15(0.1-0.3)	0.2(0.1-0.4)	0.3(0.2-0.5)
	High-carbon steel, Alloy steel	180-280	YBM253 YB9320	260(220-320)	0.15(0.1-0.3)	0.2(0.1-0.4)	0.3(0.2-0.5)
	Alloy tool steel	280-350	YBM253 YB9320	240(180-300)	0.15(0.1-0.3)	0.2(0.1-0.4)	0.3(0.2-0.5)
M	Stainless steel	≤270	YBM253 YB9320	160(110-270)	0.1(0.08-0.2)	0.15(0.1-0.3)	0.2(0.1-0.3)
K	Cast iron, Ductile iron, High nickel cast iron	180-250	YBD152	270(150-300)	0.2(0.1-0.3)	0.3(0.1-0.4)	0.4(0.2-0.5)
S	hard-to-cut material	≤400	YBS203 YBS303	100(60-120)	--	0.15(0.1-0.25)	--

Case for FMP17

Workpiece: Truck axle housing
Workpiece material: QT600(HB250)
Tool type: FMP17-100-A32-SN12-08C
Insert: SNGX1205PNN-GM/YB9320
Cutting parameters: Vc=267m/min, fz=0.18mm/z, ap=1.5mm, ae=90mm
Cooling: External coolant



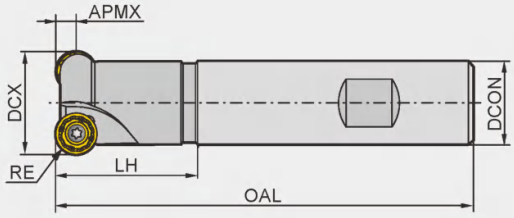




Face milling tools

FMR01 P M K S



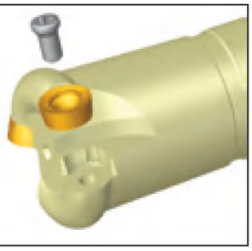


Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
			DCX	DCON	OAL	LH	RE	APMX		
FMR01	**-020-XP20-RC10-02**	▲	20	20	100	30	5	5	2	0.1
	-025-XP20-RC10-02	▲	25	20	100	30	5	5	2	0.2
	-032-XP25-RC10-03	▲	32	25	120	35	5	5	3	0.5
	-025-XP20-RC12-02	▲	25	20	100	30	6	6	2	0.2
	-032-XP25-RC12-03	▲	32	25	120	35	6	6	3	0.4
	-040-XP32-RC12-03	▲	40	32	120	40	6	6	3	0.7
	-040-XP32-RC12-04	▲	40	32	120	40	6	6	4	0.6

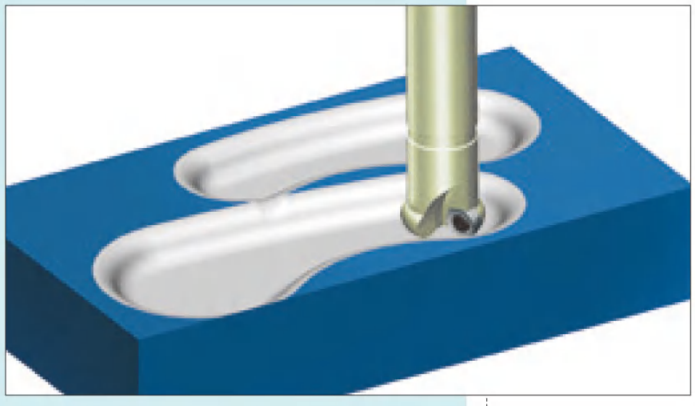
▲Stock available △Make-to-order

Spare parts

Diameter DCX	Inserts	Insert screw	Wrench	
				
Ø20 -Ø32	RC□□10T3MO-DM	I60M4×8.4	WT15IP	
Ø25 -Ø40	RC□□1204MO-□□	I60M3.5×10	WT15IP	

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Case for FMR01





Workpiece material: 42CrMo (HRC35)
Cooling system: Dry cutting
Machine: Vertical machining center
Cutting parameters:
Vc=200m/min
a_p=3mm
f_z=0.2mm/z

Tool type: FMR01-025-XP20-RC10-02

Insert type/grade: RCKT10T3MO-DM/YBG202

●Comparison of insert abrasion

ZCC·CT



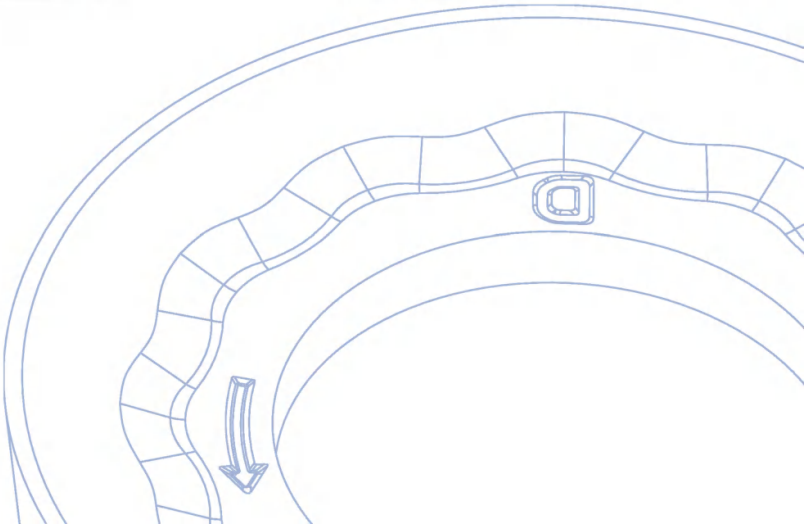
22minutes later

Similar overseas products



22minutes later



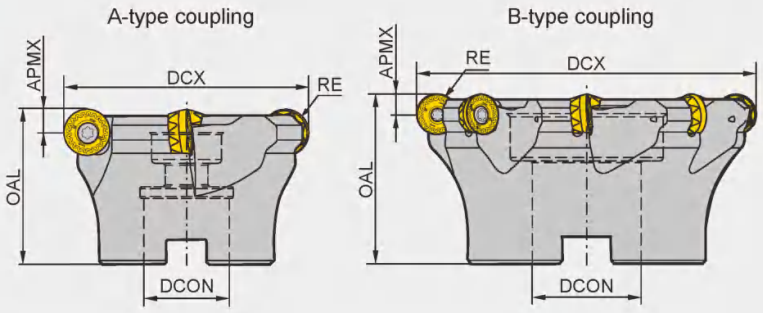




Face milling tools

FMR02 P M K H S





Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			DCX	DCON	OAL	RE	APMX			
FMR02 Coarse pitch	**-050-A22-RC12-03**	▲	50	22	40	6	6	3	A	0.29
	-063-A22-RC12-04	▲	63	27	50	6	6	4	A	0.41
	-080-B27-RC12-05	▲	80	27	50	6	6	5	B	0.81
	-100-B32-RC12-06	▲	100	32	50	6	6	6	B	1.25
	-063-A22-RC16-04	▲	63	22	40	8	8	4	A	0.35
	-080-B27-RC16-05	▲	80	27	50	8	8	5	B	0.74
	-100-B32-RC16-06	▲	100	32	50	8	8	6	B	1.18
	-125-B40-RC16-07	▲	125	40	63	8	8	7	B	2.49
	-080-A27-RC20-04	▲	80	27	50	10	10	4	A	0.77
	-100-B32-RC20-05	▲	100	32	50	10	10	5	B	1.07
	-125-B40-RC20-06	▲	125	40	63	10	10	6	B	2.42
	-160-B40-RC20-06	▲	160	40	63	10	10	6	B	4.17
Close pitch	**-050-A22-RC12-05**	▲	50	22	40	6	6	5	A	0.27
	-063-A22-RC12-06	▲	63	27	50	6	6	6	A	0.38
	-080-B27-RC12-07	▲	80	27	50	6	6	7	B	0.79
	-100-B32-RC12-08	▲	100	32	50	6	6	8	B	1.23
	-063-A22-RC16-05	▲	63	22	40	8	8	5	A	0.34
	-080-B27-RC16-07	▲	80	27	50	8	8	7	B	0.72
	-100-B32-RC16-08	▲	100	32	50	8	8	8	B	1.17
	-125-B40-RC16-09	▲	125	40	63	8	8	9	B	2.47
	-080-A27-RC20-05	▲	80	27	50	10	10	5	A	0.74
	-100-B32-RC20-06	▲	100	32	50	10	10	6	B	1.07
	-125-B40-RC20-07	▲	125	40	63	10	10	7	B	2.39
	-160-B40-RC20-08	▲	160	40	63	10	10	8	B	4.06

▲Stock available △Make-to-order

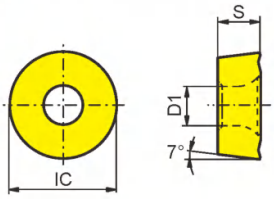
Spare parts

Diameter DCX	Inserts	Insert screw	Wrench	
				
Ø50 -Ø100	RC□□1204MO-□□	I60M3.5×10	WT15IS	--
Ø63 -Ø125	RC□□1606MO-□□	I60M5×13	--	WT20IT
Ø125 -Ø160	RC□□2006MO-□□	I43M6×16	--	WT25IT



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



Good working condition 😊 Normal working condition 😐 Bad working condition

Workpiece material		P Steel	M Stainless steel	K Cast iron	N Non-ferrous metal	S Heat resistant alloy, Ti alloy
YBC302		😐	😐			
YBM253		😐	😐			
YBD152				😐		
YBD203				😐		
YBD252				☹		
YBG105				😊		😊
YBG202		😐	😐	😐		😐
YBG205		😐	😐	😐		😐
YB9320		😊	😐			😐
YBG302		☹	☹			
YBS203						😐
YBS303						☹
YNG151	Cermet	😊	😊			
YNG151C	Cermet	😊	😊			
YD101	Cemented carbide				😐	
YD201	Cemented carbide			☹	☹	

Insert shape	Type	Basic dimensions(mm) IC	S	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	RCKT10T3MO-DM	10.0	3.97	4.4							●	★								
	RCKT1204MO-DM	12.0	4.76	4.0			○				●	★		●						
	RCKT1606MO-DM	16.0	6.35	5.56										●						
	RCKT1204MO-DR	12.0	4.76	4.0							●	★								
	RCKT1606MO-DR	16.0	6.35	5.56					○		●	★								
	RCKT2006MO-DR	20.0	6.35	6.55					○		○	★		●						
	RCKT1204MO-ER	12.0	4.76	4.0		★														
	RCKT1606MO-ER	16.0	6.35	5.56		★														
	RCKT2006MO-ER	20.0	6.35	6.55		★														
	RCKT1204MO-NM	12.0	4.76	4.0		○							○	○		○				
	RCKT1606MO-NM	16.0	6.35	5.56		○							○	○		○				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

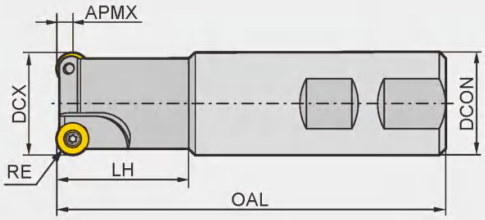
Workpiece material		Hardness HB	Insert grade	Cutting parameters					
				V(m/min)	f(mm/z)				
					-DM	-DR	-ER	-PCBN	-NM
P	Low-carbon steel, Soft steel	≤HB180	YBM253 YBC302	270 (220-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)			
			YBM253 YBG302	220 (180-300)	0.25(0.1-0.5)	0.3 (0.2-0.8)			0.25 (0.1-0.5)
			YBG202 YBG205 YB9320	270 (200-360)	0.2(0.1-0.5)	0.3 (0.2-0.8)			0.2 (0.1-0.5)
	High-carbon steel, Alloy steel	HB180-280	YBM253 YBC302	240 (200-320)	0.2(0.1-0.5)	0.3 (0.2-0.8)			
			YBM253 YBG302	200 (160-280)	0.25(0.1-0.5)	0.3 (0.2-0.8)			0.25 (0.1-0.5)
			YBG202 YBG205 YB9320	240 (180-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)			0.2 (0.1-0.5)
	Alloy tool steel	HB280-350	YBM253 YBC302	220 (180-300)	0.2(0.1-0.4)	0.3 (0.2-0.6)			
			YBM253 YBG302	180 (150-250)	0.2(0.1-0.5)	0.3 (0.2-0.8)			0.2 (0.1-0.5)
			YBG202 YBG205 YB9320	220 (170-340)	0.2(0.1-0.4)	0.3 (0.2-0.6)			0.2 (0.1-0.4)
M	Stainless steel	≤HB270	YBM253	150 (100-220)	0.2(0.1-0.4)	0.3 (0.2-0.6)	0.3(0.2-0.6)		0.2 (0.1-0.4)
			YBG202 YBG205 YB9320	160 (110-270)	0.2(0.1-0.4)	0.3 (0.2-0.6)			0.2 (0.1-0.4)
K	Cast iron	HB180-250	YBG302	210 (120-300)	0.2(0.1-0.5)	0.3 (0.2-0.8)			0.2 (0.1-0.5)
			YCB011	800 (500-1200)				0.2(0.1-0.5)	
			YBD152	240 (180-300)	0.2(0.1-0.3)				
			YBD252	220 (180-300)		0.2 (0.1-0.3)			
H	Hardened steel	≥HRC45	YCB012	150 (100-500)				0.15(0.1-0.5)	
S	Difficult-to-machine materials	≤400	YBS203 YBS303	100 (60-120)					0.15 (0.1-0.3)

Face milling tools



FMR03 P M K S





Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
			DCX	DCON	OAL	LH	RE	APMX		
FMR03	-016-XP16-RD08-02	▲	16	16	100	25	4	4	2	0.1
	-020-XP20-RD08-02	▲	20	20	100	30	4	4	2	0.2
	-025-XP25-RD08-02	▲	25	25	100	30	4	4	2	0.3
	-025-XP25-RD08-03	▲	25	25	100	30	4	4	3	0.2
	-020-XP20-RD10-02	▲	20	20	100	30	5	5	2	0.2
	-025-XP25-RD10-02	▲	25	25	100	30	5	5	2	0.3
	-032-XP32-RD10-02	▲	32	32	120	40	5	5	2	0.7
	-032-XP32-RD10-03	▲	32	32	120	40	5	5	3	0.6
	-025-XP25-RD12-02	▲	25	25	100	30	6	6	2	0.2
	-032-XP32-RD12-02	▲	32	32	120	40	6	6	2	0.6
	-040-XP32-RD12-03	▲	40	32	120	40	6	6	3	0.7
	-040-XP32-RD12-04	▲	40	32	120	40	6	6	4	0.6

▲Stock available △Make-to-order

Spare parts

Diameter DCX	Inserts	Insert screw	Wrench
			
Ø16-Ø25	RDKW0803MO	I60M3×7	WT09IP
Ø32-Ø50	RDKW10T3MO	I60M4×10	WT15IP
	RDKW10T3MO-NM		
	RDKW1204MO		



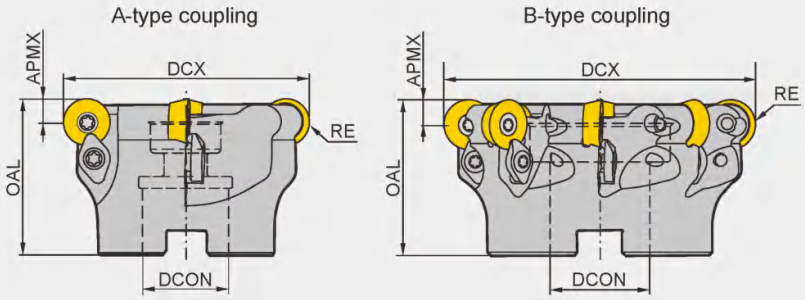
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Face milling tools



FMR04 P M K





Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			DCX	DCON	OAL	RE	APMX			
FMR04 Coarse pitch	**-050-A22-RD12-03**	▲	50	22	40	6	6	3	A	0.25
	-063-A22-RD12-04	▲	63	22	40	6	6	4	A	0.37
	-080-B27-RD12-05	▲	80	27	50	6	6	5	B	0.77
	-063-A22-RD16-04	△	63	22	40	8	8	4	A	0.32
	-080-B27-RD16-05	△	80	27	50	8	8	5	B	0.67
	-100-B32-RD16-06	▲	100	32	50	8	8	6	B	1.18
	-125-B40-RD16-08	△	125	40	63	8	8	8	B	2.55
	-125-B40-RD20-06	▲	125	40	63	10	10	6	B	2.33
	-160-B40-RD20-07	▲	160	40	63	10	10	7	B	3.83
Close pitch	**-050-A22-RD12-05**	△	50	22	40	6	6	5	A	0.23
	-063-A22-RD12-06	△	63	22	40	6	6	6	A	0.48
	-080-B27-RD12-07	△	80	27	50	6	6	7	B	0.78
	-063-A22-RD16-05	△	63	22	40	8	8	5	A	0.3
	-080-B27-RD16-07	△	80	27	50	8	8	7	B	0.66
	-100-B32-RD16-08	△	100	32	50	8	8	8	B	1.18
	-125-B40-RD16-10	△	125	40	63	8	8	10	B	2.51
	-125-B40-RD20-08	△	125	40	63	10	10	8	B	2.45
	-160-B40-RD20-10	△	160	40	63	10	10	10	B	3.98

▲Stock available △Make-to-order

Spare parts

Diameter DCX	Inserts	Insert screw	Clamp	Clamp screw	Wrench	
Ø50-Ø80	RDKW1204MO	I60M3.5×10	WD-204	I60M4×10	WT15IP	--
Ø63 -Ø125	RDKW1605MO	I60M5×13	WD-207	I60M5×13	--	WT20IT
Ø125 -Ø160	RDKW2006MO	I43M6×16	--	--	--	WT25IT



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

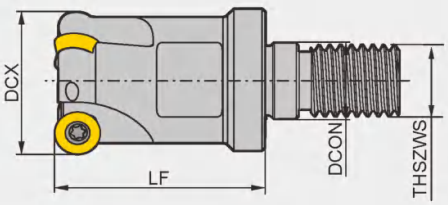
Face milling tools



QCH-*RD*M*Series

P M K





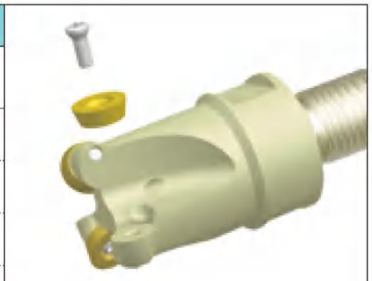
Specification of tools

Type		Stock	Basic dimensions(mm)				Applicable inserts	Number of teeth Z	Weight (kg)
			DCX	DCON	LF	THSZWS			
QCH	-16-RD07-M8-02	△	16	8.5	25	8	RDKW0702MO	2	0.027
	-16-RD07-M8-03	△	16	8.5	25	8		3	0.030
	-20-RD07-M10-03	△	20	10.5	30	10		3	0.058
	-22-RD07-M10-03	△	22	10.5	30	10		3	0.060
	-25-RD07-M12-03	△	25	12.5	35	12		3	0.093
	-20-RD10-M10-02	△	20	10.5	30	10	RDKW10T3MO	2	0.054
	-22-RD10-M10-02	△	22	10.5	35	10		2	0.065
	-25-RD10-M12-02	△	25	12.5	35	12		2	0.097
	-32-RD10-M16-03	△	32	17	45	16		3	0.183
	-32-RD10-M16-04	△	32	17	45	16		4	0.210
	-25-RD12-M12-02	△	25	12.5	35	12	RDKW1204MO	2	0.086
	-32-RD12-M16-03	△	32	17	45	16		3	0.193
	-40-RD12-M16-04	△	40	17	45	16		4	0.218
	-32-RD16-M16-02	△	32	17	45	16	RDKW1605MO	2	0.156
	-40-RD16-M16-03	△	40	17	45	16		3	0.220

▲Stock available △Make-to-order

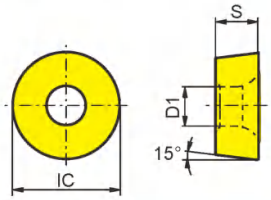
Spare parts

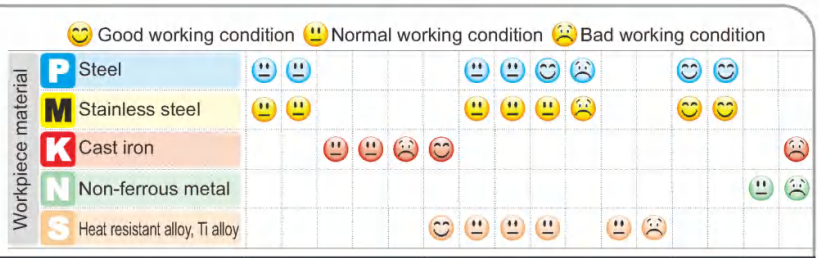
Diameter DCX	Insert	Screw	Wrench	
				
Ø16-Ø25	RDKW07□□	I60M2.5×6.5T	WT08IP	--
Ø20-Ø32	RDKW10□□	I60M4×8	WT15IP	--
Ø25-Ø40	RDKW12□□	I60M4×10	WT15IP	--
Ø32-Ø40	RDKW16□□	I60M5×13	--	WT20IT



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts





Insert shape	Type	Basic dimensions(mm)			CVD Coating					PVD Coating						Cermet		Cemented carbide	
		IC	S	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**RDKW0803MO**	8	3.18	3.4							●	★		○						
	RDKW10T3MO	10	3.97	4.4							●	★								
	RDKW1204MO	12.0	4.76	4.4							●	★								
	RDKW1605MO	16.0	5.56	5.5							○	★		○						
	RDKW2006MO	20.0	6.35	6.5								○								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

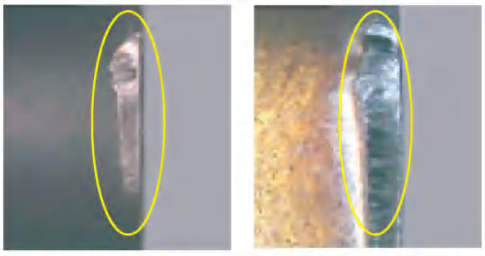
Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(mm/z)
P	Low-carbon steel, Soft steel	≤180	YBM253 YBC302	270 (220-350)	0.2 (0.08-0.45)
			YBM253 YBG302	220 (180-300)	0.25 (0.15-0.45)
			YBG202 YBG205	270 (200-360)	0.2 (0.1-0.45)
	High-carbon steel, Alloy steel	180-280	YBM253 YBC302	240 (200-320)	0.2 (0.08-0.45)
			YBM253 YBG302	200 (160-280)	0.25 (0.15-0.45)
			YBG202 YBG205	240 (180-350)	0.2 (0.1-0.45)
	Alloy tool steel	280-350	YBM253 YBC302	220 (180-300)	0.2 (0.08-0.45)
			YBM253 YBG302	180 (150-250)	0.25 (0.15-0.45)
			YBG202 YBG205	220 (170-340)	0.2 (0.1-0.45)
M	Stainless steel	≤270	YBG205	150 (120-240)	0.2 (0.08-0.45)
			YBM253 YBG302	150 (120-240)	0.2 (0.08-0.45)
			YBM253	150 (100-220)	0.25 (0.1-0.45)
			YBG202 YBG205	160 (110-270)	0.2 (0.1-0.45)
K	Cast iron	180-250	YBG302	210 (120-300)	0.2 (0.1-0.45)
S	Difficult-to-machine materials	≤400	YBS203 YBS303	100 (60-120)	0.15 (0.1-0.3)

Case for FMR04

Workpiece material: 42CrMo (HRC35)
Cooling system: Dry cutting
Machine: Vertical machining center
Tool type: FMR04-063-A22-RD12-04
Insert type/grade: RDKW1204MO/YBG202
Cutting parameters: V_c=200m/min, a_p=3mm, f_z=0.3mm/z



Abrasion comparison after 90 minutes cavity milling



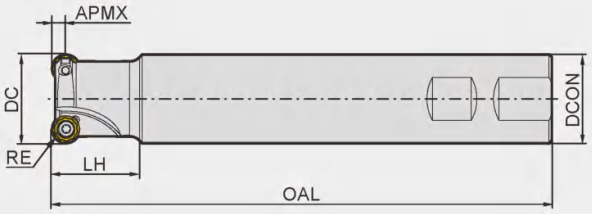
ZCC·CT Similar overseas products

Face milling tools



FMR11 P M K S



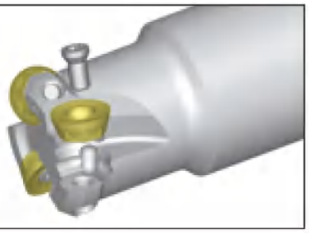


Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			DC	DCON	OAL	LH	APMX		
FMR11	-020-XP20-RD10-02C(30,160)	▲	20	20	160	30	5	2	0.345
	-025-XP25-RD10-03C(30,180)	▲	25	25	180	30	5	3	0.575
	-032-XP32-RD10-03C(30,180)	▲	32	32	180	30	5	3	0.982
	-040-XP32-RD10-04C(30,200)	▲	40	32	200	30	5	4	1.200
	-025-XP25-RD12-02C(30,180)	▲	25	25	180	30	6	2	0.565
	-032-XP32-RD12-03C(30,180)	▲	32	32	180	30	6	3	0.970
	-040-XP32-RD12-04C(30,200)	▲	40	32	200	30	6	4	1.150
	-020-XP20-RP10-02C(30,160)	▲	20	20	160	30	5	2	0.335
	-025-XP25-RP10-03C(30,180)	▲	25	25	180	30	5	3	0.586
	-032-XP32-RP10-03C(30,180)	▲	32	32	180	30	5	3	0.982
	-040-XP32-RP10-04C(30,200)	▲	40	32	200	30	5	4	1.175
	-025-XP25-RP12-02C(30,180)	▲	25	25	180	30	6	2	0.577
	-032-XP32-RP12-02C(30,180)	▲	32	32	180	30	6	2	0.980
	-032-XP32-RP12-03C(30,180)	▲	32	32	180	30	6	3	0.980
	-040-XP32-RP12-04C(30,200)	▲	40	32	200	30	6	4	1.162

▲Stock available △Make-to-order

Spare parts

Diameter DC	Insert	Insert screw	Wrench	
				
Ø20-Ø40	RO□□10□□-H/M/MM	I60M3.5×8	WT15IP	
	RO□□12□□-H/M/MM			

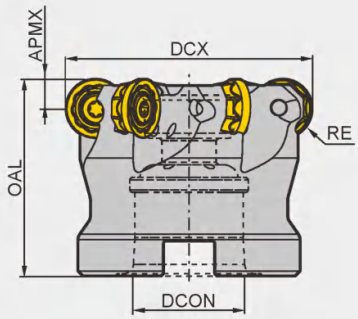
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276



Face milling tools

FMR11 P M K S





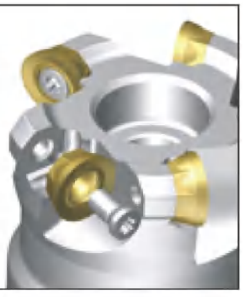
Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Weight (kg)
			DCX	DCON	OAL	APMX		
FMR11	-040-A16-RD10-06C	▲	40	16	40	5	6	0.188
	-050-A22-RD10-07C	▲	50	22	40	5	7	0.300
	-063-A22-RD10-08C	▲	63	22	40	5	8	0.500
	-040-A16-RD12-05C	▲	40	16	40	6	5	0.180
	-050-A22-RD12-05C	▲	50	22	40	6	5	0.260
	-050-A22-RD12-06C	▲	50	22	40	6	6	0.270
	-063-A22-RD12-07C	▲	63	22	40	6	7	0.410
	-080-A27-RD12-08C	▲	80	27	50	6	8	1.000
	-040-A16-RP10-06C	▲	40	16	40	5	6	0.190
	-050-A22-RP10-07C	▲	50	22	40	5	7	0.290
	-063-A22-RP10-08C	▲	63	22	40	5	8	0.480
	-040-A16-RP12-05C	▲	40	16	40	6	5	0.160
	-050-A22-RP12-06C	▲	50	22	40	6	6	0.270
	-063-A22-RP12-07C	▲	63	22	40	6	7	0.450
	-080-A27-RP12-08C	▲	80	27	50	6	8	1.000

▲Stock available △Make-to-order

Spare parts

Diameter DC	Insert	Insert screw	Wrench
			
Ø40-Ø63	R□□□10□□-H/M/MM	I60M3.5×8	WT15IP
	R□□□12□□-H/M/MM		
Ø80	R□□□12□□-H/M/MM	I60M4×8.4	WT15IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

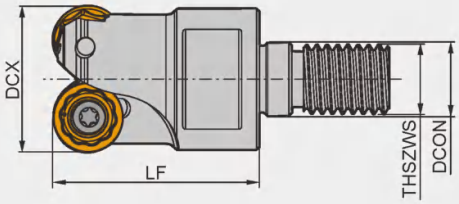


Face milling tools

QCH-*M*(FMR11)Series

P M K





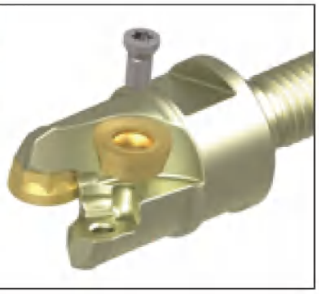
Specification of tools

Type		Stock	Basic dimensions(mm)				Applicable inserts	Number of teeth Z	Weight (kg)
			DCX	DCON	LF	THSZWS			
QCH	-25-RD10-M12-03(FMR11)	△	25	12.5	35	12	RD□□10T3MO-□□	2	0.027
	-32-RD10-M16-03(FMR11)	△	32	17	45	16		3	0.030
	-42-RD10-M16-05(FMR11)	△	42	17	45	16		3	0.058
	-25-RD12-M12-02(FMR11)	△	25	12.5	35	12	RD□□1204MO-□□	3	0.060
	-32-RD12-M16-05(FMR11)	△	32	17	45	16		3	0.093
	-42-RD12-M16-05(FMR11)	△	42	17	45	16		2	0.054
	-25-RP10-M12-03(FMR11)	△	25	12.5	40	12	RD□□1204MO-□□	2	0.065
	-32-RP10-M16-03(FMR11)	△	32	17	45	16		2	0.097
	-42-RP10-M16-05(FMR11)	△	42	17	45	16		3	0.183
	-25-RP12-M12-02(FMR11)	△	25	12.5	40	12	RP□□1204MO-□□	4	0.210
	-32-RP12-M16-03(FMR11)	△	32	17	45	16		2	0.156
	-42-RP12-M16-05(FMR11)	△	42	17	45	16		3	0.220

▲Stock available △Make-to-order

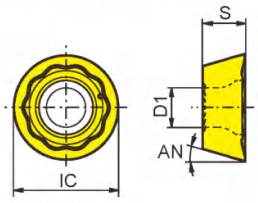
Spare parts

Diameter DCX	Insert	Insert screw	Wrench
			
Ø25-Ø42	RD□□10T3	I60M3.5×8	WT15IP
Ø25-Ø42	RD□□1204	I60M4×8.4	WT15IP
Ø25-Ø42	RP□□10T3	I60M3.5×8	WT15IP
Ø25-Ø42	RP□□1204	I60M4×8.4	WT15IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating							Cermet		Cemented carbide	
		IC	S	D1	AN	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	RPMW10T3MO-H	10.0	3.97	4.1	11°								●								
	RPMW1204MO-H	12.0	4.76	4.4	11°								●								
	RDMW10T3MO-H	10.0	3.97	4.1	15°								●								
	RDMW1204MO-H	12.0	4.76	4.4	15°								●								
	RPMT10T3MO-M	10.0	3.97	4.1	11°								●			●	●				
	RPMT1204MO-M	12.0	4.76	4.4	11°								●			●	●				
	RDMT10T3MO-M	10.0	3.97	4.1	15°								●			●	●				
	RDMT1204MO-M	12.0	4.76	4.4	15°								●			●	●				
	RPMT10T3MO-MM	10.0	3.97	4.1	11°								●			●	●				
	RPMT1204MO-MM	12.0	4.76	4.4	11°								●			●	●				
	RDMT10T3MO-MM	10.0	3.97	4.1	15°								●			●	●				
	RDMT1204MO-MM	12.0	4.76	4.4	15°								●			●	●				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(mm/z)
P	Low-carbon steel, Soft steel	≤180	YBG205	270(200-360)	0.2(0.1-0.4)
	High-carbon steel, Alloy steel	180-280	YBG205	240(180-350)	0.2(0.1-0.4)
	Alloy tool steel	280-350	YBG205	220(170-340)	0.2(0.1-0.4)
M	Stainless steel	≤270	YBG205	160(110-270)	0.2(0.1-0.4)
S	Difficult-to-machine materials	≤400	YBS203 YBS303	100(60-120)	0.15(0.1-0.3)

Square shoulder milling tools

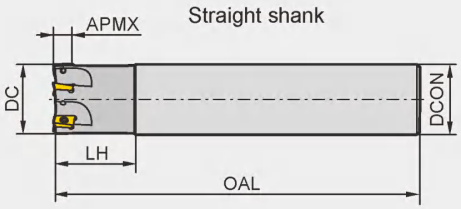
KAPR:90°



EMP01 P M K S N



Straight shank



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			DC	DCON	OAL	LH	APMX		
EMP01 Straight shank	**-010-G10-AP07-02C(25/85)**	▲	10	10	85	25	6.0	2	0.043
	-010-G10-AP07-02C(25/120)	▲	10	10	120	25	6.0	2	0.063
	-012-G12-AP07-02C(25/85)	▲	12	12	85	25	6.0	2	0.061
	-012-G12-AP07-02C(25/120)	▲	12	12	120	25	6.0	2	0.089
	-014-G16-AP07-03C(25/85)	▲	14	16	85	25	6.0	3	0.104
	-014-G16-AP07-03C(25/120)	▲	14	16	120	25	6.0	3	0.153
	-016-G16-AP07-03C(25/85)	▲	16	16	85	25	6.0	3	0.112
	-016-G16-AP07-03C(25/120)	▲	16	16	120	25	6.0	3	0.162
	-012-G16-AP11-01	▲	12	16	85	25	10.5	1	0.1
	-016-G16-AP11-02	▲	16	16	90	25	10.5	2	0.1
	-016-G16-AP11-02C(25/85)	▲	16	16	85	25	10.5	2	0.108
	-016-G16-AP11-02C(25/120)	▲	16	16	120	25	10.5	2	0.16
	-016-G16-AP11-02C(25/180)	▲	16	16	180	25	10.5	2	0.248
	-020-G16-AP11-03C(25/85)	▲	20	16	85	25	10.5	3	0.121
	-020-G20-AP11-02	▲	20	20	100	30	10.5	2	0.2
	-020-G20-AP11-02C(30/100)	▲	20	20	100	30	10.5	2	0.18
	-020-G20-AP11-02C(30/150)	▲	20	20	150	30	10.5	2	0.312
	-020-G20-AP11-02C(30/200)	▲	20	20	200	30	10.5	2	0.401
	-020-G20-AP11-03C(30/100)	▲	20	20	100	30	10.5	3	0.2
	-020-G20-AP11-03C(30/150)	▲	20	20	150	30	10.5	3	0.357
	-020-G20-AP11-03C(30/200)	▲	20	20	200	30	10.5	3	0.424
	-025-G25-AP11-03	▲	25	25	115	35	10.5	3	0.4
	-025-G25-AP11-03C(35/115)	▲	25	25	115	35	10.5	3	0.357
	-025-G25-AP11-03C(35/170)	▲	25	25	170	35	10.5	3	0.577
	-025-G25-AP11-03C(35/220)	▲	25	25	220	35	10.5	3	0.758
	-025-G25-AP11-04C(35/115)	▲	25	25	115	35	10.5	4	0.376
	-025-G25-AP11-04C(35/170)	▲	25	25	170	35	10.5	4	0.575
	-025-G25-AP11-04C(35/220)	▲	25	25	220	35	10.5	4	0.686

▲Stock available △Make-to-order

EMP01-010-G10-AP07-02C(25/85)

Effective cutting depth/Overall length

Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			DC	DCON	OAL	LH	APMX		
EMP01 Straight shank	**-030-G25-AP11-04C(35/115)**	▲	30	25	115	35	10.5	4	0.411
	-030-G25-AP11-04C(35/170)	▲	30	25	170	35	10.5	4	0.61
	-030-G25-AP11-04C(35/220)	▲	30	25	220	35	10.5	4	0.791
	-032-G32-AP11-04	▲	32	32	125	40	10.5	4	0.7
	-032-G32-AP11-04C(45/125)	▲	32	32	125	45	10.5	4	0.673
	-032-G32-AP11-04C(45/190)	▲	32	32	190	45	10.5	4	1.057
	-032-G32-AP11-04C(45/260)	▲	32	32	260	45	10.5	4	1.47
	-032-G32-AP11-05C(45/125)	▲	32	32	125	45	10.5	5	0.71
	-032-G32-AP11-05C(45/190)	▲	32	32	190	45	10.5	5	1.054
	-032-G32-AP11-05C(45/260)	▲	32	32	260	45	10.5	5	1.53
	-025-G25-AP16-02	▲	25	25	115	35	15.5	2	0.4
	-025-G25-AP16-02C(35/115)	▲	25	25	115	35	15.5	2	0.374
	-025-G25-AP16-02C(35/170)	▲	25	25	170	35	15.5	2	0.496
	-025-G25-AP16-02C(35/220)	▲	25	25	220	35	15.5	2	0.658
	-030-G25-AP16-02C(35/115)	▲	30	25	115	35	15.5	2	0.521
	-030-G25-AP16-02C(35/170)	▲	30	25	170	35	15.5	2	0.632
	-030-G25-AP16-02C(35/220)	▲	30	25	220	35	15.5	2	0.78
	-032-G32-AP16-03	▲	32	32	125	40	15.5	3	0.7
	-032-G32-AP16-03C(45/125)	▲	32	32	125	45	15.5	3	0.607
	-032-G32-AP16-03C(45/190)	▲	32	32	190	45	15.5	3	0.976
	-032-G32-AP16-03C(45/260)	▲	32	32	260	45	15.5	3	1.374
	-040-G32-AP16-04	▲	40	32	130	42	15.5	4	0.8
	-040-G32-AP16-04C(45/125)	▲	40	32	125	45	15.5	4	0.716
	-040-G32-AP16-04C(45/190)	▲	40	32	190	45	15.5	4	1.085
	-040-G32-AP16-04C(45/260)	▲	40	32	260	45	15.5	4	1.483
	-050-G32-AP16-05	▲	50	32	135	45	15.5	5	1.0
	-050-G32-AP16-05C(45/125)	▲	50	32	125	45	15.5	5	0.825
	-050-G32-AP16-05C(45/190)	▲	50	32	190	45	15.5	5	1.195
	-050-G32-AP16-05C(45/260)	▲	50	32	260	45	15.5	5	1.592
	-063-G32-AP16-06	▲	63	32	135	45	15.5	6	1.4

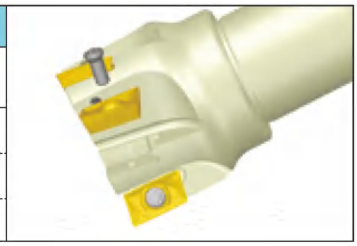
▲Stock available △Make-to-order

EMP01-010-G10-AP07-02C(25/85)

Effective cutting depth/Overall length

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø10-Ø16	APKT07	I60M1.8×4	WT05IP
Ø12-Ø32	APKT11	I60M2.5×6.5T	WT08IP
Ø25-Ø63	APKT16	I60M4×8.4	WT15IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

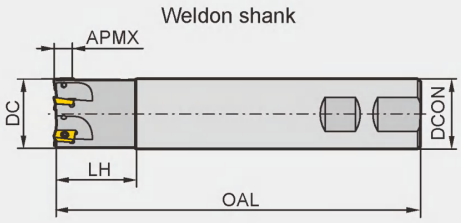
Square shoulder milling tools

KAPR:90°



EMP01 P M K S N





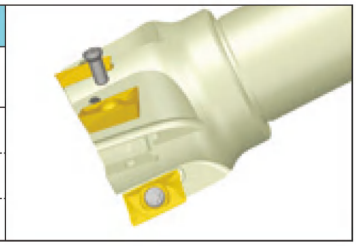
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			DC	DCON	OAL	LH	APMX		
EMP01 Weldon shank	**-012-XP16-AP11-01**	▲	12	16	85	25	10.5	1	0.1
	-016-XP16-AP11-02	▲	16	16	90	25	10.5	2	0.1
	-020-XP20-AP11-02	▲	20	20	100	30	10.5	2	0.2
	-025-XP25-AP11-03	▲	25	25	115	35	10.5	3	0.4
	-032-XP32-AP11-04	▲	32	32	125	40	10.5	4	0.7
	-025-XP25-AP16-02	▲	25	25	115	35	15.5	2	0.4
	-032-XP32-AP16-03	▲	32	32	125	40	15.5	3	0.7
	-040-XP32-AP16-04	▲	40	32	130	42	15.5	4	0.8
	-050-XP32-AP16-05	▲	50	32	135	45	15.5	5	1.0
	-063-XP32-AP16-06	▲	63	32	135	45	15.5	6	1.4

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø12-Ø32	APKT11	I60M2.5×6.5T	WT08IP
Ø25-Ø63	APKT16	I60M4×8.4	WT15IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

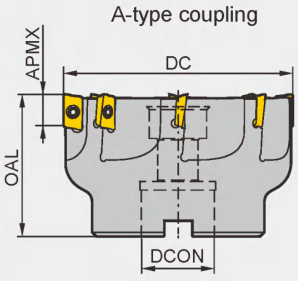
Square shoulder milling tools

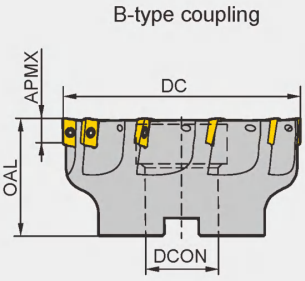
KAPR:90°



EMP02 P M K S N







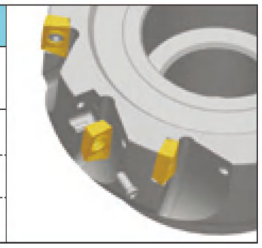
Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	OAL	APMX			
EMP02	-050-A22-AP11-06	▲	50	22	40	10.5	6	A	0.3
	-063-A22-AP11-08	▲	63	22	40	10.5	8	A	0.6
	-080-A27-AP11-08	▲	80	27	50	10.5	8	A	1.2
	-100-B32-AP11-10	▲	100	32	50	10.5	10	B	1.7
	-050-A22-AP16-05	▲	50	22	40	15.5	5	A	0.3
	-063-A22-AP16-06	▲	63	22	40	15.5	6	A	0.5
	-080-A27-AP16-07	▲	80	27	50	15.5	7	A	1.1
	-100-B32-AP16-08	▲	100	32	50	15.5	8	B	1.6
	-125-B40-AP16-10	▲	125	40	63	15.5	10	B	3.2
	-160-B40-AP16-10	▲	160	40	63	15.5	10	B	6.3

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø50-Ø100	AP11	I60M2.5×6.5T	WT08IS
Ø50-Ø160	AP16	I60M4×10	WT15IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

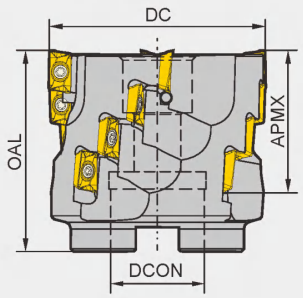
KAPR:90°



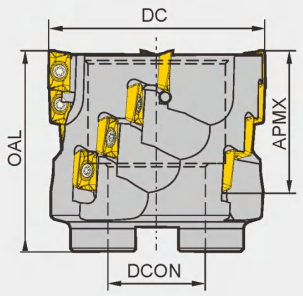
EMP03 P M K S N



A-type coupling



B-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth z	Number of inserts	Type of coupling	Weight (kg)
			DC	DCON	OAL	APMX				
EMP03	-050-A22-AP11-04	▲	50	22	58	39	4	16	A	0.5
	-063-A27-AP11-04	▲	63	27	58	39	4	16	A	0.9
	-080-B32-AP11-05	▲	80	32	63	39	5	20	B	1.3
	-100-B40-AP11-06	▲	100	40	63	39	6	24	B	2.0
	-040x43-A16-AP16-02	△	40	16	63	43	2	6	A	0.4
	-050x43-A22-AP16-03	△	50	22	63	43	3	9	A	0.6
	-063x57-A27-AP16-04	△	63	27	80	57	4	16	A	1.2
	-080x57-A32-AP16-04	△	80	32	80	57	4	16	A	2.1

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø50-Ø63	APKT11	I60M2.5×6.5T	WT08IP
Ø80-Ø100			WT08IS
Ø40-Ø63	APKT16	I60M4×10	WT15IP
Ø80			WT15IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

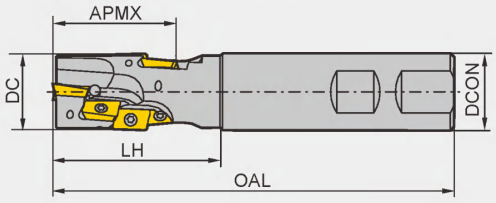
KAPR:90°



EMP04 P M K S N



Weldon shank



Specification of tools

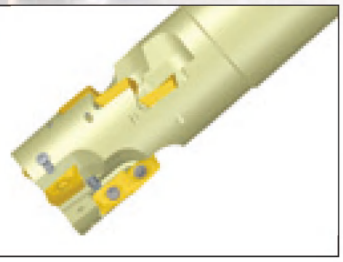
Type		Stock	Basic dimensions(mm)					Number of teeth z	Number of inserts	Weight (kg)
			DC	DCON	OAL	LH	APMX			
EMP04	**-020-XP20-AP11-01**	▲	20	20	120	45	29.4	1	3	0.3
	-025-XP25-AP11-02	▲	25	25	130	55	38.9	2	8	0.4
	-032-XP32-AP11-02	▲	32	32	140	65	48.5	2	10	0.7
	-040-XP40-AP11-02	▲	40	40	150	75	58.0	2	14	1.3
	040x57-XP40-AP16-02	△	40	40	150	75	57	2	8	1.3
	050x57-XP50-AP16-03	△	50	50	160	75	57	3	12	2.1

▲Stock available △Make-to-order



Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø20-Ø40	APKT11	I60M2.5×6.5T	WT08IP
Ø40-Ø50	APKT16	I60M4×10	WT15IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

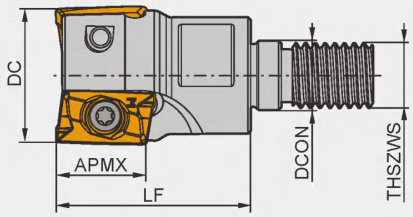
KAPR:90°



QCH-*APKT*M*Series

P M K S N





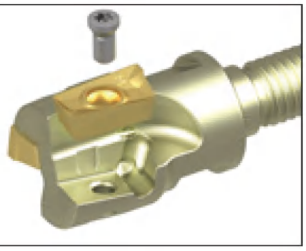
Specification of tools

Type		Stock	Basic dimensions(mm)					Applicable inserts	Number of teeth Z	Weight (kg)
			DC	DCON	LF	APMX	THSZWS			
QCH	-16-APKT07-M8-03	▲	16	8.5	25	6	8	APKT0702□□-□□	3	0.030
	-20-APKT07-M10-04	▲	20	10.5	30	6	10		4	0.060
	-16-APKT11-M8-02	▲	16	8.5	28	10.5	8	APKT11T3□□-□□	2	0.026
	-20-APKT11-M10-03	▲	20	10.5	30	10.5	10		3	0.050
	-22-APKT11-M10-03	▲	22	10.5	35	10.5	10		3	0.065
	-25-APKT11-M12-04	▲	25	12.5	35	10.5	12		4	0.100
	-28-APKT11-M12-04	▲	28	12.5	40	10.5	12		4	0.120
	-32-APKT11-M16-05	▲	32	17	45	10.5	16		5	0.219
	-40-APKT11-M16-06	▲	40	17	42	10.5	16		6	0.270
	-25-APKT16-M12-02	▲	25	12.5	35	15.5	12	APKT1604□□-□□	2	0.081
	-28-APKT16-M12-02	▲	28	12.5	40	15.5	12		2	0.120
	-32-APKT16-M16-02	▲	32	17	45	15.5	16		2	0.210
	-32-APKT16-M16-03	▲	32	17	45	15.5	16		3	0.189
	-40-APKT16-M16-03	▲	40	17	45	15.5	16		3	0.235
	-40-APKT16-M16-04	▲	40	17	45	15.5	16		4	0.225

▲Stock available △Make-to-order

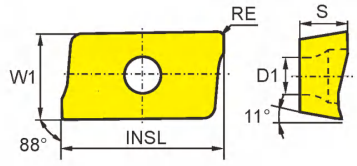
Spare parts

Diameter DC	Inserts	Insert screw	Wrench
			
Ø16-Ø20	APKT07	I60M1.8×4	WT05IP
Ø16-Ø40	APKT11	I60M2.5×5.5	WT07IP
Ø25-Ø40	APKT16	I60M4×8.4	WT15IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

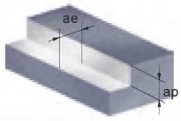
Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	APKT11T304-APL	12.24	6.6	3.6	2.8	0.4									★					○		
	APKT11T308-APL	12.24	6.6	3.6	2.8	0.8	★	★	★						★			○				
	APKT160408-APL	17.877	9.33	5.76	4.4	0.8	★	★	★						★			○				
	APKT160420-APL	17.877	9.33	5.76	4.4	2.0									★							
	APKT070204-APM	7.32	4.34	2.38	2	0.4		●	●						★							
	APKT11T304-APM	12.24	6.6	3.6	2.8	0.4		●							★							
	APKT11T308-APM	12.24	6.6	3.6	2.8	0.8		●	●						★		●	●				
	APKT11T312-APM	12.24	6.6	3.6	2.8	1.2			●						★							
	APKT11T316-APM	12.24	6.6	3.6	2.8	1.6									★							
	APKT11T320-APM	12.24	6.6	3.6	2.8	2.0		●							★							
	APKT160408-APM	17.877	9.33	5.76	4.4	0.8		●	●						★		●	●				
	APKT160416-APM	17.877	9.33	5.76	4.4	1.6		●	●						★		●					
	APKT160420-APM	17.877	9.33	5.76	4.4	2.0			●						★							
	APKT160424-APM	17.877	9.33	5.76	4.4	2.4									★							
	APKT160430-APM	17.877	9.33	5.76	4.4	3.0									★							
	APKT070204-APF	7.32	4.34	2.38	2	0.4	●	●							★							
	APKT11T304-APF	12.24	6.6	3.6	2.8	0.4	●	●							★							
	APKT11T308-APF	12.24	6.6	3.6	2.8	0.8	●	●							★		●	●				
	APKT160408-APF	17.877	9.33	5.76	4.4	0.8	●								★		●	●				
	APKT11T304-ALH	12.24	6.6	3.6	2.8	0.4															★	★
	APKT11T308-ALH	12.24	6.6	3.6	2.8	0.8															★	○
	APKT160408-ALH	17.877	9.33	5.76	4.4	0.8															★	★

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker selection

Classification \ Application	Finishing	Medium, semi-finishing	Light,semi-finishing
P	-APF	-APM	-APL
M	-APF	-APM	-APL
S	-APF	-APM	-APL
K	-APF	-APM	-APL
N	-ALH		

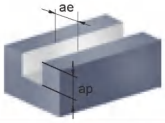
1 Square shoulder milling



Recommended cutting parameters (D: Diameter)

Workpiece material		Hardness HB	Insert grade	Cutting parameters				
				V (m/min)	f (mm/z)			a_e(mm)
					-APF	-APM	-APL	
P	Low-carbon steel, Soft steel	⩽180	YBC302	320 (240-400)	0.1 (0.08-0.2)	--	0.1 (0.08-0.2)	⩽0.5D
			YB9320	320 (200-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	
			YBM253	300 (320-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	
	High-carbon steel, Alloy steel	180-280	YBC302	280 (210-380)	0.1 (0.08-0.2)	--	0.1 (0.08-0.2)	⩽0.5D
			YB9320	280 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	
			YBM253	260 (150-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	
	Alloy tool steel	280-350	YBC302	260 (180-350)	0.1 (0.08-0.2)	--	0.1 (0.08-0.2)	⩽0.5D
			YB9320	260 (160-330)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	
			YBM253	220 (150-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	
M	Stainless steel	⩽270	YB9320	200 (110-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	⩽0.5D
			YBM253	180 (150-300)				
K	Cast iron	180-250	YB9320	180 (150-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	⩽0.5D
			YBD152	200 (150-250)	--	0.2 (0.1-0.3)	--	
S	Difficult-to-machine materials	⩽400	YBS203	100 (60-120)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	⩽0.5D
			YBS303	100 (60-120)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	⩽0.5D
N					-ALH			
	Aluminium alloy	--	YD101	300-	0.2 (0.08-0.4)			⩽0.5D
			YD201	300-	0.2 (0.08-0.4)			⩽0.5D

2 Slot milling



Recommended cutting parameters (D: Diameter)

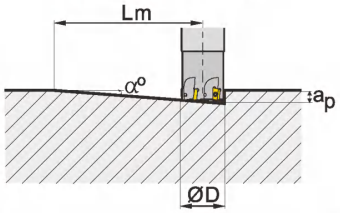
Workpiece material		Hardness HB	Insert grade	Cutting parameters				
				V (m/min)	f (mm/z)			a_e(mm)
					-APF	-APM	-APL	
P	Low-carbon steel, Soft steel	⩽180	YBC302	190 (170-250)	0.1 (0.08-0.15)	--	0.1 (0.08-0.15)	D
			YB9320	190 (140-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	
			YBM253	150 (130-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	
	High-carbon steel, Alloy steel	180-280	YBC302	170 (150-220)	0.1 (0.08-0.15)	--	0.1 (0.08-0.15)	D
			YB9320	170 (130-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	
			YBM253	140 (110-200)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	
	Alloy tool steel	280-350	YBC302	150 (130-210)	0.1 (0.08-0.15)	--	0.1 (0.08-0.15)	D
			YB9320	150 (110-240)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	
			YBM253	130 (110-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	
M	Stainless steel	⩽270	YB9320	120 (80-190)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	D
			YBM253	100 (80-170)				
K	Cast iron	180-250	YB9320	120 (80-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	D
			YBD152	120 (80-210)	--	0.15 (0.1-0.25)	--	
S	Difficult-to-machine materials	⩽400	YBS203	60 (45-110)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	D
			YBS303	60 (45-110)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	D
N					-ALH			
	Aluminium alloy	--	YD101	300-	0.2 (0.08-0.3)			D
			YD201	300-	0.2 (0.08-0.3)			D



3 Ramp milling, helical interpolation milling

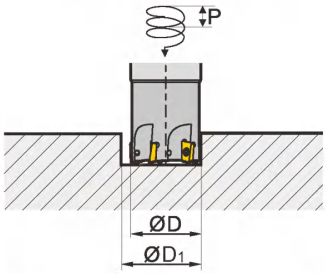
Recommended cutting parameters (D: Diameter)

● Ramp milling



$L_m = \frac{a_p}{tg\alpha}$ (α:Maximum ramp angle)

● Helical interpolation milling



$tg\alpha = \frac{P}{\pi D_1}$ (α:Helical angle)

Diameter ØD(mm)	APKT Ramp milling, helical interpolation milling (Inserts-7)				
	Ramp milling			Helical interpolation milling	
	Maximum cutting depth	Maximum ramp angle	Minimum length	Minimum diameter	Maximum pitch
	a_p(mm)	α°	Lm(mm)	$ØD_1$(mm)	(mm)
10	6	6	57	12	2.0
12	6	4	85	15	2.0
14	6	3	114	18	2.0
16	6	2.5	137	21	2.0

Diameter ØD(mm)	APKT Ramp milling, helical interpolation milling (Inserts-11)				
	Ramp milling			Helical interpolation milling	
	Maximum cutting depth	Maximum ramp angle	Minimum length	Minimum diameter	Maximum pitch
	a_p(mm)	α°	Lm(mm)	$ØD_1$(mm)	(mm)
16	10.0	10.0	56.7	20.0	2.0
20	10.0	5.0	114.4	28.0	2.0
25	10.0	4.5	127.0	40.0	2.0
30	10.0	3.5	153.0	48.0	2.0
32	10.0	3.0	190.8	56.0	2.0
40	10.0	2.0	286.4	70.0	2.0

Diameter ØD(mm)	APKT Ramp milling, helical interpolation milling (Inserts-16)				
	Ramp milling			Helical interpolation milling	
	Maximum cutting depth	Maximum ramp angle	Minimum length	Minimum diameter	Maximum pitch
	a_p(mm)	α°	Lm(mm)	$ØD_1$(mm)	(mm)
25	15	6	142	32	2.0
30	15	5	171	40	2.0
32	15	4.5	214	45	2.0
40	15	2.5	343	60	2.0
50	15	1.5	572	80	2.0
63	15	1	859	105	2.0

Note: For cutting speed and feed rate per tooth, see square shoulder milling.

Case for EMP01



Machine: Vertical machining center
Diameter: Ø40mm
Operation: Interpolation milling
Insert: APKT160408-APM/YB9320
Workpiece material: P20(HRC 33-36)
Cutting data:
Vc=150m/min
f= 0.2mm/z



Insert specification/grade: APKT160408-APM/YB9320

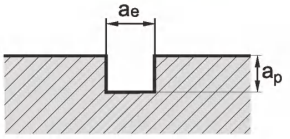
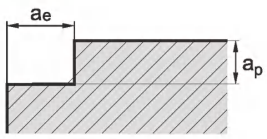
Tools specification: EMP01-040-XP32-AP16-04

●Comprehensively improve mould cavity machining efficiency



Optimized structure in combination with brand-new "golden drill" coating technique, ZCC·CT products with APM chipbreaker is more suitable for mold cavity machining, greatly improve machining efficiency when compare with competitors similar products.

Recommended cutting parameters

Slot milling	Square shoulder milling	Deep square shoulder milling
		
a_e=D，a_p≤0.5D	a_e≤0.5D，a_p≤1.2D	a_e≤0.2D，a_p<Cutting length of insert

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				Square shoulder milling			
				V (m/min)	f (mm/z)		
					-APF	-APM	-APL
P	Low-carbon steel, Soft steel	≤180	YBC302	270 (240-350)	0.1 (0.08-0.2)	--	0.1 (0.08-0.2)
			YB9320	220 (200-360)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
			YBM253	270 (180-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
	High-carbon steel, Alloy steel	180-280	YBC302	240 (210-320)	0.1 (0.08-0.2)	--	0.1 (0.08-0.2)
			YB9320	240 (180-360)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
			YBM253	200 (160-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
	Alloy tool steel	280-350	YBC302	220 (180-300)	0.1 (0.08-0.2)	--	0.1 (0.08-0.2)
			YB9320	220 (160-340)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
			YBM253	180 (150-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
M	Stainless steel	≤270	YB9320	150 (110-270)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
			YBM253	140 (100-250)			
K	Cast iron	180-250	YB9320	150 (100-200)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
			YBD152	180 (120-300)	--	0.2 (0.1-0.3)	--
S	Difficult-to-machine materials	≤400	YBS203	100 (60-120)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
			YBS303	100 (60-120)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
N					-ALH		
	Aluminium alloy	--	YD101	300-	0.2 (0.08-0.4)		
			YD201	300-	0.2 (0.08-0.4)		

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				Slot milling、Deep square shoulder milling			
				V (m/min)	f (mm/z)		
					-APF	-APM	-APL
P	Low-carbon steel, Soft steel	≤180	YBC302	270 (240-350)	0.1 (0.08-0.15)	--	0.1 (0.08-0.15)
			YB9320	270 (200-360)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
			YBM253	220 (180-300)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
	High-carbon steel, Alloy steel	180-280	YBC302	240 (210-320)	0.1 (0.08-0.15)	--	0.1 (0.08-0.15)
			YB9320	240 (180-360)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
			YBM253	200 (160-280)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
	Alloy tool steel	280-350	YBC302	220 (180-300)	0.1 (0.08-0.15)	--	0.1 (0.08-0.15)
			YB9320	220 (160-340)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
			YBM253	180 (150-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
M	Stainless steel	≤270	YB9320	150 (110-270)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
			YBM253	140 (100-250)			
K	Cast iron	180-250	YB9320	150 (100-200)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
			YBD152	180 (120-300)	--	0.15 (0.1-0.25)	--
S	Difficult-to-machine materials	≤400	YBS203	60 (45-110)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
			YBS303	60 (45-110)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
N					-ALH		
	Aluminium alloy	--	YD101	300-	0.2 (0.08-0.3)		
			YD201	300-	0.2 (0.08-0.3)		

Square shoulder milling tools

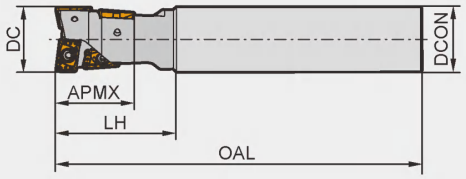
KAPR:90°



EMP05 P M K



Standardized edge



Specification of tools

Type		Stock	Basic dimensions(mm)					Insert quantities			
			DC	DCON	LH	OAL	APMX	End teeth	Quantity	Peripheral	Quantity
EMP05	**-016-G16-AD08-C**	▲	16	16	33	120	19	ADKT080308L-GM	1	ADKT090308R-GM	3
	-020-G20-AD10-C	▲	20	20	35	130	23	ADKT100308L-GM	1	ADKT100308R-GM	3
	-025-G25-AD12-C	▲	25	25	45	140	29	ADKT12T308L-GM	1	ADKT12T308R-GM	3
	-032-G32-AD15-C	▲	32	32	50	150	34	ADKT160508L-GM	1	ADKT150508R-GM	3
	-040-G32-AD12-C	▲	40	32	55	160	40	ADKT12T308L-GM	2	ADKT12T308R-GM	4
	-050-G40-AD15-C	▲	50	40	70	170	50	ADKT160508L-GM	2	ADKT150508R-GM	4

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø16	ADKT-GM	I60M2.2×5.5	WT07IP
Ø20		I60M2.5×6.5T	WT08IP
Ø25		I60M3×7	WT09IP
Ø32		I43M4×8	WT15S
Ø40		I60M3×7	WT09IP
Ø50		I43M4×8	WT15S



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

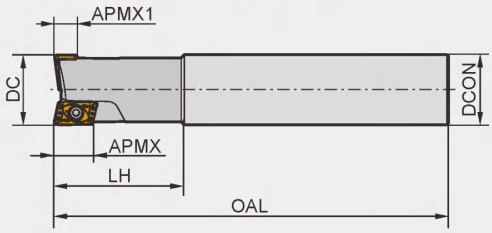
KAPR:90°



EMP05 P M K



short flutes



Specification of tools

Type		Stock	Basic dimensions(mm)						Insert quantities			
			DC	DCON	LH	OAL	APMX	APMX1	End teeth	Quantity	Peripheral	Quantity
EMP05	**-S016-G16-AD08-C**	▲	16	16	33	120	8.5	4.5	ADKT080308L-GM	1	ADKT090308R-GM	1
	-S017-G16-AD08-C	▲	17									
	-S020-G20-AD10-C	▲	20	20	35	130	9.5	5.5	ADKT100308L-GM	1	ADKT100308R-GM	1
	-S021-G20-AD10-C	▲	21									
	-S025-G25-AD12-C	▲	25	25	45	140	12.5	7	ADKT12T308L-GM	1	ADKT12T308R-GM	1
	-S026-G25-AD12-C	▲	26									
	-S032-G32-AD15-C	▲	32	32	50	150	14.5	8.5	ADKT160508L-GM	1	ADKT150508R-GM	1
	-S040-G32-AD12-C	▲	40	32	55	160	12.5	7	ADKT12T308L-GM	2	ADKT12T308R-GM	1
	-S050-G40-AD15-C	▲	50	40	70	170	14.5	8.5	ADKT160508L-GM	2	ADKT150508R-GM	1

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø16	ADKT-GM	I60M2.2X5.5	WT07IP
Ø17			
Ø20		I60M2.5X6.5T	WT08IP
Ø21			
Ø25		I60M3X7	WT09IP
Ø26			
Ø32		I43M4X8	WT15S
Ø40		I60M3X7	WT09IP
Ø50		I43M4X8	WT15S



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

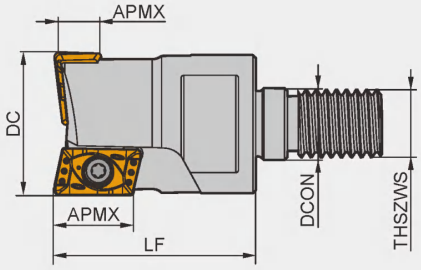
KAPR:90°



QCH-*AD*M*Series

P M K





Specification of tools

Type		Stock	Basic dimensions(mm)						Insert quantities				Weight (kg)
			DC	THSZWS	DCON	LF	APMX	APMX1	End teeth	Quantity	Peripheral	Quantity	
QCH	-16-AD08-M08-C	▲	16	M8	8.5	28	8.5	4.5	ADKT080308L-GM	1	ADKT090308R-GM	1	0.027
	-17-AD08-M08-C	▲	17	M8	8.5	28	8.5	4.5	ADKT080308L-GM	1	ADKT090308R-GM	1	0.029
	-20-AD10-M10-C	▲	20	M10	10.5	30	9.5	5.5	ADKT100308L-GM	1	ADKT100308R-GM	1	0.053
	-21-AD10-M10-C	▲	21	M10	10.5	30	9.5	5.5	ADKT100308L-GM	1	ADKT100308R-GM	1	0.055
	-25-AD12-M12-C	▲	25	M12	12.5	35	12.5	7	ADKT12T308L-GM	1	ADKT12T308R-GM	1	0.087
	-26-AD12-M12-C	▲	26	M12	12.5	35	12.5	7	ADKT12T308L-GM	1	ADKT12T308R-GM	1	0.095
	-32-AD15-M16-C	▲	32	M16	17	43	14.5	8.5	ADKT160508L-GM	1	ADKT150508R-GM	1	0.19
	-33-AD15-M16-C	▲	33	M16	17	43	14.5	8.5	ADKT160508L-GM	1	ADKT150508R-GM	1	0.2
	-40-AD12-M16-C	▲	40	M16	17	45	12.5	7	ADKT12T308L-GM	2	ADKT12T308R-GM	1	0.25

▲Stock available △Make-to-order

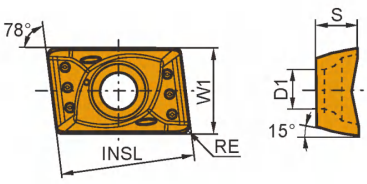
Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø16-17	ADKT-GM	I60M2.2×5.5	WT07IP
Ø20-21		I60M2.5×6.5T	WT08IP
Ø25-26		I60M3×7	WT09IP
Ø32-33		I43M4×8	WT15S
Ø40		I60M3×7	WT09IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



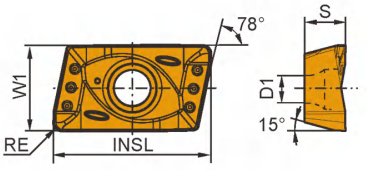
😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material																	
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ADKT080308L-GM	7.96	5.33	3	2.4	0.5									★							
	ADKT100308L-GM	10	6.44	3.2	2.8	0.5									★							
	ADKT12T308L-GM	12.44	8	3.9	3.5	0.5									★							
	ADKT160508L-GM	16	9.62	5	4.4	0.5									★							

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts



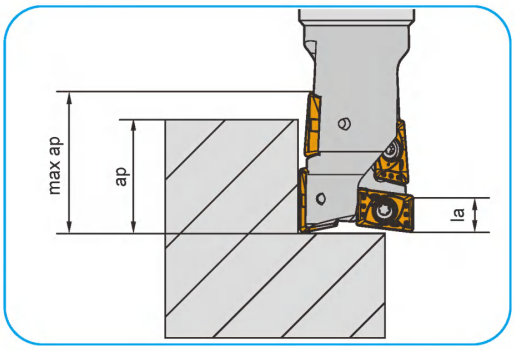
😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material																	
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ADKT090308R-GM	10	5	2.8	2.4	0.8									★							
	ADKT100308R-GM	11.65	6.04	3.5	2.8	0.8									★							
	ADKT12T308R-GM	15	8.16	3.9	3.54	0.8									★							
	ADKT150508R-GM	17.05	8.81	4.95	4.5	0.8									★							

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

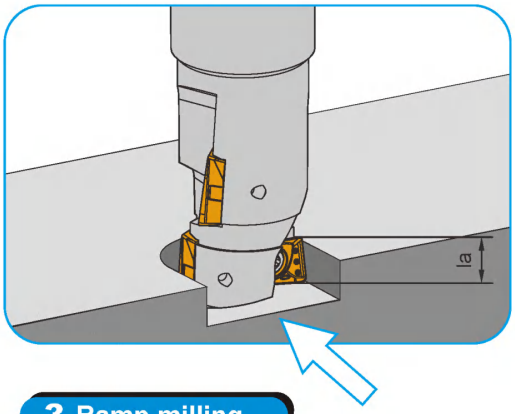
1 Square shoulder milling



- When the cutting depth is less than la, both the left and right inserts are involved in cutting
- When the cutting depth is larger than la, the right insert is involved in cutting for exceeding depth beyond la
- Generally, as the cutting depth increases, it is necessary to reduce the tool speed appropriately and feed rate
- The longer the overhang of the shank, the more likely it is to vibrate during machining. When vibration occurs, please reduce the cutting parameters appropriately until there is no visible vibration.

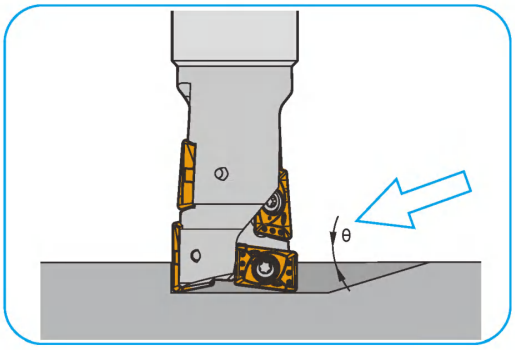
External diameter	L&R double-edge cutting zone la	Recommended cutting depth ap	Maximum cutting depth Max ap
Ø6, Ø17	~4.5	13~16	19
Ø20, Ø21	~5.5	15~18	23
Ø25, Ø26	~7.0	18~24	29
Ø32, Ø33	~8.5	21~28	34
Ø40	~7.0~	21~23	42
Ø50	~8.5~	21~28	50

2 Slot milling



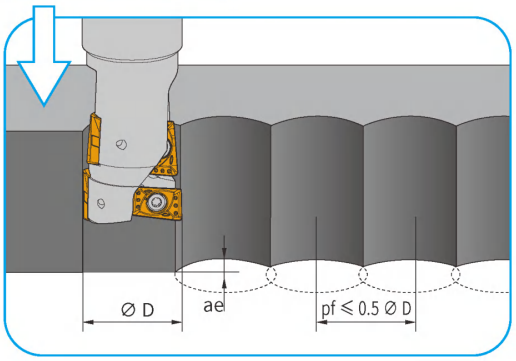
- It is recommended that the cutting depth for slot milling should not exceed la
- It is recommended that the feed for slot milling does not exceed 70% of that for shoulder milling with the same parameters.
- The longer the overhang of the shank, the more likely it is to vibrate during machining. When vibration occurs, please reduce the cutting parameters appropriately until there is no visible vibration

3 Ramp milling



- It is recommended that the ramp angle of normal P materials should not exceed 3° when conducting a ramp milling
- It is recommended that the feed for ramp milling does not exceed 70% of that for shoulder milling with the same parameters
- It is recommended that the ramp angle for P materials with a hardness of more than HRC45 should not exceed 1°
- The longer the overhang of the shank, the more likely it is to vibrate during machining. When vibration occurs, please reduce the cutting parameters appropriately until there is no visible vibration

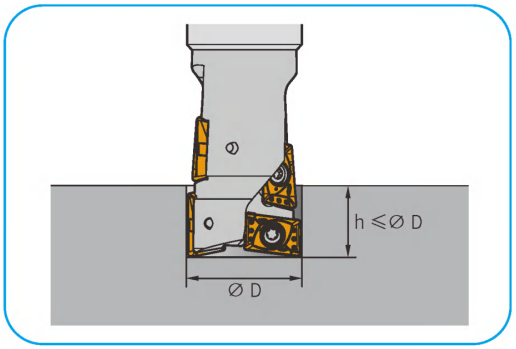
4 Plunging



- It is recommended that the feed of insert for plunging is 1.5-1.8 times that of drilling and milling
- The recommended radial feed ae refer to the following table when the stepover pf ≤ 0.5D

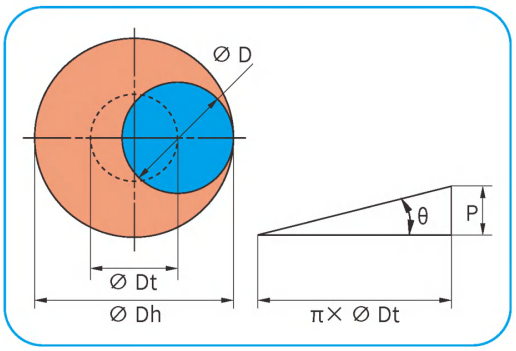
Diameter	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50
Radial cutting depth ae	4.5	6	7.5	8.5	7.5	8.5

5 Drilling and milling



- The drilling depth h should be less than half of the tool diameter ØD. In addition, materials with a hardness over HRC40 should be helical bored
- For chip removal, step feed should be performed
- Blast equipment removes cuts during processing
- Take appropriate safety measures during machining as chips may fly off in unexpected directions

6 Helical interpolation



- Referring to the machining parameters, feed is set 70% value. The outer diameter of helical interpolation milling is 1.2-1.8 times the diameter of the milling tool. The size of the inclination angle refers to the angle range of ramp milling; use compressed air to remove the chips in the hole

Tool centre path: Ø Dt= Ø Dh- Ø Dc

Feed per helix: P=π× Ø Dt×tanθ

1 Drilling and milling



Recommended cutting parameters

The drilling depth h should be less than half of the tool diameter φD. Materials with a hardness over HRC40 should be helical bored

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V（m/min）	f（mm/z）
P	Low-carbon steel, Soft steel	≤180	YB9320	180(120-220)	0.2(0.08-0.25)
P	High-carbon steel, Alloy steel	180-280	YB9320	160(130-200)	0.15(0.08-0.2)
P	Alloy tool steel	280-350	YB9320	140(120-180)	0.12(0.05-0.2)
M	Stainless steel	≤270	YB9320	80(50-150)	0.08(0.03-0.15)
K	Cast iron	180-250	YB9320	150(100-220)	0.15(0.08-0.2)

2 Miliing

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Square shoulder milling	
				V（m/min）	f（mm/z）
P	Low-carbon steel, Soft steel	≤180	YB9320	190(140-250)	0.08(0.04-0.15)
P	High-carbon steel, Alloy steel	180-280	YB9320	170(130-250)	0.08(0.04-0.15)
P	Alloy tool steel	280-350	YB9320	150(120-180)	0.08(0.04-0.15)
M	Stainless steel	≤270	YB9320	120(80-190)	0.08(0.04-0.15)
K	Cast iron	180-250	YB9320	120(80-210)	0.08(0.04-0.15)



- 4 available cutting edges and precise 90°square shoulder.
- Double rake angle can effectively reduce cutting force.
- High precision of cutting tool can achieve high quality and efficient roughing.
- The Tangential assembling can change the cutting force of main direction to be borne by the thickness direction to realize the high rigidity of the cutting tool.
- The optimized material of cutter body with high strength and special coating treatment achieves better wear-resistance and longer tool life.

KAPR:90°

A New Generation of Tangential Milling Tool EMP09 Series

To meet the diverse processing needs and achieve efficient rough machining.





- High strength of tool nose, sharp cutting and good wear resistance.
- The spiral cutting edge stands for a lighter chipbreaker.
- Excellent universal coating materials, super smooth coating technology, no sticky chip and longer life.
- The vertical design makes the carbide has large volume along the direction of the cutting force, so that the feed per tooth is 30% higher than the flat load insert.

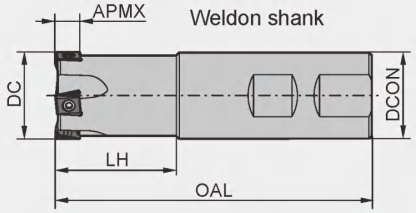
Square shoulder milling tools

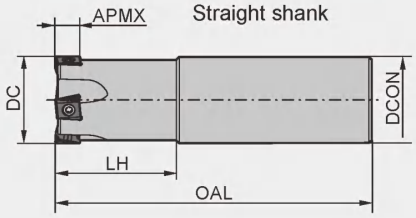
KAPR:90°



EMP09 P M K S







Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			DC	DCON	OAL	LH	APMX		
EMP09 Weldon shank	**-020-XP20-LN08-02C**	▲	20	20	100	25	8.0	2	0.20
	-020-XP20-LN08-03C	▲	20	32	100	25	8.0	3	0.20
	-025-XP25-LN08-03C	▲	25	25	100	32	8.0	3	0.36
	-025-XP25-LN08-04C	▲	25	25	100	32	8.0	4	0.35
	-032-XP32-LN08-04C	▲	32	32	115	40	8.0	4	0.67
	-032-XP32-LN08-05C	▲	32	32	115	40	8.0	5	0.67
	-040-XP40-LN08-05C	▲	40	40	125	40	8.0	5	1.15
	-040-XP40-LN08-06C	▲	40	40	125	40	8.0	6	1.14
	-032-XP32-LN12-03C	▲	32	32	115	40	11.5	3	0.60
	-040-XP40-LN12-03C	▲	40	40	125	40	11.5	3	1.11
	-040-XP40-LN12-04C	▲	40	40	125	40	11.5	4	1.10
Straight shank	**-020-G20-LN08-02C**	▲	20	20	100	25	8.0	2	0.2
	-020-G20-LN08-03C	▲	20	20	100	25	8.0	3	0.2
	-025-G25-LN08-03C	▲	25	25	100	32	8.0	3	0.36
	-025-G25-LN08-04C	▲	25	25	100	32	8.0	4	0.35
	-032-G32-LN08-04C	▲	32	32	115	40	8.0	4	0.67
	-032-G32-LN08-05C	▲	32	32	115	40	8.0	5	0.67
	-040-G40-LN08-05C	▲	40	40	125	40	8.0	5	1.1
	-040-G40-LN08-06C	▲	40	40	125	40	8.0	6	1.1
	-032-G32-LN12-03C	▲	32	32	115	40	11.5	3	0.6
	-040-G40-LN12-03C	▲	40	40	125	40	11.5	3	1.11
	-040-G40-LN12-04C	▲	40	40	125	40	11.5	4	1.10

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø20-Ø40	LN□T0804□□-GM/GL	I60M3×7	WT09IP
Ø32-Ø40	LN□T1206□□-GM/GL	I60M4×12	WT15IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

KAPR:90°

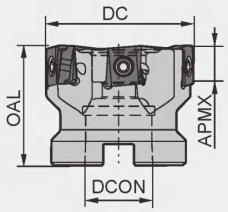

Face milling


Step shoulder milling

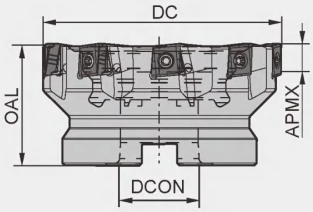
EMP09 P M K S



A-type coupling



B-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	OAL	APMX			
EMP09	-040-A16-LN08-05C	▲	40	16	40	8.0	5	A	0.21
	-040-A16-LN08-06C	▲	40	16	40	8.0	6	A	0.21
	-050-A22-LN08-06C	▲	50	22	40	8.0	6	A	0.35
	-050-A22-LN08-07C	▲	50	22	40	8.0	7	A	0.35
	-063-A22-LN08-08C	▲	63	22	40	8.0	8	A	0.60
	-063-A22-LN08-10C	▲	63	22	40	8.0	10	A	0.60
	-080-A27-LN08-10C	▲	80	27	50	8.0	10	A	1.26
	-080-A27-LN08-12C	▲	80	27	50	8.0	12	A	1.26
	-040-A16-LN12-03C	▲	40	16	40	11.5	3	A	0.20
	-040-A16-LN12-04C	▲	40	16	40	11.5	4	A	0.19
	-050-A22-LN12-05C	▲	50	22	40	11.5	5	A	0.30
	-050-A22-LN12-06C	▲	50	22	40	11.5	6	A	0.30
	-063-A22-LN12-06C	▲	63	22	40	11.5	6	A	0.54
	-063-A22-LN12-08C	▲	63	22	40	11.5	8	A	0.54
	-080-A27-LN12-07C	▲	80	27	50	11.5	7	A	1.18
	-080-A27-LN12-10C	▲	80	27	50	11.5	10	A	1.18
	-100-B32-LN12-09C	▲	100	32	50	11.5	9	B	1.64
	-100-B32-LN12-13C	▲	100	32	50	11.5	13	B	1.64
	-125-B40-LN12-11C	▲	125	40	63	11.5	11	B	2.74
	-125-B40-LN12-16C	▲	125	40	63	11.5	16	B	2.74

▲Stock available △Make-to-order

Square shoulder milling tools

KAPR:90°

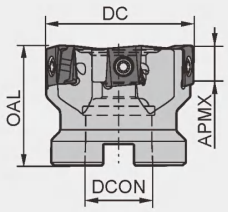

Face milling


Step shoulder milling

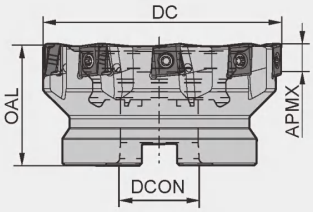
EMP09 P M K S



A-type coupling



B-type coupling



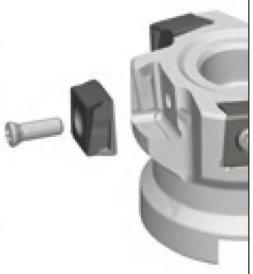
Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	OAL	APMX			
EMP09	-050-A22-LN16-04C	▲	50	22	40	15	4	A	0.31
	-050-A22-LN16-05C	▲	50	22	40	15	5	A	0.31
	-063-A22-LN16-05C	▲	63	22	40	15	5	A	0.56
	-063-A22-LN16-06C	▲	63	22	40	15	6	A	0.56
	-080-A27-LN16-06C	▲	80	27	50	15	6	A	1.20
	-080-A27-LN16-07C	▲	80	27	50	15	7	A	1.20
	-100-B32-LN16-08C	▲	100	32	50	15	8	B	1.62
	-100-B32-LN16-10C	▲	100	32	50	15	10	B	1.62
	-125-B40-LN16-10C	▲	125	40	63	15	10	B	3.27
	-125-B40-LN16-13C	▲	125	40	63	15	13	B	3.27
	-160-B40-LN16-12C	▲	160	40	63	15	12	B	6.37
	-160-B40-LN16-16C	▲	160	40	63	15	16	B	6.37

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
Ø40~Ø63	LN□T0804□□-GM/GL	I60M3×7	WT09IP
Ø80			WT09IS
Ø40~Ø63	LN□T1206□□-GM/GL	I60M4×12	WT15IP
Ø80~Ø125			WT15IS
Ø50~Ø63	LN□T1607□□-GM/GL	I60M5×13	WT20IP
Ø80~Ø125			WT20IS
Ø160			WT20IT



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

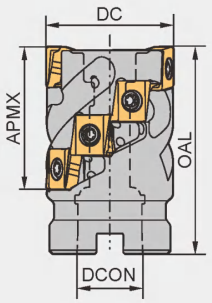
Square shoulder milling tools

KAPR:90°



EMP09 P M K S





Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Number of inserts	Weight (kg)
			DC	DCON	OAL	APMX			
EMP09	-032×38-A16-LN08-03C	▲	32	16	55	38	3	15	0.15
	-040×38-A16-LN08-04C	▲	40	16	55	38	4	20	0.3
	-040×45-A16-LN08-04C	▲	40	16	65	45	4	24	0.4
	-050×38-A22-LN08-05C	▲	50	22	55	38	5	25	0.5
	-050×45-A22-LN08-05C	▲	50	22	65	45	5	30	0.6
	-040×33-A16-LN12-02C	▲	40	16	55	33	2	6	0.3
	-040×43-A16-LN12-02C	▲	40	16	65	43	2	8	0.34
	-050×33-A16-LN12-03C	▲	50	16	55	33	3	9	0.5
	-050×43-A22-LN12-03C	▲	50	22	70	43	3	12	0.62
	-063×43-A27-LN12-04C	▲	63	27	70	43	4	16	1.03
	-063×53-A27-LN12-04C	▲	63	27	80	53	4	20	1.2
	-080×43-A27-LN12-05C	▲	80	27	70	43	5	20	1.91
	-080×53-A27-LN12-05C	▲	80	27	80	53	5	25	2.1
	-100×63-A27-LN12-06C	▲	100	27	90	63	6	36	3.3

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench	
				
Ø32×38-Ø50×45	LN□T0804□□-GM/GL	I60M3×7	WT09IP	
Ø40×33-Ø63×53	LN□T1206□□-GM/GL	I60M4×12	WT15IP	
Ø80×43-Ø100×63			WT15IS	

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

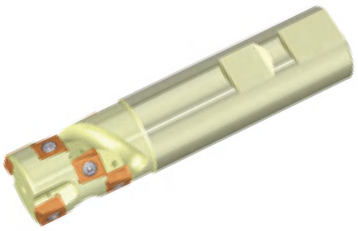
KAPR:90°

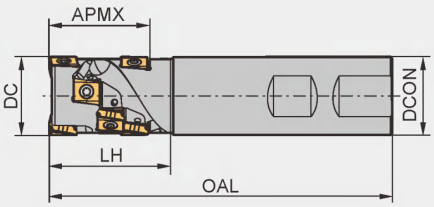

Step shoulder milling


Slot milling


Side milling

EMP09 P M K S



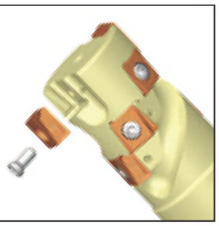


Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Number of inserts	Weight (kg)
			DC	DCON	OAL	LH	APMX			
EMP09	-025×30-XP25-LN08-02C	▲	25	25	100	40	30	2	8	0.31
	-032×38-XP32-LN08-03C	▲	32	32	115	45	38	3	15	0.62
	-040×45-XP32-LN08-04C	▲	40	32	120	55	45	4	24	0.7
	-040×33-XP32-LN12-02C	▲	40	32	115	45	33	2	6	0.7
	-040×43-XP32-LN12-02C	▲	40	32	125	55	43	2	8	0.7
	-050×43-XP40-LN12-03C	▲	50	40	135	55	43	3	12	1.4
	-050×53-XP40-LN12-03C	▲	50	40	145	65	53	3	15	1.5

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench	
				
Ø25×30-Ø40×45	LN□T0804□□-GM/GL	I60M3×7	WT09IP	
Ø40×33-Ø50×53	LN□T1206□□-GM/GL	I60M4×12	WT15IP	

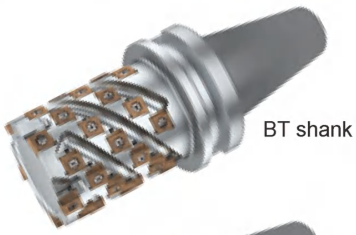
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

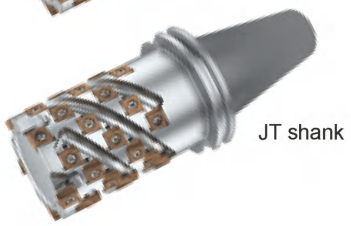
Square shoulder milling tools

KAPR:90°

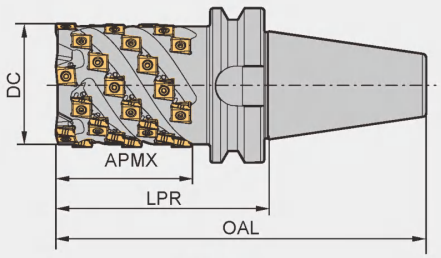


EMP09 P M K S

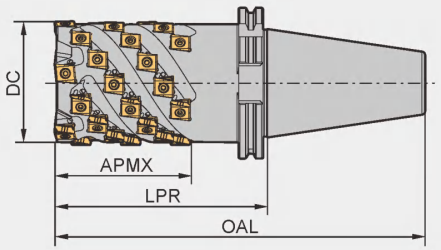




BT shank



JT shank

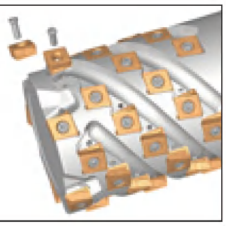


Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Shank type	Number of inserts	Weight (kg)
			DC	APMX	LPR	OAL				
EMP09	-050×63-BT50-LN12-03C	△	50	63	124	225.8	3	BT	18	4.34
	-050×85-BT50-LN12-03C	△	50	85	146	246.8	3	BT	24	4.57
	-050×103-BT50-LN12-03C	△	50	103	164	265.8	3	BT	30	4.89
	-063×85-BT50-LN12-04C	△	63	85	146	246.8	4	BT	32	5.35
	-063×115-BT50-LN12-04C	△	63	115	176	277.8	4	BT	44	6.07
	-080×125-BT50-LN12-05C	△	80	125	186	287.8	5	BT	60	8.25
	-050×103-JT50-LN12-03C	△	50	103	164	265.75	3	JT	30	5.11
	-063×85-JT50-LN12-04C	△	63	85	146	246.75	4	JT	32	4.34
	-063×115-JT50-LN12-04C	△	63	115	176	277.75	4	JT	44	5.46
	-080×125-JT50-LN12-05C	△	80	125	186	287.75	5	JT	60	7.82

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench	
				
Ø50×63-Ø63×115	LN□T1206□□-GM/GL	I60M4×12	WT15IP	
Ø80×125			WT15IS	

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

KAPR:90°


Step shoulder milling

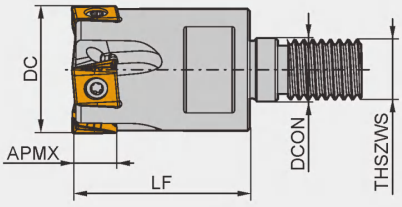

Slot milling


Side milling

QCH-*LN*M*Series

P M K S





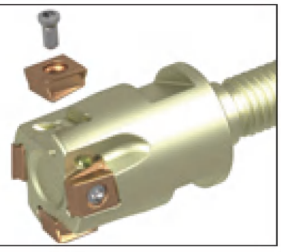
Specification of tools

Type		Stock	Basic dimensions(mm)					Applicable inserts	Number of teeth Z	Weight (kg)
			DC	DCON	LF	APMX	THSZWS			
QCH	-20-LN08-M10-02	△	20	10.5	30	8.0	10	LN□T0804□□-GM/GL	2	0.062
	-20-LN08-M10-03	△	20	10.5	30	8.0	10		3	0.059
	-22-LN08-M10-03	△	22	10.5	35	8.0	10		3	0.075
	-25-LN08-M12-03	△	25	12.5	35	8.0	12		3	0.112
	-25-LN08-M12-04	△	25	12.5	35	8.0	12		4	0.116
	-32-LN08-M16-04	△	32	17	45	8.0	16		4	0.230
	-32-LN08-M16-05	△	32	17	45	8.0	16		5	0.228
	-40-LN08-M16-05	△	40	17	45	8.0	16		5	0.309
	-40-LN08-M16-06	△	40	17	45	8.0	16		6	0.316
	-32-LN12-M16-02	△	32	17	45	11.5	16	LN□T1206□□-GM/GL	2	0.230
	-32-LN12-M16-03	△	32	17	45	11.5	16		3	0.225
	-40-LN12-M16-03	△	40	17	45	11.5	16		3	0.290
	-40-LN12-M16-04	△	40	17	45	11.5	16		4	0.288

▲Stock available △Make-to-order

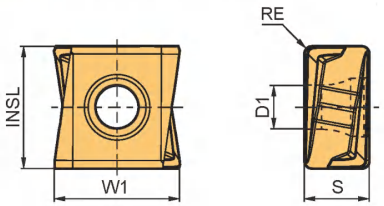
Spare parts

Diameter DC	Inserts	Insert screw	Wrench
Ø20-Ø40	LN□T0804□□-GM/GL	I60M3×7	WT09IP
Ø32-Ø40	LN□T1206□□-GM/GL	I60M4×12	WT15IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😃 😃 — — — 😃 😃 😊 ☹ — — 😊 😊 — —
M	Stainless steel	😃 😃 — — — 😃 😃 😃 ☹ — — 😊 😊 — —
K	Cast iron	— — 😃 😃 ☹ 😊 — — — — — — — — ☹
N	Non-ferrous metal	— — — — — — — — — — — — — — 😃 ☹
S	Heat resistant alloy, Ti alloy	— — — — — 😊 😃 😃 😃 — 😃 ☹ — — — —

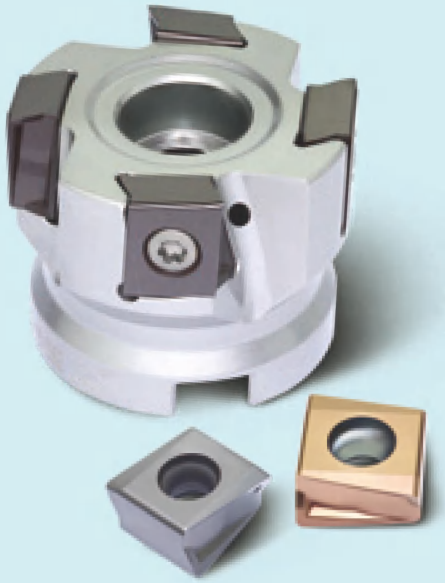
Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	LNKT080404PNR-GL	8.75	8.5	4.45	3.4	0.4		★	●		●				★			●				
	LNKT120608PNR-GL	12.7	13	6.75	4.4	0.8		★	●		●				★			●				
	LNKT160708PNR-GL	16.05	15	7.35	5.5	0.8		★	●		●				★			●				
	LNKT080404PNR-GM	8.75	8.5	4.45	3.4	0.4		★	●		●				★			●				
	LNKT080408PNR-GM	8.75	8.5	4.45	3.4	0.8		★	●		●				★							
	LNKT080412PNR-GM	8.75	8.5	4.45	3.4	1.2		★	●		●				★							
	LNKT120608PNR-GM	12.7	13	6.75	4.4	0.8		★	●		●				★			●				
	LNKT120612PNR-GM	12.7	13	6.75	4.4	1.2		★	●		●				★							
	LNKT120616PNR-GM	12.7	13	6.75	4.4	1.6		★	●		●				★							
	LNKT120620PNR-GM	12.7	13	6.75	4.4	2.0		★	●		●				★							
	LNKT120624PNR-GM	12.7	13	6.75	4.4	2.4		★	●		●				★							
	LNKT120632PNR-GM	12.7	13	6.75	4.4	3.2		★	●		●				★							
	LNKT160708PNR-GM	16.05	15	7.35	5.5	0.8		★	●		●				★			●				
	LNKT160712PNR-GM	16.05	15	7.35	5.5	1.2		★	●		●				★							
	LNKT160716PNR-GM	16.05	15	7.35	5.5	1.6		★	●		●				★							
	LNMT080404PNR-GM	8.75	8.5	4.45	3.4	0.4		★	●		●				★							
	LNMT120608PNR-GM	12.7	13	6.75	4.4	0.8		★	●		●				★							
	LNMT160708PNR-GM	16.05	15	7.35	5.5	0.8		★	●		●				★							

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	fz(mm/z)
P	Low-carbon steel, Soft steel	≤180	YBM253	260 (160-300)	0.3 (0.1-0.35)
			YB9320	260 (160-300)	0.3 (0.1-0.35)
	High-carbon steel, Alloy steel	180-280	YBM253	240 (160-240)	0.25 (0.1-0.35)
			YB9320	240 (160-240)	0.25 (0.1-0.35)
	Alloy tool steel	280-350	YBM253	200 (120-240)	0.2 (0.1-0.35)
			YB9320	200 (120-240)	0.2 (0.1-0.35)
M	Stainless stee	≤270	YBM253	180 (100-230)	0.15 (0.1-0.3)
			YB9320	160 (100-230)	0.15 (0.1-0.3)
K	Cast iron	180-250	YBD152 YBD252	220 (140-250)	0.2 (0.1-0.3)
				220 (140-250)	0.2 (0.1-0.3)
				220 (140-250)	0.2 (0.1-0.3)
S	Difficult-to-machine materials	≤400	YBS303	100 (60-120)	0.15 (0.1-0.25)

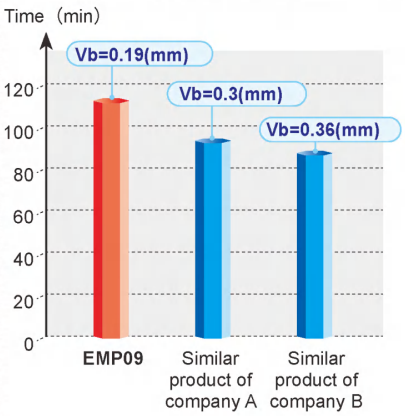
Case for EMP09



●Ultra-long working life

The material of workpiece: 45#
Hardness: 175-190（HB）
Machine tool: Planer-type milling machine
Type of cooling: No cooling
The machining type: Shoulder milling
Toolholder: EMP09-050-A22-LN12-05C
Insert: LNKT120608PNR-GM/YB9320
Cutting parameter: Vc=260m/min, Ap=8mm, Ae=2mm, fz=0.2mm/z

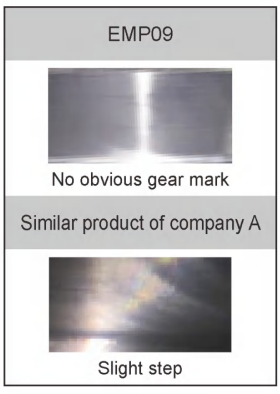
Comparison of tool life



Result:The processing life of LNKT12 (YB9320) is approximately 1.3 times of the similar product of company A and 1.4 times of the similar product of company B, with excellent wear resistance and longer tool life.

●Better surface quality

The material of workpiece: NAK80
Hardness: HRC(33-37)
Machine tool: Planer-type milling machine
Type of cooling: No cooling
The machining type: Shoulder milling
Toolholder: EMP09-050-A22-LN12-05C
Insert: LNKT120608PNR-GM (YB9320)
Similar product of company A
Cutting parameter: Vc=240m/min, Ap=8mm
Ae=2mm, fz=0.2mm/z



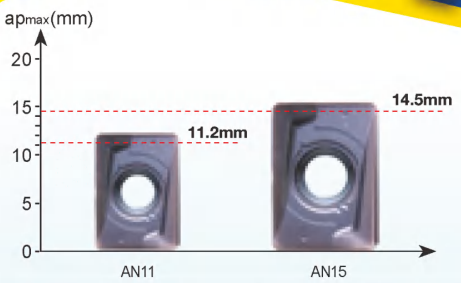
Result: EMP09 series of tangential milling cutter has higher precision and better surface quality, no obvious gear mark, and runout value, which is better than the similar product of company A.



Achieving High Quality 90° Square Shoulder Milling,

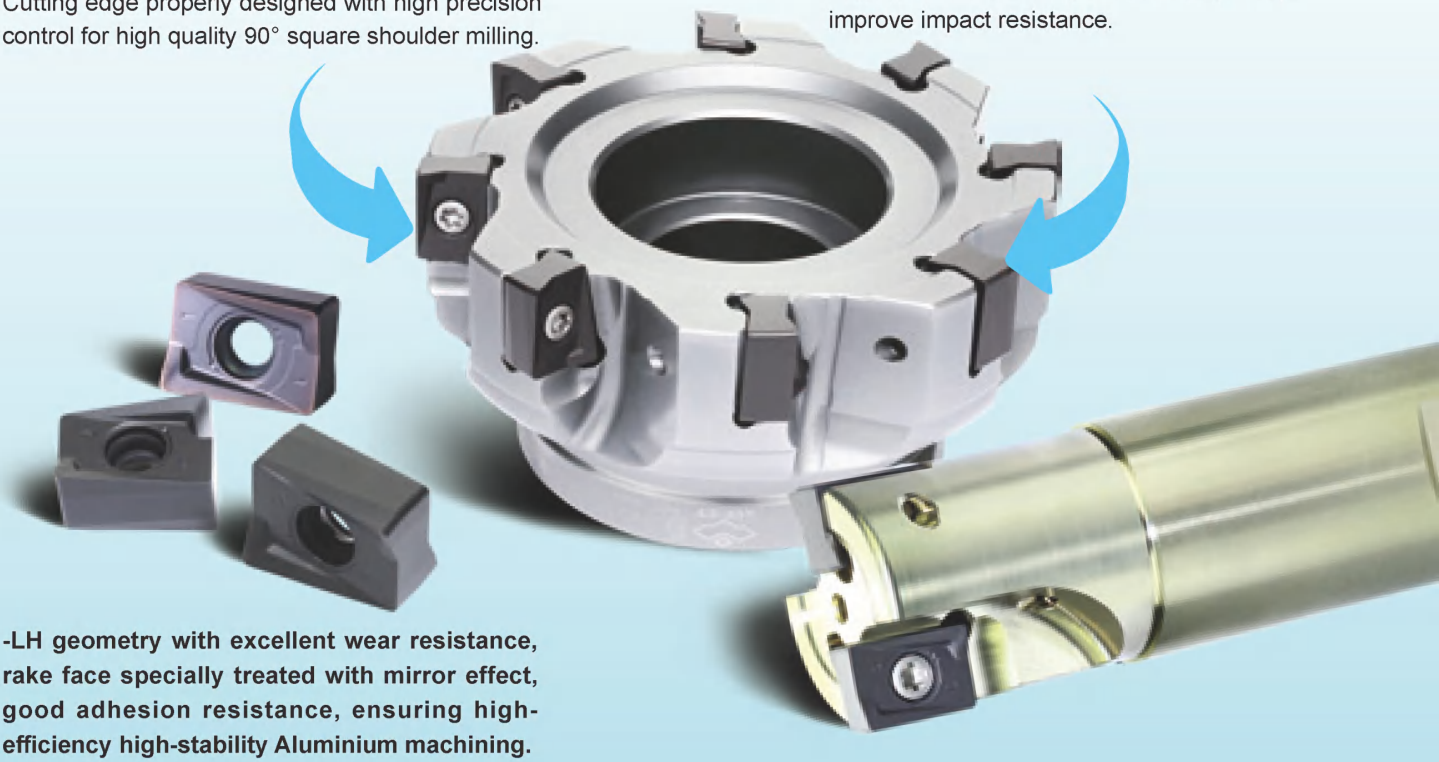
EMP13 Square Shoulder Milling Tool Series

KAPR:90°



Cutting edge properly designed with high precision control for high quality 90° square shoulder milling.

Extra thick insert with double negative cutter can achieve double positive cutting angle, reduce cutting force and greatly improve impact resistance.



-LH geometry with excellent wear resistance, rake face specially treated with mirror effect, good adhesion resistance, ensuring high-efficiency high-stability Aluminium machining.

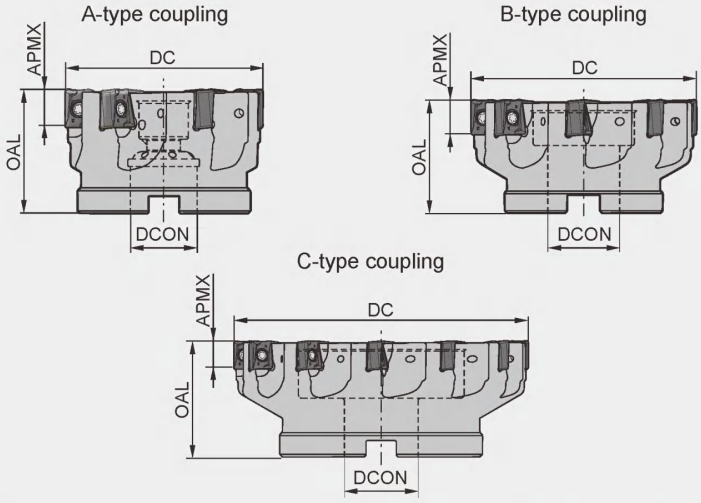
Square shoulder milling tools

KAPR:90°



EMP13 P M K S N





Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	OAL	APMX			
EMP13	-050-A22-AN11-06C	▲	50	22	40	11.2	6	A	0.30
	-063-A22-AN11-07C	▲	63	22	40	11.2	7	A	0.49
	-080-A27-AN11-09C	▲	80	27	50	11.2	9	A	1.18
	-100-B32-AN11-12	▲	100	32	50	11.2	12	B	1.46
	-125-B40-AN11-14	▲	125	40	63	11.2	14	B	2.92
	-160-C40-AN11-16	▲	160	40	63	11.2	16	C	4.30
	-050-A22-AN15-04C	▲	50	22	40	14.5	4	A	0.26
	-063-A22-AN15-05C	▲	63	22	40	14.5	5	A	0.53
	-080-A27-AN15-06C	▲	80	27	50	14.5	6	A	1.23
	-100-B32-AN15-08	▲	100	32	50	14.5	8	B	1.52
	-125-B40-AN15-10	▲	125	40	63	14.5	10	B	3.05
	-160-C40-AN15-12	▲	160	40	63	14.5	12	C	4.46

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Insert screw	Wrench
			
Ø50-Ø160	AN□X11□□□□-GM/LH	I60M3×9	WT09IS
Ø50-Ø160	AN□X15□□□□-GM/LH	I60M4×12	WT15IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

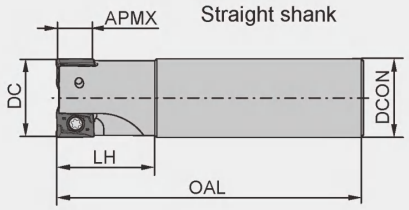
KAPR:90°

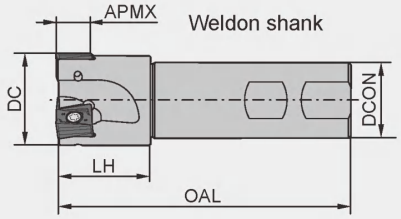


EMP13 P M K S N


Straight shank


Weldon shank





Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			DC	DCON	OAL	LH	APMX		
EMP13 Weldon shank	**-025-XP25-AN11-02C**	▲	25	25	100	32	11.2	2	0.31
	-032-XP32-AN11-03C	▲	32	32	115	40	11.2	3	0.61
	-040-XP32-AN11-04C	▲	40	32	125	40	11.2	4	0.75
	-032-XP32-AN15-02C	▲	32	32	125	40	14.5	2	0.66
	-040-XP32-AN15-03C	▲	40	32	125	40	14.5	3	0.76
Straight shank	**-025-G25-AN11-02C**	▲	25	25	100	32	11.2	2	0.31
	-032-G32-AN11-03C	▲	32	32	115	40	11.2	3	0.61
	-040-G32-AN11-04C	▲	40	32	125	40	11.2	4	0.75
	-032-G32-AN15-02C	▲	32	32	125	40	14.5	2	0.66
	-040-G32-AN15-03C	▲	40	32	125	40	14.5	3	0.76

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Insert screw	Wrench
			
Ø25-Ø40	AN□X11□□□□-GM/LH	I60M3×9	WT09IP
Ø32-Ø40	AN□X15□□□□-GM/LH	I60M4×12	WT15IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

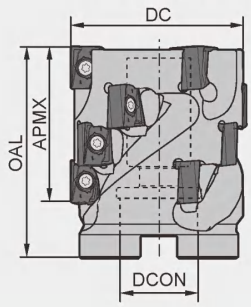
KAPR:90°

Face milling | Step shoulder milling | Slot milling | Side milling

EMP13 P M K S N



A-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Number of inserts	Type of coupling	Weight (kg)
			DC	DCON	OAL	APMX				
EMP13	-050×43-A22-AN11-03	▲	50	22	60	43	3	12	A	0.52
	-063×65-A27-AN11-04	▲	63	27	80	64	4	24	A	1.15
	-063×53-A27-AN15-03	▲	63	27	75	53	3	12	A	1.14
	-080×56-A32-AN15-04	▲	80	32	75	53	4	16	A	1.82

▲Stock available △Make-to-order

Square shoulder milling tools

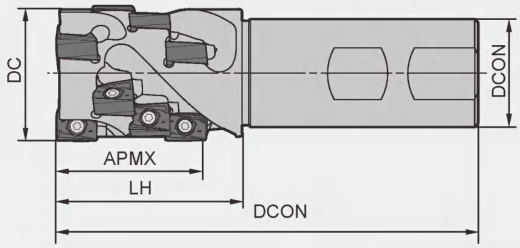
KAPR:90°

Face milling | Step shoulder milling | Slot milling | Side milling

EMP13 P M K S N



Weldon shank



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Number of inserts	Weight (kg)
			DC	DCON	OAL	LH	APMX			
EMP13	-032×43-XP32-AN11-02	▲	32	32	115	48	43	2	8	0.61
	-040×43-XP32-AN11-03	▲	40	32	125	55	43	3	12	0.79
	-040×40-XP32-AN15-02	▲	40	32	115	55	40	2	6	0.79
	-050×53-XP40-AN15-02	▲	50	40	145	70	53	2	8	1.53

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Insert screw	Wrench	
				
Ø50-Ø63	AN□X11□□□□-GM/LH	I60M3×9	WT09IP	
Ø63	AN□X15□□□□-GM/LH	I60M4×12	WT15IP	
Ø80			WT15IS	
Diameter DC	Inserts	Insert screw	Wrench	
				
Ø32-Ø40	AN□X11□□□□-GM/LH	I60M3×9	WT09IP	
Ø40-Ø50	AN□X15□□□□-GM/LH	I60M4×12	WT15IP	

Tools code key B26–B27 | Grade selection guide B19–B23 | Technical data B271–B276

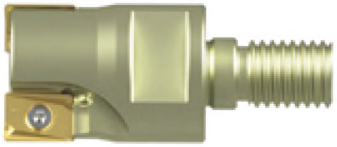
Square shoulder milling tools

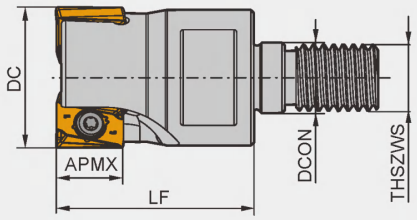
KAPR:90°



QCH-*AN*M*Series

P M K S N





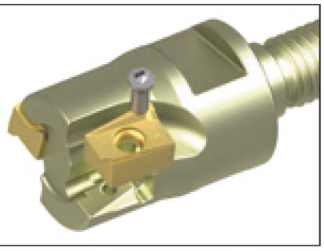
Specification of tools

Type		Stock	Basic dimensions(mm)					Applicable inserts	Number of teeth Z	Weight (kg)
			DC	DCON	LF	APMX	THSZWS			
QCH	-25-AN11-M12-02	△	25	12.5	35	11.2	12	AN□X1105□□-□□	2	0.105
	-32-AN11-M16-03	△	32	17	45	11.2	16		3	0.230
	-40-AN11-M16-04	△	40	17	45	11.2	16		4	0.300
	-32-AN15-M16-02	△	32	17	45	14.5	16	AN□X1506□□-□□	2	0.205
	-40-AN15-M16-03	△	40	17	45	14.5	16		3	0.255

▲Stock available △Make-to-order

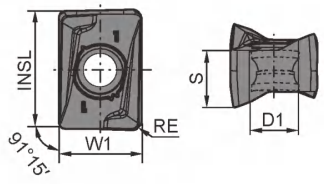
Spare parts

Diameter DC	Inserts	Insert screw	Wrench
			
Ø25-Ø40	AN□X11	I60M3×9	WT09IP
Ø32-Ø40	AN□X15	I60M4×12	WT15IP



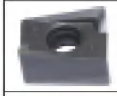
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😐 😐 — — — 😐 😐 😊 ☹ — — 😊 😊 — —
M	Stainless steel	😐 😐 — — — 😐 😐 😐 ☹ — — 😊 😊 — —
K	Cast iron	— — 😐 😐 ☹ 😊 — — — — — — — — ☹
N	Non-ferrous metal	— — — — — — — — — — — — — — 😐 ☹
S	Heat resistant alloy, Ti alloy	— — — — — 😊 😐 😐 😐 — — 😐 ☹ — — —

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ANGX110504PNR-GM	11.85	8.4	5.7	3.5	0.4		★	★					★	★							
	ANGX110508PNR-GM	11.85	8.4	5.7	3.5	0.8		★	★					★	★			●				
	ANGX110520PNR-GM	11.85	8.4	5.7	3.5	2.0		★	★		★			★								
	ANGX150608PNR-GM	15.43	11.0	7.3	4.4	0.8		★	★					★	★			●				
	ANGX150616PNR-GM	15.43	11.0	7.3	4.4	1.6		★	★					★	★							
	ANGX150620PNR-GM	15.43	11.0	7.3	4.4	2.0			★		★			★								
	ANMX110508PNR-GM	11.85	8.4	5.7	3.5	0.8		★	★						★			★				
	ANMX150608PNR-GM	15.43	11.0	7.3	4.4	0.8		★	★					★	★							
	ANGX110502PNR-LH	11.85	8.4	5.7	3.5	0.2															★	
	ANGX110504PNR-LH	11.85	8.4	5.7	3.5	0.4															★	
	ANGX150608PNR-GM	15.43	11.0	7.3	4.4	0.8															★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

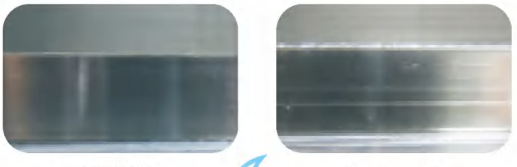
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters		
				Vc(m/min)	fz(mm/z)	apmax(mm)
P	Low carbon steel	⩽180	YBM253 YBG205 YB9320	270(220-350)	0.25(0.1-0.4)	11.2(AN11) 14.5(AN15)
P	Alloy steel	180-350	YBM253 YBG205 YB9320	240(180-320)	0.2(0.1-0.4)	
M	Stainless stee	⩽270	YB9320 YBM253	200(110-300) 180(150-300)	0.2(0.1-0.3)	
K	Cast iron	180-260	YBD152 YBD252	270(150-300) 220(120-320)	0.25(0.1-0.4) 0.2(0.1-0.3)	
N	Aluminium alloy	--	YD101	-LH		
				300-	0.2(0.08-0.4)	
S	Difficult-to-machine materials	⩽400	YBS303	100(60-120)	0.15(0.1-0.25)	

Case for EMP13

Workpiece material: NAK80(HRC36)
Tool: EMP13-032-G32-AN15-02C
Insert: ANGX150608PNR-GM/YBG205
Cutting data: fz=0.1mm/z,
Vc=220m/min,
ae=10mm,
ap=14.5mm
Cutting condition: Dry cutting

●Surface quality comparison



EMP13 Company A

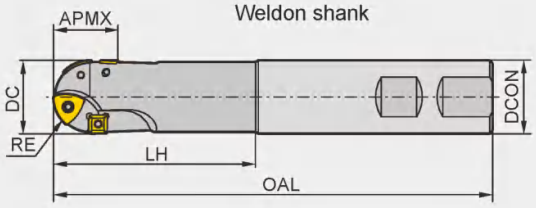
Surface quality and perpendicularity of workpiece machined by EMP13 is obviously superior to that of company A.

Profile milling tools



BMR01 P M K





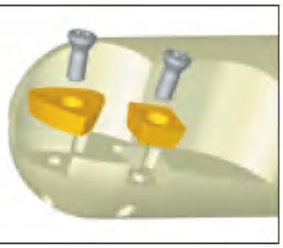
Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts				Weight (kg)
			RE	DC	APMX	DCON	OAL	LH	Type	Quantity	Type	Quantity	
BMR01	**-020-XP20-S**	▲	10	20	20	20	125	50	ZDET08T2CYR10	2	SPMT060304	2	0.3
	-020-XP20-M	▲	10	20	20	20	150	75	ZDET08T2CYR10	2	SPMT060304	2	0.3
	-020-XP20-L	▲	10	20	20	20	200	100	ZDET08T2CYR10	2	SPMT060304	2	0.4
	-025-XP25-S	▲	12.5	25	23	25	150	70	ZDET1103CYR12.5	2	SPMT060304	2	0.5
	-025-XP25-M	▲	12.5	25	23	25	175	95	ZDET1103CYR12.5	2	SPMT060304	2	0.6
	-025-XP25-L	▲	12.5	25	23	25	200	100	ZDET1103CYR12.5	2	SPMT060304	2	0.7
	-032-XP32-S	▲	16	32	31	32	175	85	ZDET13T3CYR16	2	SDMT090308	2	0.9
	-032-XP32-M	▲	16	32	31	32	200	100	ZDET13T3CYR16	2	SDMT090308	2	1.1
	-032-XP32-L	▲	16	32	31	32	250	150	ZDET13T3CYR16	2	SDMT090308	2	1.4
	-040-XP40-S	▲	20	40	41	40	175	85	ZPNT2204CY(R20)	3	SPMT120408	2	1.4
	-040-XP40-M	▲	20	40	41	40	200	100	ZPNT2204CY(R20)	3	SPMT120408	2	1.7
	-040-XP40-L	▲	20	40	41	40	250	150	ZPNT2204CY(R20)	3	SPMT120408	2	2.1
	-050-XP40-S	▲	25	50	45	40	200	100	ZPNT2204CY(R25)	3	SPMT120408	2	1.8
	-050-XP40-M	▲	25	50	45	40	300	100	ZPNT2204CY(R25)	3	SPMT120408	2	2.8
	-063-XP40-S	▲	31.5	63	52	40	200	100	ZPNT2204CY(R31)	4	SPMT120408	2	3.0
	-063-XP40-M	▲	31.5	63	52	40	300	100	ZPNT2204CY(R31)	4	SPMT120408	2	3.5

▲Stock available △Make-to-order

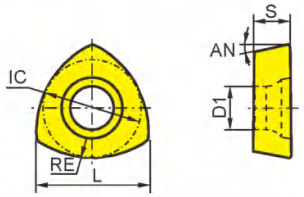
Spare parts

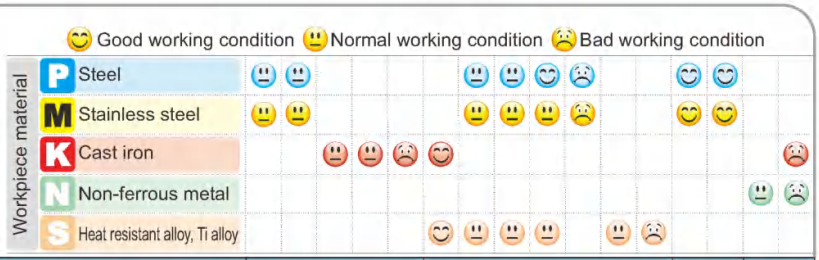
Diameter DC	Screw	Wrench	
			
Ø20-Ø25	I43M2.5×5.7	WT07IP	--
Ø32	I43M4×8	--	WT15IS
Ø40-Ø63	I43M5×11	--	WT20IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

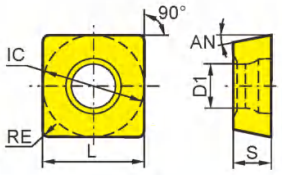
Selection of inserts

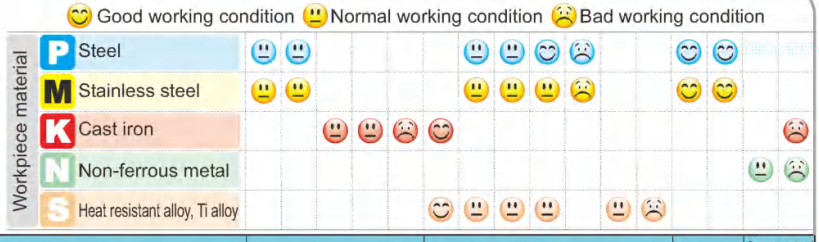




Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		RE	L	IC	S	D1	AN	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ZDET08T2CYR10	10	8.4	6.75	2.78	2.8	14°										○						
	ZDET1103CYR12.5	12.5	10.6	8.5	3.18	2.8	14°										○						
	ZDET13T3CYR16	16	13.2	10.5	3.97	4.4	14°										○						
	ZPNT2204CY(R20)	20	16.1	12.7	4.76	5.56	11°										○						
	ZPNT2204CY(R25)	25	16.9	12.7	4.76	5.56	11°										○						
	ZPNT2204CY(R31)	31.5	17.6	12.7	4.76	5.56	11°										○						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order





Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		RE	L	IC	S	D1	AN	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SPMT060304	0.4	6.35	6.35	3.18	2.8	11°										○						
	SDMT090308	0.8	9.525	9.525	3.18	4.4	15°										○						
	SPMT120408	0.8	12.7	12.70	4.76	5.5	11°										★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	fz(mm/z)
P	Low-carbon steel, Soft steel	≤180	YBM253	180(120-220)	0.25(0.1-0.4)
			YBG302	160(120-220)	0.25(0.1-0.4)
	High-carbon steel, Alloy steel	180-280	YBM253	150(100-200)	0.2(0.1-0.4)
			YBG302	120(100-200)	0.2(0.1-0.4)
	Alloy tool steel	280-350	YBM253	100(80-150)	0.2(0.1-0.3)
			YBG302	100(80-150)	0.2(0.1-0.3)
M	Stainless steel	≤270	YBM253	100(80-150)	0.2(0.1-0.3)
			YBG302	100(80-150)	0.2(0.1-0.3)
K	Cast iron	180-250	YBG302	150(100-180)	0.3(0.2-0.5)

Profile milling tools

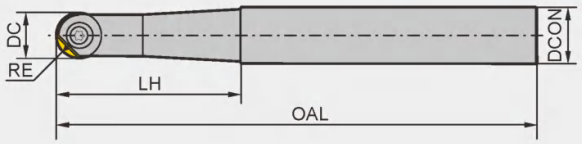

Profile milling


Side milling(R)


Slot milling

BMR02 P M K





Specification of tools

Type		Stock	Basic dimensions(mm)					Weight (kg)
			RE	DC	DCON	OAL	LH	
BMR02	-012-G16-S	▲	6	12	16	110	40	0.1
	-012-G16-M	▲	6	12	16	130	50	0.2
	-012-G16-L	▲	6	12	16	160	50	0.2
	-016-G20-S	▲	8	16	20	140	45	0.3
	-016-G20-M	▲	8	16	20	170	65	0.3
	-016-G20-L	▲	8	16	20	200	65	0.4
	-020-G25-S	▲	10	20	25	160	60	0.5
	-020-G25-M	▲	10	20	25	200	80	0.6
	-020-G25-L	▲	10	20	25	240	80	0.8

▲Stock available △Make-to-order

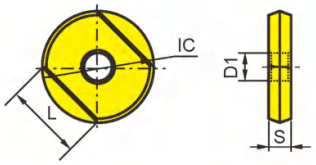
Spare parts

Diameter DC	Screw	Wrench
		
Ø12	I70M4×10TT	WT15IS
Ø16	I70M5×12TT	WT20IS
Ø20	I70M5×16TT	WT20IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



😊 Good working condition 😐 Normal working condition ☹ Bad working condition

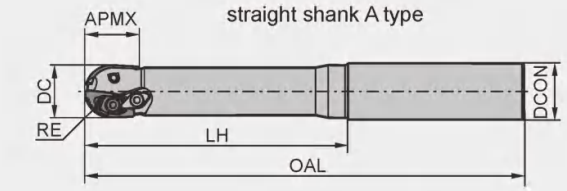
| Workpiece material | | |

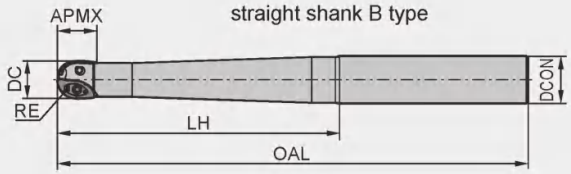
Profile milling tools



BMR03 P M K







Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)	Type	Clamp
			RE	DC	DCON	OAL	LH	APMX				
BMR03	-016-G20-S	▲	8	16	20	150	70	16	2	0.3	B	--
	-016-G20-M	▲	8	16	20	180	80	16	2	0.4	B	
	-020-G25-S	▲	10	20	25	180	80	20	2	0.5	B	
	-020-G25-M	▲	10	20	25	200	100	20	2	0.6	B	
	-020-G25-L	▲	10	20	25	250	150	20	2	0.7	B	
	-020-G25-XL	▲	10	20	25	300	110	20	2	1.0	B	
	-025-G25-S	▲	12.5	25	25	180	80	25	2	0.6	B	
	-025-G25-M	▲	12.5	25	25	200	100	25	2	0.7	B	
	-025-G25-L	▲	12.5	25	25	250	110	25	2	0.8	B	
	-025-G25-XL	▲	12.5	25	25	300	120	25	2	1.0	B	
	-030-G32-S	△	15	30	32	200	120	30	2	1.0	A	WD-208
	-030-G32-M	▲	15	30	32	250	150	30	2	1.3	A	
	-030-G32-L	▲	15	30	32	300	200	30	2	1.6	A	
	-030-G32-XL	△	15	30	32	350	200	30	2	1.9	A	
	-032-G32-S	▲	16	32	32	200	120	32	2	1.1	A	
	-032-G32-M	▲	16	32	32	250	150	32	2	1.4	A	
	-032-G32-L	▲	16	32	32	300	200	32	2	1.6	A	
	-032-G32-XL	△	16	32	32	350	200	32	2	2.0	A	
	-040-G40-S	△	20	40	40	200	120	40	2	1.6	A	CBH5R1
	-040-G40-M	▲	20	40	40	250	150	40	2	2.0	A	
	-040-G40-L	▲	20	40	40	300	200	40	2	2.5	A	
	-040-G40-XL	△	20	40	40	350	200	40	2	3.0	A	

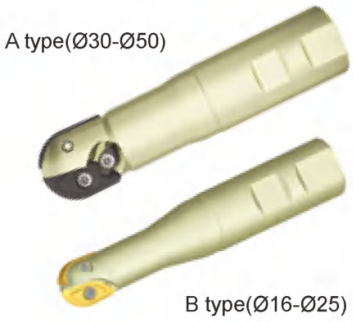
▲Stock available △Make-to-order

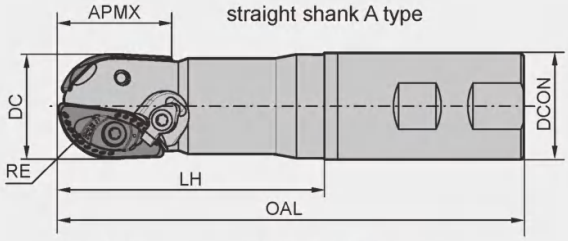
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

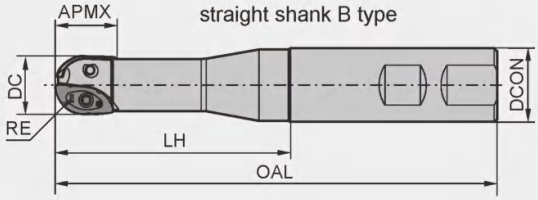
Profile milling tools



BMR03 P M K







Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)	Type	Clamp
			RE	DC	DCON	OAL	LH	APMX				
BMR03	**-016-XP20-M**	▲	8	16	20	111	60	16	2	0.2	B	
	-020-XP25-M	▲	10	20	25	127	70	20	2	0.3	B	
	-020-XP25-L	▲	10	20	25	150	80	20	2	0.4	B	--
	-025-XP25-M	▲	12.5	25	25	137	80	25	2	0.4	B	
	-025-XP25-L	▲	12.5	25	25	200	100	25	2	0.6	B	
	-030-XP32-M	▲	15	30	32	161	100	30	2	0.8	A	
	-030-XP32-L	▲	15	30	32	250	150	30	2	1.3	A	WD-208
	-032-XP32-M	▲	16	32	32	161	100	32	2	0.8	A	
	-032-XP32-L	▲	16	32	32	250	120	32	2	1.3	A	
	-040-XP40-M	▲	20	40	40	175	100	40	2	1.3	A	
	-040-XP40-L	▲	20	40	40	250	120	40	2	2.0	A	CBH5R1
	-050-XP50-M	▲	25	50	50	200	100	50	2	2.5	A	
	-050-XP50-L	▲	25	50	50	250	150	50	2	3.1	A	

▲Stock available △Make-to-order

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

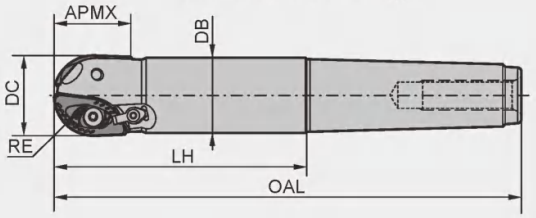
Profile milling tools



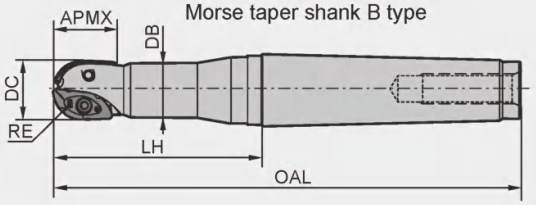
BMR03 P M K



Morse taper shank A type



Morse taper shank B type



Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)	Type	Clamp
			RE	DC	DB	OAL	LH	APMX				
BMR03	-020-MT3-M	▲	10	20	18.7	156	70	20	2	0.4	B	--
	-020-MT3-L	△	10	20	18.7	186	100	20	2	0.4	B	
	-025-MT3-M	▲	12.5	25	23.5	156	70	25	2	0.4	B	
	-025-MT3-L	△	12.5	25	23.5	186	100	25	2	0.4	B	
	-030-MT4-M	▲	15	30	28.2	189	70	30	2	0.8	A	WD-208
	-030-MT4-L	△	15	30	28.2	229	120	30	2	1.0	A	
	-032-MT4-M	▲	16	32	29.2	179	70	32	2	0.9	A	
	-032-MT4-L	△	16	32	29.2	209	100	32	2	0.9	A	
	-040-MT4-M	▲	20	40	36.9	199	100	40	2	1.0	A	CBH5R1
	-040-MT5-L	▲	20	40	36.9	226	90	40	2	1.8	A	
	-040-MT5-XL	▲	20	40	36.9	256	120	40	2	2.0	A	
	-050-MT5-M	▲	25	50	46.8	236	100	50	2	2.2	A	
	-050-MT5-L	▲	25	50	46.8	286	150	50	2	2.9	A	

▲Stock available △Make-to-order

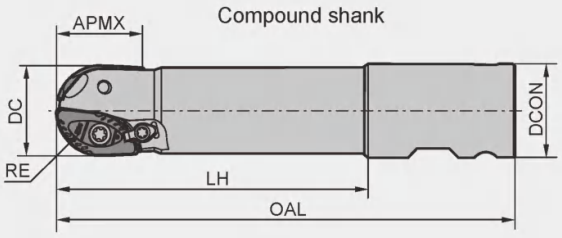
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Profile milling tools



BMR03 P M K





Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)	Clamp
			RE	DC	DCON	OAL	LH	APMX			
BMR03	-040-XPX-M	▲	20	40	50.8	250	170	40	2	1.3	CBH5R1
	-040-XPX-L	▲	20	40	50.8	300	220	40	2	3.1	
	-040-XPX-XL	▲	20	40	50.8	350	270	40	2	3.5	
	-050-XPX-M	▲	25	50	50.8	250	170	50	2	3.1	
	-050-XPX-L	▲	25	50	50.8	300	200	50	2	3.8	
	-050-XPX-XL	▲	25	50	50.8	350	270	50	2	4.4	

▲Stock available △Make-to-order

Spare parts

Diameter DC	Clamp	Screw	Wrench	
Ø16	--	I60M2.5×6.5	--	WT07P
Ø20	--	I60M3.5×08TT		WT10IP
Ø25	--	I60M4×10		WT15S
Ø30	WD-208	I60M5×13	WT20IT	--
Ø32	WD-208	I60M5×13		
Ø40	CBH5R1	I43M6×16	WT25IT	
Ø50	CBH5R1	I43M8×21 I43M6×16	WT25IT WT30IT	



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

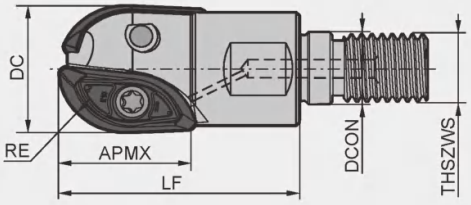
Profile milling tools



QCH-*XPHT*M*Series

P M K





Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Weight (kg)
			DC	RE	DCON	LF	APMX	THSZWS			
QCH	-16-XPHT16-M10	▲	16	8	10.5	28	16	10	XPHT16R0803-GM	2	0.036
	-20-XPHT20-M12	▲	20	10	12.5	30	20	12	XPHT20R10T3-GM	2	0.051
	-25-XPHT25-M12	▲	25	12.5	12.5	35	25	12	XPHT25R1204-GM	2	0.071
	-30-XPHT30-M16	▲	30	15	17	45	30	16	XPHT30R1506-GM	2	0.140
	-32-XPHT32-M16	▲	32	16	17	45	32	16	XPHT32R1606-GM	2	0.162

▲Stock available △Make-to-order

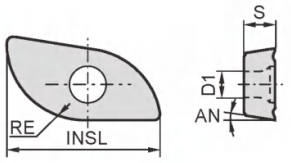
Spare parts

Diameter DC	Screw	Wrench		
				
Ø16	I60M2.5×6.5	WT07IP	--	--
Ø20	I60M3.5×08TT	WT10IP	--	--
Ø25	I60M4×10	WT15IP	--	--
Ø30	I60M5×13.2	--	--	WT20IT
Ø32	I60M5×13.2	--		



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts

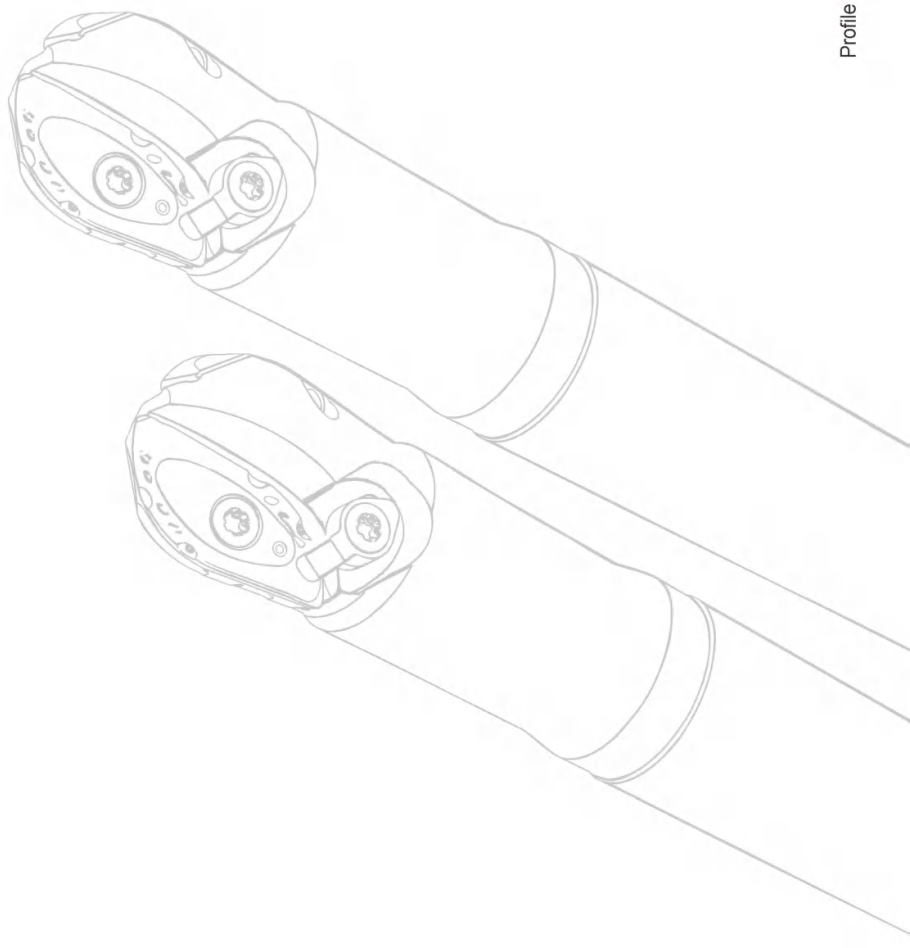


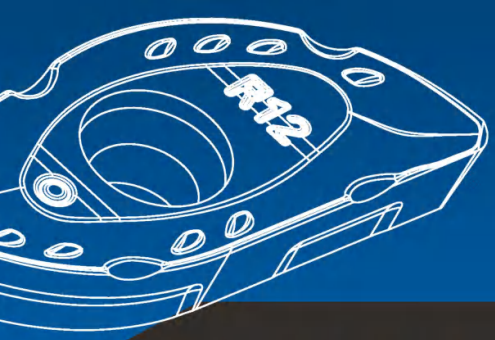
Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		RE	D1	S	AN	INSL	Applicable tools	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**XPHT16R0803-GM**	8	3.1	3.18	9°	16	ø16										★						
	XPHT20R10T3-GM	10	4.0	3.97	9°	20	ø20										★						
	XPHT25R1204-GM	12.5	4.7	4.76	9°	25	ø25										★						
	XPHT30R1506-GM	15	5.8	6.35	11°	30	ø30										★						
	XPHT32R1606-GM	16	5.8	6.35	9°	32	ø32										★						
	XPHT40R2007-GM	20	6.7	7.94	9°	40	ø40										★						
	XPHT50R2507-GM	25	9.2	7.94	9°	50	ø50										★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order







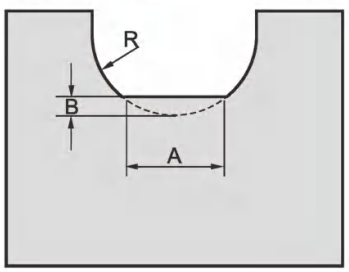
BMR03

Ball Nose End Milling Tool Series

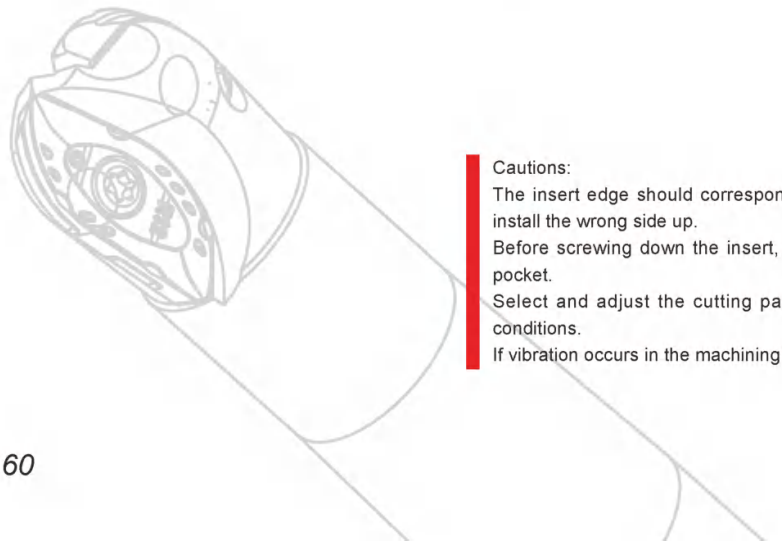


- The unique chipbreaker and big rake angle can effectively control the curling and flowing direction of chips and reduce the cutting force, improving workpiece surface quality and tool life.
- After precise grinding of periphery and locating surface, the insert can sufficiently ensure the shape accuracy of cutting edge and the precision of installation and location, improving installation security and workpiece precision after machining.
- The concave structure of the flank can effectively enhance the strength of cutting edge and prevent scraping between the clearance face and workpiece surface. Therefore, it improves the workpiece surface quality and prolongs the life of insert.
- The designs of cutting edge over center and a large negative rake angle make it possible to cut vertically, thus anti-breakage capability is enhanced.
- The rough ball nose milling cutters with large diameter adopt the top and hole clamping style, so insert clamping becomes more firm and stable. The machining is also highly efficient even under poor conditions such as long overhang and large vibration, etc.
- The adapter types include straight shank, Weldon shank, Morse taper shank and combination shank.

Slot shape after machining

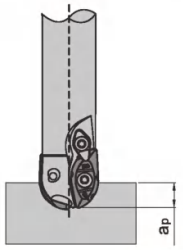
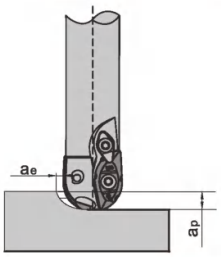
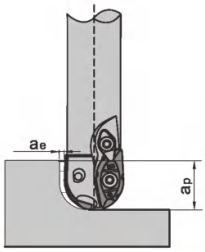


R	A	B
08	1.7	0.09
10	2.2	0.12
12.5	3.0	0.18
15	3.9	0.20
16	3.5	0.22
20	3.6	0.24
25	3.8	0.26



Cautions:
The insert edge should correspond to the locating face of insert pocket in the tool. Don't install the wrong side up.
Before screwing down the insert, confirm the good connection between insert and insert pocket.
Select and adjust the cutting parameters according to machine power and machining conditions.
If vibration occurs in the machining process, cutting speed should be reduced properly.

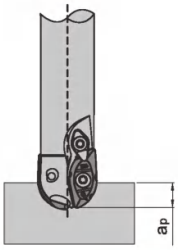
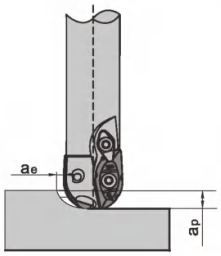
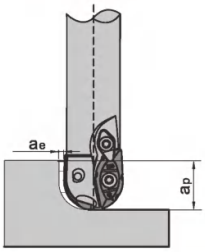
Recommended cutting parameters Diameter Ø16

Operations						
Workpiece material	Cutting parameters	Slot milling	Side milling (slight)		Side milling (deep)	Insert grade
Medium carbon steel Hardness 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	4	4	8	16	
	a_e(mm)	--	3	4	1.5	
Alloy steel Hardness 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	4	4	8	16	
	a_e(mm)	--	3	4	1.5	
Die steel Hardness 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	4	4	8	16	
	a_e(mm)	--	3	4	1.5	
Hardened steel Hardness 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	4	4	8	--	
	a_e(mm)	--	2	3	--	
Gray cast iron Hardness 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	4	4	8	16	
	a_e(mm)	--	3	4	1.5	
Nodular cast iron Hardness 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	4	4	8	16	
	a_e(mm)	--	3	4	1.5	

Note: 1. Parameters in the table shall be adjusted according to the rigidity of the machine or workpiece.

2. Wind cooling to be preferred.

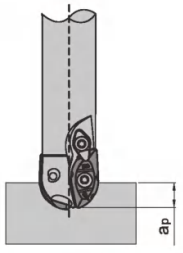
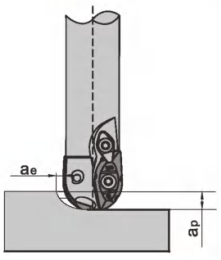
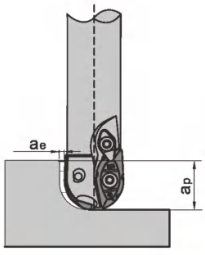
Recommended cutting parameters Diameter Ø20

Operations						
Workpiece material	Cutting parameters	Slot milling	Side milling (slight)		Side milling (deep)	Insert grade
Medium carbon steel Hardness 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	5	5	10	20	
	a_e(mm)	--	4	5	2	
Alloy steel Hardness 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	5	5	10	20	
	a_e(mm)	--	4	5	2	
Die steel Hardness 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	5	5	10	20	
	a_e(mm)	--	4	5	2	
Hardened steel Hardness 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	5	5	10	--	
	a_e(mm)	--	4	5	--	
Gray cast iron Hardness 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	5	5	10	20	
	a_e(mm)	--	4	5	2	
Nodular cast iron Hardness 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	5	5	10	20	
	a_e(mm)	--	4	5	2	

Note: 1. Parameters in the table shall be adjusted according to the rigidity of the machine or workpiece.

2. Wind cooling to be preferred.

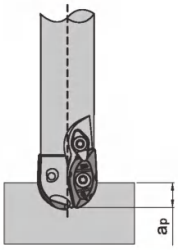
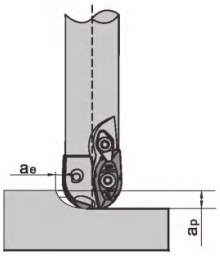
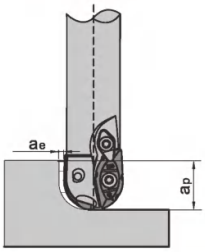
Recommended cutting parameters Diameter Ø25

Operations						
Workpiece material	Cutting parameters	Slot milling	Side milling (slight)		Side milling (deep)	Insert grade
Medium carbon steel Hardness 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	6	6	12.5	25	
	a_e(mm)	--	5	6.5	3	
Alloy steel Hardness 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	6	6	12.5	25	
	a_e(mm)	--	5	6.5	3	
Die steel Hardness 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	6	6	12.5	25	
	a_e(mm)	--	5	6.5	3	
Hardened steel Hardness 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	6	6	12.5	--	
	a_e(mm)	--	5	6.5	--	
Gray cast iron Hardness 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	6	6	12.5	25	
	a_e(mm)	--	5	6.5	3	
Nodular cast iron Hardness 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	6	6	12.5	25	
	a_e(mm)	--	5	6.5	3	

Note: 1. Parameters in the table shall be adjusted according to the rigidity of the machine or workpiece.

2. Wind cooling to be preferred.

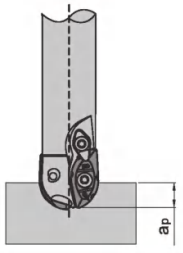
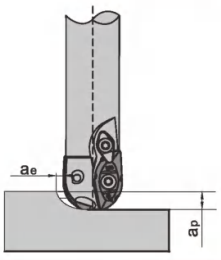
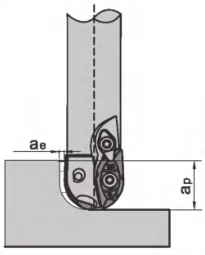
Recommended cutting parameters Diameter Ø30, Ø32

Operations						
Workpiece material	Cutting parameters	Slot milling	Side milling (slight)		Side milling (deep)	Insert grade
Medium carbon steel Hardness 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	10	10	16	28	
	a_e(mm)	--	6	9	6	
Alloy steel Hardness 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	10	10	16	28	
	a_e(mm)	--	6	9	6	
Die steel Hardness 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	10	10	16	28	
	a_e(mm)	--	6	9	6	
Hardened steel Hardness 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	10	10	16	--	
	a_e(mm)	--	6	9	--	
Gray cast iron Hardness 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	10	10	16	28	
	a_e(mm)	--	6	9	6	
Nodular cast iron Hardness 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	10	10	16	28	
	a_e(mm)	--	6	9	6	

Note: 1. Parameters in the table shall be adjusted according to the rigidity of the machine or workpiece.

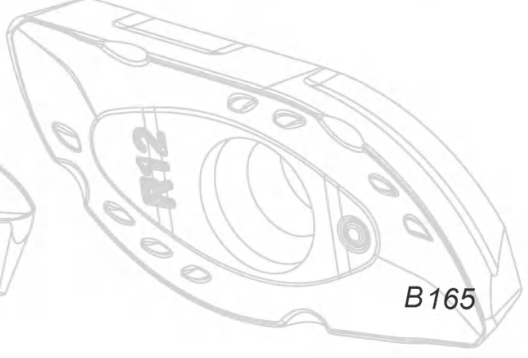
2. Wind cooling to be preferred.

Recommended cutting parameters Diameter Ø40

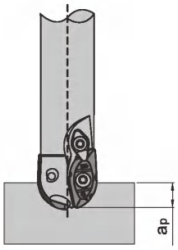
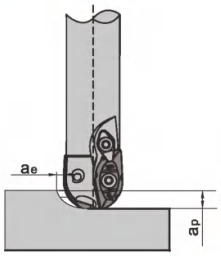
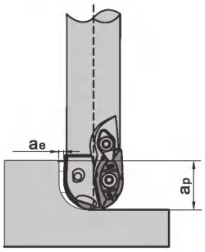
Operations						
Workpiece material	Cutting parameters	Slot milling	Side milling (slight)		Side milling (deep)	Insert grade
Medium carbon steel Hardness 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	
Alloy steel Hardness 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	
Die steel Hardness 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	
Hardened steel Hardness 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	12	10	20	--	
	a_e(mm)	--	8	12	--	
Gray cast iron Hardness 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	
Nodular cast iron Hardness 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	

Note: 1. Parameters in the table shall be adjusted according to the rigidity of the machine or workpiece.

2. Wind cooling to be preferred.



Recommended cutting parameters Diameter Ø50

Operations						
Workpiece material	Cutting parameters	Slot milling	Side milling (slight)		Side milling (deep)	Insert grade
Medium carbon steel Hardness 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	15	10	25	40	
	a_e(mm)	--	10	15	10	
Alloy steel Hardness 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	15	10	25	40	
	a_e(mm)	--	10	15	10	
Die steel Hardness 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	15	10	25	40	
	a_e(mm)	--	10	15	10	
Hardened steel Hardness 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	15	10	25	--	
	a_e(mm)	--	10	15	--	
Gray cast iron Hardness 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	15	10	25	40	
	a_e(mm)	--	10	15	10	
Nodular cast iron Hardness 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	15	10	25	40	
	a_e(mm)	--	10	15	10	

Note: 1. Parameters in the table shall be adjusted according to the rigidity of the machine or workpiece.

2. Wind cooling to be preferred.

Profile milling tools


Side milling(R)

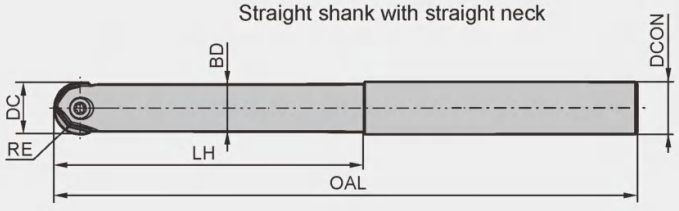
Slot milling

Profile milling

BMR04 P M K



Straight shank with straight neck



Specification of tools

Type		Stock	Basic dimensions(mm)						Weight (kg)
			RE	DC	DCON	BD	LH	OAL	
BMR04	-012-G12-M	▲	6	12	12	11	35	125	0.1
	-012-G12-L	△	6	12	12	11	45	150	0.1
	-016-G16-M	▲	8	16	16	14	40	150	0.2
	-016-G16-L	△	8	16	16	14	55	180	0.3
	-020-G20-M	▲	10	20	20	18	65	180	0.4
	-020-G20-L	△	10	20	20	18	100	250	0.6
	-025-G25-M	▲	12.5	25	25	23	70	200	0.7
	-025-G25-L	△	12.5	25	25	23	100	250	0.9
	-030-G32-M	▲	15	30	32	27	130	250	1.2
	-030-G32-L	△	15	30	32	27	150	300	1.5
	-032-G32-M	▲	16	32	32	29	80	250	1.4
	-032-G32-L	△	16	32	32	29	109	300	1.7

▲Stock available △Make-to-order

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Profile milling tools


Side milling(R)

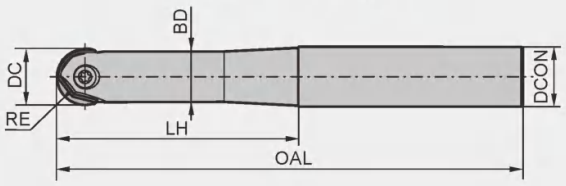
Slot milling

Profile milling

BMR04 P M K



Straight shank with taper neck



Specification of tools

Type		Stock	Basic dimensions(mm)						Weight (kg)
			RE	DC	DCON	BD	LH	OAL	
BMR04	-012-G16-M	▲	6	12	16	11	50	125	0.2
	-012-G16-L	△	6	12	16	11	60	150	0.2
	-016-G20-M	▲	8	16	20	14	60	150	0.3
	-016-G20-L	△	8	16	20	14	80	180	0.3
	-020-G25-M	▲	10	20	25	18	75	180	0.6
	-020-G25-L	△	10	20	25	18	85	200	0.6
	-025-G32-M	▲	12.5	25	32	23	90	200	1.0
	-025-G32-L	△	12.5	25	32	23	110	250	1.3
	-030-G40-M	▲	15	30	40	27	110	250	2.0
	-030-G40-L	△	15	30	40	27	125	300	2.4
	-032-G40-M	▲	16	32	40	29	110	250	2.0
	-032-G40-L	△	16	32	40	29	125	300	2.4

▲Stock available △Make-to-order

Spare parts

Diameter	Screw	Wrench	
			
Ø12	I70M4×10TT	WT15IP	--
Ø16	I70M5×12TT	WT20IP	--
Ø20	I70M5×16TT	WT20IP	--
Ø25	I70M6×20TT	WT20IP	--
Ø30	I70M8×25TT	--	WT30IT
Ø32	I70M8×25TT	--	WT30IT



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Profile milling tools

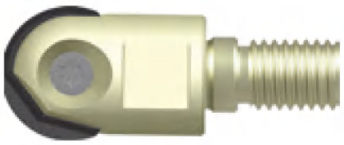

Side milling(R)

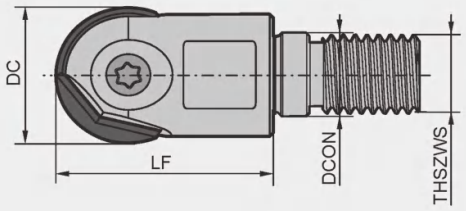
Slot milling

Profile milling

QCH-*ZOHX*M*Series

P M K S N





Specification of tools

Type		Stock	Basic dimensions(mm)				Applicable inserts	Weight (kg)
			DC	DCON	LF	THSZWS		
QCH	-16-ZOHX16-M8	▲	16	8.5	28	8	ZOHX1604-□□	0.029
	-20-ZOHX20-M10	▲	20	10.5	30	10	ZOHX2005-□□	0.048
	-25-ZOHX25-M12	▲	25	12.5	35	12	ZOHX2506-□□	0.087
	-30-ZOHX30-M16	▲	30	17	45	16	ZOHX3007-□□	0.170
	-32-ZOHX32-M16	▲	32	17	45	16	ZOHX3207-□□	0.180

▲Stock available △Make-to-order

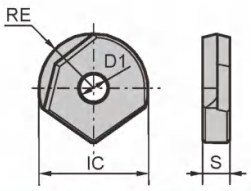
Spare parts

Diameter DC	Screw	Wrench	
			
Ø16	I70M5×12TT	WT20IP	--
Ø20	I70M5×16TT	WT20IP	--
Ø25	I70M6×20TT	WT20IP	--
Ø30	I70M8×25TT	--	WT30IT
Ø32	I70M8×25TT	--	WT30IT



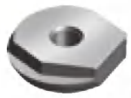
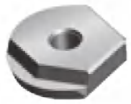
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material																							
P	Steel	😐	😐					😐	😐	😊	☹	😊			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹				😊	😊		
K	Cast iron			😐	😐	☹	😊											☹
N	Non-ferrous metal																😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐			😐	☹				

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating								Cermet		Cemented carbide	
		RE	IC	S	D1	Applicable tools ØD	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBH053	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ZOHX1203-GF	6	12	3	4	Ø12											★						
	ZOHX1604-GF	8	16	4	5	Ø16											★						
	ZOHX2005-GF	10	20	5	5	Ø20											★						
	ZOHX2506-GF	12.5	25	6	6	Ø25											★						
	ZOHX3007-GF	15	30	7	8	Ø30											★						
	ZOHX3207-GF	16	32	7	8	Ø32											★						
	ZOHX1203-GM	6	12	3	4	Ø12											★						
	ZOHX1604-GM	8	16	4	5	Ø16											★						
	ZOHX2005-GM	10	20	5	5	Ø20											★						
	ZOHX2506-GM	12.5	25	6	6	Ø25											★						
	ZOHX3007-GM	15	30	7	8	Ø30											★						
	ZOHX3207-GM	16	32	7	8	Ø32											★						
	ZOHX1203-HM	6	12	3	4	Ø12											★						
	ZOHX1604-HM	8	16	4	5	Ø16											★						
	ZOHX2005-HM	10	20	5	5	Ø20											★						
	ZOHX2506-HM	12.5	25	6	6	Ø25											★						
	ZOHX3007-HM	15	30	7	8	Ø30											★						
	ZOHX3207-HM	16	32	7	8	Ø32											★						

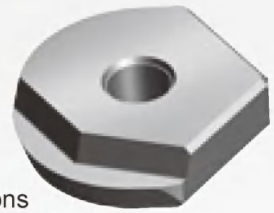
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



BMR04

Ball Nose End Finishing Milling Tool Series

-GM



- 0° rake angle, only one clearance angle, high edge strength, suitable for conditions requiring high cutting efficiency.

-GF

- With positive rake angle and double clearance angle, the design of curved cutting edge combines sharpness and strength. The edge with high precision is applicable under stable machining conditions and in conditions requiring high workpiece profile precision.

-HM



- The combination of variable rake angle and streamlined cutting edge takes full consideration of the different cutting edges
- The cutting conditions at the position take into account cutting sharpness and edge strength, Improved processing stability

The inserts are a combination of ultra-fine cemented carbide substrate and nano coating grade YBG252. With excellent cutting performance, they are suitable for semi-finish to finish machining.

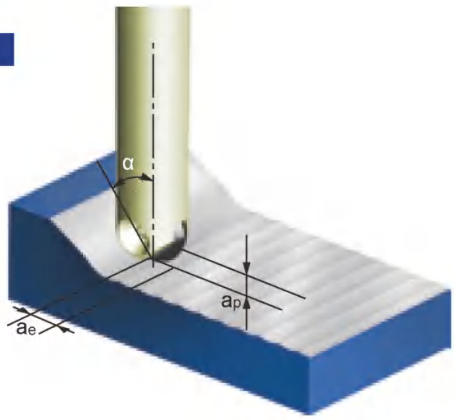
Calculation of cutting speed for BMR02/04 series ball nose end mills

1.When the tool axial line is vertical to the surface being machined,

$$N = \frac{1000Vc}{\pi Dc}(r/min)$$

$$Dc = 2\sqrt{a_p(D-a_p)}$$

N：rotating speed
Vc：actual cutting speed
Dc：effective cutting diameter
D：tool nominal diameter
a_p：axial cutting depth



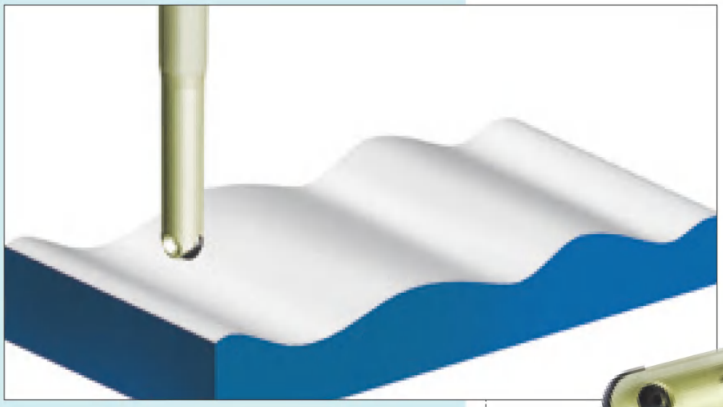
2.When there is an inclined angle between the tool axial line and the surface being machined, the recommended cutting speed should be multiplied by a factor in the table below to obtain the cutting speed used for programming.

Diameter(mm)		Ø12		Ø16		Ø20		Ø25		Ø30		Ø32	
Cutting depth a_p(mm)		0.2	0.5	0.2	0.5	0.5	1	0.5	1	0.5	1.5	0.5	1.5
Inclined angle α	15°	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.01	1.00	1.00	1.00	1.00
	30°	1.04	1.01	1.05	1.01	1.02	1.04	1.03	1.04	1.04	1.01	1.04	1.00
	45°	1.16	1.07	1.18	1.10	1.12	1.06	1.14	1.08	1.16	1.06	1.16	1.06
	60°	1.42	1.24	1.47	1.30	1.34	1.21	1.38	1.25	1.42	1.21	1.43	1.22
	75°	2.02	1.60	2.14	1.73	1.83	1.53	1.93	1.62	2.01	1.53	2.04	1.55
	90°	3.92	2.50	4.48	2.87	3.20	2.29	3.57	2.55	3.9	2.29	4.03	2.37

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	Tool specification					
					Ø12	Ø16	Ø20	Ø25	Ø30	Ø32
P	Carbon steel	HB≤180	YBH053	V(m/min)	100~200	100~200	100~200	100~200	100~200	100~200
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3	0.25~0.35	0.25~0.35	0.25~0.35
				a_{pmax}(mm)	0.8	1	1.25	1.5	2	2
				a_{emax}(mm)	0.8	1	1.25	1.5	2	2
	Alloy stee	HB180~280		V(m/min)	80~180	80~180	80~180	80~180	80~180	80~180
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3	0.25~0.35	0.25~0.35	0.25~0.35
				a_{pmax}(mm)	0.8	1	1.25	1.5	2	2
				a_{emax}(mm)	0.8	1	1.25	1.5	2	2
	Hardened steel	HRC55~65		V(m/min)	60~100	60~100	60~100	60~100	60~100	60~100
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3	0.25~0.35	0.25~0.35	0.25~0.35
				a_{pmax}(mm)	0.4	0.5	0.6	0.8	1	1
				a_{emax}(mm)	0.4	0.5	0.6	0.8	1	1
M	Stainless steel	HB≤270		V(m/min)	70~150	70~150	70~150	70~150	70~150	70~150
				fz(mm/z)	0.1~0.2	0.1~0.25	0.1~0.25	0.2~0.3	0.2~0.3	0.2~0.3
				a_{pmax}(mm)	0.6	0.8	1	1.25	1.5	1.5
				a_{emax}(mm)	0.6	0.8	1	1.25	1.5	1.5
K	Cast iron	HB180-250		V(m/min)	160~300	160~300	160~300	160~300	160~300	160~300
				fz(mm/z)	0.2~0.3	0.25~0.35	0.25~0.35	0.3~0.4	0.3~0.4	0.3~0.4
				a_{pmax}(mm)	1	1.5	1.8	2	2.5	2.5
				a_{emax}(mm)	1	1.5	1.8	2	2.5	2.5

Case for BMR04

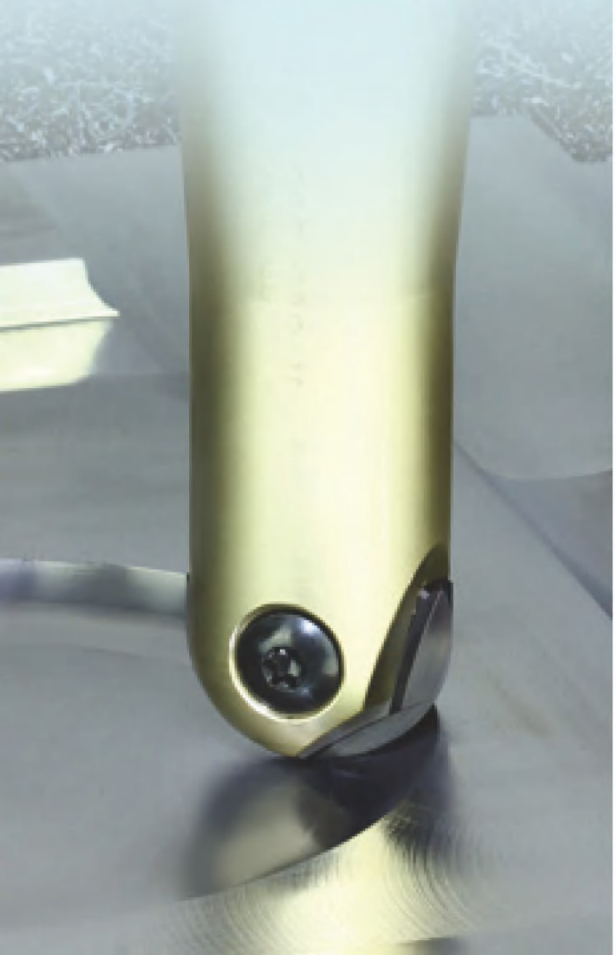




Workpiece material: 42CrMo (HRC35)
Cooling system: Dry cutting
Machine: Vertical machining center
Cutting parameters:
Vc=150m/min
a_p=0.1mm
fz=0.2mm/Z

Tool type: BMR04-020-G25-M

Insert type/grade: ZOHX2005-GM/YBG252

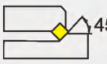


●Abrasion comparison of inserts after milling curved face

	ZCC-CT	Other company product
After 60 minutes of cutting	 Abrasion on the clearance face 0.08	 Abrasion on the clearance face 0.10
After 120 minutes of cutting	 Abrasion on the clearance face 0.12	 Abrasion on the clearance face 0.16

Side and face milling tools code key

Cutter style	
FM	Face milling
EM	Square shoulder milling
HM	Helical end milling
SM	Side and face milling
BM	Profile milling
CM	Chamfer milling
XM	Special milling

Approach angle		
P	90°	
E	75°	
D	60°	
A	45°	
R		

Sequence number of series

Cutting diameter ØD (mm)

Cutting width of milling tools

Coupling structure and demension			
A	A type of coupling	D	D type of coupling
B	B type of coupling	K	Mounting by keyway
C	C type of coupling		

SM P 03 - 160 × 16 - K40 - M P 12 - 12 L

Insert shape	
C	Diamond with 80°
D	Diamond with 55°
R	Round
S	Square
T	Regular triangle
V	Diamond with 35°
M	Diamond with 86°

Insert clearance angle	
N	0°
B	5°
C	7°
P	11°
D	15°
E	20

Length of cutting edge						
Diameter of IC	Insert shape					
	C	D	R	S	T	V
5.556	—	—	—	—	09	—
6.350	06	07	—	—	11	—
9.525	09	11	09	09	16	16
12.700	12	15	12	12	22	22
15.875	16	19	15	15	27	—
19.050	19	—	19	19	33	—
25.400	25	—	25	25	44	—

Cutting direction

(R: Right L: Left)

Number of teeth

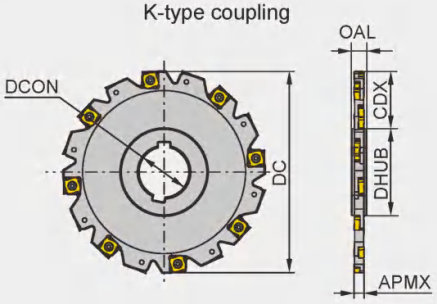
Side and face milling tools

Slot milling

SMP01 P M K



K-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	DHUB	OAL	APMX	CDX				
SMP01 Mounting by keyway	**-100×4-K27-SN12-10**	△	100	27	45	12	4	25	XSEQ1202	10	K	0.2
	-125×4-K40-SN12-12	△	125	40	56	12	4	32		12	K	0.3
	-160×4-K40-SN12-16	△	160	40	67	12	4	44		16	K	0.5
	-100×5-K27-SN12-10	△	100	27	45	12	5	25	XSEQ1203	10	K	0.2
	-125×5-K40-SN12-12	△	125	40	56	12	5	32		12	K	0.3
	-160×5-K40-SN12-16	△	160	40	67	12	5	44		16	K	0.6
	-100×6-K27-SN12-10	△	100	27	45	12	6	25	XSEQ12T3	10	K	0.3
	-125×6-K40-SN12-12	△	125	40	56	12	6	32		12	K	0.4
	-160×6-K40-SN12-16	△	160	40	67	12	6	44		16	K	0.7
	-200×6-K50-SN12-18	△	200	50	71	12	6	62		18	K	1.1
	-250×6-K50-SN12-24	△	250	50	71	12	6	87		24	K	1.7
	-100×7-K27-SN12-10	△	100	27	45	12	7	25	XSEQ1204	10	K	0.3
	-125×7-K40-SN12-12	△	125	40	56	12	7	32		12	K	0.4
	-160×7-K40-SN12-16	△	160	40	67	12	7	44		16	K	0.8
	-200×7-K50-SN12-18	△	200	50	71	12	7	62		18	K	1.2
	-250×7-K50-SN12-24	△	250	50	71	12	7	87		24	K	1.9
	-100×8-K27-SN12-10	△	100	27	45	12	8	25	XSEQ12T4	10	K	0.3
	-125×8-K40-SN12-12	△	125	40	56	12	8	32		12	K	0.5
	-160×8-K40-SN12-16	△	160	40	67	12	8	44		16	K	0.9
	-200×8-K50-SN12-18	△	200	50	71	12	8	62		18	K	1.4
	-250×8-K50-SN12-24	△	250	50	71	12	8	87		24	K	2.2

▲Stock available △Make-to-order

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

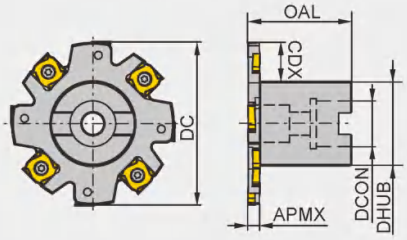
Side and face milling tools

Slot milling

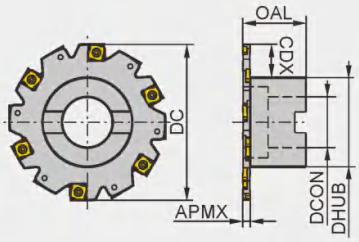
SMP01 P M K



A-type coupling



B-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DCON	DHUB	OAL	APMX	CDX				
SMP01 Arbor mounting	**-063×4-A22-SN12-06**	△	△	63	22	32	40	4	14	XSEQ1202	6	A	0.2
	-080×4-A22-SN12-08	△	△	80	22	40	40	4	18		8	A	0.4
	-100×4-A27-SN12-10	△	△	100	27	48	50	4	23		10	A	0.6
	-063×5-A22-SN12-06	△	△	63	22	32	40	5	14	XSEQ1203	6	A	0.2
	-080×5-A22-SN12-08	△	△	80	22	40	40	5	18		8	A	0.4
	-100×5-A27-SN12-10	△	△	100	27	48	50	5	23		10	A	0.7
	-063×6-A22-SN12-06	△	△	63	22	32	40	6	14	XSEQ12T3	6	A	0.2
	-080×6-A22-SN12-08	△	△	80	22	40	40	6	18		8	A	0.5
	-100×6-A27-SN12-10	△	△	100	27	48	50	6	23		10	A	0.7
	-125×6-B32-SN12-12	△	△	125	32	70	50	6	30		12	B	1.0
	-160×6-B40-SN12-16	△	△	160	40	70	50	6	41		16	B	1.3
	-063×7-A22-SN12-06	△	△	63	22	32	40	7	14	XSEQ1204	6	A	0.2
	-080×7-A22-SN12-08	△	△	80	22	40	40	7	18		8	A	0.5
	-100×7-A27-SN12-10	△	△	100	27	48	50	7	23		10	A	0.7
	-125×7-B32-SN12-12	△	△	125	32	70	50	7	30		12	B	1.1
	-160×7-B40-SN12-16	△	△	160	40	70	50	7	41		16	B	1.4
	-063×8-A22-SN12-06	△	△	63	22	32	40	8	14	XSEQ12T4	6	A	0.2
	-080×8-A22-SN12-08	△	△	80	22	40	40	8	18		8	A	0.5
	-100×8-A27-SN12-10	△	△	100	27	48	50	8	23		10	A	0.8
	-125×8-B32-SN12-12	△	△	125	32	70	50	8	30		12	B	1.1
	-160×8-B40-SN12-16	△	△	160	40	70	50	8	41		16	B	1.5

▲Stock available △Make-to-order

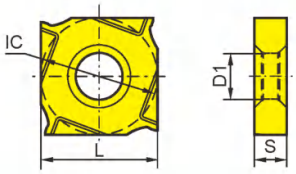
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

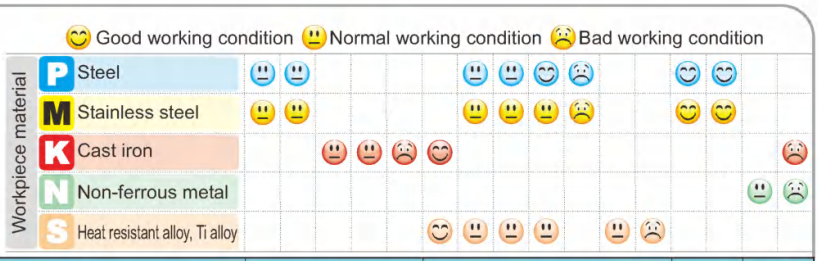
Spare parts

Diameter DC	Edge width a_p	Screw	Wrench
			
Ø63-Ø160	4	I91M4×3.2X	WT08IS/IP
Ø63-Ø160	5	I91M4×4.2X	
Ø63-Ø250	6	I91M4×5.1X	
Ø63-Ø250	7	I91M4×6.1X	
Ø63-Ø250	8	I91M4×7.1X	



Selection of inserts





Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating							Cermet		Cemented carbide	
		IC	L	S	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**XSEQ1202**	12.7	12.7	2.3	5.0										★						
	XSEQ1203	12.7	12.7	3.0	5.0										★						
	XSEQ12T3	12.7	12.7	3.5	5.0										★						
	XSEQ1204	12.7	12.7	4.0	5.0										★						
	XSEQ12T4	12.7	12.7	4.5	5.0										★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Cutting parameters		Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	fz(mm/z)
P	Low-carbon steel, Soft steel	≤180	YBG302	150 (100-200)	0.15(0.1-0.3)
	High-carbon steel, Alloy steel	180-280	YBG302	120 (80-200)	0.15(0.1-0.3)
	Alloy tool steel	280-350	YBG302	100 (80-200)	0.15(0.1-0.3)
M	Stainless steel	≤270	YBG302	100 (80-200)	0.08(0.05-0.15)
K	Cast iron	180-250	YBG302	150 (100-250)	0.08(0.05-0.15)

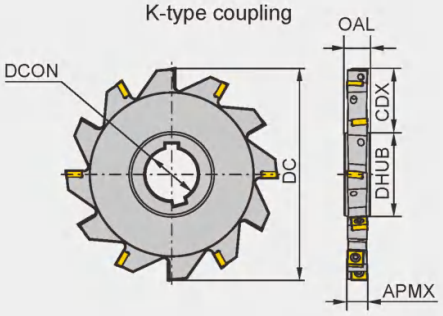
Side and face milling tools

Slot milling

SMP03 P M K



K-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			DC	DHUB	DCON	CDX	APMX	OAL				
SMP03 Mounting by keyway	**-080×8-K27-MP06-10**	△	80	43	27	17	8	12	MPHT060304-DM	10	K	0.2
	-100×8-K32-MP06-14	△	100	47	32	25	8	12		14	K	0.3
	-100×10-K32-MP06-14	△	100	47	32	25	10	14		14	K	0.4
	-125×10-K40-MP06-16	△	125	55	40	34	10	14		16	K	0.6
	-125×12-K40-MP08-12	△	125	55	40	34	12	16	MPHT080305-DM	12	K	0.7
	-160×12-K40-MP08-14	△	160	62	40	47	12	16		14	K	1.3
	-160×16-K40-MP12-12	△	160	62	40	49	16	20	MPHT120408-DM	12	K	1.6
	-160×18-K40-MP12-12	△	160	62	40	49	18	24		12	K	1.9
	-160×20-K40-MP12-12	△	160	62	40	49	20	26		12	K	2.1
	-200×16-K50-MP12-14	△	200	72	50	62	16	20		14	K	2.5
	-200×18-K50-MP12-14	△	200	72	50	62	18	24		14	K	2.9
	-200×20-K50-MP12-14	△	200	72	50	62	20	26		14	K	3.3

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench	
				
Ø80-Ø125	MP06	I60M2.5x6.5	WT07IP	--
Ø125-Ø160	MP08	I60M3x7	WT09IP	--
Ø160-Ø200	MP12	I60M5x13	--	WT20IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

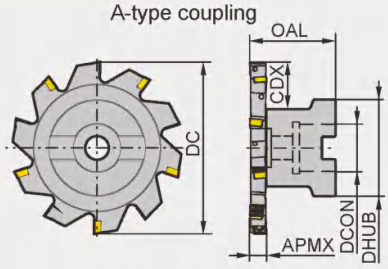
Side and face milling tools

Slot milling

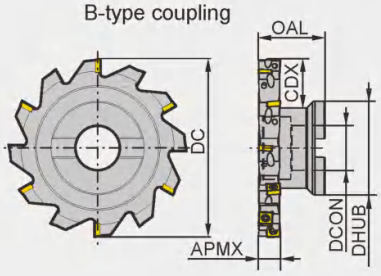
SMP03 P M K



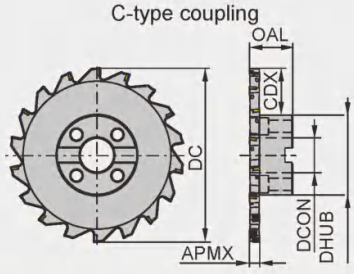
A-type coupling



B-type coupling



C-type coupling



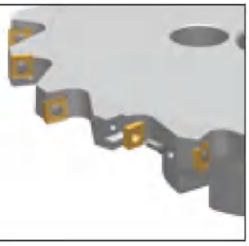
Specification of tools

Type		Stock		Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
		R	L	DC	DHUB	DCON	CDX	APMX	OAL				
SMP03 Arbor mounting	**-080×8-A22-MP06-10**	△	△	80	45	22	21	8	40	MPHT060304-DM	10	A	0.4
	-100×8-B27-MP06-14	△	△	100	55	27	24	8	40		14	B	0.6
	-100×10-B27-MP06-14	△	△	100	55	27	24	10	40		14	B	0.7
	-125×10-B32-MP06-16	△	△	125	65	32	33	10	45		16	B	1.1
	-125×12-B32-MP08-12	△	△	125	65	32	33	12	45	MPHT080305-DM	12	B	1.4
	-160×12-B40-MP08-14	△	△	160	80	40	45	12	50		14	B	1.9
	-200×12-C40-MP08-18	△	△	200	92	40	53	12	50		18	C	3.2
	-125×16-B32-MP12-10	△	△	125	65	32	33	16	50	MPHT120408-DM	10	B	2.3
	-160×16-B40-MP12-12	△	△	160	80	40	45	16	60		12	B	2.3
	-160×18-B40-MP12-12	△	△	160	80	40	45	18	60		12	B	2.4
	-200×16-C40-MP12-14	△	△	200	92	40	53	16	50		14	C	3.6
	-200×18-C40-MP12-14	△	△	200	92	40	53	18	50		14	C	3.9
	-200×20-C40-MP12-14	△	△	200	92	40	53	20	50		14	C	4.2

▲Stock available △Make-to-order

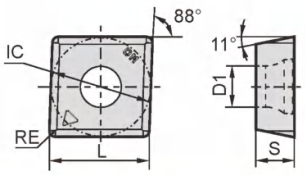
Spare parts

Diameter DC	Inserts	Screw	Wrench	
				
Ø80-Ø125	MP06	I60M2.5×6.5	WT07IP	--
Ø125-Ø200	MP08	I60M3×7	WT09IP	--
Ø125-Ø200	MP12	I60M5×13	--	WT20IS

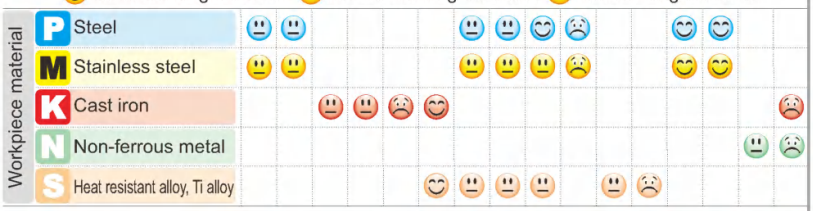


Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



Good working condition Normal working condition Bad working condition

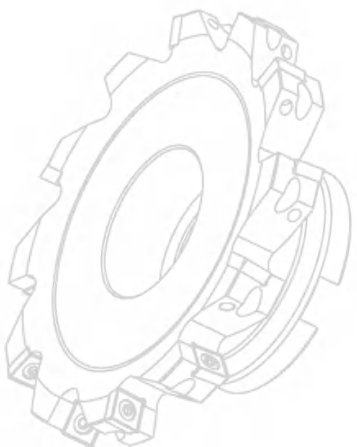


Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		IC	L	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**MPHT060304-DM**	6.35	6.35	3.18	2.8	0.4									★	★						
	MPHT080305-DM	8.3	8.3	3.18	3.4	0.5									★	★						
	MPHT120408-DM	12.7	12.7	4.76	5.56	0.8									★	★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	fz(mm/z)
P	Low-carbon steel, Soft steel	≤180	YBG302	150 (100-200)	0.15(0.1-0.3)
P	High-carbon steel, Alloy steel	180-280	YBG302	120 (80-200)	0.15(0.1-0.3)
P	Alloy tool steel	280-350	YBG302	100 (80-200)	0.15(0.1-0.3)
M	Stainless steel	≤270	YBG302	100 (80-200)	0.08(0.05-0.15)
K	Cast iron	180-250	YBG302	150 (100-250)	0.08(0.05-0.15)





SMP05 Slot Milling

Groove width 1.1~4.8mm.
Maximum cutting depth 5mm.
Multi-function milling holder: slot milling,plunge milling, root cleaning

Slot milling specification code

Slot milling | Weldon shank | Insert | Teeth

SMP05 - 039×3.0 - XP 25 - QC 16- 03

Minimum machining diameter(mm)	
Code	Diameter
25	25
39	39
44	44

Maximum cutting width(mm)	
Code	Cutting width
3.0	3.0
4.8	4.8

Cutter diameter(mm)	
Code	Diameter
25	25
32	32

Cutting edge length code	Inscribed circuler(mm)
16	9.525
22	12.70

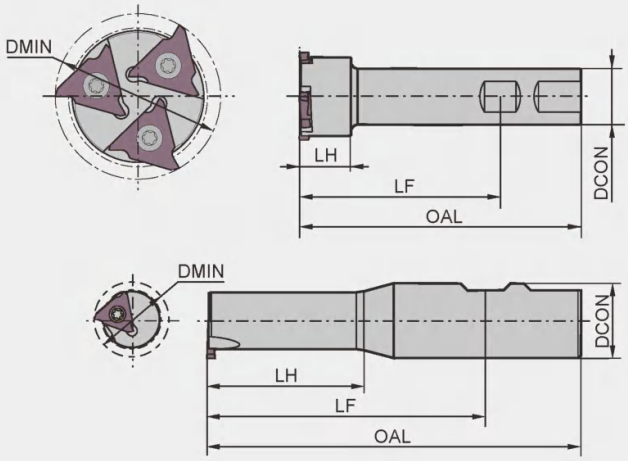
Slot milling tool

Slot milling

SMP05



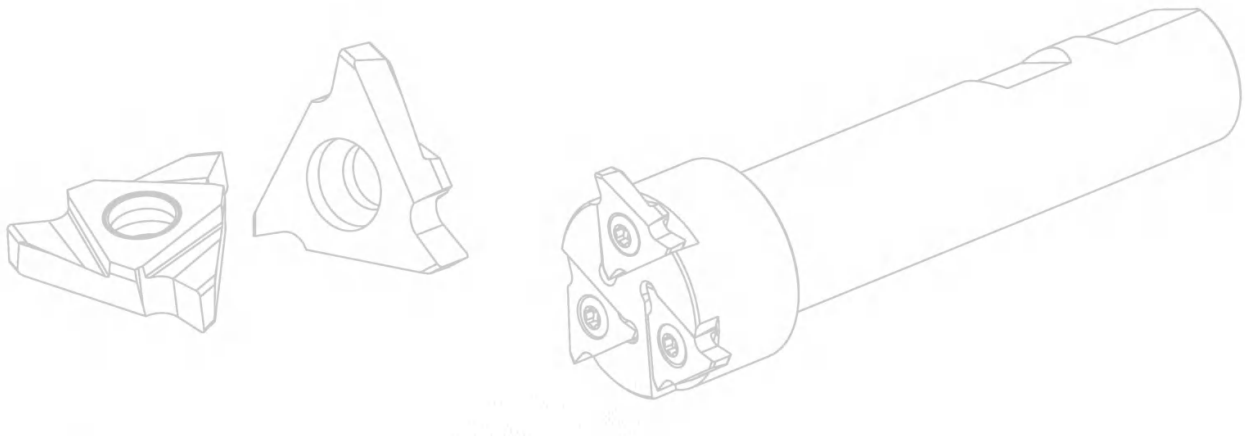
Single tooth slot milling tool



Specification of tools

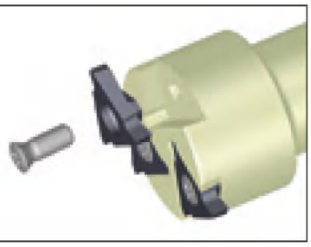
Type		Stock	Basic dimensions(mm)					Number of teeth Z	Applicable inserts	Width(mm)
			DMIN	DCON	LH	LF	OAL			
SMP05	-025×3.0-XP25-QC16-01	△	25	25	40	89	125	1	QC16L 110~300	1.10-3.00
	-039×3.0-XP25-QC16-03	△	39	25	23	89	125	3	QC16L 110~300	1.10-3.00
	-044×4.8-XP25-QC22-03	△	44	25	23	89	125	3	QC22L 125~480	1.25-4.80

▲Stock available △Make-to-order



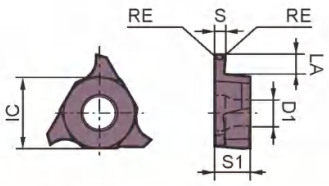
Spare parts

Diameter DMIN	Screw	Wrench
		
ø25	I60M3.5×10	WT15IP
ø39	I60M3.5×10	WT15IP
ø44	I60M5×13	WT20IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material		YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		S±0.025	LA	RE	IC	S1	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	QC16L110-R01	1.10	2.00	R0.1	9.525	3.18	4.4							○	○								
	QC16L125-R02	1.25	2.00	R0.2	9.525	3.18	4.4							○	○								
	QC16L145-R02	1.45	2.00	R0.2	9.525	3.18	4.4							○	○								
	QC16L150-R02	1.50	2.00	R0.2	9.525	3.18	4.4							○	★								
	QC16L175-R02	1.75	2.00	R0.2	9.525	3.18	4.4							○	○								
	QC16L185-R02	1.85	2.50	R0.2	9.525	3.18	4.4							○	○								
	QC16L200-R02	2.00	2.50	R0.2	9.525	3.18	4.4							○	★								
	QC16L250-R02	2.50	2.50	R0.2	9.525	3.18	4.4							○	★								
	QC16L300-R02	3.00	3.00	R0.2	9.525	3.18	4.4							○	★								
	QC22L125-R02	1.25	2.00	R0.2	12.70	4.76	5.5							○	○								
	QC22L145-R02	1.45	2.00	R0.2	12.70	4.76	5.5							○	○								
	QC22L150-R02	1.50	3.50	R0.2	12.70	4.76	5.5							○	★								
	QC22L175-R02	1.75	3.50	R0.2	12.70	4.76	5.5							○	○								
	QC22L185-R02	1.85	3.50	R0.2	12.70	4.76	5.5							○	○								
	QC22L200-R02	2.00	3.50	R0.2	12.70	4.76	5.5							○	★								
	QC22L230-R02	2.30	3.50	R0.2	12.70	4.76	5.5							○	○								
	QC22L250-R03	2.50	4.00	R0.3	12.70	4.76	5.5							○	★								
	QC22L265-R03	2.65	4.00	R0.3	12.70	4.76	5.5							○	○								
	QC22L280-R03	2.80	4.00	R0.3	12.70	4.76	5.5							○	○								
	QC22L300-R03	3.00	4.00	R0.3	12.70	4.76	5.5							○	★								
	QC22L320-R03	3.20	4.00	R0.3	12.70	4.76	5.5							○	○								
	QC22L330-R03	3.30	4.00	R0.3	12.70	4.76	5.5							○	○								
	QC22L350-R03	3.50	5.00	R0.3	12.70	4.76	5.5							○	★								
	QC22L400-R04	4.00	5.00	R0.4	12.70	4.76	5.5							○	★								
	QC22L430-R04	4.30	5.00	R0.4	12.70	4.76	5.5							○	○								
	QC22L450-R04	4.50	5.00	R0.4	12.70	4.76	5.5							○	○								
	QC22L480-R04	4.80	5.00	R0.4	12.70	5.06	5.5							○	○								

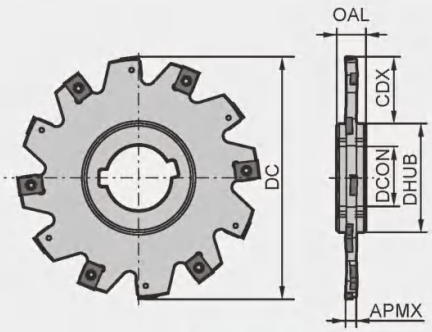
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Side and face milling tools

Slot milling

SMP08 P M K





K-type coupling

Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	DHUB	OAL	APMX	CDX				
SMP08	-063×4-K22-LN1023-08	▲	63	22	34	8	4	12.0		8	K	0.1
	-080×4-K22-LN1023-10	▲	80	22	34	8	4	21.0		10	K	0.1
	-100×4-K27-LN1023-12	▲	100	27	41	12	4	27.0	LNET102304-GM	12	K	0.2
	-125×4-K40-LN1023-14	▲	125	40	55	12	4	32.0		14	K	0.4
	-160×4-K40-LN1023-18	▲	160	40	55	12	4	50.0		18	K	0.6
	-063×5-K22-LN1028-08	▲	63	22	34	8	5	13.0		8	K	0.1
	-080×5-K22-LN1028-10	▲	80	22	34	8	5	21.0		10	K	0.2
	-100×5-K27-LN1028-12	▲	100	27	41	12	5	27.0	LNET102804-GM	12	K	0.3
	-125×5-K40-LN1028-14	▲	125	40	55	12	5	33.0		14	K	0.4
	-160×5-K40-LN1028-18	▲	160	40	55	12	5	50.0		18	K	0.7
	-063×6-K22-LN1033-08	▲	63	22	34	8	6	13.0		8	K	0.1
	-080×6-K22-LN1033-10	▲	80	22	34	8	6	21.5		10	K	0.2
	-100×6-K27-LN1033-12	▲	100	27	41	12	6	27.0		12	K	0.3
	-125×6-K40-LN1033-14	▲	125	40	55	12	6	33.0	LNET103304-GM	14	K	0.5
	-160×6-K40-LN1033-18	▲	160	40	55	12	6	50.0		18	K	0.8
	-200×6-K50-LN1033-20	▲	200	50	69	12	6	63.0		20	K	1.2
	-250×6-K50-LN1033-24	▲	250	50	69	12	6	88.0		24	K	2.0
	-080×7-K22-LN1238-08	▲	80	22	34	12	7	20.0		8	K	0.2
	-100×7-K27-LN1238-10	▲	100	27	41	12	7	26.5		10	K	0.3
	-125×7-K40-LN1238-12	▲	125	40	55	12	7	32.0	LNET123804-GM	12	K	0.5
	-160×7-K40-LN1238-16	▲	160	40	55	12	7	49.5		16	K	0.8
	-200×7-K50-LN1238-18	▲	200	50	69	12	7	62.5		18	K	1.3
	-250×7-K50-LN1238-24	▲	250	50	69	12	7	87.5		24	K	2.1

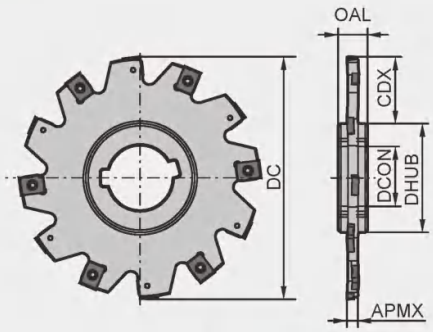
▲Stock available △Make-to-order

Side and face milling tools

Slot milling

SMP08 P M K





K-type coupling

Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	DHUB	OAL	APMX	CDX				
SMP08	-080×8-K22-LN1243-08	▲	80	22	34	12	8	20.5	LNET124304-GM	8	K	0.2
	-100×8-K27-LN1243-10	▲	100	27	41	12	8	27.0		10	K	0.3
	-125×8-K40-LN1243-12	▲	125	40	55	12	8	32.5		12	K	0.9
	-160×8-K40-LN1243-16	▲	160	40	55	12	8	50.0		16	K	0.9
	-200×8-K50-LN1243-18	▲	200	50	69	12	8	63.0		18	K	1.4
	-250×8-K50-LN1243-24	▲	250	50	69	12	8	83.0		24	K	2.3
	-100×9-K27-LN1248-10	▲	100	27	41	12	9	27.5	LNET124804-GM	10	K	0.4
	-125×9-K40-LN1248-12	▲	125	40	55	12	9	33.0		12	K	0.6
	-160×9-K40-LN1248-16	▲	160	40	55	12	9	50.5		16	K	1
	-200×9-K50-LN1248-18	▲	200	50	69	12	9	63.5		18	K	1.6
	-250×9-K50-LN1248-24	▲	250	50	69	12	9	88.5		24	K	2.6
	-100×10-K27-LN1253-10	▲	100	27	41	12	10	28.0	LNET125304-GM	10	K	0.4
	-125×10-K40-LN1253-12	▲	125	40	55	12	10	33.5		12	K	0.6
	-160×10-K40-LN1253-16	▲	160	40	55	12	10	51.0		16	K	1.1
	-200×10-K50-LN1253-18	▲	200	50	69	12	10	64.0		18	K	1.8
	-250×10-K50-LN1253-24	▲	250	50	69	12	10	89.0		24	K	2.9

▲Stock available △Make-to-order

Spare parts

Diameter DC	Edge width a_p (mm)	Screw	Wrench
			
Ø63-Ø160	4	I60M2.5×3.2×B	WT06IP/IS
	5	I60M2.5×3.9×B	
Ø63-Ø250	6	I60M2.5×4.8×B	
	7	I60M4×5.1×B	WT10IP/IS
	8	I60M4×6.6×B	
	9	I60M4×7.6×B	
	10	I60M4×8.5×B	



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

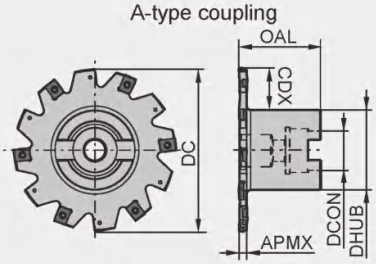
Side and face milling tools

Slot milling

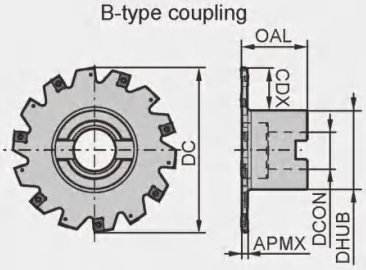
SMP08 P M K



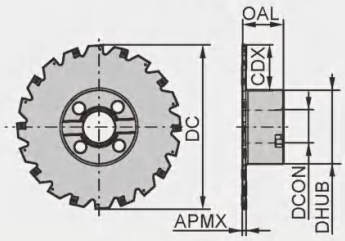
A-type coupling



B-type coupling



C-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	DHUB	OAL	APMX	CDX				
SMP08	-080×4-A22-LN1023-10	▲	80	22	42	50	4	18	LNET102304-GM	10	A	0.4
	-100×4-A27-LN1023-12	▲	100	27	52	50	4	23		12	A	0.6
	-125×4-B32-LN1023-14	▲	125	32	63	50	4	30		14	B	1.0
	-160×4-B40-LN1023-18	▲	160	40	76	50	4	41		18	B	1.2
	-080×5-A22-LN1028-10	▲	80	22	42	50	5	18	LNET102804-GM	10	A	0.4
	-100×5-A27-LN1028-12	▲	100	27	52	50	5	23		12	A	0.6
	-125×5-B32-LN1028-14	▲	125	32	63	50	5	30		14	B	1.0
	-160×5-B40-LN1028-18	▲	160	40	76	50	5	41		18	B	1.2
	-080×6-A22-LN1033-10	▲	80	22	42	50	6	18	LNET103304-GM	10	A	0.5
	-100×6-A27-LN1033-12	▲	100	27	52	50	6	23		12	A	0.7
	-125×6-B32-LN1033-14	▲	125	32	63	50	6	30		14	B	1.1
	-160×6-B40-LN1033-18	▲	160	40	76	50	6	41		18	B	1.4
	-200×6-C40-LN1033-20	▲	200	40	94	50	6	52		20	C	2.8
	-250×6-C60-LN1033-24	▲	250	60	132	50	6	58		24	C	4.6
	-080×7-A22-LN1238-08	▲	80	22	42	50	7	18	LNET123804-GM	8	A	0.5
	-100×7-A27-LN1238-10	▲	100	27	52	50	7	23		10	A	0.7
	-125×7-B32-LN1238-12	▲	125	32	63	50	7	30		12	B	1.1
	-160×7-B40-LN1238-16	▲	160	40	76	50	7	41		16	B	1.4
	-200×7-C40-LN1238-18	▲	200	40	94	50	7	52		18	C	2.9
	-250×7-C60-LN1238-24	▲	250	60	132	50	7	58		24	C	4.7

▲Stock available △Make-to-order

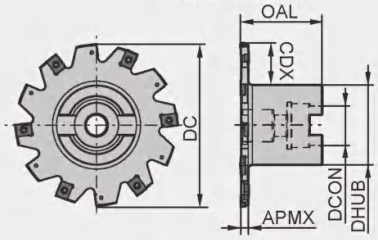
Side and face milling tools

Slot milling

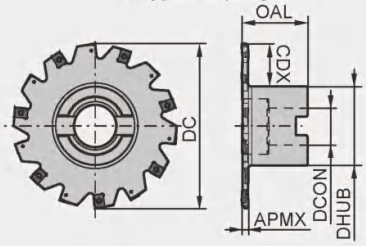
SMP08 P M K



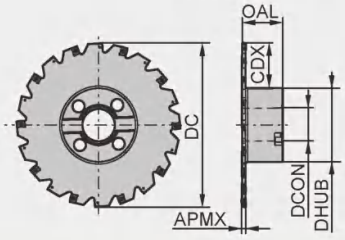
A-type coupling



B-type coupling



C-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	DHUB	OAL	APMX	CDX				
SMP08	-080×8-A22-LN1243-08	▲	80	22	42	50	8	18	LNET124304-GM	8	A	0.5
	-100×8-A27-LN1243-10	▲	100	27	52	50	8	23		10	A	0.7
	-125×8-B32-LN1243-12	▲	125	32	63	50	8	30		12	B	1.1
	-160×8-B40-LN1243-16	▲	160	40	76	50	8	41		16	B	1.4
	-200×8-C40-LN1243-18	▲	200	40	94	50	8	52		18	C	2.9
	-250×8-C60-LN1243-24	▲	250	60	132	50	8	58		24	C	4.7
	-100×9-A27-LN1248-10	▲	100	27	52	50	9	23	LNET124804-GM	10	A	0.7
	-125×9-B32-LN1248-12	▲	125	32	63	50	9	30		12	B	1.1
	-160×9-B40-LN1248-16	▲	160	40	76	50	9	41		16	B	1.5
	-200×9-C40-LN1248-18	▲	200	40	94	50	9	52		18	C	3
	-250×9-C60-LN1248-24	▲	250	60	132	50	9	58		24	C	4.8
	-100×10-A27-LN1253-10	▲	100	27	52	50	10	23	LNET125304-GM	10	A	0.7
	-125×10-B32-LN1253-12	▲	125	32	63	50	10	30		12	B	1.1
	-160×10-B40-LN1253-16	▲	160	40	76	50	10	41		16	B	1.5
	-200×10-C40-LN1253-18	▲	200	40	94	50	10	52		18	C	3
	-250×10-C60-LN1253-24	▲	250	60	132	50	10	58		24	C	5

▲Stock available △Make-to-order

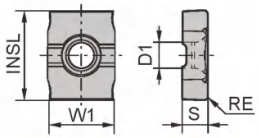
Spare parts

Diameter DC	Edge width a_p (mm)	Screw	Wrench
Ø63-Ø160	4	I60M2.5×3.2×B	WT06IP/IS
	5	I60M2.5×3.9×B	
Ø63-Ø250	6	I60M2.5×4.8×B	
	7	I60M4×5.1×B	WT10IP/IS
	8	I60M4×6.6×B	
	9	I60M4×7.6×B	
	10	I60M4×8.5×B	



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material																					
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		W1	INSL	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	LNET102304-GM	7.5	10	2.3	2.9	0.4									★			●				
	LNET102804-GM	7.5	10	2.8	2.9	0.4									★			●				
	LNET103304-GM	7.5	10	3.3	2.9	0.4									★			●				
	LNET123804-GM	10	13	3.8	4.4	0.4									★			●				
	LNET124304-GM	10	13	4.3	4.4	0.4									★			●				
	LNET124804-GM	10	13	4.8	4.4	0.4									★			●				
	LNET125304-GM	10	13	5.3	4.4	0.4									★			●				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

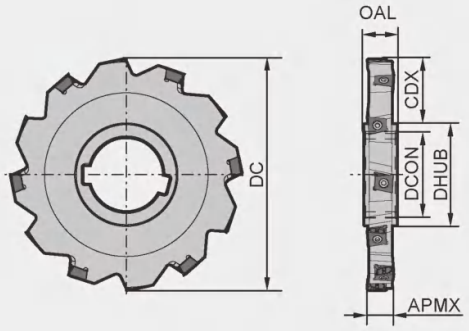
	Workpiece material	Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	fz(mm/z)
P	Low-carbon steel, Soft steel	≤ 180	YB9320	150(100-200)	0.12(0.1-0.3)
P	High-carbon steel, Alloy steel	180-280	YB9320	120(80-200)	0.12(0.1-0.3)
P	Alloy tool steel	280-350	YB9320	100(80-200)	0.12(0.1-0.3)
M	Stainless steel	≤ 270	YB9320	100(80-200)	0.08(0.05-0.15)
K	Cast iron, Ductile iron, High nickel cast iron	180-250	YB9320	150(100-250)	0.08(0.05-0.15)

Side and face milling tools

Slot milling

SMP09 P M K





K-type coupling

Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	DHUB	OAL	APMX	CDX				
SMP09	-080×10-K27-LN10-08	△	80	27	43	14	10	17	LNGX1005□□-GM	8	K	0.2
	-100×10-K32-LN10-10	△	100	32	47	14	10	25		10	K	0.37
	-125×10-K40-LN10-12	△	125	40	55	14	10	34		12	K	0.5
	-160×10-K40-LN10-14	△	160	40	62	14	10	47		14	K	1
	-200×10-K50-LN10-16	△	200	50	72	14	10	62		16	K	1.6
	-100×12-K32-LN14-08	△	100	32	47	16	12	25	LNGX1407□□-GM	8	K	0.4
	-125×12-K40-LN14-10	△	125	40	55	16	12	34		10	K	0.6
	-160×12-K40-LN14-12	△	160	40	62	16	12	47		12	K	1.1
	-200×12-K50-LN14-14	△	200	50	72	16	12	62		14	K	1.8
	-100×14-K32-LN10-10	△	100	32	47	18	14	25	LNGX1005□□-GM	10	K	0.4
	-125×14-K40-LN10-12	△	125	40	55	18	14	34		12	K	0.9
	-160×14-K40-LN10-14	△	160	40	62	18	14	47		14	K	1.6
	-200×14-K50-LN10-16	△	200	50	72	18	14	62		16	K	2.5
	-125×16-K40-LN10-12	△	125	40	55	20	16	34	LNGX1005□□-GM	12	K	1
	-160×16-K40-LN10-14	△	160	40	62	20	16	47		14	K	1.8
	-200×16-K50-LN10-16	△	200	50	72	20	16	62		16	K	2.9

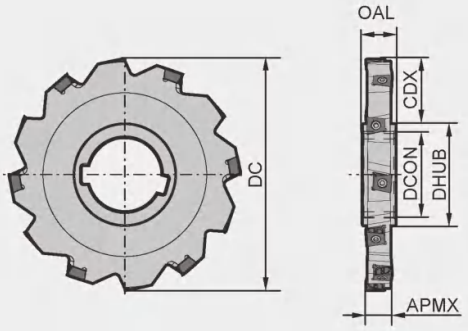
▲Stock available △Make-to-order

Side and face milling tools

Slot milling

SMP09 P M K





K-type coupling

Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	DHUB	OAL	APMX	CDX				
SMP09	-125×18-K40-LN10-12	△	125	40	55	24	18	34	LNGX1005□□-GM	12	K	1.2
	-160×18-K40-LN10-14	△	160	40	62	24	18	47		14	K	2.1
	-200×18-K50-LN10-16	△	200	50	72	24	18	62		16	K	3.4
	-250×18-K50-LN10-18	△	250	50	80	24	18	83		18	K	5.5
	-125×20-K40-LN14-10	△	125	40	55	26	20	34	LNGX1407□□-GM	10	K	1.2
	-160×20-K40-LN14-12	△	160	40	62	26	20	47		12	K	2.1
	-200×20-K50-LN14-14	△	200	50	72	26	20	62		14	K	3.5
	-250×20-K50-LN14-16	△	250	50	80	26	20	83		16	K	5.8
	-160×25-K40-LN14-12	△	160	40	62	30	25	47	LNGX1407□□-GM	12	K	2.8
	-200×25-K50-LN14-14	△	200	50	72	30	25	62		14	K	4.5
	-250×25-K50-LN14-16	△	250	50	80	30	25	83		16	K	7.5

▲Stock available △Make-to-order

Spare parts

Diameter DC	Edge width a_p (mm)	Inserts	Screw	Wrench
				
Ø80-Ø200	10	LNGX1005□□-GM	I60M3.5×8TT	WP10IS
Ø100-Ø200	12	LNGX1407□□-GM	I60M4×10	WP15IS
Ø100-Ø250	14-18	LNGX1005□□-GM	I60M3.5×8TT	WP10IS
Ø125-Ø315	20-25	LNGX1407□□-GM	I60M4×12	WP15IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

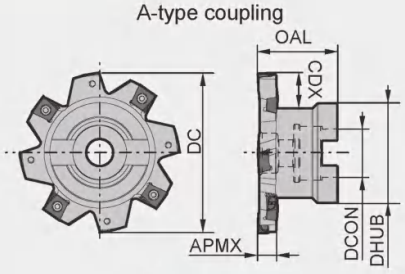
Side and face milling tools

Slot milling

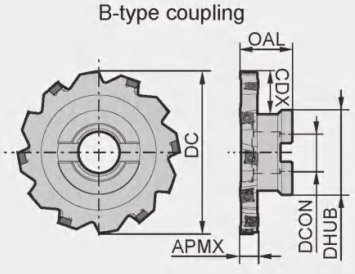
SMP09 P M K



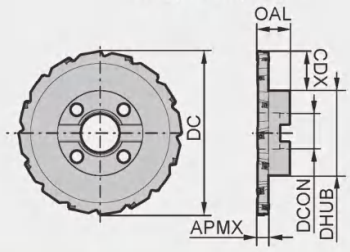
A-type coupling



B-type coupling



C-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	DHUB	OAL	APMX	CDX				
SMP09	-080×10-A22-LN10-08	△	80	22	45	40	10	20	LNGX1005□□-GM	8	A	0.4
	-100×10-B27-LN10-10	△	100	27	55	45	10	24		10	B	0.6
	-125×10-B32-LN10-12	△	125	32	65	45	10	33		12	B	1
	-160×10-B40-LN10-14	△	160	40	80	50	10	42		14	B	2
	-200×10-C40-LN10-16	△	200	40	92	50	10	53		16	C	2.9
	-100×12-B27-LN14-08	△	100	27	55	45	12	24	LNGX1407□□-GM	8	B	0.6
	-125×12-B32-LN14-10	△	125	32	65	45	12	33		10	B	1
	-160×12-B40-LN14-12	△	160	40	80	50	12	42		12	B	2.1
	-200×12-C40-LN14-14	△	200	40	92	50	12	53		14	C	2.9
	-100×14-B27-LN10-10	△	100	27	55	50	14	24	LNGX1005□□-G	10	B	0.7
	-125×14-B32-LN10-12	△	125	32	65	50	14	33		12	B	1.2
	-160×14-B40-LN10-14	△	160	40	80	50	14	42		14	B	2.4
	-200×14-C40-LN10-16	△	200	40	92	50	14	53		16	C	3.6
	-125×16-B32-LN10-12	△	125	32	65	50	16	33	LNGX1005□□-GM	12	B	1.4
	-160×16-B40-LN10-14	△	160	40	80	50	16	42		14	B	2.6
	-200×16-C40-LN10-16	△	200	40	92	50	16	53		16	C	4

▲Stock available △Make-to-order

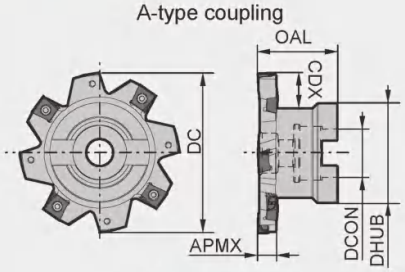
Side and face milling tools

Machining of slot

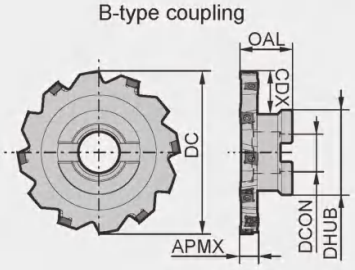
SMP09 P M K



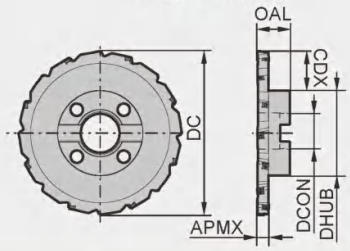
A-type coupling



B-type coupling



C-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	DHUB	OAL	APMX	CDX				
SMP09	**-125×18-B32-LN10-12**	△	125	32	65	50	18	33	LNGX1005□□-GM	12	B	1.5
	-160×18-B40-LN10-14	△	160	40	80	50	18	42		14	B	2.9
	-200×18-C40-LN10-16	△	200	40	92	50	18	53		16	C	4.3
	-250×18-C60-LN10-18	△	250	60	132	50	18	58		18	C	7.2
	-125×20-B32-LN14-10	△	125	32	65	50	20	33	LNGX1407□□-GM	10	B	1.6
	-160×20-B40-LN14-12	△	160	40	80	50	20	42		12	B	2.7
	-200×20-C40-LN14-14	△	200	40	92	50	20	53		14	C	4.6
	-250×20-C60-LN14-16	△	250	60	132	50	20	58		16	C	7.4
	-160×25-B40-LN14-12	△	160	40	80	50	25	42	LNGX1407□□-GM	12	B	3.2
	-200×25-C40-LN14-14	△	200	40	92	50	25	53		14	C	5.2
	-250×25-C60-LN14-16	△	250	60	132	50	25	58		16	C	8.6
	-315×25-C60-LN14-20	△	315	60	132	50	25	90		20	C	13.2

▲Stock available △Make-to-order

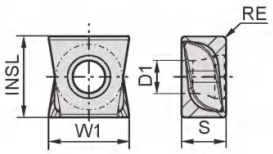
Spare parts

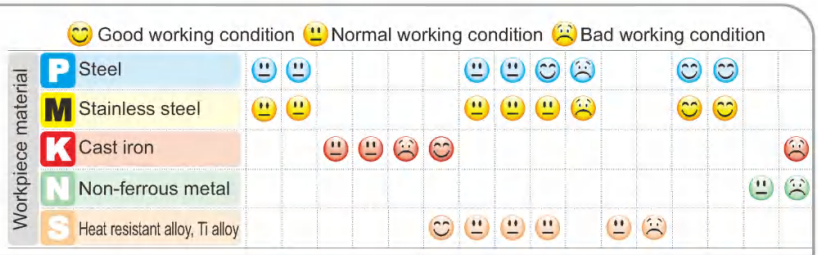
Diameter DC	Edge width a_p (mm)	Inserts	Screw	Wrench
Ø80-Ø200	10	LNGX1005□□-GM	I60M3.5×8TT	WP10IS
Ø100-Ø200	12	LNGX1407□□-GM	I60M4×10	WP15IS
Ø100-Ø250	14-18	LNGX1005□□-GM	I60M3.5×8TT	WP10IS
Ø125-Ø315	20-25	LNGX1407□□-GM	I60M4×12	WP15IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts





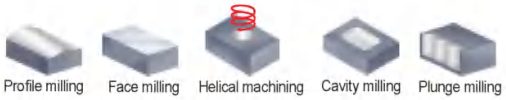
Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		W1	INSL	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	LNGX100504-GM	9.9	10	5.5	4.1	0.4									★			●				
	LNGX100508-GM	9.9	10	5.5	4.1	0.8									★			●				
	LNGX100512-GM	9.9	10	5.5	4.1	1.2									★			●				
	LNGX100516-GM	9.9	10	5.5	4.1	1.6									★			●				
	LNGX100520-GM	9.9	10	5.5	4.1	2.0									★			●				
	LNGX100524-GM	9.9	10	5.5	4.1	2.4									★			●				
	LNGX100530-GM	9.9	10	5.5	4.1	3.0									★			●				
	LNGX100540-GM	9.9	10	5.5	4.1	4.0									★			●				
	LNGX140704-GM	13.4	14	7.5	4.4	0.4									★			●				
	LNGX140708-GM	13.4	14	7.5	4.4	0.8									★			●				
	LNGX140712-GM	13.4	14	7.5	4.4	1.2									★			●				
	LNGX140716-GM	13.4	14	7.5	4.4	1.6									★			●				
	LNGX140720-GM	13.4	14	7.5	4.4	2.0									★			●				
	LNGX140724-GM	13.4	14	7.5	4.4	2.4									★			●				
	LNGX140730-GM	13.4	14	7.5	4.4	3.0									★			●				
	LNGX140740-GM	13.4	14	7.5	4.4	4.0									★			●				
	LNGX140750-GM	13.4	14	7.5	4.4	5.0									★			●				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	fz(mm/z)
P	Low-carbon steel, Soft steel	⩽180	YB9320 YBM253	150(100-200)	0.12(0.1-0.3)
P	High-carbon steel, Alloy steel	180-280	YB9320 YBM253	120(80-200)	0.12(0.1-0.3)
P	Alloy tool steel	280-350	YB9320 YBM253	100(80-200)	0.12(0.1-0.3)
M	Stainless steel	⩽270	YB9320 YBM253	100(80-200)	0.08(0.05-0.15)
K	Cast iron, Ductile iron, High nickel cast iron	180-250	YB9320 YBM253	150(100-250)	0.08(0.05-0.15)

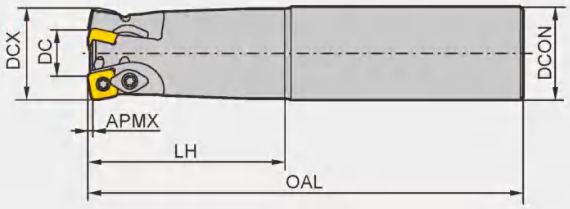
High feed milling tools



XMR01 P M K S



S-type insert, straight shank



Specification of tools

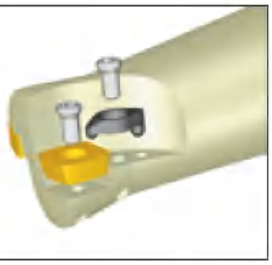
Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
			DCX	APMX	DC	LH	OAL	DCON		
XMR01	-020-G20-SD06-02	▲	20	0.8	11.1	50	130	20	2	0.26
	-020-G20-SD06-02CL	△	20	0.8	11.1	100	180	20	2	0.364
	-020-G20-SD06-02CXL	△	20	0.8	11.1	130	250	20	2	0.522
	-025-G25-SD06-03	▲	25	0.8	16.1	60	140	25	3	0.46
	-025-G25-SD06-03CL	△	25	0.8	16.1	120	200	25	3	0.670
	-025-G25-SD06-03CXL	△	25	0.8	16.1	130	250	25	3	0.850
	-025-G25-SD09-02	▲	25	1.4	11.24	60	140	25	2	0.5
	-025-G25-SD09-02CL	△	25	1.4	11.24	120	200	25	2	0.636
	-025-G25-SD09-02CXL	△	25	1.4	11.24	180	300	25	3	0.980
	-032-G32-SD09-03	▲	32	1.4	18.24	90	150	32	3	0.8
	-032-G32-SD09-03CL	△	32	1.4	18.24	120	200	32	3	1.006
	-032-G32-SD09-03CXL	△	32	1.4	18.24	180	300	32	3	1.551
	-035-G32-SD09-03	▲	35	1.4	18.24	70	150	32	3	0.8
	-035-G32-SD09-03CL	△	35	1.4	18.24	120	200	32	3	1.037
	-035-G32-SD09-03CXL	△	35	1.4	18.24	180	300	32	3	1.582
	-032-G32-SD12-02	▲	32	1.8	14.46	90	150	32	2	0.8
	-032-G32-SD12-02CL	△	32	1.8	14.46	120	200	32	2	1.002
	-032-G32-SD12-02CXL	△	32	1.8	14.46	180	300	32	2	1.547
	-040-G40-SD12-03	▲	40	1.8	22.46	70	150	40	3	1.3
	-040-G40-SD12-03CL	△	40	1.8	22.46	70	250	40	3	2.118
	-040-G40-SD12-03CXL	△	40	1.8	22.46	70	300	40	3	2.579
	-040-G40-SD15-02	▲	40	2.2	16.6	70	200	40	2	1.6
	-040-G40-SD15-02CL	△	40	2.2	16.6	70	250	40	2	2.061
	-040-G40-SD15-02CXL	△	40	2.2	16.6	70	300	40	2	3.522

▲Stock available △Make-to-order

XMR01-020-G20-SD06QL-02CL/CXL
Standard toolholder sery
Long sery
Extended sery

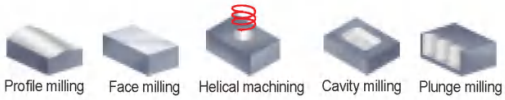
Spare parts

Tool type	Screw	Clamp Screw	Clamp	Wrench	
XMR01□□-SD06□□	I60M2.2×5.5	--	--	WT07IP	--
XMR01□□-SD09□□	I60M3.5×08TT	I60M4×8.4	WD-204	WT10IP	WT15IP
XMR01□□-SD12□□	I60M4×8.4			WT15IP	
XMR01□□-SD15□□	I60M5×13		WD-208	WT20IP	--



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

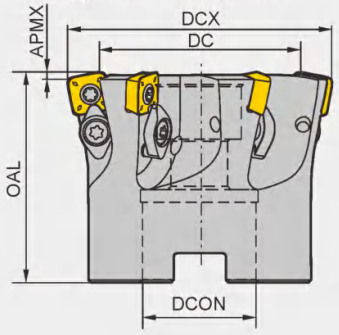
High feed milling tools



XMR01 P M K S



S type insert milling cutter



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			DCX	APMX	DC	OAL	DCON			
XMR01	-050-A22-SD06-07C	▲	50	0.8	38.4	40	22	7	A	0.36
	-063-A22-SD06-10C	▲	63	0.8	51.4	40	22	10	A	0.53
	-063-A27-SD06-10C	▲	63	0.8	51.4	50	27	10	A	0.57
	-050-A22-SD09-04C	▲	50	1.4	32.4	40	22	4	A	0.3
	-063-A22-SD09-06C	▲	63	1.4	45.4	40	22	6	A	0.5
	-063-A27-SD09-06C	▲	63	1.4	45.4	50	27	6	A	0.6
	-063-A22-SD12-05C	▲	63	1.8	39.6	40	22	5	A	0.5
	-063-A27-SD12-05C	▲	63	1.8	39.6	50	27	5	A	0.6
	-080-A27-SD12-05C	▲	80	1.8	56.6	50	27	5	A	0.9
	-100-B32-SD12-06	▲	100	1.8	76.6	50	32	6	B	1.8
	-080-A27-SD15-05C	▲	80	2.2	52	50	27	5	A	0.78
	-080-A32-SD15-05	▲	80	2.2	52	50	32	5	A	0.72
	-100-B32-SD15-07	▲	100	2.2	72	50	32	7	B	1.2
	-125-B40-SD15-09	▲	125	2.2	97	63	40	9	B	2.9
	-160-B40-SD15-12	▲	160	2.2	132	63	40	12	B	4.4

▲Stock available △Make-to-order

Spare parts

Tool type	Screw	Clamp Screw	Clamp	Wrench	
XMR01□□-SD06□□	I60M2.2×5.5	--	--	WT07IP	--
XMR01□□-SD09□□	I60M3.5×08TT	I60M4×8.4	WD-204	WT10IP	WT15IP
XMR01□□-SD12□□	I60M4×8.4			WT15IP	
XMR01□□-SD15□□	I60M5×13		WD-208	WT20IP	--



Tools code key B26–B27
Grade selection guide B19–B23
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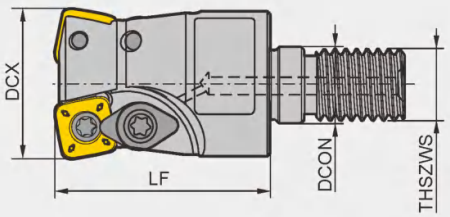
High feed milling tools



QCH-*SDMT*M*Series

P M K





Specification of tools

Type		Stock	Basic dimensions(mm)				Applicable inserts	Number of teeth Z	Weight (kg)
			DCX	DCON	LF	THSZWS			
QCH	-16-SDMT06-M8-02	▲	16	8.5	28	8	SDMT06T208-□□	2	0.031
	-20-SDMT06-M10-03	▲	20	10.5	30	10		3	0.050
	-25-SDMT06-M12-04	▲	25	12.5	35	12		4	0.090
	-32-SDMT06-M16-06	▲	32	17	45	16		6	0.219
	-25-SDMT09-M12-02	▲	25	12.5	35	12	SDMT09T312-□□	2	0.088
	-30-SDMT09-M16-03	▲	30	17	45	16		3	0.176
	-35-SDMT09-M16-03	▲	35	17	45	16		3	0.216
	-35-SDMT09-M16-05	▲	35	17	45	16		5	0.219
	-40-SDMT09-M16-04	▲	40	17	45	16		4	0.230
	-32-SDMT12-M16-03	▲	32	17	45	16	SDMT120412-□□	2	0.175
	-35-SDMT12-M16-02	▲	35	17	45	16		2	0.200
	-35-SDMT12-M16-03	▲	35	17	45	16		3	0.201
	-40-SDMT12-M16-03	▲	40	17	45	16		3	0.214

▲Stock available △Make-to-order

Spare parts

Diameter DCX	Inserts	Screw	Clamp	Clamp screw	Wrench
Ø16-Ø32	SDMT06	I60M2.2×5.5	--	--	WT07IP
Ø25-Ø40	SDMT09	I60M3×08TT	WD-204	I60M4×8.4	WT10IP WT15IP
Ø32-Ø40	SDMT12	I60M4×8.4	WD-204	I60M4×8.4	WT15IP



Tools code key B26–B27
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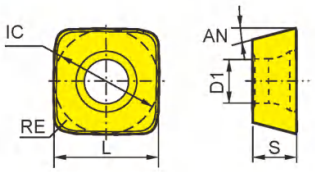
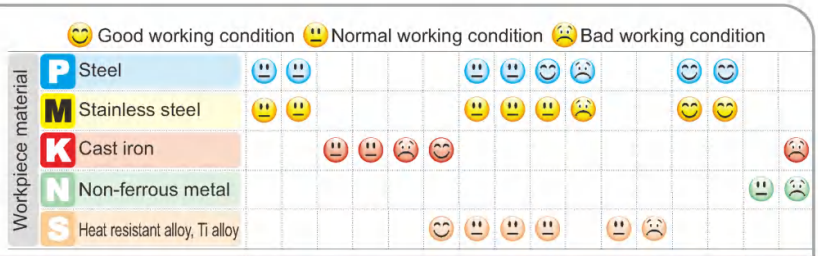
Technical data B271–B276

Selection of inserts





Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		IC	L	RE	S	D1	AN	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SDMT06T208-DM	6.35	6.35	0.8	2.58	2.5	15°	★	★							●	●		●				
	SDMT09T312-DM	9.525	9.525	1.2	3.97	4.0	15°	★	★							●	●						
	SDMT120412-DM	12.7	12.7	1.2	4.76	4.4	15°	★	★						★	●	●						
	SDMT150520-DM	15.875	15.875	2.0	5.56	5.5	15°	★	★						●	●	●						
	SDMT06T208-PM	6.35	6.35	0.8	2.58	2.5	15°	★	●						●				●				
	SDMT09T312-PM	9.525	9.525	1.2	3.97	4.0	15°	★	●						●								
	SDMT120412-PM	12.7	12.7	1.2	4.76	4.4	15°	★	●						●								
	SDMT150520-PM	15.875	15.875	2.0	5.56	5.5	15°	★	●						●								
	SDMT06T208-NM	6.35	6.35	0.8	2.58	2.5	15°		●										●				
	SDMT09T312-NM	9.525	9.525	1.2	3.97	4.0	15°		●										●				
	SDMT120412-NM	12.7	12.7	1.2	4.76	4.4	15°		●							●			●				
	SDMT150520-NM	15.875	15.875	2.0	5.56	5.5	15°		●							●			●				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker introduction:
-PM chipbreaker has sharp cutting edge, it is more suitable for machining with power shortage and for relatively adhesive materials, such as stainless steel and Ti alloy, etc.
-DM chipbreaker has blunt cutting edge and is relatively suitable for machining of hard materials such as hardened steel and cast iron, etc.



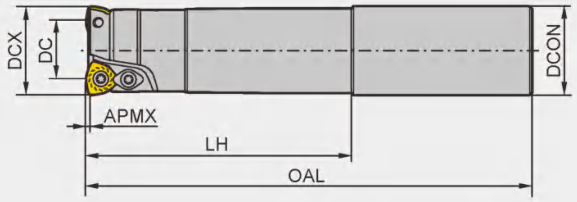
High feed milling tools



XMR01 P M K



W-type insert, straight shank



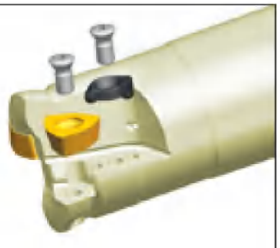
Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
			DCX	APMX	DC	LH	OAL	DCON		
XMR01	-020-G20-WP05-02-M	△	20	1.5	12.4	50	130	20	2	0.2
	-020-G20-WP05-02-L	△	20	1.5	12.4	100	180	20	2	0.3
	-020-G20-WP05-02-XL	△	20	1.5	12.4	130	250	20	2	0.8
	-025-G25-WP06-02-M	△	25	1.5	16.3	60	140	25	2	0.4
	-025-G25-WP06-02-L	△	25	1.5	16.3	120	200	25	2	0.6
	-025-G25-WP06-02-XL	△	25	1.5	16.3	180	300	25	2	1.0
	-032-G32-WP06-03-M	△	32	1.5	23.3	70	150	32	3	0.8
	-032-G32-WP06-03-L	△	32	1.5	23.3	120	200	32	3	1.0
	-032-G32-WP06-03-XL	△	32	1.5	23.3	180	300	32	3	1.6
	-040-G32-WP06-03-M	△	40	1.5	31.3	50	150	32	3	0.9
	-040-G32-WP06-03-L	△	40	1.5	31.3	50	250	32	3	1.5
	-040-G32-WP06-03-XL	△	40	1.5	31.3	50	300	32	3	1.8
	-040-G32-WP08-02-M	△	40	1.5	28.68	50	150	32	2	0.9
	-040-G32-WP08-02-L	△	40	1.5	28.68	50	250	32	2	1.5
	-040-G32-WP08-02-XL	△	40	1.5	28.68	50	300	32	2	1.9
	-050-G32-WP09-02-M	△	50	3.0	36.4	50	150	32	2	1.9
	-050-G32-WP09-02-L	△	50	3.0	36.4	50	250	32	2	2.5

▲Stock available △Make-to-order

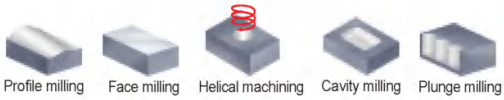
Spare parts

Diameter	Clamp/Insert screw	Clamp	Wrench	
XMR01□□-WP05□□	I60M3.5×08TT	--	WT10P	--
XMR01□□-WP06□□	I60M4×8.4		WT15P	
XMR01□□-WP08□□	I60M5×13	WD-208	--	WT20IT
XMR01□□-WP09□□				



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

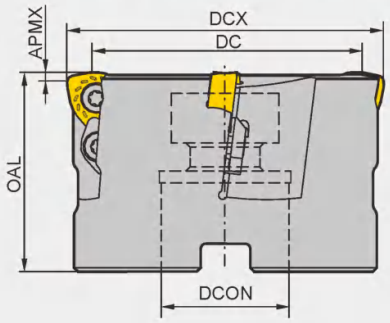
High feed milling tools



XMR01 P M K



W-type insert, arbor mounting



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			DCX	APMX	DC	OAL	DCON			
XMR01	**-050-A22-WP06-04**	△	50	1.5	41.3	40	22	4	A	0.4
	-050-A22-WP08-03	△	50	1.5	38.68	50	22	3	A	0.4
	-063-A22-WP08-04C	△	63	1.5	51.68	50	22	4	A	0.7
	-063-A27-WP08-04C	△	63	1.5	51.68	50	27	4	A	0.7
	-080-A27-WP08-05C	△	80	1.5	68.68	63	27	5	A	1.5
	-100-B32-WP08-06	△	100	1.5	88.68	63	32	6	B	2.2
	-125-B40-WP08-07	△	125	1.5	113.68	63	40	7	B	3.5
	-160-B40-WP08-08	△	160	1.5	148.68	63	40	8	B	6.0
	-063-A22-WP09-03C	△	63	3.0	49.4	50	22	3	A	0.7
	-080-A27-WP09-04C	△	80	3.0	66.4	63	27	4	A	1.4
	-100-B32-WP09-05	△	100	3.0	86.4	63	32	5	B	2.1
	-125-B40-WP09-06	△	125	3.0	111.4	63	40	6	B	3.7
	-160-B40-WP09-07	△	160	3.0	146.4	63	40	7	B	6.3

▲Stock available △Make-to-order

Spare parts

Diameter	Clamp/Insert screw	Clamp	Wrench	
				
XMR01□□-WP06□□	I60M4×8.4	--	WT15S	--
XMR01□□-WP08□□	I60M5×13	WD-208	--	WT20IT
XMR01□□-WP09□□	I60M5×13	WD-208	--	



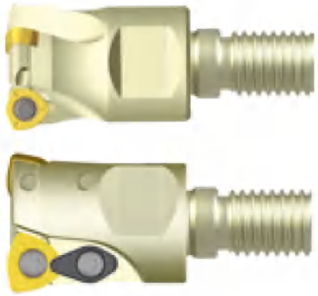
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

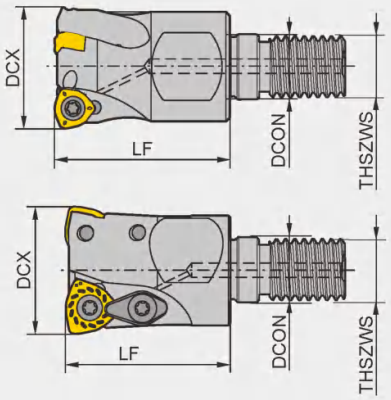
High feed milling tools



QCH-*WPGT*M*Series

P M K





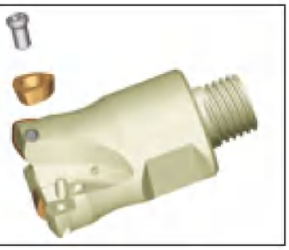
Specification of tools

Type		Stock	Basic dimensions(mm)				Applicable inserts	Number of teeth Z	Weight (kg)
			DCX	DCON	LF	THSZWS			
QCH	-20-WPGT05-M10-02	△	20	10.5	30	10	WPGT050315ZSR	2	0.056
	-20-WPGT05-M10-03	△	20	10.5	30	10		3	0.055
	-22-WPGT05-M10-02	△	22	10.5	30	10		2	0.062
	-22-WPGT05-M10-03	△	22	10.5	30	10		3	0.060
	-25-WPGT05-M12-03	△	25	12.5	35	12		3	0.106
	-28-WPGT05-M12-03	△	28	12.5	35	12		3	0.110
	-25-WPGT06-M12-02	△	25	12.5	35	12	WPGT060415ZSR	2	0.097
	-28-WPGT06-M12-02	△	28	12.5	35	12		2	0.109
	-30-WPGT06-M16-03	△	30	17	45	16		3	0.197
	-32-WPGT06-M16-03	△	32	17	45	16		3	0.185
	-35-WPGT06-M16-03	△	35	17	45	16		3	0.201
	-40-WPGT06-M16-04	△	40	17	45	16		4	0.240
	-42-WPGT06-M16-04	△	42	17	45	16		4	0.270
	-30-WPGT08-M16-02	△	30	17	45	16	WPGT080615ZSR	2	0.176
	-32-WPGT08-M16-02	△	32	17	45	16		2	0.179
	-35-WPGT08-M16-02	△	35	17	45	16		2	0.196
	-40-WPGT08-M16-03	△	40	17	45	16		3	0.220

▲Stock available △Make-to-order

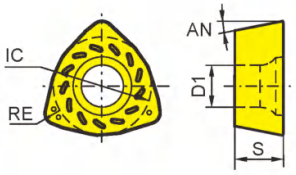
Spare parts

Diameter DCX	Inserts	Screw	Clamp	Wrench	
Ø20-Ø28	WPGT05	I60M3.5×6.5TT	--	WT10P	
Ø25-Ø42	WPGT06	I60M4×8.4	--	WT15P	
Ø30-Ø40	WPGT08	I60M4×8.4	--	WT15P	



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material		CVD Coating					PVD Coating							Cermet		Cemented carbide	
		YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
P	Steel	😃	😃					😃	😃	😊	☹			😊	😊		
M	Stainless steel	😃	😃					😃	😃	😃	☹			😊	😊		
K	Cast iron			😃	😃	☹	😊										☹
N	Non-ferrous metal															😃	☹
S	Heat resistant alloy, Ti alloy						😊	😃	😃	😃		😃	☹				

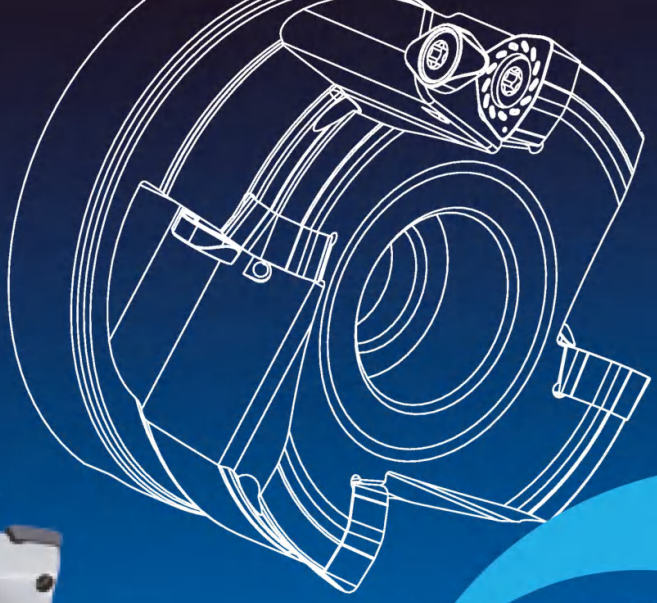
Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		IC	RE	S	D1	AN	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**WPGT050315ZSR**	7.94	1.5	3.5	4.0	11°	★															
	WPGT060415ZSR	9.525	1.5	4.2	4.4	11°	★															
	WPGT080615ZSR	12.85	1.5	6.35	5.5	11°	★															
	WPGT090725ZSR	15.00	2.5	7	5.5	11°	★															
	**WPGT050315ZSR-PM**	7.94	1.5	3.5	4.0	11°	★							●								
	WPGT060415ZSR-PM	9.525	1.5	4.2	4.4	11°	★							●								
	WPGT080615ZSR-PM	12.85	1.5	6.35	5.5	11°	★							●								
	WPGT090725ZSR-PM	15.00	2.5	7.00	5.5	11°	★							●								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker introduction:
-PM chipbreaker has sharp cutting edge, it is more suitable for machining with power shortage and for relatively adhesive materials, such as stainless steel and Ti alloy, etc.
General chipbreaker has blunt cutting edge and is relatively suitable for machining of hard materials such as hardened steel and cast iron, etc.

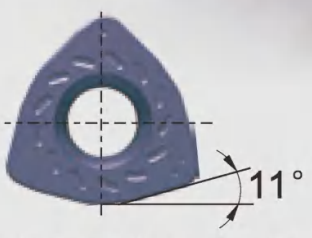


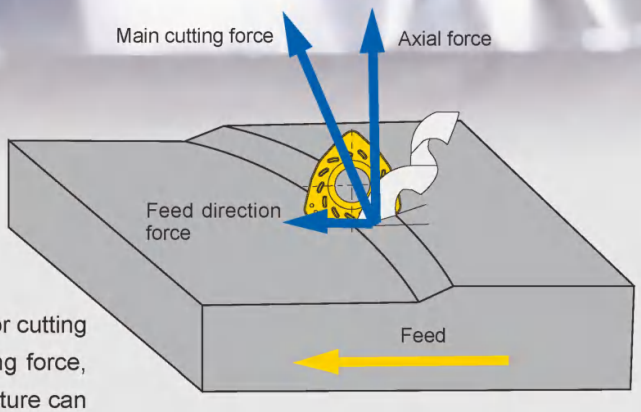




XMR01

Milling Tool Series

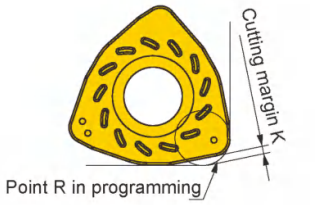


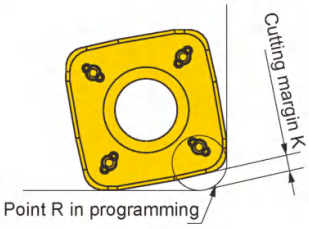


The main feature of high feed tools is to resolve the major cutting force to the axial direction, greatly reducing the radial cutting force, thus improve tool's vibration resistance. In addition, this structure can effectively reduce vibration in long-overhang milling operation.

Approximate R in machining program

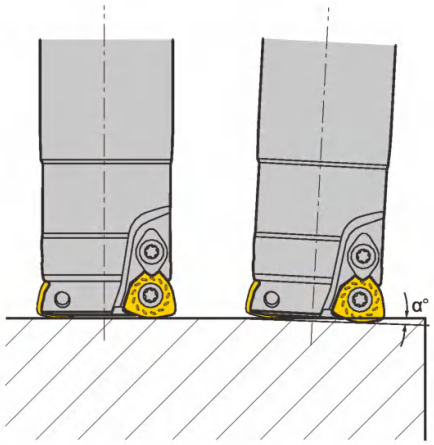
Applicable insert	Approximate R(mm)	Cutting margin K(mm)
WPGT050315ZSR/-PM	2	0.5
WPGT060415ZSR/-PM	2.5	0.7
WPGT080615ZSR/-PM	2.5	0.7
WPGT090725ZSR/-PM	4.5	1.2
SDMT06T208-DM/-PM/NM	1.6	0.5
SDMT09T312-DM/-PM/NM	2.5	0.87
SDMT120412-DM/-PM/NM	4.0	0.93
SDMT150520-DM/-PM	4.0	1.38



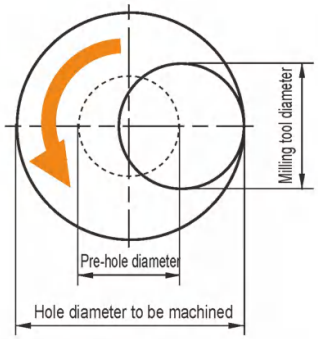


Different machining styles

■ Ramp milling



■ Helical interpolation milling



- Reduce the feed rate in ramp and helical machining operations.
- Set the axial feed rate below 0.2mm/rev in drilling operation.
- Be careful ! Long chips may fly off in drilling operation.
- The cutting depth of each rotation must not exceed the maximum cutting depth (a_p).
- The S-type insert can be used for plunge milling in addition to the machining operations mentioned above.

Selection guide for XMR01 series

XMR01 series tools (with SD□□ inserts) have perfect edge strength and good economical efficiency, advantageous in face milling.

XMR01 series tools (with WP□□ inserts) has good capability of chip removal, proficient in cavity milling.

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting speed (m/min)	Ø20/Ø25		Ø30/Ø32/Ø35	
					Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth
P	Soft steel Carbon Steel	≤HB180 HB180-280	YBC302 YBM253 YBG205 YB9320	170(120-220) 150(100-200)	0.6~1.5	0.6~1.2	0.6~1.2	0.5~1.4
P	Alloy steel Alloy tool steel	HB280-350	YBC302 YBM253 YBG205 YB9320	130(80-180)	0.4~1.2	0.6~1.2	0.4~1.0	0.5~1.4
P	pre-hardened steel	≤HRC35	YBC302 YBM253 YBG205 YB9320	120(80-160)	0.4~1.0	0.5~1.0	0.4~1.0	0.5~1.0
M	Stainless steel	≤HB270	YBM253	120(80-160)	0.6~1.0	0.6~1.0	0.8~1.2	0.8~1.2
M	Stainless steel	≤HB270	YBG205 YB9320	120(80-190)	0.6~1.0	0.6~1.0	0.8~1.2	0.8~1.2
K	Common cast iron	Tensile strength ≤350MPa	YBG302	150(100-200)	0.6~1.0	0.6~1.4	0.6~1.2	0.6~1.6
K	Nodular cast iron	Tensile strength ≤800MPa	YBG302	120(80-160)	0.4~0.8	0.5~1.2	0.4~1.0	0.5~1.4
S	Difficult-to-machine materials	≤400	YBS203	80(60-120)	0.6~1.0	0.6~1.0	0.8~1.2	0.8~1.2
S	Difficult-to-machine materials	≤400	YBS303	60(45-110)	0.4~0.8	0.4~0.8	0.4~1.0	0.4~0.8

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting speed (m/min)	Ø40/Ø50		Ø63/Ø80		Ø100/Ø125/Ø160	
					Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth
P	Soft steel Carbon Steel	≤HB180 HB180-280	YBC302 YBM253 YBG205 YB9320	170(120-220) 150(100-200)	0.6~1.5	0.8~1.5	0.6~1.5	0.8~1.5	0.6~1.5	0.5~1.5
P	Alloy steel Alloy tool steel	HB280-350	YBC302 YBM253 YBG205 YB9320	130(80-180)	0.4~1.2	0.6~1.5	0.4~1.3	0.6~1.5	0.4~1.3	0.5~1.5
P	pre-hardened steel	≤HRC35	YBC302 YBM253 YBG205 YB9320	120(80-160)	0.4~1.0	0.5~1.0	0.4~1.3	0.5~1.0	0.4~1.3	0.5~1.0
M	Stainless steel	≤HB270	YBM253	120(80-160)	0.8~1.2	0.8~1.2	1.1~1.5	0.9~1.3	1.0~1.5	0.8~1.3
M	Stainless steel	≤HB270	YBG205 YB9320	120(80-190)	0.8~1.2	0.8~1.2	1.1~1.5	0.9~1.3	1.0~1.5	0.8~1.3
K	Common cast iron	Tensile strength ≤350MPa	YBG302	150(100-200)	0.6~1.5	0.8~1.6	0.6~1.5	0.8~1.7	0.6~1.5	0.6~1.7
K	Nodular cast iron	Tensile strength ≤800MPa	YBG302	120(80-160)	0.4~1.2	0.6~1.4	0.6~1.3	0.6~1.5	0.4~1.3	0.5~1.5
S	Difficult-to-machine materials	≤400	YBS203	80(60-120)	0.8~1.2	0.6~1.0	1.1~1.5	0.6~1.2	1.0~1.5	0.4~1.2
S	Difficult-to-machine materials	≤400	YBS303	60(45-110)	0.4~1.0	0.4~1.0	0.6~1.2	0.6~1.0	0.4~1.0	0.4~0.8



After reasonable calculation and optimization, the axial and radial inclination angles effectively reduce the machining resistance of the tool.

The whole cutting tool can realize stable processing with excellent impact resistance and strong vibration resistance.

Screw clamping achieves high positioning accuracy and good economy.



XMR03

High Feed Milling Tool Series



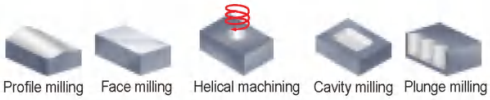
8 cutting edges on both sides achieve economical and cost-effective machining.

Large rake angle design, low cutting resistance, special edge shape and tool combination achieve a large chip space, leading to excellent chip removal performance.

Due to the good versatility, it can be used for large-feed processing of various steels, as well as processing viscous materials such as stainless steel and titanium alloy.

④×2=8 cutting edges



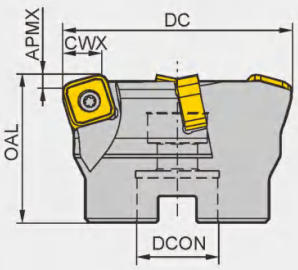


High feed milling tools

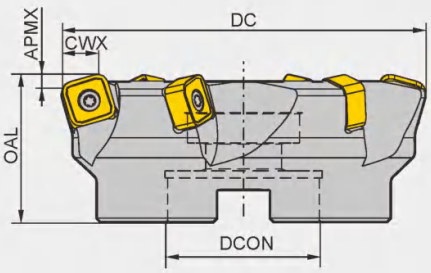
XMR03 P M



A-type coupling



B-type coupling



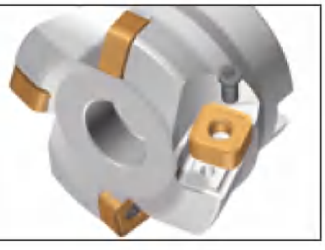
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			DC	APMX	CWX	OAL	DCON			
XMR03 Coarse pitch	**-050-A22-SN12-03**	▲	50	1.8	9.8	40	22	3	A	0.289
	-063-A22-SN12-04	▲	63	1.8	9.8	40	22	4	A	0.482
	-080-A27-SN12-05	▲	80	1.8	9.8	50	27	5	A	1.014
	-100-B32-SN12-06	▲	100	1.8	9.8	50	32	6	B	1.45
	-125-B40-SN12-07	▲	125	1.8	9.8	63	40	7	B	2.7
Close pitch	**-050-A22-SN12-04**	△	50	1.8	9.8	40	22	4	A	0.319
	-063-A22-SN12-05	△	63	1.8	9.8	40	22	5	A	0.512
	-080-A27-SN12-06	△	80	1.8	9.8	50	27	6	A	1.044
	-100-B32-SN12-07	△	100	1.8	9.8	50	32	7	B	1.48
	-125-B40-SN12-08	△	125	1.8	9.8	63	40	8	B	2.73
Extra close pitch	**-050-A22-SN12-05**	△	50	1.8	9.8	40	22	5	A	0.354
	-063-A22-SN12-06	△	63	1.8	9.8	40	22	6	A	0.547
	-080-A27-SN12-07	△	80	1.8	9.8	50	27	7	A	1.079
	-100-B32-SN12-08	△	100	1.8	9.8	50	32	8	B	1.435
	-125-B40-SN12-09	△	125	1.8	9.8	63	40	9	B	2.765

▲Stock available △Make-to-order

Spare parts

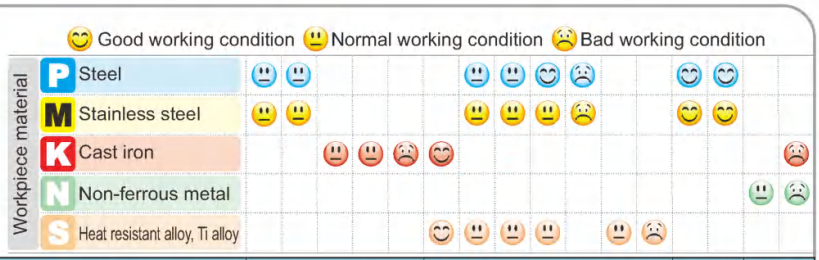
Diameter	Insert screw	Wrench
		
XMR03□□-SD12□□	I60M4×10	WT15IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts





Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	RE	S	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**SNGU120620-GM**	12.7	12.7	2.0	5.6	4.4		●						●	●							

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting speed (m/min)	Ø50/63		Ø80/125	
					Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth
P	Soft steel, carbon steel	≤HB180 HB180-280	YB9320 YBM253 YBG205	170(120-220) 150(100-200)	0.6~1.5	0.5~1.5	0.6~1.5	0.6~1.5
P	Alloy steel, alloy tool steel	HB280-350	YB9320 YBM253 YBG205	130(80-180)	0.4~1.3	0.5~1.5	0.4~1.3	0.6~1.5
P	Pre-hardened steel	≤HRC35	YB9320 YBM253 YBG205	120(80-160)	0.4~1.3	0.5~1.0	0.4~1.3	0.5~1.0
M	Stainless steel	≤HB270	YBM253	120(80-160)	0.4~1.5	0.4~1.2	0.4~1.5	0.5~1.3
M	Stainless steel	≤HB270	YBG205 YB9320	120(80-190)	0.4~1.5	0.4~1.2	0.4~1.5	0.5~1.3

XMR03series milling cutter processing case

Workpiece: 718H(HRC 34)

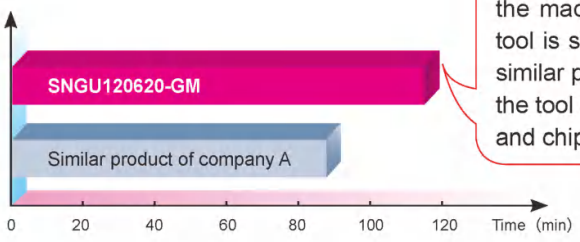
Toolholder: XMR03-050-A22-SN12-03

Insert: SNGU120620-GM/YB9320

Cutting parameter:

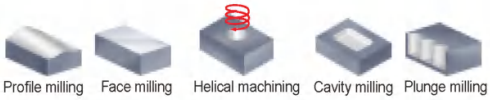
Vc=142m/min , fz=1.25mm/z ,

ap=0.8mm



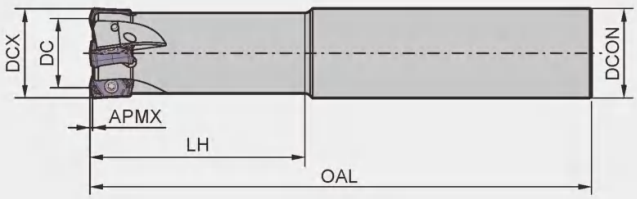
Under the same circumstances, the machining life of our XMR03 tool is significantly better than the similar product of company A , and the tool has better wear resistance and chipping resistance.

High feed milling tools



XMR12 P M





Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
			DCX	DC	APMX	OAL	LH	DCON		
XMR12	-016-G16-EN12-02C	▲	16	10.4	1	100	30	16	2	0.12
	-017-G16-EN12-02C	▲	17	11.4	1	100	30	16	2	0.13
	-018-G16-EN12-02C	▲	18	12.4	1	100	30	16	2	0.13
	-020-G20-EN12-03C	▲	20	14.4	1	130	50	20	3	0.25
	-022-G20-EN12-03C	▲	22	16.4	1	130	50	20	3	0.27
	-025-G25-EN12-04C	▲	25	19.4	1	140	60	25	4	0.44
	-028-G25-EN12-04C	▲	28	22.4	1	140	60	25	4	0.48
	-030-G32-EN12-04C	▲	30	24.4	1	150	70	32	4	0.74
	-032-G32-EN12-05C	▲	32	26.4	1	150	70	32	5	0.79
	-033-G32-EN12-05C	▲	33	27.4	1	150	70	32	5	0.81
	-035-G32-EN12-05C	▲	35	29.4	1	150	35	32	5	0.86

▲Stock available △Make-to-order

Note: The dimensions in the above table are based on ENMX1206XR-GM inserts. The values of DCX, OAL and LH for ENMX120608-GM or ENMX1206R30-GM inserts are shown in the table below:

ENMX1206XR-GM	ENMX120608-GM	ENMX1206R30-GM
LH	LH+0.11	LH+0.11
OAL	OAL+0.11	OAL+0.11
DCX	DCX-0.4	DCX-0.4

Spare parts

Tool model	Insert screw	Wrench	
			
XMR12-□□-G□□-EN12-□□C	I60M2.5×6.5	WT07IP	

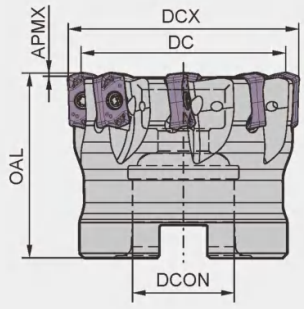
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

High feed milling tools



XMR12 P M





Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			DCX	DC	APMX	OAL	DCON		
XMR12	-040-A16-EN12-06C	▲	40	34.4	1	40	16	6	0.42
	-050-A22-EN12-08C	▲	50	44.4	1	40	22	8	0.32
	-063-A22-EN12-10C	▲	63	57.4	1	40	22	10	0.48

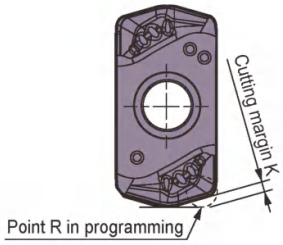
▲Stock available △Make-to-order

Note: The dimensions in the above table are based on ENMX1206XR-GM inserts. The values of DCX, OAL for ENMX120608-GM or ENMX1206R30-GM inserts are shown in the table below:

ENMX1206XR-GM	ENMX120608-GM	ENMX1206R30-GM
OAL	OAL+0.11	OAL+0.11
DCX	DCX-0.4	DCX-0.4

Approximate R in machining program

Applicable insert	Approximate R(mm)	Cutting margin K(mm)
ENMX1206XR-GM	1	0.5
	1.5	0.4
	2	0.3



Spare parts

Tool model	Insert screw	Wrench	
			
XMR12-□□-A□□-EN12-□□C	I60M2.5×6.5	WT07IP	

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

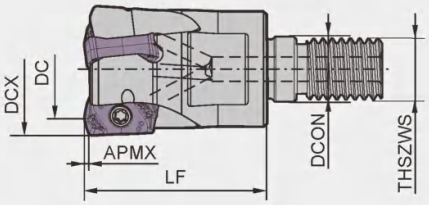
High feed milling tools



QCH-*EN*M*Series

P M





Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
			DCX	DC	APMX	LF	DCON	THSZWS		
QCH	-16-EN12-M8-02(XMR12)	▲	16	10.4	1	28	8.5	8	2	0.025
	-17-EN12-M8-02(XMR12)	▲	17	11.4	1	28	8.5	8	2	0.029
	-18-EN12-M8-02(XMR12)	▲	18	12.4	1	28	8.5	8	2	0.033
	-20-EN12-M10-03(XMR12)	▲	20	14.4	1	30	10.5	10	3	0.046
	-22-EN12-M10-03(XMR12)	▲	22	16.4	1	30	10.5	10	3	0.057
	-25-EN12-M12-04(XMR12)	▲	25	19.4	1	35	12.5	12	4	0.090
	-28-EN12-M12-04(XMR12)	▲	28	22.4	1	35	12.5	12	4	0.104
	-30-EN12-M16-05(XMR12)	▲	30	24.4	1	40	17	16	5	0.189
	-32-EN12-M16-05(XMR12)	▲	32	26.4	1	40	17	16	5	0.196
	-33-EN12-M16-05(XMR12)	▲	33	27.5	1	40	17	16	5	0.199

▲Stock available △Make-to-order

Note: The dimensions in the above table are based on ENMX1206XR-GM inserts. The values of DCX and LF for ENMX120608-GM or ENMX1206R30-GM inserts are shown in the table below:

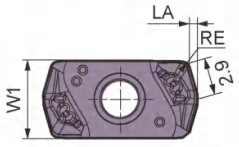
ENMX1206XR-GM	ENMX120608-GM	ENMX1206R30-GM
LF	LF+0.11	LF+0.11
DCX	DCX-0.4	DCX-0.4

Spare parts

Tool model	Insert screw	Wrench	
			
XMR12-□□-EN12-M□□-□□	I60M2.5×6.5	WT07IP	

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



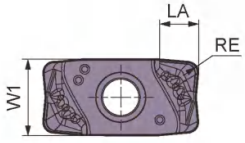
😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material		YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205H	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)			CVD Coating					PVD Coating							Cermet		Cemented carbide	
		W1	RE	LA	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205H	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ENMX1206XR-GM	6	0.6	1								●								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts



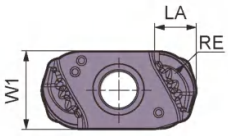
😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material		YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205H	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)			CVD Coating					PVD Coating							Cermet		Cemented carbide	
		W1	RE	LA	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205H	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ENMX120608-GM	6	0.8	3								●								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😃 😃 — — — 😃 😃 😊 ☹ — — 😊 😊 — —
M	Stainless steel	😃 😃 — — — 😃 😃 😃 ☹ — — 😊 😊 — —
K	Cast iron	— — 😃 😃 ☹ 😊 — — — — — — — — ☹
N	Non-ferrous metal	— — — — — — — — — — — — — — 😃 ☹
S	Heat resistant alloy, Ti alloy	— — — — — 😊 😃 😃 😃 — — ☹ — — — —

Insert shape	Type	Basic dimensions(mm)			CVD Coating					PVD Coating							Cermet		Cemented carbide	
		W1	RE	LA	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205H	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ENMX1206R20-GM	6	2.0	1.8								○								
	ENMX1206R30-GM	6	3.0	2.8								●								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

1.Large feed

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				Cutting speed (m/min)	f(mm/z)		
					Ø16-30	Ø30-63	Plunge milling
P	Low-carbon steel, Soft steel	≤HB180	YBG205H	200(100-300)	0.5-1.2	0.5-1.5	0.1
P	Alloy steel, alloy tool steel	HB180-280	YBG205H	150(100-200)	0.5-1.2	0.5-1.5	0.1
P	Pre-hardened steel	≤HRC35	YBG205H	150(100-200)	0.5-0.7	0.5-1	0.1
M	Stainless steel	≤HB200	YBG205H	125(100-150)	0.5-0.5	0.5-0.7	0.08
K	Cast iron	HB150-250	YBG205H	140(80-200)	0.5-1.2	0.5-1.5	0.1

2.Square shoulder milling

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Cutting speed (m/min)	f(mm/z)
P	Low-carbon steel, Soft steel	≤HB180	YBG205H	260(160-300)	0.1-0.35
P	Alloy steel, Alloy tool steel	HB180-280	YBG205H	240(160-240)	0.1-0.35
P	Pre-hardened steel	≤HRC35	YBG205H	200(120-240)	0.1-0.35
M	Stainless steel	≤HB200	YBG205H	160(100-230)	0.1-0.3
K	Cast iron	HB150-250	YBG205H	220(140-250)	0.1-0.3

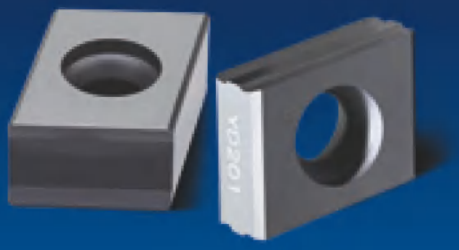
3.Profile milling

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Cutting speed (m/min)	f(mm/z)
P	Low-carbon steel, Soft steel	≤HB180	YBG205H	150-250	0.2-0.6
P	Alloy steel, alloy tool steel	HB180-280	YBG205H	150-250	0.2-0.6
P	Pre-hardened steel	≤HRC35	YBG205H	100-200	0.15-0.4
M	Stainless steel	≤HB200	YBG205H	100-200	0.2-0.6
K	Cast iron	HB150-250	YBG205H	150-250	0.2-0.6

XMP01

Boring and Milling Tools

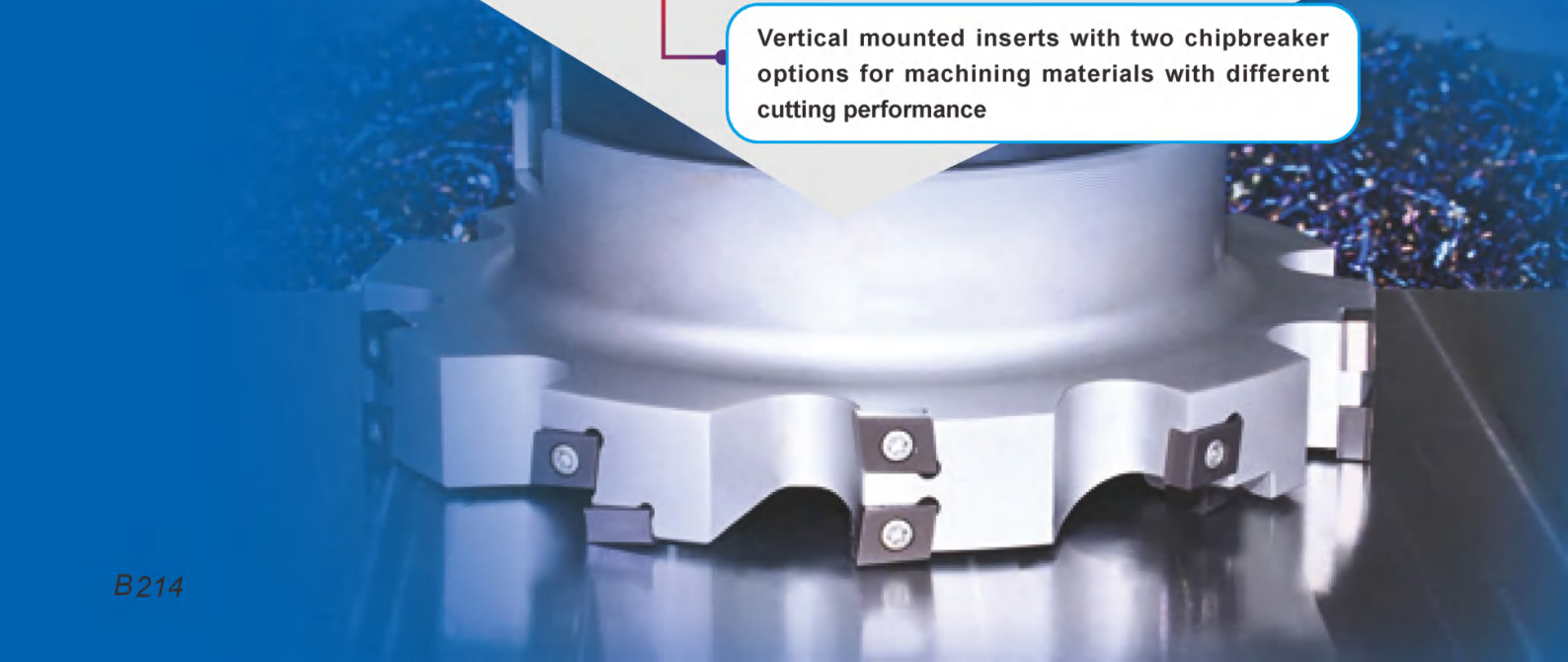


Composite milling tools, mainly used for boring and milling of large diameter holes and cavities



Highly versatile, can be used as a face and side milling tool

Vertical mounted inserts with two chipbreaker options for machining materials with different cutting performance



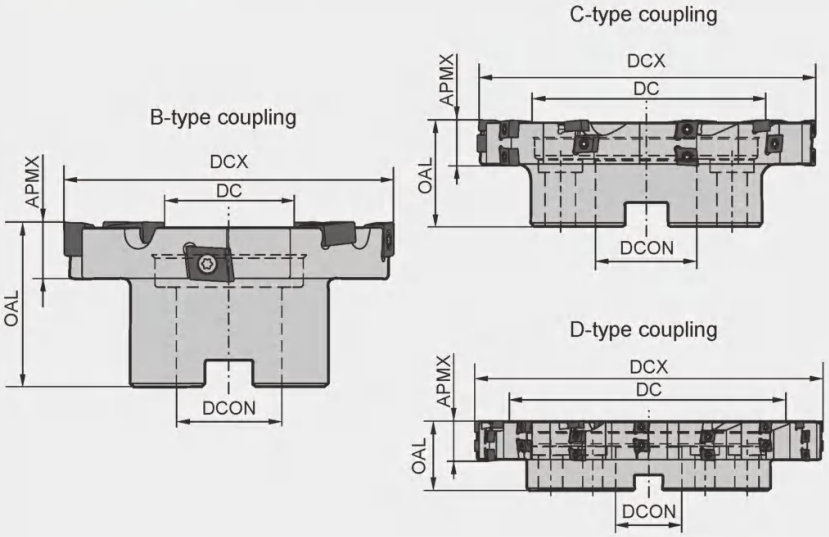
Boring and milling tools

KAPR:90°



XMP01 P M K





Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Zeff (Peripheral/ End teeth)	Type of coupling	Weight (kg)
			DCX	DCON	OAL	DC	APMX				
XMP01	**-080X18-B27-CNE1210-08**	△	80	27	50	42	18	8	2/2	B	0.67
	-100X18-B32-CNE1210-08	△	100	32	50	62	18	8	2/2	B	0.99
	-125X27-B40-CNE1210-15	△	125	40	63	71	27	15	3/2	B	2.46
	-160X27-C40-CNE1210-18	△	160	40	63	106	27	18	4/2	C	3.7
	-200X27-C60-CNE1210-21	△	200	60	63	146	27	21	5/2	C	5.46
	-250X36-C60-CNE1210-32	△	250	40	63	178	36	32	6/2	C	9.79
	-315X36-D60-CNE1210-42	△	315	60	63	225	36	42	8/2	D	17.65
	-400X36-D60-CNE1210-52	△	400	60	63	294	36	52	10/2	D	27.36

Note: APMX, DCX values can be customised within a certain range according to customer requirements; Zeff means the effective number of teeth

▲Stock available △Make-to-order

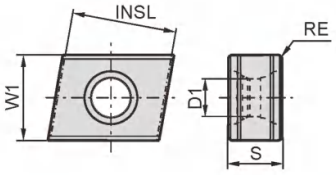
Spare parts

Diameter DCX	Inserts	Screws	Wrench
			
Ø80-Ø400	CNE121006*	I60M4×12	WT15IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts

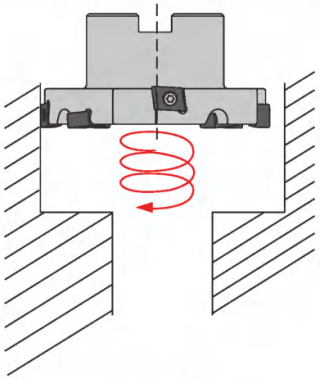


😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material																				
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	RE	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	CNE121006A	12.8	10.0	6.35	0.4	4.4		●	○													
	CNE121006B	12.0	10.0	6.35	0.6	4.4		●	○													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				V (m/min)	f (mm/Zeff)	apmax (mm)	
						CNE121006A	CNE121006B
P	Soft steel,Carbon steel	≤180	YBM253	270 (220-350)	0.2 (0.15-0.3)	15-90	15-90
P	High-carbon steel, Alloy steel	180-280	YBM253	260 (200-320)	0.2 (0.15-0.3)	15-90	15-90
P	Alloy tool steel	280-350	YBM253	240 (180-300)	0.2 (0.15-0.3)	15-90	15-90
M	Stainless steel	≤270	YBM253	230(180-300)	0.2(0.1-0.3)	15-90	15-90
K	Cast iron	180-250	YBD152	270 (150-300)	0.2(0.15-0.3)	15-90	15-90

Note: Zeff means the effective number of teeth

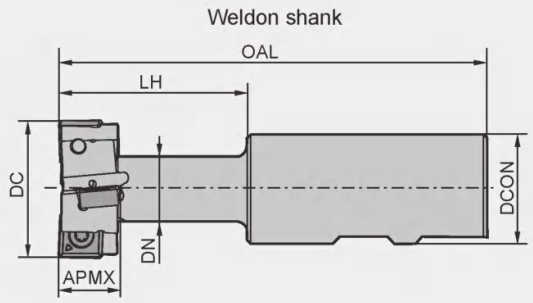
T-slot milling tools

KAPR:90°


T-Slot milling

TMP01 K





Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Number of insert	T-slot specification
			DC	DCON	DN	OAL	LH	APMX			
TMP01	**-021-XP25-MP06-01**	▲	21	25	10	100	32	9	1	2	12
	-025-XP25-MP06-01	▲	25	25	12	100	35	11	1	2	14
	-032-XP32-MP08-02	▲	32	32	15	110	45	14	2	4	18
	-040-XP32-MP12-02	▲	40	32	19	125	55	18	2	4	22
	-050-XP40-MP12-02	▲	50	40	25	140	65	22	2	4	28
	-060-XP50-MP12-02	▲	60	50	32	160	80	28	2	6	36

▲Stock available △Make-to-order

Spare parts

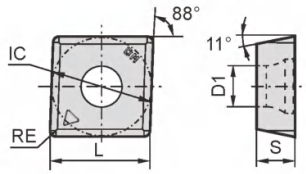
Tool type	Screw	Wrench	
			
TMP01-021-XP25-MP06-01	I60M2.5×5.5	WT07IP	--
TMP01-025-XP25-MP06-01	I60M2.5×5.5		
TMP01-032-XP32-MP08-02	I60M3×7	WT10IP	--
TMP01-040-XP32-MP12-02	I60M5×10	--	WT20IT
TMP01-050-XP40-MP12-02	I60M5×10		
TMP01-060-XP50-MP12-02	I60M5×10		



Caution: When installing inserts, make sure the insert nose marked with "DM" or "Δ" is pointing to the slot.

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



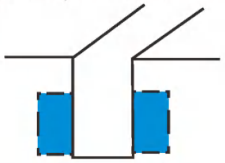
Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😃 😃 — — — 😃 😃 😊 ☹ — — 😊 😊 — —
M	Stainless steel	😃 😃 — — — 😃 😃 😃 ☹ — — 😊 😊 — —
K	Cast iron	— — 😃 😃 ☹ 😊 — — — — — — — — ☹
N	Non-ferrous metal	— — — — — — — — — — — — — — 😃 ☹
S	Heat resistant alloy, Ti alloy	— — — — — 😊 😃 😃 😃 — 😃 ☹ — — — —

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		IC	L	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	MPHT060304-DM	6.35	6.35	3.18	2.8	0.4										★						
	MPHT080305-DM	8.3	8.3	3.18	3.4	0.5										★						
	MPHT120408-DM	12.7	12.7	4.76	5.56	0.8										★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

◆Workpiece before machining



Recommended cutting parameters

Workpiece material	Insert grade	Cutting parameters		
		V(m/min)	f(mm/z)	Cooling
Grey cast iron	YBG302	80~160	0.05~0.2	Wet / Dry

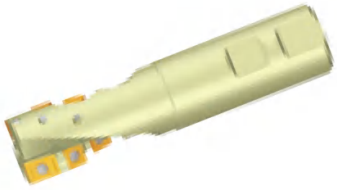
Helical milling tools

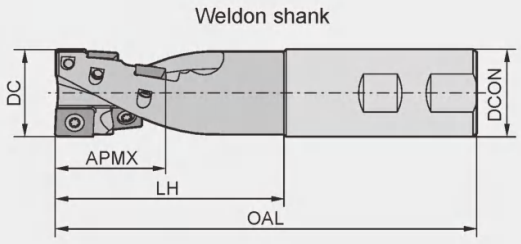
KAPR:90°


Side milling


Slot milling

HMP01 P K





Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Number of inserts		Shank type
		R	L	DC	DCON	APMX	LH	OAL		APKT 150412-PM/KM	SPMT 120408-PM/KM	
HMP01	-040×55-XP40-SP12-02	△	△	40	40	55	95	175	2	1	5	Weldon shank
	-050×55-XP40-SP12-04	△	△	50	40	55	95	175	4	2	10	Weldon shank

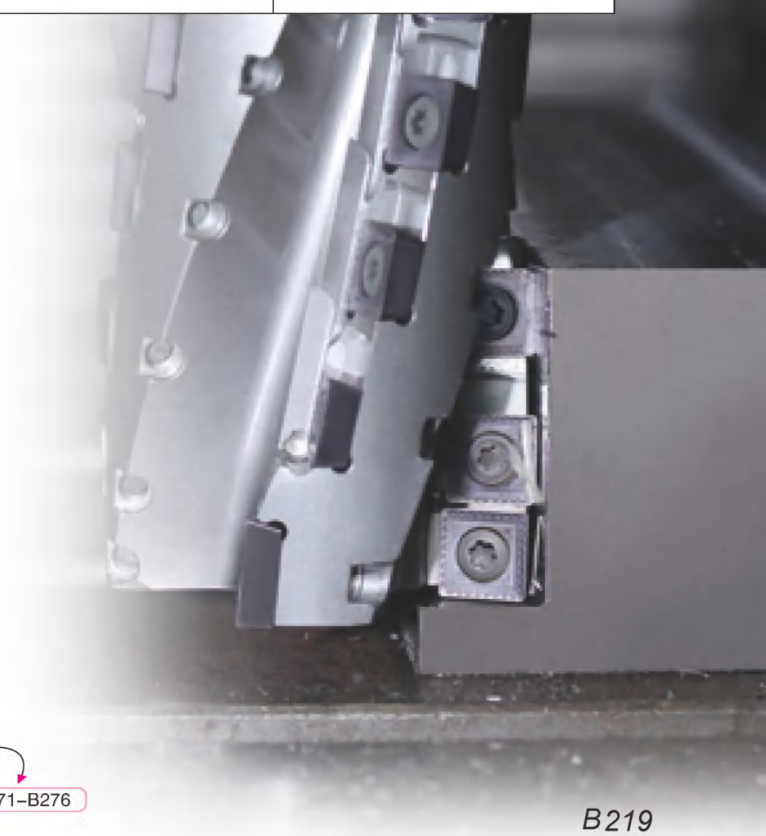
▲Stock available △Make-to-order

Spare parts

Diameter DC	Screw	Wrench
		
Ø40	I60M5×10	WT20T
Ø50	I60M5×13	WT20T







Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Helical milling tools

KAPR:90°

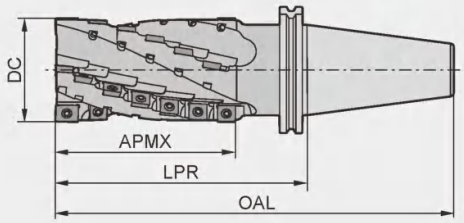

Side milling


Slot milling

HMP01 P K



JT shank/ BT shank (JT shank shown)



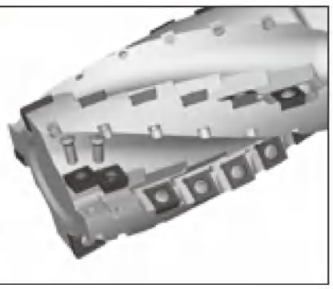
Specification of tools

Type		Stock		Basic dimensions(mm)				Number of teeth Z	Number of inserts		Shank type
		R	L	DC	APMX	LPR	OAL		APKT 150412-PM/KM	SPMT 120408-PM/KM	
HMP01	**-050×84-JT50-SP12-04**	△	△	50	84	145	246.75	4	2	16	JT
	-063×74-JT50-SP12-04	△	△	63	74	135	236.75	4	2	14	JT
	-063×104-JT50-SP12-04	△	△	63	104	165	266.75	4	2	20	JT
	-063×134-JT50-SP12-04	△	△	63	134	195	296.75	4	2	26	JT
	-080×104-JT50-SP12-04	△	△	80	104	165	266.75	4	2	20	JT
	-080×144-JT50-SP12-04	△	△	80	144	205	306.75	4	2	28	JT
	-050×84-BT50-SP12-04	△	△	50	84	145	246.8	4	2	16	BT
	-063×74-BT50-SP12-04	△	△	63	74	135	236.8	4	2	14	BT
	-063×104-BT50-SP12-04	△	△	63	104	165	266.8	4	2	20	BT
	-063×134-BT50-SP12-04	△	△	63	134	195	296.8	4	2	26	BT
	-080×104-BT50-SP12-04	△	△	80	104	165	266.8	4	2	20	BT
	-080×144-BT50-SP12-04	△	△	80	144	205	306.8	4	2	28	BT

▲Stock available △Make-to-order

Spare parts

Diameter DC	Screw	Wrench
		
Ø50	I60M5×13	WT20IS
Ø63	I60M5×13	WT20IS
Ø80	I60M5×13	WT20IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Interchangeable helical end mills

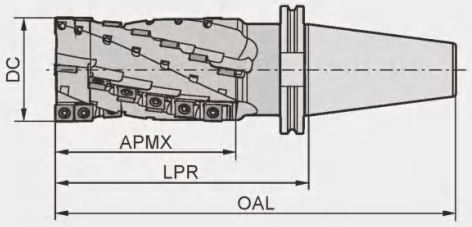
KAPR:90°

Side milling Slot milling

HMP01 EC P K



JT shank/ BT shank (JT shank shown)



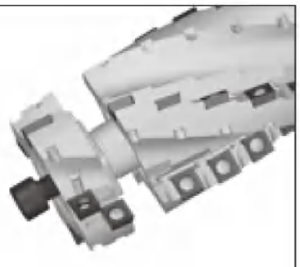
Specification of tools

Type		Stock		Basic dimensions(mm)				Number of teeth Z	Number of inserts		Shank type
		R	L	DC	APMX	LPR	OAL		APKT 150412-PM/KM	SPMT 120408-PM/KM	
HMP01	**-050×84EC-JT50-SP12-04**	△	△	50	84	145	246.75	4	2	16	JT
	-063×74EC-JT50-SP12-04	△	△	63	74	135	236.75	4	2	14	JT
	-063×104EC-JT50-SP12-04	△	△	63	104	165	266.75	4	2	20	JT
	-063×134EC-JT50-SP12-04	△	△	63	134	195	296.75	4	2	26	JT
	-080×104EC-JT50-SP12-04	△	△	80	104	165	266.75	4	2	20	JT
	-080×144EC-JT50-SP12-04	△	△	80	144	205	306.75	4	2	28	JT
	-050×84EC-BT50-SP12-04	△	△	50	84	145	246.8	4	2	16	BT
	-063×74EC-BT50-SP12-04	△	△	63	74	135	236.8	4	2	14	BT
	-063×104EC-BT50-SP12-04	△	△	63	104	165	266.8	4	2	20	BT
	-063×134EC-BT50-SP12-04	△	△	63	134	195	296.8	4	2	26	BT
	-080×104EC-BT50-SP12-04	△	△	80	104	165	266.8	4	2	20	BT
	-080×144EC-BT50-SP12-04	△	△	80	144	205	306.8	4	2	28	BT

▲Stock available △Make-to-order

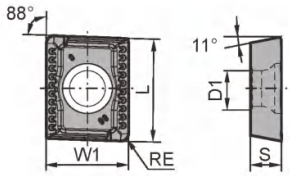
Spare parts

Diameter DC	Insert screw	Screw of interchangeable head	Wrench of insert screw	Wrench of interchangeable head	Interchangeable head
Ø50	I60M5×13	M10×50	WT20IS	WH80L	050EC
Ø63	I60M5×13	M10×50	WT20IS	WH80L	063EC
Ø80	I60M5×13	M12×55	WT20IS	WH100L	080EC



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



Good working condition Normal working condition Bad working condition

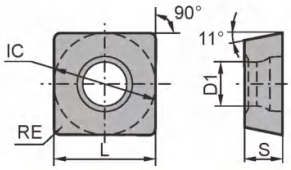
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	APKT150412-PM	16.33	12.7	4.76	5.4	1.2		★								●						
	APKT150412-KM	16.33	12.7	4.76	5.4	1.2										●						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

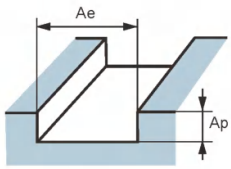
Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SPMT120408-PM	12.7	12.7	4.76	5.5	0.8		★								●						
	SPMT120408-KM	12.7	12.7	4.76	5.5	0.8										●						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker selection for HMP01 milling inserts

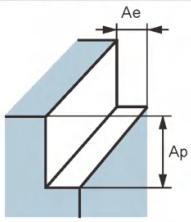
Classification \ Function	For semi-finishing	For roughing
P	-PM	-PM
K	-KM	-KM

A Slot milling



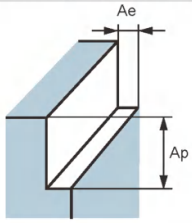
Ae=D
Ap=0.5D(cast iron)
Maximum 12mm(steel)

B Square shoulder milling



Ae=0.5D
Ap=1.5D(cast iron)
1.0D(steel)

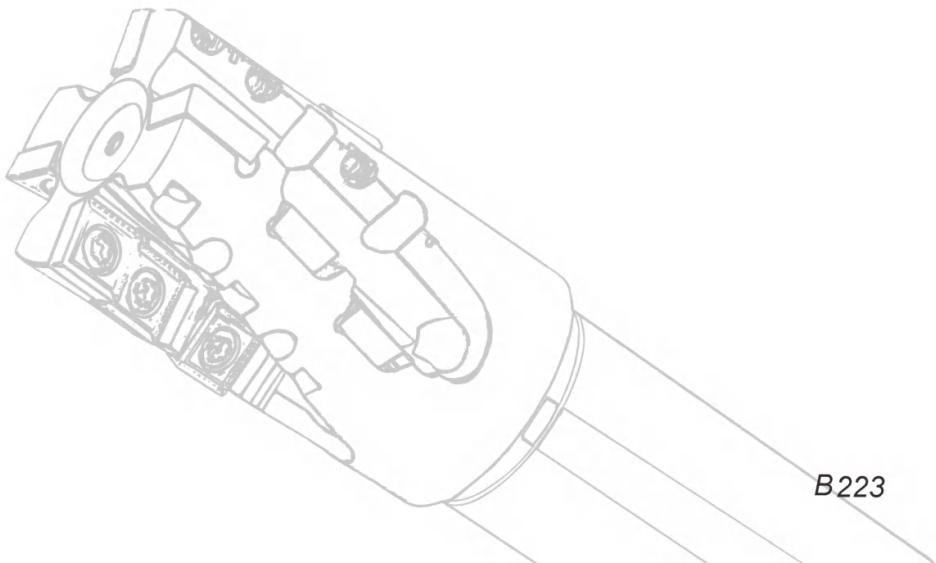
C Narrow shoulder milling



Ae=0.1D
Ap≤Maximum cutting length

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters		Operation (figure)
				Cutting speed(m/min)	Feed speed(mm/z)	
P	Low-carbon steel, Soft steel	⩽180	YBM253 YBG302	80(60-90)	0.25(0.1-0.35)	A
				90(70-120)	0.3(0.15-0.4)	B
				90(70-120)	0.3(0.15-0.4)	C
	High-carbon steel, Alloy steel	180-280	YBM253 YBG302	70(60-100)	0.2(0.1-0.35)	A
				80(60-120)	0.25(0.15-0.35)	B
				90(70-120)	0.25(0.15-0.35)	C
	Alloy tool steel	280-350	YBM253 YBG302	50(40-80)	0.15(0.08-0.25)	A
				60(50-100)	0.2(0.1-0.35)	B
				70(50-100)	0.2(0.1-0.35)	C
K	Cast iron	180-250	YBG152 YBG302	70(50-100)	0.2(0.1-0.35)	A
				80(60-120)	0.25(0.15-0.35)	B
				90(80-120)	0.25(0.15-0.35)	C



Chamfer milling tools

KAPR:30°

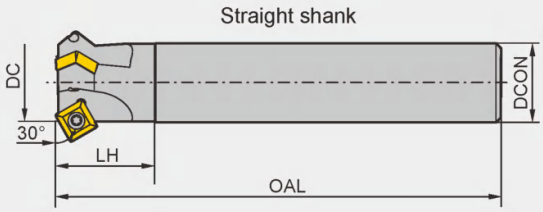

Chamfering


Face milling


Hole stomata chamfering

CMZ01 P M K



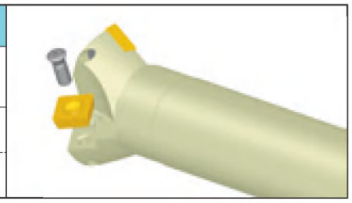


Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Weight (kg)
			DC	DCON	OAL	LH		
CMZ01 Straight shank	**-012-G20-SP12-01**	△	12	20	100	40	1	0.2
	-025-G25-SP12-02	△	25	25	120	40	2	0.8
	-032-G32-SP12-03	△	32	32	180	40	3	1.1

▲Stock available △Make-to-order

Spare parts

Diameter DC	Screw	Wrench	
			
Ø12-Ø32	I43M5×11	WT20IS	

Indexable milling tools
Chamfer milling tools

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

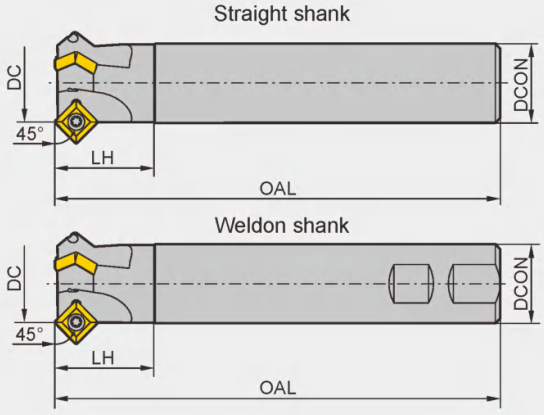
Chamfer milling tools

KAPR:45°



CMA01 P M K





Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Weight (kg)
			DC	DCON	OAL	LH		
CMA01 Straight shank	**-012-G20-SP12-01**	▲	12	20	100	40	1	0.2
	-025-G25-SP12-02	▲	25	25	120	40	2	0.8
	-032-G32-SP12-03	▲	32	32	180	40	3	1.1
Weldon shank	**-012-XP20-SP12-01**	▲	12	20	100	40	1	0.2
	-025-XP25-SP12-02	▲	25	25	120	40	2	0.6
	-032-XP32-SP12-03	▲	32	32	180	40	3	1.0

▲Stock available △Make-to-order

Spare parts

Diameter DC	Screw	Wrench
		
Ø12-Ø32	I43M5×11	WT20IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

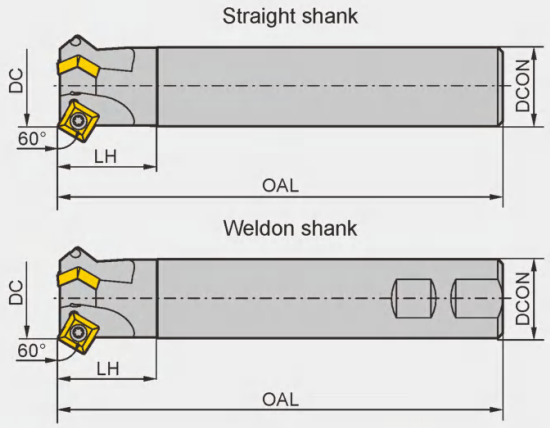
Chamfer milling tools

KAPR:60°



CMD01 P M K





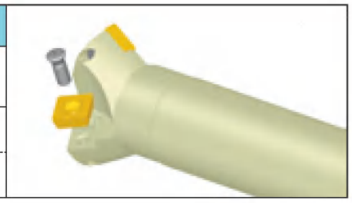
Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Weight (kg)
			DC	DCON	OAL	LH		
CMD01 Straight shank	**-012-G20-SP12-01**	▲	12	20	100	40	1	0.2
	-025-G25-SP12-02	▲	25	25	120	40	2	0.8
	-036-G32-SP12-03	▲	36	32	180	40	3	1.0
Weldon shank	**-012-XP20-SP12-01**	▲	12	20	100	40	1	0.2
	-025-XP25-SP12-02	▲	25	25	120	40	2	0.6
	-036-XP32-SP12-03	▲	36	32	180	40	3	1.0

▲Stock available △Make-to-order

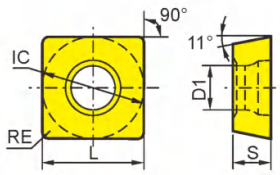
Spare parts

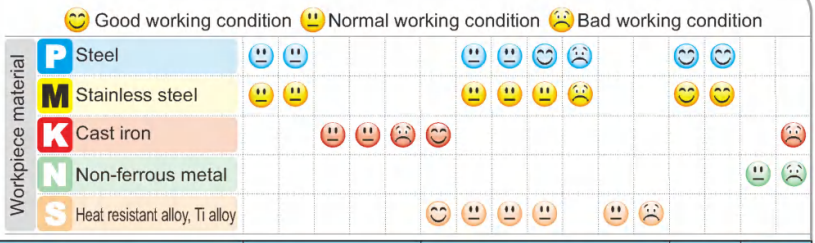
Diameter DC	Screw	Wrench
		
Ø12-Ø36	I43M5×11	WT20IS



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts





Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		IC	L	RE	S	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SPMT120408	12.7	12.7	0.8	4.76	5.5										★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Cutting speed(m/min)	Feed speed(mm/z)
P	Low-carbon steel, Soft steel	≤180	YBM253 YBC302	180(100-250)	0.25 (0.1-0.4)
			YBM253 YBG302	150(100-200)	0.3 (0.1-0.5)
	High-carbon steel, Alloy steel	180-280	YBM253 YBC302	160(100-220)	0.3 (0.1-0.4)
			YBM253 YBG302	130(100-180)	0.3 (0.1-0.5)
	Alloy tool steel	280-350	YBM253 YBC302	120(80-180)	0.3 (0.1-0.4)
			YBM253 YBG302	100(80-150)	0.3 (0.1-0.5)
M	Stainless steel	≤270	YBM253 YBC302	120(80—180)	0.3 (0.1-0.4)
			YBM253 YBG302	100(80-150)	0.3 (0.1-0.5)
K	Cast iron	180-250	YBG302	130(100-180)	0.4 (0.1-0.5)

Interchangable Milling Tools

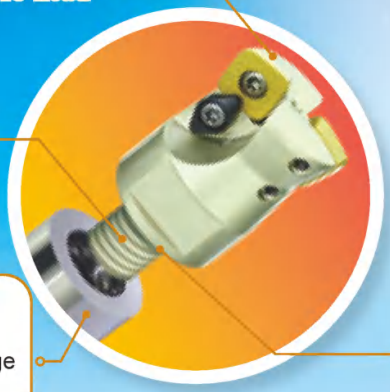
Interchangable cutters head

Screw interface

High precision, double threaded, taper contact provides good accuracy and stability for the tool

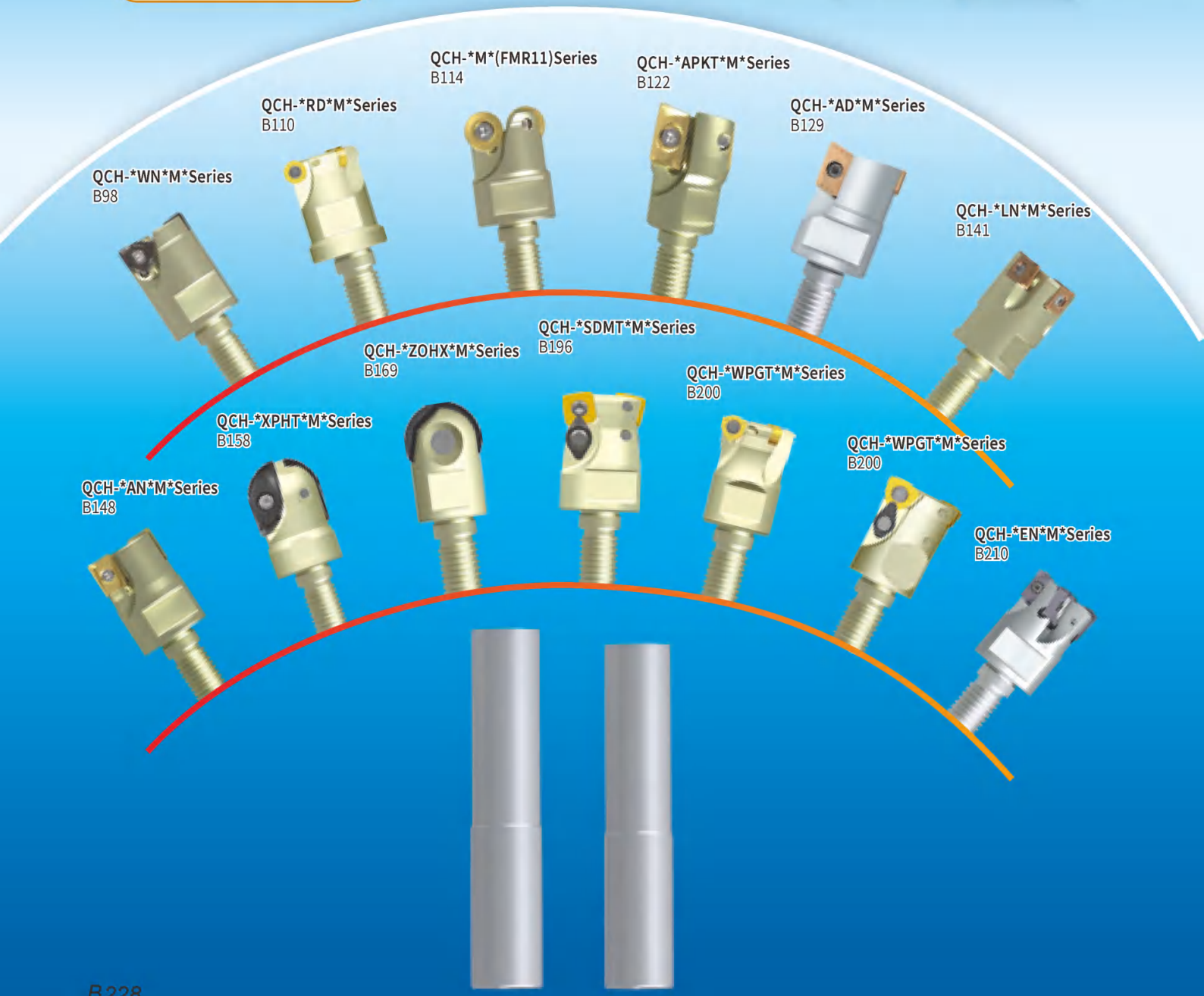
Interchangable shanks

Steel shanks, cemented carbide shanks, and tooling systems are available for large overhangs and large feeds



High precision positioning surface

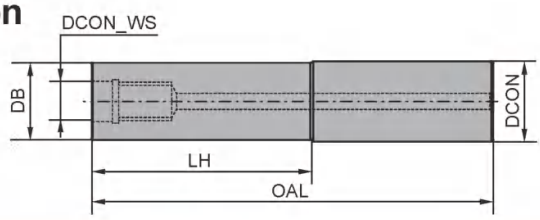
Guaranteeing the perfect combination of toolholder and cutter head



Interchangeable tool holder selection

Cemented carbide shank





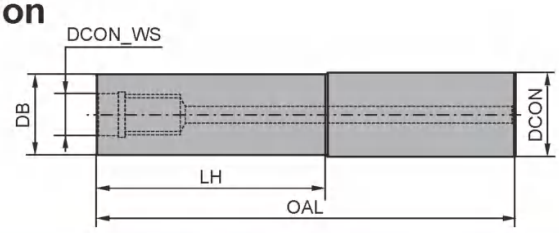
Type		Stock	Basic dimensions(mm)				
			DCON_WS	OAL	LH	DCON	DB
M8	G16-QCH-M8-100C	△	8.5	100	45	16	15
	G16-QCH-M8-150C	▲	8.5	150	95	16	15
	G16-QCH-M8-200C	△	8.5	200	145	16	15
M10	G20-QCH-M10-100C	△	10.5	100	45	20	19
	G20-QCH-M10-150C	▲	10.5	150	95	20	19
	G20-QCH-M10-200C	△	10.5	200	145	20	19
M12	G25-QCH-M12-120C	△	12.5	120	55	25	24
	G25-QCH-M12-170C	▲	12.5	170	105	25	24
	G25-QCH-M12-220C	△	12.5	220	155	25	24
M16	G32-QCH-M16-150C	△	17	150	85	32	30
	G32-QCH-M16-200C	▲	17	200	135	32	30
	G32-QCH-M16-300C	△	17	300	235	32	30

▲Stock available △Make-to-order

Interchangeable tool holder selection

Steel shank



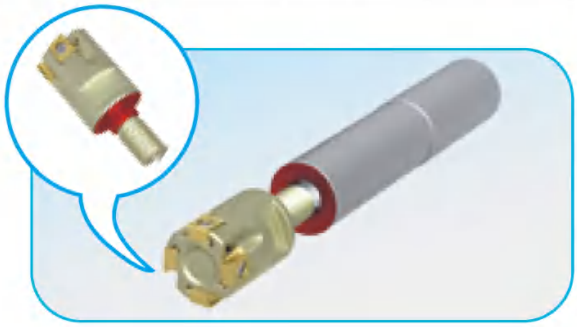


Type		Stock	Basic dimensions(mm)				
			DCON_WS	OAL	LH	DCON	DB
M8	G16-QCH-M8-100S	▲	8.5	100	52	16	15
	G16-QCH-M8-150S	▲	8.5	150	102	16	15
M10	G20-QCH-M10-100S	▲	10.5	100	50	20	19
	G20-QCH-M10-150S	▲	10.5	150	100	20	19
M12	G25-QCH-M12-125S	▲	12.5	125	71	25	24
	G25-QCH-M12-150S	▲	12.5	150	96	25	24
	G25-QCH-M12-200S	▲	12.5	200	144	25	24
M16	G32-QCH-M16-150S	▲	17	150	90	32	30
	G32-QCH-M16-200S	▲	17	200	140	32	30
	G32-QCH-M16-230S	▲	17	230	170	32	30

▲Stock available △Make-to-order

Installation Notes:

1.Before installation, clean the mounting parts of the cutter head and the shank. Ensure that the contact surfaces are tightly fitted after installation.
2.High temperatures are generated when the tool is cutting. Do not touch the cutter with your hands immediately after use to prevent burns.
3.Carbide inserts are very sharp. Be careful when changing inserts to avoid injured.

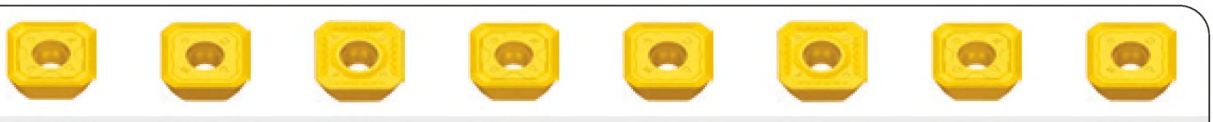


PCD&PCBN inserts

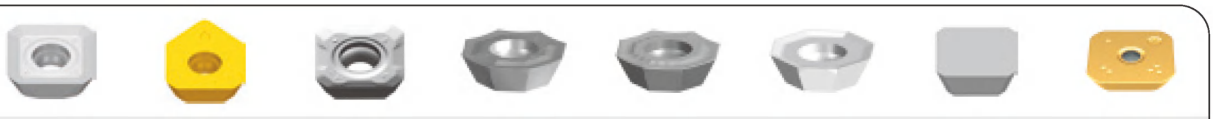


	APHT-PCD	APHT-W	APHT-CBN	SEHT-PCD	SEHT-CBN
Page	B237	B237	B237	B262	B262

Inserts for face milling



	SEET-CF	SEET-CM	SEET-CR	SEET-DF	SEET-DM	SEET-DR	SEET-EF	SEET-EM
Page	B256	B256	B256	B256	B256	B256	B256	B256



	SEET-LH	SEET-W	SEHT-AL	OFKT-DF	OFKT-DM	OFKT-LH	SEEN	SEKN
Page	B256	B256	B262	B246	B246	B246	B257	B257



	SEMR-M	SEKR-M	SEKN	SEMR-M	SEKR-M	ODHT-GM	ODHT-GH	ODHT-GL
Page	B257	B257	B257	B257	B257	B247	B247	B247



	ODMT-GM	ODHT-LH	ONHU-PF	ONHU-PM	ONHU-W	ONHU-GM	ONHU-GH	ONHU-GL
Page	B247	B247	B248	B248	B248	B248	B248	B248



	ONMU-GM	ONMU-GH	ONHU-W	ONHU-CM	SNEG-GM	SNEG-GR	SNEG-HGR	SNEG-W
Page	B248	B248	B248	B247	B258	B258	B258	B258

Inserts for face milling

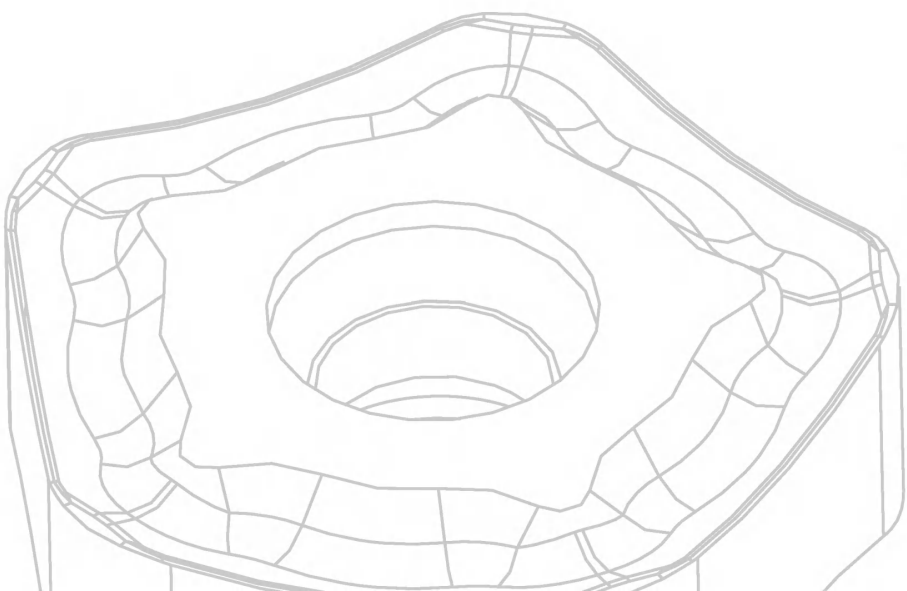
								
	HNEX-DF	HNEX-DM	HNEX-DR	PNEG-CF/CM/CR	PNEG-GL	PNEG-GM	PNEG-GH	PNEG-PF/PM/PR
Page	B242	B242	B242	B249	B249	B249	B249	B250

							
	SPKN	SPKR-GM	SPMR-M	SPEX	TPKN	TPMR	SEET□PER-APF
Page	B264	B264,B265	B264,B265	B266	B266	B266	B258

								
	PNEG-KL	PNEG-KM	PNEG-KH	LNKT-ZR	LNKT-ZR	LNKT-ZR	SPKW	SPKT
Page	B250	B250	B250	B242	B242	B242	B265	B265

								
	SEET□PER-APM	SEET□PER-APR	SEET-LH	WN□U-GM	WNHU-LH	RCKT-DM	RCKT-DM	RCKT-DR
Page	B258	B258	B258	B267	B267	B252	B252	B252

								
	RCKT-ER	RCKT-NM	RDKW□MO	RPMW-H	RPMT-M	R□MT-MM	SN□X□-GL	SN□X□-GM
Page	B252	B252	B253	B254	B254	B254	B259,B260,B261	B259,B260,B261



Inserts for face milling



	SN□X□-GH	SNGX-LH	SNCU-W4	SNGX-W	SNGX-W	SNGX-W	XEEC
Page	B259,B260,B261	B259	B261	B259	B260	B261	B268

Inserts for square shoulder milling



	ADKT-GM	ADKT-GM	APHT-AL	APKT-APL	APKT-APF	APKT-APM	APKT-ALH	ANGX□PNR-GM
Page	B236	B236	B237	B238	B238	B238	B238	B239



	ANMX□PNR-GM	ANGX□PNR-LH	LNKT-GM	LNKT-GL	LNMT-GM
Page	B239	B239	B243	B243	B243

Inserts for profile milling

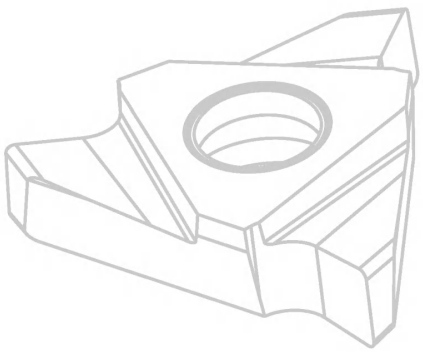


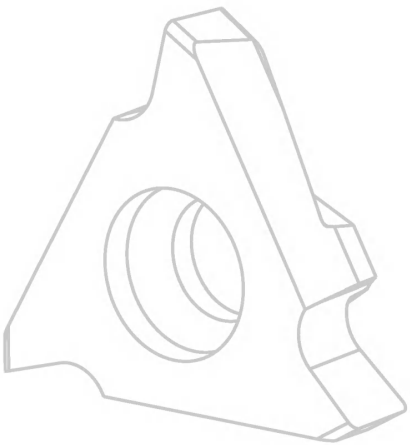
	ZDET	ZPNT	SDMT/SPMT	ROHX	XPHT-GM	ZOHX-GF	ZOHX-GM	ZOHX-HM
Page	B269	B270	B254,B263	B253	B268	B270	B270	B270

Inserts for side and face milling



	XSEQ	QC□□L	LNET-GM	LNGX-GM
Page	B269	B251	B244	B245





Inserts for high feed


SDMT-DM


SDMT-PM


SDMT-NM


WPGT


WPGT-PM


SNGU-GM


ENMX□□-GM

Page	B255	B255	B255	B267	B267	B262	B240-B241

Inserts for boring


CNE-A


CNE-B

Page	B240	B240

Inserts for T-slot milling


MPHT

Page	B246

Inserts for helical milling


APKT-PM/KM


SPMT-PM/KM

Page	B238	B263

Inserts for chamfering

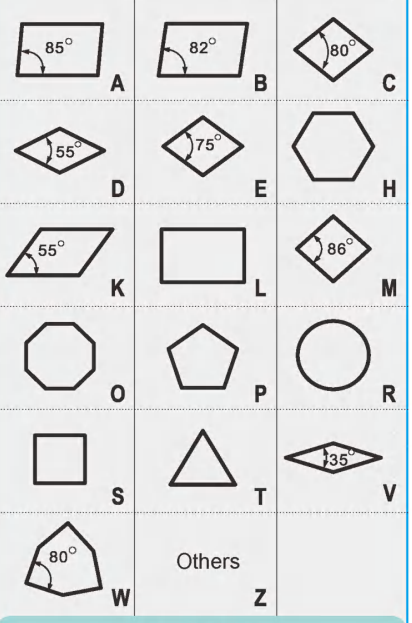

SPMT

Page	B263



Indexable milling inserts code key

Insert Shape / Code



Insert shape

Metric

Code	With/Without hole	With/Without chipbreaker	Section plane of Insert	Code	With/Without hole	With/Without chipbreaker	Section plane of Insert
B	With	Without	>65°	N	Without	Without	
H	With	Single-side	>65°	R	Without	Single-side	
C	With	Without	>65°	F	Without	Double-side	
J	With	Double-side	>65°	A	With	Without	
W	With	Without	≤65°	M	With	Single-side	
T	With	Single-side	≤65°	G	With	Double-side	
Q	With	Without	≤65°	X	---	---	Special
U	With	Double-side	≤65°				

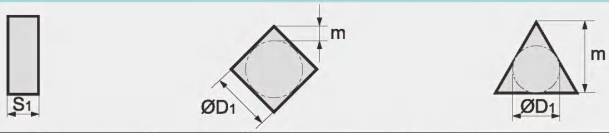
Chipbreaker and clamping system

S P K N

Clearance angle of main cutting edge

Code	Clearance angle	Code	Clearance angle
A	3°	B	5°
C	7°	D	15°
E	20°	F	25°
G	30°	N	0°
P	11°	O	Other clearance angle

Tolerance



Code	Nose height M Tolerance(mm)	Inscribed circle ØD1 Tolerance(mm)	Thickness S Tolerance(mm)
A	±0.005	±0.025	±0.025
F	±0.005	±0.013	±0.025
C	±0.013	±0.025	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.005	±0.05-±0.13	±0.025
K	±0.013	±0.05-±0.13	±0.025
L	±0.025	±0.05-±0.13	±0.025
M	±0.08-±0.18	±0.05-±0.13	±0.13
N	±0.08-±0.18	±0.05-±0.13	±0.025
U	±0.13-±0.38	±0.08-±0.25	±0.13

(Reference) details of M-class tolerance (identified by shape and size)

● Nose height tolerance(mm)

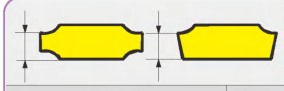
Inscribed circle	Regular triangle	Square	Diamond with 80°	Diamond with 55°	Diamond with 35°	Round
6.35	±0.08	±0.08	±0.08	±0.11	±0.16	---
9.525	±0.08	±0.08	±0.08	±0.11	±0.16	---
12.7	±0.13	±0.13	±0.13	±0.15	---	---
15.875	±0.15	±0.15	±0.15	±0.18	---	---
19.05	±0.15	±0.15	±0.15	±0.18	---	---
25.4	---	±0.18	---	---	---	---

● Tolerance of Inscribed Circle ØD1(mm)

Inscribed circle	Regular triangle	Square	Diamond with 80°	Diamond with 55°	Diamond with 35°	Round
6.35	±0.05	±0.05	±0.05	±0.05	±0.05	---
9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
12.7	±0.08	±0.08	±0.08	±0.08	---	±0.08
15.875	±0.10	±0.10	±0.10	±0.10	---	±0.10
19.05	±0.10	±0.10	±0.10	±0.10	---	±0.10
25.4	---	±0.13	---	---	---	±0.13

Diameter of IC	Insert shape						
	C	D	R	S	T	V	W
3.97					06		
5.0			05				
5.56					09		
6.0			06				
6.35	06	07			11	11	
8.0			08				
9.525	09	11	09	09	16	16	06
10.0			10				
12.0			12				
12.7	12	15	12	12	22	22	08
15.875	16		15	15	27		
16.0		19	16				
19.05	19		19	19	33		
20.0			20				
25.0	25	25	25				
25.4			25	25			
31.75			31				
32			32				

Length of cutting edge



Thickness is defined as the height from the bottom of insert to the highest part of cutting edge

Code	Insert thickness(mm)
00	0.79
T0	0.99
01	1.59
T1	1.98
02	2.38
T2	2.58
03	3.18
T3	3.97
04	4.76
T4	4.96
05	5.96
T5	5.95
06	6.35
T6	6.75
07	7.94
09	9.52
T9	9.72
11	11.11
12	12.70

Insert thickness

12 04 ED T21 R -DM

Wiper

	Kr		αn
A	45°	A	3°
D	60°	B	5°
E	75°	C	7°
F	85°	D	15°
P	90°	E	20°
Z	Others	F	25°
		G	30°
		N	0°
		P	11°
		Z	Others

Chamfer (mm)

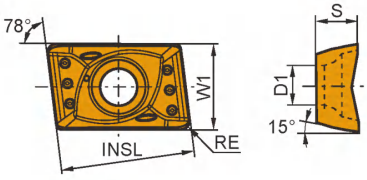
F	0-5°	0-0.10	K
E	1-10°	1-0.15	P
	2-15°	2-0.20	
	3-20°	3-0.25	
T	4-25°	4-0.30	W
	5-30°	5-0.35	
		6-0.40	
S		7-0.45	No mark

Chipbreaker code

Cutting direction

R	Right hand
L	Left hand
N	Neutral

AD□□



Good working condition Normal working condition Bad working condition

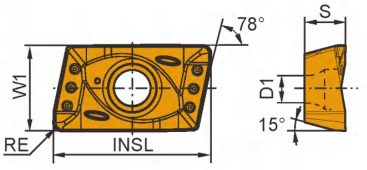
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ADKT080308L-GM	7.96	5.33	3	2.4	0.5									★							
	ADKT100308L-GM	10	6.44	3.2	2.8	0.5									★							
	ADKT12T308L-GM	12.44	8	3.9	3.5	0.5									★							
	ADKT160508L-GM	16	9.62	5	4.4	0.5									★							

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

AD□□



Good working condition Normal working condition Bad working condition

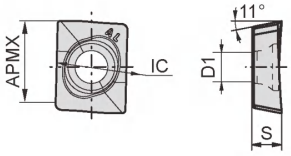
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ADKT090308R-GM	10	5	2.8	2.4	0.8									★							
	ADKT100308R-GM	11.65	6.04	3.5	2.8	0.8									★							
	ADKT12T308R-GM	15	8.16	3.9	3.54	0.8									★							
	ADKT150508R-GM	17.05	8.81	4.95	4.5	0.8									★							

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

APㅁㅁ



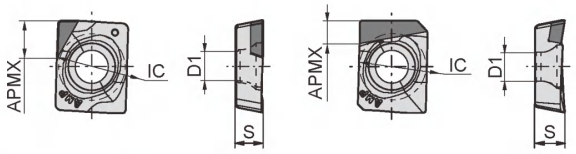
Good working condition 😊 Normal working condition 😐 Bad working condition

Workpiece material					
H	High hardness materials			😐	
K	Cast iron		😊		☹
N	Non-ferrous metal	😐			😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN		Cemented carbide
		IC	S	D1	APMX	YCD011	YCB011	YCB012	YD201
	**APHT12T304PPFR-AL**	12.7	3.97	4.4	12				★

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

APㅁㅁ



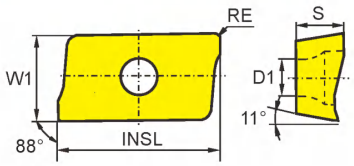
Good working condition 😊 Normal working condition 😐 Bad working condition

Workpiece material					
H	High hardness materials			😐	
K	Cast iron		😊		☹
N	Non-ferrous metal	😐			😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN		Cemented carbide
		IC	S	D1	APMX	YCD011	YCB011	YCB012	YD201
	**APHT12T304PPFR-PCD**	12.7	3.97	4.4	3	★			
	**APHT12T304PPFR-CBN**	12.7	3.97	4.4	2		○	○	
	**APHT12T304-W**	12.7	3.97	4.4	1	★	★	★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

APKT



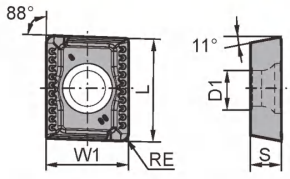
Good working condition　Normal working condition　Bad working condition

Workpiece material		
P	Steel	
M	Stainless steel	
K	Cast iron	
N	Non-ferrous metal	
S	Heat resistant alloy, Ti alloy	

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	APKT11T304-APL	12.24	6.6	3.6	2.8	0.4									★					○		
	APKT11T308-APL	12.24	6.6	3.6	2.8	0.8	★	★	★						★			○				
	APKT160408-APL	17.877	9.33	5.76	4.4	0.8	★	★	★						★			○				
	APKT160420-APL	17.877	9.33	5.76	4.4	2.0									★							
	APKT070204-APM	7.32	4.34	2.38	2	0.4		●	●						★							
	APKT11T304-APM	12.24	6.6	3.6	2.8	0.4		●							★							
	APKT11T308-APM	12.24	6.6	3.6	2.8	0.8		●	●						★		●	●				
	APKT11T312-APM	12.24	6.6	3.6	2.8	1.2			●						★							
	APKT11T316-APM	12.24	6.6	3.6	2.8	1.6									★							
	APKT11T320-APM	12.24	6.6	3.6	2.8	2.0		●							★							
	APKT160408-APM	17.877	9.33	5.76	4.4	0.8		●	●						★		●	●				
	APKT160416-APM	17.877	9.33	5.76	4.4	1.6		●	●						★		●					
	APKT160420-APM	17.877	9.33	5.76	4.4	2.0			●						★							
	APKT160424-APM	17.877	9.33	5.76	4.4	2.4									★							
	APKT160430-APM	17.877	9.33	5.76	4.4	3.0									★							
	APKT070204-APF	7.32	4.34	2.38	2	0.4	●	●							★							
	APKT11T304-APF	12.24	6.6	3.6	2.8	0.4	●	●							★							
	APKT11T308-APF	12.24	6.6	3.6	2.8	0.8	●	●							★		●	●				
	APKT160408-APF	17.877	9.33	5.76	4.4	0.8	●								★		●	●				
	APKT11T304-ALH	12.24	6.6	3.6	2.8	0.4															★	★
	APKT11T308-ALH	12.24	6.6	3.6	2.8	0.8															★	○
	APKT160408-ALH	17.877	9.33	5.76	4.4	0.8															★	★

★Recommended grade (always stock available)　●Available grade (always stock available)　○Make-to-order

APㅁㅁ



Good working condition Normal working condition Bad working condition

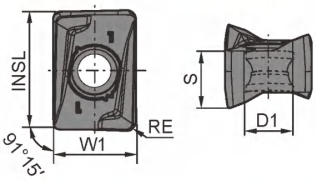
Workpiece material

P	Steel	😐	😐				😐	😐	😊	☹					😊	😊								
M	Stainless steel	😐	😐				😐	😐	😐	☹					😊	😊								
K	Cast iron			😐	😐	☹	😊																	☹
N	Non-ferrous metal																						😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐			😐	☹										

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	APKT150412-PM	16.33	12.7	4.76	5.4	1.2		★								●						
	APKT150412-KM	16.33	12.7	4.76	5.4	1.2										●						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

ANㅁㅁ



Good working condition Normal working condition Bad working condition

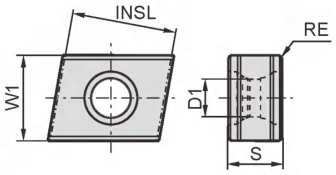
Workpiece material

P	Steel	😐	😐				😐	😐	😊	☹					😊	😊								
M	Stainless steel	😐	😐				😐	😐	😐	☹					😊	😊								
K	Cast iron			😐	😐	☹	😊																	☹
N	Non-ferrous metal																						😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐			😐	☹										

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ANGX110504PNR-GM	11.85	8.4	5.7	3.5	0.4		★	★					★	★							
	ANGX110508PNR-GM	11.85	8.4	5.7	3.5	0.8		★	★					★	★			●				
	ANGX110520PNR-GM	11.85	8.4	5.7	3.5	2.0		★	★		★			★								
	ANGX150608PNR-GM	15.43	11.0	7.3	4.4	0.8		★	★					★	★			●				
	ANGX150616PNR-GM	15.43	11.0	7.3	4.4	1.6		★	★					★	★							
	ANGX150620PNR-GM	15.43	11.0	7.3	4.4	2.0			★		★			★								
	ANMX110508PNR-GM	11.85	8.4	5.7	3.5	0.8		★	★						★			★				
	ANMX150608PNR-GM	15.43	11.0	7.3	4.4	0.8		★	★					★	★							
	ANGX110502PNR-LH	11.85	8.4	5.7	3.5	0.2															★	
	ANGX110504PNR-LH	11.85	8.4	5.7	3.5	0.4															★	
	ANGX150608PNR-LH	15.43	11.0	7.3	4.4	0.8															★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

CN□□



Good working condition Normal working condition Bad working condition

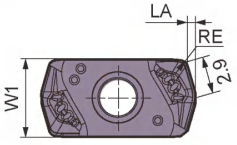
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	RE	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	CNE121006A	12.8	10.0	6.35	0.4	4.4		●	○													
	CNE121006B	12.0	10.0	6.35	0.6	4.4		●	○													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

EN□□



Good working condition Normal working condition Bad working condition

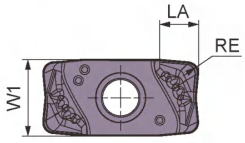
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)			CVD Coating					PVD Coating							Cermet		Cemented carbide	
		W1	RE	LA	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205H	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ENMX1206XR-GM	6	0.6	1								●								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

EN□□



Good working condition Normal working condition Bad working condition

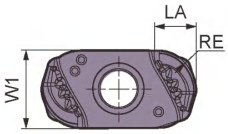
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)			CVD Coating					PVD Coating							Cermet		Cemented carbide	
		W1	RE	LA	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205H	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**ENMX120608-GM**	6	0.8	3								●								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

EN□□



Good working condition Normal working condition Bad working condition

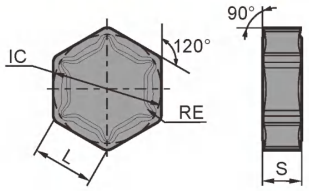
Workpiece material

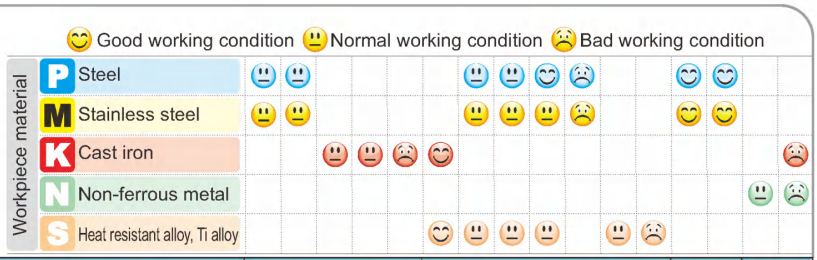
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)			CVD Coating					PVD Coating							Cermet		Cemented carbide	
		W1	RE	LA	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205H	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**ENMX1206R20-GM**	6	2.0	1.8								○								
	ENMX1206R30-GM	6	3.0	2.8								●								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

HN□□

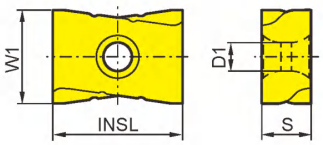


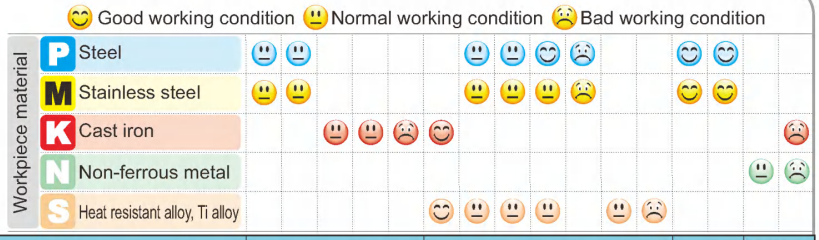


Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**HNEX090512-DF**	9.16	15.875	5.56	1.2			★													
	**HNEX090512-DM**	9.16	15.875	5.56	1.2			★													
	**HNEX090512-DR**	9.16	15.875	5.56	1.2			○		★											

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

LN□□

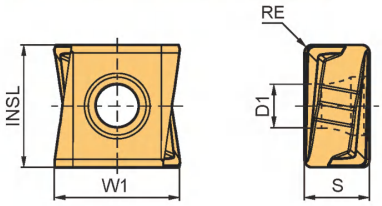




Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**LNKT2007DN-ZR**	20	17	7.94	4.6		○	○							★						
	**LNKT2510-ZR**	25	18	9.525	5.5		○			○					★						
	**LNKT1506EN-ZR**	15.875	14	6.35	4.6		○	○							★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

LN□□



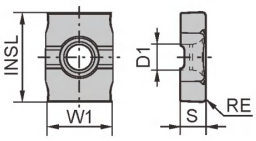
😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material																			
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	LNKT080404PNR-GL	8.75	8.5	4.45	3.4	0.4		★	●		●				★			●				
	LNKT120608PNR-GL	12.7	13	6.75	4.4	0.8		★	●		●				★			●				
	LNKT160708PNR-GL	16.05	15	7.35	5.5	0.8		★	●		●				★			●				
	LNKT080404PNR-GM	8.75	8.5	4.45	3.4	0.4		★	●		●				★			●				
	LNKT080408PNR-GM	8.75	8.5	4.45	3.4	0.8		★	●		●				★							
	LNKT080412PNR-GM	8.75	8.5	4.45	3.4	1.2		★	●		●				★							
	LNKT120608PNR-GM	12.7	13	6.75	4.4	0.8		★	●		●				★			●				
	LNKT120612PNR-GM	12.7	13	6.75	4.4	1.2		★	●		●				★							
	LNKT120616PNR-GM	12.7	13	6.75	4.4	1.6		★	●		●				★							
	LNKT120620PNR-GM	12.7	13	6.75	4.4	2.0		★	●		●				★							
	LNKT120624PNR-GM	12.7	13	6.75	4.4	2.4		★	●		●				★							
	LNKT120632PNR-GM	12.7	13	6.75	4.4	3.2		★	●		●				★							
	LNKT160708PNR-GM	16.05	15	7.35	5.5	0.8		★	●		●				★			●				
	LNKT160712PNR-GM	16.05	15	7.35	5.5	1.2		★	●		●				★							
	LNKT160716PNR-GM	16.05	15	7.35	5.5	1.6		★	●		●				★							
	LNMT080404PNR-GM	8.75	8.5	4.45	3.4	0.4		★	●		●				★							
	LNMT120608PNR-GM	12.7	13	6.75	4.4	0.8		★	●		●				★							
	LNMT160708PNR-GM	16.05	15	7.35	5.5	0.8		★	●		●				★							

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

LN□□

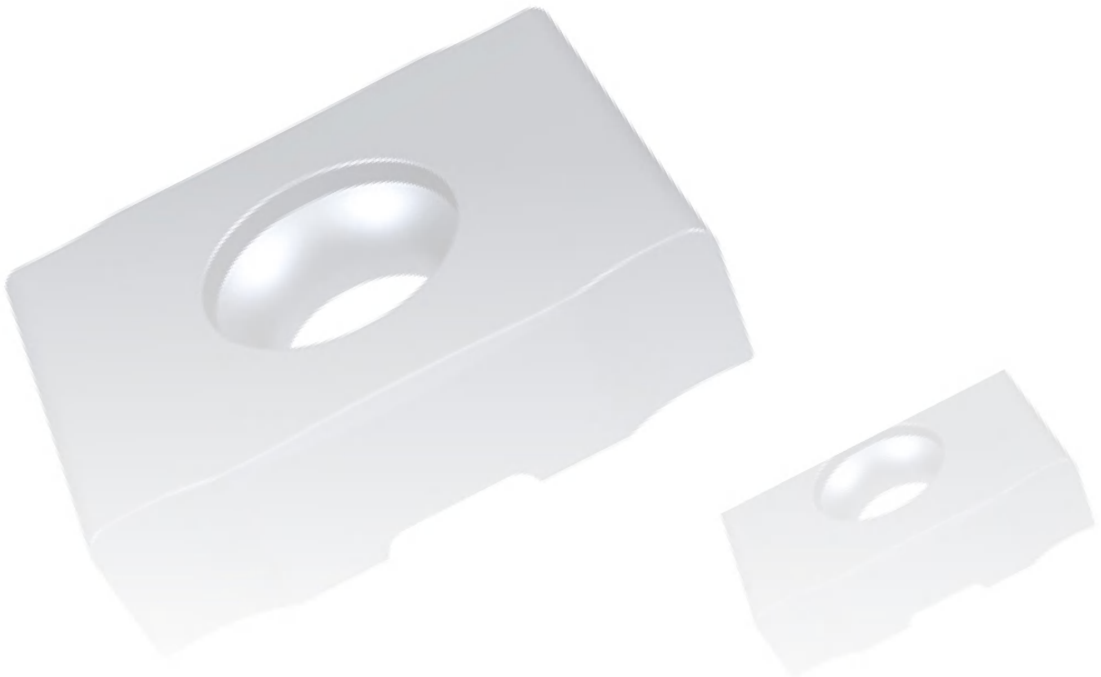


😊 Good working condition 😐 Normal working condition ☹ Bad working condition

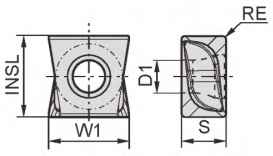
Workpiece material		YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
P	Steel	😐	😐				😐	😐	😊	☹				😊	😊		
M	Stainless steel	😐	😐				😐	😐	😐	☹				😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		W1	INSL	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	LNET102304-GM	7.5	10	2.3	2.9	0.4									★			●				
	LNET102804-GM	7.5	10	2.8	2.9	0.4									★			●				
	LNET103304-GM	7.5	10	3.3	2.9	0.4									★			●				
	LNET123804-GM	10	13	3.8	4.4	0.4									★			●				
	LNET124304-GM	10	13	4.3	4.4	0.4									★			●				
	LNET124804-GM	10	13	4.8	4.4	0.4									★			●				
	LNET125304-GM	10	13	5.3	4.4	0.4									★			●				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



LN□□



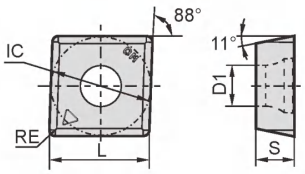
Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😐 😐 😊 ☹ 😊
M	Stainless steel	😐 😐 😐 ☹ 😊
K	Cast iron	😐 😐 ☹ 😊 ☹
N	Non-ferrous metal	😐 ☹
S	Heat resistant alloy, Ti alloy	😊 😐 😐 😐 😐 ☹

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		W1	INSL	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	LNGX100504-GM	9.9	10	5.5	4.1	0.4									★			●				
	LNGX100508-GM	9.9	10	5.5	4.1	0.8									★			●				
	LNGX100512-GM	9.9	10	5.5	4.1	1.2									★			●				
	LNGX100516-GM	9.9	10	5.5	4.1	1.6									★			●				
	LNGX100520-GM	9.9	10	5.5	4.1	2.0									★			●				
	LNGX100524-GM	9.9	10	5.5	4.1	2.4									★			●				
	LNGX100530-GM	9.9	10	5.5	4.1	3.0									★			●				
	LNGX100540-GM	9.9	10	5.5	4.1	4.0									★			●				
	LNGX140704-GM	13.4	14	7.5	4.4	0.4									★			●				
	LNGX140708-GM	13.4	14	7.5	4.4	0.8									★			●				
	LNGX140712-GM	13.4	14	7.5	4.4	1.2									★			●				
	LNGX140716-GM	13.4	14	7.5	4.4	1.6									★			●				
	LNGX140720-GM	13.4	14	7.5	4.4	2.0									★			●				
	LNGX140724-GM	13.4	14	7.5	4.4	2.4									★			●				
	LNGX140730-GM	13.4	14	7.5	4.4	3.0									★			●				
	LNGX140740-GM	13.4	14	7.5	4.4	4.0									★			●				
	LNGX140750-GM	13.4	14	7.5	4.4	5.0									★			●				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

MP□□



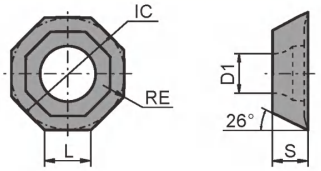
Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	
M	Stainless steel	
K	Cast iron	
N	Non-ferrous metal	
S	Heat resistant alloy, Ti alloy	

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		IC	L	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	MPHT060304-DM	6.35	6.35	3.18	2.8	0.4									★	★						
	MPHT080305-DM	8.3	8.3	3.18	3.4	0.5									★	★						
	MPHT120408-DM	12.7	12.7	4.76	5.56	0.8									★	★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

OF□□



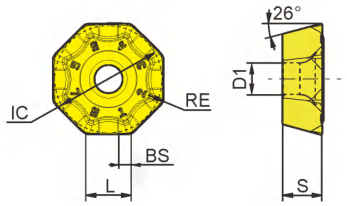
Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	
M	Stainless steel	
K	Cast iron	
N	Non-ferrous metal	
S	Heat resistant alloy, Ti alloy	

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	OFKT05T3-DF	5.26	12.7	3.97	4.4	0.5						○	★									
	OFKT05T3-DM	5.26	12.7	3.97	4.4	0.5						★	★		★	★						
	OFKT05T3-LH	5.26	12.7	3.97	4.4	0.5															○	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

OD□□



Good working condition Normal working condition Bad working condition

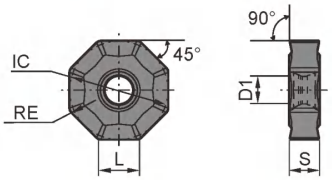
Workpiece material

		YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm) L	IC	S	D1	RE	BS	CVD Coating YBC302	YBM253	YBD152	YBD203	YBD252	PVD Coating YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	Cermet YNG151	YNG151C	Cemented carbide YD101	YD201
	ODHT060508-GL	6.5	15.875	5.56	5.4	0.8	1.6		●	●					●	●							
	ODHT060508-GM	6.5	15.875	5.56	5.4	0.8	1.6		●	●					●	●			●				
	ODMT060512-GM	6.5	15.875	5.56	5.4	1.2	--		●	●					●	●			●				
	ODHT060508-GH	6.5	15.875	5.56	5.4	0.8	1.6		●	●					●	●							
	ODHT060508-LH	6.5	15.875	5.56	5.4	0.8	1.6															●	●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

ON□□



Good working condition Normal working condition Bad working condition

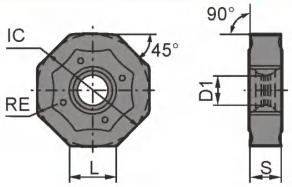
Workpiece material

		YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm) L	IC	S	D1	RE	CVD Coating YBC302	YBM253	YBD152	YBD203	YBD252	PVD Coating YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	Cermet YNG151	YNG151C	Cemented carbide YD101	YD201
	ONHU060408-CM	6.58	15.875	4.76	4.4	0.8			●			●			●							

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

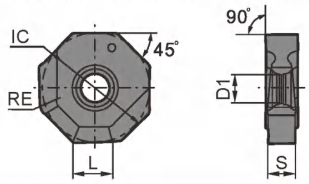
ON□□

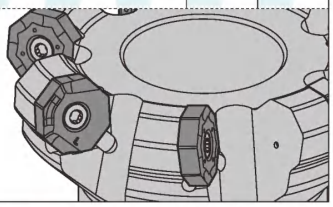


Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😃 😃 — — — 😃 😃 😊 ☹ — — 😊 😊 — —
M	Stainless steel	😃 😃 — — — 😃 😃 😃 ☹ — — 😊 😊 — —
K	Cast iron	— — 😃 😃 ☹ 😊 — — — — — — — — ☹
N	Non-ferrous metal	— — — — — — — — — — — — — — 😃 ☹
S	Heat resistant alloy, Ti alloy	— — — — — 😊 😃 😃 😃 — 😃 ☹ — — — —

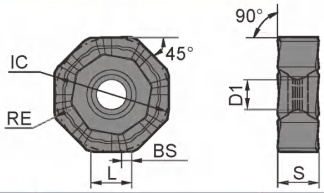
Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ONHU060408-PF	6.58	15.875	4.76	4.4	0.83	★		★				★									
	ONHU08T508-PF	8.37	20.2	5.77	5.3	0.83	★		★				★									
	ONHU060408-PM	6.58	15.875	4.76	4.4	0.83	★	★	★													
	ONHU08T508-PM	8.37	20.2	5.79	5.3	0.83	★	★	★													
	ONHU08T508-W	6.9	20.5	6.00	5.3	0.80						★		★								





★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

ON□□



Good working condition Normal working condition Bad working condition

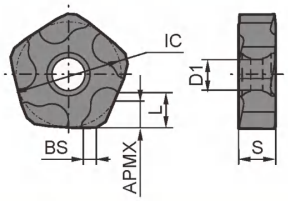
Workpiece material		
P	Steel	😃 😃 — — — 😃 😃 😊 ☹ — — 😊 😊 — —
M	Stainless steel	😃 😃 — — — 😃 😃 😃 ☹ — — 😊 😊 — —
K	Cast iron	— — 😃 😃 ☹ 😊 — — — — — — — — ☹
N	Non-ferrous metal	— — — — — — — — — — — — — — 😃 ☹
S	Heat resistant alloy, Ti alloy	— — — — — 😊 😃 😃 😃 — 😃 ☹ — — — —

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	RE	BS	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ONHU060404ANN-GL	6.15	15.875	5.54	6	0.4	1.2		●	●					●	●			●				
	ONHU09T508ANN-GL	8.0	20.2	5.8	7	0.8	1.2		●	●					●	●			●				
	ONHU060408ANN-GM	6.15	15.875	5.54	6	0.8	1		●	●					●	●			●				
	ONMU060408-GM	6.15	15.875	5.54	6	0.8	-		●	●					●	●							
	ONHU09T508ANN-GM	8.0	20.2	5.8	7	0.8	1.2		●	●					●	●			●				
	ONMU09T512-GM	8.0	20.2	5.8	7	1.2	-		●	●					●	●							
	ONMU060408-GH	6.15	15.875	5.54	6	0.8	-		●	●					●	●			●				
	ONHU060408ANN-GH	6.15	15.875	5.54	6	0.8	1		●	●					●	●			●				
	ONHU09T508ANN-GH	8.0	20.2	5.8	7	0.8	1.2		●	●					●	●			●				
	ONMU09T512-GH	8.0	20.2	5.8	7	1.2	-		●	●					●	●							
	ONHU0604AN-W	6.15	15.875	4.97	6	0.8	-						●										

●Inserts are suitable for both left and right cuts

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

PN□□



Good working condition Normal working condition Bad working condition

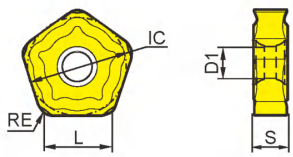
Workpiece material

		YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
P	Steel	😐	😐				😐	😐	😊	☹				😊	😊		
M	Stainless steel	😐	😐				😐	😐	😐	☹				😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm) L	IC	S	D1	BS	APMX	CVD Coating YBC302	YBM253	YBD152	YBD203	YBD252	PVD Coating YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	Cermet YNG151	YNG151C	Cemented carbide YD101	YD201
	PNEG110512R-CF	5.4	15.875	5.56	4.64	1.6	5			●													
	PNEG110512L-CF	5.4	15.875	5.56	4.64	1.6	5			●													
	PNEG110512R-CM	5.4	15.875	5.56	4.64	1.6	5			●													
	PNEG110512L-CM	5.4	15.875	5.56	4.64	1.6	5			●													
	PNEG110512R-CR	5.4	15.875	5.56	4.64	1.6	5			●													
	PNEG110512L-CR	5.4	15.875	5.56	4.64	1.6	5			●													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

PN□□



Good working condition Normal working condition Bad working condition

Workpiece material

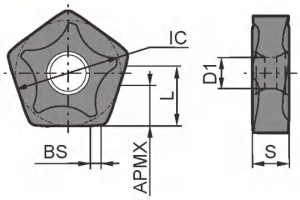
		YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
P	Steel	😐	😐				😐	😐	😊	☹				😊	😊		
M	Stainless steel	😐	😐				😐	😐	😐	☹				😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm) L	IC	S	D1	RE	CVD Coating YBC302	YBM253	YBD152	YBD203	YBD252	PVD Coating YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	Cermet YNG151	YNG151C	Cemented carbide YD101	YD201
	PNEG110512-GL	7.5	15.875	5.56	4.64	1.2		●						●	★							
	PNEG110530-GM	7.5	15.875	5.56	4.64	3.0		●						●	★							
	PNEG110530-GH	7.5	15.875	5.56	4.64	3.0		●						●	★							

●Inserts are suitable for both left and right cuts

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

PN□□



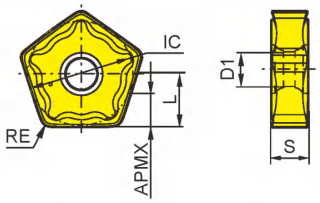
😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material																		
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊			
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊			
K	Cast iron			😐	😐	☹	😊											☹
N	Non-ferrous metal															😐	☹	
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹					

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	BS	APMX	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	PNEG110512R-PF	7.5	15.875	5.56	4.64	1.4	7.5	★	●														
	PNEG110512L-PF	7.5	15.875	5.56	4.64	1.4	7.5	★	●														
	PNEG110512R-PM	7.5	15.875	5.56	4.64	1.4	7.5	★	●														
	PNEG110512L-PM	7.5	15.875	5.56	4.64	1.4	7.5	★	●														
	PNEG110512R-PR	7.5	15.875	5.56	4.64	1.4	7.5	★	●														
	PNEG110512L-PR	7.5	15.875	5.56	4.64	1.4	7.5	★	●														

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

PN□□



😊 Good working condition 😐 Normal working condition ☹ Bad working condition

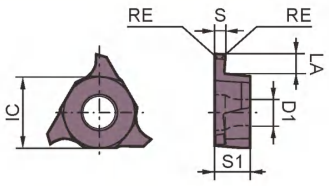
Workpiece material																		
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊			
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊			
K	Cast iron			😐	😐	☹	😊											☹
N	Non-ferrous metal															😐	☹	
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹					

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	RE	APMX	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	PNEG110512-KL	6.5	15.875	5.56	4.64	1.2	6.5			●		●											
	PNEG110512-KM	6.5	15.875	5.56	4.64	1.2	6.5			●		●											
	PNEG110512-KH	6.5	15.875	5.56	4.64	1.2	6.5			●		●											

●Inserts are suitable for both left and right cuts

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

QC□□



Good working condition Normal working condition Bad working condition

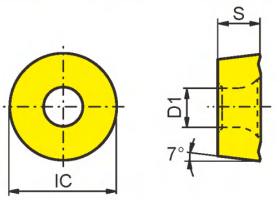
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		S±0.025	LA	RE	IC	S1	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	QC16L110-R01	1.10	2.00	R0.1	9.525	3.18	4.4							○	○								
	QC16L125-R02	1.25	2.00	R0.2	9.525	3.18	4.4							○	○								
	QC16L145-R02	1.45	2.00	R0.2	9.525	3.18	4.4							○	○								
	QC16L150-R02	1.50	2.00	R0.2	9.525	3.18	4.4							○	★								
	QC16L175-R02	1.75	2.00	R0.2	9.525	3.18	4.4							○	○								
	QC16L185-R02	1.85	2.50	R0.2	9.525	3.18	4.4							○	○								
	QC16L200-R02	2.00	2.50	R0.2	9.525	3.18	4.4							○	★								
	QC16L250-R02	2.50	2.50	R0.2	9.525	3.18	4.4							○	★								
	QC16L300-R02	3.00	3.00	R0.2	9.525	3.18	4.4							○	★								
	QC22L125-R02	1.25	2.00	R0.2	12.70	4.76	5.5							○	○								
	QC22L145-R02	1.45	2.00	R0.2	12.70	4.76	5.5							○	○								
	QC22L150-R02	1.50	3.50	R0.2	12.70	4.76	5.5							○	★								
	QC22L175-R02	1.75	3.50	R0.2	12.70	4.76	5.5							○	○								
	QC22L185-R02	1.85	3.50	R0.2	12.70	4.76	5.5							○	○								
	QC22L200-R02	2.00	3.50	R0.2	12.70	4.76	5.5							○	★								
	QC22L230-R02	2.30	3.50	R0.2	12.70	4.76	5.5							○	○								
	QC22L250-R03	2.50	4.00	R0.3	12.70	4.76	5.5							○	★								
	QC22L265-R03	2.65	4.00	R0.3	12.70	4.76	5.5							○	○								
	QC22L280-R03	2.80	4.00	R0.3	12.70	4.76	5.5							○	○								
	QC22L300-R03	3.00	4.00	R0.3	12.70	4.76	5.5							○	★								
	QC22L320-R03	3.20	4.00	R0.3	12.70	4.76	5.5							○	○								
	QC22L330-R03	3.30	4.00	R0.3	12.70	4.76	5.5							○	○								
	QC22L350-R03	3.50	5.00	R0.3	12.70	4.76	5.5							○	★								
	QC22L400-R04	4.00	5.00	R0.4	12.70	4.76	5.5							○	★								
	QC22L430-R04	4.30	5.00	R0.4	12.70	4.76	5.5							○	○								
	QC22L450-R04	4.50	5.00	R0.4	12.70	4.76	5.5							○	○								
	QC22L480-R04	4.80	5.00	R0.4	12.70	5.06	5.5							○	○								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

RC□□



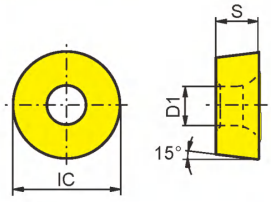
Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😃 😃 · · · · 😃 😃 😊 ☹ · · 😊 😊 · ·
M	Stainless steel	😃 😃 · · · · 😃 😃 😃 ☹ · · 😊 😊 · ·
K	Cast iron	· · 😃 😃 ☹ 😊 · · · · · · · · · ☹
N	Non-ferrous metal	· · · · · · · · · · · · · · 😃 ☹
S	Heat resistant alloy, Ti alloy	· · · · · 😊 😃 😃 😃 · ☹ · · · · ·

Insert shape	Type	Basic dimensions(mm)			CVD Coating					PVD Coating							Cermet		Cemented carbide	
		IC	S	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	RCKT10T3MO-DM	10.0	3.97	4.4							●	★								
	RCKT1204MO-DM	12.0	4.76	4.0			○				●	★		●						
	RCKT1606MO-DM	16.0	6.35	5.56										●						
	RCKT1204MO-DR	12.0	4.76	4.0							●	★								
	RCKT1606MO-DR	16.0	6.35	5.56					○		●	★								
	RCKT2006MO-DR	20.0	6.35	6.55					○		○	★		●						
	RCKT1204MO-ER	12.0	4.76	4.0		★														
	RCKT1606MO-ER	16.0	6.35	5.56		★														
	RCKT2006MO-ER	20.0	6.35	6.55		★														
	RCKT1204MO-NM	12.0	4.76	4.0		○							○	○		○				
	RCKT1606MO-NM	16.0	6.35	5.56		○							○	○		○				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

RD□□



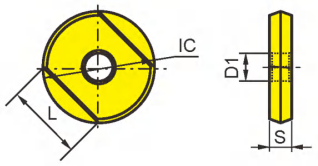
😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material																
P Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K Cast iron			😐	😐	☹	😊										☹
N Non-ferrous metal															😐	☹
S Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)			CVD Coating					PVD Coating							Cermet		Cemented carbide	
		IC	S	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	RDKW0803MO	8	3.18	3.4							●	★		○						
	RDKW10T3MO	10	3.97	4.4							●	★								
	RDKW1204MO	12.0	4.76	4.4							●	★								
	RDKW1605MO	16.0	5.56	5.5							○	★		○						
	RDKW2006MO	20.0	6.35	6.5								○								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

RO□□



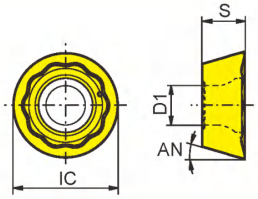
😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material																
P Steel	😐	😐					😐	😐	😊	☹	😊			😊	😊		
M Stainless steel	😐	😐					😐	😐	😐	☹				😊	😊		
K Cast iron			😐	😐	☹	😊											☹
N Non-ferrous metal																😐	☹
S Heat resistant alloy, Ti alloy						😊	😐	😐	😐			😐	☹				

Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating								Cermet		Cemented carbide	
		IC	L	S	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBH053	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ROHX1203	12	8.5	3	4											○						
	ROHX1604	16	11.3	4	5											○						
	ROHX2005	20	14.1	5	5											○						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

RP/D□□



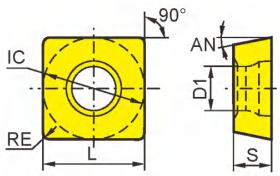
Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	
M	Stainless steel	
K	Cast iron	
N	Non-ferrous metal	
S	Heat resistant alloy, Ti alloy	

Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating							Cermet		Cemented carbide	
		IC	S	D1	AN	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	RPMW10T3MO-H	10.0	3.97	4.1	11°								●								
	RPMW1204MO-H	12.0	4.76	4.4	11°								●								
	RDMW10T3MO-H	10.0	3.97	4.1	15°								●								
	RDMW1204MO-H	12.0	4.76	4.4	15°								●								
	RPMT10T3MO-M	10.0	3.97	4.1	11°								●			●	●				
	RPMT1204MO-M	12.0	4.76	4.4	11°								●			●	●				
	RDMT10T3MO-M	10.0	3.97	4.1	15°								●			●	●				
	RDMT1204MO-M	12.0	4.76	4.4	15°								●			●	●				
	RPMT10T3MO-MM	10.0	3.97	4.1	11°								●			●	●				
	RPMT1204MO-MM	12.0	4.76	4.4	11°								●			●	●				
	RDMT10T3MO-MM	10.0	3.97	4.1	15°								●			●	●				
	RDMT1204MO-MM	12.0	4.76	4.4	15°								●			●	●				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SD□□



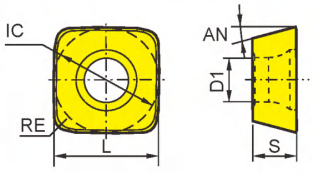
Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	
M	Stainless steel	
K	Cast iron	
N	Non-ferrous metal	
S	Heat resistant alloy, Ti alloy	

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		RE	L	IC	S	D1	AN	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SDMT090308	0.8	9.525	9.525	3.18	4.4	15°										○						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SD□□



😊 Good working condition 😐 Normal working condition ☹ Bad working condition

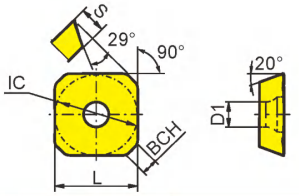
Workpiece material		YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	P Steel	😐	😐				😐	😐	😊	☹				😊	😊		
	M Stainless steel	😐	😐				😐	😐	😐	☹				😊	😊		
	K Cast iron			😐	😐	☹	😊										☹
	N Non-ferrous metal															😐	☹
	S Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	IC	L	RE	S	D1	AN	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SDMT06T208-DM	6.35	6.35	0.8	2.58	2.5	15°	★	★							●	●		●				
	SDMT09T312-DM	9.525	9.525	1.2	3.97	4.0	15°	★	★							●	●						
	SDMT120412-DM	12.7	12.7	1.2	4.76	4.4	15°	★	★						★	●	●						
	SDMT150520-DM	15.875	15.875	2.0	5.56	5.5	15°	★	★						●	●	●						
	SDMT06T208-PM	6.35	6.35	0.8	2.58	2.5	15°	★	●						●				●				
	SDMT09T312-PM	9.525	9.525	1.2	3.97	4.0	15°	★	●						●								
	SDMT120412-PM	12.7	12.7	1.2	4.76	4.4	15°	★	●						●								
	SDMT150520-PM	15.875	15.875	2.0	5.56	5.5	15°	★	●						●								
	SDMT06T208-NM	6.35	6.35	0.8	2.58	2.5	15°		●										●				
	SDMT09T312-NM	9.525	9.525	1.2	3.97	4.0	15°		●										●				
	SDMT120412-NM	12.7	12.7	1.2	4.76	4.4	15°		●							●			●				
	SDMT150520-NM	15.875	15.875	2.0	5.56	5.5	15°		●							●			●				

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker introduction:
-PM chipbreaker has sharp cutting edge, it is more suitable for machining with power shortage and for relatively adhesive materials, such as stainless steel and Ti alloy, etc.
-DM chipbreaker has blunt cutting edge and is relatively suitable for machining of hard materials such as hardened steel and cast iron, etc.

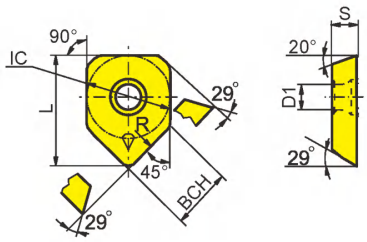
SE□□

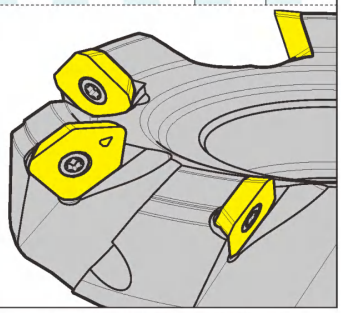


😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material																						
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

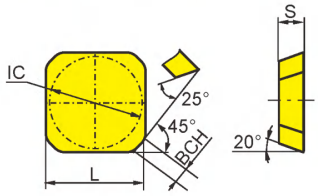
Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	BCH	R	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SEET12T3-DF	13.4	13.4	3.97	4.1	2.55	--	★							★		○	○	○				
	SEET12T3-CF	13.4	13.4	3.97	4.1	2.55	--			○			★		★		○						
	SEET12T3-EF	13.4	13.4	3.97	4.1	2.55	--								★		○	○	○				
	SEET12T3-DM	13.4	13.4	3.97	4.1	2.55	--	★							★		★	○	○				
	SEET18T6-DM	18.0	18.0	6.1	5.5	1.5	--	○	○														
	SEET12T3-CM	13.4	13.4	3.97	4.1	2.55	--			★					★		○						
	SEET12T3-EM	13.4	13.4	3.97	4.1	2.55	--								★		★	○	○				
	SEET18T6-EM	18.0	18.0	6.1	5.5	1.5	--		○							○							
	SEET12T3-DR	13.4	13.4	3.97	4.1	2.55	--	★							★		★						
	SEET12T3-CR	13.4	13.4	3.97	4.1	2.55	--			★					★		★						
	SEET12T3-LH	13.4	13.4	3.97	4.1	2.55	--															○	★
	SEET12T3-W	17.82	13.4	3.97	4.1	9.46	500	★		★			★		★					★			
	SEET18T6-W	24.78	18.0	6.1	5.5	11.0	500						★		○								





★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SE□□



Good working condition Normal working condition Bad working condition

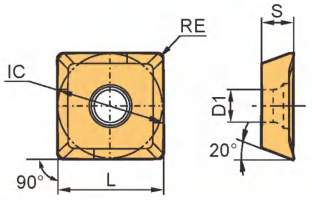
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BCH	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SEEN1203AFTN	12.7	12.7	3.18	1.8							○						●			
	SEKN1203AFFN	12.7	12.7	3.18	1.8						★										
	SEKN1203AFN	12.7	12.7	3.18	1.8	●						○									
	SEKN1203AFTN	12.7	12.7	3.18	1.8	★	★	●				★	★					●			
	SEMR1203AN-M	12.7	12.7	3.3	-								●								
	SEKR1203AN-M	12.7	12.7	3.3	-								●								
	SEKN1504AFN	15.875	15.875	4.76	1.6	●	●														
	SEKN1504AFTN	15.875	15.875	4.76	1.6	★	★							★	●						
	SEMR1504AN-M	15.875	15.875	4.9	-								●								
	SEKR1504AN-M	15.875	15.875	4.9	-								●								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SE□□



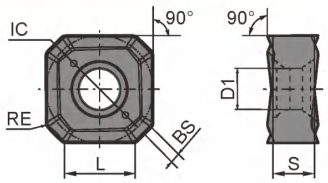
Good working condition / Normal working condition / Bad working condition

Workpiece material		
P	Steel	😐 😐 — — — 😐 😐 😊 ☹ — — 😊 😊 — —
M	Stainless steel	😐 😐 — — — 😐 😐 😐 ☹ — — 😊 😊 — —
K	Cast iron	— — 😐 😐 ☹ 😊 — — — — — — — — ☹
N	Non-ferrous metal	— — — — — — — — — — — — — — 😐 ☹
S	Heat resistant alloy, Ti alloy	— — — — — 😊 😐 😐 😐 — — 😐 ☹ — —

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SEET09T308PER-APF	9.525	9.525	4.01	3.3	0.8			★				●		★							
	SEET120308PER-APF	13.308	13.308	4.04	4.1	0.8			★				●		★							
	SEET09T308PER-APM	9.525	9.525	4.01	3.3	0.8			★				●		★							
	SEET120308PER-APM	13.308	13.308	4.04	4.1	0.8			★				●		★							
	SEET09T308PER-APR	9.525	9.525	4.01	3.3	0.8			★				●		★							
	SEET120308PER-APR	13.308	13.308	4.04	4.1	0.8			★				●		★							
	SEET120308-LH	13.3	13.3	4.05	4.1	0.8															★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

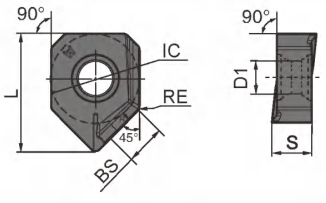
SN□□

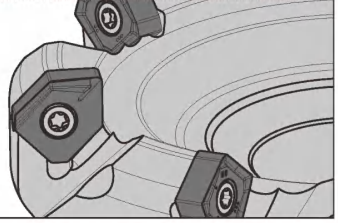


Good working condition / Normal working condition / Bad working condition

Workpiece material		
P	Steel	😐 😐 — — — 😐 😐 😊 ☹ — — 😊 😊 — —
M	Stainless steel	😐 😐 — — — 😐 😐 😐 ☹ — — 😊 😊 — —
K	Cast iron	— — 😐 😐 ☹ 😊 — — — — — — — — ☹
N	Non-ferrous metal	— — — — — — — — — — — — — — 😐 ☹
S	Heat resistant alloy, Ti alloy	— — — — — 😊 😐 😐 😐 — — 😐 ☹ — —

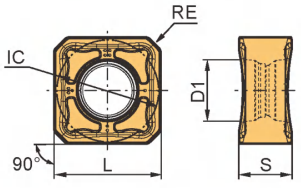
Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BS	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SNEG1205ANR-GM	7.6	12.0	4.76	1.05	4.6	0.6	★	★	★	○				★	★		○	○				
	SNEG1506ANR-GM	9.4	15.0	5.54	1.30	5.5	0.9	★	★	★	○				★	★		○	○				
	SNEG1205ANR-GR	7.6	12.0	4.76	1.05	4.6	0.6	★	★	★					★				●				
	SNEG1506ANR-GR	9.4	15.0	5.54	1.30	5.5	0.9	★	★	★					★				●				
	SNEG1907ANR-GR	12.1	19.0	7.0	1.67	7.2	1.0	★	★	★		★			★								
	SNEG1205ANR-HGR	7.6	12.0	4.76	1.05	4.6	0.8	★	★	★	○	○			★	★							
	SNEG1506ANR-HGR	9.4	15.0	5.54	1.30	5.5	0.9	★	★	★	○	○			★	★							
	SNEG1907ANR-HGR	12.1	19.0	7.0	1.67	7.2	1.0	★	★	★		○			★	★							
	SNEG1205ANR-W	15.9	12.0	4.76	4.07	4.6	0.6								●								
	SNEG1506ANR-W	19.9	15.0	5.54	4.97	5.5	0.9								●								

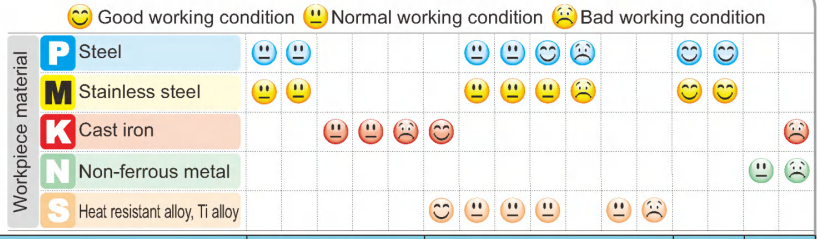




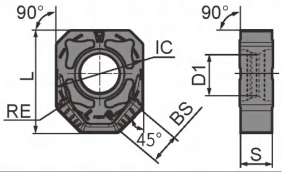
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

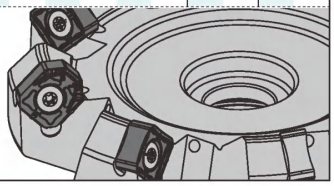
SN□□





Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BS	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SNGX1205ANN-GL	12.7	12.7	6.5	-	5.9	0.8		●	●						★							
	SNMX120512-GL	12.7	12.7	6.5	-	5.9	1.2		●	●						★							
	SNGX1205ANN-GM	12.7	12.7	6.5	-	5.9	0.8		●	●						★			●				
	SNMX1205ANN-GM	12.7	12.7	6.5	-	5.9	0.8		●	●						★			●				
	SNMX120512-GM	12.7	12.7	6.5	-	5.9	1.2		●	●						★			●				
	SNGX1205ANN-GH	12.7	12.7	6.5	-	5.9	0.8		●	●						★							
	SNMX120512-GH	12.7	12.7	6.5	-	5.9	1.2		●	●						★							
	SNGX1205ANN-LH	12.7	12.7	6.5	-	5.9	0.8																●
	SNGX1205ANN-W	15	12.7	4.8	4.32	5.9	1.2						●										

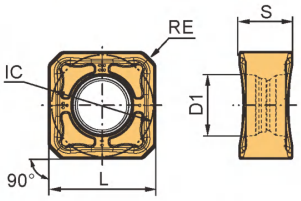




●Inserts are suitable for both left and right cuts

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

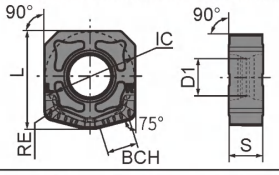
SN□□

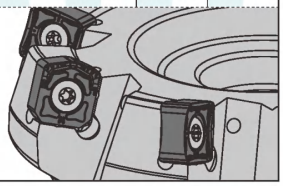


😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material																				
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BCH	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SNGX1205ENN-GL	12.7	12.7	6.5	-	5.9	0.8		●	●						★							
	SNMX120512-GL	12.7	12.7	6.5	-	5.9	1.2		●	●						★							
	SNGX1205ENN-GM	12.7	12.7	6.5	-	5.9	0.8		●	●						★			●				
	SNMX120512-GM	12.7	12.7	6.5	-	5.9	1.2		●	●						★			●				
	SNGX1205ENN-GH	12.7	12.7	6.5	-	5.9	0.8		●	●						★							
	SNMX120512-GH	12.7	12.7	6.5	-	5.9	1.2		●	●						★							
	SNGX1205ENN-W	13.7	12.7	4.8	4.69	5.9	1.2						●										

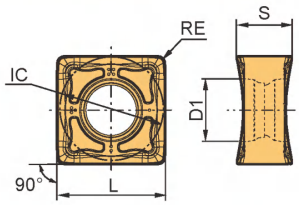


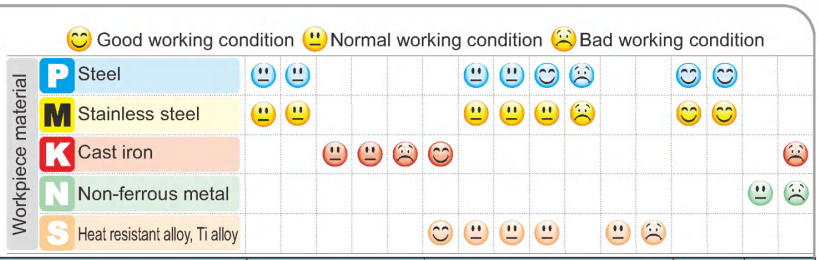


●Inserts are suitable for both left and right cuts

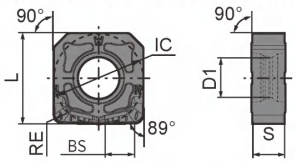
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

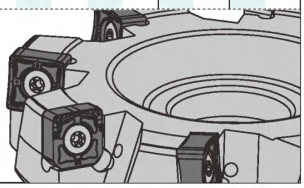
SN□□





Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BS	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SNGX1205PNN-GL	12.7	12.7	6.5	-	5.9	0.8		●	●						○	★						
	SNMX120512-GL	12.7	12.7	6.5	-	5.9	1.2		●	●						○	★						
	SNGX1205PNN-GM	12.7	12.7	6.5	-	5.9	0.8		●	●						○	★		●				
	SNMX120512-GM	12.7	12.7	6.5	-	5.9	1.2		●	●						○	★		●				
	SNGX1205PNN-GH	12.7	12.7	6.5	-	5.9	0.8		●	●						○	★						
	SNMX120512-GH	12.7	12.7	6.5	-	5.9	1.2		●	●						○	★						
	SNCU120420-W4	12.7	12.7	4.8	-	5.9	2.0						●										
	SNGX1205PNN-W	12.86	12.7	4.8	4.26	5.9	1.2									●							

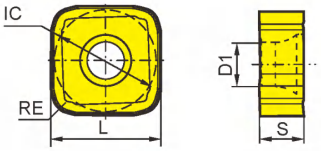




★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

- Inserts can be mounted left or right.
- The W4 wiper inserts for adjustable tool holders.
- The W wiper inserts can be mounted directly on the cutting teeth.

SN□□



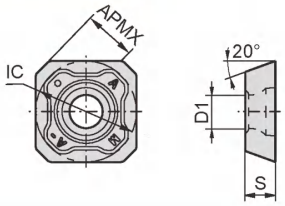
😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material																	
P Steel	😐	😐					😐	😐	😊	☹			😊	😊			
M Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊			
K Cast iron			😐	😐	☹	😊											☹
N Non-ferrous metal															😐	☹	
S Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹					

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	RE	S	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**SNGU120620-GM**	12.7	12.7	2.0	5.6	4.4		●						●	●							

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SE□□



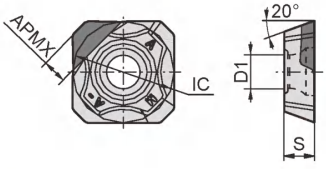
😊 Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material					
H High hardness materials				😐	
K Cast iron			😊		☹
N Non-ferrous metal	😐				😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN		Cemented carbide
		IC	S	D1	APMX	YCD011	YCB011	YCB012	YD201
	**SEHT12T3AFFN-AL**	12.7	3.97	4.4	6.6				★

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SE□□



😊 Good working condition 😐 Normal working condition ☹ Bad working condition

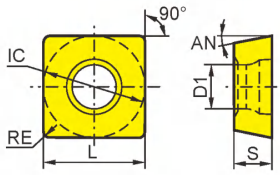
Workpiece material					
H High hardness materials				😐	
K Cast iron			😊		☹
N Non-ferrous metal	😐				😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN		Cemented carbide
		IC	S	D1	APMX	YCD011	YCB011	YCB012	YD201
	**SEHT12T308AFFN-PCD**	12.7	3.97	4.4	2.5	★			
	SEHT12T308AFFN-CBN	12.7	3.97	4.4	2		○	○	

CBN insert edge can be treated as per machining requirements

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□□



Good working condition Normal working condition Bad working condition

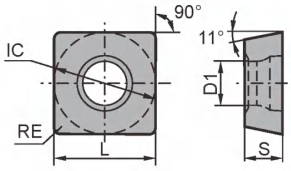
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating						Cermet		Cemented carbide	
		RE	L	IC	S	D1	AN	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**SPMT060304**	0.4	6.35	6.35	3.18	2.8	11°										○						
	SPMT120408	0.8	0.8	12.70	4.76	5.5	11°										★						
	**SPMT120408**	12.7	12.7	0.8	4.76	5.5	11°										★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□□



Good working condition Normal working condition Bad working condition

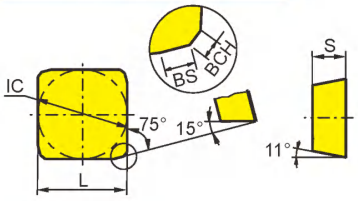
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**SPMT120408-PM**	12.7	12.7	4.76	5.5	0.8		★								●						
	SPMT120408-KM	12.7	12.7	4.76	5.5	0.8										●						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□N



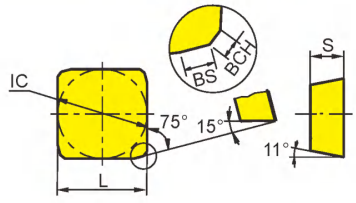
Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BCH	BS	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SPKN1203EDER	12.7	12.7	3.18	1	1.4							○									
	SPKN1203EDEL	12.7	12.7	3.18	1	1.4							○									
	SPKN1203EDFR	12.7	12.7	3.18	1	1.4						★	○									●
	SPKN1203EDFL	12.7	12.7	3.18	1	1.4						○	○									○
	SPKN1203EDSKR	12.7	12.7	3.18	1	1.4										○						
	SPKN1203EDSKL	12.7	12.7	3.18	1	1.4										○						
	SPKN1203EDTKR	12.7	12.7	3.18	1	1.4							○			★						○
	SPKN1203EDTKL	12.7	12.7	3.18	1	1.4							○			○						○
	SPKN1203EDS31R	12.7	12.7	3.18	1	1.4										○						
	SPKN1203EDS31L	12.7	12.7	3.18	1	1.4										○						
	SPKN1203EDT31R	12.7	12.7	3.18	1	1.4							○			★						○
	SPKN1203EDT31L	12.7	12.7	3.18	1	1.4							○			○						○
	SPKR1203EDR-GM	12.7	12.7	3.18	1	1.4							★			★						●
	SPKR1203EDL-GM	12.7	12.7	3.18	1	1.4							★			★						●
	SPMR1203EDSR-M	12.7	12.7	3.18	-	1.3	●	★	●													
	SPMR1203EDSL-M	12.7	12.7	3.18	-	1.3	●	★	●													
	SPKN1504EDER	15.875	15.875	4.76	1	1.4							○									
	SPKN1504EDEL	15.875	15.875	4.76	1	1.4							○									
	SPKN1504EDFR	15.875	15.875	4.76	1	1.4						○	○									○
	SPKN1504EDFL	15.875	15.875	4.76	1	1.4						○	○									○
	SPKN1504EDSKR	15.875	15.875	4.76	1	1.4										○						
	SPKN1504EDSKL	15.875	15.875	4.76	1	1.4										○						
	SPKN1504EDTKR	15.875	15.875	4.76	1	1.4							★			○						●
	SPKN1504EDTKL	15.875	15.875	4.76	1	1.4							○			○						●
	SPKN1504EDS32R	15.875	15.875	4.76	1	1.4										○						
	SPKN1504EDS32L	15.875	15.875	4.76	1	1.4										○						
	SPKN1504EDT32R	15.875	15.875	4.76	1	1.4							★			○						●
	SPKN1504EDT32L	15.875	15.875	4.76	1	1.4							○			○						●

Ordering guide: **SPKN1203EDT3 1 R** chamfering angle 20° , chamfering width 0.15mm. For other edge shapes, see inserts code key standard.

SP□N



Good working condition Normal working condition Bad working condition

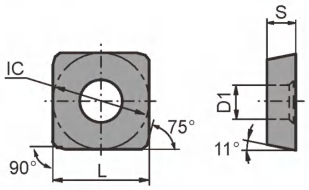
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BCH	BS	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SPKR1504EDR-GM	15.875	15.875	4.76	1	1.4							★			★						●
	SPKR1504EDL-GM	15.875	15.875	4.76	1	1.4							★			★						●
	SPMR1504ESR-M	15.875	15.875	4.76	-	1.2	●	★	●													
	SPMR1504ESL-M	15.875	15.875	4.76	-	1.2	●	★	●													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□□



Good working condition Normal working condition Bad working condition

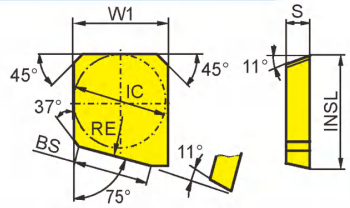
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	SPKW1204EDFR	12.7	12.7	4.76	5.56							○									
	SPKW1204EDSR	12.7	12.7	4.76	5.56							○									
	SPKT1204EDR	12.7	12.7	4.76	5.56							★									

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□X



Good working condition Normal working condition Bad working condition

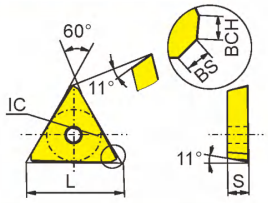
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	IC	W1	S	BS	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
inserts with wiper	SPEX1203EDL-1	15	12.7	12.7	3.18	10	500																●
	SPEX1203EDR-1	15	12.7	12.7	3.18	10	500																●
	SPEX1504EDL-1	18.2	15.875	15.875	4.76	10	500																●
	SPEX1504EDR-1	18.2	15.875	15.875	4.76	10	500																●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

TP□□



Good working condition Normal working condition Bad working condition

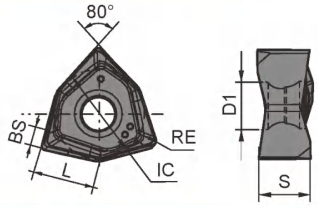
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	BCH	BS	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	TPKN2204PDFR	22	12.7	4.76	1.4	0.7						●										
	TPKN2204PDFL	22	12.7	4.76	1.4	0.7						●										
	TPKN2204PDR	22	12.7	4.76	1.4	0.7	●	●				●	★	●		●						
	TPKN2204PDL	22	12.7	4.76	1.4	0.7	●							●								
	TPKN2204PDTR	22	12.7	4.76	1.4	0.7	●															
	TPKN2204PDTL	22	12.7	4.76	1.4	0.7	●															
	TPMR2204PDSL	22	12.7	4.76	1.4	0.7	○	○														
	TPMR2204PDSR	22	12.7	4.76	1.4	0.7	○	○														

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

WN□□



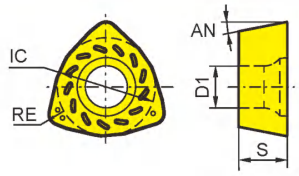
Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		L	IC	S	D1	BS	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	WNHU060404PNR-GM	5.7	9.525	4.0	3.5	1.35	0.4		★	★					★	★							
	WNHU060408PNR-GM	5.7	9.525	4.0	3.5	1.35	0.8		★	★					★	★							
	WNHU080608PNR-GM	7.7	12.7	5.4	4.4	1.6	0.8		★	★					★	★							
	WNHU080612PNR-GM	7.7	12.7	5.4	4.4	1.6	1.2		★	★					★	★							
	WNHU080616PNR-GM	7.7	12.7	5.4	4.4	1.6	1.6		★	★					★	★							
	WNMU060408PNN-GM	5.7	9.525	4.0	3.5	1.35	0.8		★	★					★	★							
	WNMU080608PNN-GM	7.7	12.7	5.4	4.4	1.6	0.8		★	★					★	★							
	WNHU080608PNR-LH	7.7	12.7	5.4	4.4	1.6	0.8															★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

WP□□



Good working condition Normal working condition Bad working condition

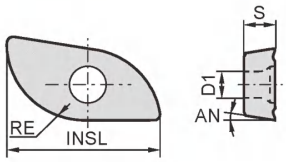
Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		IC	RE	S	D1	AN	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	WPGT050315ZSR	7.94	1.5	3.5	4.0	11°	★															
	WPGT060415ZSR	9.525	1.5	4.2	4.4	11°	★															
	WPGT080615ZSR	12.85	1.5	6.35	5.5	11°	★															
	WPGT090725ZSR	15.00	2.5	7	5.5	11°	★															
	WPGT050315ZSR-PM	7.94	1.5	3.5	4.0	11°	★							●								
	WPGT060415ZSR-PM	9.525	1.5	4.2	4.4	11°	★							●								
	WPGT080615ZSR-PM	12.85	1.5	6.35	5.5	11°	★							●								
	WPGT090725ZSR-PM	15.00	2.5	7.00	5.5	11°	★							●								

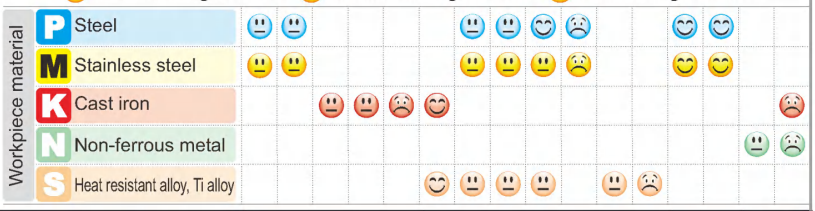
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker introduction:
-PM chipbreaker has sharp cutting edge, it is more suitable for machining with power shortage and for relatively adhesive materials, such as stainless steel and Ti alloy, etc.
General chipbreaker has blunt cutting edge and is relatively suitable for machining of hard materials such as hardened steel and cast iron, etc.

XP□□



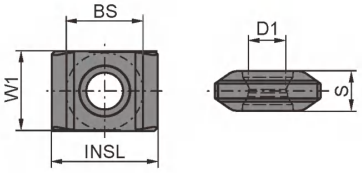
Good working condition Normal working condition Bad working condition



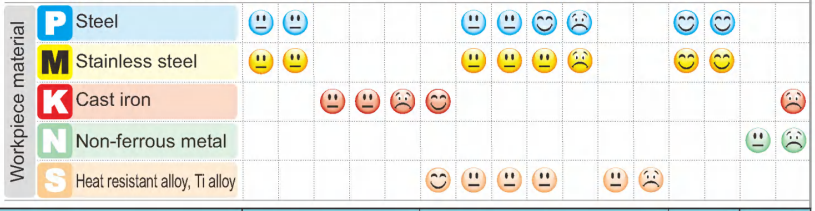
Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		RE	D1	S	AN	INSL	Applicable tools	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**XPHT16R0803-GM**	8	3.1	3.18	9°	16	Ø16										★						
	XPHT20R10T3-GM	10	4.0	3.97	9°	20	Ø20										★						
	XPHT25R1204-GM	12.5	4.7	4.76	9°	25	Ø25										★						
	XPHT30R1506-GM	15	5.8	6.35	11°	30	Ø30										★						
	XPHT32R1606-GM	16	5.8	6.35	9°	32	Ø32										★						
	XPHT40R2007-GM	20	6.7	7.94	9°	40	Ø40										★						
	XPHT50R2507-GM	25	9.2	7.94	9°	50	Ø50										★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

XE□□



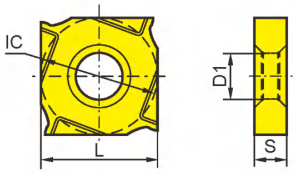
Good working condition Normal working condition Bad working condition



Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	BS	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**XEEC120904**	12.7	9.525	4.76	4.4	7.3			●			●										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

XS□□



Good working condition Normal working condition Bad working condition

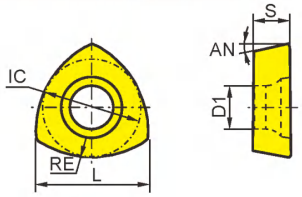
Workpiece material

		YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
P	Steel	😐	😐				😐	😐	😊	☹				😊	😊		
M	Stainless steel	😐	😐				😐	😐	😐	☹				😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm) IC	L	S	D1	CVD Coating YBC302	YBM253	YBD152	YBD203	YBD252	PVD Coating YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	Cermet YNG151	YNG151C	Cemented carbide YD101	YD201
	**XSEQ1202**	12.7	12.7	2.3	5.0										★						
	XSEQ1203	12.7	12.7	3.0	5.0										★						
	XSEQ12T3	12.7	12.7	3.5	5.0										★						
	XSEQ1204	12.7	12.7	4.0	5.0										★						
	XSEQ12T4	12.7	12.7	4.5	5.0										★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

ZD□□



Good working condition Normal working condition Bad working condition

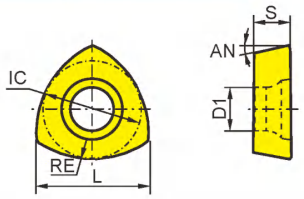
Workpiece material

		YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
P	Steel	😐	😐				😐	😐	😊	☹				😊	😊		
M	Stainless steel	😐	😐				😐	😐	😐	☹				😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm) RE	L	IC	S	D1	AN	CVD Coating YBC302	YBM253	YBD152	YBD203	YBD252	PVD Coating YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	Cermet YNG151	YNG151C	Cemented carbide YD101	YD201
	**ZDET08T2CYR10**	10	8.4	6.75	2.78	2.8	14°										○						
	ZDET1103CYR12.5	12.5	10.6	8.5	3.18	2.8	14°										○						
	ZDET13T3CYR16	16	13.2	10.5	3.97	4.4	14°										○						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

ZP□□



Good working condition Normal working condition Bad working condition

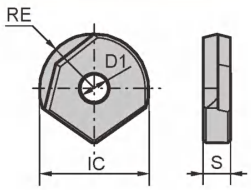
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating							Cermet		Cemented carbide	
		RE	L	IC	S	D1	AN	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ZPNT2204CY(R20)	20	16.1	12.7	4.76	5.56	11°										○						
	ZPNT2204CY(R25)	25	16.9	12.7	4.76	5.56	11°										○						
	ZPNT2204CY(R31)	31.5	17.6	12.7	4.76	5.56	11°										○						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

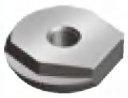
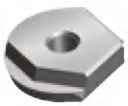
ZO□□



Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

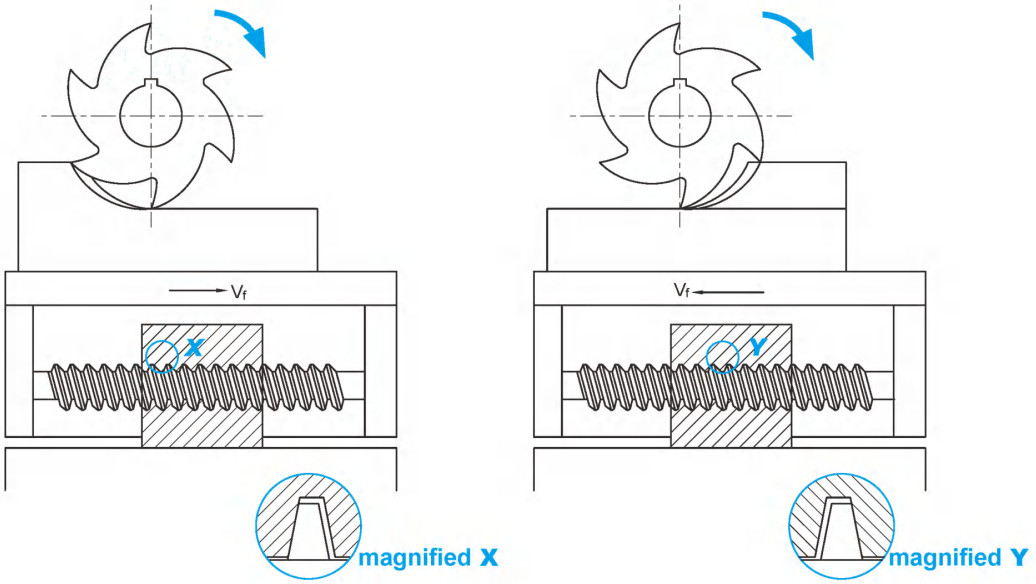
Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating								Cermet		Cemented carbide	
		RE	IC	S	D1	Applicable tools ØD	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBH053	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ZOHX1203-GF	6	12	3	4	Ø12											★						
	ZOHX1604-GF	8	16	4	5	Ø16											★						
	ZOHX2005-GF	10	20	5	5	Ø20											★						
	ZOHX2506-GF	12.5	25	6	6	Ø25											★						
	ZOHX3007-GF	15	30	7	8	Ø30											★						
	ZOHX3207-GF	16	32	7	8	Ø32											★						
	ZOHX1203-GM	6	12	3	4	Ø12											★						
	ZOHX1604-GM	8	16	4	5	Ø16											★						
	ZOHX2005-GM	10	20	5	5	Ø20											★						
	ZOHX2506-GM	12.5	25	6	6	Ø25											★						
	ZOHX3007-GM	15	30	7	8	Ø30											★						
	ZOHX3207-GM	16	32	7	8	Ø32											★						
	ZOHX1203-HM	6	12	3	4	Ø12											★						
	ZOHX1604-HM	8	16	4	5	Ø16											★						
	ZOHX2005-HM	10	20	5	5	Ø20											★						
	ZOHX2506-HM	12.5	25	6	6	Ø25											★						
	ZOHX3007-HM	15	30	7	8	Ø30											★						
	ZOHX3207-HM	16	32	7	8	Ø32											★						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Common problems in milling and solutions

Failure			Material with higher hardness	Material with perfect toughness	Cutting speed	Feed rate	Cutting depth	Change the diameter and width of milling tools	Cutting liquid	Rake angle	Approach angle	Strength of cutting edge	Number of teeth	Increase the width of chip pocket	Examine the geometry shape of Minor cutting edge.	check the end face run-out	Improve the rigidity of tool	Clamping system of workpiece	Overhang of tool	Power, gap
Fracture of tool nose	severe abrasion on clearance face	Improper cutting condition			↓				✓											
		Unsuitable geometry shape of cutting edge	✓							↑		↓								
	severe abrasion on rake face	Improper cutting condition			↓	↓	↓		✓											
		Unsuitable geometry shape of cutting edge	✓							↑	↓	↓								
	Fracture of cutting edge	Improper cutting condition				↓	↓													
		Unsuitable geometry shape of cutting edge		✓							↓	↑			✓	✓	✓	✓	✓	✓
	Thermal cracking	Improper cutting condition			↓	↓	↓		✓											
		Unsuitable geometry shape of cutting edge								↑		↓								
	Build-up edge	Improper cutting condition			↑	↑			✓											
		Unsuitable geometry shape of cutting edge								↑		↓								
Machining precision	Bad surface roughness	Abrasion of tool Great vibration of milling tool	✓		↑	↓	↓		✓			↓			Wiper	✓				
	Burrs occuring	Unsuitable geometry shape of cutting edge			↓	↓	↓	✓												
		Improper geometry shape of cutting edge								↑	↑	↓			✓					
	Side collapse	Unsuitable geometry shape of cutting edge				↓	↓													
		Unsuitable geometry shape of cutting edge								↑	↓	↓	↑		✓		✓			
	Planeness and parallelism deterioration	Improper geometry Improper technique				↓	↓			↑	↑		↓		✓	✓	✓	✓	✓	✓
Other	Vibration	Cutting condition Improper technology			↓	↓	↓	✓		↑	↑	↓					✓	✓	✓	✓
	Chips twisting and jamming	Improper cutting condition			↑	↑↓		✓	✓				↓							
		Unsuitable geometry shape of cutting edge								↑			↓	✓						

Difference and selection between down milling and up milling



Up milling

Down milling

Climb milling (also called down milling): the feed direction of workpiece is the same as that of the milling rotation at the connecting position.

Conventional milling (also called up milling): the feed direction of workpiece is opposite to that of the milling rotation at the connecting position.

In down milling, the major force of cutting edge is the compressive stress, while in up milling is the tensile stress. The compressive strength of cemented carbide material is much larger than its tensile strength. In down milling, as chips become thin from thick gradually, cutting edge and workpiece press against each other. The friction between edge and workpiece is small, thus reducing the abrasion of edge, the hardening of workpiece surface and the surface roughness (Ra). In up milling, chips become thick from thin gradually. When the insert is cutting into the workpiece, it produces strong friction and more heat than in down milling, and make workpiece surface hardened.

In up milling, because horizontal direction of cutting force milling cutter conducting on workpiece is opposite to the feed direction of workpiece, the lead screw of worktable joints closely with one side of the screw nut. In down milling, the direction of cutting force is the same as the feed direction. When edge's radial force on workpiece is large enough, the worktable will bounce left and right, thus make the gap fall behind. The gap will return to the front side with the continuing rotation of lead screw. At this moment the worktable stops motion, however, it will bounce left and right again when the radial cutting force is large enough again. The periodical bounce of worktable will cause poor surface quality of workpiece and tool breakage.

When using end mills for down milling, the edges always starts cutting at the workpiece surface, therefore end mills are not suitable for machining workpiece with hardened surface.

Up milling is recommended for milling thin-wall components or square milling with high requirement for precision.

Pitch selection

Pitch is the distance between one point on one cutting edge and the same point on the next edge. Milling cutters are mainly classified into coarse, close and extra close pitches.

Optimized stability		
L (Low)	**M** (Medium)	**H** (High)
Coarse pitch Unequal pitch design 	**Close pitch** 	**Extra close pitch** 
When the milling width is equal to diameter of cutter, the machining system is stable and main power of machine is sufficient, the use of coarse pitch can achieve high productive efficiency.	Used in general milling and multiple mixed productions.	When the milling width is less than diameter of cutter, cutting by maximum edges can achieve high productive efficiency.

Selection of approach angle

The approach angle is formed by insert and tool body. It affects chip thickness, cutting forces and tool-life. Decreasing the approach angle reduces chip thickness and expands the cutting area between cutting edge and workpiece at a given feed rate.

A smaller approach angle also ensures stable entry or exit, protecting the cutting edge and extending tool life. However, this will increase axial cutting forces on the workpiece, thus is not suitable for machining thin workpiece such as thin plate.

Approach angle	Feed rate per tooth	Real maximum cutting depth
90°	f_z	$h_{ex}=f_z\times sinkr$
75°	f_z	$h_{ex}=0.96\times f_z$
60°	f_z	$h_{ex}=0.86\times f_z$
45°	f_z	$h_{ex}=0.707\times f_z$
Round insert	f_z	$h_{ex}=\frac{\sqrt{iC^2\times(iC-2a_p)^2}}{iC}\times f_z$

General formula

V_c : cutting speed(*m/min*)
D_c : nominal diameter of milling tool(*mm*)
n : spindle speed(*rev/min*)
z_n : number of teeth
Q : metal removal rate(*cm³/min*)
L : Actual working distance(*mm*)
V_f : feed rate of worktable (feed speed)(*mm/min*)
f_z : feed rate per tooth(*mm/z*)
π : circumference ratio≈*3.14*
T_c : machining time(*min*)
f_z : feed rate per revolution (*mm/rev*)

- Cutting speed

$$V_c = \frac{\pi \times D_c \times n}{1000} \text{ (m/min)}$$

- Spindle speed

$$n = \frac{1000 \times V_c}{\pi \times D_c} \text{ (rev/min)}$$

- Feed rate of worktable (feed speed)

$$V_f = f_z \times n \times z_n \text{ (mm/min)}$$

- Feed rate per tooth

$$f_z = \frac{V_f}{n \times Z_n} \text{ (mm/z)}$$

- Feed rate per revolution

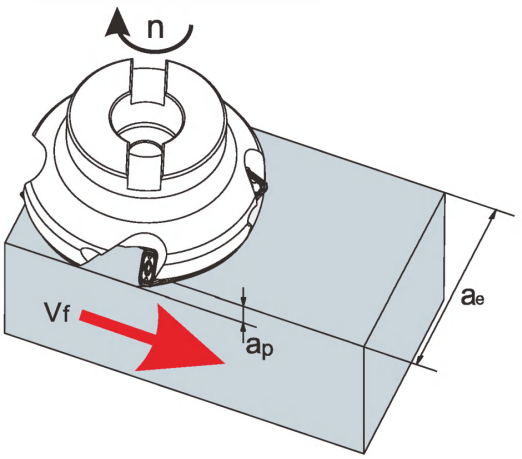
$$f_n = \frac{V_f}{n} \text{ (mm/rev)}$$

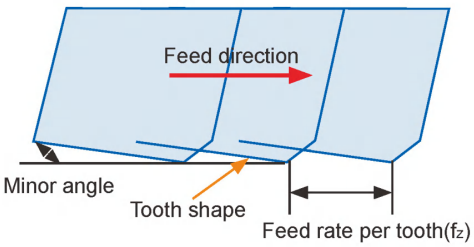
- Machining time

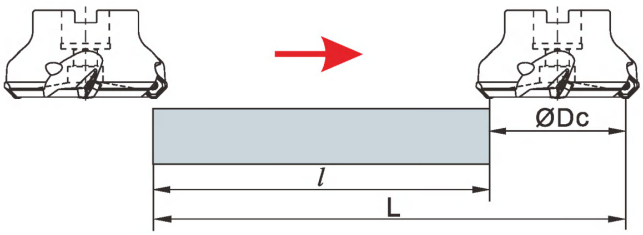
$$T_c = \frac{L}{V_f} \text{ (min)}$$

- Metal removal rate

$$Q = \frac{a_p \times a_e \times V_f}{1000} \text{ (cm}^3\text{/min)}$$

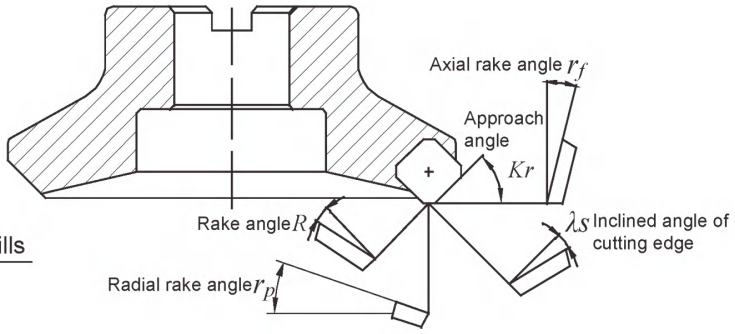






Function of each part in face milling

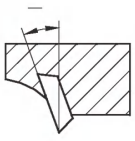
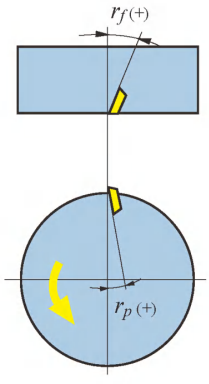
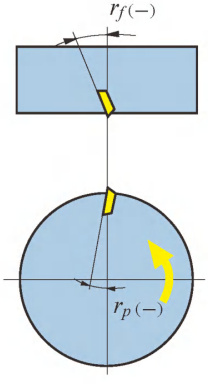
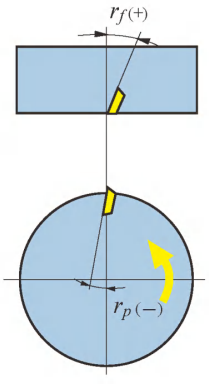
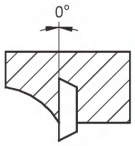
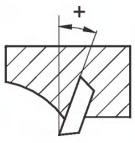
Main angles of face mills



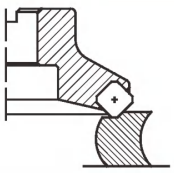
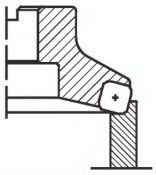
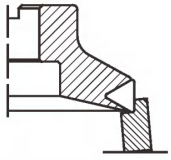
Main angles of face mills

Designation	Function	Effect		
Axial rake angle r_f	Determining the chip direction	Negative angle, excellent capability of chip removal		
Radial rake angle r_p	Determining whether the cutting is easy and fast or not	Positive angle: good cutting performanc		
Approach angle Kr	Determining the chip thickness	Kr↑, chip thickness↑; Kr↓, chip thickness↓;		
Rake angle R	Determining whether easy and fast the cutting is or not	Poor cutting performance, High-strength cutting edge	(−)←0→(+)	Good cutting performance, Low-strength cutting edge
Inclined angle of cutting edge λs	Determining the chip flow direction	Poor capability of chip removal, High-strength cutting edge	(−)←0→(+)	Good performance of chip removal, Low-strength cutting edge

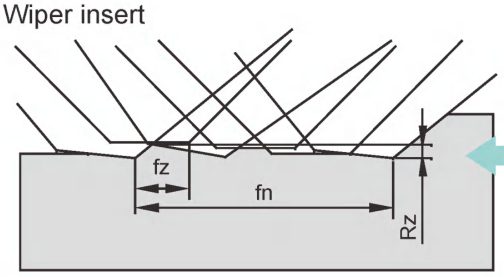
Characteristics of different rake angles combined

		Double positive rake angle	Double negative rake angle	Positive and negative rake angle
Negative rake angle				
0° rake angle				
Positive rake angle				
Axial rake angle r_f		+	−	+
Radial rake angle r_p		+	−	−
Applicable material machined	**P**	✓		✓
	M	✓		✓
	K		✓	✓
	N	✓		
	S	✓		✓

Cutting performances of different approach angles

Approach angle	45°	75°	90°
Schematic diagram			
Instruction	Axial force is the largest. It will bend when machining thin-wall workpiece, reducing the precision of workpiece. It can help avoid fringe breakage of workpiece when machining cast iron.	The main force is radial cutting force. It is often used in general face milling.	The axial force is zero in theory, suitable for milling thin-wall workpiece.

Wiper insert

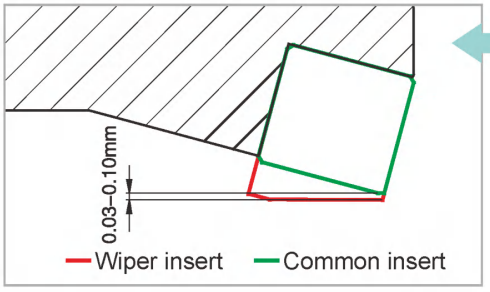


It has axial and radial run-out because tools and inserts have manufacturing tolerance. The axial run-out leads to poor surface roughness.

Solution

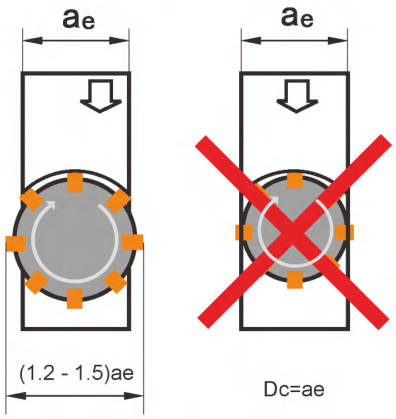
Mounting wiper inserts

usage



The wiper insert must protrude below the other inserts by 0.03-0.10 mm at axial direction, so that the wiping function can take effect. Generally speaking, a cutter just needs only one wiper insert. If the diameter of cutter is much larger or cutter's feed rate per revolution is higher than the length of wiper edge, 2 to 3 wiper inserts can be mounted.

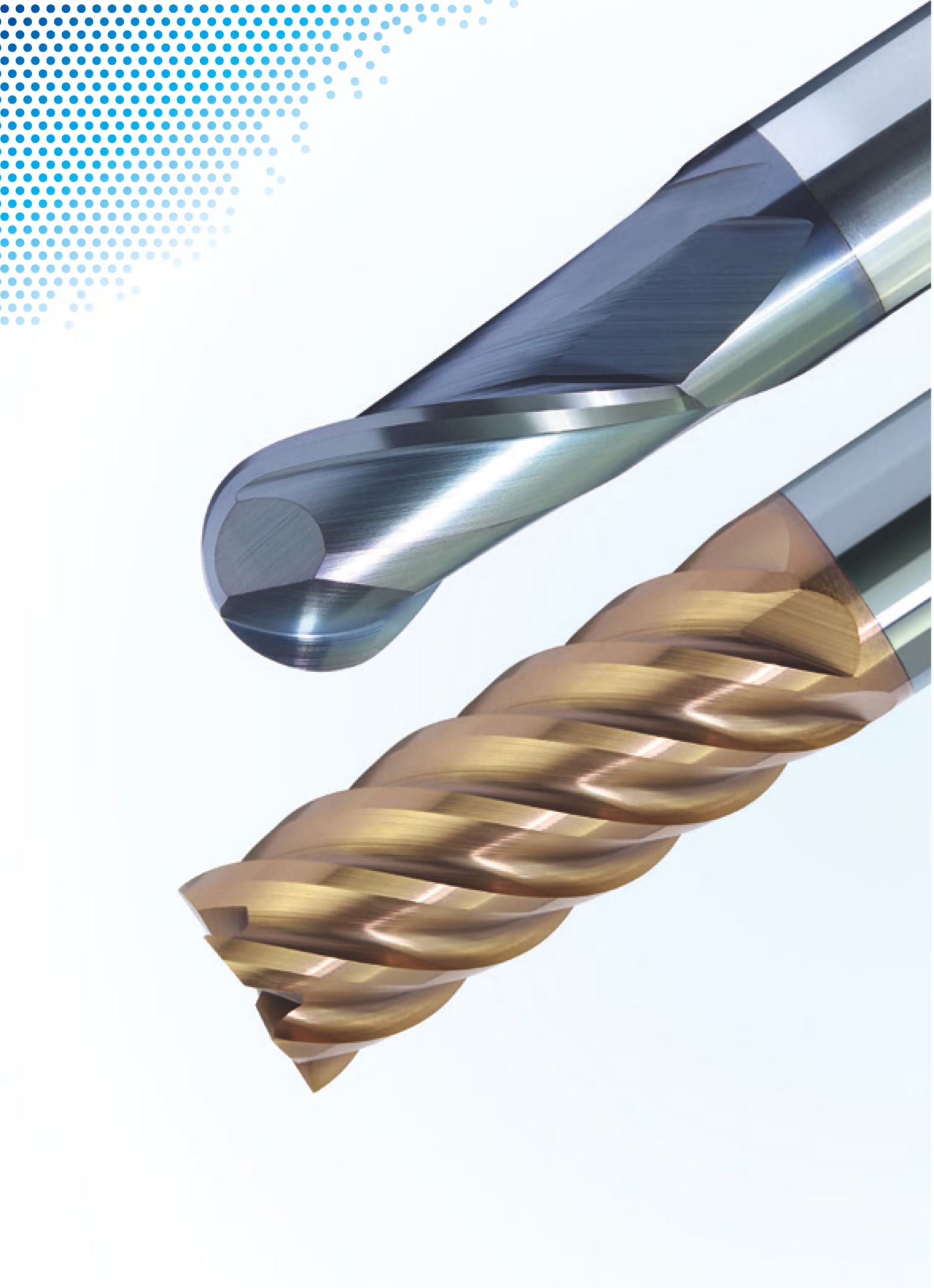
Selection of cutting width and tool cutting diameter in face milling

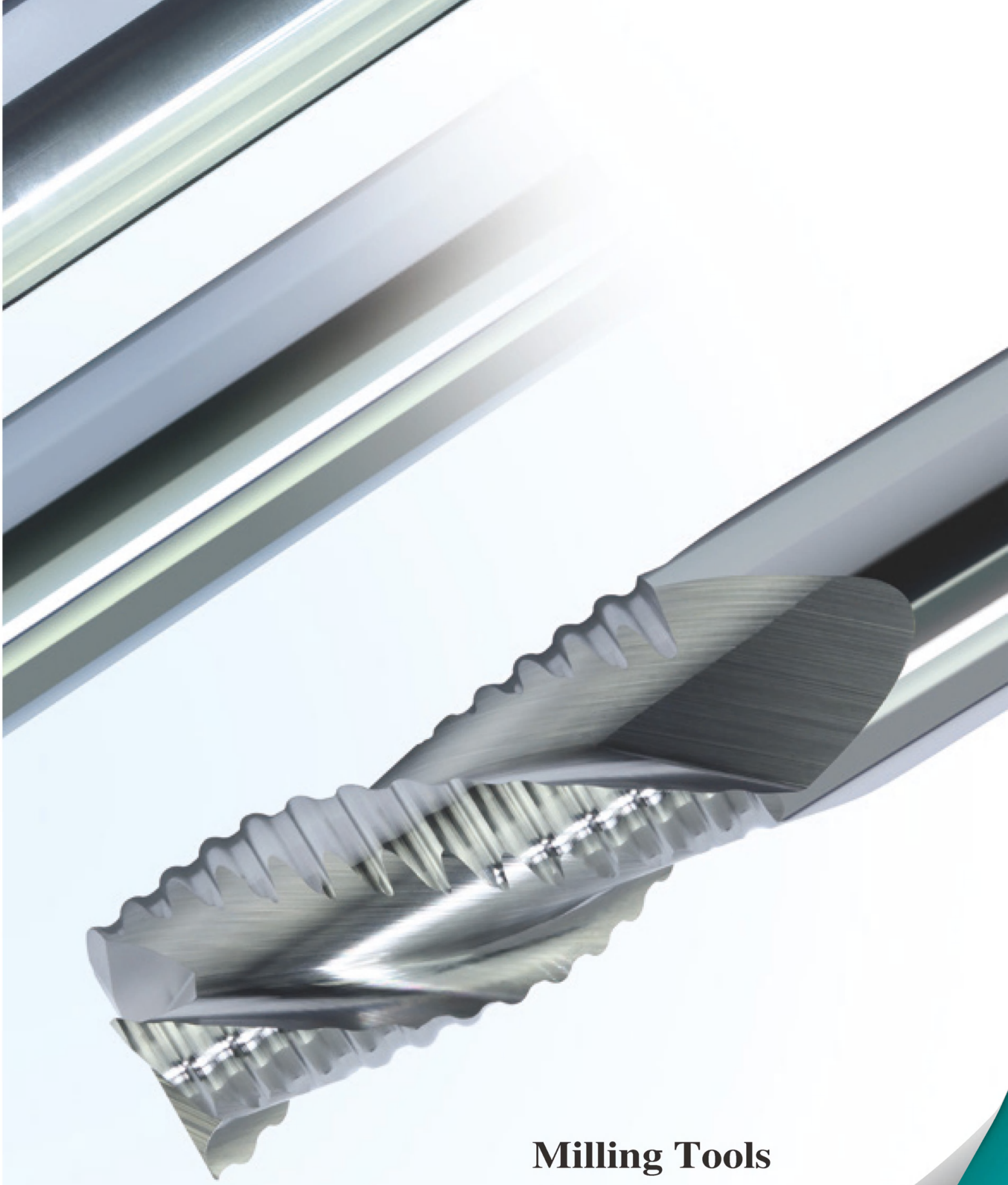


Generally speaking, the relation between cutting width and tool cutting diameter is Dc=(1.2—1.5) ae.
In practical machining, same center line of tool center and work piece center should be avoided.

Dc: Tool cutting diameter
ae: Cutting width







Milling Tools

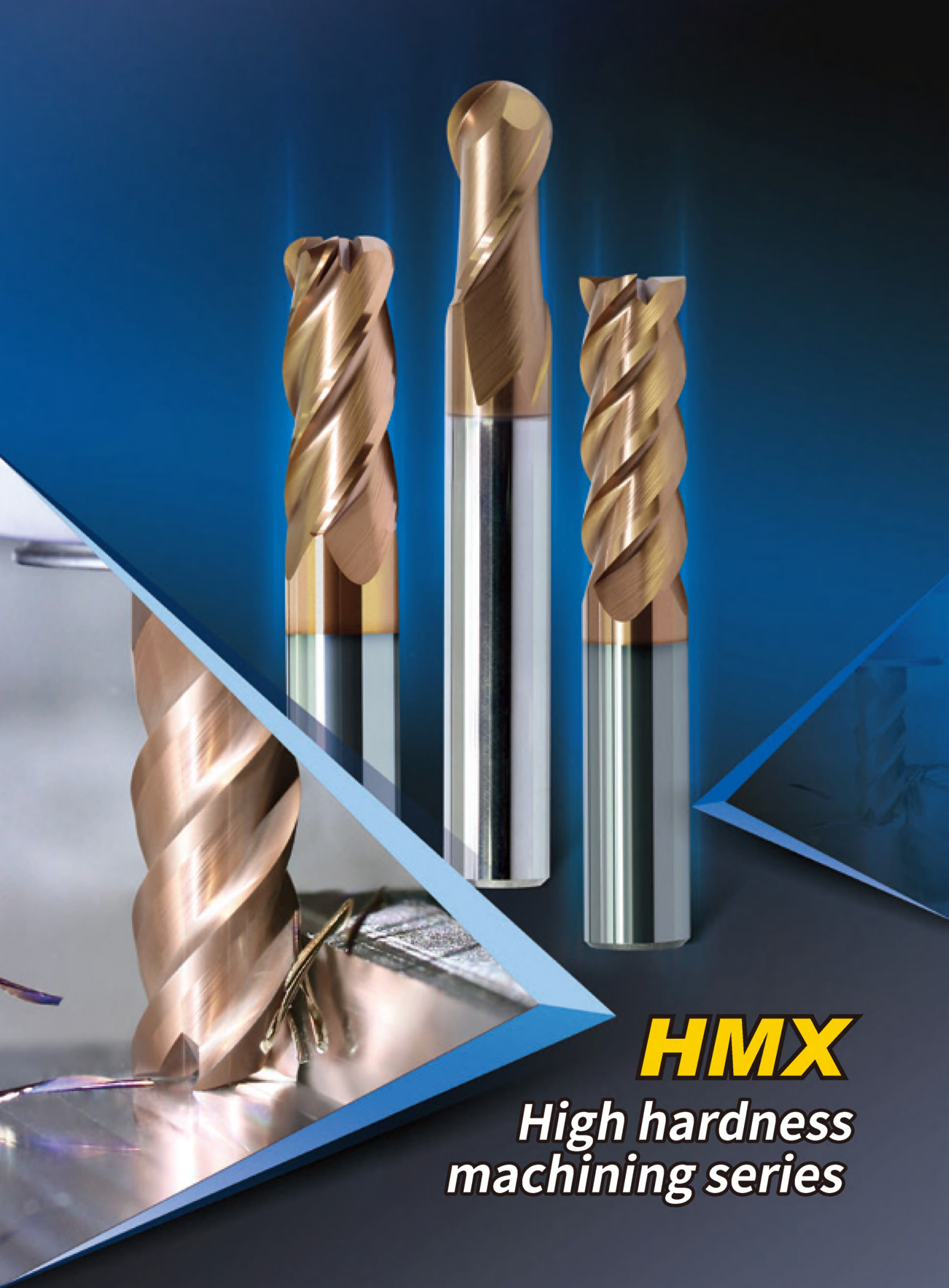
Solid carbide end mills


UM series
High performance machining
with unequal pitch

PML series




PM series


HMX
High hardness
machining series

Selection guide for solid carbide end mills

Selection guide for solid carbide end mills

Tool shape

Tool type

Series of tools

Solid Carbide End Mills
PML series

Machining application

shape and size



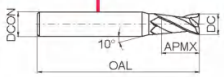
2-flute flattened end mills with straight shank

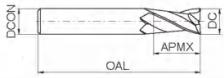
PML-2E



● Very suitable for slot milling. ● Wide application.







Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-2E-D1.0S	1.0	4	3	50	2	Picture 1	●
PML-2E-D1.0	1.0	6	3	50	2	Picture 1	●
PML-2E-D1.5S	1.5	4	4	50	2	Picture 1	●
PML-2E-D1.5	1.5	6	4	50	2	Picture 1	●
PML-2E-D2.0S	2.0	4	6	50	2	Picture 1	●
PML-2E-D2.0	2.0	6	6	50	2	Picture 1	●
PML-2E-D2.5S	2.5	4	8	50	2	Picture 1	●
PML-2E-D2.5	2.5	6	8	50	2	Picture 1	●
PML-2E-D3.0S	3.0	4	8	50	2	Picture 1	●
PML-2E-D3.0	3.0	6	8	50	2	Picture 1	●
PML-2E-D3.5	3.5	6	10	50	2	Picture 1	●
PML-2E-D4.0S	4.0	4	11	50	2	Picture 2	●
PML-2E-D4.0	4.0	6	11	50	2	Picture 1	●
PML-2E-D4.5	4.5	6	11	50	2	Picture 1	●
PML-2E-D5.0	5.0	6	13	50	2	Picture 1	●
PML-2E-D5.5	5.5	6	16	50	2	Picture 1	●
PML-2E-D6.0	6.0	6	16	50	2	Picture 2	●
PML-2E-D7.0	7.0	8	20	60	2	Picture 1	●
PML-2E-D8.0	8.0	8	20	60	2	Picture 2	●
PML-2E-D9.0	9.0	10	22	75	2	Picture 1	●
PML-2E-D10.0	10.0	10	25	75	2	Picture 2	●
PML-2E-D11.0	11.0	12	26	75	2	Picture 1	●
PML-2E-D12.0	12.0	12	30	75	2	Picture 2	●
PML-2E-D14.0	14.0	14	32	75	2	Picture 2	●
PML-2E-D16.0	16.0	16	45	100	2	Picture 2	●
PML-2E-D18.0	18.0	18	45	100	2	Picture 2	●
PML-2E-D20.0	20.0	20	45	100	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294 | Graphics category and identification B295 | Cutting parameters B552 | Non-standard customization B652-B653

Applicable workpiece material range

Helical angle, coating and cutting diameter tolerance, etc.

Product features

Specification
Type, basic dimension, number of teeth and structure

Code key, cutting parameters, graphics category and identification, Non-standard customization



MILLING

Solid Carbide End Mills

Solid carbide end mills overview	B286-B293
Solid carbide end mills code key	B294
Graphics category and identification	B295
Detail information of solid carbide end mills	B296-B539
High-performance general milling VPM series	B296-B305
High-performance general milling UM series	B306-B312
High-performance general milling PMX series	B313-B326
High-performance general milling PML series	B327-B355
High-performance general milling PM series	B356-B402
GM series for general machining	B403-B444
HMX series for machining high hardness steel	B445-B473
Super alloy end mills RM series	B474-B488
High performance universal end mills MM series	B489-B493
TM series for titanium alloy machining	B494-B503
NM series for copper machining	B504-B510
ALU series high-efficiency end mills for aluminium	B511-B513
AL/ALG series for machining aluminum	B514-B529
SM/VSM series for machining materials hard to cut	B530-B537
CM series for general chamfering	B538-B539
Recommended cutting parameters	B540-B646
Technical Information	B647-B651
Customized non-standard order	B652-B653







Solid carbide end mills overview

Machining application	Geometry	Number of teeth	Type	Shape	Size range	Workpiece material									Page	
						P		M	K	N		S	H			
						Carbon steel, alloy steel	Pre-hardened steel	Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Heat resistant alloy, Titanium alloy	High hardness steel Below 55HRC	High hardness steel Above 55HRC	Specification	Cutting parameters
High-performance general milling	Flattened	4	**VPM-4E** (Unequal pitch)		Ø3.0~Ø20.0	◎	◎		◎				◎		B298	B540
			VPM-4EBL/X (Unequal pitch)		Ø3.0~Ø20.0	◎	◎		◎				◎		B299	B540
			VPM-4EFP (Unequal pitch)		Ø3.0~Ø20.0	◎	◎		◎				◎		B300	B540
	Radius	4	**VPM-4R** (Unequal pitch)		Ø3.0~Ø12.0	◎	◎		◎				◎		B301 -302	B541
			VPM-4RBL/X (Unequal pitch)		Ø3.0~Ø12.0	◎	◎		◎				◎		B303 -304	B541
			VPM-4RFP (Unequal pitch)		Ø3.0~Ø12.0	◎	◎		◎				◎		B305	B541
	Flattened	4	**UM-4E** (Unequal pitch)		Ø4.0~Ø20.0	◎	◎	○	◎			○	◎		B307	B542 -543
			UM-4EL (Unequal pitch)		Ø4.0~Ø20.0	◎	◎	○	◎			○	◎		B308	B542 -543
			UM-4EFP (Unequal pitch)		Ø6.0~Ø20.0	◎	◎	○	◎			○	◎		B309	B544 -545
	Radius	4	**UM-4R** (Unequal pitch)		Ø4.0~Ø20.0	◎	◎	○	◎			○	◎		B310	B546 -547
			UM-4RL (Unequal pitch)		Ø6.0~Ø16.0	◎	◎	○	◎			○	◎		B311	B546 -547
			UM-4RFP (Unequal pitch)		Ø6.0~Ø16.0	◎	◎	○	◎			○	◎		B312	B548
	Flattened	4	**PMX-4E** (Unequal pitch)		Ø1.0~Ø20.0	◎	◎		◎				◎		B315 -316	B549
			PMX-4EBL/X (Unequal pitch)		Ø3.0~Ø20.0	◎	◎		◎				◎		B317	B549
			PMX-4EFP (Unequal pitch)		Ø3.0~Ø20.0	◎	◎		◎				◎		B318	B549
	Radius		**PMX-4R** (Unequal pitch)		Ø1.0~Ø16.0	◎	◎		◎				◎		B319 -320	B550
			PMX-4RBL/X (Unequal pitch)		Ø3.0~Ø16.0	◎	◎		◎				◎		B321 -322	B550
			PMX-4RFP (Unequal pitch)		Ø3.0~Ø16.0	◎	◎		◎				◎		B323	B550
	Ball nose	2	**PMX-2B**		R1.0~R10.0	◎	◎		◎				◎		B324	B551
			PMX-2BL/ M/X		R1.0~R10.0	◎	◎		◎				◎		B325	B551
			PMX-2BFP		R0.5~R10.0	◎	◎		◎				◎		B326	B551
	Flattened	2	**PML-2E** (Corner protection)		Ø1.0~ Ø20.0	◎	◎	○	◎			○			B328	B552
			PML-2F (Sharp)		Ø1.0~ Ø20.0	◎	◎	○	◎			○			B329	B553
			PML-2EL (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○			B330	B552
			PML-2FL (Sharp)		Ø3.0~ Ø20.0	◎	◎	○	◎			○			B331	B553

◎Very suitable ○Suitable

Solid carbide end mills overview

Machining application	Geometry	Number of teeth	Type	Shape	Size range	Workpiece material									Page	
						P		M	K	N		S	H			
						Carbon steel, alloy steel	Pre-hardened steel	Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Heat resistant alloy, Titanium alloy	High hardness steel Below 55HRC	High hardness steel Above 55HRC	Specification	Cutting parameters
High-performance general milling	Flattened	2	PML-2EFP (Corner protection)		Ø6.0~ Ø20.0	◎	◎	○	◎			○			B332	B554
		3	PML-3E-H (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○			B333	B555
			PML-3EL-H (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○			B334	B555
		4	PML-4E-G (Corner protection)		Ø1.0~ Ø20.0	◎	◎	○	◎			○			B335	B556 -557
			PML-4F-G (Sharp)		Ø1.0~ Ø20.0	◎	◎	○	◎			○			B336	B558 -559
			PML-4EL-G (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○			B337	B556 -557
			PML-4FL-G (Sharp)		Ø3.0~ Ø20.0	◎	◎	○	◎			○			B338	B558 -559
			PML-4EX-G (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○			B339	B560
			PML-4E (Corner protection)		Ø1.0~ Ø20.0	◎	◎	○	◎			○			B340	B561 -562
			PML-4EL (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○			B341	B561 -562
			PML-4E-H (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○			B342	B556 -557
			PML-4EL-H (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○			B343	B556 -557
			PML-4EFP (Corner protection)		Ø6.0~ Ø20.0	◎	◎	○	◎			○			B344	B563 -564
		6	PML-6E (Corner protection)		Ø6.0~ Ø20.0	◎	◎	○	◎			○			B345	B565
			PML-6EL (Corner protection)		Ø6.0~ Ø20.0	◎	◎	○	◎			○			B346	B566
	Ball nose	2	PML-2B		R0.5~R10.0	◎	◎	○	◎			○			B347	B567 -568
			PML-2BL		R1.0~R10.0	◎	◎	○	◎			○			B348	B567 -568
			PML-2BFP		R0.5~R10.0	◎	◎	○	◎			○			B349	B567 -568
		4	PML-4B		R1.5~R10.0	◎	◎	○	◎			○			B350	B569
			PML-4BL		R1.5~R10.0	◎	◎	○	◎			○			B351	B569
	Radius	2	PML-2R		Ø1.0~ Ø12.0	◎	◎	○	◎			○			B352	B573
		4	PML-4R		Ø3.0~ Ø12.0	◎	◎	○	◎			○			B353	B574
			PML-4R-H		Ø3.0~ Ø12.0	◎	◎	○	◎			○			B354	B574
			PML-4RFP		Ø6.0~ Ø16.0	◎	◎	○	◎			○			B355	B574
	Flattened	2	PM-2E (Corner protection)		Ø1.0~ Ø20.0	◎	◎	○	◎			○	◎		B358	B552

◎Very suitable ○Suitable

Solid carbide end mills overview

Machining application	Geometry	Number of teeth	Type	Shape	Size range	Workpiece material									Page	
						P		M	K	N		S	H			
						Carbon steel, alloy steel	Pre-hardened steel	Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Heat resistant alloy, Titanium alloy	High hardness steel Below 55HRC	High hardness steel Above 55HRC	Specification	Cutting parameters
High-performance general milling	Flattened	2	PM-2F (Sharp)		Ø1.0~ Ø20.0	◎	◎	○	◎			○	◎		B359	B553
			PM-2EL (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○	◎		B360	B552
			PM-2FL (Sharp)		Ø3.0~ Ø20.0	◎	◎	○	◎			○	◎		B361	B553
			PM-2EFP (Corner protection)		Ø6.0~ Ø20.0	◎	◎	○	◎			○	◎		B362	B554
			PM-2EBL/X (Corner protection)		Ø3.0~ Ø12.0	◎	◎	○	◎			○	◎		B363	B552
		3	PM-3E-H (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○	◎		B364	B555
			PM-3EL-H (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○	◎		B365	B555
		4	PM-4E-G (Corner protection)		Ø1.0~ Ø20.0	◎	◎	○	◎			○	◎		B366 -367	B556 -557
			PM-4F-G (Sharp)		Ø1.0~ Ø20.0	◎	◎	○	◎			○	◎		B368	B558 -559
			PM-4EL-G (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○	◎		B369	B556 -557
			PM-4FL-G (Sharp)		Ø3.0~ Ø20.0	◎	◎	○	◎			○	◎		B370	B558 -559
			PM-4EX-G (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○	◎		B371	B560
			PM-4EBL/X-G (Corner protection)		Ø3.0~ Ø12.0	◎	◎	○	◎			○	◎		B372	B556 -557
			PM-4E (Corner protection)		Ø1.0~ Ø20.0	◎	◎	○	◎			○	◎		B373 -374	B561 -562
			PM-4EL (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○	◎		B375	B561 -562
			PM-4E-H (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○	◎		B376	B556 -557
			PM-4EL-H (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎			○	◎		B377	B556 -557
			PM-4EFP (Corner protection)		Ø6.0~ Ø20.0	◎	◎	○	◎			○	◎		B378	B563 -564
			PM-4EBL/X (Corner protection)		Ø3.0~ Ø12.0	◎	◎	○	◎			○	◎		B379	B561 -562
		6	PM-6E (Corner protection)		Ø6.0~ Ø20.0	◎	◎	○	◎			○	◎		B380	B565
			PM-6EL (Corner protection)		Ø6.0~ Ø20.0	◎	◎	○	◎			○	◎		B381	B566
	Ball nose	2	PM-2B		R0.5~R10.0	◎	◎	○	◎			○	◎		B382	B567 -568
			PM-2BL/M/X		R1.0~R10.0	◎	◎	○	◎			○	◎		B383	B567 -568
			PM-2BFP		R0.5~R10.0	◎	◎	○	◎			○	◎		B384	B567 -568
		4	PM-4B		R1.5~R10.0	◎	◎	○	◎			○	◎		B385	B569

◎Very suitable ○Suitable

Solid carbide end mills overview

Machining application	Geometry	Number of teeth	Type	Shape	Size range	Workpiece material									Page	
						P		M	K	N		S	H			
						Carbon steel, alloy steel	Pre-hardened steel	Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Heat resistant alloy, Titanium alloy	High hardness steel Below 55HRC	High hardness steel Above 55HRC	Specification	Cutting parameters
High-performance general milling	Ball nose	4	PM-4BL/M/X		R1.5~R10.0	◎	◎	○	◎			○	◎		B386	B569
	Taper neck ball nose	2	PM-2BC		R0.25~R2.0	◎	◎	○	◎			○	◎		B387 -390	B570 -572
	Radius	2	PM-2R		Ø1.0~ Ø12.0	◎	◎	○	◎			○	◎		B391 -392	B573
		4	PM-4R		Ø3.0~ Ø12.0	◎	◎	○	◎			○	◎		B393 -394	B574
			PM-4RBL/M/X		Ø4.0~ Ø10.0	◎	◎	○	◎			○	◎		B395 -396	B574
			PM-4R-H		Ø3.0~ Ø12.0	◎	◎	○	◎			○	◎		B397 -398	B574
			PM-4RBL/ M/X-H		Ø4.0~ Ø12.0	◎	◎	○	◎			○	◎		B399	B574
			PM-4RFP		Ø6.0~ Ø16.0	◎	◎	○	◎			○	◎		B400	B574
	High-feed-rate		PM-4H		Ø3.0~ Ø12.0	◎	◎	○	◎			○	◎		B401	B575 -576
			PM-4HL		Ø4.0~ Ø12.0	◎	◎	○	◎			○	◎		B402	B575 -576
General milling	Flattened	2	GM-2E (Corner protection)		Ø1.0~ Ø20.0	◎	◎	○	◎						B405	B577
			GM-2F (Sharp)		Ø1.0~ Ø20.0	◎	◎	○	◎						B406	B578
			GM-2EL (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎						B407	B577
			GM-2FL (Sharp)		Ø3.0~ Ø20.0	◎	◎	○	◎						B408	B578
			GM-2EX (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎						B409	B579
			GM-2EFP (Corner protection)		Ø6.0~ Ø20.0	◎	◎	○	◎						B410	B580
			GM-2EBL/X (Corner protection)		Ø3.0~ Ø12.0	◎	◎	○	◎						B411	B577
		3	GM-3E (Corner protection)		Ø1.0~ Ø20.0	◎	◎	○	◎						B412 -413	B581
			GM-3EL (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎						B414	B581
		4	GM-4E-G (Corner protection)		Ø1.0~ Ø20.0	◎	◎	○	◎						B415 -416	B582
			GM-4F-G (Sharp)		Ø1.0~ Ø20.0	◎	◎	○	◎						B417	B583
			GM-4EL-G (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎						B418	B582
		4	GM-4FL-G (Sharp)		Ø3.0~ Ø20.0	◎	◎	○	◎						B419	B583
			GM-4EX-G (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎						B420	B584
			GM-4EBL/X-G (Corner protection)		Ø3.0~ Ø12.0	◎	◎	○	◎						B421	B582

◎Very suitable ○Suitable

Solid carbide end mills overview

Machining application	Geometry	Number of teeth	Type	Shape	Size range	Workpiece material: P – Carbon steel, alloy steel	P – Pre-hardened steel	M – Stainless steel	K – Cast iron	N – Copper alloy	N – Aluminum alloy	S – Heat resistant alloy, Titanium alloy	H – High hardness steel: Below 55HRC	H – High hardness steel: Above 55HRC	Page: Specification	Page: Cutting parameters
General milling	Flattened	4	GM-4E (Corner protection)		Ø1.0~ Ø20.0	◎	◎	○	◎						B422 -423	B585
			GM-4EL (Corner protection)		Ø3.0~ Ø20.0	◎	◎	○	◎						B424	B585
			GM-4EFP (Corner protection)		Ø6.0~ Ø20.0	◎	◎	○	◎						B425	B586
			GM-4EBL/X (Corner protection)		Ø3.0~ Ø12.0	◎	◎	○	◎						B426	B585
		6	GM-6E (Corner protection)		Ø6.0~ Ø20.0	◎	◎	○	◎						B427	B587
			GM-6EL (Corner protection)		Ø6.0~ Ø20.0	◎	◎	○	◎						B428	B588
	Long neck flattened	2	GM-2EP		Ø0.3~ Ø5.0	◎	◎	○	◎						B429 -430	B589 -590
	Tiny head flattened		GM-2ES		Ø0.3~ Ø3.0	◎	◎	○	◎						B431	B591
	Ball nose		GM-2B		R0.5~R10.0	◎	◎	○	◎						B432	B592
			GM-2BL/M/X		R1.0~R10.0	◎	◎	○	◎						B433	B592
			GM-2BFP		R0.5~R10.0	◎	◎	○	◎						B434	B592
		4	GM-4B		R1.5~R10.0	◎	◎	○	◎						B435	B593
			GM-4BL/M/X		R1.5~R10.0	◎	◎	○	◎						B436	B593
	Tiny ball nose	2	GM-2BS		R0.15~ R1.5	◎	◎	○	◎						B437	B594
	Long neck ball nose		GM-2BP		R0.15~R2.5	◎	◎	○	◎						B438 -439	B595 -596
	Radius		GM-2R		Ø1.0~Ø12.0	◎	◎	○	◎						B440	B597
		4	GM-4R		Ø1.0~Ø12.0	◎	◎	○	◎						B441	B598
			GM-4RL/M/X		Ø4.0~Ø16.0	◎	◎	○	◎						B442 -443	B598
	Corrugated edge		GM-4W		Ø6.0~Ø20.0	◎	◎	○	◎						B444	B599 -600
Machining high hardness steel	Flattened	2	HMX-2E (Corner protection)		Ø1.0~Ø20.0				○				◎	◎	B446 -447	B601
			HMX-2EFP (Corner protection)		Ø6.0~Ø20.0				○				◎	◎	B448	B602
			HMX-2EBL/X (Corner protection)		Ø3.0~Ø12.0				○				◎	◎	B449	B601
		4	HMX-4E (Corner protection)		Ø1.0~Ø20.0				○				◎	◎	B450 -451	B603
			HMX-4EL (Corner protection)		Ø3.0~Ø20.0				○				◎	◎	B452	B603
			HMX-4EFP (Corner protection)		Ø6.0~Ø20.0				○				◎	◎	B453	B604

◎Very suitable ○Suitable

Solid carbide end mills overview

Machining application	Geometry	Number of teeth	Type	Shape	Size range	Workpiece material									Page	
						P		M	K	N		S	H			
						Carbon steel, alloy steel	Pre-hardened steel	Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Heat resistant alloy, Titanium alloy	High hardness steel Below 55HRC	High hardness steel Above 55HRC	Specification	Cutting parameters
Machining high hardness steel	Flattened	4	HMX-4EBL/X (Corner protection)		Ø3.0~Ø12.0				○				◎	◎	B454	B603
		6	HMX-6E (Corner protection)		Ø6.0~Ø20.0				○				◎	◎	B455	B605
			HMX-6EL (Corner protection)		Ø6.0~Ø20.0				○				◎	◎	B456	B606
	Long neck flattened	2	HMX-2EP		Ø0.3~Ø5.0				○				◎	◎	B457 -458	B607 -608
	Tiny head flattened		HMX-2ES		Ø0.3~Ø3.0				○				◎	◎	B459	B609
	Ball nose		HMX-2B		R0.5~R10.0				○				◎	◎	B460	B610
			HMX-2BL/M/X		R1.0~R10.0				○				◎	◎	B461	B610
			HMX-2BFP		R0.5~R10.0				○				◎	◎	B462	B610
		4	HMX-4B		R1.5~R10.0				○				◎	◎	B463	B611
			HMX-4BL		R1.5~R10.0				○				◎	◎	B464	B611
	Tiny ball nose	2	HMX-2BS		R0.15~R1.5				○				◎	◎	B465	B612
	Long neck ball nose		HMX-2BP		R0.15~R2.5				○				◎	◎	B466 -467	B613 -614
	Radius	4	HMX-4R		Ø1.0~Ø12.0				○				◎	◎	B468 -469	B615
			HMX-4RBL/M/X		Ø4.0~Ø12.0				○				◎	◎	B470	B615
			HMX-4RF		Ø6.0~Ø12.0				○				◎	◎	B471	B615
			HMX-4RP		Ø6.0~Ø16.0				○				◎	◎	B472	B615
		6	HMX-6R-MAX		Ø6.0~Ø20.0				○				◎	◎	B473	B616
Super alloy machining	Flattened	4	RM-4E		Ø6.0~Ø25.0	○		○				◎			B476	B617
		5	RM-5E		Ø10.0~Ø25.0	○		○				◎			B477	B617
		6	RM-6E		Ø10.0~Ø25.0	○		○				◎			B478	B618
	Ball nose	4	RM-4B		R3.0~R10.0	○		○				◎			B479	B621
	Radius		RM-4R		Ø6.0~Ø25.0	○		○				◎			B480 -482	B619
		5	RM-5R		Ø6.0~Ø25.0	○		○				◎			B483 -485	B619
		6	RM-6R		Ø10.0~Ø25.0	○		○				◎			B486	B620
		7	RM-7R		Ø10.0~Ø25.0	○		○				◎			B487 -488	B620

◎Very suitable ○Suitable

Solid carbide end mills overview

Machining application	Geometry	Number of teeth	Type	Shape	Size range	Workpiece material									Page	
						P		M	K	N		S	H			
						Carbon steel, alloy steel	Pre-hardened steel	Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Heat resistant alloy, Titanium alloy	High hardness steel Below 55HRC	High hardness steel Above 55HRC	Specification	Cutting parameters
High performance general milling for stainless steel	Flattened	4	MM-4E		Ø1.0~Ø20.0	○		◎				○			B490	B622
			MM-4EF		Ø1.0~Ø20.0	○		◎				○			B491	B622
	Radius		MM-4R		Ø1.0~Ø20.0	○		◎				○			B492	B623
			MM-4RFP		Ø6.0~Ø20.0	○		◎				○			B493	B623
Machining titanium	Flattened	4	TM-4E		Ø6.0~Ø25.0	○		○				◎			B495	B624
	Ball nose		TM-4B		R3.0~R10.0	○		○				◎			B496	B624
	Radius		TM-4R		Ø6.0~Ø25.0	○		○				◎			B497 -499	B624
			TM-4RP		Ø8.0~Ø25.0	○		○				◎			B500	B624
		5	TM-5R		Ø6.0~Ø25.0	○		○				◎			B501 -502	B625
		6	TM-6R		Ø10.0~Ø25.0	○		○				◎			B503	B626
Copper machining	Flattened	2	NM-2E		Ø1.0~Ø12.0					◎	○				B505	B627
		4	NM-4E		Ø3.0~Ø12.0					◎	○				B506	B628
	Long neck flattened	2	NM-2EP		Ø0.5~Ø5.0					◎	○				B507	B629
	Ball nose		NM-2B		R0.5~R6.0					◎	○				B508	B630
	Long neck Ball nose		NM-2BP		R0.25~R2.5					◎	○				B509	B631
High-efficiency milling for Al	Flattened	3	ALU-3E		Ø3.0~Ø20.0					○	◎				B513	B632
Machining aluminum	Flattened	2	AL-2E		Ø1.0~Ø20.0						◎				B515	B633
			AL-2EL		Ø3.0~Ø20.0						◎				B516	B633
		3	AL-3E		Ø1.0~Ø20.0						◎				B517	B634
			AL-3EL		Ø3.0~Ø20.0						◎				B518	B634
	Ball nose	2	AL-2B		R1.0~R6.0						◎				B519	B635
	Corrugated edge	3	AL-3W		Ø6.0~Ø20.0						◎				B520	B636
	Radius (Super high speed)	2	AL-2R-AIR		Ø6.0~Ø20.0						◎				B521	B637
			AL-2RL-AIR		Ø6.0~Ø20.0						◎				B522	B637
		3	AL-3R-AIR		Ø12.0~Ø20.0						◎				B523	B638

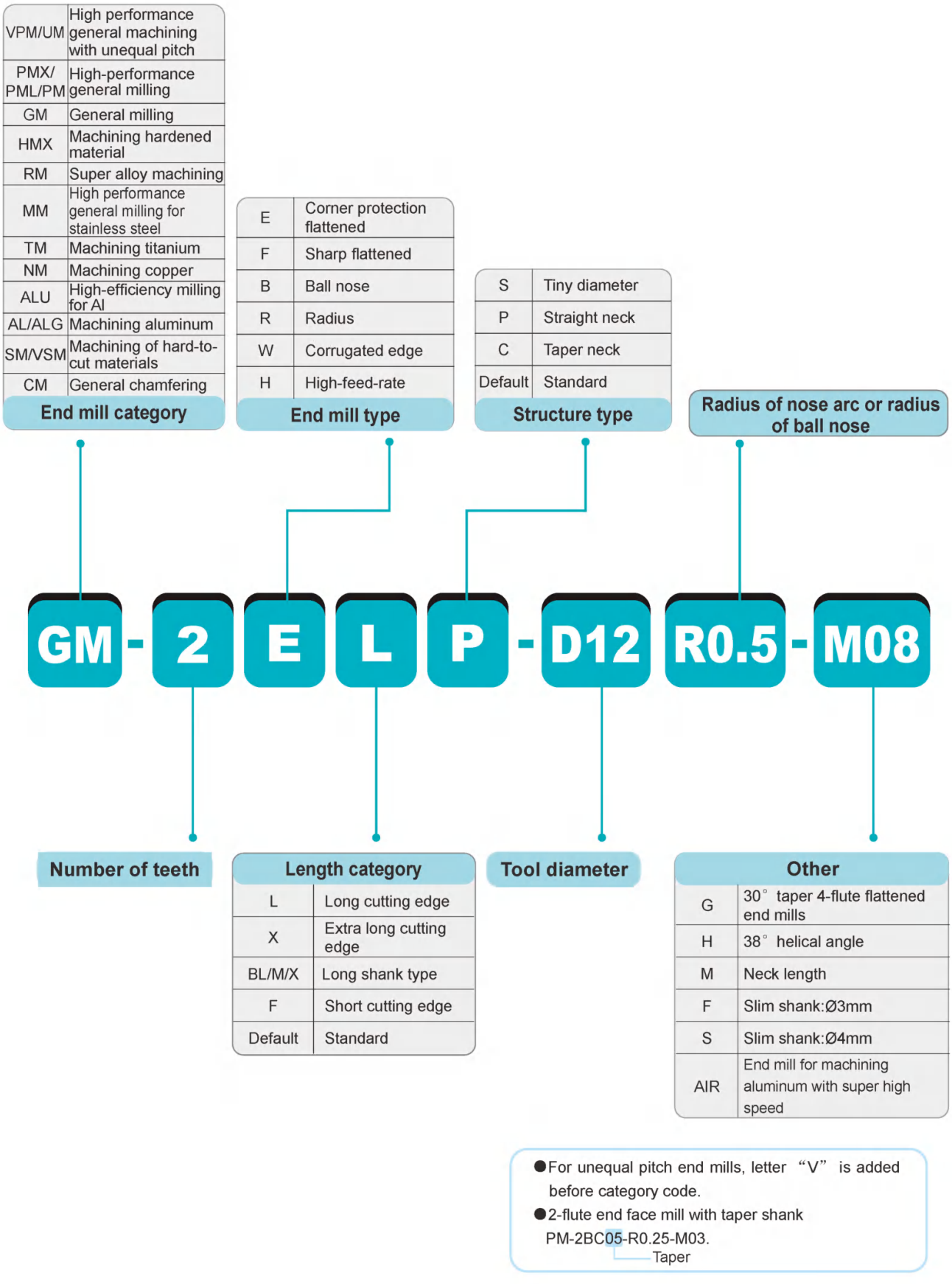
◎Very suitable ○Suitable

Solid carbide end mills overview

Machining application	Geometry	Number of teeth	Type	Shape	Size range	Workpiece material								Page	
						P		M	K	N		S	H		
						Carbon steel, alloy steel	Pre-hardened steel	Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Heat resistant alloy, Titanium alloy	High hardness steel: Below 55HRC	Specification	Cutting parameters
													High hardness steel: Above 55HRC		
Machining aluminum	Radius (Super high speed)	3	AL-3RL-AIR		Ø12.0~Ø20.0						◎			B524	B638
	Flattened	2	ALG-2E		Ø1.0~Ø20.0						◎			B526	B639
		3	ALG-3E		Ø1.0~Ø20.0						◎			B527	B640
	Radius	2	ALG-2R		Ø1.0~Ø12.0						◎			B528	B641
		3	ALG-3R		Ø1.0~Ø12.0						◎			B529	B642
Machining of hard-to-cut materials	Flattened	3	SM-3E		Ø3.0~Ø20.0	◎		◎				○		B532	B643
		4	VSM-4E (Unequal pitch)		Ø4.0~Ø20.0	◎		◎				◎		B533	B644
			VSM-4EFP (Unequal pitch)		Ø6.0~Ø16.0	◎		◎				◎		B534	B644
	Radius	4	SM-4R		Ø6.0~Ø12.0	◎		◎				○		B535	B645
			VSM-4R (Unequal pitch)		Ø6.0~Ø20.0	◎		◎				◎		B536	B646
			VSM-4RFP (Unequal pitch)		Ø6.0~Ø16.0	◎		◎				◎		B537	B646
Chamfering	Flattened	2	CM-2E		Ø3.0~Ø16.0	◎	◎	○	○	◎	◎	○	◎	B538	--
		4	CM-4E		Ø3.0~Ø16.0	◎	◎	○	○	◎	◎	○	◎	B539	--

◎Very suitable ○Suitable

Solid carbide end mills code key



- For unequal pitch end mills, letter "V" is added before category code.
- 2-flute end face mill with taper shank PM-2BC05-R0.25-M03.
  Taper

Coating of mills

Coated NaNo TiAlCrN	Super nanometer crystal TiAlCrN coating
Coated NaNo TiAlXN	Super crystal nano heat resistant TiAlXN coatings
Coated NaNo TiAlN	Nano TiAlN coating
Coated TiAlN	TiAlN coating
Coated AlTiN	AlTiN coating
Coated CrN	CrN coating
Coated AlCrXN	AlCrXN coating
Coated TiALXN	TiALXN coating
Coated AlCrXN-Plus	AlCrXN-Plus coating

End tooth type of mills

	2-flute flattened end mills		4-flute R end mills
	2-flute ball nose end mills		5-flute flattened end mills
	2-flute R end mills		5-flute R end mills
	3-flute flattened end mills		6-flute flattened end mills
	3-flute R end mills		6-flute R end mills
	4-flute flattened end mills		7-flute R end mills
	4-flute ball nose end mills		

Helical angle

β	β is helical angle: 30° ,35° ,38° ,45° ,55°

Cutting diameter tolerance

DC DC≤12 0~-0.020 12<DC 0~-0.030	Cutting diameter tolerance

Radius tolerance of ball nose end mills

PRFRAD PRFRAD±0.01	Radius tolerance

Nose type

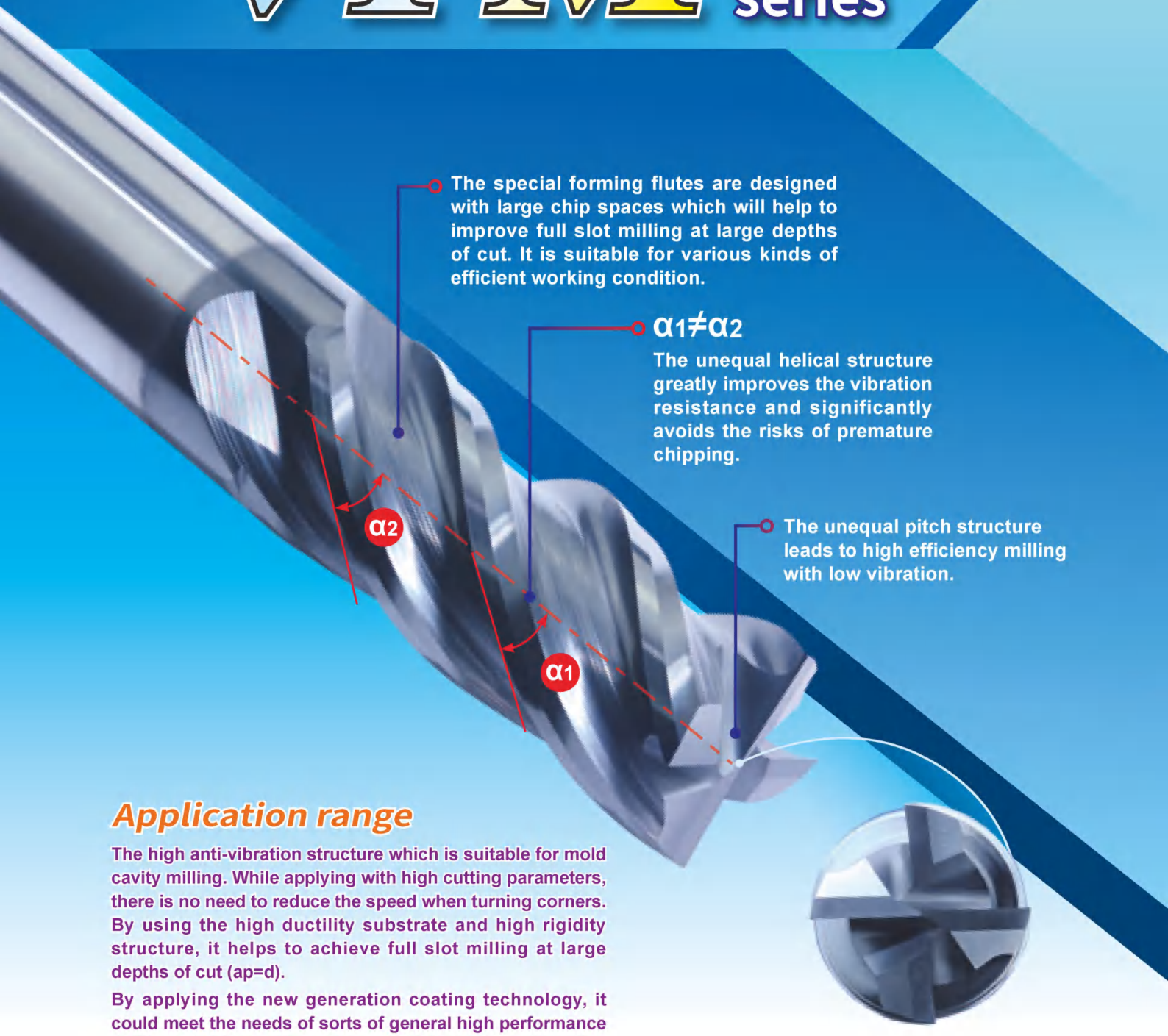
	Corner protection
	Sharp

Machining operation

Side face	Flattened end mills for side machining
Step shoulder	Flattened end mills for shoulder machining
Straight slot	Flattened end mills for straight slot machining
Deep flattened slot	Flattened end mills for deep slot machining
Profile	Ball nose end mills for profile machining
Cavity	Ball nose end mills for cavity machining
Ball nose slot	Ball nose end mills for slot machining
Deep ball nose slot	Ball nose end mills for deep slot machining
Radius shoulder	R end mills for side machining
Radius corner slot	R end mills for slot machining
Profile	R end mills for profile machining
Chamferring	Chamferring

High Performance End mills for General Machining

VPM series



The special forming flutes are designed with large chip spaces which will help to improve full slot milling at large depths of cut. It is suitable for various kinds of efficient working condition.

$\alpha_1 \neq \alpha_2$

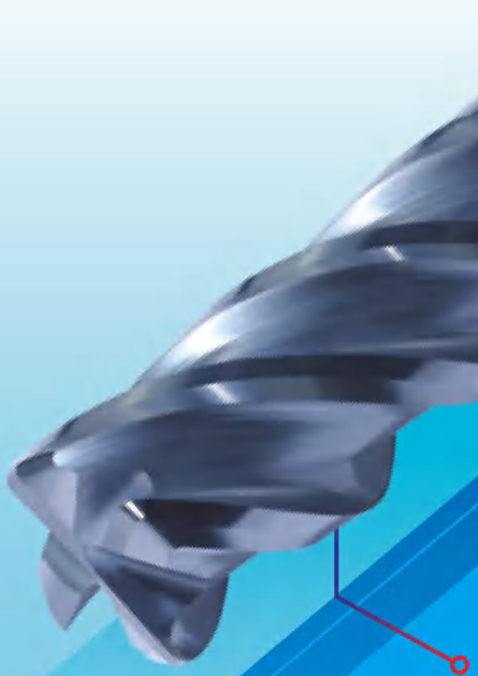
The unequal helical structure greatly improves the vibration resistance and significantly avoids the risks of premature chipping.

The unequal pitch structure leads to high efficiency milling with low vibration.

Application range

The high anti-vibration structure which is suitable for mold cavity milling. While applying with high cutting parameters, there is no need to reduce the speed when turning corners. By using the high ductility substrate and high rigidity structure, it helps to achieve full slot milling at large depths of cut (ap=d).

By applying the new generation coating technology, it could meet the needs of sorts of general high performance steel machining for dry and wet conditions.



Substrate and coating



By selecting the substrate with high versatility and wear resistance, it offers better bending stiffness to meet efficient machining requirements.



Coating grades with lower friction coefficient, especially are suitable for machining carbon steel, mild steel, stainless steel and other viscous materials.

CASE 1

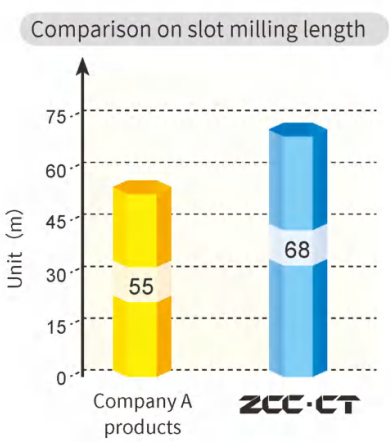
Cutting tool: VPM-4E-D8.0
Method: Side milling
Workpiece material: 45#
Cutting parameters: Vc=190m/min, fz=0.08mm/z, ap=12mm, ae=2.4mm
CNC Machine type:
5-Axis Vertical Machining Center
Cooling method: Emulsion
Overhang: 24mm



Test result: After processing 120 meters, the normal flank wear of our cutting tool reaches 0.039mm which can still work.

CASE 2

Cutting tool: VPM-4E-D8.0
Method: Slot milling
Workpiece material: 45#
Cutting parameters: Vc=150m/min, fr=0.2mm/r, ap=8mm
CNC Machine type: 5-Axis Vertical Machining Center
Cooling method: Emulsion
Overhang: 24mm



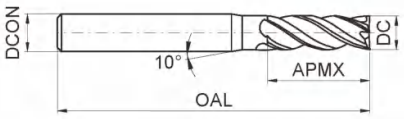


4-flute unequal pitch flattened end mills with straight shank

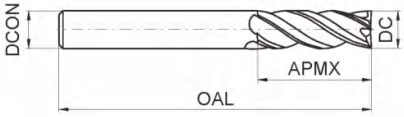


VPM-4E





Picture 1

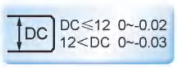


Picture 2

- Suitable for high-efficient machining of ordinary steel and cast iron.
- Differential helical angle and pitch design offer high vibration resistance.
- Suitable for machining of large depth and width of cut.









Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
VPM-4E-D3.0S	3.0	4	8	50	4	Picture 1	●
VPM-4E-D3.0	3.0	6	8	50	4	Picture 1	●
VPM-4E-D3.5S	3.5	4	10	50	4	Picture 1	●
VPM-4E-D3.5	3.5	6	10	50	4	Picture 1	●
VPM-4E-D4.0S	4.0	4	11	50	4	Picture 2	●
VPM-4E-D4.0	4.0	6	11	50	4	Picture 1	●
VPM-4E-D4.5	4.5	6	11	50	4	Picture 1	●
VPM-4E-D5.0	5.0	6	13	50	4	Picture 1	●
VPM-4E-D5.5	5.5	6	16	50	4	Picture 1	●
VPM-4E-D6.0	6.0	6	16	50	4	Picture 2	●
VPM-4E-D7.0	7.0	8	20	60	4	Picture 1	●
VPM-4E-D8.0	8.0	8	20	60	4	Picture 2	●
VPM-4E-D9.0	9.0	10	22	75	4	Picture 1	●
VPM-4E-D10.0	10.0	10	25	75	4	Picture 2	●
VPM-4E-D11.0	11.0	12	26	75	4	Picture 1	●
VPM-4E-D12.0	12.0	12	30	75	4	Picture 2	●
VPM-4E-D14.0	14.0	14	32	75	4	Picture 2	●
VPM-4E-D16.0	16.0	16	45	100	4	Picture 2	●
VPM-4E-D18.0	18.0	18	45	100	4	Picture 2	●
VPM-4E-D20.0	20.0	20	45	100	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	○			◎				

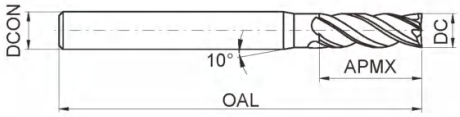
Code key B294
Graphics category and identification B295
Cutting parameters B540
Non-standard customization B652-B653

4-flute flattened end mills with long shank

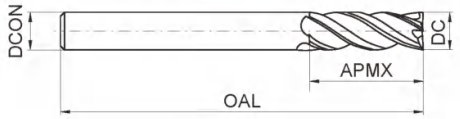


VPM-4EBL/X



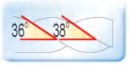


Picture 1

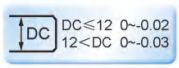


Picture 2

● VPM-4E series with long shank.









Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
VPM-4EBL-D3.0S	3.0	4	8	75	4	Picture 1	○
VPM-4EBL-D3.0	3.0	6	8	75	4	Picture 1	○
VPM-4EBL-D4.0S	4.0	4	11	75	4	Picture 2	○
VPM-4EBL-D4.0	4.0	6	11	75	4	Picture 1	○
VPM-4EBL-D5.0	5.0	6	13	75	4	Picture 1	○
VPM-4EBL-D6.0	6.0	6	16	75	4	Picture 2	○
VPM-4EBX-D6.0	6.0	6	16	100	4	Picture 2	○
VPM-4EBL-D8.0	8.0	8	20	75	4	Picture 2	○
VPM-4EBX-D8.0	8.0	8	20	100	4	Picture 2	○
VPM-4EBL-D10.0	10.0	10	25	100	4	Picture 2	○
VPM-4EBL-D12.0	12.0	12	30	100	4	Picture 2	○
VPM-4EBL-D16.0	16.0	16	45	150	4	Picture 2	○
VPM-4EBL-D20.0	20.0	20	45	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	○			◎				

Code key B294
Graphics category and identification B295
Cutting parameters B540
Non-standard customization B652-B653

4-flute unequal pitch flattened end mills with straight shank, long neck and short cutting edge



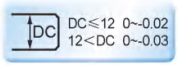
VPM-4EFP



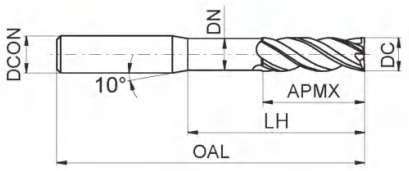
- Suitable for high-efficient machining of ordinary steel and cast iron.
- Differential helical angle and pitch design offer high vibration resistance.
- Suitable for machining of large depth and width of cut.



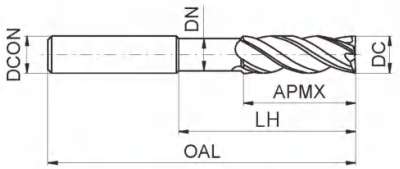








Picture 1



Picture 2

Type	Basic dimension(mm)						Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	LH	DN	OAL			
VPM-4EFP-D3.0S	3.0	4	4.5	15	2.8	75	4	Picture 1	○
VPM-4EFP-D3.0	3.0	6	4.5	15	2.8	75	4	Picture 1	○
VPM-4EFP-D4.0S	4.0	4	6.0	20	3.8	75	4	Picture 2	○
VPM-4EFP-D4.0	4.0	6	6.0	20	3.8	75	4	Picture 1	○
VPM-4EFP-D5.0	5.0	6	8.0	25	4.8	75	4	Picture 1	○
VPM-4EFP-D6.0	6.0	6	9.0	30	5.8	75	4	Picture 2	○
VPM-4EFP-D8.0	8.0	8	12.0	40	7.8	100	4	Picture 2	○
VPM-4EFP-D10.0	10.0	10	15.0	50	9.5	100	4	Picture 2	○
VPM-4EFP-D12.0	12.0	12	18.0	50	11.5	100	4	Picture 2	○
VPM-4EFP-D16.0	16.0	16	24.0	60	15.5	150	4	Picture 2	○
VPM-4EFP-D20.0	20.0	20	30.0	60	19.5	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	○			◎				

Code key B294
Graphics category and identification B295
Cutting parameters B540
Non-standard customization B652-B653

4-flute unequal pitch R end mills with straight shank

Radius shoulder Profile Radius corner slot

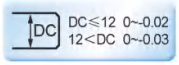
VPM-4R



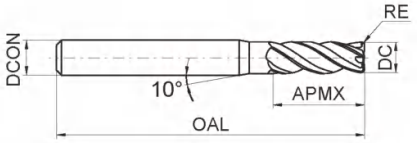
- Suitable for high-efficient machining of ordinary steel and cast iron.
- Differential helical angle and pitch design offer high vibration resistance.
- Suitable for machining of large depth and width of cut.



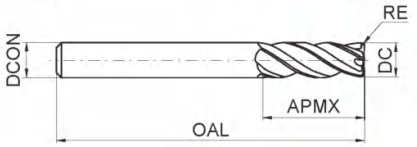








Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
VPM-4R-D3.0R0.2S	3.0	0.2	4	8	50	4	Picture 1	●
VPM-4R-D3.0R0.2	3.0	0.2	6	8	50	4	Picture 1	●
VPM-4R-D3.0R0.3S	3.0	0.3	4	8	50	4	Picture 1	●
VPM-4R-D3.0R0.3	3.0	0.3	6	8	50	4	Picture 1	●
VPM-4R-D4.0R0.2S	4.0	0.2	4	11	50	4	Picture 2	●
VPM-4R-D4.0R0.2	4.0	0.2	6	11	50	4	Picture 1	●
VPM-4R-D4.0R0.3S	4.0	0.3	4	11	50	4	Picture 2	●
VPM-4R-D4.0R0.3	4.0	0.3	6	11	50	4	Picture 1	●
VPM-4R-D4.0R0.5S	4.0	0.5	4	11	50	4	Picture 2	●
VPM-4R-D4.0R0.5	4.0	0.5	6	11	50	4	Picture 1	●
VPM-4R-D5.0R0.3	5.0	0.3	6	13	50	4	Picture 1	●
VPM-4R-D5.0R0.5	5.0	0.5	6	13	50	4	Picture 1	●
VPM-4R-D5.0R1.0	5.0	1.0	6	13	50	4	Picture 1	●
VPM-4R-D6.0R0.3	6.0	0.3	6	16	50	4	Picture 2	●
VPM-4R-D6.0R0.5	6.0	0.5	6	16	50	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	○			◎				

Code key B294 Graphics category and identification B295 Cutting parameters B541 Non-standard customization B652-B653

4-flute unequal pitch R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

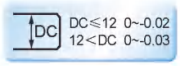
VPM-4R



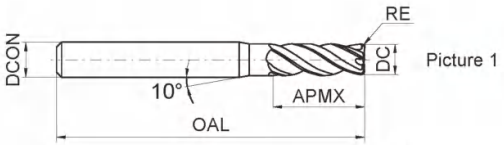
- Suitable for high-efficient machining of ordinary steel and cast iron.
- Differential helical angle and pitch design offer high vibration resistance.
- Suitable for machining of large depth and width of cut.



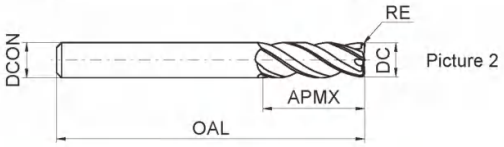








Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
VPM-4R-D6.0R1.0	6.0	1.0	6	16	50	4	Picture 2	●
VPM-4R-D8.0R0.3	8.0	0.3	8	20	60	4	Picture 2	●
VPM-4R-D8.0R0.5	8.0	0.5	8	20	60	4	Picture 2	●
VPM-4R-D8.0R1.0	8.0	1.0	8	20	60	4	Picture 2	●
VPM-4R-D10.0R0.3	10.0	0.3	10	25	75	4	Picture 2	●
VPM-4R-D10.0R0.5	10.0	0.5	10	25	75	4	Picture 2	●
VPM-4R-D10.0R1.0	10.0	1.0	10	25	75	4	Picture 2	●
VPM-4R-D10.0R1.5	10.0	1.5	10	25	75	4	Picture 2	●
VPM-4R-D10.0R2.0	10.0	2.0	10	25	75	4	Picture 2	●
VPM-4R-D12.0R0.3	12.0	0.3	12	30	75	4	Picture 2	●
VPM-4R-D12.0R0.5	12.0	0.5	12	30	75	4	Picture 2	●
VPM-4R-D12.0R1.0	12.0	1.0	12	30	75	4	Picture 2	●
VPM-4R-D12.0R1.5	12.0	1.5	12	30	75	4	Picture 2	●
VPM-4R-D12.0R2.0	12.0	2.0	12	30	75	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	○			◎				

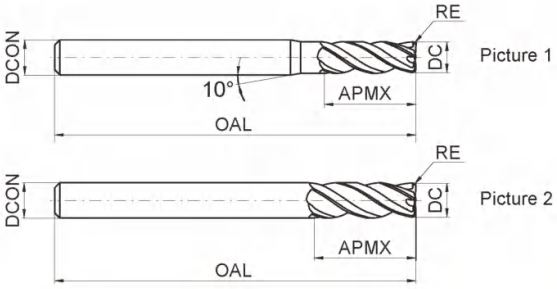
Code key B294 | Graphics category and identification B295 | Cutting parameters B541 | Non-standard customization B652-B653

4-flute R end mills with long shank

Radius shoulder Profile Radius corner slot

VPM-4RBL/X





● VPM-4R series with long shank.

36° 38° Coated AlCrXN DC DC≤12 0~-0.02 12<DC 0~-0.03

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
VPM-4RBL-D3.0R0.2S	3.0	0.2	4	8	75	4	Picture 1	○
VPM-4RBL-D3.0R0.2	3.0	0.2	6	8	75	4	Picture 1	○
VPM-4RBL-D3.0R0.3S	3.0	0.3	4	8	75	4	Picture 1	○
VPM-4RBL-D3.0R0.3	3.0	0.3	6	8	75	4	Picture 1	○
VPM-4RBL-D4.0R0.2S	4.0	0.2	4	11	75	4	Picture 2	○
VPM-4RBL-D4.0R0.2	4.0	0.2	6	11	75	4	Picture 1	○
VPM-4RBL-D4.0R0.3S	4.0	0.3	4	11	75	4	Picture 2	○
VPM-4RBL-D4.0R0.3	4.0	0.3	6	11	75	4	Picture 1	○
VPM-4RBL-D4.0R0.5S	4.0	0.5	4	11	75	4	Picture 2	○
VPM-4RBL-D4.0R0.5	4.0	0.5	6	11	75	4	Picture 1	○
VPM-4RBL-D6.0R0.3	6.0	0.3	6	16	75	4	Picture 2	○
VPM-4RBL-D6.0R0.5	6.0	0.5	6	16	75	4	Picture 2	○
VPM-4RBL-D6.0R1.0	6.0	1.0	6	16	75	4	Picture 2	○
VPM-4RBX-D6.0R0.3	6.0	0.3	6	16	100	4	Picture 2	○
VPM-4RBX-D6.0R0.5	6.0	0.5	6	16	100	4	Picture 2	○
VPM-4RBX-D6.0R1.0	6.0	1.0	6	16	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	○			◎				

Code key B294 Graphics category and identification B295 Cutting parameters B541 Non-standard customization B652-B653

4-flute R end mills with long shank

Radius shoulder Profile Radius corner slot

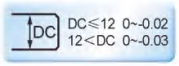
VPM-4RBL/X



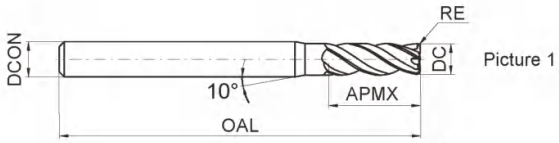
- VPM-4R series with long shank.



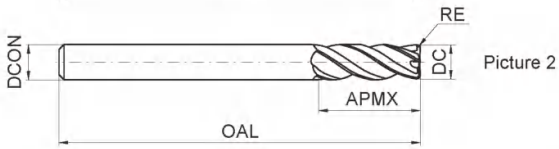








Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
VPM-4RBL-D8.0R0.3	8.0	0.3	8	20	75	4	Picture 2	○
VPM-4RBL-D8.0R0.5	8.0	0.5	8	20	75	4	Picture 2	○
VPM-4RBL-D8.0R1.0	8.0	1.0	8	20	75	4	Picture 2	○
VPM-4RBX-D8.0R0.3	8.0	0.3	8	20	100	4	Picture 2	○
VPM-4RBX-D8.0R0.5	8.0	0.5	8	20	100	4	Picture 2	○
VPM-4RBX-D8.0R1.0	8.0	1.0	8	20	100	4	Picture 2	○
VPM-4RBL-D10.0R0.3	10.0	0.3	10	25	100	4	Picture 2	○
VPM-4RBL-D10.0R0.5	10.0	0.5	10	25	100	4	Picture 2	○
VPM-4RBL-D10.0R1.0	10.0	1.0	10	25	100	4	Picture 2	○
VPM-4RBL-D10.0R1.5	10.0	1.5	10	25	100	4	Picture 2	○
VPM-4RBL-D10.0R2.0	10.0	2.0	10	25	100	4	Picture 2	○
VPM-4RBL-D12.0R0.3	12.0	0.3	12	30	100	4	Picture 2	○
VPM-4RBL-D12.0R0.5	12.0	0.5	12	30	100	4	Picture 2	○
VPM-4RBL-D12.0R1.0	12.0	1.0	12	30	100	4	Picture 2	○
VPM-4RBL-D12.0R1.5	12.0	1.5	12	30	100	4	Picture 2	○
VPM-4RBL-D12.0R2.0	12.0	2.0	12	30	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	○			◎				

Code key B294 Graphics category and identification B295 Cutting parameters B541 Non-standard customization B652-B653

4-flute long neck and short cutting edge unequal pitch R end mills with straight shank

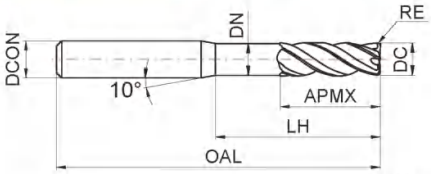
Radius shoulder Profile Radius corner slot

VPM-4RFP

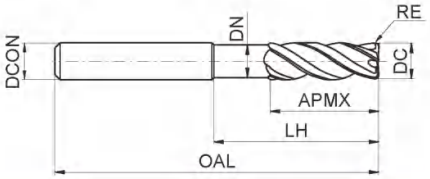


- Suitable for high-efficient machining of ordinary steel and cast iron.
- Differential helical angle and pitch design offer high vibration resistance.
- Suitable for machining of large depth and width of cut.

36° 38° | Coated AlCrXN | DC DC≤12 0~-0.02 12<DC 0~-0.03



Picture 1



Picture 2

Type	Basic dimension(mm)							Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	LH	DN	OAL			
VPM-4RFP-D3.0R0.2S	3.0	0.2	4	3	9	2.8	75	4	Picture 1	○
VPM-4RFP-D3.0R0.2	3.0	0.2	6	3	9	2.8	75	4	Picture 1	○
VPM-4RFP-D3.0R0.3S	3.0	0.3	4	3	9	2.8	75	4	Picture 1	○
VPM-4RFP-D3.0R0.3	3.0	0.3	6	3	9	2.8	75	4	Picture 1	○
VPM-4RFP-D4.0R0.2S	4.0	0.2	4	4	12	3.8	75	4	Picture 2	○
VPM-4RFP-D4.0R0.2	4.0	0.2	6	4	12	3.8	75	4	Picture 1	○
VPM-4RFP-D4.0R0.3S	4.0	0.3	4	4	12	3.8	75	4	Picture 2	○
VPM-4RFP-D4.0R0.3	4.0	0.3	6	4	12	3.8	75	4	Picture 1	○
VPM-4RFP-D4.0R0.5S	4.0	0.5	4	4	12	3.8	75	4	Picture 2	○
VPM-4RFP-D4.0R0.5	4.0	0.5	6	4	12	3.8	75	4	Picture 1	○
VPM-4RFP-D6.0R0.3	6.0	0.3	6	6	18	5.8	75	4	Picture 2	○
VPM-4RFP-D6.0R0.5	6.0	0.5	6	6	18	5.8	75	4	Picture 2	○
VPM-4RFP-D6.0R1.0	6.0	1.0	6	6	18	5.8	75	4	Picture 2	○
VPM-4RFP-D8.0R0.3	8.0	0.3	8	8	24	7.8	75	4	Picture 2	○
VPM-4RFP-D8.0R0.5	8.0	0.5	8	8	24	7.8	75	4	Picture 2	○
VPM-4RFP-D8.0R1.0	8.0	1.0	8	8	24	7.8	75	4	Picture 2	○
VPM-4RFP-D10.0R0.3	10.0	0.3	10	10	30	9.5	100	4	Picture 2	○
VPM-4RFP-D10.0R0.5	10.0	0.5	10	10	30	9.5	100	4	Picture 2	○
VPM-4RFP-D10.0R1.0	10.0	1.0	10	10	30	9.5	100	4	Picture 2	○
VPM-4RFP-D10.0R1.5	10.0	1.5	10	10	30	9.5	100	4	Picture 2	○
VPM-4RFP-D10.0R2.0	10.0	2.0	10	10	30	9.5	100	4	Picture 2	○
VPM-4RFP-D12.0R0.3	12.0	0.3	12	12	36	11.5	100	4	Picture 2	○
VPM-4RFP-D12.0R0.5	12.0	0.5	12	12	36	11.5	100	4	Picture 2	○
VPM-4RFP-D12.0R1.0	12.0	1.0	12	12	36	11.5	100	4	Picture 2	○
VPM-4RFP-D12.0R1.5	12.0	1.5	12	12	36	11.5	100	4	Picture 2	○
VPM-4RFP-D12.0R2.0	12.0	2.0	12	12	36	11.5	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	○			◎				

Code key B294 | Graphics category and identification B295 | Cutting parameters B541 | Non-standard customization B652-B653

High-performance general machining end mills

UM Series

- Unequal pitch and variable inclined angle design reduce vibration risk and ensure better machining stability.
- Variable flute depth design improves rigidity for higher chip removal capacity.



Application range:

Suitable for high effectively machining of cast iron, carbon, alloy steel, pre-hardened steel, quenched and tempered steel, hardened steel under HRC55, etc.

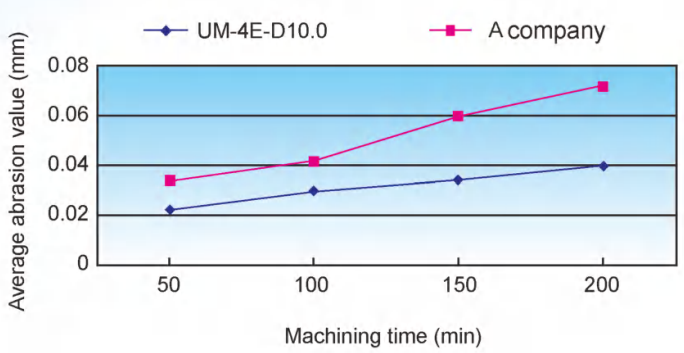
Excellent machining stability under weak rigidity working condition such as thin-walled parts, parts corner, large overhang, etc.

Machining case:

Workpiece material: 42CrMo (HRC35)
Cutting style: side milling
Tool type: UM-4E-D10.0
Cutting parameters: n=6000r/min,
f_z=0.16mm/z,
a_p=10mm, a_e=1mm



Comparison of tool wear

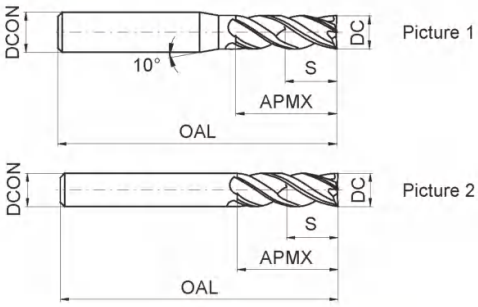


4-flute unequal pitch flattened end mills with straight shank

Side face | Step shoulder | Straight slot

UM-4E





38°,41° | Coated AlTiN | DC DC≤12 0~-0.020 12<DC 0~-0.030

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	S	OAL			
UM-4E-D4.0S	4.0	4	11	6.00	50	4	Picture 2	○
UM-4E-D4.0	4.0	6	11	6.00	50	4	Picture 1	○
UM-4E-D4.5	4.5	6	11	6.75	50	4	Picture 1	○
UM-4E-D5.0	5.0	6	13	7.50	50	4	Picture 1	○
UM-4E-D5.5	5.5	6	16	8.25	50	4	Picture 1	○
UM-4E-D6.0	6.0	6	16	9.00	50	4	Picture 2	○
UM-4E-D7.0	7.0	8	20	10.5	60	4	Picture 1	○
UM-4E-D8.0	8.0	8	20	12.0	60	4	Picture 2	○
UM-4E-D9.0	9.0	10	22	13.5	75	4	Picture 1	○
UM-4E-D10.0	10.0	10	25	15.0	75	4	Picture 2	○
UM-4E-D11.0	11.0	12	26	16.5	75	4	Picture 1	○
UM-4E-D12.0	12.0	12	30	18.0	75	4	Picture 2	○
UM-4E-D14.0	14.0	14	32	21.0	75	4	Picture 2	○
UM-4E-D16.0	16.0	16	45	24.0	100	4	Picture 2	○
UM-4E-D18.0	18.0	18	45	27.0	100	4	Picture 2	○
UM-4E-D20.0	20.0	20	45	30.0	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294 | Graphics category and identification B295 | Cutting parameters B542-B543 | Non-standard customization B652-B653

4-flute long cutting edge and unequal pitch flattened end mills with straight shank


Side face


Step shoulder


Straight slot

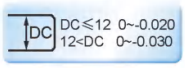
UM-4EL



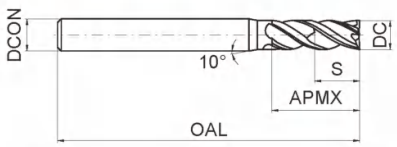
● UM-4E series with long cutting edge.



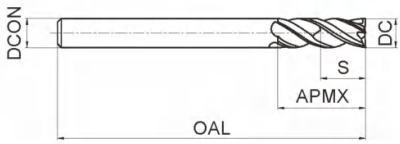








Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	S	OAL			
UM-4EL-D4.0	4.0	6	15	6.00	75	4	Picture 1	○
UM-4EL-D5.0	5.0	6	20	7.50	75	4	Picture 1	○
UM-4EL-D6.0	6.0	6	20	9.00	75	4	Picture 2	○
UM-4EL-D8.0	8.0	8	25	12.0	100	4	Picture 2	○
UM-4EL-D10.0	10.0	10	30	15.0	100	4	Picture 2	○
UM-4EL-D12.0	12.0	12	35	18.0	100	4	Picture 2	○
UM-4EL-D14.0	14.0	14	40	21.0	100	4	Picture 2	○
UM-4EL-D16.0	16.0	16	50	24.0	150	4	Picture 2	○
UM-4EL-D20.0	20.0	20	55	30.0	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B542-B543
Non-standard customization B652-B653

4-flute unequal pitch flattened end mills with long neck, short cutting edge and straight shank

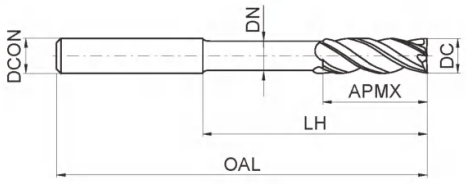

Side face


Step shoulder


Straight slot

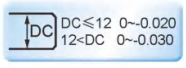
UM-4EFP













Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	DCON	APMX	LH	DN	OAL		
UM-4EFP-D6.0	6.0	6	9	30	5.8	75	4	○
UM-4EFP-D8.0	8.0	8	12	40	7.8	100	4	○
UM-4EFP-D10.0	10.0	10	15	50	9.6	100	4	○
UM-4EFP-D12.0	12.0	12	18	50	11.5	100	4	○
UM-4EFP-D16.0	16.0	16	24	50	15.5	150	4	○
UM-4EFP-D20.0	20.0	20	30	60	19.5	150	4	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

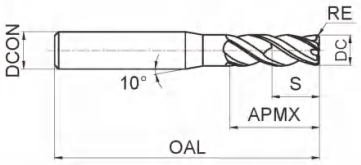
Code key B294 Graphics category and identification B295 Cutting parameters B544-B545 Non-standard customization B652-B653

4-flute unequal pitch R end mills with straight shank

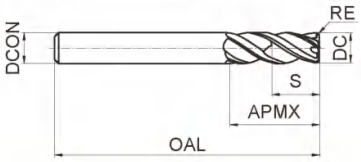
Radius shoulder Profile Radius corner slot

UM-4R





Picture 1



Picture 2

38°,41° Coated AlTiN DC DC≤12 0~-0.020 12<DC 0~-0.030

Type	Basic dimension(mm)						Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	S	OAL			
UM-4R-D4.0R0.3	4.0	0.3	6	10	6.0	50	4	Picture 1	○
UM-4R-D4.0R0.5	4.0	0.5	6	10	6.0	50	4	Picture 1	○
UM-4R-D5.0R0.5	5.0	0.5	6	13	7.5	50	4	Picture 1	○
UM-4R-D5.0R1.0	5.0	1.0	6	13	7.5	50	4	Picture 1	○
UM-4R-D6.0R0.5	6.0	0.5	6	16	9.0	50	4	Picture 2	○
UM-4R-D6.0R1.0	6.0	1.0	6	16	9.0	50	4	Picture 2	○
UM-4R-D8.0R0.5	8.0	0.5	8	20	12	60	4	Picture 2	○
UM-4R-D8.0R1.0	8.0	1.0	8	20	12	60	4	Picture 2	○
UM-4R-D10.0R0.5	10.0	0.5	10	25	15	75	4	Picture 2	○
UM-4R-D10.0R1.0	10.0	1.0	10	25	15	75	4	Picture 2	○
UM-4R-D10.0R2.0	10.0	2.0	10	25	15	75	4	Picture 2	○
UM-4R-D10.0R3.0	10.0	3.0	10	25	15	75	4	Picture 2	○
UM-4R-D12.0R0.5	12.0	0.5	12	30	18	75	4	Picture 2	○
UM-4R-D12.0R1.0	12.0	1.0	12	30	18	75	4	Picture 2	○
UM-4R-D12.0R2.0	12.0	2.0	12	30	18	75	4	Picture 2	○
UM-4R-D12.0R3.0	12.0	3.0	12	30	18	75	4	Picture 2	○
UM-4R-D16.0R1.0	16.0	1.0	16	45	24	100	4	Picture 2	○
UM-4R-D16.0R2.0	16.0	2.0	16	45	24	100	4	Picture 2	○
UM-4R-D16.0R3.0	16.0	3.0	16	45	24	100	4	Picture 2	○
UM-4R-D20.0R1.0	20.0	1.0	20	45	30	100	4	Picture 2	○
UM-4R-D20.0R2.0	20.0	2.0	20	45	30	100	4	Picture 2	○
UM-4R-D20.0R3.0	20.0	3.0	20	45	30	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

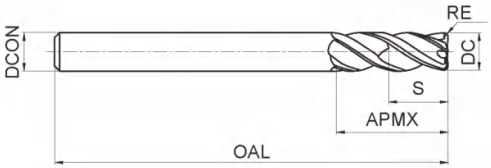
Code key B294 Graphics category and identification B295 Cutting parameters B546-B547 Non-standard customization B652-B653

4-flute long cutting edge and unequal pitch R end mills with straight shank

Radius shoulder Profile Radius corner slot

UM-4RL





● UM-4R series with cutting edge.

38°,41° Coated AlTiN DC DC≤12 0~-0.020 12<DC 0~-0.030

Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	RE	DCON	APMX	S	OAL		
UM-4RL-D6.0R0.5	6.0	0.5	6	16	9	75	4	○
UM-4RL-D6.0R1.0	6.0	1.0	6	16	9	75	4	○
UM-4RL-D8.0R0.5	8.0	0.5	8	20	12	100	4	○
UM-4RL-D8.0R1.0	8.0	1.0	8	20	12	100	4	○
UM-4RL-D10.0R0.5	10.0	0.5	10	25	15	100	4	○
UM-4RL-D10.0R1.0	10.0	1.0	10	25	15	100	4	○
UM-4RL-D10.0R2.0	10.0	2.0	10	25	15	100	4	○
UM-4RL-D12.0R0.5	12.0	0.5	12	30	18	100	4	○
UM-4RL-D12.0R1.0	12.0	1.0	12	30	18	100	4	○
UM-4RL-D12.0R2.0	12.0	2.0	12	30	18	100	4	○
UM-4RL-D16.0R1.0	16.0	1.0	16	45	24	150	4	○
UM-4RL-D16.0R2.0	16.0	2.0	16	45	24	150	4	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

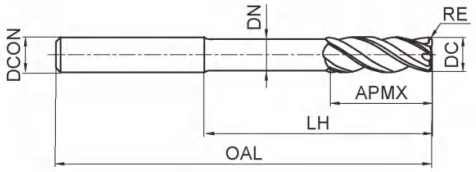
Code key B294 Graphics category and identification B295 Cutting parameters B546-B547 Non-standard customization B652-B653

4-flute long neck and short cutting edge unequal pitch R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

UM-4RFP





38°,41° | Coated AlTiN | DC DC≤12 0~-0.020 12<DC 0~-0.030

Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	RE	DCON	DN	APMX	LH	OAL		
UM-4RFP-D6.0R0.5	6.0	0.5	6	5.8	6	18	75	4	○
UM-4RFP-D6.0R1.0	6.0	1.0	6	5.8	6	18	75	4	○
UM-4RFP-D8.0R0.5	8.0	0.5	8	7.7	8	24	100	4	○
UM-4RFP-D8.0R1.0	8.0	1.0	8	7.7	8	24	100	4	○
UM-4RFP-D10.0R0.5	10.0	0.5	10	9.6	10	30	100	4	○
UM-4RFP-D10.0R1.0	10.0	1.0	10	9.6	10	30	100	4	○
UM-4RFP-D10.0R2.0	10.0	2.0	10	9.6	10	30	100	4	○
UM-4RFP-D12.0R0.5	12.0	0.5	12	11.5	12	36	100	4	○
UM-4RFP-D12.0R1.0	12.0	1.0	12	11.5	12	36	100	4	○
UM-4RFP-D12.0R2.0	12.0	2.0	12	11.5	12	36	100	4	○
UM-4RFP-D16.0R1.0	16.0	1.0	16	15.5	16	40	150	4	○
UM-4RFP-D16.0R2.0	16.0	2.0	16	15.5	16	40	150	4	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294 | Graphics category and identification B295 | Cutting parameters B548 | Non-standard customization B652-B653

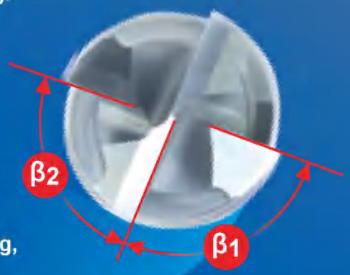
PMX series

High-performance universal end mills



Stable and high anti-vibration machining

Brand new U shape flutes design, taking the tool rigidity account with chip flowing performance, new flutes have good dynamic balance, and more stable for high speed high-efficiency machining.

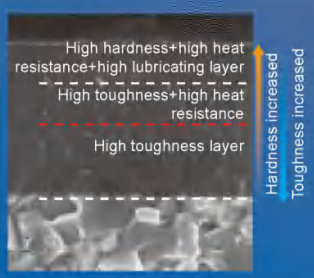


Unequal teeth pitch and unequal helical structure effectively restrain the vibration when processing, improve cutting stability and effectively avoid tools abnormal chipping and lose valid.

Accuracy class improvement

Grinding process overall optimized, accuracy grades improve greatly.

	Flute diameter		Radiu		Ballnose		Shank diameter
Tolerance (mm)	D≤3	0~-0.012	R<0.5	±0.005	SR≤3	±0.005	h5
	3<D≤12	0~-0.015	R≥0.5	±0.008	SR>3	±0.008	
	D>12	0~-0.02					



New coating grades

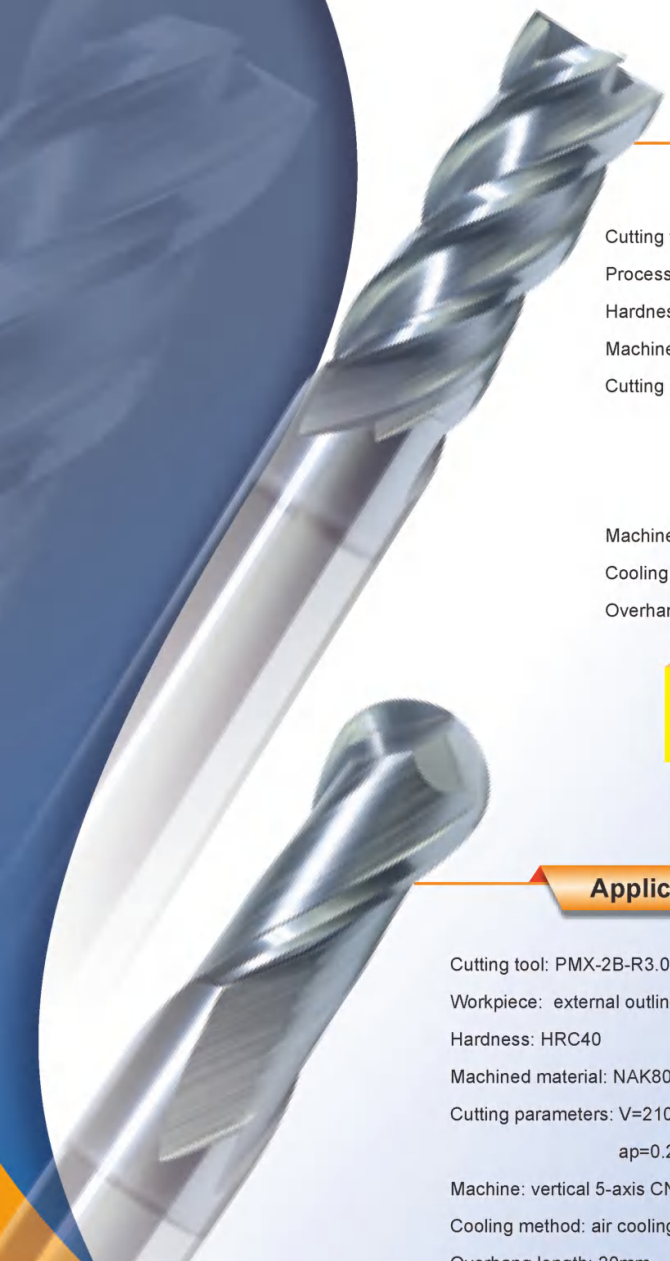
New "AlCrX-based" gradient coating to optimize stress distribution and improve impact resistance of the coating.

Nano-multilayer structure coating to restrain crack propagation effectively in the as-processed state.

With 40Gpa high hardness surface layer, the wear resistance of coating is excellent, and significantly improves tool service life.

Application range

It is widely applied in high-speed and high-efficiency side milling, slot milling and profiling of carbon steel, alloy steel, die steel, etc., materials in the mold, automobile industries under dry cutting, water cooling, MQL cooling conditions.



Application case 1

Cutting tool: PMX-4E-D10.0

Processing: side milling

Hardness: HRC53~56

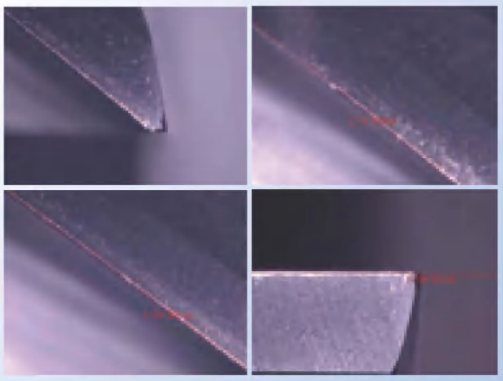
Machined material: SKD61

Cutting parameters: V=150m/min,
fr=0.2mm/r,
ap=10mm,
ae=0.5mm

Machine: vertical 5-axis CNC

Cooling method: emulsion coolant

Overhang length: 30mm



Test result: after machining 86m, flank face of ZCC·CT tool only normal wear 0.024mm, and it was available to continue cut.

Application case 2

Cutting tool: PMX-2B-R3.0

Workpiece: external outline of support arm

Hardness: HRC40

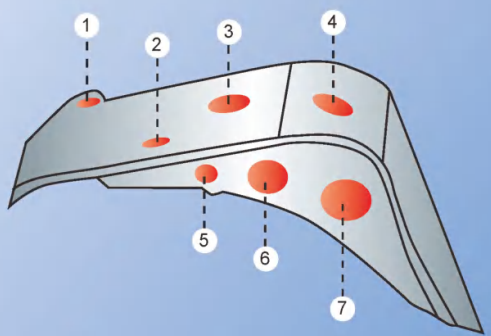
Machined material: NAK80

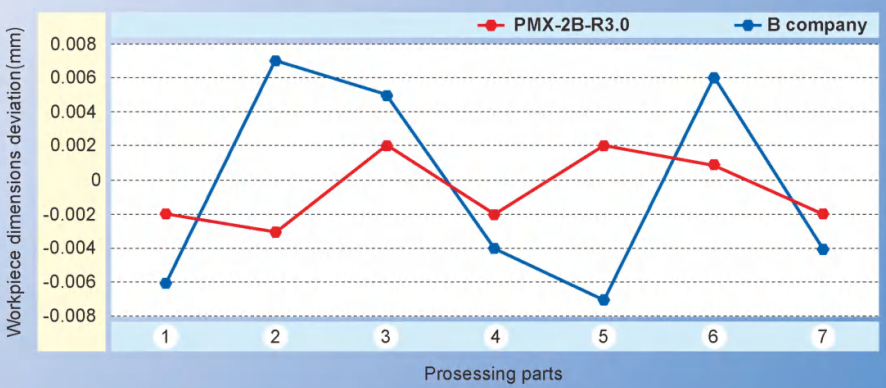
Cutting parameters: V=210m/min, fr=0.25mm/r,
ap=0.2mm, ae=0.3mm

Machine: vertical 5-axis CNC

Cooling method: air cooling

Overhang length: 20mm





Result: After measuring the dimensions of seven parts of the workpiece, ZCC·CT tool PMX-2B-R3.0 product has higher accuracy and is stable within ±0.003mm.

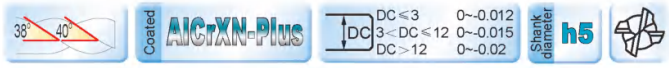
4-flute flattened end mills with straight shank

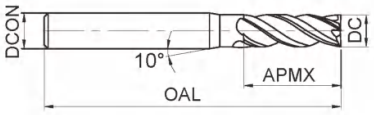


PMX-4E



- It's suitable for high-efficiency machining on mould steel, pre-hardened steel and carbon steel.
- Unequal Teeth pitch and unequal helical angle design, has good performance on vibration resistance.





Picture 1



Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PMX-4E-D1.0F	1.0	3	3	50	4	Picture 1	●
PMX-4E-D1.5F	1.5	3	4	50	4	Picture 1	●
PMX-4E-D2.0F	2.0	3	6	50	4	Picture 1	●
PMX-4E-D2.5F	2.5	3	8	50	4	Picture 1	●
PMX-4E-D3.0F	3.0	3	8	50	4	Picture 2	●
PMX-4E-D1.0S	1.0	4	3	50	4	Picture 1	●
PMX-4E-D1.5S	1.5	4	4	50	4	Picture 1	●
PMX-4E-D2.0S	2.0	4	6	50	4	Picture 1	●
PMX-4E-D2.5S	2.5	4	8	50	4	Picture 1	●
PMX-4E-D3.0S	3.0	4	8	50	4	Picture 1	●
PMX-4E-D3.5S	3.5	4	10	50	4	Picture 1	●
PMX-4E-D4.0S	4.0	4	11	50	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~65HRC						
◎	◎	◎	◎	◎	○		◎				

Code key B294
Graphics category and identification B295
Cutting parameters B549
Non-standard customization B652-B653

4-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

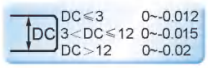
PMX-4E



- It's suitable for high-efficiency machining on mould steel, pre-hardened steel and carbon steel.
- Unequal Teeth pitch and unequal helical angle design, has good performance on vibration resistance.

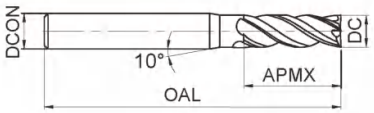




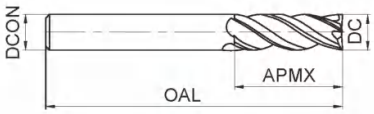








Picture 1



Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PMX-4E-D1.0	1.0	6	3	50	4	Picture 1	●
PMX-4E-D1.5	1.5	6	4	50	4	Picture 1	●
PMX-4E-D2.0	2.0	6	6	50	4	Picture 1	●
PMX-4E-D2.5	2.5	6	8	50	4	Picture 1	●
PMX-4E-D3.0	3.0	6	8	50	4	Picture 1	●
PMX-4E-D3.5	3.5	6	10	50	4	Picture 1	●
PMX-4E-D4.0	4.0	6	11	50	4	Picture 1	●
PMX-4E-D4.5	4.5	6	11	50	4	Picture 1	●
PMX-4E-D5.0	5.0	6	13	50	4	Picture 1	●
PMX-4E-D5.5	5.5	6	16	50	4	Picture 1	●
PMX-4E-D6.0	6.0	6	16	50	4	Picture 2	●
PMX-4E-D7.0	7.0	8	20	60	4	Picture 1	●
PMX-4E-D8.0	8.0	8	20	60	4	Picture 2	●
PMX-4E-D9.0	9.0	10	22	75	4	Picture 1	●
PMX-4E-D10.0	10.0	10	25	75	4	Picture 2	●
PMX-4E-D11.0	11.0	12	26	75	4	Picture 1	●
PMX-4E-D12.0	12.0	12	30	75	4	Picture 2	●
PMX-4E-D14.0	14.0	14	32	75	4	Picture 2	●
PMX-4E-D16.0	16.0	16	45	100	4	Picture 2	●
PMX-4E-D18.0	18.0	18	45	100	4	Picture 2	●
PMX-4E-D20.0	20.0	20	45	100	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~65HRC						
◎	◎	◎	◎	◎	○		◎				

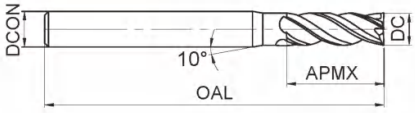
Code key B294
Graphics category and identification B295
Cutting parameters B549
Non-standard customization B652-B653

4-flute flattened end mills with long shank

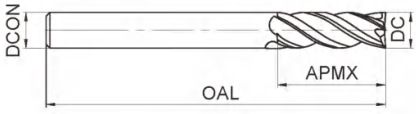


PMX-4EBL/X





Picture 1

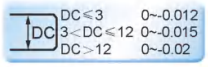


Picture 2

- PMX-4E long shank series.
- It's suitable for high-efficiency machining on mould steel, pre-hardened steel and carbon steel.
- Unequal Teeth pitch and unequal helical angle structure has good performance on vibration resistance.











Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PMX-4EBL-D3.0S	3.0	4	8	75	4	Picture 1	○
PMX-4EBL-D4.0S	4.0	4	11	75	4	Picture 2	○
PMX-4EBL-D3.0	3.0	6	8	75	4	Picture 1	○
PMX-4EBL-D4.0	4.0	6	11	75	4	Picture 1	○
PMX-4EBL-D5.0	5.0	6	13	75	4	Picture 1	○
PMX-4EBL-D6.0	6.0	6	16	75	4	Picture 2	○
PMX-4EBX-D6.0	6.0	6	16	100	4	Picture 2	○
PMX-4EBL-D8.0	8.0	8	20	75	4	Picture 2	○
PMX-4EBX-D8.0	8.0	8	20	100	4	Picture 2	○
PMX-4EBL-D10.0	10.0	10	25	100	4	Picture 2	○
PMX-4EBL-D12.0	12.0	12	30	100	4	Picture 2	○
PMX-4EBL-D16.0	16.0	16	45	150	4	Picture 2	○
PMX-4EBL-D20.0	20.0	20	45	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~65HRC						
◎	◎	◎	◎	◎	○		◎				

Code key B294
Graphics category and identification B295
Cutting parameters B549
Non-standard customization B652-B653

4-flute flattened end mills with straight shank, long neck and short cutting edge

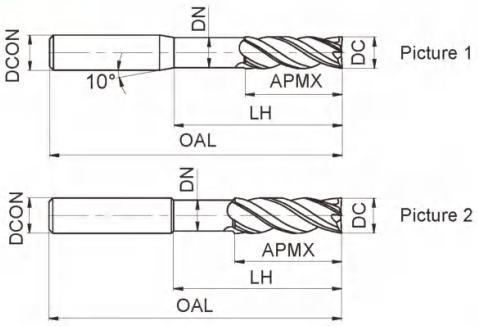


PMX-4EFP



- It's suitable for high-efficiency machining on mould steel, pre-hardened steel and carbon steel.
- Unequal Teeth pitch and unequal helical angle structure has good performance on vibration resistance.
- High rigidity short flute design, it's more suitable for high efficiency machining.





Type	Basic dimension(mm)						Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	LH	DN	OAL			
PMX-4EFP-D3.0S	3.0	4	4.5	15	2.8	75	4	Picture 1	○
PMX-4EFP-D4.0S	4.0	4	6	20	3.8	75	4	Picture 2	○
PMX-4EFP-D3.0	3.0	6	4.5	15	2.8	75	4	Picture 1	○
PMX-4EFP-D4.0	4.0	6	6	20	3.8	75	4	Picture 1	○
PMX-4EFP-D5.0	5.0	6	8	25	4.8	75	4	Picture 1	○
PMX-4EFP-D6.0	6.0	6	9	30	5.8	75	4	Picture 2	○
PMX-4EFP-D8.0	8.0	8	12	40	7.8	100	4	Picture 2	○
PMX-4EFP-D10.0	10.0	10	15	50	9.5	100	4	Picture 2	○
PMX-4EFP-D12.0	12.0	12	18	50	11.5	100	4	Picture 2	○
PMX-4EFP-D16.0	16.0	16	24	60	15.5	150	4	Picture 2	○
PMX-4EFP-D20.0	20.0	20	30	60	19.5	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~65HRC						
◎	◎	◎	◎	◎	○		◎				

Code key B294
Graphics category and identification B295
Cutting parameters B549
Non-standard customization B652-B653

4-flute R end mills with straight shank


Radius shoulder

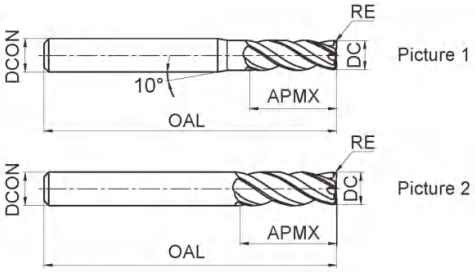

Profile


Radius corner slot

PMX-4R

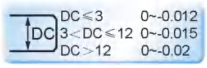


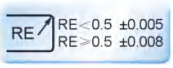
- It's suitable for high-efficiency machining on mould steel, pre-hardened steel and carbon steel.
- Unequal Teeth pitch and unequal helical angle design, has good performance on vibration resistance.















Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PMX-4R-D1.0R0.2S	1.0	0.2	4	3	50	4	Picture 1	●
PMX-4R-D1.5R0.2S	1.5	0.2	4	4	50	4	Picture 1	●
PMX-4R-D2.0R0.2S	2.0	0.2	4	6	50	4	Picture 1	●
PMX-4R-D2.0R0.5S	2.0	0.5	4	6	50	4	Picture 1	●
PMX-4R-D2.5R0.2S	2.5	0.2	4	8	50	4	Picture 1	●
PMX-4R-D2.5R0.5S	2.5	0.5	4	8	50	4	Picture 1	●
PMX-4R-D3.0R0.2S	3.0	0.2	4	8	50	4	Picture 1	●
PMX-4R-D3.0R0.3S	3.0	0.3	4	8	50	4	Picture 1	●
PMX-4R-D4.0R0.2S	4.0	0.2	4	11	50	4	Picture 2	●
PMX-4R-D4.0R0.3S	4.0	0.3	4	11	50	4	Picture 2	●
PMX-4R-D4.0R0.5S	4.0	0.5	4	11	50	4	Picture 2	●
PMX-4R-D1.0R0.2	1.0	0.2	6	3	50	4	Picture 1	●
PMX-4R-D1.5R0.2	1.5	0.2	6	4	50	4	Picture 1	●
PMX-4R-D2.0R0.2	2.0	0.2	6	6	50	4	Picture 1	●
PMX-4R-D2.0R0.5	2.0	0.5	6	6	50	4	Picture 1	●
PMX-4R-D2.5R0.2	2.5	0.2	6	8	50	4	Picture 1	●
PMX-4R-D2.5R0.5	2.5	0.5	6	8	50	4	Picture 1	●
PMX-4R-D3.0R0.2	3.0	0.2	6	8	50	4	Picture 1	●
PMX-4R-D3.0R0.3	3.0	0.3	6	8	50	4	Picture 1	●
PMX-4R-D4.0R0.2	4.0	0.2	6	11	50	4	Picture 1	●
PMX-4R-D4.0R0.3	4.0	0.3	6	11	50	4	Picture 1	●
PMX-4R-D4.0R0.5	4.0	0.5	6	11	50	4	Picture 1	●
PMX-4R-D5.0R0.3	5.0	0.3	6	13	50	4	Picture 1	●
PMX-4R-D5.0R0.5	5.0	0.5	6	13	50	4	Picture 1	●
PMX-4R-D5.0R1.0	5.0	1.0	6	13	50	4	Picture 1	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~65HRC						
◎	◎	◎	◎	◎	○		◎				

Code key B294
Graphics category and identification B295
Cutting parameters B550
Non-standard customization B652-B653

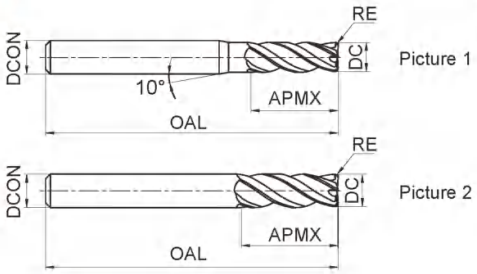
4-flute R end mills with straight shank

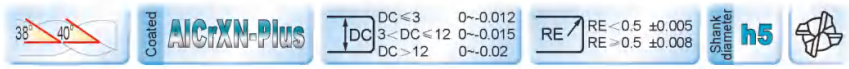
Radius shoulder | Profile | Radius corner slot

PMX-4R



- It's suitable for high-efficiency machining on mould steel, pre-hardened steel and carbon steel.
- Unequal teeth pitch and unequal helical angle design, has good performance on vibration resistance.





Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PMX-4R-D5.0R0.2	5.0	0.2	6	13	50	4	Picture 1	●
PMX-4R-D6.0R0.2	6.0	0.2	6	16	50	4	Picture 2	●
PMX-4R-D6.0R0.3	6.0	0.3	6	16	50	4	Picture 2	●
PMX-4R-D6.0R0.5	6.0	0.5	6	16	50	4	Picture 2	●
PMX-4R-D6.0R1.0	6.0	1.0	6	16	50	4	Picture 2	●
PMX-4R-D8.0R0.2	8.0	0.2	8	20	60	4	Picture 2	●
PMX-4R-D8.0R0.3	8.0	0.3	8	20	60	4	Picture 2	●
PMX-4R-D8.0R0.5	8.0	0.5	8	20	60	4	Picture 2	●
PMX-4R-D8.0R1.0	8.0	1.0	8	20	60	4	Picture 2	●
PMX-4R-D10.0R0.2	10.0	0.2	10	25	75	4	Picture 2	●
PMX-4R-D10.0R0.3	10.0	0.3	10	25	75	4	Picture 2	●
PMX-4R-D10.0R0.5	10.0	0.5	10	25	75	4	Picture 2	●
PMX-4R-D10.0R1.0	10.0	1.0	10	25	75	4	Picture 2	●
PMX-4R-D10.0R1.5	10.0	1.5	10	25	75	4	Picture 2	●
PMX-4R-D10.0R2.0	10.0	2.0	10	25	75	4	Picture 2	●
PMX-4R-D12.0R0.3	12.0	0.3	12	30	75	4	Picture 2	●
PMX-4R-D12.0R0.5	12.0	0.5	12	30	75	4	Picture 2	●
PMX-4R-D12.0R1.0	12.0	1.0	12	30	75	4	Picture 2	●
PMX-4R-D12.0R1.5	12.0	1.5	12	30	75	4	Picture 2	●
PMX-4R-D12.0R2.0	12.0	2.0	12	30	75	4	Picture 2	●
PMX-4R-D12.0R3.0	12.0	3.0	12	30	75	4	Picture 2	●
PMX-4R-D16.0R0.5	16.0	0.5	16	45	100	4	Picture 2	●
PMX-4R-D16.0R1.0	16.0	1.0	16	45	100	4	Picture 2	●
PMX-4R-D16.0R2.0	16.0	2.0	16	45	100	4	Picture 2	●
PMX-4R-D16.0R3.0	16.0	3.0	16	45	100	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~65HRC						
◎	◎	◎	◎	◎	○		◎				

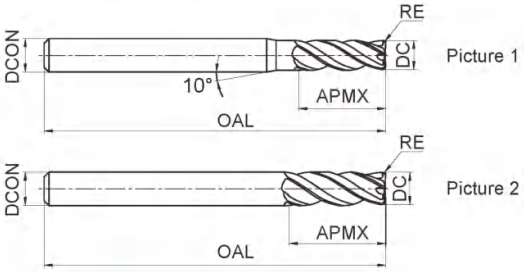
Code key B294 | Graphics category and identification B295 | Cutting parameters B550 | Non-standard customization B652-B653

4-flute R end mills with long shank

Radius shoulder | Profile | Radius corner slot

PMX-4RBL/X





- PMX-4R series with long shank.

38 40 | Coated AlCrXN-Plus | DC DC≤3 0~-0.012 3<DC≤12 0~-0.015 DC>12 0~-0.02 | RE RE<0.5 ±0.005 RE>0.5 ±0.008 | Shank diameter h5

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PMX-4RBL-D3.0R0.2S	3.0	0.2	4	8	75	4	Picture 1	○
PMX-4RBL-D3.0R0.3S	3.0	0.3	4	8	75	4	Picture 1	○
PMX-4RBL-D4.0R0.2S	4.0	0.2	4	11	75	4	Picture 2	○
PMX-4RBL-D4.0R0.3S	4.0	0.3	4	11	75	4	Picture 2	○
PMX-4RBL-D4.0R0.5S	4.0	0.5	4	11	75	4	Picture 2	○
PMX-4RBL-D3.0R0.2	3.0	0.2	6	8	75	4	Picture 1	○
PMX-4RBL-D3.0R0.3	3.0	0.3	6	8	75	4	Picture 1	○
PMX-4RBL-D4.0R0.2	4.0	0.2	6	11	75	4	Picture 1	○
PMX-4RBL-D4.0R0.3	4.0	0.3	6	11	75	4	Picture 1	○
PMX-4RBL-D4.0R0.5	4.0	0.5	6	11	75	4	Picture 1	○
PMX-4RBL-D6.0R0.2	6.0	0.2	6	16	75	4	Picture 2	○
PMX-4RBL-D6.0R0.3	6.0	0.3	6	16	75	4	Picture 2	○
PMX-4RBL-D6.0R0.5	6.0	0.5	6	16	75	4	Picture 2	○
PMX-4RBL-D6.0R1.0	6.0	1.0	6	16	75	4	Picture 2	○
PMX-4RBX-D6.0R0.2	6.0	0.2	6	16	100	4	Picture 2	○
PMX-4RBX-D6.0R0.3	6.0	0.3	6	16	100	4	Picture 2	○
PMX-4RBX-D6.0R0.5	6.0	0.5	6	16	100	4	Picture 2	○
PMX-4RBX-D6.0R1.0	6.0	1.0	6	16	100	4	Picture 2	○
PMX-4RBL-D8.0R0.2	8.0	0.2	8	20	75	4	Picture 2	○
PMX-4RBL-D8.0R0.3	8.0	0.3	8	20	75	4	Picture 2	○
PMX-4RBL-D8.0R0.5	8.0	0.5	8	20	75	4	Picture 2	○
PMX-4RBL-D8.0R1.0	8.0	1.0	8	20	75	4	Picture 2	○
PMX-4RBX-D8.0R0.2	8.0	0.2	8	20	100	4	Picture 2	○
PMX-4RBX-D8.0R0.3	8.0	0.3	8	20	100	4	Picture 2	○
PMX-4RBX-D8.0R0.5	8.0	0.5	8	20	100	4	Picture 2	○
PMX-4RBX-D8.0R1.0	8.0	1.0	8	20	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~65HRC						
◎	◎	◎	◎	◎	○		◎				

Code key B294 | Graphics category and identification B295 | Cutting parameters B550 | Non-standard customization B652-B653

4-flute R end mills with long shank

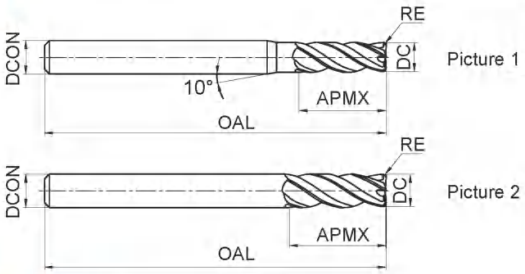

Radius shoulder


Profile


Radius corner slot

PMX-4RBL/X





- PMX-4R series with long shank.

38° 40° | Coated AlCrXN-Plus | DC: DC≤3 0~-0.012; 3<DC≤12 0~-0.015; DC>12 0~-0.02 | RE: RE<0.5 ±0.005; RE>0.5 ±0.008 | Shank diameter h5

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PMX-4RBL-D10.0R0.2	10.0	0.2	10	25	100	4	Picture 2	○
PMX-4RBL-D10.0R0.3	10.0	0.3	10	25	100	4	Picture 2	○
PMX-4RBL-D10.0R0.5	10.0	0.5	10	25	100	4	Picture 2	○
PMX-4RBL-D10.0R1.0	10.0	1.0	10	25	100	4	Picture 2	○
PMX-4RBL-D10.0R1.5	10.0	1.5	10	25	100	4	Picture 2	○
PMX-4RBL-D10.0R2.0	10.0	2.0	10	25	100	4	Picture 2	○
PMX-4RBX-D10.0R0.2	10.0	0.2	10	25	150	4	Picture 2	○
PMX-4RBX-D10.0R0.3	10.0	0.3	10	25	150	4	Picture 2	○
PMX-4RBX-D10.0R0.5	10.0	0.5	10	25	150	4	Picture 2	○
PMX-4RBX-D10.0R1.0	10.0	1.0	10	25	150	4	Picture 2	○
PMX-4RBX-D10.0R1.5	10.0	1.5	10	25	150	4	Picture 2	○
PMX-4RBX-D10.0R2.0	10.0	2.0	10	25	150	4	Picture 2	○
PMX-4RBL-D12.0R0.3	12.0	0.3	12	30	100	4	Picture 2	○
PMX-4RBL-D12.0R0.5	12.0	0.5	12	30	100	4	Picture 2	○
PMX-4RBL-D12.0R1.0	12.0	1.0	12	30	100	4	Picture 2	○
PMX-4RBL-D12.0R1.5	12.0	1.5	12	30	100	4	Picture 2	○
PMX-4RBL-D12.0R2.0	12.0	2.0	12	30	100	4	Picture 2	○
PMX-4RBL-D12.0R3.0	12.0	3.0	12	30	100	4	Picture 2	○
PMX-4RBX-D12.0R0.3	12.0	0.3	12	30	150	4	Picture 2	○
PMX-4RBX-D12.0R0.5	12.0	0.5	12	30	150	4	Picture 2	○
PMX-4RBX-D12.0R1.0	12.0	1.0	12	30	150	4	Picture 2	○
PMX-4RBX-D12.0R1.5	12.0	1.5	12	30	150	4	Picture 2	○
PMX-4RBX-D12.0R2.0	12.0	2.0	12	30	150	4	Picture 2	○
PMX-4RBX-D12.0R3.0	12.0	3.0	12	30	150	4	Picture 2	○
PMX-4RBL-D16.0R0.5	16.0	0.5	16	45	150	4	Picture 2	○
PMX-4RBL-D16.0R1.0	16.0	1.0	16	45	150	4	Picture 2	○
PMX-4RBL-D16.0R2.0	16.0	2.0	16	45	150	4	Picture 2	○
PMX-4RBL-D16.0R3.0	16.0	3.0	16	45	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~65HRC						
◎	◎	◎	◎	◎	○		◎				

Code key B294
Graphics category and identification B295
Cutting parameters B550
Non-standard customization B652-B653

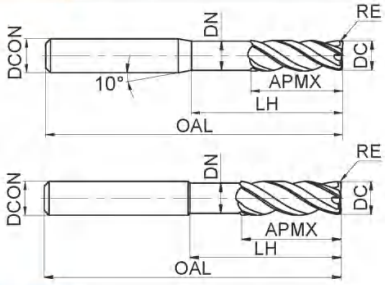
4-flute R end mills with straight shank, long neck and short cutting edge

Radius shoulder Profile Radius corner slot

PMX-4RFP



- It's suitable for high-efficiency machining on mould steel, pre-hardened steel and carbon steel.
- Unequal Teeth pitch and unequal helical angle structure has good performance on vibration resistance.
- High rigidity short flute design, it's more suitable for high efficiency machining.



Picture 1 Picture 2

38° 40° Coated AlCrXN-Plus DC DC≤3 0~-0.012 3<DC≤12 0~-0.015 DC>12 0~-0.02 RE RE<0.5 ±0.005 RE≥0.5 ±0.008 Shank diameter h5

Type	Basic dimension(mm)							Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	LH	DN	OAL			
PMX-4RFP-D3.0R0.2S	3.0	0.2	4	3	9	2.8	75	4	Picture 1	○
PMX-4RFP-D3.0R0.3S	3.0	0.3	4	3	9	2.8	75	4	Picture 1	○
PMX-4RFP-D4.0R0.2S	4.0	0.2	4	4	12	3.8	75	4	Picture 2	○
PMX-4RFP-D4.0R0.3S	4.0	0.3	4	4	12	3.8	75	4	Picture 2	○
PMX-4RFP-D4.0R0.5S	4.0	0.5	4	4	12	3.8	75	4	Picture 2	○
PMX-4RFP-D3.0R0.2	3.0	0.2	6	3	9	2.8	75	4	Picture 1	○
PMX-4RFP-D3.0R0.3	3.0	0.3	6	3	9	2.8	75	4	Picture 1	○
PMX-4RFP-D4.0R0.2	4.0	0.2	6	4	12	3.8	75	4	Picture 1	○
PMX-4RFP-D4.0R0.3	4.0	0.3	6	4	12	3.8	75	4	Picture 1	○
PMX-4RFP-D4.0R0.5	4.0	0.5	6	4	12	3.8	75	4	Picture 1	○
PMX-4RFP-D6.0R0.3	6.0	0.3	6	6	18	5.8	75	4	Picture 2	○
PMX-4RFP-D6.0R0.5	6.0	0.5	6	6	18	5.8	75	4	Picture 2	○
PMX-4RFP-D6.0R1.0	6.0	1.0	6	6	18	5.8	75	4	Picture 2	○
PMX-4RFP-D8.0R0.3	8.0	0.3	8	8	24	7.8	75	4	Picture 2	○
PMX-4RFP-D8.0R0.5	8.0	0.5	8	8	24	7.8	75	4	Picture 2	○
PMX-4RFP-D8.0R1.0	8.0	1.0	8	8	24	7.8	75	4	Picture 2	○
PMX-4RFP-D10.0R0.3	10.0	0.3	10	10	30	9.5	100	4	Picture 2	○
PMX-4RFP-D10.0R0.5	10.0	0.5	10	10	30	9.5	100	4	Picture 2	○
PMX-4RFP-D10.0R1.0	10.0	1.0	10	10	30	9.5	100	4	Picture 2	○
PMX-4RFP-D10.0R1.5	10.0	1.5	10	10	30	9.5	100	4	Picture 2	○
PMX-4RFP-D10.0R2.0	10.0	2.0	10	10	30	9.5	100	4	Picture 2	○
PMX-4RFP-D12.0R0.3	12.0	0.3	12	12	36	11.5	100	4	Picture 2	○
PMX-4RFP-D12.0R0.5	12.0	0.5	12	12	36	11.5	100	4	Picture 2	○
PMX-4RFP-D12.0R1.0	12.0	1.0	12	12	36	11.5	100	4	Picture 2	○
PMX-4RFP-D12.0R1.5	12.0	1.5	12	12	36	11.5	100	4	Picture 2	○
PMX-4RFP-D12.0R2.0	12.0	2.0	12	12	36	11.5	100	4	Picture 2	○
PMX-4RFP-D16.0R1.0	16.0	1.0	16	16	40	15.5	150	4	Picture 2	○
PMX-4RFP-D16.0R2.0	16.0	2.0	16	16	40	15.5	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~65HRC						
◎	◎	◎	◎	◎	○		◎				

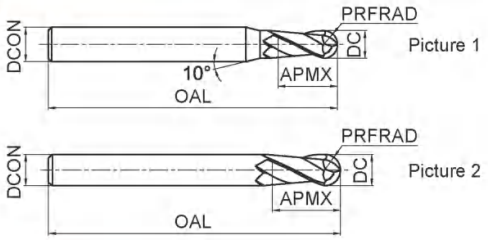
Code key B294 Graphics category and identification B295 Cutting parameters B550 Non-standard customization B652-B653

2-flute ball nose end mills with straight shank

Profile | Cavity | Ball nose slot

PMX-2B





- It's suitable for profiling on mould steel, pre-hardened steel and carbon steel.
- Wide application.

30° | Coated AlCrXN-Plus | DC: DC≤3 0~-0.012; 3<DC≤12 0~-0.015; DC>12 0~-0.02 | PRFRAD: PRFRAD≤3 ±0.005; PRFRAD>3 ±0.008 | Shank diameter h5

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
PMX-2B-R1.0F	2.0	1.0	3	4	50	2	Picture 1	●
PMX-2B-R1.25F	2.5	1.25	3	5	50	2	Picture 1	●
PMX-2B-R1.5F	3.0	1.5	3	6	50	2	Picture 2	●
PMX-2B-R0.5S	1.0	0.5	4	2	50	2	Picture 1	●
PMX-2B-R0.75S	1.5	0.75	4	3	50	2	Picture 1	●
PMX-2B-R1.0S	2.0	1.0	4	4	50	2	Picture 1	●
PMX-2B-R1.25S	2.5	1.25	4	5	50	2	Picture 1	●
PMX-2B-R1.5S	3.0	1.5	4	6	50	2	Picture 1	●
PMX-2B-R1.75S	3.5	1.75	4	8	50	2	Picture 1	●
PMX-2B-R2.0S	4.0	2.0	4	8	50	2	Picture 2	●
PMX-2B-R0.5	1.0	0.5	6	2	50	2	Picture 1	●
PMX-2B-R0.75	1.5	0.75	6	3	50	2	Picture 1	●
PMX-2B-R1.0	2.0	1.0	6	4	50	2	Picture 1	●
PMX-2B-R1.25	2.5	1.25	6	5	50	2	Picture 1	●
PMX-2B-R1.5	3.0	1.5	6	6	50	2	Picture 1	●
PMX-2B-R1.75	3.5	1.75	6	8	50	2	Picture 1	●
PMX-2B-R2.0	4.0	2.0	6	8	50	2	Picture 1	●
PMX-2B-R2.5	5.0	2.5	6	10	50	2	Picture 1	●
PMX-2B-R2.75	5.5	2.75	6	12	50	2	Picture 1	●
PMX-2B-R3.0	6.0	3.0	6	12	50	2	Picture 2	●
PMX-2B-R3.5	7.0	3.5	8	14	60	2	Picture 1	●
PMX-2B-R4.0	8.0	4.0	8	16	60	2	Picture 2	●
PMX-2B-R4.5	9.0	4.5	10	18	75	2	Picture 1	●
PMX-2B-R5.0	10.0	5.0	10	20	75	2	Picture 2	●
PMX-2B-R6.0	12.0	6.0	12	24	75	2	Picture 2	●
PMX-2B-R7.0	14.0	7.0	14	28	75	2	Picture 2	●
PMX-2B-R8.0	16.0	8.0	16	32	100	2	Picture 2	●
PMX-2B-R10.0	20.0	10.0	20	40	100	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~65HRC						
◎	◎	◎	◎	◎	○		◎				

Code key B294 | Graphics category and identification B295 | Cutting parameters B551 | Non-standard customization B652-B653

2-flute ball nose end mills with long shank

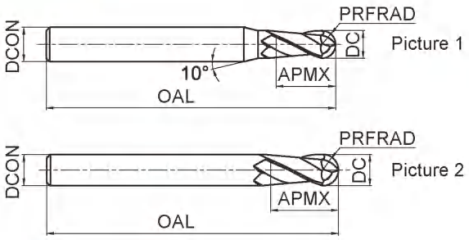

Profile


Cavity

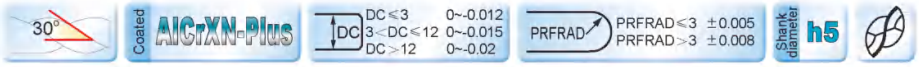

Ball nose slot

PMX-2BL/M/X





● PMX-2B series with long shank.



Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
PMX-2BL-R1.0S	2.0	1.0	4	4	75	2	Picture 1	○
PMX-2BL-R1.25S	2.5	1.25	4	5	75	2	Picture 1	○
PMX-2BL-R1.5S	3.0	1.5	4	6	75	2	Picture 1	○
PMX-2BL-R1.75S	3.5	1.75	4	8	75	2	Picture 1	○
PMX-2BL-R2.0S	4.0	2.0	4	8	75	2	Picture 2	○
PMX-2BL-R1.0	2.0	1.0	6	4	75	2	Picture 1	○
PMX-2BL-R1.25	2.5	1.25	6	5	75	2	Picture 1	○
PMX-2BL-R1.5	3.0	1.5	6	6	75	2	Picture 1	○
PMX-2BL-R1.75	3.5	1.75	6	8	75	2	Picture 1	○
PMX-2BL-R2.0	4.0	2.0	6	8	75	2	Picture 2	○
PMX-2BL-R2.5	5.0	2.5	6	10	75	2	Picture 1	○
PMX-2BL-R2.75	5.5	2.75	6	12	75	2	Picture 1	○
PMX-2BL-R3.0	6.0	3.0	6	12	75	2	Picture 2	○
PMX-2BX-R3.0	6.0	3.0	6	12	100	2	Picture 2	○
PMX-2BL-R3.5	7.0	3.5	8	14	75	2	Picture 1	○
PMX-2BM-R4.0	8.0	4.0	8	16	75	2	Picture 2	○
PMX-2BL-R4.0	8.0	4.0	8	16	100	2	Picture 2	○
PMX-2BL-R4.5	9.0	4.5	10	20	100	2	Picture 1	○
PMX-2BL-R5.0	10.0	5.0	10	20	100	2	Picture 2	○
PMX-2BX-R5.0	10.0	5.0	10	20	150	2	Picture 2	○
PMX-2BL-R6.0	12.0	6	12	24	100	2	Picture 2	○
PMX-2BX-R6.0	12.0	6.0	12	24	150	2	Picture 2	○
PMX-2BL-R7.0	14.0	7.0	14	28	100	2	Picture 2	○
PMX-2BL-R8.0	16.0	8.0	16	32	150	2	Picture 2	○
PMX-2BL-R10.0	20.0	10.0	20	40	150	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~65HRC						
◎	◎	◎	◎	◎	○		◎				

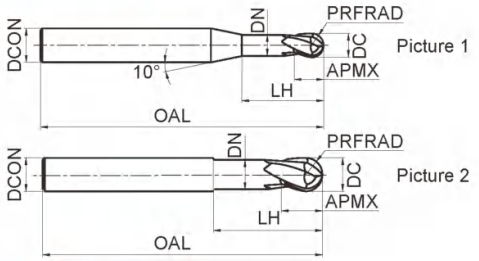
Code key B294
Graphics category and identification B295
Cutting parameters B551
Non-standard customization B652-B653

2-flute ball nose end mills with long neck and short cutting edge

Profile Cavity Ball nose slot

PMX-2BFP





- High rigidity short flute design, it's suitable for heavy machining.

30° Coated AlCrXN-Plus DC DC≤3 0~-0.012 3<DC≤12 0~-0.015 DC>12 0~-0.02 PRFRAD PRFRAD≤3 ±0.005 PRFRAD>3 ±0.008 Shank diameter h5

Type	Basic dimension(mm)							Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	LH	DN	OAL			
PMX-2BFP-R0.5	1.0	0.5	6	1	2.5	0.95	75	2	Picture 1	○
PMX-2BFP-R0.75	1.5	0.75	6	1.5	3	1.45	75	2	Picture 1	○
PMX-2BFP-R1.0	2.0	1.0	6	2	4	1.95	75	2	Picture 1	○
PMX-2BFP-R1.5	3.0	1.5	6	3	6	2.85	75	2	Picture 1	○
PMX-2BFP-R2.0	4.0	2.0	6	4	8	3.85	75	2	Picture 1	○
PMX-2BFP-R2.5	5.0	2.5	6	5	10	4.85	75	2	Picture 1	○
PMX-2BFP-R3.0	6.0	3.0	6	6	12	5.8	75	2	Picture 2	○
PMX-2BFP-R4.0	8.0	4.0	8	8	16	7.8	100	2	Picture 2	○
PMX-2BFP-R5.0	10.0	5.0	10	10	20	9.6	100	2	Picture 2	○
PMX-2BFP-R6.0	12.0	6.0	12	12	24	11.5	100	2	Picture 2	○
PMX-2BFP-R8.0	16.0	8.0	16	16	32	15.5	150	2	Picture 2	○
PMX-2BFP-R10.0	20.0	10.0	20	20	40	19.5	150	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~65HRC						
◎	◎	◎	◎	◎	○		◎				

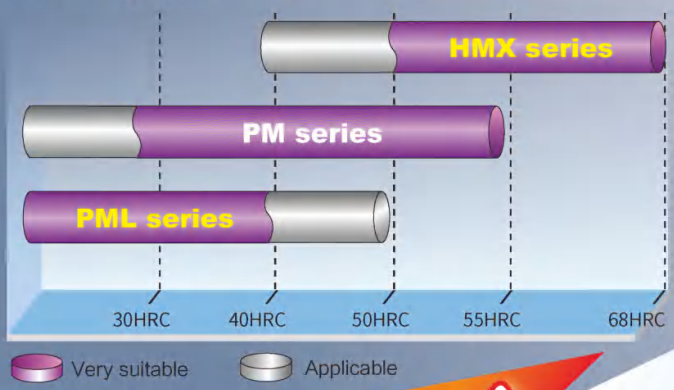
Code key B294 Graphics category and identification B295 Cutting parameters B551 Non-standard customization B652-B653

High performance universal machining

PML series

Applicable of high efficiency machining in a variety of materials under HRC50, while significantly promoting machinability of soft materials such as carbon steel, low carbon alloy steel under HRC40!

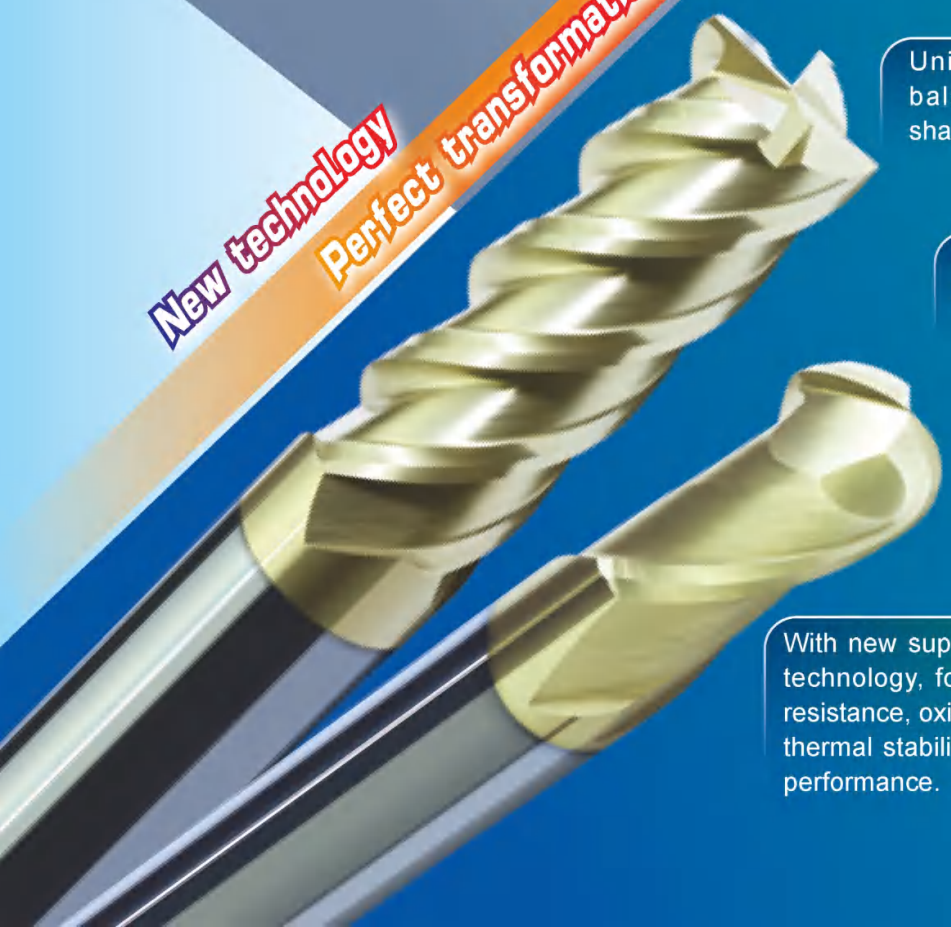
PML, **PM**, **HMX** high performance solid carbide end mills series
Recommendation for steel materials machining application



Application range:

Applicable for high-efficiency machining in a variety of materials under HRC50, e.g., non-ferrous alloy, steel, pre-hardened steel, stainless steel, especially suitable for soft materials such as carbon steel, low carbon alloy steel under HRC40. With excellent cutting performance in both dry and wet cutting conditions.

New technology
Perfect transformation

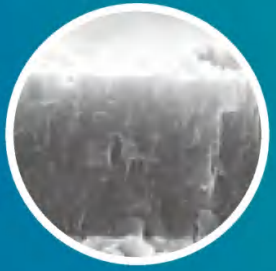


Unique cutting edge design, balancing edge strength and sharpness, with low cutting force.

Light yellow coating allows for better wear observation.

Advanced coating after-treatment technology, for closer combination with substrate, lower friction and superior surface quality.

With new superlattice coatings technology, for excellent wear resistance, oxidation resistance, thermal stability and lubrication performance.



2-flute flattened end mills with straight shank

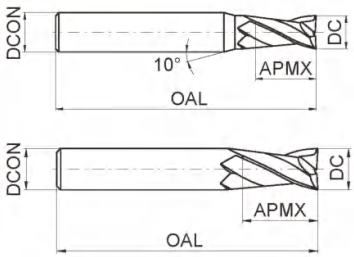


PML-2E



- Very suitable for slot milling.
- Wide application.





Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-2E-D1.0S	1.0	4	3	50	2	Picture 1	●
PML-2E-D1.0	1.0	6	3	50	2	Picture 1	●
PML-2E-D1.5S	1.5	4	4	50	2	Picture 1	●
PML-2E-D1.5	1.5	6	4	50	2	Picture 1	●
PML-2E-D2.0S	2.0	4	6	50	2	Picture 1	●
PML-2E-D2.0	2.0	6	6	50	2	Picture 1	●
PML-2E-D2.5S	2.5	4	8	50	2	Picture 1	●
PML-2E-D2.5	2.5	6	8	50	2	Picture 1	●
PML-2E-D3.0S	3.0	4	8	50	2	Picture 1	●
PML-2E-D3.0	3.0	6	8	50	2	Picture 1	●
PML-2E-D3.5	3.5	6	10	50	2	Picture 1	●
PML-2E-D4.0S	4.0	4	11	50	2	Picture 2	●
PML-2E-D4.0	4.0	6	11	50	2	Picture 1	●
PML-2E-D4.5	4.5	6	11	50	2	Picture 1	●
PML-2E-D5.0	5.0	6	13	50	2	Picture 1	●
PML-2E-D5.5	5.5	6	16	50	2	Picture 1	●
PML-2E-D6.0	6.0	6	16	50	2	Picture 2	●
PML-2E-D7.0	7.0	8	20	60	2	Picture 1	●
PML-2E-D8.0	8.0	8	20	60	2	Picture 2	●
PML-2E-D9.0	9.0	10	22	75	2	Picture 1	●
PML-2E-D10.0	10.0	10	25	75	2	Picture 2	●
PML-2E-D11.0	11.0	12	26	75	2	Picture 1	●
PML-2E-D12.0	12.0	12	30	75	2	Picture 2	●
PML-2E-D14.0	14.0	14	32	75	2	Picture 2	●
PML-2E-D16.0	16.0	16	45	100	2	Picture 2	●
PML-2E-D18.0	18.0	18	45	100	2	Picture 2	●
PML-2E-D20.0	20.0	20	45	100	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B552
Non-standard customization B652-B653

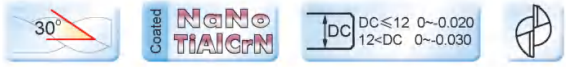
2-flute flattened end mills with straight shank

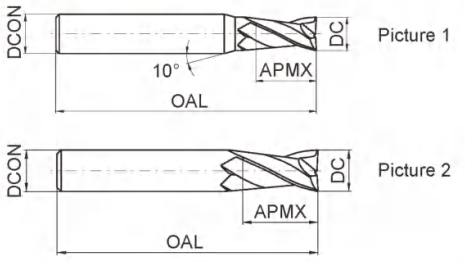


PML-2F



- Very suitable for slot milling.
- Wide application.





Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-2F-D1.0S	1.0	4	3	50	2	Picture 1	○
PML-2F-D1.0	1.0	6	3	50	2	Picture 1	○
PML-2F-D1.5S	1.5	4	4	50	2	Picture 1	○
PML-2F-D1.5	1.5	6	4	50	2	Picture 1	○
PML-2F-D2.0S	2.0	4	6	50	2	Picture 1	○
PML-2F-D2.0	2.0	6	6	50	2	Picture 1	○
PML-2F-D2.5S	2.5	4	8	50	2	Picture 1	○
PML-2F-D2.5	2.5	6	8	50	2	Picture 1	○
PML-2F-D3.0S	3.0	4	8	50	2	Picture 1	○
PML-2F-D3.0	3.0	6	8	50	2	Picture 1	○
PML-2F-D3.5	3.5	6	10	50	2	Picture 1	○
PML-2F-D4.0S	4.0	4	11	50	2	Picture 2	○
PML-2F-D4.0	4.0	6	11	50	2	Picture 1	○
PML-2F-D4.5	4.5	6	11	50	2	Picture 1	○
PML-2F-D5.0	5.0	6	13	50	2	Picture 1	○
PML-2F-D5.5	5.5	6	16	50	2	Picture 1	○
PML-2F-D6.0	6.0	6	16	50	2	Picture 2	○
PML-2F-D7.0	7.0	8	20	60	2	Picture 1	○
PML-2F-D8.0	8.0	8	20	60	2	Picture 2	○
PML-2F-D9.0	9.0	10	22	75	2	Picture 1	○
PML-2F-D10.0	10.0	10	25	75	2	Picture 2	○
PML-2F-D11.0	11.0	12	26	75	2	Picture 1	○
PML-2F-D12.0	12.0	12	30	75	2	Picture 2	○
PML-2F-D14.0	14.0	14	32	75	2	Picture 2	○
PML-2F-D16.0	16.0	16	45	100	2	Picture 2	○
PML-2F-D18.0	18.0	18	45	100	2	Picture 2	○
PML-2F-D20.0	20.0	20	45	100	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

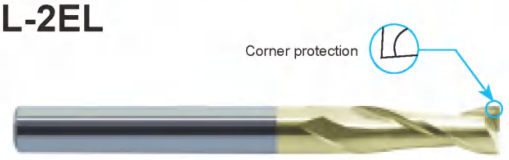
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

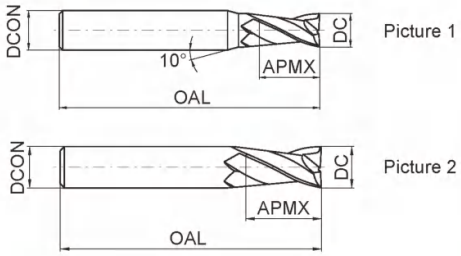
Code key B294
Graphics category and identification B295
Cutting parameters B553
Non-standard customization B652-B653

2-flute flattened end mills with straight shank and long cutting edge



PML-2EL







Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-2EL-D3.0	3.0	6	12	75	2	Picture 1	○
PML-2EL-D4.0	4.0	6	15	75	2	Picture 1	○
PML-2EL-D5.0	5.0	6	20	75	2	Picture 1	○
PML-2EL-D6.0	6.0	6	20	75	2	Picture 2	○
PML-2EL-D8.0	8.0	8	25	100	2	Picture 2	○
PML-2EL-D10.0	10.0	10	30	100	2	Picture 2	○
PML-2EL-D12.0	12.0	12	35	100	2	Picture 2	○
PML-2EL-D14.0	14.0	14	40	100	2	Picture 2	○
PML-2EL-D16.0	16.0	16	50	150	2	Picture 2	○
PML-2EL-D20.0	20.0	20	55	150	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

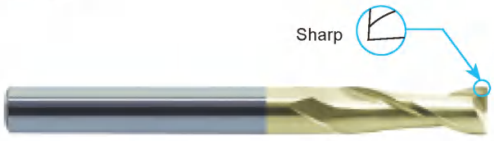
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B552
Non-standard customization B652-B653

2-flute flattened end mills with straight shank and long cutting edge

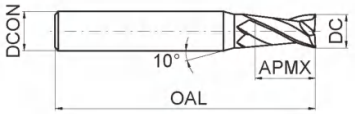


PML-2FL

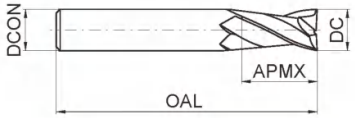


● PML-2F series with long cutting edge.





Picture 1



Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-2FL-D3.0	3.0	6	12	75	2	Picture 1	○
PML-2FL-D4.0	4.0	6	15	75	2	Picture 1	○
PML-2FL-D5.0	5.0	6	20	75	2	Picture 1	○
PML-2FL-D6.0	6.0	6	20	75	2	Picture 2	○
PML-2FL-D8.0	8.0	8	25	100	2	Picture 2	○
PML-2FL-D10.0	10.0	10	30	100	2	Picture 2	○
PML-2FL-D12.0	12.0	12	35	100	2	Picture 2	○
PML-2FL-D14.0	14.0	14	40	100	2	Picture 2	○
PML-2FL-D16.0	16.0	16	50	150	2	Picture 2	○
PML-2FL-D20.0	20.0	20	55	150	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

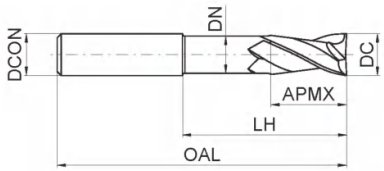
Code key B294
Graphics category and identification B295
Cutting parameters B553
Non-standard customization B652-B653

2-flute flattened end mills with straight shank, long neck and short cutting edge



PML-2EFP





● High-rigidity short cutting edge, suitable for heavy cutting and also deep cavity milling.



Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	DCON	APMX	LH	DN	OAL		
PML-2EFP-D6.0	6.0	6	9	30	5.8	75	2	○
PML-2EFP-D8.0	8.0	8	12	40	7.8	100	2	○
PML-2EFP-D10.0	10.0	10	15	50	9.6	100	2	○
PML-2EFP-D12.0	12.0	12	18	50	11.5	100	2	○
PML-2EFP-D16.0	16.0	16	24	50	15.5	150	2	○
PML-2EFP-D20.0	20.0	20	30	60	19.5	150	2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B554
Non-standard customization B652-B653

3-flute flattened end mills with straight shank

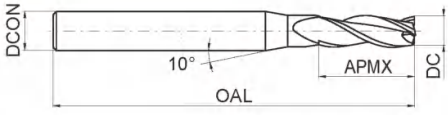

Side face


Step shoulder

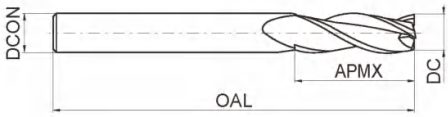

Straight slot

PML-3E-H





Picture 1

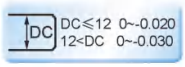


Picture 2

● Especially suitable for slot milling. ● Wide application.









Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-3E-D3.0S-H	3.0	4	8	50	3	Picture 1	○
PML-3E-D3.0-H	3.0	6	8	50	3	Picture 1	○
PML-3E-D3.5-H	3.5	6	10	50	3	Picture 1	○
PML-3E-D4.0S-H	4.0	4	11	50	3	Picture 2	○
PML-3E-D4.0-H	4.0	6	11	50	3	Picture 1	○
PML-3E-D4.5-H	4.5	6	11	50	3	Picture 1	○
PML-3E-D5.0-H	5.0	6	13	50	3	Picture 1	○
PML-3E-D5.5-H	5.5	6	16	50	3	Picture 1	○
PML-3E-D6.0-H	6.0	6	16	50	3	Picture 2	○
PML-3E-D7.0-H	7.0	8	20	60	3	Picture 1	○
PML-3E-D8.0-H	8.0	8	20	60	3	Picture 2	○
PML-3E-D9.0-H	9.0	10	22	75	3	Picture 1	○
PML-3E-D10.0-H	10.0	10	25	75	3	Picture 2	○
PML-3E-D11.0-H	11.0	12	26	75	3	Picture 1	○
PML-3E-D12.0-H	12.0	12	30	75	3	Picture 2	○
PML-3E-D14.0-H	14.0	14	32	75	3	Picture 2	○
PML-3E-D16.0-H	16.0	16	45	100	3	Picture 2	○
PML-3E-D18.0-H	18.0	18	45	100	3	Picture 2	○
PML-3E-D20.0-H	20.0	20	45	100	3	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

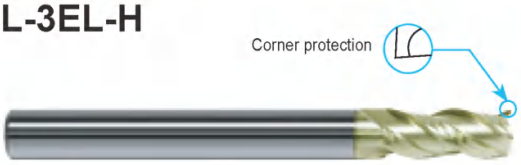
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294 Graphics category and identification B295 Cutting parameters B555 Non-standard customization B652-B653

3-flute flattened end mills with straight shank and long cutting edge

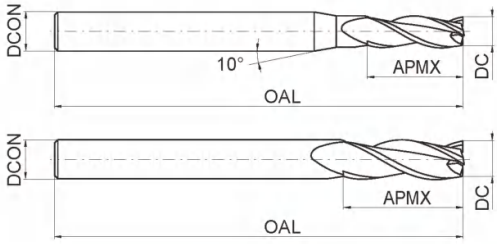


PML-3EL-H



● PML-3E-H series with long shank.





Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-3EL-D3.0-H	3.0	6	12	75	3	Picture 1	○
PML-3EL-D4.0-H	4.0	6	15	75	3	Picture 1	○
PML-3EL-D5.0-H	5.0	6	20	75	3	Picture 1	○
PML-3EL-D6.0-H	6.0	6	20	75	3	Picture 2	○
PML-3EL-D8.0-H	8.0	8	25	100	3	Picture 2	○
PML-3EL-D10.0-H	10.0	10	30	100	3	Picture 2	○
PML-3EL-D12.0-H	12.0	12	35	100	3	Picture 2	○
PML-3EL-D14.0-H	14.0	14	40	100	3	Picture 2	○
PML-3EL-D16.0-H	16.0	16	50	150	3	Picture 2	○
PML-3EL-D20.0-H	20.0	20	55	150	3	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

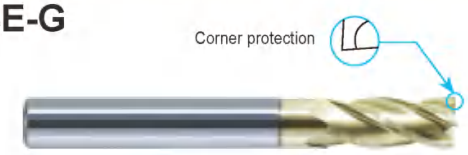
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

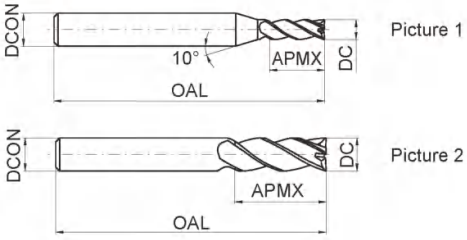
Code key B294
Graphics category and identification B295
Cutting parameters B555
Non-standard customization B652-B653

4-flute flattened end mills with straight shank



PML-4E-G





● Very suitable for side milling. ● Wide application.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-4E-D1.0S-G	1.0	4	3	50	4	Picture 1	●
PML-4E-D1.0-G	1.0	6	3	50	4	Picture 1	●
PML-4E-D1.5S-G	1.5	4	4	50	4	Picture 1	●
PML-4E-D1.5-G	1.5	6	4	50	4	Picture 1	●
PML-4E-D2.0S-G	2.0	4	6	50	4	Picture 1	●
PML-4E-D2.0-G	2.0	6	6	50	4	Picture 1	●
PML-4E-D2.5S-G	2.5	4	8	50	4	Picture 1	●
PML-4E-D2.5-G	2.5	6	8	50	4	Picture 1	●
PML-4E-D3.0S-G	3.0	4	8	50	4	Picture 1	●
PML-4E-D3.0-G	3.0	6	8	50	4	Picture 1	●
PML-4E-D3.5-G	3.5	6	10	50	4	Picture 1	●
PML-4E-D4.0S-G	4.0	4	11	50	4	Picture 2	●
PML-4E-D4.0-G	4.0	6	11	50	4	Picture 1	●
PML-4E-D4.5-G	4.5	6	11	50	4	Picture 1	●
PML-4E-D5.0-G	5.0	6	13	50	4	Picture 1	●
PML-4E-D5.5-G	5.5	6	16	50	4	Picture 1	●
PML-4E-D6.0-G	6.0	6	16	50	4	Picture 2	●
PML-4E-D7.0-G	7.0	8	20	60	4	Picture 1	●
PML-4E-D8.0-G	8.0	8	20	60	4	Picture 2	●
PML-4E-D9.0-G	9.0	10	22	75	4	Picture 1	●
PML-4E-D10.0-G	10.0	10	25	75	4	Picture 2	●
PML-4E-D11.0-G	11.0	12	26	75	4	Picture 1	●
PML-4E-D12.0-G	12.0	12	30	75	4	Picture 2	●
PML-4E-D14.0-G	14.0	14	32	75	4	Picture 2	●
PML-4E-D16.0-G	16.0	16	45	100	4	Picture 2	●
PML-4E-D18.0-G	18.0	18	45	100	4	Picture 2	●
PML-4E-D20.0-G	20.0	20	45	100	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B556-B557
Non-standard customization B652-B653

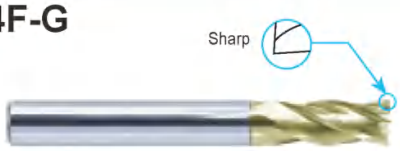
4-flute flattened end mills with straight shank

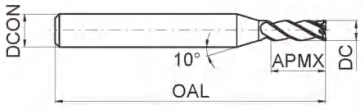

Side face


Step shoulder

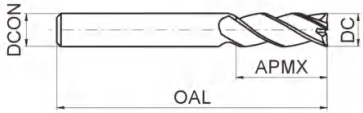

Straight slot

PML-4F-G





Picture 1

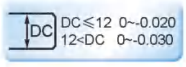


Picture 2

● Very suitable for side milling. ● Wide application.









Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-4F-D1.0S-G	1.0	4	3	50	4	Picture 1	○
PML-4F-D1.0-G	1.0	6	3	50	4	Picture 1	○
PML-4F-D1.5S-G	1.5	4	4	50	4	Picture 1	○
PML-4F-D1.5-G	1.5	6	4	50	4	Picture 1	○
PML-4F-D2.0S-G	2.0	4	6	50	4	Picture 1	○
PML-4F-D2.0-G	2.0	6	6	50	4	Picture 1	○
PML-4F-D2.5S-G	2.5	4	8	50	4	Picture 1	○
PML-4F-D2.5-G	2.5	6	8	50	4	Picture 1	○
PML-4F-D3.0S-G	3.0	4	8	50	4	Picture 1	○
PML-4F-D3.0-G	3.0	6	8	50	4	Picture 1	○
PML-4F-D3.5-G	3.5	6	10	50	4	Picture 1	○
PML-4F-D4.0S-G	4.0	4	11	50	4	Picture 2	○
PML-4F-D4.0-G	4.0	6	11	50	4	Picture 1	○
PML-4F-D4.5-G	4.5	6	11	50	4	Picture 1	○
PML-4F-D5.0-G	5.0	6	13	50	4	Picture 1	○
PML-4F-D5.5-G	5.5	6	16	50	4	Picture 1	○
PML-4F-D6.0-G	6.0	6	16	50	4	Picture 2	○
PML-4F-D7.0-G	7.0	8	20	60	4	Picture 1	○
PML-4F-D8.0-G	8.0	8	20	60	4	Picture 2	○
PML-4F-D9.0-G	9.0	10	22	75	4	Picture 1	○
PML-4F-D10.0-G	10.0	10	25	75	4	Picture 2	○
PML-4F-D11.0-G	11.0	12	26	75	4	Picture 1	○
PML-4F-D12.0-G	12.0	12	30	75	4	Picture 2	○
PML-4F-D14.0-G	14.0	14	32	75	4	Picture 2	○
PML-4F-D16.0-G	16.0	16	45	100	4	Picture 2	○
PML-4F-D18.0-G	18.0	18	45	100	4	Picture 2	○
PML-4F-D20.0-G	20.0	20	45	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

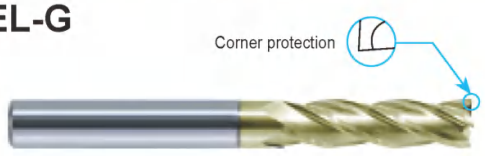
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

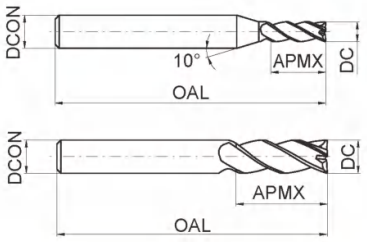
Code key B294
Graphics category and identification B295
Cutting parameters B558-B559
Non-standard customization B652-B653

4-flute flattened end mills with straight shank and long cutting edge



PML-4EL-G





● PML-4E-G series with long cutting edge.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-4EL-D3.0-G	3.0	6	12	75	4	Picture 1	○
PML-4EL-D4.0-G	4.0	6	15	75	4	Picture 1	○
PML-4EL-D5.0-G	5.0	6	20	75	4	Picture 1	○
PML-4EL-D6.0-G	6.0	6	20	75	4	Picture 2	○
PML-4EL-D8.0-G	8.0	8	25	100	4	Picture 2	○
PML-4EL-D10.0-G	10.0	10	30	100	4	Picture 2	○
PML-4EL-D12.0-G	12.0	12	35	100	4	Picture 2	○
PML-4EL-D14.0-G	14.0	14	40	100	4	Picture 2	○
PML-4EL-D16.0-G	16.0	16	50	150	4	Picture 2	○
PML-4EL-D20.0-G	20.0	20	55	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B556-B557
Non-standard customization B652-B653

4-flute flattened end mills with straight shank and long cutting edge

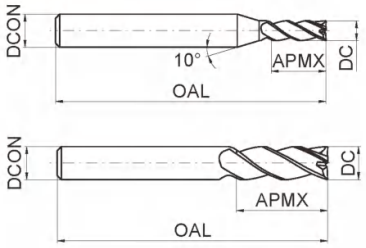


PML-4FL-G



● PML-4F-G series with long cutting edge.





Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-4FL-D3.0-G	3.0	6	12	75	4	Picture 1	○
PML-4FL-D4.0-G	4.0	6	15	75	4	Picture 1	○
PML-4FL-D5.0-G	5.0	6	20	75	4	Picture 1	○
PML-4FL-D6.0-G	6.0	6	20	75	4	Picture 2	○
PML-4FL-D8.0-G	8.0	8	25	100	4	Picture 2	○
PML-4FL-D10.0-G	10.0	10	30	100	4	Picture 2	○
PML-4FL-D12.0-G	12.0	12	35	100	4	Picture 2	○
PML-4FL-D14.0-G	14.0	14	40	100	4	Picture 2	○
PML-4FL-D16.0-G	16.0	16	50	150	4	Picture 2	○
PML-4FL-D20.0-G	20.0	20	55	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

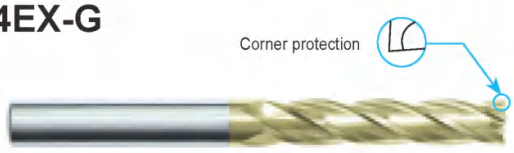
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

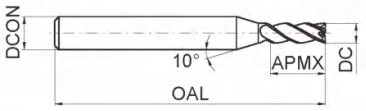
Code key B294
Graphics category and identification B295
Cutting parameters B558-B559
Non-standard customization B652-B653

4-flute flattened end mills with straight shank and extra long cutting edge

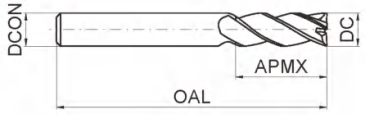


PML-4EX-G





Picture 1



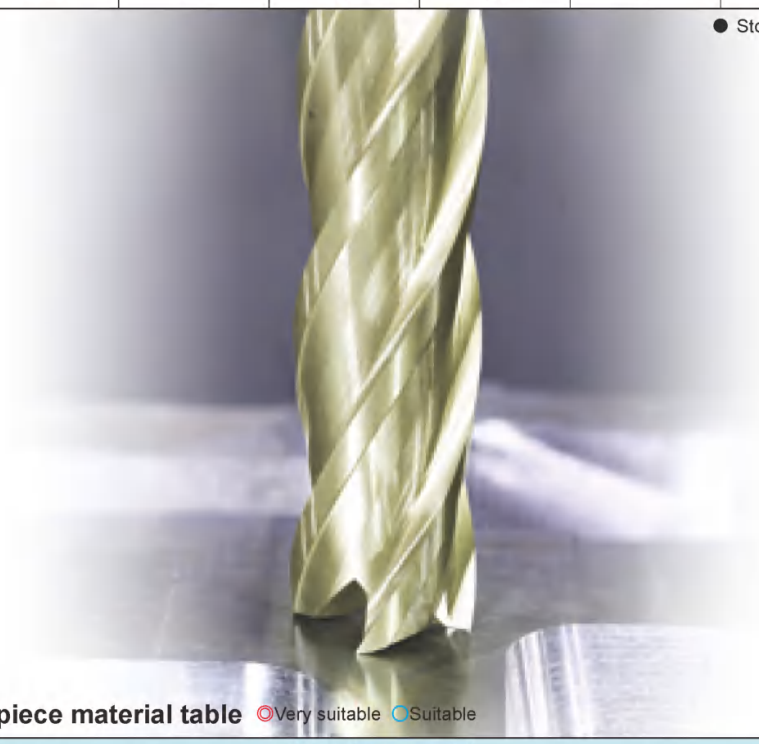
Picture 2

● Extra long cutting edge, for deep side wall machining.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-4EX-D3.0-G	3.0	6	20	75	4	Picture 1	○
PML-4EX-D4.0-G	4.0	6	25	75	4	Picture 1	○
PML-4EX-D5.0-G	5.0	6	30	75	4	Picture 1	○
PML-4EX-D6.0-G	6.0	6	30	75	4	Picture 2	○
PML-4EX-D8.0-G	8.0	8	40	100	4	Picture 2	○
PML-4EX-D10.0-G	10.0	10	50	110	4	Picture 2	○
PML-4EX-D12.0-G	12.0	12	50	110	4	Picture 2	○
PML-4EX-D16.0-G	16.0	16	70	150	4	Picture 2	○
PML-4EX-D20.0-G	20.0	20	75	150	4	Picture 2	○

● Stock available ○ Make-to-order



Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B560
Non-standard customization B652-B653

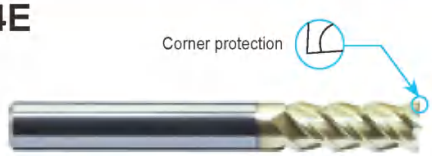

Side face

Step shoulder

Straight slot

4-flute flattened end mills with straight shank

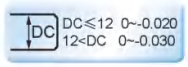
PML-4E



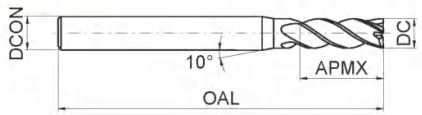
- Very suitable for side milling and shallow slot machining.
- Wide application.



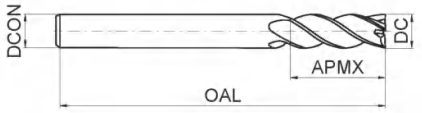








Picture 1



Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-4E-D1.0S	1.0	4	3	50	4	Picture 1	○
PML-4E-D1.0	1.0	6	3	50	4	Picture 1	○
PML-4E-D1.5S	1.5	4	4	50	4	Picture 1	○
PML-4E-D1.5	1.5	6	4	50	4	Picture 1	○
PML-4E-D2.0S	2.0	4	6	50	4	Picture 1	○
PML-4E-D2.0	2.0	6	6	50	4	Picture 1	○
PML-4E-D2.5S	2.5	4	8	50	4	Picture 1	○
PML-4E-D2.5	2.5	6	8	50	4	Picture 1	○
PML-4E-D3.0S	3.0	4	8	50	4	Picture 1	○
PML-4E-D3.0	3.0	6	8	50	4	Picture 1	○
PML-4E-D3.5	3.5	6	10	50	4	Picture 1	○
PML-4E-D4.0S	4.0	4	11	50	4	Picture 2	○
PML-4E-D4.0	4.0	6	11	50	4	Picture 1	○
PML-4E-D4.5	4.5	6	11	50	4	Picture 1	○
PML-4E-D5.0	5.0	6	13	50	4	Picture 1	○
PML-4E-D5.5	5.5	6	16	50	4	Picture 1	○
PML-4E-D6.0	6.0	6	16	50	4	Picture 2	○
PML-4E-D7.0	7.0	8	20	60	4	Picture 1	○
PML-4E-D8.0	8.0	8	20	60	4	Picture 2	○
PML-4E-D9.0	9.0	10	22	75	4	Picture 1	○
PML-4E-D10.0	10.0	10	25	75	4	Picture 2	○
PML-4E-D11.0	11.0	12	26	75	4	Picture 1	○
PML-4E-D12.0	12.0	12	30	75	4	Picture 2	○
PML-4E-D14.0	14.0	14	32	75	4	Picture 2	○
PML-4E-D16.0	16.0	16	45	100	4	Picture 2	○
PML-4E-D18.0	18.0	18	45	100	4	Picture 2	○
PML-4E-D20.0	20.0	20	45	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

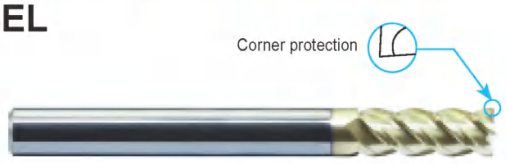
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

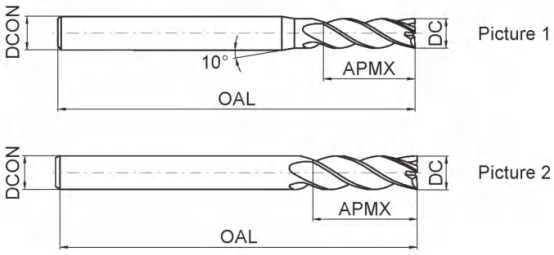
Code key B294 Graphics category and identification B295 Cutting parameters B561-B562 Non-standard customization B652-B653

4-flute flattened end mills with straight shank and long cutting edge



PML-4EL





● PML-4E series with long cutting edge.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-4EL-D3.0	3.0	6	12	75	4	Picture 1	○
PML-4EL-D4.0	4.0	6	15	75	4	Picture 1	○
PML-4EL-D5.0	5.0	6	20	75	4	Picture 1	○
PML-4EL-D6.0	6.0	6	20	75	4	Picture 2	○
PML-4EL-D8.0	8.0	8	25	100	4	Picture 2	○
PML-4EL-D10.0	10.0	10	30	100	4	Picture 2	○
PML-4EL-D12.0	12.0	12	35	100	4	Picture 2	○
PML-4EL-D14.0	14.0	14	40	100	4	Picture 2	○
PML-4EL-D16.0	16.0	16	50	150	4	Picture 2	○
PML-4EL-D20.0	20.0	20	55	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B561-B562
Non-standard customization B652-B653

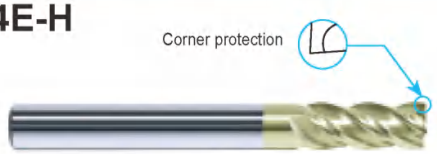
4-flute flattened end mills with straight shank

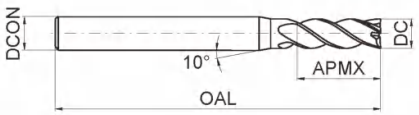

Side face


Step shoulder

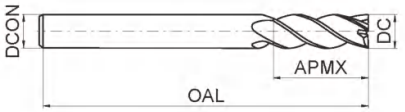

Straight slot

PML-4E-H





Picture 1

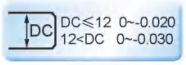


Picture 2

● Most suitable for slot milling. ● Wide application.









Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-4E-D3.0S-H	3.0	4	8	50	4	Picture 1	○
PML-4E-D3.0-H	3.0	6	8	50	4	Picture 1	○
PML-4E-D3.5-H	3.5	6	10	50	4	Picture 1	○
PML-4E-D4.0S-H	4.0	4	11	50	4	Picture 2	○
PML-4E-D4.0-H	4.0	6	11	50	4	Picture 1	○
PML-4E-D4.5-H	4.5	6	11	50	4	Picture 1	○
PML-4E-D5.0-H	5.0	6	13	50	4	Picture 1	○
PML-4E-D5.5-H	5.5	6	16	50	4	Picture 1	○
PML-4E-D6.0-H	6.0	6	16	50	4	Picture 2	○
PML-4E-D7.0-H	7.0	8	20	60	4	Picture 1	○
PML-4E-D8.0-H	8.0	8	20	60	4	Picture 2	○
PML-4E-D9.0-H	9.0	10	22	75	4	Picture 1	○
PML-4E-D10.0-H	10.0	10	25	75	4	Picture 2	○
PML-4E-D11.0-H	11.0	12	26	75	4	Picture 1	○
PML-4E-D12.0-H	12.0	12	30	75	4	Picture 2	○
PML-4E-D14.0-H	14.0	14	32	75	4	Picture 2	○
PML-4E-D16.0-H	16.0	16	45	100	4	Picture 2	○
PML-4E-D18.0-H	18.0	18	45	100	4	Picture 2	○
PML-4E-D20.0-H	20.0	20	45	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

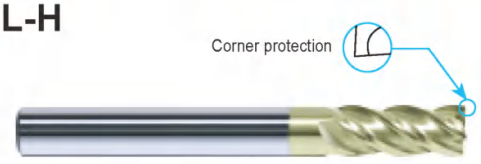
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

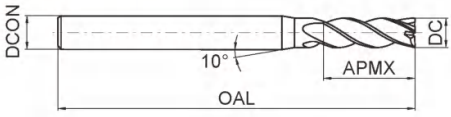
Code key B294 Graphics category and identification B295 Cutting parameters B556-B557 Non-standard customization B652-B653

4-flute flattened end mills with straight shank and long cutting edge

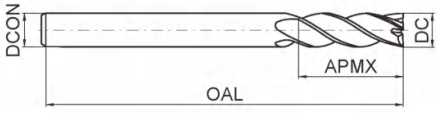


PML-4EL-H



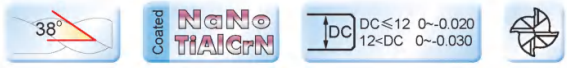


Picture 1



Picture 2

● PML-4E-H series with long shank.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PML-4EL-D3.0-H	3.0	6	12	75	4	Picture 1	○
PML-4EL-D4.0-H	4.0	6	15	75	4	Picture 1	○
PML-4EL-D5.0-H	5.0	6	20	75	4	Picture 1	○
PML-4EL-D6.0-H	6.0	6	20	75	4	Picture 2	○
PML-4EL-D8.0-H	8.0	8	25	100	4	Picture 2	○
PML-4EL-D10.0-H	10.0	10	30	100	4	Picture 2	○
PML-4EL-D12.0-H	12.0	12	35	100	4	Picture 2	○
PML-4EL-D14.0-H	14.0	14	40	100	4	Picture 2	○
PML-4EL-D16.0-H	16.0	16	50	150	4	Picture 2	○
PML-4EL-D20.0-H	20.0	20	55	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

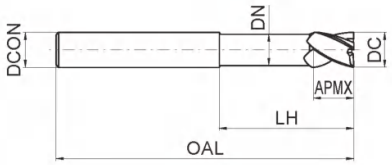
Code key B294
Graphics category and identification B295
Cutting parameters B556-B557
Non-standard customization B652-B653

4-flute flattened end mills with straight shank, long neck and short cutting edge



PML-4EFP





● High-rigidity short cutting edge, suitable for heavy cutting and also deep cavity milling.



Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	DCON	APMX	LH	DN	OAL		
PML-4EFP-D6.0	6.0	6	9	30	5.8	75	4	○
PML-4EFP-D8.0	8.0	8	12	40	7.8	100	4	○
PML-4EFP-D10.0	10.0	10	15	50	9.6	100	4	○
PML-4EFP-D12.0	12.0	12	18	50	11.5	100	4	○
PML-4EFP-D16.0	16.0	16	24	50	15.5	150	4	○
PML-4EFP-D20.0	20.0	20	30	60	19.5	150	4	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

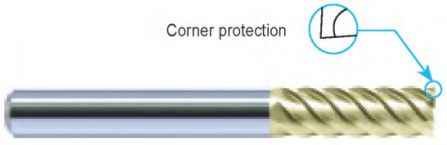
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

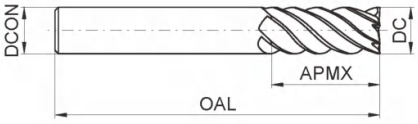
Code key B294
Graphics category and identification B295
Cutting parameters B563-B564
Non-standard customization B652-B653

6-flute flattened end mills with straight shank



PML-6E

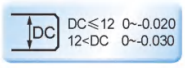




- Perfect rigidity, very suitable for side finish machining.
- High speed, high feed rate machining applicable.









Type	Basic dimension(mm)				Number of teeth Z	Stock
	DC	DCON	APMX	OAL		
PML-6E-D6.0	6.0	6	18	60	6	○
PML-6E-D8.0	8.0	8	20	60	6	○
PML-6E-D10.0	10.0	10	30	75	6	○
PML-6E-D12.0	12.0	12	32	75	6	○
PML-6E-D16.0	16.0	16	40	100	6	○
PML-6E-D20.0	20.0	20	45	100	6	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

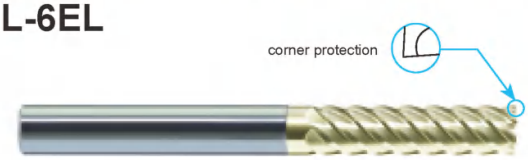
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

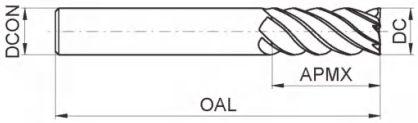
Code key B294
Graphics category and identification B295
Cutting parameters B565
Non-standard customization B652-B653

6-flute flattened end mills with straight shank and long cutting edge



PML-6EL





● PML-6E series with long cutting edge.



Type	Basic dimension(mm)				Number of teeth Z	Stock
	DC	DCON	APMX	OAL		
PML-6EL-D6.0	6.0	6	24	75	6	○
PML-6EL-D8.0	8.0	8	32	75	6	○
PML-6EL-D10.0	10.0	10	40	100	6	○
PML-6EL-D12.0	12.0	12	45	100	6	○
PML-6EL-D16.0	16.0	16	64	150	6	○
PML-6EL-D20.0	20.0	20	75	150	6	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B566
Non-standard customization B652-B653

2-flute ball nose end mills with straight shank


Profile

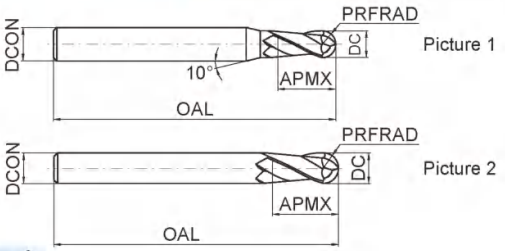

Cavity


Ball nose slot

PML-2B

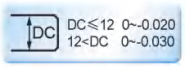


- For profile milling, high speed machining applicable.
- Wide application.













Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
PML-2B-R0.5S	1.0	0.5	4	2	50	2	Picture 1	●
PML-2B-R0.5	1.0	0.5	6	2	50	2	Picture 1	●
PML-2B-R0.75S	1.5	0.75	4	3	50	2	Picture 1	●
PML-2B-R0.75	1.5	0.75	6	3	50	2	Picture 1	●
PML-2B-R1.0S	2.0	1.0	4	4	50	2	Picture 1	●
PML-2B-R1.0	2.0	1.0	6	4	50	2	Picture 1	●
PML-2B-R1.25S	2.5	1.25	4	5	50	2	Picture 1	●
PML-2B-R1.25	2.5	1.25	6	5	50	2	Picture 1	●
PML-2B-R1.5S	3.0	1.5	4	6	50	2	Picture 1	●
PML-2B-R1.5	3.0	1.5	6	6	50	2	Picture 1	●
PML-2B-R1.75	3.5	1.75	6	8	50	2	Picture 1	●
PML-2B-R2.0S	4.0	2.0	4	8	50	2	Picture 2	●
PML-2B-R2.0	4.0	2.0	6	8	50	2	Picture 1	●
PML-2B-R2.5	5.0	2.5	6	10	50	2	Picture 1	●
PML-2B-R2.75	5.5	2.75	6	12	50	2	Picture 1	●
PML-2B-R3.0	6.0	3.0	6	12	50	2	Picture 2	●
PML-2B-R3.5	7.0	3.5	8	14	60	2	Picture 1	●
PML-2B-R4.0	8.0	4.0	8	16	60	2	Picture 2	●
PML-2B-R4.5	9.0	4.5	10	18	75	2	Picture 1	●
PML-2B-R5.0	10.0	5.0	10	20	75	2	Picture 2	●
PML-2B-R6.0	12.0	6.0	12	24	75	2	Picture 2	●
PML-2B-R7.0	14.0	7.0	14	28	75	2	Picture 2	●
PML-2B-R8.0	16.0	8.0	16	32	100	2	Picture 2	●
PML-2B-R10.0	20.0	10.0	20	40	100	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B567-B568
Non-standard customization B652-B653

2-flute ball nose end mills with straight shank

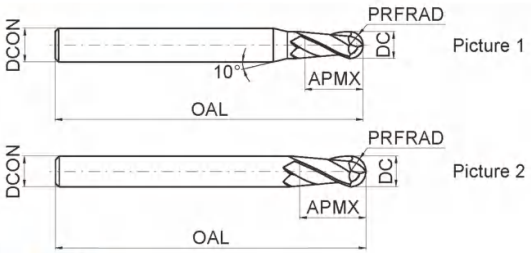

Profile


Cavity


Ball nose slot

PML-2BL

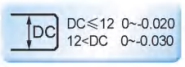




● PML-2B series with long shank.











Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
PML-2BL-R1.0	2.0	1.0	6	4	75	2	Picture 1	○
PML-2BL-R1.25	2.5	1.25	6	5	75	2	Picture 1	○
PML-2BL-R1.5	3.0	1.5	6	6	75	2	Picture 1	○
PML-2BL-R1.75	3.5	1.75	6	8	75	2	Picture 1	○
PML-2BL-R2.0	4.0	2.0	6	8	75	2	Picture 1	○
PML-2BL-R2.5	5.0	2.5	6	10	75	2	Picture 1	○
PML-2BL-R2.75	5.5	2.75	6	12	75	2	Picture 1	○
PML-2BL-R3.0	6.0	3.0	6	12	75	2	Picture 2	○
PML-2BL-R3.5	7.0	3.5	8	14	75	2	Picture 1	○
PML-2BL-R4.0	8.0	4.0	8	16	100	2	Picture 2	○
PML-2BL-R4.5	9.0	4.5	10	18	100	2	Picture 1	○
PML-2BL-R5.0	10.0	5.0	10	20	100	2	Picture 2	○
PML-2BL-R6.0	12.0	6.0	12	24	100	2	Picture 2	○
PML-2BL-R7.0	14.0	7.0	14	28	100	2	Picture 2	○
PML-2BL-R8.0	16.0	8.0	16	32	150	2	Picture 2	○
PML-2BL-R10.0	20.0	10.0	20	40	150	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B567-B568
Non-standard customization B652-B653

2-flute ball nose end mills with straight shank, long neck and short cutting edge


Profile


Cavity

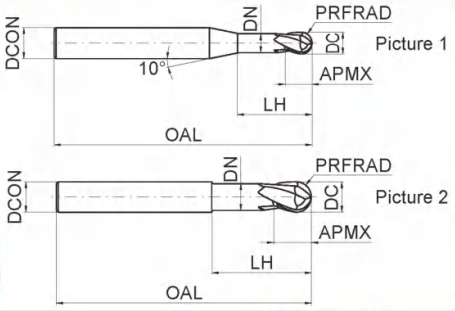

Ball nose slot

PML-2BFP



- High-rigidity short cutting edge, suitable for heavy cutting.

30° | Coated NaNo TiAlCrN | DC DC≤12 0~-0.020 12<DC 0~-0.030 | PRFRAD PRFRAD±0.01



Type	Basic dimension(mm)							Number of teeth Z	Geometry	Stock
	DC	PRFRAD	APMX	DN	LH	DCON	OAL			
PML-2BFP-R0.5	1.0	0.5	1	0.95	2.5	6	75	2	Picture 1	○
PML-2BFP-R0.75	1.5	0.75	1.5	1.45	3.0	6	75	2	Picture 1	○
PML-2BFP-R1.0	2.0	1.0	2	1.95	4.0	6	75	2	Picture 1	○
PML-2BFP-R1.5	3.0	1.5	3	2.85	6.0	6	75	2	Picture 1	○
PML-2BFP-R2.0	4.0	2.0	4	3.85	8.0	6	75	2	Picture 1	○
PML-2BFP-R2.5	5.0	2.5	5	4.85	10.0	6	75	2	Picture 1	○
PML-2BFP-R3.0	6.0	3.0	6	5.8	12.0	6	75	2	Picture 2	○
PML-2BFP-R4.0	8.0	4.0	8	7.8	16.0	8	100	2	Picture 2	○
PML-2BFP-R5.0	10.0	5.0	10	9.6	20.0	10	100	2	Picture 2	○
PML-2BFP-R6.0	12.0	6.0	12	11.5	24.0	12	100	2	Picture 2	○
PML-2BFP-R8.0	16.0	8.0	16	15.5	32.0	16	150	2	Picture 2	○
PML-2BFP-R10.0	20.0	10.0	20	19.5	40.0	20	150	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294 | Graphics category and identification B295 | Cutting parameters B567-B568 | Non-standard customization B652-B653

4-flute ball nose end mills with straight shank

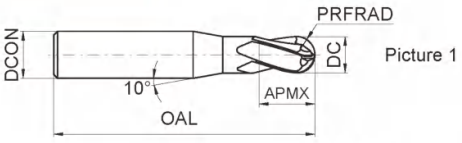

Profile

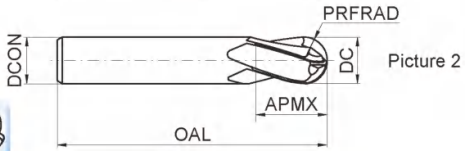

Cavity


Ball nose slot

PML-4B



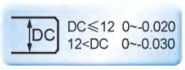




● 4-flute ball nose end mill can operate with higher feed speed and machining efficiency, extending too life in machining high-hardness workpiece.











Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
PML-4B-R1.5	3.0	1.5	6	6	50	4	Picture 1	○
PML-4B-R2.0	4.0	2.0	6	8	50	4	Picture 1	○
PML-4B-R2.5	5.0	2.5	6	10	50	4	Picture 1	○
PML-4B-R3.0	6.0	3.0	6	12	50	4	Picture 2	○
PML-4B-R4.0	8.0	4.0	8	16	60	4	Picture 2	○
PML-4B-R5.0	10.0	5.0	10	20	75	4	Picture 2	○
PML-4B-R6.0	12.0	6.0	12	24	75	4	Picture 2	○
PML-4B-R7.0	14.0	7.0	14	28	75	4	Picture 2	○
PML-4B-R8.0	16.0	8.0	16	32	100	4	Picture 2	○
PML-4B-R9.0	18.0	9.0	18	36	100	4	Picture 2	○
PML-4B-R10.0	20.0	10.0	20	40	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294 Graphics category and identification B295 Cutting parameters B569 Non-standard customization B652-B653

4-flute ball nose end mills with straight and long shank

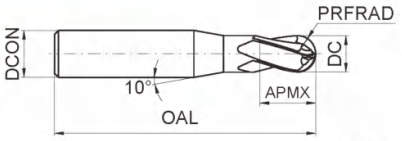
Profile | Cavity | Ball nose slot

PML-4BL

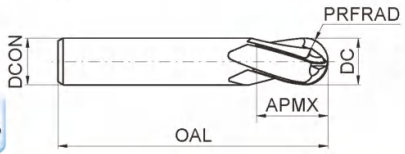


- PML-4B series with long shank.

30° | Coated NaNo TiAlCrN | DC DC≤12 0~-0.020 12<DC 0~-0.030 | PRFRAD PRFRAD±0.01



Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
PML-4BL-R1.5	3.0	1.5	6	6	75	4	Picture 1	○
PML-4BL-R2.0	4.0	2.0	6	8	75	4	Picture 1	○
PML-4BL-R2.5	5.0	2.5	6	10	75	4	Picture 1	○
PML-4BL-R3.0	6.0	3.0	6	12	75	4	Picture 2	○
PML-4BL-R4.0	8.0	4.0	8	16	100	4	Picture 2	○
PML-4BL-R5.0	10.0	5.0	10	20	100	4	Picture 2	○
PML-4BL-R6.0	12.0	6.0	12	24	100	4	Picture 2	○
PML-4BL-R7.0	14.0	7.0	14	28	100	4	Picture 2	○
PML-4BL-R8.0	16.0	8.0	16	32	150	4	Picture 2	○
PML-4BL-R9.0	18.0	9.0	18	36	150	4	Picture 2	○
PML-4BL-R10.0	20.0	10.0	20	40	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294 | Graphics category and identification B295 | Cutting parameters B569 | Non-standard customization B652-B653

2-flute R end mills with straight shank

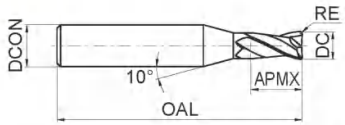
Radius shoulder | Profile | Radius corner slot

PML-2R

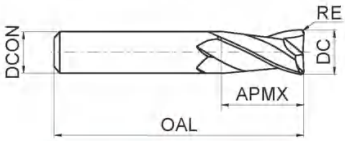


- Wide applications, applicable for several machining styles.

30° | Coated NaNo TiAlCrN | DC 0~-0.020



Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PML-2R-D1.0R0.2	1.0	0.2	4	3	50	2	Picture 1	○
PML-2R-D1.5R0.2	1.5	0.2	4	4	50	2	Picture 1	○
PML-2R-D2.0R0.2	2.0	0.2	4	6	50	2	Picture 1	○
PML-2R-D2.0R0.5	2.0	0.5	4	6	50	2	Picture 1	○
PML-2R-D2.5R0.2	2.5	0.2	4	8	50	2	Picture 1	○
PML-2R-D2.5R0.5	2.5	0.5	4	8	50	2	Picture 1	○
PML-2R-D3.0R0.2	3.0	0.2	4	8	50	2	Picture 1	○
PML-2R-D3.0R0.3	3.0	0.3	4	8	50	2	Picture 1	○
PML-2R-D3.0R0.5	3.0	0.5	4	8	50	2	Picture 1	○
PML-2R-D4.0R0.2	4.0	0.2	4	11	50	2	Picture 2	○
PML-2R-D4.0R0.3	4.0	0.3	4	11	50	2	Picture 2	○
PML-2R-D4.0R0.5	4.0	0.5	4	11	50	2	Picture 2	○
PML-2R-D4.0R1.0	4.0	1.0	4	11	50	2	Picture 2	○
PML-2R-D5.0R0.3	5.0	0.3	6	13	50	2	Picture 1	○
PML-2R-D5.0R0.5	5.0	0.5	6	13	50	2	Picture 1	○
PML-2R-D5.0R1.0	5.0	1.0	6	13	50	2	Picture 1	○
PML-2R-D6.0R0.3	6.0	0.3	6	16	50	2	Picture 2	○
PML-2R-D6.0R0.5	6.0	0.5	6	16	50	2	Picture 2	○
PML-2R-D6.0R1.0	6.0	1.0	6	16	50	2	Picture 2	○
PML-2R-D8.0R0.3	8.0	0.3	8	20	60	2	Picture 2	○
PML-2R-D8.0R0.5	8.0	0.5	8	20	60	2	Picture 2	○
PML-2R-D8.0R1.0	8.0	1.0	8	20	60	2	Picture 2	○
PML-2R-D10.0R0.5	10.0	0.5	10	25	75	2	Picture 2	○
PML-2R-D10.0R1.0	10.0	1.0	10	25	75	2	Picture 2	○
PML-2R-D10.0R1.5	10.0	1.5	10	25	75	2	Picture 2	○
PML-2R-D10.0R2.0	10.0	2.0	10	25	75	2	Picture 2	○
PML-2R-D12.0R0.5	12.0	0.5	12	30	75	2	Picture 2	○
PML-2R-D12.0R1.0	12.0	1.0	12	30	75	2	Picture 2	○
PML-2R-D12.0R1.5	12.0	1.5	12	30	75	2	Picture 2	○
PML-2R-D12.0R2.0	12.0	2.0	12	30	75	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294 | Graphics category and identification B295 | Cutting parameters B573 | Non-standard customization B652-B653

4-flute R end mills with straight shank

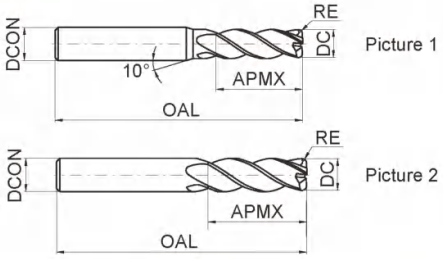
Radius shoulder | Profile | Radius corner slot

PML-4R



- Wide applications, applicable for several machining styles.

30° | Coated NaNo TiAlCrN | DC 0~-0.020



Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PML-4R-D3.0R0.2	3.0	0.2	6	8	50	4	Picture 1	●
PML-4R-D4.0R0.3	4.0	0.3	6	10	50	4	Picture 1	●
PML-4R-D4.0R0.5	4.0	0.5	6	10	50	4	Picture 1	●
PML-4R-D5.0R0.5	5.0	0.5	6	13	50	4	Picture 1	●
PML-4R-D5.0R1.0	5.0	1.0	6	13	50	4	Picture 1	●
PML-4R-D6.0R0.5	6.0	0.5	6	16	50	4	Picture 2	●
PML-4R-D6.0R1.0	6.0	1.0	6	16	50	4	Picture 2	●
PML-4R-D8.0R0.5	8.0	0.5	8	20	60	4	Picture 2	●
PML-4R-D8.0R1.0	8.0	1.0	8	20	60	4	Picture 2	●
PML-4R-D10.0R0.5	10.0	0.5	10	25	75	4	Picture 2	●
PML-4R-D10.0R1.0	10.0	1.0	10	25	75	4	Picture 2	●
PML-4R-D10.0R2.0	10.0	2.0	10	25	75	4	Picture 2	●
PML-4R-D10.0R3.0	10.0	3.0	10	25	75	4	Picture 2	●
PML-4R-D12.0R0.5	12.0	0.5	12	30	75	4	Picture 2	●
PML-4R-D12.0R1.0	12.0	1.0	12	30	75	4	Picture 2	●
PML-4R-D12.0R2.0	12.0	2.0	12	30	75	4	Picture 2	●
PML-4R-D12.0R3.0	12.0	3.0	12	30	75	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

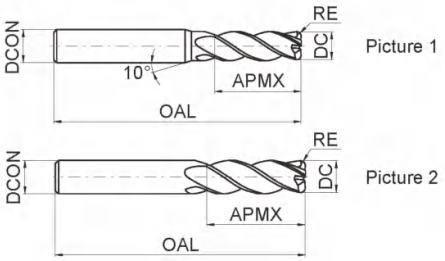
Code key B294 | Graphics category and identification B295 | Cutting parameters B574 | Non-standard customization B652-B653

4-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

PML-4R-H





- Wide applications, applicable for several machining styles.



Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PML-4R-D3.0R0.2-H	3.0	0.2	6	8	50	4	Picture 1	●
PML-4R-D4.0R0.3-H	4.0	0.3	6	10	50	4	Picture 1	●
PML-4R-D4.0R0.5-H	4.0	0.5	6	10	50	4	Picture 1	●
PML-4R-D5.0R0.5-H	5.0	0.5	6	13	50	4	Picture 1	●
PML-4R-D5.0R1.0-H	5.0	1.0	6	13	50	4	Picture 1	●
PML-4R-D6.0R0.5-H	6.0	0.5	6	16	50	4	Picture 2	●
PML-4R-D6.0R1.0-H	6.0	1.0	6	16	50	4	Picture 2	●
PML-4R-D8.0R0.5-H	8.0	0.5	8	20	60	4	Picture 2	●
PML-4R-D8.0R1.0-H	8.0	1.0	8	20	60	4	Picture 2	●
PML-4R-D10R0.5-H	10.0	0.5	10	25	75	4	Picture 2	●
PML-4R-D10R1.0-H	10.0	1.0	10	25	75	4	Picture 2	●
PML-4R-D10R2.0-H	10.0	2.0	10	25	75	4	Picture 2	●
PML-4R-D10R3.0-H	10.0	3.0	10	25	75	4	Picture 2	●
PML-4R-D12R0.5-H	12.0	0.5	12	30	75	4	Picture 2	●
PML-4R-D12R1.0-H	12.0	1.0	12	30	75	4	Picture 2	●
PML-4R-D12R2.0-H	12.0	2.0	12	30	75	4	Picture 2	●
PML-4R-D12R3.0-H	12.0	3.0	12	30	75	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B294 | Graphics category and identification B295 | Cutting parameters B574 | Non-standard customization B652-B653

4-flute R end mills with straight shank, long neck and short cutting edge

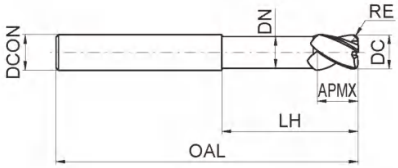

Radius shoulder


Profile


Radius corner slot

PML-4RFP

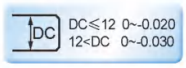




● Long shank and short cutting edge designed for deep cavity milling.









Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	RE	DCON	DN	APMX	LH	OAL		
PML-4RFP-D6.0R0.5	6.0	0.5	6	5.8	6	18	75	4	○
PML-4RFP-D6.0R1.0	6.0	1.0	6	5.8	6	18	75	4	○
PML-4RFP-D8.0R0.5	8.0	0.5	8	7.8	8	24	100	4	○
PML-4RFP-D8.0R1.0	8.0	1.0	8	7.8	8	24	100	4	○
PML-4RFP-D10.0R0.5	10.0	0.5	10	9.6	10	30	100	4	○
PML-4RFP-D10.0R1.0	10.0	1.0	10	9.6	10	30	100	4	○
PML-4RFP-D10.0R2.0	10.0	2.0	10	9.6	10	30	100	4	○
PML-4RFP-D12.0R0.5	12.0	0.5	12	11.5	12	36	100	4	○
PML-4RFP-D12.0R1.0	12.0	1.0	12	11.5	12	36	100	4	○
PML-4RFP-D12.0R2.0	12.0	2.0	12	11.5	12	36	100	4	○
PML-4RFP-D16.0R1.0	16.0	1.0	16	15.5	16	40	150	4	○
PML-4RFP-D16.0R2.0	16.0	2.0	16	15.5	16	40	150	4	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

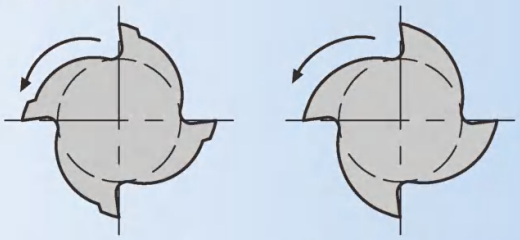
Code key B294
Graphics category and identification B295
Cutting parameters B574
Non-standard customization B652-B653

High performance universal machining

PM series



Optimized geometry, improves chip removal and chip forming with reduced cutting force.



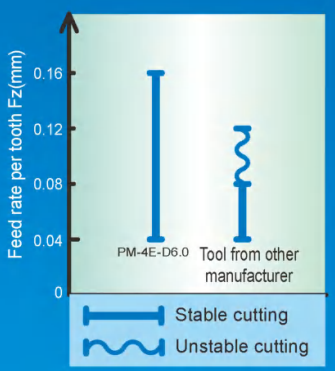
a) PM flute profile

b) Conventional flute profile



Higher feed rates and improved metal removal rate for efficient machining, due to high stability of cutting edge and rigid tool structure.

Tool diameter: Ø6.0mm
Tool type: a) PM-4E-D6.0
b) Tool from overseas manufacturer
Mmachine tool: Mikron UCP1000
Workpiece material: NAK80(40HRC)
Cooling method: Air cooling
Machining operation: Side milling (down milling)
Cutting parameters: V_c=100m/min,
a_p=9mm, a_e=0.6mm,
F_z=0.04mm~0.16mm



With excellent wear resistance and toughness, high wear resistance and breakage resistance is achieved even during high performance milling.

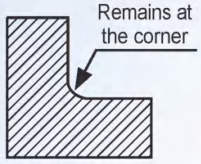
Updated flattened end mills

End mills series of sharp and corner protection type

The characteristic of corner protection end mills:

It's suitable for bad cutting condition or hardness material machining.

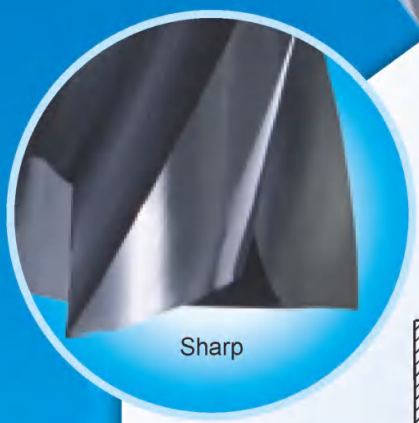
- It's not easy to break with high cutter edge strength.
- The sharpness of the corner is reduced, and there are residues in it.





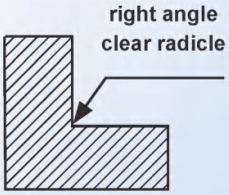
Corner protection

Sharp



The characteristic of sharp end mill:

True 90 degree angle is obtained without material left in the corner.



The corner part is sharp; it is applicable in finishing or soft material machining. Especially, it is usually used in machining of non-ferrous material such as Al.

2-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

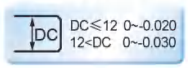
PM-2E



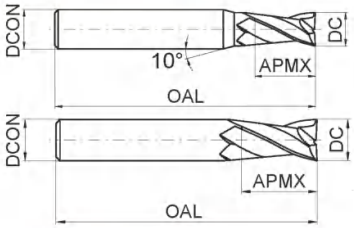
- Very suitable for slot milling.
- Wide application.











Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-2E-D1.0F	1.0	3	3	50	2	Picture 1	○
PM-2E-D1.0S	1.0	4	3	50	2	Picture 1	●
PM-2E-D1.0	1.0	6	3	50	2	Picture 1	●
PM-2E-D1.5S	1.5	4	4	50	2	Picture 1	●
PM-2E-D1.5	1.5	6	4	50	2	Picture 1	●
PM-2E-D2.0F	2.0	3	6	50	2	Picture 1	○
PM-2E-D2.0S	2.0	4	6	50	2	Picture 1	●
PM-2E-D2.0	2.0	6	6	50	2	Picture 1	●
PM-2E-D2.5S	2.5	4	8	50	2	Picture 1	●
PM-2E-D2.5	2.5	6	8	50	2	Picture 1	●
PM-2E-D3.0F	3.0	3	8	50	2	Picture 2	○
PM-2E-D3.0S	3.0	4	8	50	2	Picture 1	●
PM-2E-D3.0	3.0	6	8	50	2	Picture 1	●
PM-2E-D3.5S	3.5	4	10	50	2	Picture 1	○
PM-2E-D3.5	3.5	6	10	50	2	Picture 1	●
PM-2E-D4.0S	4.0	4	11	50	2	Picture 2	●
PM-2E-D4.0	4.0	6	11	50	2	Picture 1	●
PM-2E-D4.5	4.5	6	11	50	2	Picture 1	●
PM-2E-D5.0	5.0	6	13	50	2	Picture 1	●
PM-2E-D5.5	5.5	6	16	50	2	Picture 1	●
PM-2E-D6.0	6.0	6	16	50	2	Picture 2	●
PM-2E-D7.0	7.0	8	20	60	2	Picture 1	●
PM-2E-D8.0	8.0	8	20	60	2	Picture 2	●
PM-2E-D9.0	9.0	10	22	75	2	Picture 1	●
PM-2E-D10.0	10.0	10	25	75	2	Picture 2	●
PM-2E-D11.0	11.0	12	26	75	2	Picture 1	●
PM-2E-D12.0	12.0	12	30	75	2	Picture 2	●
PM-2E-D14.0	14.0	14	32	75	2	Picture 2	●
PM-2E-D16.0	16.0	16	45	100	2	Picture 2	●
PM-2E-D18.0	18.0	18	45	100	2	Picture 2	●
PM-2E-D20.0	20.0	20	45	100	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B552
Non-standard customization B652-B653

2-flute flattened end mills with straight shank

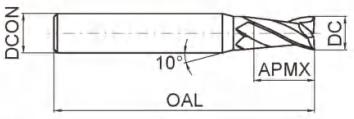

Side face


Step shoulder

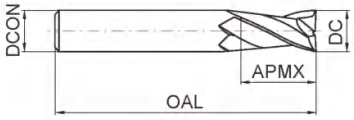

Straight slot

PM-2F





Picture 1

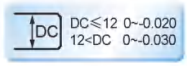


Picture 2

- Very suitable for slot milling.
- Wide application.









Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-2F-D1.0S	1.0	4	3	50	2	Picture 1	○
PM-2F-D1.0	1.0	6	3	50	2	Picture 1	○
PM-2F-D1.5S	1.5	4	4	50	2	Picture 1	○
PM-2F-D1.5	1.5	6	4	50	2	Picture 1	○
PM-2F-D2.0S	2.0	4	6	50	2	Picture 1	○
PM-2F-D2.0	2.0	6	6	50	2	Picture 1	○
PM-2F-D2.5S	2.5	4	8	50	2	Picture 1	○
PM-2F-D2.5	2.5	6	8	50	2	Picture 1	○
PM-2F-D3.0S	3.0	4	8	50	2	Picture 1	○
PM-2F-D3.0	3.0	6	8	50	2	Picture 1	○
PM-2F-D3.5	3.5	6	10	50	2	Picture 1	○
PM-2F-D4.0S	4.0	4	11	50	2	Picture 2	○
PM-2F-D4.0	4.0	6	11	50	2	Picture 1	○
PM-2F-D4.5	4.5	6	11	50	2	Picture 1	○
PM-2F-D5.0	5.0	6	13	50	2	Picture 1	○
PM-2F-D5.5	5.5	6	16	50	2	Picture 1	○
PM-2F-D6.0	6.0	6	16	50	2	Picture 2	○
PM-2F-D7.0	7.0	8	20	60	2	Picture 1	○
PM-2F-D8.0	8.0	8	20	60	2	Picture 2	○
PM-2F-D9.0	9.0	10	22	75	2	Picture 1	○
PM-2F-D10.0	10.0	10	25	75	2	Picture 2	○
PM-2F-D11.0	11.0	12	26	75	2	Picture 1	○
PM-2F-D12.0	12.0	12	30	75	2	Picture 2	○
PM-2F-D14.0	14.0	14	32	75	2	Picture 2	○
PM-2F-D16.0	16.0	16	45	100	2	Picture 2	○
PM-2F-D18.0	18.0	18	45	100	2	Picture 2	○
PM-2F-D20.0	20.0	20	45	100	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

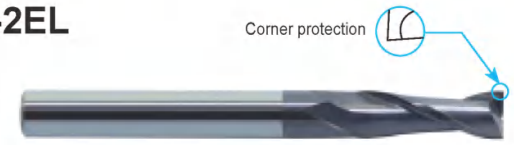
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

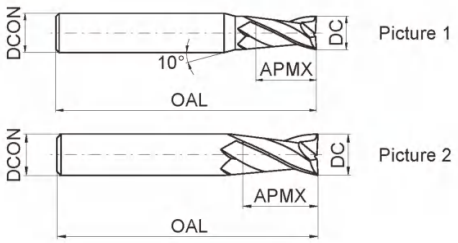
Code key B294
Graphics category and identification B295
Cutting parameters B553
Non-standard customization B652-B653

2-flute flattened end mills with straight shank and long cutting edge



PM-2EL





- PM-2E series with long cutting edge.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-2EL-D3.0	3.0	6	12	75	2	Picture 1	○
PM-2EL-D4.0	4.0	6	15	75	2	Picture 1	○
PM-2EL-D5.0	5.0	6	20	75	2	Picture 1	○
PM-2EL-D6.0	6.0	6	20	75	2	Picture 2	○
PM-2EL-D8.0	8.0	8	25	100	2	Picture 2	○
PM-2EL-D10.0	10.0	10	30	100	2	Picture 2	○
PM-2EL-D12.0	12.0	12	35	100	2	Picture 2	○
PM-2EL-D14.0	14.0	14	40	100	2	Picture 2	○
PM-2EL-D16.0	16.0	16	50	150	2	Picture 2	○
PM-2EL-D20.0	20.0	20	55	150	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

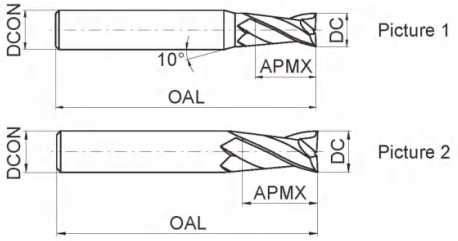
Code key B294
Graphics category and identification B295
Cutting parameters B552
Non-standard customization B652-B653

2-flute flattened end mills with straight shank and long cutting edge



PM-2FL





● PM-2F series with long cutting edge.

30° | Coated NaNo TiAlN | DC DC≤12 0~-0.020 12<DC 0~-0.030

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-2FL-D3.0	3.0	6	12	75	2	Picture 1	○
PM-2FL-D4.0	4.0	6	15	75	2	Picture 1	○
PM-2FL-D5.0	5.0	6	20	75	2	Picture 1	○
PM-2FL-D6.0	6.0	6	20	75	2	Picture 2	○
PM-2FL-D8.0	8.0	8	25	100	2	Picture 2	○
PM-2FL-D10.0	10.0	10	30	100	2	Picture 2	○
PM-2FL-D12.0	12.0	12	35	100	2	Picture 2	○
PM-2FL-D14.0	14.0	14	40	100	2	Picture 2	○
PM-2FL-D16.0	16.0	16	50	150	2	Picture 2	○
PM-2FL-D20.0	20.0	20	55	150	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

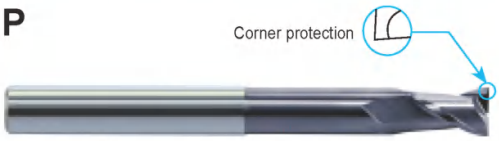
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

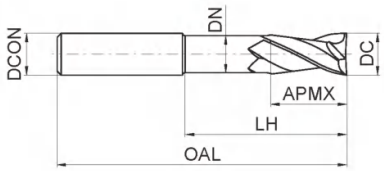
Code key B294 | Graphics category and identification B295 | Cutting parameters B553 | Non-standard customization B652-B653

2-flute flattened end mills with straight shank, long neck and short cutting edge



PM-2EFP





● High-rigidity short cutting edge, suitable for heavy cutting and also deep cavity milling.



Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	DCON	APMX	LH	DN	OAL		
PM-2EFP-D6.0	6.0	6	9	30	5.8	75	2	○
PM-2EFP-D8.0	8.0	8	12	40	7.8	100	2	○
PM-2EFP-D10.0	10.0	10	15	50	9.6	100	2	○
PM-2EFP-D12.0	12.0	12	18	50	11.5	100	2	○
PM-2EFP-D16.0	16.0	16	24	50	15.5	150	2	○
PM-2EFP-D20.0	20.0	20	30	60	19.5	150	2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B554
Non-standard customization B652-B653

2-flute flattened end mills with long shank

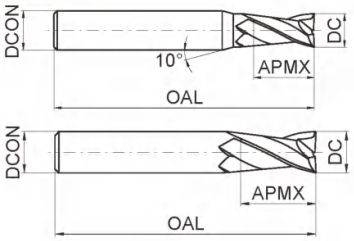

Side face


Step shoulder


Straight slot

PM-2EBL/X

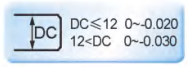




- PM-2E series with long shank.









Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DOCN	APMX	OAL			
PM-2EBL-D3.0S	3.0	4	8	75	2	Picture 1	○
PM-2EBL-D3.0	3.0	6	8	75	2	Picture 1	○
PM-2EBL-D4.0S	4.0	4	11	75	2	Picture 2	○
PM-2EBL-D4.0	4.0	6	11	75	2	Picture 1	○
PM-2EBL-D6.0	6.0	6	16	75	2	Picture 2	○
PM-2EBX-D6.0	6.0	6	16	100	2	Picture 2	○
PM-2EBL-D8.0	8.0	8	20	75	2	Picture 2	○
PM-2EBX-D8.0	8.0	8	20	100	2	Picture 2	○
PM-2EBL-D10.0	10.0	10	25	100	2	Picture 2	○
PM-2EBX-D10.0	10.0	10	25	150	2	Picture 2	○
PM-2EBL-D12.0	12.0	12	30	100	2	Picture 2	○
PM-2EBX-D12.0	12.0	12	30	150	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B552
Non-standard customization B652-B653

3-flute flattened end mills with straight shank

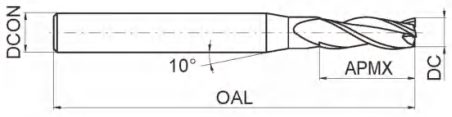

Side face


Step shoulder

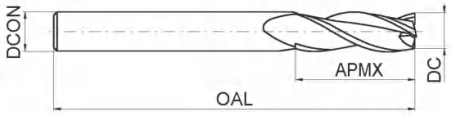

Straight slot

PM-3E-H





Picture 1

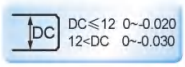


Picture 2

● Especially suitable for slot milling. ● Wide application.









Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-3E-D3.0F-H	3.0	3	8	5	3	Picture 2	○
PM-3E-D3.0S-H	3.0	4	8	50	3	Picture 1	○
PM-3E-D3.0-H	3.0	6	8	50	3	Picture 1	○
PM-3E-D3.5-H	3.5	6	10	50	3	Picture 1	○
PM-3E-D4.0S-H	4.0	4	11	50	3	Picture 2	○
PM-3E-D4.0-H	4.0	6	11	50	3	Picture 1	○
PM-3E-D4.5-H	4.5	6	11	50	3	Picture 1	○
PM-3E-D5.0-H	5.0	6	13	50	3	Picture 1	○
PM-3E-D5.5-H	5.5	6	16	50	3	Picture 1	○
PM-3E-D6.0-H	6.0	6	16	50	3	Picture 2	○
PM-3E-D7.0-H	7.0	8	20	60	3	Picture 1	○
PM-3E-D8.0-H	8.0	8	20	60	3	Picture 2	○
PM-3E-D9.0-H	9.0	10	22	75	3	Picture 1	○
PM-3E-D10.0-H	10.0	10	25	75	3	Picture 2	○
PM-3E-D11.0-H	11.0	12	26	75	3	Picture 1	○
PM-3E-D12.0-H	12.0	12	30	75	3	Picture 2	○
PM-3E-D14.0-H	14.0	14	32	75	3	Picture 2	○
PM-3E-D16.0-H	16.0	16	45	100	3	Picture 2	○
PM-3E-D18.0-H	18.0	18	45	100	3	Picture 2	○
PM-3E-D20.0-H	20.0	20	45	100	3	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

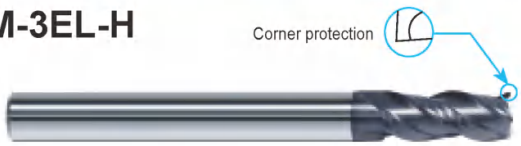
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B555
Non-standard customization B652-B653

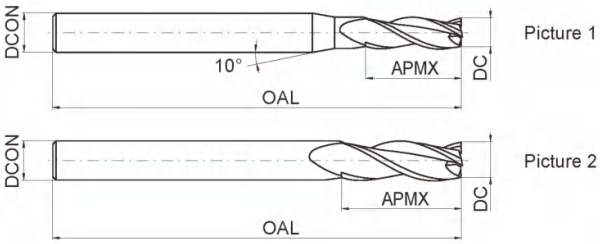
3-flute flattened end mills with straight shank and long cutting edge



PM-3EL-H



● PM-3E-H series with long shank.





Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-3EL-D3.0-H	3.0	6	12	75	3	Picture 1	○
PM-3EL-D4.0-H	4.0	6	15	75	3	Picture 1	○
PM-3EL-D5.0-H	5.0	6	20	75	3	Picture 1	○
PM-3EL-D6.0-H	6.0	6	20	75	3	Picture 2	○
PM-3EL-D8.0-H	8.0	8	25	100	3	Picture 2	○
PM-3EL-D10.0-H	10.0	10	30	100	3	Picture 2	○
PM-3EL-D12.0-H	12.0	12	35	100	3	Picture 2	○
PM-3EL-D14.0-H	14.0	14	40	100	3	Picture 2	○
PM-3EL-D16.0-H	16.0	16	50	150	3	Picture 2	○
PM-3EL-D20.0-H	20.0	20	55	150	3	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B555
Non-standard customization B652-B653

4-flute flattened end mills with straight shank

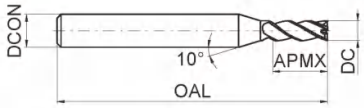

Side face


Step shoulder

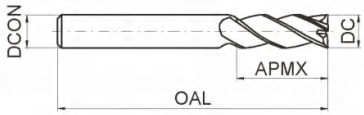

Straight slot

PM-4E-G





Picture 1

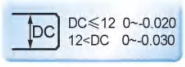


Picture 2

● Very suitable for side milling. ● Wide application.









Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-4E-D1.0F-G	1.0	3	3	50	4	Picture 1	○
PM-4E-D1.0S-G	1.0	4	3	50	4	Picture 1	●
PM-4E-D1.0-G	1.0	6	3	50	4	Picture 1	●
PM-4E-D1.5F-G	1.5	3	4	50	4	Picture 1	○
PM-4E-D1.5S-G	1.5	4	4	50	4	Picture 1	●
PM-4E-D1.5-G	1.5	6	4	50	4	Picture 1	●
PM-4E-D2.0F-G	2.0	3	6	50	4	Picture 1	○
PM-4E-D2.0S-G	2.0	4	6	50	4	Picture 1	●
PM-4E-D2.0-G	2.0	6	6	50	4	Picture 1	●
PM-4E-D2.5F-G	2.5	3	8	50	4	Picture 1	○
PM-4E-D2.5S-G	2.5	4	8	50	4	Picture 1	●
PM-4E-D2.5-G	2.5	6	8	50	4	Picture 1	●
PM-4E-D3.0F-G	3.0	3	8	50	4	Picture 2	○
PM-4E-D3.0S-G	3.0	4	8	50	4	Picture 1	●
PM-4E-D3.0-G	3.0	6	8	50	4	Picture 1	●
PM-4E-D3.5S-G	3.5	4	10	50	4	Picture 1	○
PM-4E-D3.5-G	3.5	6	10	50	4	Picture 1	●
PM-4E-D4.0S-G	4.0	4	11	50	4	Picture 2	●
PM-4E-D4.0-G	4.0	6	11	50	4	Picture 1	●
PM-4E-D4.5-G	4.5	6	11	50	4	Picture 1	●
PM-4E-D5.0-G	5.0	6	13	50	4	Picture 1	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B556-B557
Non-standard customization B652-B653

4-flute flattened end mills with straight shank

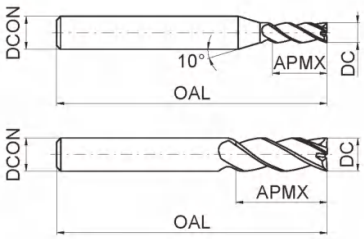

Side face

Step shoulder

Straight slot

PM-4E-G

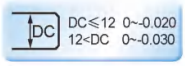




● Very suitable for side milling. ● Wide application.









Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-4E-D5.5-G	5.5	6	16	50	4	Picture 1	●
PM-4E-D6.0-G	6.0	6	16	50	4	Picture 2	●
PM-4E-D7.0-G	7.0	8	20	60	4	Picture 1	●
PM-4E-D8.0-G	8.0	8	20	60	4	Picture 2	●
PM-4E-D9.0-G	9.0	10	22	75	4	Picture 1	●
PM-4E-D10.0-G	10.0	10	25	75	4	Picture 2	●
PM-4E-D10.0-G	10.0	10	25	75	4	Picture 2	●
PM-4E-D11.0-G	11.0	12	26	75	4	Picture 1	●
PM-4E-D12.0-G	12.0	12	30	75	4	Picture 2	●
PM-4E-D14.0-G	14.0	14	32	75	4	Picture 2	●
PM-4E-D16.0-G	16.0	16	45	100	4	Picture 2	●
PM-4E-D18.0-G	18.0	18	45	100	4	Picture 2	●
PM-4E-D20.0-G	20.0	20	45	100	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B556-B557
Non-standard customization B652-B653

4-flute flattened end mills with straight shank

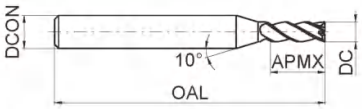

Side face


Step shoulder

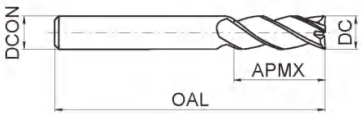

Straight slot

PM-4F-G





Picture 1

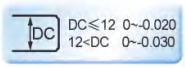


Picture 2

● Very suitable for side milling. ● Wide application.









Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-4F-D1.0S-G	1.0	4	3	50	4	Picture 1	○
PM-4F-D1.0-G	1.0	6	3	50	4	Picture 1	○
PM-4F-D1.5S-G	1.5	4	4	50	4	Picture 1	○
PM-4F-D1.5-G	1.5	6	4	50	4	Picture 1	○
PM-4F-D2.0S-G	2.0	4	6	50	4	Picture 1	○
PM-4F-D2.0-G	2.0	6	6	50	4	Picture 1	○
PM-4F-D2.5S-G	2.5	4	8	50	4	Picture 1	○
PM-4F-D2.5-G	2.5	6	8	50	4	Picture 1	○
PM-4F-D3.0S-G	3.0	4	8	50	4	Picture 1	○
PM-4F-D3.0-G	3.0	6	8	50	4	Picture 1	○
PM-4F-D3.5-G	3.5	6	10	50	4	Picture 1	○
PM-4F-D4.0S-G	4.0	4	11	50	4	Picture 2	○
PM-4F-D4.0-G	4.0	6	11	50	4	Picture 1	○
PM-4F-D4.5-G	4.5	6	11	50	4	Picture 1	○
PM-4F-D5.0-G	5.0	6	13	50	4	Picture 1	○
PM-4F-D5.5-G	5.5	6	16	50	4	Picture 1	○
PM-4F-D6.0-G	6.0	6	16	50	4	Picture 2	○
PM-4F-D7.0-G	7.0	8	20	60	4	Picture 1	○
PM-4F-D8.0-G	8.0	8	20	60	4	Picture 2	○
PM-4F-D9.0-G	9.0	10	22	75	4	Picture 1	○
PM-4F-D10.0-G	10.0	10	25	75	4	Picture 2	○
PM-4F-D11.0-G	11.0	12	26	75	4	Picture 1	○
PM-4F-D12.0-G	12.0	12	30	75	4	Picture 2	○
PM-4F-D14.0-G	14.0	14	32	75	4	Picture 2	○
PM-4F-D16.0-G	16.0	16	45	100	4	Picture 2	○
PM-4F-D18.0-G	18.0	18	45	100	4	Picture 2	○
PM-4F-D20.0-G	20.0	20	45	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

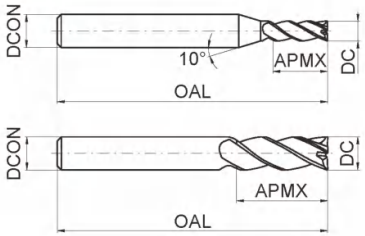
Code key B294
Graphics category and identification B295
Cutting parameters B558-B559
Non-standard customization B652-B653

4-flute flattened end mills with straight shank and long cutting edge



PM-4EL-G





- PM-4E-G series with long cutting edge.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-4EL-D3.0-G	3.0	6	12	75	4	Picture 1	○
PM-4EL-D4.0-G	4.0	6	15	75	4	Picture 1	○
PM-4EL-D5.0-G	5.0	6	20	75	4	Picture 1	○
PM-4EL-D6.0-G	6.0	6	20	75	4	Picture 2	○
PM-4EL-D8.0-G	8.0	8	25	100	4	Picture 2	○
PM-4EL-D10.0-G	10.0	10	30	100	4	Picture 2	○
PM-4EL-D12.0-G	12.0	12	35	100	4	Picture 2	○
PM-4EL-D14.0-G	14.0	14	40	100	4	Picture 2	○
PM-4EL-D16.0-G	16.0	16	50	150	4	Picture 2	○
PM-4EL-D20.0-G	20.0	20	55	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

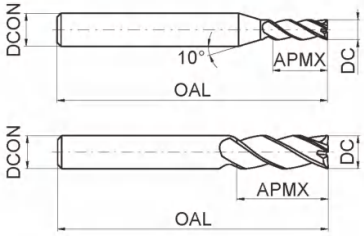
Code key B294
Graphics category and identification B295
Cutting parameters B556-B557
Non-standard customization B652-B653

4-flute flattened end mills with straight shank and long cutting edge



PM-4FL-G





● PM-4F-G series with long cutting edge.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-4FL-D3.0-G	3.0	6	12	75	4	Picture 1	○
PM-4FL-D4.0-G	4.0	6	15	75	4	Picture 1	○
PM-4FL-D5.0-G	5.0	6	20	75	4	Picture 1	○
PM-4FL-D6.0-G	6.0	6	20	75	4	Picture 2	○
PM-4FL-D8.0-G	8.0	8	25	100	4	Picture 2	○
PM-4FL-D10.0-G	10.0	10	30	100	4	Picture 2	○
PM-4FL-D12.0-G	12.0	12	35	100	4	Picture 2	○
PM-4FL-D14.0-G	14.0	14	40	100	4	Picture 2	○
PM-4FL-D16.0-G	16.0	16	50	150	4	Picture 2	○
PM-4FL-D20.0-G	20.0	20	55	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

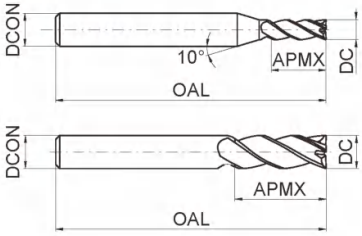
Code key B294
Graphics category and identification B295
Cutting parameters B558-B559
Non-standard customization B652-B653

4-flute flattened end mills with straight shank and extra long cutting edge



PM-4EX-G





- Extra long cutting edge, for deep side wall machining.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-4EX-D3.0-G	3.0	6	20	75	4	Picture 1	○
PM-4EX-D4.0-G	4.0	6	25	75	4	Picture 1	○
PM-4EX-D5.0-G	5.0	6	30	75	4	Picture 1	○
PM-4EX-D6.0-G	6.0	6	30	75	4	Picture 2	○
PM-4EX-D8.0-G	8.0	8	40	100	4	Picture 2	○
PM-4EX-D10.0-G	10.0	10	50	110	4	Picture 2	○
PM-4EX-D12.0-G	12.0	12	50	110	4	Picture 2	○
PM-4EX-D16.0-G	16.0	16	70	150	4	Picture 2	○
PM-4EX-D20.0-G	20.0	20	75	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

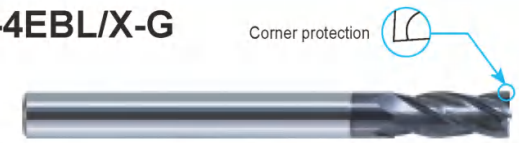
Code key B294
Graphics category and identification B295
Cutting parameters B560
Non-standard customization B652-B653

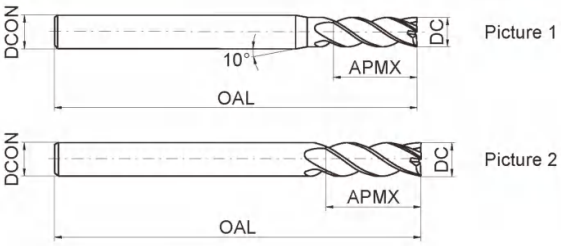
4-flute flattened endmills with long shank



PM-4EBL/X-G

Corner protection





● PM-4E-G series with long shank.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-4EBL-D3.0S-G	3.0	4	8	75	4	Picture 1	○
PM-4EBL-D3.0-G	3.0	6	8	75	4	Picture 1	○
PM-4EBL-D4.0S-G	4.0	4	11	75	4	Picture 2	○
PM-4EBL-D4.0-G	4.0	6	11	75	4	Picture 1	○
PM-4EBL-D6.0-G	6.0	6	16	75	4	Picture 2	○
PM-4EBX-D6.0-G	6.0	6	16	100	4	Picture 2	○
PM-4EBL-D8.0-G	8.0	8	20	75	4	Picture 2	○
PM-4EBX-D8.0-G	8.0	8	20	100	4	Picture 2	○
PM-4EBL-D10.0-G	10.0	10	25	100	4	Picture 2	○
PM-4EBX-D10.0-G	10.0	10	25	150	4	Picture 2	○
PM-4EBL-D12.0-G	12.0	12	30	100	4	Picture 2	○
PM-4EBX-D12.0-G	12.0	12	30	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B556-B557
Non-standard customization B652-B653

4-flute flattened end mills with straight shank


Side face

Step shoulder

Straight slot

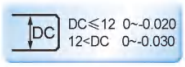
PM-4E



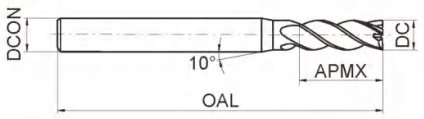
- Very suitable for side milling and shallow slot machining.
- Wide application.



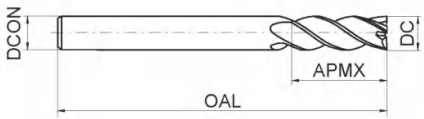








Picture 1



Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-4E-D1.0F	1.0	3	3	50	4	Picture 1	○
PM-4E-D1.0S	1.0	4	3	50	4	Picture 1	○
PM-4E-D1.0	1.0	6	3	50	4	Picture 1	○
PM-4E-D1.5F	1.5	3	4	50	4	Picture 1	○
PM-4E-D1.5S	1.5	4	4	50	4	Picture 1	○
PM-4E-D1.5	1.5	6	4	50	4	Picture 1	○
PM-4E-D2.0F	2.0	3	6	50	4	Picture 1	○
PM-4E-D2.0S	2.0	4	6	50	4	Picture 1	○
PM-4E-D2.0	2.0	6	6	50	4	Picture 1	○
PM-4E-D2.5F	2.5	3	8	50	4	Picture 1	○
PM-4E-D2.5S	2.5	4	8	50	4	Picture 1	○
PM-4E-D2.5	2.5	6	8	50	4	Picture 1	○
PM-4E-D3.0F	3.0	3	8	50	4	Picture 2	○
PM-4E-D3.0S	3.0	4	8	50	4	Picture 1	○
PM-4E-D3.0	3.0	6	8	50	4	Picture 1	○
PM-4E-D3.5S	3.5	4	10	50	4	Picture 1	○
PM-4E-D4.0S	4.0	4	11	50	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294 Graphics category and identification B295 Cutting parameters B561-B562 Non-standard customization B652-B653

4-flute flattened end mills with straight shank



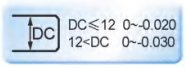
PM-4E



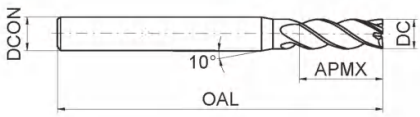
- Very suitable for side milling and shallow slot machining.
- Wide application.



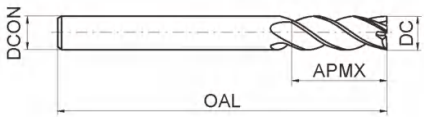








Picture 1



Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-4E-D3.5	3.5	6	10	50	4	Picture 1	○
PM-4E-D4.0	4.0	6	11	50	4	Picture 1	○
PM-4E-D4.5	4.5	6	11	50	4	Picture 1	○
PM-4E-D5.0	5.0	6	13	50	4	Picture 1	○
PM-4E-D5.5	5.5	6	16	50	4	Picture 1	○
PM-4E-D6.0	6.0	6	16	50	4	Picture 2	○
PM-4E-D7.0	7.0	8	20	60	4	Picture 1	○
PM-4E-D8.0	8.0	8	20	60	4	Picture 2	○
PM-4E-D9.0	9.0	10	22	75	4	Picture 1	○
PM-4E-D10.0	10.0	10	25	75	4	Picture 2	○
PM-4E-D11.0	11.0	12	26	75	4	Picture 1	○
PM-4E-D12.0	12.0	12	30	75	4	Picture 2	○
PM-4E-D14.0	14.0	14	32	75	4	Picture 2	○
PM-4E-D16.0	16.0	16	45	100	4	Picture 2	○
PM-4E-D18.0	18.0	18	45	100	4	Picture 2	○
PM-4E-D20.0	20.0	20	45	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

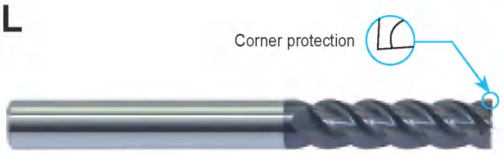
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

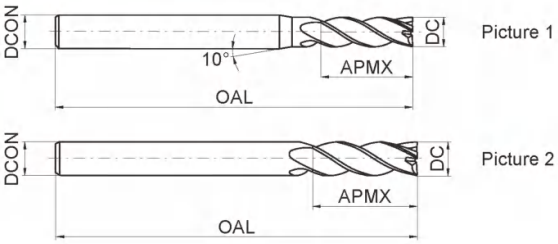
Code key B294
Graphics category and identification B295
Cutting parameters B561-B562
Non-standard customization B652-B653

4-flute flattened end mills with straight shank and long cutting edge



PM-4EL





● PM-4E series with long cutting edge.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-4EL-D3.0	3.0	6	12	75	4	Picture 1	○
PM-4EL-D4.0	4.0	6	15	75	4	Picture 1	○
PM-4EL-D5.0	5.0	6	20	75	4	Picture 1	○
PM-4EL-D6.0	6.0	6	20	75	4	Picture 2	○
PM-4EL-D8.0	8.0	8	25	100	4	Picture 2	○
PM-4EL-D10.0	10.0	10	30	100	4	Picture 2	○
PM-4EL-D12.0	12.0	12	35	100	4	Picture 2	○
PM-4EL-D14.0	14.0	14	40	100	4	Picture 2	○
PM-4EL-D16.0	16.0	16	50	150	4	Picture 2	○
PM-4EL-D20.0	20.0	20	55	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

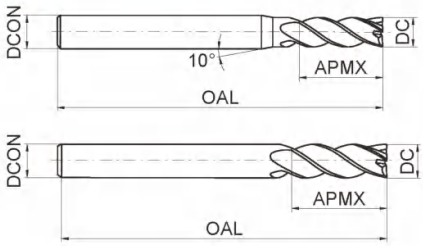
Code key B294
Graphics category and identification B295
Cutting parameters B561-B562
Non-standard customization B652-B653

4-flute flattened end mills with straight shank



PM-4E-H





● Most suitable for slot milling. ● Wide application.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-4E-D3.0S-H	3.0	4	8	50	4	Picture 1	○
PM-4E-D3.0-H	3.0	6	8	50	4	Picture 1	○
PM-4E-D3.5-H	3.5	6	10	50	4	Picture 1	○
PM-4E-D4.0S-H	4.0	4	11	50	4	Picture 2	○
PM-4E-D4.0-H	4.0	6	11	50	4	Picture 1	○
PM-4E-D4.5-H	4.5	6	11	50	4	Picture 1	○
PM-4E-D5.0-H	5.0	6	13	50	4	Picture 1	○
PM-4E-D5.5-H	5.5	6	16	50	4	Picture 1	○
PM-4E-D6.0-H	6.0	6	16	50	4	Picture 2	○
PM-4E-D7.0-H	7.0	8	20	60	4	Picture 1	○
PM-4E-D8.0-H	8.0	8	20	60	4	Picture 2	○
PM-4E-D9.0-H	9.0	10	22	75	4	Picture 1	○
PM-4E-D10.0-H	10.0	10	25	75	4	Picture 2	○
PM-4E-D11.0-H	11.0	12	26	75	4	Picture 1	○
PM-4E-D12.0-H	12.0	12	30	75	4	Picture 2	○
PM-4E-D14.0-H	14.0	14	32	75	4	Picture 2	○
PM-4E-D16.0-H	16.0	16	45	100	4	Picture 2	○
PM-4E-D18.0-H	18.0	18	45	100	4	Picture 2	○
PM-4E-D20.0-H	20.0	20	45	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

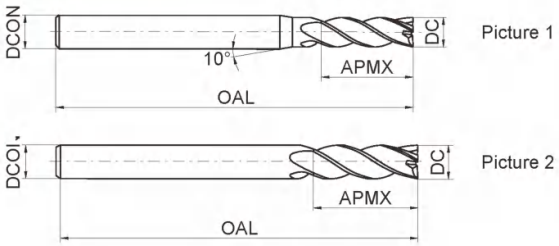
Code key B294
Graphics category and identification B295
Cutting parameters B556-B557
Non-standard customization B652-B653

4-flute flattened end mills with straight shank and long cutting edge



PM-4EL-H





● PM-4E-H series with long shank.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-4EL-D3.0-H	3.0	6	12	75	4	Picture 1	○
PM-4EL-D4.0-H	4.0	6	15	75	4	Picture 1	○
PM-4EL-D5.0-H	5.0	6	20	75	4	Picture 1	○
PM-4EL-D6.0-H	6.0	6	20	75	4	Picture 2	○
PM-4EL-D8.0-H	8.0	8	25	100	4	Picture 2	○
PM-4EL-D10.0-H	10.0	10	30	100	4	Picture 2	○
PM-4EL-D12.0-H	12.0	12	35	100	4	Picture 2	○
PM-4EL-D14.0-H	14.0	14	40	100	4	Picture 2	○
PM-4EL-D16.0-H	16.0	16	50	150	4	Picture 2	○
PM-4EL-D20.0-H	20.0	20	55	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

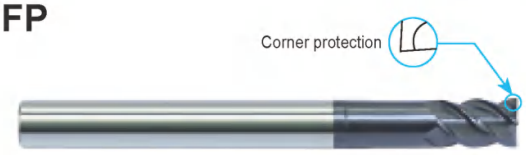
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

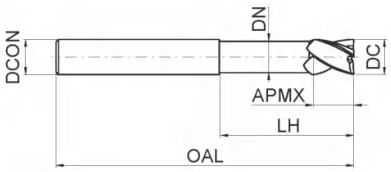
Code key B294
Graphics category and identification B295
Cutting parameters B556-B557
Non-standard customization B652-B653

4-flute flattened end mills with straight shank, long neck and short cutting edge



PM-4EFP





● High-rigidity short cutting edge, suitable for heavy cutting and also deep cavity milling.



Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	DCON	APMX	LH	DN	OAL		
PM-4EFP-D6.0	6.0	6	9	30	5.8	75	4	○
PM-4EFP-D8.0	8.0	8	12	40	7.8	100	4	○
PM-4EFP-D10.0	10.0	10	15	50	9.6	100	4	○
PM-4EFP-D12.0	12.0	12	18	50	11.5	100	4	○
PM-4EFP-D16.0	16.0	16	24	50	15.5	150	4	○
PM-4EFP-D20.0	20.0	20	30	60	19.5	150	4	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

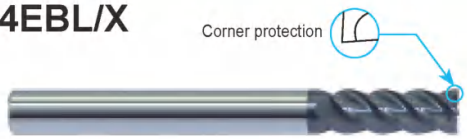
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

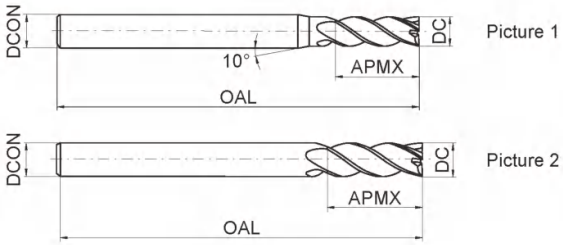
Code key B294
Graphics category and identification B295
Cutting parameters B563-B564
Non-standard customization B652-B653

4-flute flattened end mills with long shank



PM-4EBL/X





● PM-4E series with long shank.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
PM-4EBL-D3.0S	3.0	4	8	75	4	Picture 1	○
PM-4EBL-D3.0	3.0	6	8	75	4	Picture 1	○
PM-4EBL-D4.0S	4.0	4	11	75	4	Picture 2	○
PM-4EBL-D4.0	4.0	6	11	75	4	Picture 1	○
PM-4EBL-D6.0	6.0	6	16	75	4	Picture 2	○
PM-4EBX-D6.0	6.0	6	16	100	4	Picture 2	○
PM-4EBL-D8.0	8.0	8	20	75	4	Picture 2	○
PM-4EBX-D8.0	8.0	8	20	100	4	Picture 2	○
PM-4EBL-D10.0	10.0	10	25	100	4	Picture 2	○
PM-4EBX-D10.0	10.0	10	25	150	4	Picture 2	○
PM-4EBL-D12.0	12.0	12	30	100	4	Picture 2	○
PM-4EBX-D12.0	12.0	12	30	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

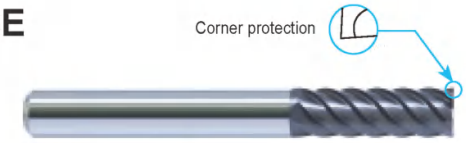
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

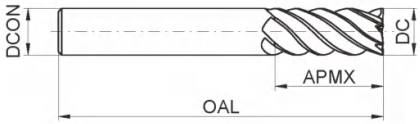
Code key B294
Graphics category and identification B295
Cutting parameters B561-B562
Non-standard customization B652-B653

6-flute flattened end mills with straight shank



PM-6E





- Perfect rigidity, very suitable for side finish machining.
- High speed, high feed rate machining applicable.



Type	Basic dimension(mm)				Number of teeth Z	Stock
	DC	DCON	APMX	OAL		
PM-6E-D6.0	6.0	6	18	60	6	○
PM-6E-D8.0	8.0	8	20	60	6	○
PM-6E-D10.0	10.0	10	30	75	6	○
PM-6E-D12.0	12.0	12	32	75	6	○
PM-6E-D16.0	16.0	16	40	100	6	○
PM-6E-D20.0	20.0	20	45	100	6	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

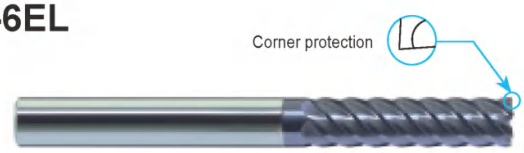
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

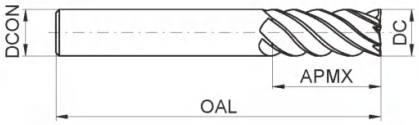
Code key B294
Graphics category and identification B295
Cutting parameters B565
Non-standard customization B652-B653

6-flute flattened end mills with straight shank and long cutting edge



PM-6EL





● PM-6E series with long cutting edge.



Type	Basic dimension(mm)				Number of teeth Z	Stock
	DC	DCON	APMX	OAL		
PM-6EL-D6.0	6.0	6	24	75	6	○
PM-6EL-D8.0	8.0	8	32	75	6	○
PM-6EL-D10.0	10.0	10	40	100	6	○
PM-6EL-D12.0	12.0	12	45	100	6	○
PM-6EL-D16.0	16.0	16	64	150	6	○
PM-6EL-D20.0	20.0	20	75	150	6	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B566
Non-standard customization B652-B653


Profile

Cavity

Ball nose slot

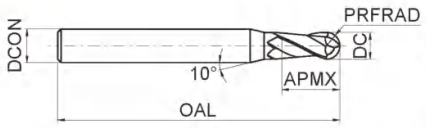
2-flute ball nose end mills with straight shank

PM-2B

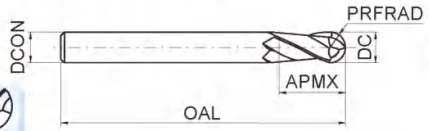


- For profile milling, high speed machining applicable.
- Wide application.

30° | Coated NaNo TiAlN | DC DC≤12 0~-0.020 12<DC 0~-0.030 | PRFRAD PRFRAD±0.01



Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
PM-2B-R0.5S	1.0	0.5	4	2	50	2	Picture 1	●
PM-2B-R0.5	1.0	0.5	6	2	50	2	Picture 1	●
PM-2B-R0.75S	1.5	0.75	4	3	50	2	Picture 1	●
PM-2B-R0.75	1.5	0.75	6	3	50	2	Picture 1	●
PM-2B-R1.0F	2.0	1.0	3	4	50	2	Picture 1	●
PM-2B-R1.0S	2.0	1.0	4	4	50	2	Picture 1	●
PM-2B-R1.0	2.0	1.0	6	4	50	2	Picture 1	●
PM-2B-R1.25F	2.5	1.25	3	5	50	2	Picture 1	○
PM-2B-R1.25S	2.5	1.25	4	5	50	2	Picture 1	●
PM-2B-R1.25	2.5	1.25	6	5	50	2	Picture 1	●
PM-2B-R1.5F	3.0	1.5	3	6	50	2	Picture 2	○
PM-2B-R1.5S	3.0	1.5	4	6	50	2	Picture 1	●
PM-2B-R1.5	3.0	1.5	6	6	50	2	Picture 1	●
PM-2B-R1.75S	3.5	1.75	4	8	50	2	Picture 1	○
PM-2B-R1.75	3.5	1.75	6	8	50	2	Picture 1	●
PM-2B-R2.0S	4.0	2.0	4	8	50	2	Picture 2	●
PM-2B-R2.0	4.0	2.0	6	8	50	2	Picture 1	●
PM-2B-R2.5	5.0	2.5	6	10	50	2	Picture 1	●
PM-2B-R2.75	5.5	2.75	6	12	50	2	Picture 1	●
PM-2B-R3.0	6.0	3.0	6	12	50	2	Picture 2	●
PM-2B-R3.5	7.0	3.5	8	14	60	2	Picture 1	●
PM-2B-R4.0	8.0	4.0	8	16	60	2	Picture 2	●
PM-2B-R4.5	9.0	4.5	10	18	75	2	Picture 1	●
PM-2B-R5.0	10.0	5.0	10	20	75	2	Picture 2	●
PM-2B-R6.0	12.0	6.0	12	24	75	2	Picture 2	●
PM-2B-R7.0	14.0	7.0	14	28	75	2	Picture 2	●
PM-2B-R8.0	16.0	8.0	16	32	100	2	Picture 2	●
PM-2B-R10.0	20.0	10.0	20	40	100	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294 | Graphics category and identification B295 | Cutting parameters B567-B568 | Non-standard customization B652-B653

2-flute ball nose end mills with long shank

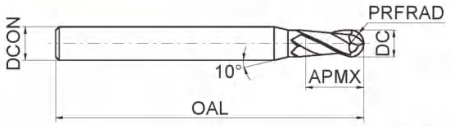

Profile


Cavity

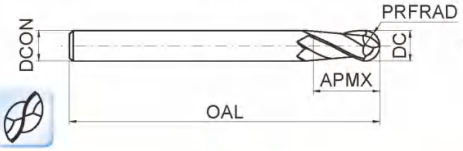

Ball nose slot

PM-2BL/M/X





Picture 1

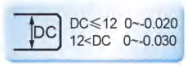


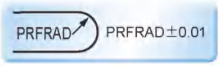
Picture 2

● PM-2B series with long shank.











Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
PM-2BL-R1.0S	2.0	1.0	4	4	75	2	Picture 1	○
PM-2BL-R1.0	2.0	1.0	6	4	75	2	Picture 1	○
PM-2BL-R1.25S	2.5	1.25	4	5	75	2	Picture 1	○
PM-2BL-R1.25	2.5	1.25	6	5	75	2	Picture 1	○
PM-2BL-R1.5S	3.0	1.5	4	6	75	2	Picture 1	○
PM-2BL-R1.5	3.0	1.5	6	6	75	2	Picture 1	○
PM-2BL-R1.75S	3.5	1.75	4	8	75	2	Picture 1	○
PM-2BL-R1.75	3.5	1.75	6	8	75	2	Picture 1	○
PM-2BL-R2.0S	4.0	2.0	4	8	75	2	Picture 2	○
PM-2BL-R2.0	4.0	2.0	6	8	75	2	Picture 1	○
PM-2BL-R2.5	5.0	2.5	6	10	75	2	Picture 1	○
PM-2BL-R2.75	5.5	2.75	6	12	75	2	Picture 1	○
PM-2BL-R3.0	6.0	3.0	6	12	75	2	Picture 2	○
PM-2BX-R3.0	6.0	3.0	6	12	100	2	Picture 2	○
PM-2BL-R3.5	7.0	3.5	8	14	75	2	Picture 1	○
PM-2BM-R4.0	8.0	4.0	8	16	75	2	Picture 2	○
PM-2BL-R4.0	8.0	4.0	8	16	100	2	Picture 2	○
PM-2BL-R4.5	9.0	4.5	10	18	100	2	Picture 1	○
PM-2BL-R5.0	10.0	5.0	10	20	100	2	Picture 2	○
PM-2BX-R5.0	10.0	5.0	10	20	150	2	Picture 2	○
PM-2BL-R6.0	12.0	6.0	12	24	100	2	Picture 2	○
PM-2BX-R6.0	12.0	6.0	12	24	150	2	Picture 2	○
PM-2BL-R7.0	14.0	7.0	14	28	100	2	Picture 2	○
PM-2BL-R8.0	16.0	8.0	16	32	150	2	Picture 2	○
PM-2BL-R10.0	20.0	10.0	20	40	150	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B567-B568
Non-standard customization B652-B653

2-flute ball nose end mills with straight shank, long neck and short cutting edge


Profile


Cavity


Ball nose slot

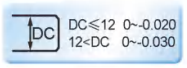
PM-2BFP

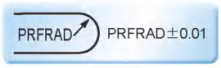


- High-rigidity short cutting edge, suitable for heavy cutting.

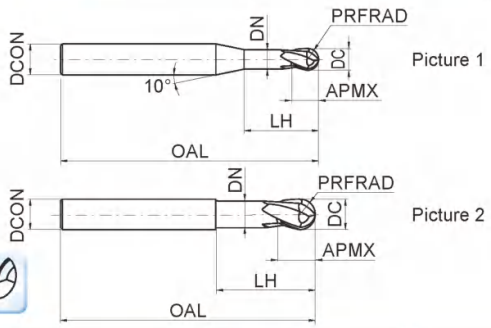












Type	Basic dimension(mm)							Number of teeth Z	Geometry	Stock
	DC	PRFRAD	APMX	DN	LH	DCON	OAL			
PM-2BFP-R0.5	1.0	0.5	1.0	0.95	2.5	6	75	2	Picture 1	○
PM-2BFP-R0.75	1.5	0.75	1.5	1.45	3.0	6	75	2	Picture 1	○
PM-2BFP-R1.0	2.0	1.0	2.0	1.95	4.0	6	75	2	Picture 1	○
PM-2BFP-R1.5	3.0	1.5	3.0	2.85	6.0	6	75	2	Picture 1	○
PM-2BFP-R2.0	4.0	2.0	4.0	3.85	8.0	6	75	2	Picture 1	○
PM-2BFP-R2.5	5.0	2.5	5.0	4.85	10.0	6	75	2	Picture 1	○
PM-2BFP-R3.0	6.0	3.0	6.0	5.8	12.0	6	75	2	Picture 2	○
PM-2BFP-R4.0	8.0	4.0	8.0	7.8	16.0	8	100	2	Picture 2	○
PM-2BFP-R5.0	10.0	5.0	10.0	9.6	20.0	10	100	2	Picture 2	○
PM-2BFP-R6.0	12.0	6.0	12.0	11.5	24.0	12	100	2	Picture 2	○
PM-2BFP-R8.0	16.0	8.0	16.0	15.5	32.0	16	150	2	Picture 2	○
PM-2BFP-R10.0	20.0	10.0	20.0	19.5	40.0	20	150	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294 Graphics category and identification B295 Cutting parameters B567-B568 Non-standard customization B652-B653

4-flute ball nose end mills with straight shank

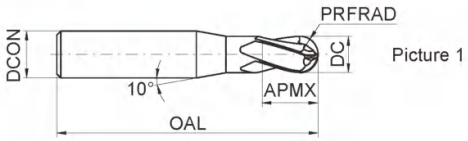

Profile


Cavity

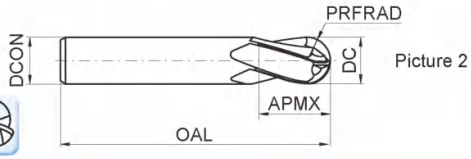

Ball nose slot

PM-4B





Picture 1

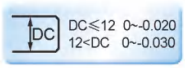


Picture 2

- 4-flute ball nose end mill can operate with higher feed speed and machining efficiency.











Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
PM-4B-R1.5	3.0	1.5	6	6	50	4	Picture 1	○
PM-4B-R2.0	4.0	2.0	6	8	50	4	Picture 1	○
PM-4B-R2.5	5.0	2.5	6	10	50	4	Picture 1	○
PM-4B-R3.0	6.0	3.0	6	12	50	4	Picture 2	○
PM-4B-R4.0	8.0	4.0	8	16	60	4	Picture 2	○
PM-4B-R5.0	10.0	5.0	10	20	75	4	Picture 2	○
PM-4B-R6.0	12.0	6.0	12	24	75	4	Picture 2	○
PM-4B-R7.0	14.0	7.0	14	28	75	4	Picture 2	○
PM-4B-R8.0	16.0	8.0	16	32	100	4	Picture 2	○
PM-4B-R9.0	18.0	9.0	18	36	100	4	Picture 2	○
PM-4B-R10.0	20.0	10.0	20	40	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B569
Non-standard customization B652-B653

4-flute ball nose end mills wit long shank


Profile


Cavity


Ball nose slot

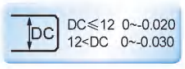
PM-4BL/M/X

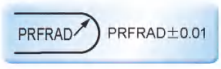


● PM-4B series with long shank.

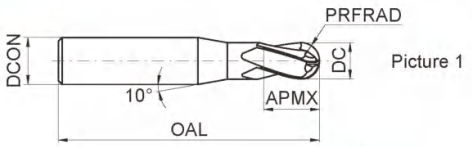




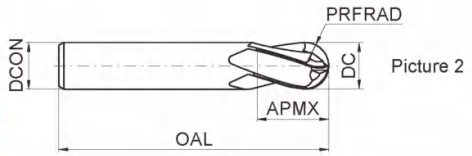








Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
PM-4BL-R1.5S	3.0	1.5	4	6	75	4	Picture 1	○
PM-4BL-R1.5	3.0	1.5	6	6	75	4	Picture 1	○
PM-4BL-R2.0S	4.0	2.0	4	8	75	4	Picture 2	○
PM-4BL-R2.0	4.0	2.0	6	8	75	4	Picture 1	○
PM-4BL-R2.5	5.0	2.5	6	10	75	4	Picture 1	○
PM-4BL-R3.0	6.0	3.0	6	12	75	4	Picture 2	○
PM-4BX-R3.0	6.0	3.0	6	12	100	4	Picture 2	○
PM-4BM-R4.0	8.0	4.0	8	16	75	4	Picture 2	○
PM-4BL-R4.0	8.0	4.0	8	16	100	4	Picture 2	○
PM-4BL-R5.0	10.0	5.0	10	20	100	4	Picture 2	○
PM-4BX-R5.0	10.0	5.0	10	20	150	4	Picture 2	○
PM-4BL-R6.0	12.0	6.0	12	24	100	4	Picture 2	○
PM-4BX-R6.0	12.0	6.0	12	24	150	4	Picture 2	○
PM-4BL-R7.0	14.0	7.0	14	28	100	4	Picture 2	○
PM-4BL-R8.0	16.0	8.0	16	32	150	4	Picture 2	○
PM-4BL-R9.0	18.0	9.0	18	36	150	4	Picture 2	○
PM-4BL-R10.0	20.0	10.0	20	40	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

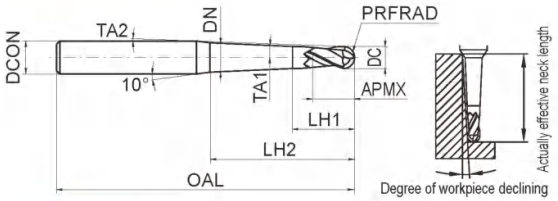
Code key B294
Graphics category and identification B295
Cutting parameters B569
Non-standard customization B652-B653

2-flute ball nose end mills with taper neck


Deep ball nose slot

PM-2BC





- High-rigidity taper neck structure.

30° | Coated NaNo TiAlN | DC 0~-0.015 | PRFRAD PRFRAD±0.005 PRFRAD±0.01 PRFRAD<0.5 PRFRAD≥0.5

Type	Basic dimension(mm)										Number of teeth Z	Degree of workpiece declining corresponding actually effective neck length				Stock
	DC	PRFRAD	TA1	APMX	LH2	LH1	TA2	DN	OAL	DCON		0.5°	1°	2°	3°	
PM-2BC05-R0.25-M03	0.5	0.25	0.5°	0.5	3	1.5	7.8°	0.49	50	4	2	3.3	3.5	3.9	4.4	○
PM-2BC05-R0.25-M05					5		6.8°	0.53			2	5.3	5.6	6.2	7.1	○
PM-2BC10-R0.25-M03			1.0°		3		7.8°	0.52			2	-	3.4	3.8	4.3	○
PM-2BC10-R0.25-M05					5		6.9°	0.59			2	-	5.4	6.0	6.8	○
PM-2BC15-R0.25-M03			1.5°		3		7.9°	0.54			2	-	-	3.7	4.1	○
PM-2BC15-R0.25-M05					5		7.0°	0.65			2	-	-	5.8	6.6	○
PM-2BC05-R0.30-M05	0.6	0.30	0.5°	0.6	5	1.6	6.8°	0.62	50	4	2	5.3	5.6	6.2	7.1	○
PM-2BC05-R0.30-M08					8		5.7°	0.68			2	8.3	8.7	9.8	11.1	○
PM-2BC10-R0.30-M05			1.0°		5		6.8°	0.68			2	-	5.4	6.0	6.8	○
PM-2BC10-R0.30-M08					8		5.8°	0.79			2	-	8.4	9.4	10.7	○
PM-2BC10-R0.30-M10					10		5.2°	0.86			2	-	10.4	11.6	13.2	○
PM-2BC10-R0.30-M12					12		4.8°	0.93			2	-	12.4	13.9	15.8	○
PM-2BC10-R0.30-M15					15		4.2°	1.03			2	-	15.4	17.2	19.6	○
PM-2BC15-R0.30-M05			1.5°		5		6.9°	0.74			2	-	-	5.8	6.6	○
PM-2BC15-R0.30-M08					8		5.9°	0.90			2	-	-	9.0	10.2	○
PM-2BC05-R0.40-M08	0.8	0.40	0.5°	0.8	8	1.8	5.5°	0.87	50	4	2	8.3	8.7	9.8	11.1	○
PM-2BC05-R0.40-M12					12		4.5°	0.94	60		2	12.3	13.0	14.5	16.5	○
PM-2BC10-R0.40-M08			1.0°		8		5.6°	0.98	50		2	-	8.4	9.4	10.7	○
PM-2BC10-R0.40-M12					12		4.6°	1.12	60		2	-	12.4	13.9	15.8	○
PM-2BC15-R0.40-M08			1.5°		8		5.8°	1.09	50		2	-	-	9.0	10.2	○
PM-2BC15-R0.40-M12					12		4.8°	1.30	60		2	-	-	13.2	15.0	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

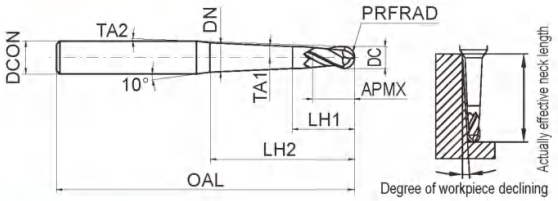
Code key B294 | Graphics category and identification B295 | Cutting parameters B570-B572 | Non-standard customization B652-B653

2-flute ball nose end mills with taper neck


Deep ball nose slot

PM-2BC





- High-rigidity taper neck structure.

30° | Coated NaNo TiAlN | DC 0~-0.015 | PRFRAD PRFRAD±0.005 PRFRAD<0.5 PRFRAD±0.01 PRFRAD≥0.5

Type	Basic dimension(mm)										Number of teeth Z	Degree of workpiece declining corresponding actually effective neck length				Stock
	DC	PRFRAD	TA1	APMX	LH2	LH1	TA2	DN	OAL	DCON		0.5°	1°	2°	3°	
PM-2BC05-R0.50-M10	1.0	0.50	0.5°	1.0	10	2.5	6.1°	1.08	60	6	2	10.4	10.9	12.2	13.9	○
PM-2BC05-R0.50-M15					15		5.1°	1.16	60		2	15.4	16.2	18.2	20.7	○
PM-2BC05-R0.50-M20					20		4.4°	1.25	70		2	20.4	21.5	24.1	27.4	○
PM-2BC05-R0.50-M25					25		3.8°	1.34	70		2	25.4	26.8	30.0	34.2	○
PM-2BC05-R0.50-M30					30		3.4°	1.42	70		2	30.4	32.0	35.9	41.0	○
PM-2BC10-R0.50-M10			1.0°		10		6.2°	1.21	60		2	-	10.5	11.8	13.4	○
PM-2BC10-R0.50-M15					15		5.2°	1.38	60		2	-	15.5	17.4	19.8	○
PM-2BC10-R0.50-M20					20		4.5°	1.56	70		2	-	20.5	23.0	26.2	○
PM-2BC10-R0.50-M25					25		3.9°	1.73	70		2	-	25.5	28.6	32.6	○
PM-2BC10-R0.50-M30					30		3.5°	1.91	70		2	-	30.5	34.2	39.0	○
PM-2BC10-R0.50-M35					35		3.2°	2.08	80		2	-	35.5	39.8	45.4	○
PM-2BC15-R0.50-M10			1.5°		10		6.3°	1.34	60		2	-	-	11.3	12.8	○
PM-2BC15-R0.50-M15					15		5.3°	1.60	60		2	-	-	16.6	18.9	○
PM-2BC15-R0.50-M20					20		4.6°	1.86	70		2	-	-	21.9	24.9	○
PM-2BC20-R0.50-M15			2°		15		5.4°	1.82	60		2	-	-	15.8	18.0	○
PM-2BC20-R0.50-M20					20		4.7°	2.17	70		2	-	-	20.8	23.7	○
PM-2BC30-R0.50-M20			3°		20		5.0°	2.78	70		2	-	-	-	21.2	○
PM-2BC50-R0.50-M20			5°		20		5.7°	4.01	70		2	-	-	-	-	○
PM-2BC05-R0.60-M12	1.2	0.60	0.5°	1.2	12	2.7	5.6°	1.31	60	6	2	12.4	13.1	14.6	16.6	○
PM-2BC05-R0.60-M24					24		3.8°	1.52	70		2	24.4	25.7	28.8	32.8	○
PM-2BC10-R0.60-M12			1.0°		12		5.7°	1.47	60		2	-	12.5	14.0	15.9	○
PM-2BC10-R0.60-M24					24		3.9°	1.89	70		2	-	24.5	27.5	31.3	○
PM-2BC15-R0.60-M12			1.5°		12		5.8°	1.63	60		2	-	-	13.4	15.2	○
PM-2BC15-R0.60-M24					24		4.1°	2.26	70		2	-	-	26.2	29.8	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

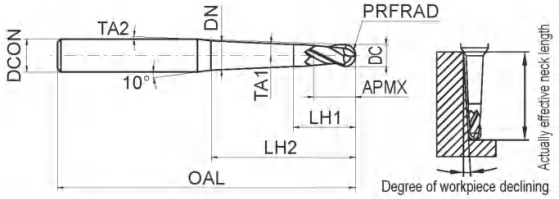
Code key B294 | Graphics category and identification B295 | Cutting parameters B570-B572 | Non-standard customization B652-B653

2-flute ball nose end mills with taper neck

Deep ball nose slot

PM-2BC





- High-rigidity taper neck structure.

30° | Coated NaNo TiAlN | DC 0~-0.015 | PRFRAD PRFRAD±0.005 PRFRAD<0.5 PRFRAD±0.01 PRFRAD≥0.5

Type	Basic dimension(mm)										Number of teeth Z	Degree of workpiece declining corresponding actually effective neck length				Stock
	DC	PRFRAD	TA1	APMX	LH2	LH1	TA2	DN	OAL	DCON		0.5°	1°	2°	3°	
PM-2BC05-R0.75-M10	1.5	0.75	0.5°	1.5	10	3	5.9°	1.57	60	6	2	10.4	10.9	12.2	13.8	○
PM-2BC05-R0.75-M15					15		4.9°	1.65	60		2	15.4	16.2	18.1	20.6	○
PM-2BC05-R0.75-M30					30		3.2°	1.92	70		2	30.4	32.0	35.9	40.9	○
PM-2BC10-R0.75-M10			1.0°		10		6.0°	1.69	60		2	-	10.5	11.8	13.3	○
PM-2BC10-R0.75-M15					15		5.0°	1.86	60		2	-	15.5	17.4	19.7	○
PM-2BC10-R0.75-M20					20		4.2°	2.04	70		2	-	20.5	23.0	26.1	○
PM-2BC10-R0.75-M30					30		3.3°	2.39	70		2	-	30.5	34.2	39.0	○
PM-2BC15-R0.75-M10			1.5°	1.5	10	3	6.1°	1.81	60	6	2	-	-	11.3	12.8	○
PM-2BC15-R0.75-M15					15		5.1°	2.07	60		2	-	-	16.6	18.9	○
PM-2BC15-R0.75-M30					30		3.4°	2.86	70		2	-	-	32.5	37.0	○
PM-2BC05-R1.0-M20	2.0	1.0	0.5°	2.0	20	4	3.9°	2.18	60	6	2	20.7	21.7	24.3	27.6	○
PM-2BC05-R1.0-M30					30		2.9°	2.36	70		2	30.7	32.3	36.2	non-interference	○
PM-2BC05-R1.0-M40					40		2.4°	2.53	80		2	40.7	42.8	48.0	non-interference	○
PM-2BC10-R1.0-M20			1.0°		20		4.0°	2.46	60		2	-	20.8	23.3	26.4	○
PM-2BC10-R1.0-M25					25		3.4°	2.64	60		2	-	25.8	28.9	32.9	○
PM-2BC10-R1.0-M30					30		3.0°	2.81	70		2	-	30.8	34.5	39.3	○
PM-2BC10-R1.0-M35					35		2.7°	2.99	80		2	-	35.8	40.1	non-interference	○
PM-2BC10-R1.0-M40					40		2.5°	3.16	80		2	-	40.8	45.8	non-interference	○
PM-2BC10-R1.0-M50					50		2.1°	3.51	90		2	-	50.8	57.0	non-interference	○
PM-2BC15-R1.0-M20			1.5°	2	20	4	4.1°	2.74	60	6	2	-	-	22.3	25.3	○
PM-2BC15-R1.0-M30					30		3.1°	3.27	70		2	-	-	32.9	37.4	○
PM-2BC15-R1.0-M40					40		2.6°	3.79	80		2	-	-	43.5	non-interference	○
PM-2BC20-R1.0-M30			2°		30		3.3°	3.72	70		2	-	-	31.3	35.5	○
PM-2BC20-R1.0-M40					40		2.7°	4.42	80		2	-	-	41.3	non-interference	○
PM-2BC30-R1.0-M30			3°		30		3.5°	4.63	70		2	-	-	-	31.8	○
PM-2BC30-R1.0-M40					40		2.9°	5.68	80		2	-	-	-	non-interference	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

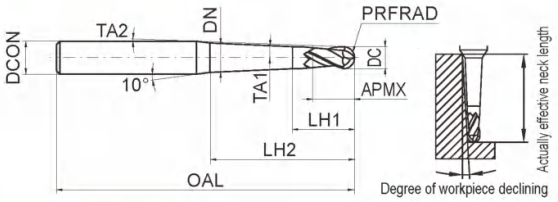
Code key B294 | Graphics category and identification B295 | Cutting parameters B570-B572 | Non-standard customization B652-B653

2-flute ball nose end mills with taper neck


Deep ball nose slot

PM-2BC





- High-rigidity taper neck structure.

30° | Coated NaNo TiAlN | DC 0~-0.015 | PRFRAD PRFRAD±0.005 PRFRAD<0.5 PRFRAD±0.01 PRFRAD≥0.5

Type	Basic dimension(mm)										Number of teeth Z	Degree of workpiece declining corresponding actually effective neck length				Stock
	DC	PRFRAD	TA1	APMX	LH2	LH1	TA2	DN	OAL	DCON		0.5°	1°	2°	3°	
PM-2BC05-R1.5-M30	3.0	1.5	0.5°	3	30	6	2.4°	3.32	70	6	2	30.7	32.3	36.2	non-interference	○
PM-2BC05-R1.5-M40					40		1.9°	3.50	80		2	40.7	42.9	non-interference	non-interference	○
PM-2BC05-R1.5-M50					50		1.6°	3.67	90		2	50.7	53.4	non-interference	non-interference	○
PM-2BC10-R1.5-M30			1.0°		30		2.5°	3.74	70		2	-	31.0	34.7	non-interference	○
PM-2BC10-R1.5-M40					40		2.0°	4.09	80		2	-	41.0	45.9	non-interference	○
PM-2BC10-R1.5-M50					50		1.7°	4.44	90		2	-	51.0	non-interference	non-interference	○
PM-2BC15-R1.5-M30			1.5°		30		2.6°	4.16	70		2	-	-	33.1	non-interference	○
PM-2BC15-R1.5-M40					40		2.1°	4.69	80		2	-	-	43.8	non-interference	○
PM-2BC15-R1.5-M50					50		1.7°	5.21	90		2	-	-	non-interference	non-interference	○
PM-2BC05-R2.0-M60	4.0	2.0	0.5°	4	60	7	1.0°	4.83	110	6	2	60.8	64.0	non-interference	non-interference	○
PM-2BC10-R2.0-M60			1.0°		60		1.0°	5.76	110		2	-	61.1	non-interference	non-interference	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

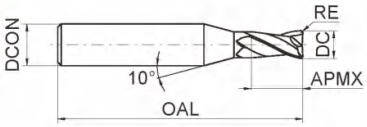
Code key B294 | Graphics category and identification B295 | Cutting parameters B570-B572 | Non-standard customization B652-B653

2-flute R end mills with straight shank

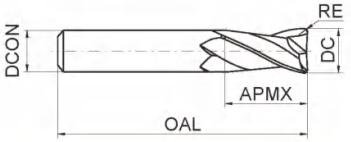
Radius shoulder | Profile | Radius corner slot

PM-2R





Picture 1



Picture 2

● Wide applications, applicable for several machining styles.



Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PM-2R-D1.0R0.2	1.0	0.2	4	3	50	2	Picture 1	○
PM-2R-D1.5R0.2	1.5	0.2	4	4	50	2	Picture 1	○
PM-2R-D2.0R0.2	2.0	0.2	4	6	50	2	Picture 1	○
PM-2R-D2.0R0.5	2.0	0.5	4	6	50	2	Picture 1	○
PM-2R-D2.5R0.2	2.5	0.2	4	8	50	2	Picture 1	○
PM-2R-D2.5R0.5	2.5	0.5	4	8	50	2	Picture 1	○
PM-2R-D3.0R0.2	3.0	0.2	4	8	50	2	Picture 1	○
PM-2R-D3.0R0.3	3.0	0.3	4	8	50	2	Picture 1	○
PM-2R-D3.0R0.5	3.0	0.5	4	8	50	2	Picture 1	○
PM-2R-D4.0R0.2	4.0	0.2	4	11	50	2	Picture 2	○
PM-2R-D4.0R0.3	4.0	0.3	4	11	50	2	Picture 2	○
PM-2R-D4.0R0.5	4.0	0.5	4	11	50	2	Picture 2	○
PM-2R-D4.0R1.0	4.0	1.0	4	11	50	2	Picture 2	○
PM-2R-D5.0R0.2	5.0	0.2	6	13	50	2	Picture 1	○
PM-2R-D5.0R0.3	5.0	0.3	6	13	50	2	Picture 1	○
PM-2R-D5.0R0.5	5.0	0.5	6	13	50	2	Picture 1	○
PM-2R-D5.0R1.0	5.0	1.0	6	13	50	2	Picture 1	○
PM-2R-D6.0R0.2	6.0	0.2	6	16	50	2	Picture 2	○
PM-2R-D6.0R0.3	6.0	0.3	6	16	50	2	Picture 2	○
PM-2R-D6.0R0.5	6.0	0.5	6	16	50	2	Picture 2	○
PM-2R-D6.0R1.0	6.0	1.0	6	16	50	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

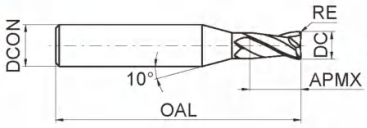
Code key B294 | Graphics category and identification B295 | Cutting parameters B573 | Non-standard customization B652-B653

2-flute R end mills with straight shank

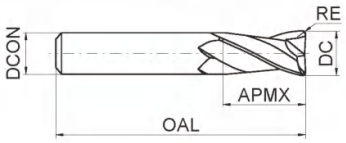
Radius shoulder | Profile | Radius corner slot

PM-2R





Picture 1



Picture 2

- Wide applications, applicable for several machining styles.



Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PM-2R-D8.0R0.3	8.0	0.3	8	20	60	2	Picture 2	○
PM-2R-D8.0R0.5	8.0	0.5	8	20	60	2	Picture 2	○
PM-2R-D8.0R1.0	8.0	1.0	8	20	60	2	Picture 2	○
PM-2R-D10.0R0.3	10.0	0.3	10	25	75	2	Picture 2	○
PM-2R-D10.0R0.5	10.0	0.5	10	25	75	2	Picture 2	○
PM-2R-D10.0R1.0	10.0	1.0	10	25	75	2	Picture 2	○
PM-2R-D10.0R1.5	10.0	1.5	10	25	75	2	Picture 2	○
PM-2R-D10.0R2.0	10.0	2.0	10	25	75	2	Picture 2	○
PM-2R-D12.0R0.3	12.0	0.3	12	30	75	2	Picture 2	○
PM-2R-D12.0R0.5	12.0	0.5	12	30	75	2	Picture 2	○
PM-2R-D12.0R1.0	12.0	1.0	12	30	75	2	Picture 2	○
PM-2R-D12.0R1.5	12.0	1.5	12	30	75	2	Picture 2	○
PM-2R-D12.0R2.0	12.0	2.0	12	30	75	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294 | Graphics category and identification B295 | Cutting parameters B573 | Non-standard customization B652-B653

4-flute R end mills with straight shank

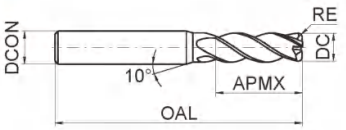

Radius shoulder


Profile

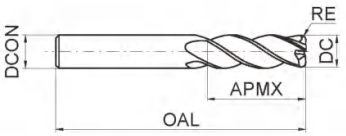

Radius corner slot

PM-4R





Picture 1

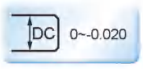


Picture 2

- Wide applications, applicable for several machining styles.









Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PM-4R-D1.0R0.2S	1.0	0.2	4	3	50	4	Picture 1	○
PM-4R-D1.5R0.2S	1.5	0.2	4	4	50	4	Picture 1	○
PM-4R-D2.0R0.2S	2.0	0.2	4	6	50	4	Picture 1	○
PM-4R-D2.0R0.2	2.0	0.2	6	6	50	4	Picture 1	○
PM-4R-D2.0R0.5S	2.0	0.5	4	6	50	4	Picture 1	○
PM-4R-D2.0R0.5	2.0	0.5	6	6	50	4	Picture 1	○
PM-4R-D2.5R0.2S	2.5	0.2	4	8	50	4	Picture 1	○
PM-4R-D2.5R0.2	2.5	0.2	6	8	50	4	Picture 1	○
PM-4R-D2.5R0.5S	2.5	0.5	4	8	50	4	Picture 1	○
PM-4R-D2.5R0.5	2.5	0.5	6	8	50	4	Picture 1	○
PM-4R-D3.0R0.2S	3.0	0.2	4	8	50	4	Picture 1	○
PM-4R-D3.0R0.2	3.0	0.2	6	8	50	4	Picture 1	●
PM-4R-D3.0R0.5S	3.0	0.5	4	8	50	4	Picture 1	○
PM-4R-D3.0R0.5	3.0	0.5	6	8	50	4	Picture 1	○
PM-4R-D4.0R0.2S	4.0	0.2	4	10	50	4	Picture 2	●
PM-4R-D4.0R0.2	4.0	0.2	6	10	50	4	Picture 1	○
PM-4R-D4.0R0.3S	4.0	0.3	4	10	50	4	Picture 2	●
PM-4R-D4.0R0.3	4.0	0.3	6	10	50	4	Picture 1	●
PM-4R-D4.0R0.5S	4.0	0.5	4	10	50	4	Picture 2	●
PM-4R-D4.0R0.5	4.0	0.5	6	10	50	4	Picture 1	●
PM-4R-D5.0R0.2	5.0	0.2	6	13	50	4	Picture 1	●
PM-4R-D5.0R0.3	5.0	0.3	6	13	50	4	Picture 1	●
PM-4R-D5.0R0.5	5.0	0.5	6	13	50	4	Picture 1	●
PM-4R-D5.0R1.0	5.0	1.0	6	13	50	4	Picture 1	●
PM-4R-D6.0R0.2	6.0	0.2	6	16	50	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

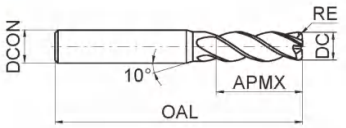
Code key B294
Graphics category and identification B295
Cutting parameters B574
Non-standard customization B652-B653

4-flute R end mills with straight shank

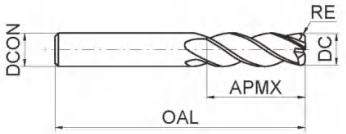
Radius shoulder | Profile | Radius corner slot

PM-4R





Picture 1



Picture 2

- Wide applications, applicable for several machining styles.

30° | Coated NaNo TiAlN | DC 0~-0.020

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PM-4R-D6.0R0.3	6.0	0.3	6	16	50	4	Picture 2	●
PM-4R-D6.0R0.5	6.0	0.5	6	16	50	4	Picture 2	●
PM-4R-D6.0R1.0	6.0	1.0	6	16	50	4	Picture 2	●
PM-4R-D8.0R0.2	8.0	0.2	8	20	60	4	Picture 2	●
PM-4R-D8.0R0.3	8.0	0.3	8	20	60	4	Picture 2	●
PM-4R-D8.0R0.5	8.0	0.5	8	20	60	4	Picture 2	●
PM-4R-D8.0R1.0	8.0	1.0	8	20	60	4	Picture 2	●
PM-4R-D10.0R0.2	10.0	0.2	10	25	75	4	Picture 2	●
PM-4R-D10.0R0.3	10.0	0.3	10	25	75	4	Picture 2	●
PM-4R-D10.0R0.5	10.0	0.5	10	25	75	4	Picture 2	●
PM-4R-D10.0R1.0	10.0	1.0	10	25	75	4	Picture 2	●
PM-4R-D10.0R2.0	10.0	2.0	10	25	75	4	Picture 2	●
PM-4R-D10.0R3.0	10.0	3.0	10	25	75	4	Picture 2	●
PM-4R-D12.0R0.2	12.0	0.2	12	30	75	4	Picture 2	●
PM-4R-D12.0R0.3	12.0	0.3	12	30	75	4	Picture 2	●
PM-4R-D12.0R0.5	12.0	0.5	12	30	75	4	Picture 2	●
PM-4R-D12.0R1.0	12.0	1.0	12	30	75	4	Picture 2	●
PM-4R-D12.0R2.0	12.0	2.0	12	30	75	4	Picture 2	●
PM-4R-D12.0R3.0	12.0	3.0	12	30	75	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294 | Graphics category and identification B295 | Cutting parameters B574 | Non-standard customization B652-B653

4-flute R end mills with long shank

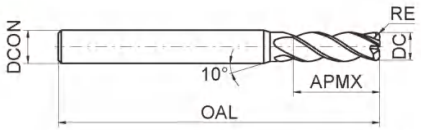
Radius shoulder | Profile | Radius corner slot

PM-4RBL/M/X

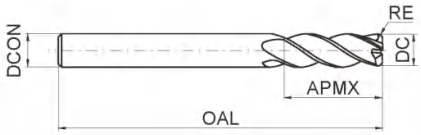


- PM-4R series with long shank.

30° | Coated NaNo TiAlN | DC 0~-0.020



Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PM-4RBL-D4.0R0.2S	4.0	0.2	4	10	75	4	Picture 2	●
PM-4RBL-D4.0R0.2	4.0	0.2	6	10	75	4	Picture 1	●
PM-4RBL-D4.0R0.5S	4.0	0.5	4	10	75	4	Picture 2	●
PM-4RBL-D4.0R0.5	4.0	0.5	6	10	75	4	Picture 1	●
PM-4RBL-D6.0R0.2	6.0	0.2	6	16	75	4	Picture 2	●
PM-4RBX-D6.0R0.2	6.0	0.2	6	16	100	4	Picture 2	●
PM-4RBL-D6.0R0.5	6.0	0.5	6	16	75	4	Picture 2	●
PM-4RBX-D6.0R0.5	6.0	0.5	6	16	100	4	Picture 2	●
PM-4RBL-D6.0R1.0	6.0	1.0	6	16	75	4	Picture 2	●
PM-4RBX-D6.0R1.0	6.0	1.0	6	16	100	4	Picture 2	●
PM-4RBM-D8.0R0.2	8.0	0.2	8	20	75	4	Picture 2	●
PM-4RBL-D8.0R0.2	8.0	0.2	8	20	100	4	Picture 2	●
PM-4RBM-D8.0R0.5	8.0	0.5	8	20	75	4	Picture 2	●
PM-4RBL-D8.0R0.5	8.0	0.5	8	20	100	4	Picture 2	●
PM-4RBM-D8.0R1.0	8.0	1.0	8	20	75	4	Picture 2	●
PM-4RBL-D8.0R1.0	8.0	1.0	8	20	100	4	Picture 2	●
PM-4RBL-D10.0R0.2	10.0	0.2	10	25	100	4	Picture 2	●
PM-4RBX-D10.0R0.2	10.0	0.2	10	25	150	4	Picture 2	●
PM-4RBL-D10.0R0.5	10.0	0.5	10	25	100	4	Picture 2	●
PM-4RBX-D10.0R0.5	10.0	0.5	10	25	150	4	Picture 2	●
PM-4RBL-D10.0R1.0	10.0	1.0	10	25	100	4	Picture 2	●
PM-4RBX-D10.0R1.0	10.0	1.0	10	25	150	4	Picture 2	●
PM-4RBL-D10.0R2.0	10.0	2.0	10	25	100	4	Picture 2	●
PM-4RBX-D10.0R2.0	10.0	2.0	10	25	150	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

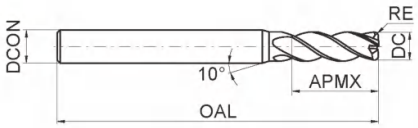
Code key B294 | Graphics category and identification B295 | Cutting parameters B574 | Non-standard customization B652-B653

4-flute R end mills with long shank

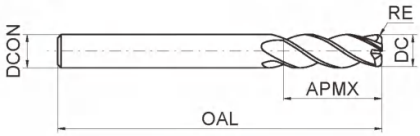
Radius shoulder | Profile | Radius corner slot

PM-4RBL/M/X





Picture 1



Picture 2

● PM-4R series with long shank.

30° | Coated NaNo TiAlN | DC 0~-0.020

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PM-4RBL-D12.0R0.2	12.0	0.2	12	30	100	4	Picture 2	●
PM-4RBX-D12.0R0.2	12.0	0.2	12	30	150	4	Picture 2	●
PM-4RBL-D12.0R0.5	12.0	0.5	12	30	100	4	Picture 2	●
PM-4RBX-D12.0R0.5	12.0	0.5	12	30	150	4	Picture 2	●
PM-4RBL-D12.0R1.0	12.0	1.0	12	30	100	4	Picture 2	●
PM-4RBX-D12.0R1.0	12.0	1.0	12	30	150	4	Picture 2	●
PM-4RBL-D12.0R2.0	12.0	2.0	12	30	100	4	Picture 2	●
PM-4RBX-D12.0R2.0	12.0	2.0	12	30	150	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

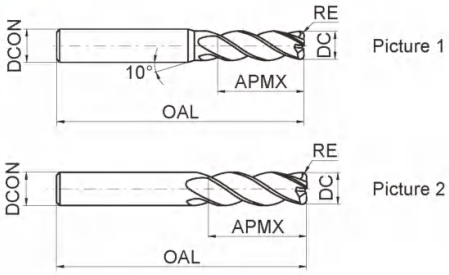
Code key B294 | Graphics category and identification B295 | Cutting parameters B574 | Non-standard customization B652-B653

4-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

PM-4R-H





Picture 1

Picture 2

● Wide applications, applicable for several machining styles.



Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PM-4R-D3.0R0.2F-H	3.0	0.2	3	8	50	4	Picture 2	●
PM-4R-D3.0R0.2S-H	3.0	0.2	4	8	50	4	Picture 1	●
PM-4R-D3.0R0.5F-H	3.0	0.5	3	8	50	4	Picture 2	●
PM-4R-D3.0R0.5S-H	3.0	0.5	4	8	50	4	Picture 1	●
PM-4R-D3.5R0.2S-H	3.5	0.2	4	10	50	4	Picture 1	●
PM-4R-D3.5R0.5S-H	3.5	0.5	4	10	50	4	Picture 1	●
PM-4R-D4.0R0.2S-H	4.0	0.2	4	10	50	4	Picture 2	●
PM-4R-D4.0R0.2-H	4.0	0.2	6	10	50	4	Picture 1	●
PM-4R-D4.0R0.3S-H	4.0	0.3	4	10	50	4	Picture 2	●
PM-4R-D4.0R0.3-H	4.0	0.3	6	10	50	4	Picture 1	●
PM-4R-D4.0R0.5S-H	4.0	0.5	4	10	50	4	Picture 2	●
PM-4R-D4.0R0.5-H	4.0	0.5	6	10	50	4	Picture 1	●
PM-4R-D5.0R0.2-H	5.0	0.2	6	13	50	4	Picture 1	●
PM-4R-D5.0R0.3-H	5.0	0.3	6	13	50	4	Picture 1	●
PM-4R-D5.0R0.5-H	5.0	0.5	6	13	50	4	Picture 1	●
PM-4R-D5.0R1.0-H	5.0	1.0	6	13	50	4	Picture 1	●
PM-4R-D6.0R0.2-H	6.0	0.2	6	16	50	4	Picture 2	●
PM-4R-D6.0R0.3-H	6.0	0.3	6	16	50	4	Picture 2	●
PM-4R-D6.0R0.5-H	6.0	0.5	6	16	50	4	Picture 2	●
PM-4R-D6.0R1.0-H	6.0	1.0	6	16	50	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294 | Graphics category and identification B295 | Cutting parameters B574 | Non-standard customization B652-B653

4-flute R end mills with straight shank

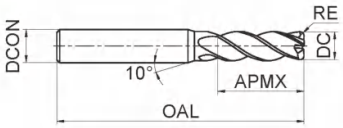

Radius shoulder


Profile

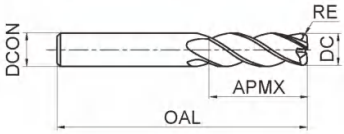

Radius corner slot

PM-4R-H





Picture 1

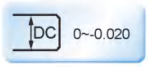


Picture 2

● Wide applications, applicable for several machining styles.









Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PM-4R-D8.0R0.3-H	8.0	0.3	8	20	60	4	Picture 2	●
PM-4R-D8.0R0.5-H	8.0	0.5	8	20	60	4	Picture 2	●
PM-4R-D8.0R1.0-H	8.0	1.0	8	20	60	4	Picture 2	●
PM-4R-D10.0R0.3-H	10.0	0.3	10	25	75	4	Picture 2	●
PM-4R-D10.0R0.5-H	10.0	0.5	10	25	75	4	Picture 2	●
PM-4R-D10.0R1.0-H	10.0	1.0	10	25	75	4	Picture 2	●
PM-4R-D10.0R2.0-H	10.0	2.0	10	25	75	4	Picture 2	●
PM-4R-D10.0R3.0-H	10.0	3.0	10	25	75	4	Picture 2	●
PM-4R-D12.0R0.3-H	12.0	0.3	12	30	75	4	Picture 2	●
PM-4R-D12.0R0.5-H	12.0	0.5	12	30	75	4	Picture 2	●
PM-4R-D12.0R1.0-H	12.0	1.0	12	30	75	4	Picture 2	●
PM-4R-D12.0R2.0-H	12.0	2.0	12	30	75	4	Picture 2	●
PM-4R-D12.0R3.0-H	12.0	3.0	12	30	75	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B574
Non-standard customization B652-B653

4-flute R end mills with long shank

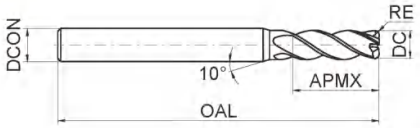
Radius shoulder | Profile | Radius corner slot

PM-4RBL/M/X-H

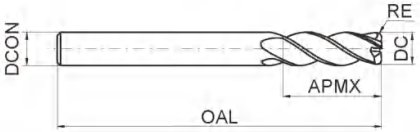


- PM-4R-H series with long shank.

38° | Coated NaNo TiAlN | DC 0~-0.020



Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
PM-4RBL-D4.0R0.2S-H	4.0	0.2	4	10	75	4	Picture 2	●
PM-4RBL-D4.0R0.2-H	4.0	0.2	6	10	75	4	Picture 1	●
PM-4RBL-D4.0R0.5S-H	4.0	0.5	4	10	75	4	Picture 2	●
PM-4RBL-D4.0R0.5-H	4.0	0.5	6	10	75	4	Picture 1	●
PM-4RBL-D6.0R0.2-H	6.0	0.2	6	16	75	4	Picture 2	●
PM-4RBX-D6.0R0.2-H	6.0	0.2	6	16	100	4	Picture 2	●
PM-4RBL-D6.0R0.5-H	6.0	0.5	6	16	75	4	Picture 2	●
PM-4RBX-D6.0R0.5-H	6.0	0.5	6	16	100	4	Picture 2	●
PM-4RBL-D6.0R1.0-H	6.0	1.0	6	16	75	4	Picture 2	●
PM-4RBX-D6.0R1.0-H	6.0	1.0	6	16	100	4	Picture 2	●
PM-4RBM-D8.0R0.2-H	8.0	0.2	8	20	75	4	Picture 2	●
PM-4RBL-D8.0R0.2-H	8.0	0.2	8	20	100	4	Picture 2	●
PM-4RBM-D8.0R0.5-H	8.0	0.5	8	20	75	4	Picture 2	●
PM-4RBL-D8.0R0.5-H	8.0	0.5	8	20	100	4	Picture 2	●
PM-4RBM-D8.0R1.0-H	8.0	1.0	8	20	75	4	Picture 2	●
PM-4RBL-D8.0R1.0-H	8.0	1.0	8	20	100	4	Picture 2	●
PM-4RBL-D10.0R0.2-H	10.0	0.2	10	25	100	4	Picture 2	●
PM-4RBX-D10.0R0.2-H	10.0	0.2	10	25	150	4	Picture 2	●
PM-4RBL-D10.0R0.5-H	10.0	0.5	10	25	100	4	Picture 2	●
PM-4RBX-D10.0R0.5-H	10.0	0.5	10	25	150	4	Picture 2	●
PM-4RBL-D10.0R1.0-H	10.0	1.0	10	25	100	4	Picture 2	●
PM-4RBX-D10.0R1.0-H	10.0	1.0	10	25	150	4	Picture 2	●
PM-4RBL-D10.0R2.0-H	10.0	2.0	10	25	100	4	Picture 2	●
PM-4RBX-D10.0R2.0-H	10.0	2.0	10	25	150	4	Picture 2	●
PM-4RBL-D12.0R0.5-H	12.0	0.5	12	30	100	4	Picture 2	●
PM-4RBX-D12.0R0.5-H	12.0	0.5	12	30	150	4	Picture 2	●
PM-4RBL-D12.0R1.0-H	12.0	1.0	12	30	100	4	Picture 2	●
PM-4RBX-D12.0R1.0-H	12.0	1.0	12	30	150	4	Picture 2	●
PM-4RBL-D12.0R2.0-H	12.0	2.0	12	30	100	4	Picture 2	●
PM-4RBX-D12.0R2.0-H	12.0	2.0	12	30	150	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

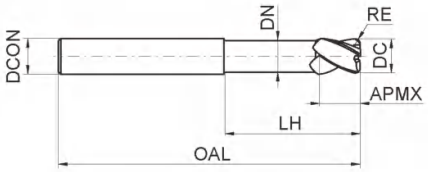
Code key B294 | Graphics category and identification B295 | Cutting parameters B574 | Non-standard customization B652-B653

4-flute R end mills with straight shank, long neck and short cutting edge

Radius shoulder Profile Radius corner slot

PM-4RFP





- Long shank and short cutting edge designed for deep cavity milling.

30° Coated NaNo TiAlN DC DC≤12 0~-0.020 12<DC 0~-0.030

Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	RE	DCON	DN	APMX	LH	OAL		
PM-4RFP-D6.0R0.2	6.0	0.2	6	5.8	6	18	75	4	○
PM-4RFP-D6.0R0.5	6.0	0.5	6	5.8	6	18	75	4	○
PM-4RFP-D6.0R1.0	6.0	1.0	6	5.8	6	18	75	4	○
PM-4RFP-D8.0R0.2	8.0	0.2	8	7.8	8	24	100	4	○
PM-4RFP-D8.0R0.5	8.0	0.5	8	7.8	8	24	100	4	○
PM-4RFP-D8.0R1.0	8.0	1.0	8	7.8	8	24	100	4	○
PM-4RFP-D10.0R0.2	10.0	0.2	10	9.6	10	30	100	4	○
PM-4RFP-D10.0R0.5	10.0	0.5	10	9.6	10	30	100	4	○
PM-4RFP-D10.0R1.0	10.0	1.0	10	9.6	10	30	100	4	○
PM-4RFP-D10.0R2.0	10.0	2.0	10	9.6	10	30	100	4	○
PM-4RFP-D12.0R0.2	12.0	0.2	12	11.5	12	36	100	4	○
PM-4RFP-D12.0R0.5	12.0	0.5	12	11.5	12	36	100	4	○
PM-4RFP-D12.0R1.0	12.0	1.0	12	11.5	12	36	100	4	○
PM-4RFP-D12.0R2.0	12.0	2.0	12	11.5	12	36	100	4	○
PM-4RFP-D16.0R0.2	16.0	0.2	16	15.5	16	40	150	4	○
PM-4RFP-D16.0R1.0	16.0	1.0	16	15.5	16	40	150	4	○
PM-4RFP-D16.0R2.0	16.0	2.0	16	15.5	16	40	150	4	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

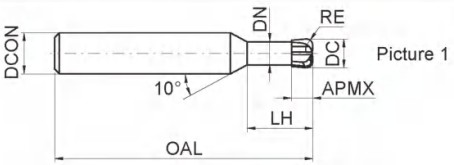
Code key B294 Graphics category and identification B295 Cutting parameters B574 Non-standard customization B652-B653

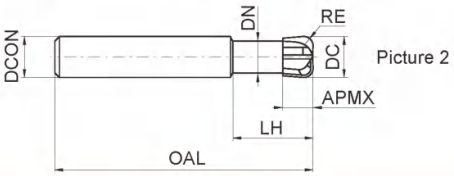
4-flute end mills with high feed rate

Radius shoulder | Profile | Radius corner slot

PM-4H







- High-rigidity short cutting edge, suitable for machining with high feed rate.

Coated NaNo TiAlN | DC 0~-0.030

Type	Basic dimension(mm)							Number of teeth Z	Geometry	Stock
	DC	RE	DCON	DN	APMX	LH	OAL			
PM-4H-D3.0R0.8	3.0	0.8	6	2.7	1.2	8.0	50	4	Picture 1	○
PM-4H-D4.0R1.0	4.0	1.0	6	3.6	1.6	10.0	50	4	Picture 1	○
PM-4H-D5.0R1.2	5.0	1.2	6	4.5	2.0	12.5	50	4	Picture 1	○
PM-4H-D6.0R1.0	6.0	1.0	6	5.4	2.5	12.0	50	4	Picture 2	○
PM-4H-D6.0R1.5	6.0	1.5	6	5.4	2.5	12.0	50	4	Picture 2	○
PM-4H-D8.0R1.0	8.0	1.0	8	7.0	3.5	16.0	60	4	Picture 2	○
PM-4H-D8.0R2.0	8.0	2.0	8	7.0	3.5	16.0	60	4	Picture 2	○
PM-4H-D10.0R1.0	10.0	1.0	10	9.0	4.0	20.0	75	4	Picture 2	○
PM-4H-D10.0R2.0	10.0	2.0	10	9.0	4.0	20.0	75	4	Picture 2	○
PM-4H-D12.0R2.0	12.0	2.0	12	11.0	5.0	24.0	75	4	Picture 2	○
PM-4H-D12.0R3.0	12.0	3.0	12	11.0	5.0	24.0	75	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294 | Graphics category and identification B295 | Cutting parameters B575-B576 | Non-standard customization B652-B653

4-flute end mills with high feed rate

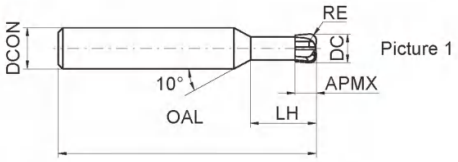

Radius shoulder

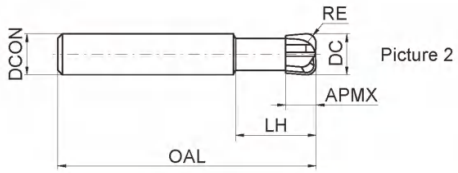
Profile

Radius corner slot

PM-4HL

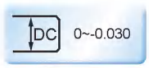






- PM-4H series with long shank.







Type	Basic dimension(mm)							Number of teeth Z	Geometry	Stock
	DC	RE	DCON	d_1	APMX	LH	OAL			
PM-4HL-D4.0R1.0	4.0	1.0	6	3.6	1.6	10.0	75	4	Picture 1	○
PM-4HL-D5.0R1.2	5.0	1.2	6	4.5	2.0	12.5	75	4	Picture 1	○
PM-4HL-D6.0R1.0	6.0	1.0	6	5.4	2.5	12.0	75	4	Picture 2	○
PM-4HL-D6.0R1.5	6.0	1.5	6	5.4	2.5	12.0	75	4	Picture 2	○
PM-4HL-D8.0R1.0	8.0	1.0	8	7.0	3.5	16.0	100	4	Picture 2	○
PM-4HL-D8.0R2.0	8.0	2.0	8	7.0	3.5	16.0	100	4	Picture 2	○
PM-4HL-D10.0R1.0	10.0	1.0	10	9.0	4.0	20.0	100	4	Picture 2	○
PM-4HL-D10.0R2.0	10.0	2.0	10	9.0	4.0	20.0	100	4	Picture 2	○
PM-4HL-D12.0R2.0	12.0	2.0	12	11.0	5.0	24.0	100	4	Picture 2	○
PM-4HL-D12.0R3.0	12.0	3.0	12	11.0	5.0	24.0	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

Code key B294
Graphics category and identification B295
Cutting parameters B575-B576
Non-standard customization B652-B653



GM series general end mills

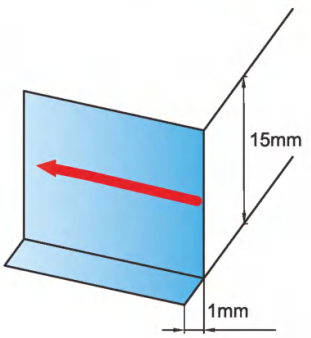
Wide application High efficiency machining can be achieved ranging from common steel to pre-hardened steel machining.

Optimized structure Appropriate combination of sharp cutting edge and tool strength makes cutting easier and faster, extending tool life.

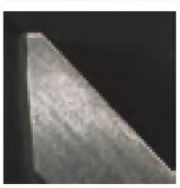
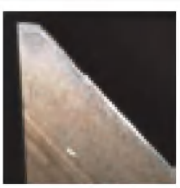
Versatile product series Suitable for rough machining with high metal removal rate to finish machining with high surface quality.

Complete diameter range Minimum diameter of 0.3mm for machining of the smallest parts.

Tool type: GM-4E-D10.0
Dimensions: Ø10.0mm
Workpiece material: NAK80(40HRC)
Rotating speed: 3200r/min(100m/min)
Feed rate: 640mm/min(0.2mm/r)
Axial cutting depth: a_p=15mm
Radial cutting depth: a_e=1.0mm
Cutting style: side milling (down milling)
Cooling system: air blow
Machine tool: MIKRON UCP 1000



Cutting edge abrasion and workpiece surface quality

End mill	GM-4E-D10.0	Similar product of company A	Similar product of company B
Cutting length	60m	20m	60m
Cutting edge abrasion			
Workpiece surface quality			



Excellent performance, super cost-effective!

The series is further completed specification, which better meet various machining needs.

Flattened end mills series with sharp corner or corner protection

GM-2E(Corner protection)



GM-□E

GM-2F(Sharp)



GM-□F

4-flute unequal helical angle flattened end mills

(30° or 45° helical angle end mills for various work conditions and machined materials)



GM-4E-G



GM-4E

Super short flutes and long neck series

(provide various kinds neck length end mills for cavity, straight slot, etc., work conditions)



GM-□EFP



GM-2BFP

Super long flutes series

(Only one step for high side wall machining, without cutting steps mark)



GM-2EX



GM-4EX－G

3-flute flattened end mills

(3-flute flattened end mills with excellent vibration resistance, which are available to realize sloting, side milling, etc., various machining processing.)



GM-3E



GM-3EL

Long shank series

(suitable for deep cavity machining)



GM-2EBL/X

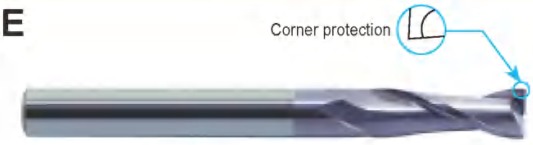


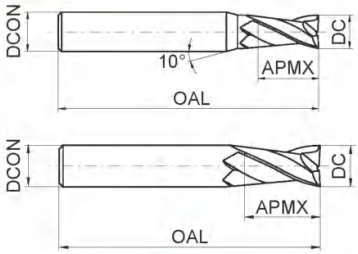
GM-4EBL/X

2-flute flattened end mills with straight shank



GM-2E





- Very suitable for slot milling.
- Wide application.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DOCN	APMX	OAL			
GM-2E-D1.0F	1.0	3	3	50	2	Picture 1	○
GM-2E-D1.0S	1.0	4	3	50	2	Picture 1	●
GM-2E-D1.0	1.0	6	3	50	2	Picture 1	●
GM-2E-D1.5F	1.5	3	4	50	2	Picture 1	○
GM-2E-D1.5S	1.5	4	4	50	2	Picture 1	●
GM-2E-D1.5	1.5	6	4	50	2	Picture 1	●
GM-2E-D2.0F	2.0	3	6	50	2	Picture 1	○
GM-2E-D2.0S	2.0	4	6	50	2	Picture 1	●
GM-2E-D2.0	2.0	6	6	50	2	Picture 1	●
GM-2E-D2.5S	2.5	4	8	50	2	Picture 1	●
GM-2E-D2.5	2.5	6	8	50	2	Picture 1	●
GM-2E-D3.0F	3.0	3	8	50	2	Picture 2	○
GM-2E-D3.0S	3.0	4	8	50	2	Picture 1	●
GM-2E-D3.0	3.0	6	8	50	2	Picture 1	●
GM-2E-D3.5S	3.5	4	10	50	2	Picture 1	○
GM-2E-D3.5	3.5	6	10	50	2	Picture 1	●
GM-2E-D4.0S	4.0	4	11	50	2	Picture 2	●
GM-2E-D4.0	4.0	6	11	50	2	Picture 1	●
GM-2E-D4.5	4.5	6	11	50	2	Picture 1	●
GM-2E-D5.0	5.0	6	13	50	2	Picture 1	●
GM-2E-D5.5	5.5	6	16	50	2	Picture 1	●
GM-2E-D6.0	6.0	6	16	50	2	Picture 2	●
GM-2E-D7.0	7.0	8	20	60	2	Picture 1	●
GM-2E-D8.0	8.0	8	20	60	2	Picture 2	●
GM-2E-D9.0	9.0	10	22	75	2	Picture 1	●
GM-2E-D10.0	10.0	10	25	75	2	Picture 2	●
GM-2E-D11.0	11.0	12	26	75	2	Picture 1	●
GM-2E-D12.0	12.0	12	30	75	2	Picture 2	●
GM-2E-D14.0	14.0	14	32	75	2	Picture 2	●
GM-2E-D16.0	16.0	16	45	100	2	Picture 2	●
GM-2E-D18.0	18.0	18	45	100	2	Picture 2	●
GM-2E-D20.0	20.0	20	45	100	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294
Graphics category and identification B295
Cutting parameters B577
Non-standard customization B652-B653

2-flute flattened end mills with straight shank

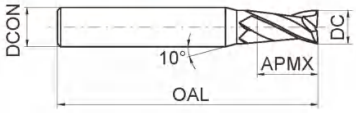


GM-2F

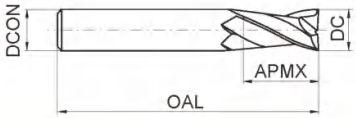


- Slot milling.
- Wide application.





Picture 1



Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-2F-D1.0S	1.0	4	3	50	2	Picture 1	○
GM-2F-D1.0	1.0	6	3	50	2	Picture 1	○
GM-2F-D1.5S	1.5	4	4	50	2	Picture 1	○
GM-2F-D1.5	1.5	6	4	50	2	Picture 1	○
GM-2F-D2.0S	2.0	4	6	50	2	Picture 1	○
GM-2F-D2.0	2.0	6	6	50	2	Picture 1	○
GM-2F-D2.5S	2.5	4	8	50	2	Picture 1	○
GM-2F-D2.5	2.5	6	8	50	2	Picture 1	○
GM-2F-D3.0S	3.0	4	8	50	2	Picture 1	○
GM-2F-D3.0	3.0	6	8	50	2	Picture 1	○
GM-2F-D3.5	3.5	6	10	50	2	Picture 1	○
GM-2F-D4.0S	4.0	4	11	50	2	Picture 2	○
GM-2F-D4.0	4.0	6	11	50	2	Picture 1	○
GM-2F-D4.5	4.5	6	11	50	2	Picture 1	○
GM-2F-D5.0	5.0	6	13	50	2	Picture 1	○
GM-2F-D5.5	5.5	6	16	50	2	Picture 1	○
GM-2F-D6.0	6.0	6	16	50	2	Picture 2	○
GM-2F-D7.0	7.0	8	20	60	2	Picture 1	○
GM-2F-D8.0	8.0	8	20	60	2	Picture 2	○
GM-2F-D9.0	9.0	10	22	75	2	Picture 1	○
GM-2F-D10.0	10.0	10	25	75	2	Picture 2	○
GM-2F-D11.0	11.0	12	26	75	2	Picture 1	○
GM-2F-D12.0	12.0	12	30	75	2	Picture 2	○
GM-2F-D14.0	14.0	14	32	75	2	Picture 2	○
GM-2F-D16.0	16.0	16	45	100	2	Picture 2	○
GM-2F-D18.0	18.0	18	45	100	2	Picture 2	○
GM-2F-D20.0	20.0	20	45	100	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

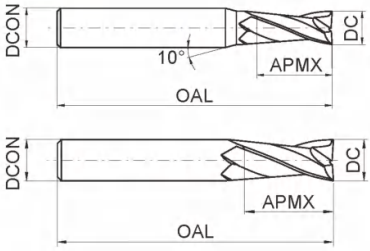
Code key B294
Graphics category and identification B295
Cutting parameters B578
Non-standard customization B652-B653

2-flute flattened end mills with straight shank and long cutting edge



GM-2EL





● GM-2E series with long cutting edge.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DOCN	APMX	OAL			
GM-2EL-D3.0	3.0	6	12	75	2	Picture 1	●
GM-2EL-D4.0	4.0	6	15	75	2	Picture 1	●
GM-2EL-D5.0	5.0	6	20	75	2	Picture 1	●
GM-2EL-D6.0	6.0	6	20	75	2	Picture 2	●
GM-2EL-D8.0	8.0	8	25	100	2	Picture 2	●
GM-2EL-D10.0	10.0	10	30	100	2	Picture 2	●
GM-2EL-D12.0	12.0	12	35	100	2	Picture 2	●
GM-2EL-D14.0	14.0	14	40	100	2	Picture 2	●
GM-2EL-D16.0	16.0	16	50	150	2	Picture 2	●
GM-2EL-D20.0	20.0	20	55	150	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294
Graphics category and identification B295
Cutting parameters B577
Non-standard customization B652-B653

2-flute flattened end mills with straight shank and long cutting edge

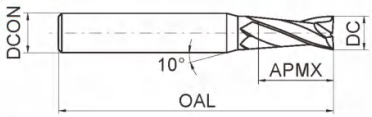


GM-2FL

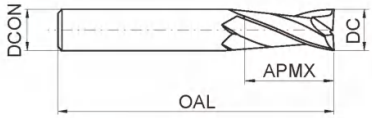


● GM-2F series with long cutting edge.





Picture 1



Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-2FL-D3.0	3.0	6	12	75	2	Picture 1	○
GM-2FL-D4.0	4.0	6	15	75	2	Picture 1	○
GM-2FL-D5.0	5.0	6	20	75	2	Picture 1	○
GM-2FL-D6.0	6.0	6	20	75	2	Picture 2	○
GM-2FL-D8.0	8.0	8	25	100	2	Picture 2	○
GM-2FL-D10.0	10.0	10	30	100	2	Picture 2	○
GM-2FL-D12.0	12.0	12	35	100	2	Picture 2	○
GM-2FL-D14.0	14.0	14	40	100	2	Picture 2	○
GM-2FL-D16.0	16.0	16	50	150	2	Picture 2	○
GM-2FL-D20.0	20.0	20	55	150	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

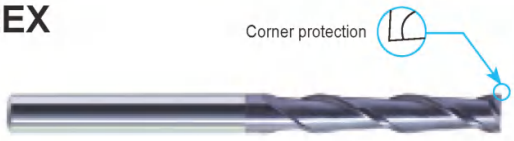
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

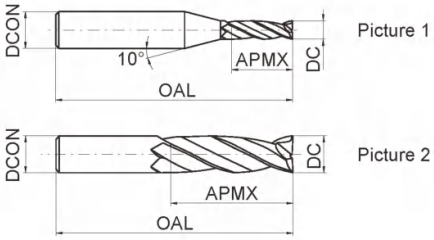
Code key B294
Graphics category and identification B295
Cutting parameters B578
Non-standard customization B652-B653

2-flute flattened end mills with straight shank and extra long cutting edge



GM-2EX





● Extra long cutting edge, for deep side wall machining.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-2EX-D3.0	3.0	6	20	75	2	Picture 1	○
GM-2EX-D4.0	4.0	6	25	75	2	Picture 1	○
GM-2EX-D5.0	5.0	6	30	75	2	Picture 1	○
GM-2EX-D6.0	6.0	6	30	75	2	Picture 2	○
GM-2EX-D8.0	8.0	8	40	100	2	Picture 2	○
GM-2EX-D10.0	10.0	10	50	110	2	Picture 2	○
GM-2EX-D12.0	12.0	12	50	110	2	Picture 2	○
GM-2EX-D16.0	16.0	16	70	150	2	Picture 2	○
GM-2EX-D20.0	20.0	20	75	150	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

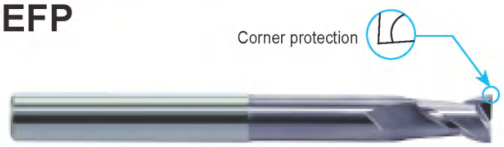
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

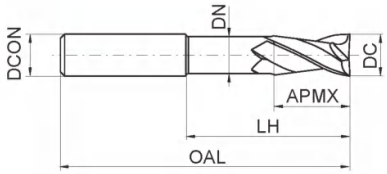
Code key B294
Graphics category and identification B295
Cutting parameters B579
Non-standard customization B652-B653

2-flute flattened end mills with straight shank, long neck and short cutting edge



GM-2EFP





● High-rigidity short cutting edge, suitable for heavy cutting and also deep cavity milling.



Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	DCON	APMX	LH	DN	OAL		
GM-2EFP-D6.0	6.0	6	9	30	5.8	75	2	○
GM-2EFP-D8.0	8.0	8	12	40	7.8	100	2	○
GM-2EFP-D10.0	10.0	10	15	50	9.6	100	2	○
GM-2EFP-D12.0	12.0	12	18	50	11.5	100	2	○
GM-2EFP-D16.0	16.0	16	24	50	15.5	150	2	○
GM-2EFP-D20.0	20.0	20	30	60	19.5	150	2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

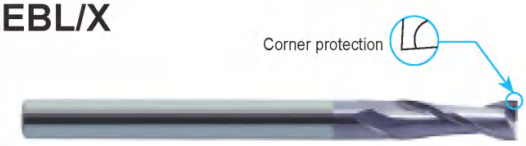
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294
Graphics category and identification B295
Cutting parameters B580
Non-standard customization B652-B653

2-flute flattened end mills with long shank

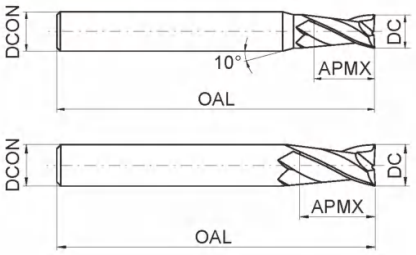


GM-2EBL/X



● GM-2E series with long shank.





Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DOCN	APMX	OAL			
GM-2EBL-D3.0S	3.0	4	8	75	2	Picture 1	○
GM-2EBL-D3.0	3.0	6	8	75	2	Picture 1	○
GM-2EBL-D4.0S	4.0	4	11	75	2	Picture 2	○
GM-2EBL-D4.0	4.0	6	11	75	2	Picture 1	○
GM-2EBL-D6.0	6.0	6	16	75	2	Picture 2	○
GM-2EBX-D6.0	6.0	6	16	100	2	Picture 2	○
GM-2EBL-D8.0	8.0	8	20	75	2	Picture 2	○
GM-2EBX-D8.0	8.0	8	20	100	2	Picture 2	○
GM-2EBL-D10.0	10.0	10	25	100	2	Picture 2	○
GM-2EBX-D10.0	10.0	10	25	150	2	Picture 2	○
GM-2EBL-D12.0	12.0	12	30	100	2	Picture 2	○
GM-2EBX-D12.0	12.0	12	30	150	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

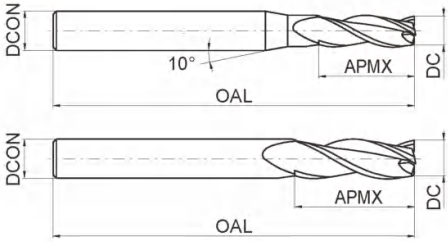
Code key B294
Graphics category and identification B295
Cutting parameters B577
Non-standard customization B652-B653

3-flute flattened end mills with straight shank



GM-3E





● Excellent vibration resistance, able to achieve various machining operations such as slot milling, side milling, drilling, etc.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-3E-D1.0F	1.0	3	3	50	3	Picture 1	○
GM-3E-D1.0S	1.0	4	3	50	3	Picture 1	○
GM-3E-D1.0	1.0	6	3	50	3	Picture 1	○
GM-3E-D1.5F	1.5	3	4	50	3	Picture 1	○
GM-3E-D1.5S	1.5	4	4	50	3	Picture 1	○
GM-3E-D1.5	1.5	6	4	50	3	Picture 1	○
GM-3E-D2.0F	2.0	3	6	50	3	Picture 1	○
GM-3E-D2.0S	2.0	4	6	50	3	Picture 1	○
GM-3E-D2.0	2.0	6	6	50	3	Picture 1	○
GM-3E-D2.5F	2.5	3	8	50	3	Picture 1	○
GM-3E-D2.5S	2.5	4	8	50	3	Picture 1	○
GM-3E-D2.5	2.5	6	8	50	3	Picture 1	○
GM-3E-D3.0F	3.0	3	8	50	3	Picture 2	○
GM-3E-D3.0S	3.0	4	8	50	3	Picture 1	○
GM-3E-D3.0	3.0	6	8	50	3	Picture 1	○
GM-3E-D3.5S	3.5	4	10	50	3	Picture 1	○
GM-3E-D3.5	3.5	6	10	50	3	Picture 1	○
GM-3E-D4.0S	4.0	4	11	50	3	Picture 2	○
GM-3E-D4.0	4.0	6	11	50	3	Picture 1	○
GM-3E-D4.5	4.5	6	11	50	3	Picture 1	○
GM-3E-D5.0	5.0	6	13	50	3	Picture 1	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294
Graphics category and identification B295
Cutting parameters B581
Non-standard customization B652-B653

3-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

GM-3E

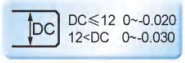
Corner protection



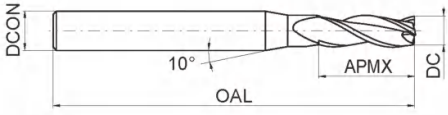
● Excellent vibration resistance, able to achieve various machining operations such as slot milling, side milling, drilling, etc.



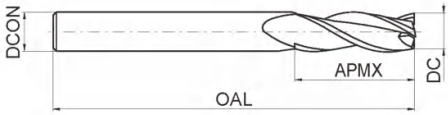








Picture 1



Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-3E-D5.5	5.5	6	16	50	3	Picture 1	○
GM-3E-D6.0	6.0	6	16	50	3	Picture 2	○
GM-3E-D7.0	7.0	8	20	60	3	Picture 1	○
GM-3E-D8.0	8.0	8	20	60	3	Picture 2	○
GM-3E-D9.0	9.0	10	22	75	3	Picture 1	○
GM-3E-D10.0	10.0	10	25	75	3	Picture 2	○
GM-3E-D11.0	11.0	12	26	75	3	Picture 1	○
GM-3E-D12.0	12.0	12	30	75	3	Picture 2	○
GM-3E-D14.0	14.0	14	32	75	3	Picture 2	○
GM-3E-D16.0	16.0	16	45	100	3	Picture 2	○
GM-3E-D18.0	18.0	18	45	100	3	Picture 2	○
GM-3E-D20.0	20.0	20	45	100	3	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

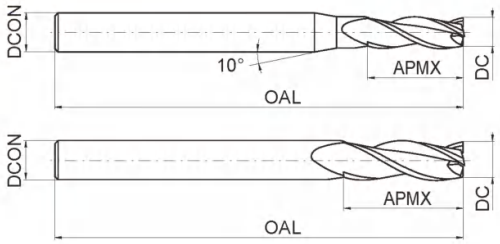
Code key B294
Graphics category and identification B295
Cutting parameters B581
Non-standard customization B652-B653

3-flute flattened end mills with straight shank and long cutting edge



GM-3EL





● GM-3E series with long cutting edge.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-3EL-D3.0	3.0	6	12	75	3	Picture 1	○
GM-3EL-D4.0	4.0	6	15	75	3	Picture 1	○
GM-3EL-D5.0	5.0	6	20	75	3	Picture 1	○
GM-3EL-D6.0	6.0	6	20	75	3	Picture 2	○
GM-3EL-D8.0	8.0	8	25	100	3	Picture 2	○
GM-3EL-D10.0	10.0	10	30	100	3	Picture 2	○
GM-3EL-D12.0	12.0	12	35	100	3	Picture 2	○
GM-3EL-D14.0	14.0	14	40	100	3	Picture 2	○
GM-3EL-D16.0	16.0	16	50	150	3	Picture 2	○
GM-3EL-D20.0	20.0	20	55	150	3	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294
Graphics category and identification B295
Cutting parameters B581
Non-standard customization B652-B653

4-flute flattened end mills with straight shank

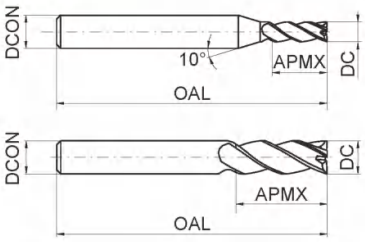

Side face


Step shoulder


Straight slot

GM-4E-G

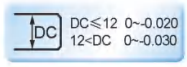




- Very suitable for side milling.
- Wide application.









Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-4E-D1.0F-G	1.0	3	3	50	4	Picture 1	○
GM-4E-D1.0S-G	1.0	4	3	50	4	Picture 1	●
GM-4E-D1.0-G	1.0	6	3	50	4	Picture 1	●
GM-4E-D1.5F-G	1.5	3	4	50	4	Picture 1	○
GM-4E-D1.5S-G	1.5	4	4	50	4	Picture 1	●
GM-4E-D1.5-G	1.5	6	4	50	4	Picture 1	●
GM-4E-D2.0F-G	2.0	3	6	50	4	Picture 1	○
GM-4E-D2.0S-G	2.0	4	6	50	4	Picture 1	●
GM-4E-D2.0-G	2.0	6	6	50	4	Picture 1	●
GM-4E-D2.5F-G	2.5	3	8	50	4	Picture 1	○
GM-4E-D2.5S-G	2.5	4	8	50	4	Picture 1	●
GM-4E-D2.5-G	2.5	6	8	50	4	Picture 1	●
GM-4E-D3.0F-G	3.0	3	8	50	4	Picture 2	○
GM-4E-D3.0S-G	3.0	4	8	50	4	Picture 1	●
GM-4E-D3.0-G	3.0	6	8	50	4	Picture 1	●
GM-4E-D3.5S-G	3.5	4	10	50	4	Picture 1	○
GM-4E-D3.5-G	3.5	6	10	50	4	Picture 1	●
GM-4E-D4.0S-G	4.0	4	11	50	4	Picture 2	●
GM-4E-D4.0-G	4.0	6	11	50	4	Picture 1	●
GM-4E-D4.5-G	4.5	6	11	50	4	Picture 1	●

● Stock available ○ Make-to-order

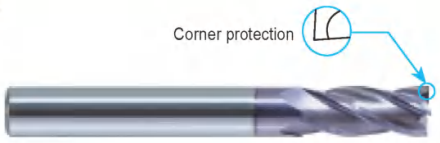
Applicable workpiece material table ◎Very suitable ○Suitable

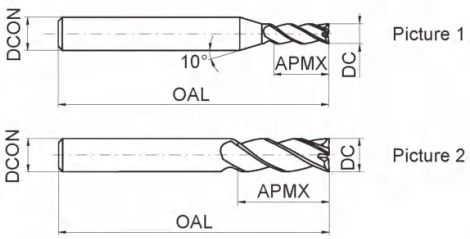
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294
Graphics category and identification B295
Cutting parameters B582
Non-standard customization B652-B653

4-flute flattened end mills with straight shank

GM-4E-G





- Very suitable for side milling.
- Wide application.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DOCN	APMX	OAL			
GM-4E-D5.0-G	5.0	6	13	50	4	Picture 1	●
GM-4E-D5.5-G	5.5	6	16	50	4	Picture 1	●
GM-4E-D6.0-G	6.0	6	16	50	4	Picture 2	●
GM-4E-D7.0-G	7.0	8	20	60	4	Picture 1	●
GM-4E-D8.0-G	8.0	8	20	60	4	Picture 2	●
GM-4E-D9.0-G	9.0	10	22	75	4	Picture 1	●
GM-4E-D10.0-G	10.0	10	25	75	4	Picture 2	●
GM-4E-D11.0-G	11.0	12	26	75	4	Picture 1	●
GM-4E-D12.0-G	12.0	12	30	75	4	Picture 2	●
GM-4E-D14.0-G	14.0	14	32	75	4	Picture 2	●
GM-4E-D16.0-G	16.0	16	45	100	4	Picture 2	●
GM-4E-D18.0-G	18.0	18	45	100	4	Picture 2	●
GM-4E-D20.0-G	20.0	20	45	100	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

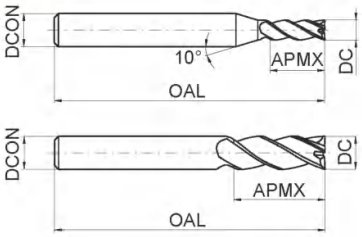
Code key B294
Graphics category and identification B295
Cutting parameters B582
Non-standard customization B652-B653

4-flute unequal pitch flattened end mills with straight shank



GM-4F-G





- Very suitable for side milling.
- Wide application.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-4F-D1.0S-G	1.0	4	3	50	4	Picture 1	○
GM-4F-D1.0-G	1.0	6	3	50	4	Picture 1	○
GM-4F-D1.5S-G	1.5	4	4	50	4	Picture 1	○
GM-4F-D1.5-G	1.5	6	4	50	4	Picture 1	○
GM-4F-D2.0S-G	2.0	4	6	50	4	Picture 1	○
GM-4F-D2.0-G	2.0	6	6	50	4	Picture 1	○
GM-4F-D2.5S-G	2.5	4	8	50	4	Picture 1	○
GM-4F-D2.5-G	2.5	6	8	50	4	Picture 1	○
GM-4F-D3.0S-G	3.0	4	8	50	4	Picture 1	○
GM-4F-D3.0-G	3.0	6	8	50	4	Picture 1	○
GM-4F-D3.5-G	3.5	6	10	50	4	Picture 1	○
GM-4F-D4.0S-G	4.0	4	11	50	4	Picture 2	○
GM-4F-D4.0-G	4.0	6	11	50	4	Picture 1	○
GM-4F-D4.5-G	4.5	6	11	50	4	Picture 1	○
GM-4F-D5.0-G	5.0	6	13	50	4	Picture 1	○
GM-4F-D5.5-G	5.5	6	16	50	4	Picture 1	○
GM-4F-D6.0-G	6.0	6	16	50	4	Picture 2	○
GM-4F-D7.0-G	7.0	8	20	60	4	Picture 1	○
GM-4F-D8.0-G	8.0	8	20	60	4	Picture 2	○
GM-4F-D9.0-G	9.0	10	22	75	4	Picture 1	○
GM-4F-D10.0-G	10.0	10	25	75	4	Picture 2	○
GM-4F-D11.0-G	11.0	12	26	75	4	Picture 1	○
GM-4F-D12.0-G	12.0	12	30	75	4	Picture 2	○
GM-4F-D14.0-G	14.0	14	32	75	4	Picture 2	○
GM-4F-D16.0-G	16.0	16	45	100	4	Picture 2	○
GM-4F-D18.0-G	18.0	18	45	100	4	Picture 2	○
GM-4F-D20.0-G	20.0	20	45	100	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

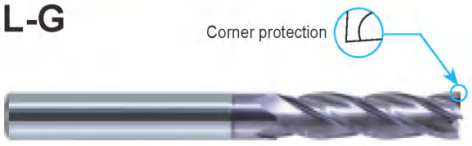
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294
Graphics category and identification B295
Cutting parameters B583
Non-standard customization B652-B653

4-flute flattened end mills with straight shank and long cutting edge

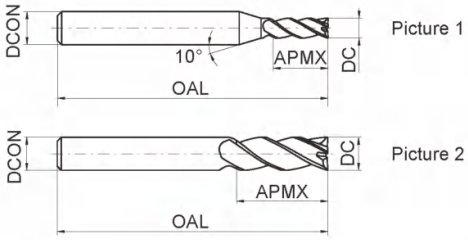


GM-4EL-G



● GM-4E-G series with long cutting edge.





Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-4EL-D3.0-G	3.0	6	12	75	4	Picture 1	○
GM-4EL-D4.0-G	4.0	6	15	75	4	Picture 1	○
GM-4EL-D5.0-G	5.0	6	20	75	4	Picture 1	○
GM-4EL-D6.0-G	6.0	6	20	75	4	Picture 2	○
GM-4EL-D8.0-G	8.0	8	25	100	4	Picture 2	○
GM-4EL-D10.0-G	10.0	10	30	100	4	Picture 2	○
GM-4EL-D12.0-G	12.0	12	35	100	4	Picture 2	○
GM-4EL-D14.0-G	14.0	14	40	100	4	Picture 2	○
GM-4EL-D16.0-G	16.0	16	50	150	4	Picture 2	○
GM-4EL-D20.0-G	20.0	20	55	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

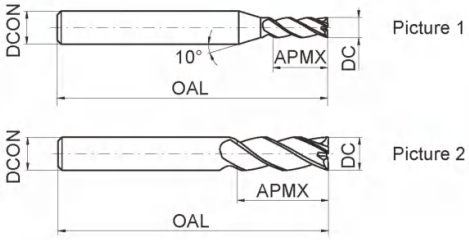
Code key B294
Graphics category and identification B295
Cutting parameters B582
Non-standard customization B652-B653

4-flute flattened end mills with straight shank and long cutting edge



GM-4FL-G





● GM-4FL-G series with long cutting edge.

30° | Coated TiAlN | DC DC≤12 0~-0.020 12<DC 0~-0.030

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-4FL-D3.0-G	3.0	6	12	75	4	Picture 1	○
GM-4FL-D4.0-G	4.0	6	15	75	4	Picture 1	○
GM-4FL-D5.0-G	5.0	6	20	75	4	Picture 1	○
GM-4FL-D6.0-G	6.0	6	20	75	4	Picture 2	○
GM-4FL-D8.0-G	8.0	8	25	100	4	Picture 2	○
GM-4FL-D10.0-G	10.0	10	30	100	4	Picture 2	○
GM-4FL-D12.0-G	12.0	12	35	100	4	Picture 2	○
GM-4FL-D14.0-G	14.0	14	40	100	4	Picture 2	○
GM-4FL-D16.0-G	16.0	16	50	150	4	Picture 2	○
GM-4FL-D20.0-G	20.0	20	55	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

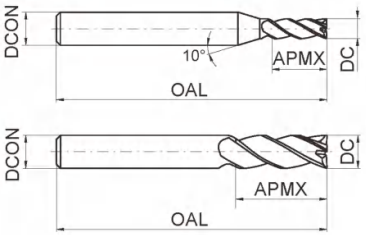
Code key B294 | Graphics category and identification B295 | Cutting parameters B583 | Non-standard customization B652-B653

4-flute flattened end mills with straight shank and extra long cutting edge



GM-4EX-G





● Extra long cutting edge, for deep side wall machining.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-4EX-D3.0-G	3.0	6	20	75	4	Picture 1	○
GM-4EX-D4.0-G	4.0	6	25	75	4	Picture 1	○
GM-4EX-D5.0-G	5.0	6	30	75	4	Picture 1	○
GM-4EX-D6.0-G	6.0	6	30	75	4	Picture 2	○
GM-4EX-D8.0-G	8.0	8	40	100	4	Picture 2	○
GM-4EX-D10.0-G	10.0	10	50	110	4	Picture 2	○
GM-4EX-D12.0-G	12.0	12	50	110	4	Picture 2	○
GM-4EX-D16.0-G	16.0	16	70	150	4	Picture 2	○
GM-4EX-D20.0-G	20.0	20	75	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

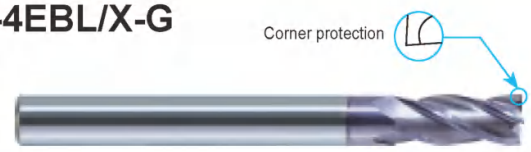
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

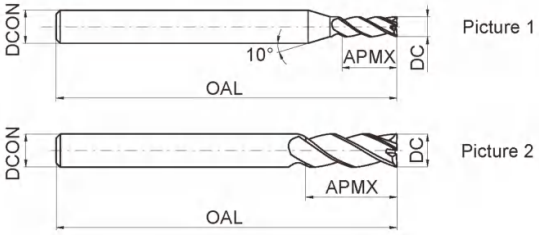
Code key B294
Graphics category and identification B295
Cutting parameters B584
Non-standard customization B652-B653

4-flute flattened end mills with long shank



GM-4EBL/X-G





● GM-4E-G series with long shank.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DOCN	APMX	OAL			
GM-4EBL-D3.0S-G	3.0	4	8	75	4	Picture 1	○
GM-4EBL-D3.0-G	3.0	6	8	75	4	Picture 1	○
GM-4EBL-D4.0S-G	4.0	4	11	75	4	Picture 2	○
GM-4EBL-D4.0-G	4.0	6	11	75	4	Picture 1	○
GM-4EBL-D6.0-G	6.0	6	16	75	4	Picture 2	○
GM-4EBX-D6.0-G	6.0	6	16	100	4	Picture 2	○
GM-4EBL-D8.0-G	8.0	8	24	75	4	Picture 2	○
GM-4EBX-D8.0-G	8.0	8	24	100	4	Picture 2	○
GM-4EBL-D10.0-G	10.0	10	30	100	4	Picture 2	○
GM-4EBX-D10.0-G	10.0	10	30	150	4	Picture 2	○
GM-4EBL-D12.0-G	12.0	12	36	100	4	Picture 2	○
GM-4EBX-D12.0-G	12.0	12	36	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

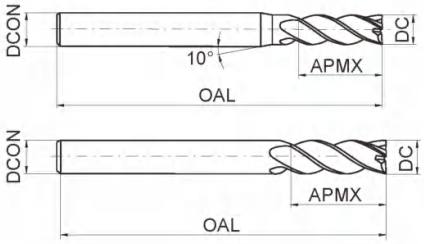
Code key B294
Graphics category and identification B295
Cutting parameters B582
Non-standard customization B652-B653

4-flute flattened end mills with straight shank



GM-4E





- Very suitable for side milling and shallow slot machining.
- Wide application.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-4E-D1.0F	1.0	3	3	50	4	Picture 1	○
GM-4E-D1.0S	1.0	4	3	50	4	Picture 1	●
GM-4E-D1.0	1.0	6	3	50	4	Picture 1	●
GM-4E-D1.5F	1.5	3	4	50	4	Picture 1	○
GM-4E-D1.5S	1.5	4	4	50	4	Picture 1	●
GM-4E-D1.5	1.5	6	4	50	4	Picture 1	●
GM-4E-D2.0F	2.0	3	6	50	4	Picture 1	○
GM-4E-D2.0S	2.0	4	6	50	4	Picture 1	●
GM-4E-D2.0	2.0	6	6	50	4	Picture 1	●
GM-4E-D2.5F	2.5	3	8	50	4	Picture 1	○
GM-4E-D2.5S	2.5	4	8	50	4	Picture 1	●
GM-4E-D2.5	2.5	6	8	50	4	Picture 1	●
GM-4E-D3.0F	3.0	3	8	50	4	Picture 2	○
GM-4E-D3.0S	3.0	4	8	50	4	Picture 1	●
GM-4E-D3.0	3.0	6	8	50	4	Picture 1	●
GM-4E-D3.5S	3.5	4	10	50	4	Picture 1	○
GM-4E-D3.5	3.5	6	10	50	4	Picture 1	●
GM-4E-D4.0S	4.0	4	11	50	4	Picture 2	●
GM-4E-D4.0	4.0	6	11	50	4	Picture 1	●
GM-4E-D4.5	4.5	6	11	50	4	Picture 1	●
GM-4E-D5.0	5.0	6	13	50	4	Picture 1	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294
Graphics category and identification B295
Cutting parameters B585
Non-standard customization B652-B653

4-flute flattened end mills with straight shank



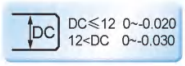
GM-4E



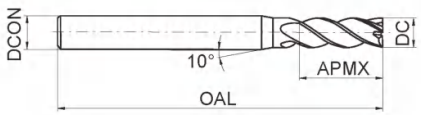
- Very suitable for side milling and shallow slot machining.
- Wide application.



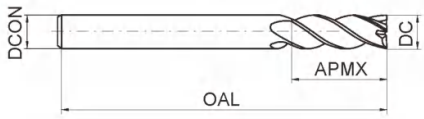








Picture 1



Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-4E-D5.5	5.5	6	16	50	4	Picture 1	●
GM-4E-D6.0	6.0	6	16	50	4	Picture 2	●
GM-4E-D7.0	7.0	8	20	60	4	Picture 1	●
GM-4E-D8.0	8.0	8	20	60	4	Picture 2	●
GM-4E-D9.0	9.0	10	22	75	4	Picture 1	●
GM-4E-D10.0	10.0	10	25	75	4	Picture 2	●
GM-4E-D11.0	11.0	12	26	75	4	Picture 1	●
GM-4E-D12.0	12.0	12	30	75	4	Picture 2	●
GM-4E-D14.0	14.0	14	32	75	4	Picture 2	●
GM-4E-D16.0	16.0	16	45	100	4	Picture 2	●
GM-4E-D18.0	18.0	18	45	100	4	Picture 2	●
GM-4E-D20.0	20.0	20	45	100	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

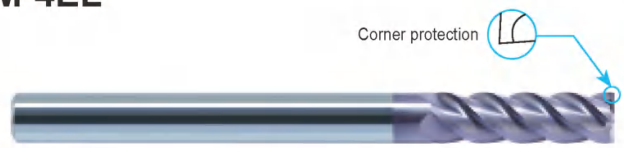
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

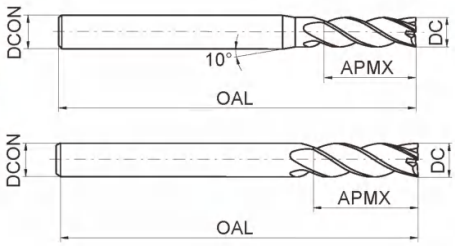
Code key B294
Graphics category and identification B295
Cutting parameters B585
Non-standard customization B652-B653

4-flute flattened end mills with straight shank and long cutting edge



GM-4EL





● GM-4E series with long cutting edge.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-4EL-D3.0	3.0	6	12	75	4	Picture 1	●
GM-4EL-D4.0	4.0	6	15	75	4	Picture 1	●
GM-4EL-D5.0	5.0	6	20	75	4	Picture 1	●
GM-4EL-D6.0	6.0	6	20	75	4	Picture 2	●
GM-4EL-D8.0	8.0	8	25	100	4	Picture 2	●
GM-4EL-D10.0	10.0	10	30	100	4	Picture 2	●
GM-4EL-D12.0	12.0	12	35	100	4	Picture 2	●
GM-4EL-D14.0	14.0	14	40	100	4	Picture 2	●
GM-4EL-D16.0	16.0	16	50	150	4	Picture 2	●
GM-4EL-D20.0	20.0	20	55	150	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

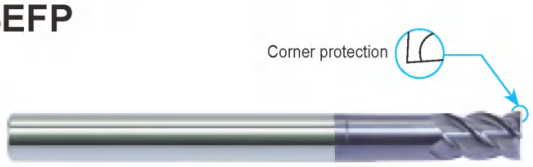
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

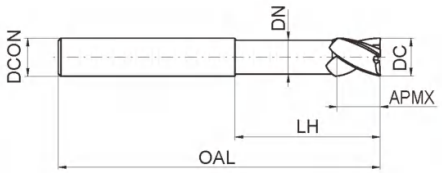
Code key B294
Graphics category and identification B295
Cutting parameters B585
Non-standard customization B652-B653

4-flute flattened end mills with straight shank, long neck and short cutting edge



GM-4EFP





● High-rigidity short cutting edge, suitable for heavy cutting and also deep cavity milling.



Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	DCON	APMX	LH	DN	OAL		
GM-4EFP-D6.0	6.0	6	9	30	5.8	75	4	○
GM-4EFP-D8.0	8.0	8	12	40	7.8	100	4	○
GM-4EFP-D10.0	10.0	10	15	50	9.6	100	4	○
GM-4EFP-D12.0	12.0	12	18	50	11.5	100	4	○
GM-4EFP-D16.0	16.0	16	24	50	15.5	150	4	○
GM-4EFP-D20.0	20.0	20	30	60	19.5	150	4	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

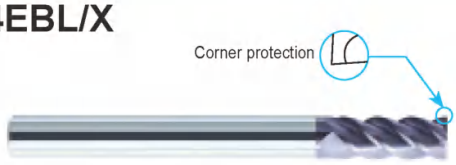
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

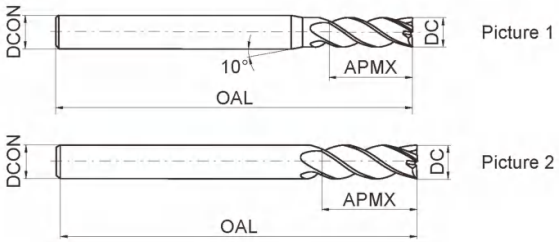
Code key B294
Graphics category and identification B295
Cutting parameters B586
Non-standard customization B652-B653

4-flute flattened end mills with long shank



GM-4EBL/X





● GM-4E series with long shank.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-4EBL-D3.0S	3.0	4	8	75	4	Picture 1	○
GM-4EBL-D3.0	3.0	6	8	75	4	Picture 1	○
GM-4EBL-D4.0S	4.0	4	11	75	4	Picture 2	○
GM-4EBL-D4.0	4.0	6	11	75	4	Picture 1	○
GM-4EBL-D6.0	6.0	6	16	75	4	Picture 2	○
GM-4EBX-D6.0	6.0	6	16	100	4	Picture 2	○
GM-4EBL-D8.0	8.0	8	24	75	4	Picture 2	○
GM-4EBX-D8.0	8.0	8	24	100	4	Picture 2	○
GM-4EBL-D10.0	10.0	10	30	100	4	Picture 2	○
GM-4EBX-D10.0	10.0	10	30	150	4	Picture 2	○
GM-4EBL-D12.0	12.0	12	36	100	4	Picture 2	○
GM-4EBX-D12.0	12.0	12	36	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

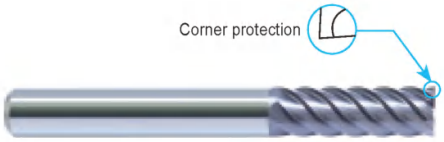
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

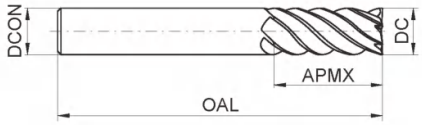
Code key B294
Graphics category and identification B295
Cutting parameters B585
Non-standard customization B652-B653

6-flute flattened end mills with straight shank



GM-6E





- Perfect rigidity, very suitable for side finish machining.
- High speed, high feed rate machining applicable.



Type	Basic dimension(mm)				Number of teeth Z	Stock
	DC	DCON	APMX	OAL		
GM-6E-D6.0	6.0	6	18	60	6	●
GM-6E-D8.0	8.0	8	20	60	6	●
GM-6E-D10.0	10.0	10	30	75	6	●
GM-6E-D12.0	12.0	12	32	75	6	●
GM-6E-D16.0	16.0	16	40	100	6	●
GM-6E-D20.0	20.0	20	45	100	6	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

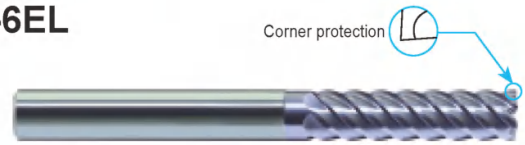
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

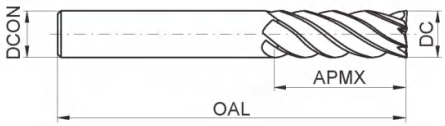
Code key B294
Graphics category and identification B295
Cutting parameters B587
Non-standard customization B652-B653

6-flute flattened end mills with straight shank and long cutting edge



GM-6EL





● GM-6E series with long cutting edge.



Type	Basic dimension(mm)				Number of teeth Z	Stock
	DC	DCON	APMX	OAL		
GM-6EL-D6.0	6.0	6	24	75	6	●
GM-6EL-D8.0	8.0	8	32	75	6	●
GM-6EL-D10.0	10.0	10	40	100	6	●
GM-6EL-D12.0	12.0	12	45	100	6	●
GM-6EL-D16.0	16.0	16	64	150	6	●
GM-6EL-D20.0	20.0	20	75	150	6	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

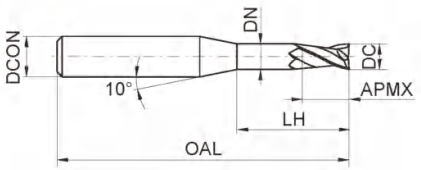
Code key B294
Graphics category and identification B295
Cutting parameters B588
Non-standard customization B652-B653

2-flute flattened end mills with straight shank, long neck and short cutting edge


Deep flattened slot

GM-2EP

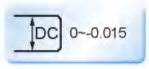




- Suitable for narrow slot milling or milling of fine parts that could generate interference.







DC<1mm

1mm≤DC


Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	DCON	APMX	LH	DN	OAL		
GM-2EP-D0.3-M02	0.3	4	0.4	2	0.25	50	2	●
GM-2EP-D0.3-M04	0.3	4	0.4	4	0.25	50	2	●
GM-2EP-D0.4-M02	0.4	4	0.6	2	0.35	50	2	●
GM-2EP-D0.4-M04	0.4	4	0.6	4	0.35	50	2	●
GM-2EP-D0.5-M04	0.5	4	0.7	4	0.45	50	2	●
GM-2EP-D0.5-M06	0.5	4	0.7	6	0.45	50	2	●
GM-2EP-D0.5-M08	0.5	4	0.7	8	0.45	50	2	●
GM-2EP-D0.6-M04	0.6	4	0.9	4	0.55	50	2	●
GM-2EP-D0.6-M06	0.6	4	0.9	6	0.55	50	2	●
GM-2EP-D0.7-M04	0.7	4	1.0	4	0.65	50	2	●
GM-2EP-D0.7-M06	0.7	4	1.0	6	0.65	50	2	●
GM-2EP-D0.7-M08	0.7	4	1.0	8	0.65	50	2	●
GM-2EP-D0.8-M04	0.8	4	1.2	4	0.75	50	2	●
GM-2EP-D0.8-M06	0.8	4	1.2	6	0.75	50	2	●
GM-2EP-D0.8-M08	0.8	4	1.2	8	0.75	50	2	●
GM-2EP-D0.8-M10	0.8	4	1.2	10	0.75	50	2	●
GM-2EP-D1.0-M04	1.0	4	1.5	4	0.95	50	2	●
GM-2EP-D1.0-M06	1.0	4	1.5	6	0.95	50	2	●
GM-2EP-D1.0-M08	1.0	4	1.5	8	0.95	50	2	●
GM-2EP-D1.0-M10	1.0	4	1.5	10	0.95	50	2	●
GM-2EP-D1.0-M12	1.0	4	1.5	12	0.95	50	2	●
GM-2EP-D1.0-M14	1.0	4	1.5	14	0.95	50	2	●
GM-2EP-D1.2-M06	1.2	4	1.8	6	1.15	50	2	●
GM-2EP-D1.2-M08	1.2	4	1.8	8	1.15	50	2	●
GM-2EP-D1.2-M10	1.2	4	1.8	10	1.15	50	2	●
GM-2EP-D1.2-M12	1.2	4	1.8	12	1.15	50	2	●
GM-2EP-D1.5-M06	1.5	4	2.3	6	1.45	50	2	●
GM-2EP-D1.5-M08	1.5	4	2.3	8	1.45	50	2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

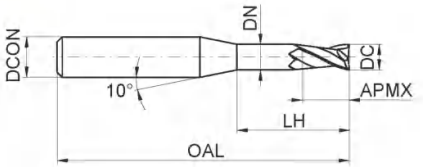
Code key B294
Graphics category and identification B295
Cutting parameters B589-B590
Non-standard customization B652-B653

2-flute flattened end mills with straight shank, long neck and short cutting edge


Deep flattened slot

GM-2EP

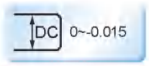




- Suitable for narrow slot milling or milling of fine parts that could generate interference.







DC<1mm 1mm≤DC


Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	DCON	APMX	LH	DN	OAL		
GM-2EP-D1.5-M10	1.5	4	2.3	10	1.45	50	2	●
GM-2EP-D1.5-M12	1.5	4	2.3	12	1.45	50	2	●
GM-2EP-D1.5-M14	1.5	4	2.3	14	1.45	50	2	●
GM-2EP-D2.0-M06	2.0	4	3.0	6	1.95	50	2	●
GM-2EP-D2.0-M08	2.0	4	3.0	8	1.95	50	2	●
GM-2EP-D2.0-M10	2.0	4	3.0	10	1.95	50	2	●
GM-2EP-D2.0-M12	2.0	4	3.0	12	1.95	50	2	●
GM-2EP-D2.0-M14	2.0	4	3.0	14	1.95	50	2	●
GM-2EP-D2.0-M16	2.0	4	3.0	16	1.95	50	2	●
GM-2EP-D2.5-M08	2.5	4	3.7	8	2.4	50	2	●
GM-2EP-D2.5-M10	2.5	4	3.7	10	2.4	50	2	●
GM-2EP-D2.5-M12	2.5	4	3.7	12	2.4	50	2	●
GM-2EP-D2.5-M14	2.5	4	3.7	14	2.4	50	2	●
GM-2EP-D2.5-M16	2.5	4	3.7	16	2.4	60	2	●
GM-2EP-D2.5-M18	2.5	4	3.7	18	2.4	60	2	●
GM-2EP-D2.5-M20	2.5	4	3.7	20	2.4	60	2	●
GM-2EP-D3.0-M06	3.0	6	4.5	6	2.85	50	2	●
GM-2EP-D3.0-M08	3.0	6	4.5	8	2.85	50	2	●
GM-2EP-D3.0-M10	3.0	6	4.5	10	2.85	50	2	●
GM-2EP-D3.0-M12	3.0	6	4.5	12	2.85	50	2	●
GM-2EP-D3.0-M14	3.0	6	4.5	14	2.85	60	2	●
GM-2EP-D3.0-M16	3.0	6	4.5	16	2.85	60	2	●
GM-2EP-D3.0-M18	3.0	6	4.5	18	2.85	60	2	●
GM-2EP-D3.0-M20	3.0	6	4.5	20	2.85	60	2	●
GM-2EP-D4.0-M12	4.0	6	6.0	12	3.85	50	2	●
GM-2EP-D4.0-M16	4.0	6	6.0	16	3.85	60	2	●
GM-2EP-D4.0-M20	4.0	6	6.0	20	3.85	60	2	●
GM-2EP-D4.0-M25	4.0	6	6.0	25	3.85	60	2	●
GM-2EP-D5.0-M16	5.0	6	7.5	16	4.85	60	2	●
GM-2EP-D5.0-M25	5.0	6	7.5	25	4.85	70	2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294 Graphics category and identification B295 Cutting parameters B589-B590 Non-standard customization B652-B653

2-flute flattened end mills with straight shank and tiny diameter

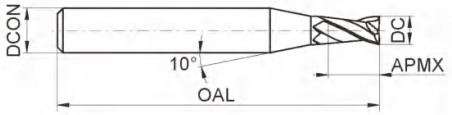

Side face


Step shoulder


Straight slot

GM-2ES

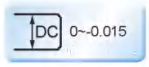




● Tiny diameter end mills can fully display high speed and high precision performances of machining center, often used for machining of precision components such as electronic part, etc.







DC<1mm 1mm≤DC



Type	Basic dimension(mm)				Number of teeth Z	Stock
	DC	DCON	APMX	OAL		
GM-2ES-D0.3	0.3	4	0.6	50	2	●
GM-2ES-D0.4	0.4	4	0.8	50	2	●
GM-2ES-D0.5	0.5	4	1.0	50	2	●
GM-2ES-D0.6	0.6	4	1.2	50	2	●
GM-2ES-D0.7	0.7	4	1.4	50	2	●
GM-2ES-D0.8	0.8	4	1.6	50	2	●
GM-2ES-D0.9	0.9	4	1.8	50	2	●
GM-2ES-D1.0	1.0	4	2.0	50	2	●
GM-2ES-D1.1	1.1	4	2.0	50	2	●
GM-2ES-D1.2	1.2	4	2.5	50	2	●
GM-2ES-D1.3	1.3	4	2.5	50	2	●
GM-2ES-D1.4	1.4	4	3.0	50	2	●
GM-2ES-D1.5	1.5	4	3.0	50	2	●
GM-2ES-D1.6	1.6	4	3.5	50	2	●
GM-2ES-D1.7	1.7	4	3.5	50	2	●
GM-2ES-D1.8	1.8	4	4.0	50	2	●
GM-2ES-D1.9	1.9	4	4.0	50	2	●
GM-2ES-D2.0	2.0	4	4.0	50	2	●
GM-2ES-D2.1	2.1	4	4.0	50	2	●
GM-2ES-D2.2	2.2	4	4.5	50	2	●
GM-2ES-D2.3	2.3	4	4.5	50	2	●
GM-2ES-D2.4	2.4	4	5.0	50	2	●
GM-2ES-D2.5	2.5	4	5.0	50	2	●
GM-2ES-D2.6	2.6	4	5.0	50	2	●
GM-2ES-D2.7	2.7	4	5.5	50	2	●
GM-2ES-D2.8	2.8	4	5.5	50	2	●
GM-2ES-D2.9	2.9	4	6.0	50	2	●
GM-2ES-D3.0	3.0	4	6.0	50	2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294
Graphics category and identification B295
Cutting parameters B591
Non-standard customization B652-B653

2-flute ball nose end mills with straight shank

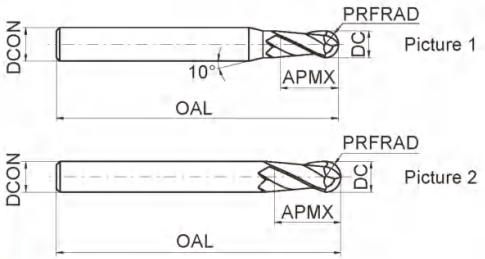
Profile | Cavity | Ball nose slot

GM-2B



- For profile milling, high speed machining applicable.
- Wide application.

35° | Coated TiAlN | DC: DC≤12 0~-0.020; 12<DC 0~-0.030 | PRFRAD: PRFRAD±0.01



Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
GM-2B-R0.5S	1.0	0.5	4	2	50	2	Picture 1	●
GM-2B-R0.5	1.0	0.5	6	2	50	2	Picture 1	●
GM-2B-R0.75S	1.5	0.75	4	3	50	2	Picture 1	●
GM-2B-R0.75	1.5	0.75	6	3	50	2	Picture 1	●
GM-2B-R1.0F	2.0	1.0	3	4	50	2	Picture 1	●
GM-2B-R1.0S	2.0	1.0	4	4	50	2	Picture 1	●
GM-2B-R1.0	2.0	1.0	6	4	50	2	Picture 1	●
GM-2B-R1.25F	2.5	1.25	3	5	50	2	Picture 1	●
GM-2B-R1.25S	2.5	1.25	4	5	50	2	Picture 1	●
GM-2B-R1.25	2.5	1.25	6	5	50	2	Picture 1	●
GM-2B-R1.5F	3.0	1.5	3	6	50	2	Picture 2	●
GM-2B-R1.5S	3.0	1.5	4	6	50	2	Picture 1	●
GM-2B-R1.5	3.0	1.5	6	6	50	2	Picture 1	●
GM-2B-R1.75S	3.5	1.75	4	8	50	2	Picture 1	●
GM-2B-R1.75	3.5	1.75	6	8	50	2	Picture 1	●
GM-2B-R2.0S	4.0	2.0	4	8	50	2	Picture 2	●
GM-2B-R2.0	4.0	2.0	6	8	50	2	Picture 1	●
GM-2B-R2.5	5.0	2.5	6	10	50	2	Picture 1	●
GM-2B-R2.75	5.5	2.75	6	12	50	2	Picture 1	●
GM-2B-R3.0	6.0	3.0	6	12	50	2	Picture 2	●
GM-2B-R3.5	7.0	3.5	8	14	60	2	Picture 1	●
GM-2B-R4.0	8.0	4.0	8	16	60	2	Picture 2	●
GM-2B-R4.5	9.0	4.5	10	18	75	2	Picture 1	●
GM-2B-R5.0	10.0	5.0	10	20	75	2	Picture 2	●
GM-2B-R6.0	12.0	6.0	12	24	75	2	Picture 2	●
GM-2B-R7.0	14.0	7.0	14	28	75	2	Picture 2	●
GM-2B-R8.0	16.0	8.0	16	32	100	2	Picture 2	●
GM-2B-R10.0	20.0	10.0	20	40	100	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294 | Graphics category and identification B295 | Cutting parameters B592 | Non-standard customization B652-B653

2-flute ball nose end mills with long shank

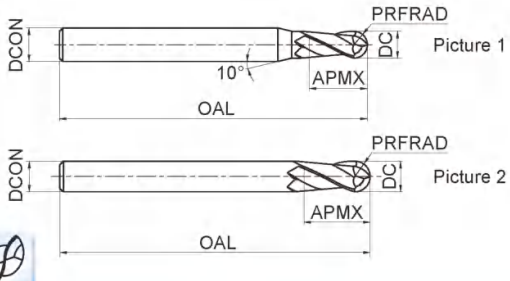

Profile


Cavity


Ball nose slot

GM-2BL/M/X





- GM-2B series with long shank.

35° Coated TiAlN DC DC≤12 0~-0.020 12<DC 0~-0.030 PRFRAD PRFRAD±0.01

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	AMPX	OAL			
GM-2BL-R1.0S	2.0	1.0	4	4	75	2	Picture 1	●
GM-2BL-R1.0	2.0	1.0	6	4	75	2	Picture 1	●
GM-2BL-R1.25F	2.5	1.25	3	5	50	2	Picture 1	●
GM-2BL-R1.25S	2.5	1.25	4	5	75	2	Picture 1	●
GM-2BL-R1.25	2.5	1.25	6	5	75	2	Picture 1	●
GM-2BL-R1.5F	3.0	1.5	3	6	50	2	Picture 2	●
GM-2BL-R1.5S	3.0	1.5	4	6	75	2	Picture 1	●
GM-2BL-R1.5	3.0	1.5	6	6	75	2	Picture 1	●
GM-2BL-R1.75S	3.5	1.75	4	8	75	2	Picture 1	●
GM-2BL-R1.75	3.5	1.75	6	8	75	2	Picture 1	●
GM-2BL-R2.0S	4.0	2.0	4	8	75	2	Picture 2	●
GM-2BL-R2.0	4.0	2.0	6	8	75	2	Picture 1	●
GM-2BL-R2.5	5.0	2.5	6	10	75	2	Picture 1	●
GM-2BL-R2.75	5.5	2.75	6	12	75	2	Picture 1	●
GM-2BL-R3.0	6.0	3.0	6	12	75	2	Picture 2	●
GM-2BX-R3.0	6.0	3.0	6	12	100	2	Picture 2	●
GM-2BL-R3.5	7.0	3.5	8	14	75	2	Picture 1	●
GM-2BM-R4.0	8.0	4.0	8	16	75	2	Picture 2	●
GM-2BL-R4.0	8.0	4.0	8	16	100	2	Picture 2	●
GM-2BL-R4.5	9.0	4.5	10	18	100	2	Picture 1	●
GM-2BL-R5.0	10.0	5.0	10	20	100	2	Picture 2	●
GM-2BX-R5.0	10.0	5.0	10	20	150	2	Picture 2	●
GM-2BL-R6.0	12.0	6.0	12	24	100	2	Picture 2	●
GM-2BX-R6.0	12.0	6.0	12	24	150	2	Picture 2	●
GM-2BL-R7.0	14.0	7.0	14	28	100	2	Picture 2	●
GM-2BL-R8.0	16.0	8.0	16	32	150	2	Picture 2	●
GM-2BL-R10.0	20.0	10.0	20	40	150	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294
Graphics category and identification B295
Cutting parameters B592
Non-standard customization B652-B653

2-flute ballnose end mills with long neck and short cutting edge

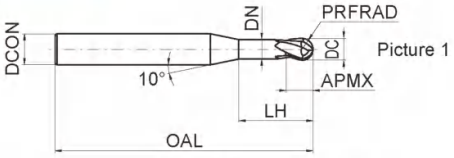

Profile


Cavity

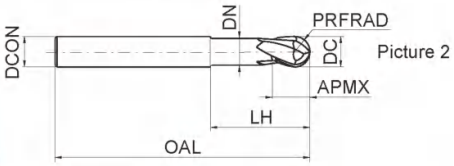

Ball nose slot

GM-2BFP





Picture 1

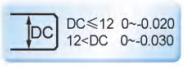


Picture 2

- High rigidity short cutting edge, suitable for heavy cutting.











Type	Basic dimension(mm)							Number of teeth Z	Geometry	Stock
	DC	PRFRAD	APMX	DN	LH	DCON	OAL			
GM-2BFP-R0.5	1.0	0.5	1	0.95	2.5	6	75	2	Picture 1	○
GM-2BFP-R0.75	1.5	0.75	1	1.45	3.0	6	75	2	Picture 1	○
GM-2BFP-R1.0	2.0	1.0	2	1.95	4.0	6	75	2	Picture 1	○
GM-2BFP-R1.5	3.0	1.5	3	2.85	6.0	6	75	2	Picture 1	○
GM-2BFP-R2.0	4.0	2.0	4	3.85	8.0	6	75	2	Picture 1	○
GM-2BFP-R2.5	5.0	2.5	5	4.85	10.0	6	75	2	Picture 1	○
GM-2BFP-R3.0	6.0	3.0	6	5.8	12.0	6	75	2	Picture 2	○
GM-2BFP-R4.0	8.0	4.0	8	7.8	16.0	8	100	2	Picture 2	○
GM-2BFP-R5.0	10.0	5.0	10	9.6	20.0	10	100	2	Picture 2	○
GM-2BFP-R6.0	12.0	6.0	12	11.5	24.0	12	100	2	Picture 2	○
GM-2BFP-R8.0	16.0	8.0	16	15.5	32.0	16	150	2	Picture 2	○
GM-2BFP-R10.0	20.0	10.0	20	19.5	40.0	20	150	2	Picture 2	○

● Stock available ○ Make-to-order



Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294
Graphics category and identification B295
Cutting parameters B592
Non-standard customization B652-B653

4-flute ball nose end mills with straight shank


Profile


Cavity


Ball nose slot

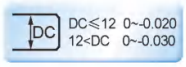
GM-4B

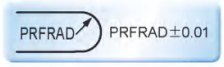


- 4-flute ball nose end mill can operate with higher feed speed and machining efficiency, extending too life in machining high-hardness workpiece.

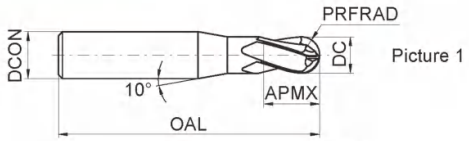




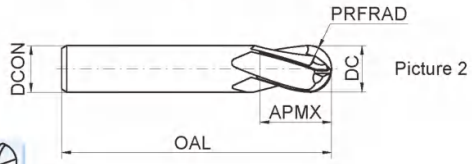








Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
GM-4B-R1.5S	3.0	1.5	4	6	50	4	Picture 1	●
GM-4B-R1.5	3.0	1.5	6	6	50	4	Picture 1	●
GM-4B-R2.0S	4.0	2.0	4	8	50	4	Picture 2	●
GM-4B-R2.0	4.0	2.0	6	8	50	4	Picture 1	●
GM-4B-R2.5	5.0	2.5	6	10	50	4	Picture 1	●
GM-4B-R3.0	6.0	3.0	6	12	50	4	Picture 2	●
GM-4B-R4.0	8.0	4.0	8	16	60	4	Picture 2	●
GM-4B-R5.0	10.0	5.0	10	20	75	4	Picture 2	●
GM-4B-R6.0	12.0	6.0	12	24	75	4	Picture 2	●
GM-4B-R7.0	14.0	7.0	14	28	75	4	Picture 2	●
GM-4B-R8.0	16.0	8.0	16	32	100	4	Picture 2	●
GM-4B-R9.0	18.0	9.0	18	36	100	4	Picture 2	●
GM-4B-R10.0	20.0	10.0	20	40	100	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294
Graphics category and identification B295
Cutting parameters B593
Non-standard customization B652-B653

4-flute ball nose end mills with long shank


Profile

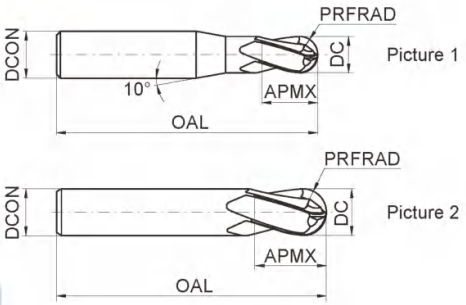

Cavity


Ball nose slot

GM-4BL/M/X



● GM-4B series with long shank.



35° | Coated TiAlN | DC: DC≤12 0~-0.020, 12<DC 0~-0.030 | PRFRAD: PRFRAD±0.01

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
GM-4BL-R1.5S	3.0	1.5	4	6	75	4	Picture 1	○
GM-4BL-R1.5	3.0	1.5	6	6	75	4	Picture 1	○
GM-4BL-R2.0S	4.0	2.0	4	8	75	4	Picture 2	○
GM-4BL-R2.0	4.0	2.0	6	8	75	4	Picture 1	○
GM-4BL-R2.5	5.0	2.5	6	10	75	4	Picture 1	○
GM-4BL-R3.0	6.0	3.0	6	12	75	4	Picture 2	○
GM-4BX-R3.0	6.0	3.0	6	12	100	4	Picture 2	○
GM-4BM-R4.0	8.0	4.0	8	16	75	4	Picture 2	○
GM-4BL-R4.0	8.0	4.0	8	16	100	4	Picture 2	○
GM-4BL-R5.0	10.0	5.0	10	20	100	4	Picture 2	○
GM-4BX-R5.0	10.0	5.0	10	20	150	4	Picture 2	○
GM-4BL-R6.0	12.0	6.0	12	24	100	4	Picture 2	○
GM-4BX-R6.0	12.0	6.0	12	24	150	4	Picture 2	○
GM-4BL-R7.0	14.0	7.0	14	28	100	4	Picture 2	○
GM-4BL-R8.0	16.0	8.0	16	32	150	4	Picture 2	○
GM-4BL-R9.0	18.0	9.0	18	36	150	4	Picture 2	○
GM-4BL-R10.0	20.0	10.0	20	40	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294 | Graphics category and identification B295 | Cutting parameters B593 | Non-standard customization B652-B653

2-flute tiny ball nose end mills with straight shank

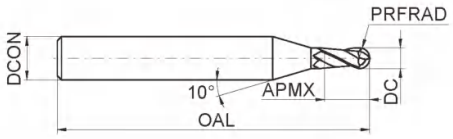

Profile


Cavity


Ball nose slot

GM-2BS

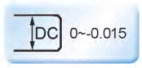


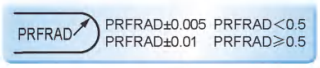


● Tiny diameter end mills can fully display high speed and high precision performances of machining center, often used for machining of precision components such as electronic part, etc.











Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	PRFRAD	DCON	APMX	OAL		
GM-2BS-R0.15	0.30	0.15	4	0.5	50	2	●
GM-2BS-R0.20	0.40	0.20	4	0.6	50	2	●
GM-2BS-R0.25	0.50	0.25	4	0.8	50	2	●
GM-2BS-R0.30	0.60	0.30	4	0.9	50	2	●
GM-2BS-R0.35	0.70	0.35	4	1.0	50	2	●
GM-2BS-R0.40	0.80	0.40	4	1.2	50	2	●
GM-2BS-R0.45	0.90	0.45	4	1.3	50	2	●
GM-2BS-R0.50	1.00	0.50	4	1.5	50	2	●
GM-2BS-R0.60	1.20	0.60	4	1.8	50	2	●
GM-2BS-R0.70	1.40	0.70	4	2.0	50	2	●
GM-2BS-R0.75	1.50	0.75	4	2.3	50	2	●
GM-2BS-R0.80	1.60	0.80	4	2.5	50	2	●
GM-2BS-R0.90	1.80	0.90	4	2.7	50	2	●
GM-2BS-R1.00	2.00	1.00	4	3.0	50	2	●
GM-2BS-R1.25	2.50	1.25	4	3.7	50	2	●
GM-2BS-R1.50	3.00	1.50	4	4.5	50	2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

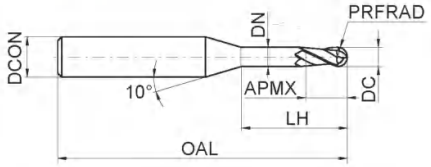
Code key B294
Graphics category and identification B295
Cutting parameters B594
Non-standard customization B652-B653

2-flute ball nose end mills with straight shank, long neck and short cutting edge


Deep ball nose slot

GM-2BP





- Suitable for machining narrow slot and free-form surface.

35° | Coated TiAlN | DC 0~-0.015 | PRFRAD PRFRAD±0.005 PRFRAD<0.5 PRFRAD±0.01 PRFRAD≥0.5

Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	PRFRAD	APMX	DN	LH	DCON	OAL		
GM-2BP-R0.15-M02	0.3	0.15	0.4	0.25	2	4	50	2	●
GM-2BP-R0.15-M04	0.3	0.15	0.4	0.25	4	4	50	2	●
GM-2BP-R0.2-M02	0.4	0.2	0.6	0.35	2	4	50	2	●
GM-2BP-R0.2-M04	0.4	0.2	0.6	0.35	4	4	50	2	●
GM-2BP-R0.25-M04	0.5	0.25	0.7	0.45	4	4	50	2	●
GM-2BP-R0.25-M06	0.5	0.25	0.7	0.45	6	4	50	2	●
GM-2BP-R0.3-M04	0.6	0.3	0.9	0.55	4	4	50	2	●
GM-2BP-R0.3-M06	0.6	0.3	0.9	0.55	6	4	50	2	●
GM-2BP-R0.3-M08	0.6	0.3	0.9	0.55	8	4	50	2	●
GM-2BP-R0.4-M04	0.8	0.4	1.2	0.75	4	4	50	2	●
GM-2BP-R0.4-M06	0.8	0.4	1.2	0.75	6	4	50	2	●
GM-2BP-R0.4-M08	0.8	0.4	1.2	0.75	8	4	50	2	●
GM-2BP-R0.4-M10	0.8	0.4	1.2	0.75	10	4	50	2	●
GM-2BP-R0.5-M04	1.0	0.5	1.5	0.95	4	4	50	2	●
GM-2BP-R0.5-M06	1.0	0.5	1.5	0.95	6	4	50	2	●
GM-2BP-R0.5-M08	1.0	0.5	1.5	0.95	8	4	50	2	●
GM-2BP-R0.5-M10	1.0	0.5	1.5	0.95	10	4	50	2	●
GM-2BP-R0.5-M12	1.0	0.5	1.5	0.95	12	4	50	2	●
GM-2BP-R0.6-M06	1.2	0.6	1.8	1.15	6	4	50	2	●
GM-2BP-R0.6-M08	1.2	0.6	1.8	1.15	8	4	50	2	●
GM-2BP-R0.6-M12	1.2	0.6	1.8	1.15	12	4	50	2	●
GM-2BP-R0.6-M16	1.2	0.6	1.8	1.15	16	4	50	2	●
GM-2BP-R0.75-M08	1.5	0.75	2.3	1.45	8	4	50	2	●
GM-2BP-R0.75-M12	1.5	0.75	2.3	1.45	12	4	50	2	●
GM-2BP-R0.75-M16	1.5	0.75	2.3	1.45	16	4	50	2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

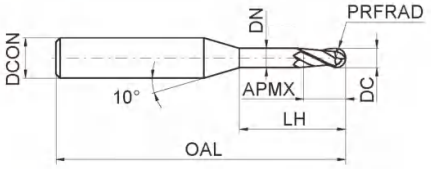
Code key B294 | Graphics category and identification B295 | Cutting parameters B595-B596 | Non-standard customization B652-B653

2-flute ball nose end mills with straight shank, long neck and short cutting edge

Deep ball nose slot

GM-2BP





- Suitable for machining narrow slot and free-form surface.

35° | Coated TiAlN | DC 0~-0.015 | PRFRAD PRFRAD±0.005 PRFRAD<0.5 PRFRAD±0.01 PRFRAD≥0.5

Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	PRFRAD	APMX	DN	LH	DCON	OAL		
GM-2BP-R1.0-M06	2.0	1.0	3.0	1.95	6	4	50	2	●
GM-2BP-R1.0-M08	2.0	1.0	3.0	1.95	8	4	50	2	●
GM-2BP-R1.0-M10	2.0	1.0	3.0	1.95	10	4	50	2	●
GM-2BP-R1.0-M12	2.0	1.0	3.0	1.95	12	4	50	2	●
GM-2BP-R1.0-M16	2.0	1.0	3.0	1.95	16	4	50	2	●
GM-2BP-R1.0-M20	2.0	1.0	3.0	1.95	20	4	50	2	●
GM-2BP-R1.25-M08	2.5	1.25	3.7	2.4	8	4	50	2	●
GM-2BP-R1.25-M12	2.5	1.25	3.7	2.4	12	4	50	2	●
GM-2BP-R1.25-M16	2.5	1.25	3.7	2.4	16	4	60	2	●
GM-2BP-R1.25-M20	2.5	1.25	3.7	2.4	20	4	60	2	●
GM-2BP-R1.5-M08	3.0	1.5	4.5	2.85	8	6	50	2	●
GM-2BP-R1.5-M10	3.0	1.5	4.5	2.85	10	6	50	2	●
GM-2BP-R1.5-M12	3.0	1.5	4.5	2.85	12	6	50	2	●
GM-2BP-R1.5-M16	3.0	1.5	4.5	2.85	16	6	60	2	●
GM-2BP-R1.5-M20	3.0	1.5	4.5	2.85	20	6	60	2	●
GM-2BP-R2.0-M10	4.0	2.0	6.0	3.85	10	6	60	2	●
GM-2BP-R2.0-M16	4.0	2.0	6.0	3.85	16	6	60	2	●
GM-2BP-R2.0-M20	4.0	2.0	6.0	3.85	20	6	60	2	●
GM-2BP-R2.0-M25	4.0	2.0	6.0	3.85	25	6	60	2	●
GM-2BP-R2.5-M16	5.0	2.5	7.5	4.85	16	6	60	2	●
GM-2BP-R2.5-M25	5.0	2.5	7.5	4.85	25	6	70	2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294 | Graphics category and identification B295 | Cutting parameters B595-B596 | Non-standard customization B652-B653

2-flute R end mills with straight shank

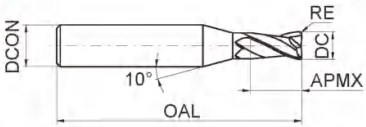
Radius shoulder | Profile | Radius corner slot

GM-2R

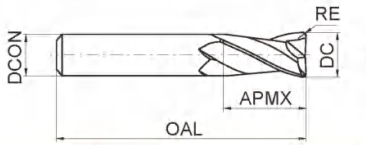


- Wide applications, applicable for several machining styles.

35° | Coated TiAlN | DC 0~-0.020



Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
GM-2R-D1.0R0.2	1.0	0.2	4	3	50	2	Picture 1	●
GM-2R-D1.5R0.2	1.5	0.2	4	4	50	2	Picture 1	●
GM-2R-D2.0R0.2	2.0	0.2	4	6	50	2	Picture 1	●
GM-2R-D2.0R0.5	2.0	0.5	4	6	50	2	Picture 1	●
GM-2R-D2.5R0.2	2.5	0.2	4	8	50	2	Picture 1	●
GM-2R-D2.5R0.5	2.5	0.5	4	8	50	2	Picture 1	●
GM-2R-D3.0R0.2	3.0	0.2	4	8	50	2	Picture 1	●
GM-2R-D3.0R0.3	3.0	0.3	4	8	50	2	Picture 1	●
GM-2R-D3.0R0.5	3.0	0.5	4	8	50	2	Picture 1	●
GM-2R-D4.0R0.2	4.0	0.2	4	11	50	2	Picture 2	●
GM-2R-D4.0R0.3	4.0	0.3	4	11	50	2	Picture 2	●
GM-2R-D4.0R0.5	4.0	0.5	4	11	50	2	Picture 2	●
GM-2R-D4.0R1.0	4.0	1.0	4	11	50	2	Picture 2	●
GM-2R-D5.0R0.3	5.0	0.3	6	13	50	2	Picture 1	●
GM-2R-D5.0R0.5	5.0	0.5	6	13	50	2	Picture 1	●
GM-2R-D5.0R1.0	5.0	1.0	6	13	50	2	Picture 1	●
GM-2R-D6.0R0.3	6.0	0.3	6	16	50	2	Picture 2	●
GM-2R-D6.0R0.5	6.0	0.5	6	16	50	2	Picture 2	●
GM-2R-D6.0R1.0	6.0	1.0	6	16	50	2	Picture 2	●
GM-2R-D8.0R0.3	8.0	0.3	8	20	60	2	Picture 2	●
GM-2R-D8.0R0.5	8.0	0.5	8	20	60	2	Picture 2	●
GM-2R-D8.0R1.0	8.0	1.0	8	20	60	2	Picture 2	●
GM-2R-D10.0R0.5	10.0	0.5	10	25	75	2	Picture 2	●
GM-2R-D10.0R1.0	10.0	1.0	10	25	75	2	Picture 2	●
GM-2R-D10.0R1.5	10.0	1.5	10	25	75	2	Picture 2	●
GM-2R-D10.0R2.0	10.0	2.0	10	25	75	2	Picture 2	●
GM-2R-D12.0R0.5	12.0	0.5	12	30	75	2	Picture 2	●
GM-2R-D12.0R1.0	12.0	1.0	12	30	75	2	Picture 2	●
GM-2R-D12.0R1.5	12.0	1.5	12	30	75	2	Picture 2	●
GM-2R-D12.0R2.0	12.0	2.0	12	30	75	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294 | Graphics category and identification B295 | Cutting parameters B597 | Non-standard customization B652-B653

4-flute R end mills with straight shank


Radius shoulder


Profile

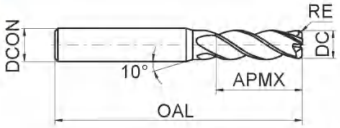

Radius corner slot

GM-4R

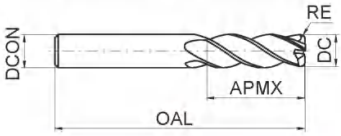


- Wide applications, applicable for several machining styles.





Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
GM-4R-D1.0R0.2	1.0	0.2	4	3	50	4	Picture 1	○
GM-4R-D1.5R0.2	1.5	0.2	4	4	50	4	Picture 1	○
GM-4R-D2.0R0.2	2.0	0.2	4	6	50	4	Picture 1	○
GM-4R-D2.0R0.5	2.0	0.5	4	6	50	4	Picture 1	○
GM-4R-D2.5R0.2	2.5	0.2	4	8	50	4	Picture 1	○
GM-4R-D2.5R0.5	2.5	0.5	4	8	50	4	Picture 1	○
GM-4R-D3.0R0.2	3.0	0.2	4	8	50	4	Picture 1	●
GM-4R-D3.0R0.5	3.0	0.5	4	8	50	4	Picture 1	○
GM-4R-D4.0R0.2	4.0	0.2	4	10	50	4	Picture 2	○
GM-4R-D4.0R0.3	4.0	0.3	4	10	50	4	Picture 2	●
GM-4R-D4.0R0.5	4.0	0.5	4	10	50	4	Picture 2	●
GM-4R-D5.0R0.2	5.0	0.2	6	13	50	4	Picture 2	○
GM-4R-D5.0R0.5	5.0	0.5	6	13	50	4	Picture 1	●
GM-4R-D5.0R1.0	5.0	1.0	6	13	50	4	Picture 1	●
GM-4R-D6.0R0.3	6.0	0.3	6	16	50	4	Picture 2	○
GM-4R-D6.0R0.5	6.0	0.5	6	16	50	4	Picture 2	●
GM-4R-D6.0R1.0	6.0	1.0	6	16	50	4	Picture 2	●
GM-4R-D8.0R0.3	8.0	0.3	8	20	60	4	Picture 2	○
GM-4R-D8.0R0.5	8.0	0.5	8	20	60	4	Picture 2	●
GM-4R-D8.0R1.0	8.0	1.0	8	20	60	4	Picture 2	●
GM-4R-D10.0R0.3	10.0	0.3	10	25	75	4	Picture 2	○
GM-4R-D10.0R0.5	10.0	0.5	10	25	75	4	Picture 2	●
GM-4R-D10.0R1.0	10.0	1.0	10	25	75	4	Picture 2	●
GM-4R-D10.0R2.0	10.0	2.0	10	25	75	4	Picture 2	●
GM-4R-D10.0R3.0	10.0	3.0	10	25	75	4	Picture 2	●
GM-4R-D12.0R0.3	12.0	0.3	12	30	75	4	Picture 2	○
GM-4R-D12.0R0.5	12.0	0.5	12	30	75	4	Picture 2	●
GM-4R-D12.0R1.0	12.0	1.0	12	30	75	4	Picture 2	●
GM-4R-D12.0R2.0	12.0	2.0	12	30	75	4	Picture 2	●
GM-4R-D12.0R3.0	12.0	3.0	12	30	75	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294
Graphics category and identification B295
Cutting parameters B598
Non-standard customization B652-B653


Radius shoulder

Profile

Radius corner slot

4-flute R end mills with long shank

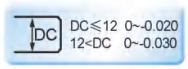
GM-4RL/M/X



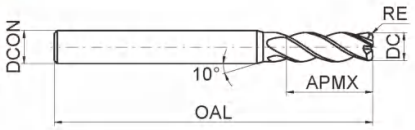
- GM-4R series with long shank.



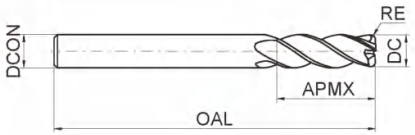








Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
GM-4RL-D4.0R0.2S	4.0	0.2	4	10	75	4	Picture 2	●
GM-4RL-D4.0R0.2	4.0	0.2	6	10	75	4	Picture 1	●
GM-4RL-D4.0R0.5S	4.0	0.5	4	10	75	4	Picture 2	●
GM-4RL-D4.0R0.5	4.0	0.5	6	10	75	4	Picture 1	●
GM-4RL-D6.0R0.2	6.0	0.2	6	16	75	4	Picture 2	●
GM-4RX-D6.0R0.2	6.0	0.2	6	16	100	4	Picture 2	●
GM-4RL-D6.0R0.5	6.0	0.5	6	16	75	4	Picture 2	●
GM-4RX-D6.0R0.5	6.0	0.5	6	16	100	4	Picture 2	●
GM-4RL-D6.0R1.0	6.0	1.0	6	16	75	4	Picture 2	●
GM-4RX-D6.0R1.0	6.0	1.0	6	16	100	4	Picture 2	●
GM-4RM-D8.0R0.2	8.0	0.2	8	20	75	4	Picture 2	●
GM-4RL-D8.0R0.2	8.0	0.2	8	20	100	4	Picture 2	●
GM-4RM-D8.0R0.5	8.0	0.5	8	20	75	4	Picture 2	●
GM-4RL-D8.0R0.5	8.0	0.5	8	20	100	4	Picture 2	●
GM-4RM-D8.0R1.0	8.0	1.0	8	20	75	4	Picture 2	●
GM-4RL-D8.0R1.0	8.0	1.0	8	20	100	4	Picture 2	●
GM-4RL-D10.0R0.2	10.0	0.2	10	25	100	4	Picture 2	●
GM-4RX-D10.0R0.2	10.0	0.2	10	25	150	4	Picture 2	●
GM-4RL-D10.0R0.5	10.0	0.5	10	25	100	4	Picture 2	●
GM-4RX-D10.0R0.5	10.0	0.5	10	25	150	4	Picture 2	●
GM-4RL-D10.0R1.0	10.0	1.0	10	25	100	4	Picture 2	●
GM-4RX-D10.0R1.0	10.0	1.0	10	25	150	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294
Graphics category and identification B295
Cutting parameters B598
Non-standard customization B652-B653

Radius shoulder Profile Radius corner slot

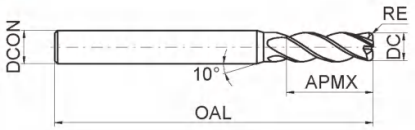
4-flute R end mills with long shank

GM-4RL/M/X

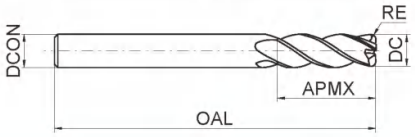


- GM-4R series with long shank.

35° Coated TiAlN DC DC≤12 0~-0.020 12<DC 0~-0.030



Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
GM-4RL-D10.0R2.0	10.0	2.0	10	25	100	4	Picture 2	●
GM-4RX-D10.0R2.0	10.0	2.0	10	25	150	4	Picture 2	●
GM-4RL-D12.0R0.2	12.0	0.2	12	30	100	4	Picture 2	●
GM-4RX-D12.0R0.2	12.0	0.2	12	30	150	4	Picture 2	●
GM-4RL-D12.0R0.5	12.0	0.5	12	30	100	4	Picture 2	●
GM-4RX-D12.0R0.5	12.0	0.5	12	30	150	4	Picture 2	●
GM-4RL-D12.0R1.0	12.0	1.0	12	30	100	4	Picture 2	●
GM-4RX-D12.0R1.0	12.0	1.0	12	30	150	4	Picture 2	●
GM-4RL-D12.0R2.0	12.0	2.0	12	30	100	4	Picture 2	●
GM-4RX-D12.0R2.0	12.0	2.0	12	30	150	4	Picture 2	●
GM-4RL-D16.0R1.0	16.0	1.0	16	45	150	4	Picture 2	●
GM-4RL-D16.0R2.0	16.0	2.0	16	45	150	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

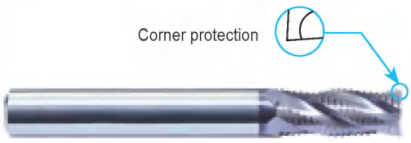
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

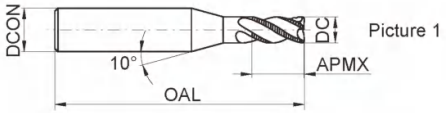
Code key B294 Graphics category and identification B295 Cutting parameters B598 Non-standard customization B652-B653

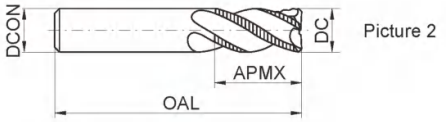
4-flute flattened end mills with straight shank and corrugated edges



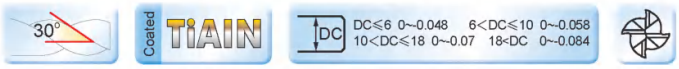
GM-4W







● Very suitable for high-efficiency rough machining.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
GM-4W-D6.0	6.0	6	16	50	4	Picture 2	●
GM-4W-D7.0	7.0	8	20	60	4	Picture 1	●
GM-4W-D8.0	8.0	8	20	60	4	Picture 2	●
GM-4W-D9.0	9.0	10	22	75	4	Picture 1	●
GM-4W-D10.0	10.0	10	25	75	4	Picture 2	●
GM-4W-D11.0	11.0	12	26	75	4	Picture 1	●
GM-4W-D12.0	12.0	12	30	75	4	Picture 2	●
GM-4W-D16.0	16.0	16	45	100	4	Picture 2	●
GM-4W-D20.0	20.0	20	45	100	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	○			○	◎				

Code key B294
Graphics category and identification B295
Cutting parameters B599-B600
Non-standard customization B652-B653



HMX series

end mills for high-hardness steel machining



Lattice heterogeneous coating

- Lattice heterogeneous coating added with special elements, with high hardness and excellent high temperature oxidation resistance, more suitable for high hardness materials and high speed machining
- Excellent coating processing technology, more closely combined with substrate

New technology
Breakthrough upgrading

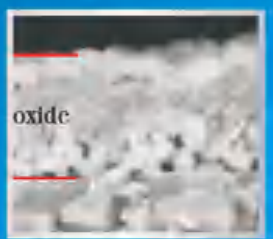
- Unique edge structure, properly designed flute profile, for outstanding cutting performance.
- Orange red coating allows for better wear observation.
- Special after treatment greatly reduces friction, for smoother chip evacuation and superior surface quality.



Perfect high temperature oxidation resistance:

After oxidation at 1100 °C, the coating of HMX series only has a very thin oxide layer, while the similar products of Company A has completely oxidized.

HMX series



A company

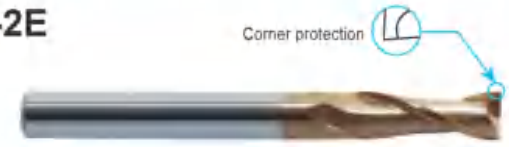
2-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

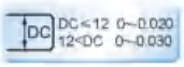
HMX-2E



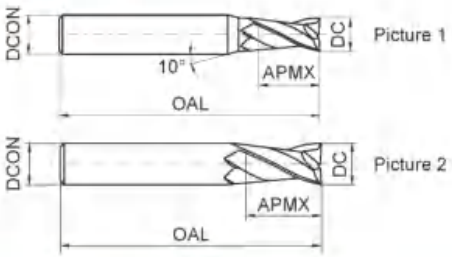
- For slot milling.
- Very suitable for high speed cutting and dry cutting.











Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
HMX-2E-D1.0F	1.0	3	3	50	2	Picture 1	●
HMX-2E-D1.0S	1.0	4	3	50	2	Picture 1	●
HMX-2E-D1.0	1.0	6	3	50	2	Picture 1	●
HMX-2E-D1.5S	1.5	4	4	50	2	Picture 1	●
HMX-2E-D1.5	1.5	6	4	50	2	Picture 1	●
HMX-2E-D2.0F	2.0	3	6	50	2	Picture 1	●
HMX-2E-D2.0S	2.0	4	6	50	2	Picture 1	●
HMX-2E-D2.0	2.0	6	6	50	2	Picture 1	●
HMX-2E-D2.5S	2.5	4	8	50	2	Picture 1	●
HMX-2E-D2.5	2.5	6	8	50	2	Picture 1	●
HMX-2E-D3.0F	3.0	3	8	50	2	Picture 2	●
HMX-2E-D3.0S	3.0	4	8	50	2	Picture 1	●
HMX-2E-D3.0	3.0	6	8	50	2	Picture 1	●
HMX-2E-D3.5S	3.5	4	10	50	2	Picture 1	●
HMX-2E-D3.5	3.5	6	10	50	2	Picture 1	●
HMX-2E-D4.0S	4.0	4	11	50	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294 Graphics category and identification B295 Cutting parameters B601 Non-standard customization B652-B653

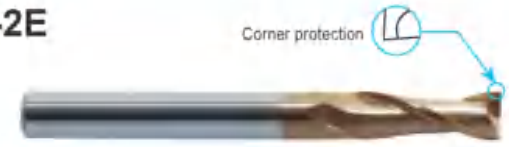
2-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

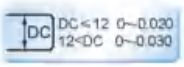
HMX-2E



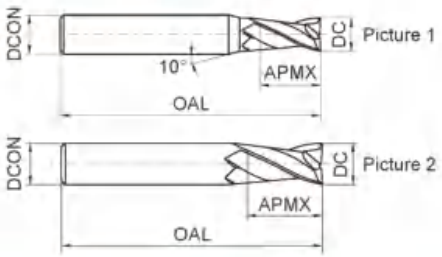
- For slot milling.
- Very suitable for high speed cutting and dry cutting.











Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
HMX-2E-D4.0	4.0	6	11	50	2	Picture 1	●
HMX-2E-D4.5	4.5	6	11	50	2	Picture 1	●
HMX-2E-D5.0	5.0	6	13	50	2	Picture 1	●
HMX-2E-D5.5	5.5	6	16	50	2	Picture 1	●
HMX-2E-D6.0	6.0	6	16	50	2	Picture 2	●
HMX-2E-D7.0	7.0	8	20	60	2	Picture 1	●
HMX-2E-D8.0	8.0	8	20	60	2	Picture 2	●
HMX-2E-D9.0	9.0	10	22	75	2	Picture 1	●
HMX-2E-D10.0	10.0	10	25	75	2	Picture 2	●
HMX-2E-D11.0	11.0	12	26	75	2	Picture 1	●
HMX-2E-D12.0	12.0	12	30	75	2	Picture 2	●
HMX-2E-D14.0	14.0	14	32	100	2	Picture 2	●
HMX-2E-D16.0	16.0	16	45	100	2	Picture 2	●
HMX-2E-D18.0	18.0	18	45	100	2	Picture 2	●
HMX-2E-D20.0	20.0	20	45	100	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294
Graphics category and identification B295
Cutting parameters B601
Non-standard customization B652-B653

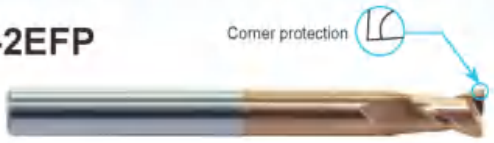
2-flute flattened end mills with straight shank, long neck and short cutting edge

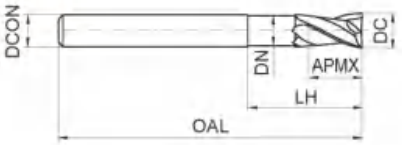

Side face


Step shoulder


Straight slot

HMX-2EFP

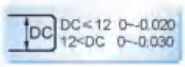




- High-rigidity short cutting edge, suitable for heavy cutting and deep cavity milling.









Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	DCON	APMX	LH	DN	OAL		
HMX-2EFP-D6.0	6.0	6	9	30	5.8	75	2	●
HMX-2EFP-D8.0	8.0	8	12	40	7.8	100	2	●
HMX-2EFP-D10.0	10.0	10	15	50	9.6	100	2	●
HMX-2EFP-D12.0	12.0	12	18	50	11.5	100	2	●
HMX-2EFP-D16.0	16.0	16	24	50	15.5	150	2	●
HMX-2EFP-D20.0	20.0	20	30	60	19.5	150	2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminium alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

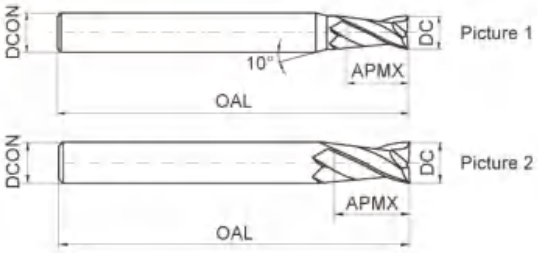
Code key B294 Graphics category and identification B295 Cutting parameters B602 Non-standard customization B652-B653



2-flute flattened end mills with long shank

HMX-2EBL/X





● HMX-2E series with long shank.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
HMX-2EBL-D3.0	3.0	6	8	75	2	Picture 1	○
HMX-2EBL-D4.0S	4.0	4	11	75	2	Picture 2	○
HMX-2EBL-D4.0	4.0	6	11	75	2	Picture 1	○
HMX-2EBL-D6.0	6.0	6	16	75	2	Picture 2	○
HMX-2EBX-D6.0	6.0	6	16	100	2	Picture 2	○
HMX-2EBL-D8.0	8.0	8	20	75	2	Picture 2	○
HMX-2EBX-D8.0	8.0	8	20	100	2	Picture 2	○
HMX-2EBL-D10.0	10.0	10	25	100	2	Picture 2	○
HMX-2EBX-D10.0	10.0	10	25	150	2	Picture 2	○
HMX-2EBL-D12.0	12.0	12	30	100	2	Picture 2	○
HMX-2EBX-D12.0	12.0	12	30	150	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material										
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294
Graphics category and identification B295
Cutting parameters B601
Non-standard customization B652-B653

4-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

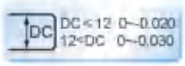
HMX-4E



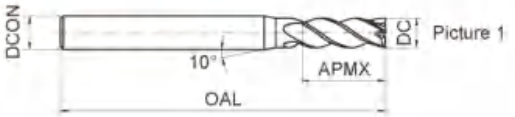
- For side milling and shallow slot milling.
- Very suitable for high speed cutting and dry cutting.

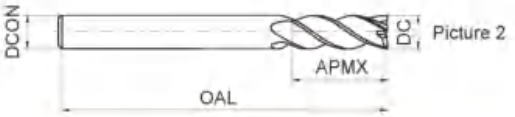












Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
HMX-4E-D1.0F	1.0	3	3	50	4	Picture 1	●
HMX-4E-D1.0S	1.0	4	3	50	4	Picture 1	●
HMX-4E-D1.0	1.0	6	3	50	4	Picture 1	●
HMX-4E-D1.5F	1.5	3	4	50	4	Picture 1	●
HMX-4E-D1.5S	1.5	4	4	50	4	Picture 1	●
HMX-4E-D1.5	1.5	6	4	50	4	Picture 1	●
HMX-4E-D2.0F	2.0	3	6	50	4	Picture 1	●
HMX-4E-D2.0S	2.0	4	6	50	4	Picture 1	●
HMX-4E-D2.0	2.0	6	6	50	4	Picture 1	●
HMX-4E-D2.5F	2.5	3	8	50	4	Picture 1	●
HMX-4E-D2.5S	2.5	4	8	50	4	Picture 1	●
HMX-4E-D2.5	2.5	6	8	50	4	Picture 1	●
HMX-4E-D3.0F	3.0	3	8	50	4	Picture 2	●
HMX-4E-D3.0S	3.0	4	8	50	4	Picture 1	●
HMX-4E-D3.0	3.0	6	8	50	4	Picture 1	●
HMX-4E-D3.5S	3.5	4	10	50	4	Picture 1	●
HMX-4E-D4.0S	4.0	4	11	50	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294 · Graphics category and identification B295 · Cutting parameters B603 · Non-standard customization B652-B653

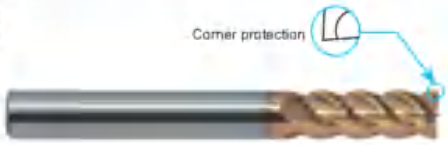
4-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

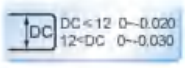
HMX-4E



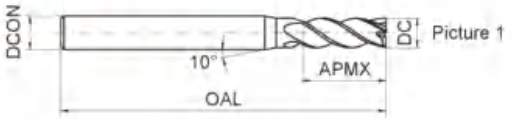
- For side milling and shallow slot milling.
- Very suitable for high speed cutting and dry cutting.

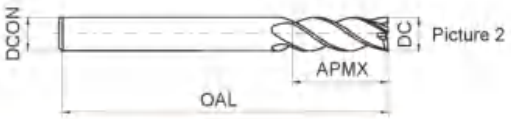












Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
HMX-4E-D3.5	3.5	6	10	50	4	Picture 1	●
HMX-4E-D4.0	4.0	6	11	50	4	Picture 1	●
HMX-4E-D4.5	4.5	6	11	50	4	Picture 1	●
HMX-4E-D5.0	5.0	6	13	50	4	Picture 1	●
HMX-4E-D5.5	5.5	6	16	50	4	Picture 1	●
HMX-4E-D6.0	6.0	6	16	50	4	Picture 2	●
HMX-4E-D7.0	7.0	8	20	60	4	Picture 1	●
HMX-4E-D8.0	8.0	8	20	60	4	Picture 2	●
HMX-4E-D9.0	9.0	10	22	75	4	Picture 1	●
HMX-4E-D10.0	10.0	10	25	75	4	Picture 2	●
HMX-4E-D11.0	11.0	12	26	75	4	Picture 1	●
HMX-4E-D12.0	12.0	12	30	75	4	Picture 2	●
HMX-4E-D14.0	14.0	14	32	75	4	Picture 2	●
HMX-4E-D16.0	16.0	16	45	100	4	Picture 2	●
HMX-4E-D18.0	18.0	18	45	100	4	Picture 2	●
HMX-4E-D20.0	20.0	20	45	100	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

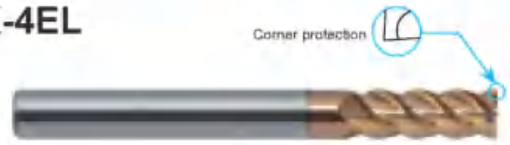
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

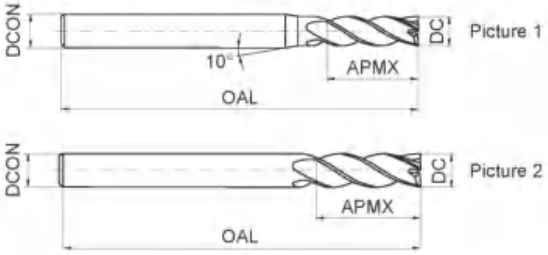
Code key B294
Graphics category and identification B295
Cutting parameters B603
Non-standard customization B652-B653

4-flute flattened end mills with straight shank and long cutting edge



HMX-4EL



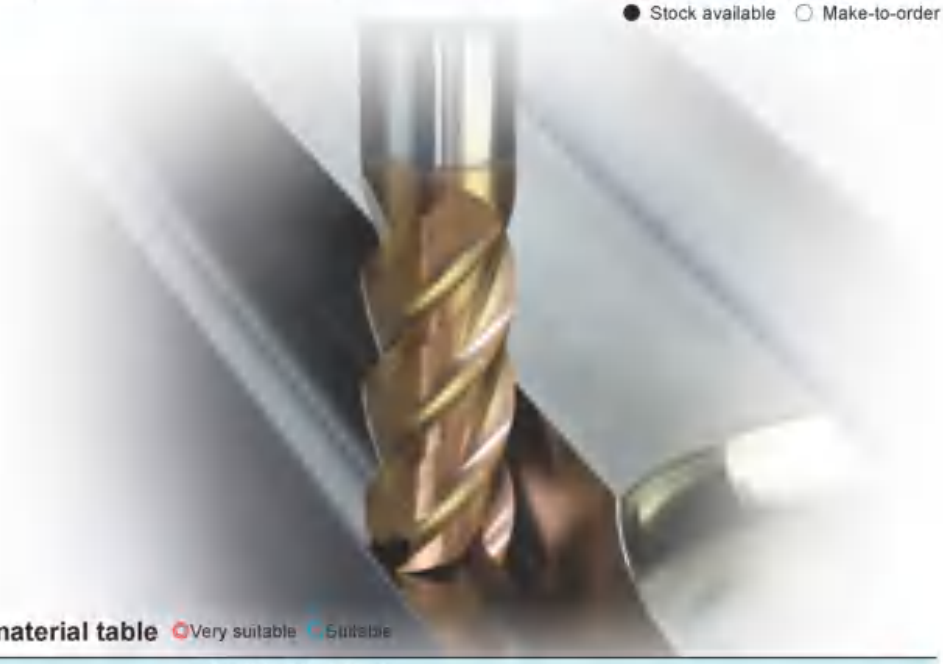


- HMX-4E series with long cutting edge.



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
HMX-4EL-D3.0	3.0	6	12	75	4	Picture 1	●
HMX-4EL-D4.0	4.0	6	15	75	4	Picture 1	●
HMX-4EL-D5.0	5.0	6	20	75	4	Picture 1	●
HMX-4EL-D6.0	6.0	6	20	75	4	Picture 2	●
HMX-4EL-D8.0	8.0	8	25	100	4	Picture 2	●
HMX-4EL-D10.0	10.0	10	30	100	4	Picture 2	●
HMX-4EL-D12.0	12.0	12	35	100	4	Picture 2	●
HMX-4EL-D14.0	14.0	14	40	100	4	Picture 2	●
HMX-4EL-D16.0	16.0	16	50	150	4	Picture 2	●
HMX-4EL-D20.0	20.0	20	55	150	4	Picture 2	●

● Stock available ○ Make-to-order



Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294
Graphics category and identification B295
Cutting parameters B603
Non-standard customization B652-B653

4-flute flattened end mills with straight shank, long neck and short cutting edge

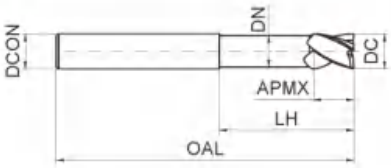

Side face


Step shoulder


Straight slot

HMX-4EFP

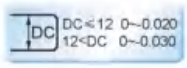




- High-rigidity short cutting edge, suitable for heavy cutting and deep cavity milling.









Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	DCON	APMX	LH	DN	OAL		
HMX-4EFP-D6.0	6.0	6	9	30	5.8	75	4	●
HMX-4EFP-D8.0	8.0	8	12	40	7.8	100	4	●
HMX-4EFP-D10.0	10.0	10	15	50	9.6	100	4	●
HMX-4EFP-D12.0	12.0	12	18	50	11.5	100	4	●
HMX-4EFP-D16.0	16.0	16	24	50	15.5	150	4	●
HMX-4EFP-D20.0	20.0	20	30	60	19.5	150	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294
Graphics category and identification B295
Cutting parameters B604
Non-standard customization B652-B653

4-flute flattened end mills with long shank

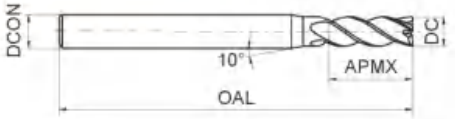

Side face


Step shoulder

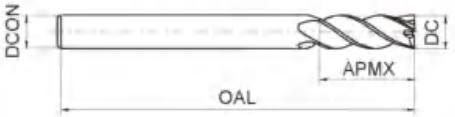

Straight slot

HMX-4EBL/X





Picture 1

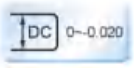


Picture 2

● HMX-4E series with long shank.









Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
HMX-4EBL-D3.0S	3.0	4	8	75	4	Picture 1	●
HMX-4EBL-D3.0	3.0	6	8	75	4	Picture 1	●
HMX-4EBL-D4.0S	4.0	4	11	75	4	Picture 2	●
HMX-4EBL-D4.0	4.0	6	11	75	4	Picture 1	●
HMX-4EBL-D6.0	6.0	6	16	75	4	Picture 2	●
HMX-4EBX-D6.0	6.0	6	16	100	4	Picture 2	●
HMX-4EBL-D8.0	8.0	8	20	75	4	Picture 2	●
HMX-4EBX-D8.0	8.0	8	20	100	4	Picture 2	●
HMX-4EBL-D10.0	10.0	10	25	100	4	Picture 2	●
HMX-4EBX-D10.0	10.0	10	25	150	4	Picture 2	●
HMX-4EBL-D12.0	12.0	12	30	100	4	Picture 2	●
HMX-4EBX-D12.0	12.0	12	30	150	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminium alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294 Graphics category and identification B295 Cutting parameters B603 Non-standard customization B652-B653

6-flute flattened end mills with straight shank

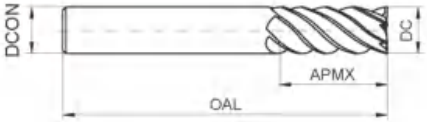

Side face


Step shoulder


Straight slot

HMX-6E

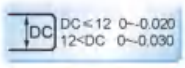




- High tool rigidity reduce tool deflection in side milling.
- Very suitable for high speed cutting and dry cutting.









Type	Basic dimension(mm)				Number of teeth Z	Stock
	DC	DCON	APMX	OAL		
HMX-6E-D6.0	6.0	6	18	60	6	●
HMX-6E-D8.0	8.0	8	20	60	6	●
HMX-6E-D10.0	10.0	10	30	75	6	●
HMX-6E-D12.0	12.0	12	32	75	6	●
HMX-6E-D16.0	16.0	16	40	100	6	●
HMX-6E-D20.0	20.0	20	45	100	6	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

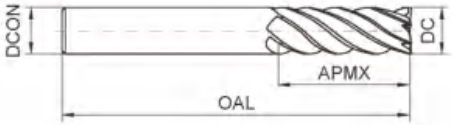
Code key B294
Graphics category and identification B295
Cutting parameters B605
Non-standard customization B652-B653

6-flute flattened end mills with straight shank and long cutting edge



HMX-6EL





- HMX-6E series with long cutting edge.



Type	Basic dimension(mm)				Number of teeth Z	Stock
	DC	DCON	APMX	OAL		
HMX-6EL-D6.0	6.0	6	24	75	6	●
HMX-6EL-D8.0	8.0	8	32	75	6	●
HMX-6EL-D10.0	10.0	10	40	100	6	●
HMX-6EL-D12.0	12.0	12	45	100	6	●
HMX-6EL-D16.0	16.0	16	64	150	6	●
HMX-6EL-D20.0	20.0	20	75	150	6	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

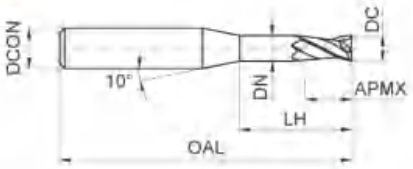
Code key B294 Graphics category and identification B295 Cutting parameters B606 Non-standard customization B652-B653

2-flute flattened end mills with straight shank, long neck and short cutting edge

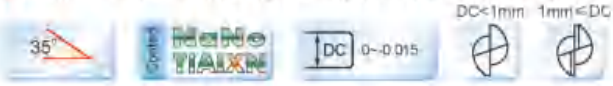
Deep flattened slot

HMX-2EP





- Suitable for narrow slot milling or milling of fine parts that could generate interference.



Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	DCON	APMX	LH	DN	OAL		
HMX-2EP-D0.3-M02	0.3	4	0.4	2	0.25	50	2	●
HMX-2EP-D0.3-M04	0.3	4	0.4	4	0.25	50	2	●
HMX-2EP-D0.4-M02	0.4	4	0.6	2	0.35	50	2	●
HMX-2EP-D0.4-M04	0.4	4	0.6	4	0.35	50	2	●
HMX-2EP-D0.5-M04	0.5	4	0.7	4	0.45	50	2	●
HMX-2EP-D0.5-M06	0.5	4	0.7	6	0.45	50	2	●
HMX-2EP-D0.5-M08	0.5	4	0.7	8	0.45	50	2	●
HMX-2EP-D0.6-M04	0.6	4	0.9	4	0.55	50	2	●
HMX-2EP-D0.6-M06	0.6	4	0.9	6	0.55	50	2	●
HMX-2EP-D0.7-M04	0.7	4	1.0	4	0.65	50	2	●
HMX-2EP-D0.7-M06	0.7	4	1.0	6	0.65	50	2	●
HMX-2EP-D0.7-M08	0.7	4	1.0	8	0.65	50	2	●
HMX-2EP-D0.8-M04	0.8	4	1.2	4	0.75	50	2	●
HMX-2EP-D0.8-M06	0.8	4	1.2	6	0.75	50	2	●
HMX-2EP-D0.8-M08	0.8	4	1.2	8	0.75	50	2	●
HMX-2EP-D0.8-M10	0.8	4	1.2	10	0.75	50	2	●
HMX-2EP-D1.0-M04	1.0	4	1.5	4	0.95	50	2	●
HMX-2EP-D1.0-M06	1.0	4	1.5	6	0.95	50	2	●
HMX-2EP-D1.0-M08	1.0	4	1.5	8	0.95	50	2	●
HMX-2EP-D1.0-M10	1.0	4	1.5	10	0.95	50	2	●
HMX-2EP-D1.0-M12	1.0	4	1.5	12	0.95	50	2	●
HMX-2EP-D1.0-M14	1.0	4	1.5	14	0.95	50	2	●
HMX-2EP-D1.2-M06	1.2	4	1.8	6	1.15	50	2	●
HMX-2EP-D1.2-M08	1.2	4	1.8	8	1.15	50	2	●
HMX-2EP-D1.2-M10	1.2	4	1.8	10	1.15	50	2	●
HMX-2EP-D1.2-M12	1.2	4	1.8	12	1.15	50	2	●
HMX-2EP-D1.5-M06	1.5	4	2.3	6	1.45	50	2	●
HMX-2EP-D1.5-M08	1.5	4	2.3	8	1.45	50	2	●
HMX-2EP-D1.5-M10	1.5	4	2.3	10	1.45	50	2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material										
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

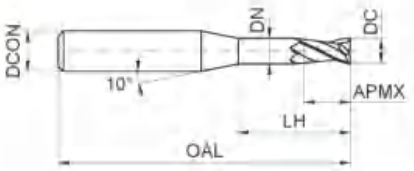
Code key B294
Graphics category and identification B295
Cutting parameters B607-B608
Non-standard customization B652-B653

2-flute flattened end mills with straight shank, long neck and short cutting edge

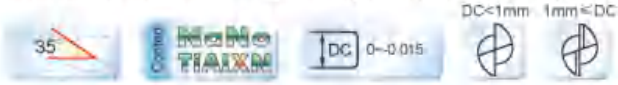

Deep flattened slot

HMX-2EP





- Suitable for narrow slot milling or milling of fine parts that could generate interference.



Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	DCON	APMX	LH	DN	OAL		
HMX-2EP-D1.5-M12	1.5	4	2.3	12	1.45	50	2	●
HMX-2EP-D1.5-M14	1.5	4	2.3	14	1.45	50	2	●
HMX-2EP-D2.0-M06	2.0	4	3.0	6	1.95	50	2	●
HMX-2EP-D2.0-M08	2.0	4	3.0	8	1.95	50	2	●
HMX-2EP-D2.0-M10	2.0	4	3.0	10	1.95	50	2	●
HMX-2EP-D2.0-M12	2.0	4	3.0	12	1.95	50	2	●
HMX-2EP-D2.0-M14	2.0	4	3.0	14	1.95	50	2	●
HMX-2EP-D2.0-M16	2.0	4	3.0	16	1.95	50	2	●
HMX-2EP-D2.5-M08	2.5	4	3.7	8	2.4	50	2	●
HMX-2EP-D2.5-M10	2.5	4	3.7	10	2.4	50	2	●
HMX-2EP-D2.5-M12	2.5	4	3.7	12	2.4	50	2	●
HMX-2EP-D2.5-M14	2.5	4	3.7	14	2.4	50	2	●
HMX-2EP-D2.5-M16	2.5	4	3.7	16	2.4	60	2	●
HMX-2EP-D2.5-M18	2.5	4	3.7	18	2.4	60	2	●
HMX-2EP-D2.5-M20	2.5	4	3.7	20	2.4	60	2	●
HMX-2EP-D3.0-M06	3.0	6	4.5	6	2.85	50	2	●
HMX-2EP-D3.0-M08	3.0	6	4.5	8	2.85	50	2	●
HMX-2EP-D3.0-M10	3.0	6	4.5	10	2.85	50	2	●
HMX-2EP-D3.0-M12	3.0	6	4.5	12	2.85	50	2	●
HMX-2EP-D3.0-M14	3.0	6	4.5	14	2.85	60	2	●
HMX-2EP-D3.0-M16	3.0	6	4.5	16	2.85	60	2	●
HMX-2EP-D3.0-M18	3.0	6	4.5	18	2.85	60	2	●
HMX-2EP-D3.0-M20	3.0	6	4.5	20	2.85	60	2	●
HMX-2EP-D4.0-M12	4.0	6	6.0	12	3.85	60	2	●
HMX-2EP-D4.0-M16	4.0	6	6.0	16	3.85	60	2	●
HMX-2EP-D4.0-M20	4.0	6	6.0	20	3.85	60	2	●
HMX-2EP-D4.0-M25	4.0	6	6.0	25	3.85	60	2	●
HMX-2EP-D5.0-M16	5.0	6	7.5	16	4.85	60	2	●
HMX-2EP-D5.0-M25	5.0	6	7.5	25	4.85	70	2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material										
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294 · Graphics category and identification B295 · Cutting parameters B607-B608 · Non-standard customization B652-B653

2-flute flattened end mills with straight shank and tiny diameter


Side face

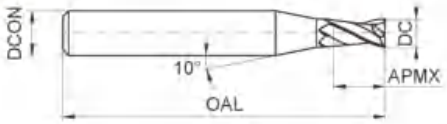

Step shoulder


Straight slot

HMX-2ES

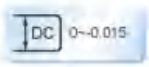


- Tiny diameter end mills can fully display high speed and high precision performances of machining center, often used for machining of precision components such as electronic part, etc.









DC<1mm 1mm≤DC



Type	Basic dimension(mm)				Number of teeth Z	Stock
	DC	DCON	APMX	OAL		
HMX-2ES-D0.3	0.3	4	0.6	50	2	●
HMX-2ES-D0.4	0.4	4	0.8	50	2	●
HMX-2ES-D0.5	0.5	4	1.0	50	2	●
HMX-2ES-D0.6	0.6	4	1.2	50	2	●
HMX-2ES-D0.7	0.7	4	1.4	50	2	●
HMX-2ES-D0.8	0.8	4	1.6	50	2	●
HMX-2ES-D0.9	0.9	4	1.8	50	2	●
HMX-2ES-D1.0	1.0	4	2.0	50	2	●
HMX-2ES-D1.1	1.1	4	2.0	50	2	●
HMX-2ES-D1.2	1.2	4	2.5	50	2	●
HMX-2ES-D1.3	1.3	4	2.5	50	2	●
HMX-2ES-D1.4	1.4	4	3.0	50	2	●
HMX-2ES-D1.5	1.5	4	3.0	50	2	●
HMX-2ES-D1.6	1.6	4	3.5	50	2	●
HMX-2ES-D1.7	1.7	4	3.5	50	2	●
HMX-2ES-D1.8	1.8	4	4.0	50	2	●
HMX-2ES-D1.9	1.9	4	4.0	50	2	●
HMX-2ES-D2.0	2.0	4	4.0	50	2	●
HMX-2ES-D2.1	2.1	4	4.0	50	2	●
HMX-2ES-D2.2	2.2	4	4.5	50	2	●
HMX-2ES-D2.3	2.3	4	4.5	50	2	●
HMX-2ES-D2.4	2.4	4	5.0	50	2	●
HMX-2ES-D2.5	2.5	4	5.0	50	2	●
HMX-2ES-D2.6	2.6	4	5.0	50	2	●
HMX-2ES-D2.7	2.7	4	5.5	50	2	●
HMX-2ES-D2.8	2.8	4	5.5	50	2	●
HMX-2ES-D2.9	2.9	4	6.0	50	2	●
HMX-2ES-D3.0	3.0	4	6.0	50	2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294
Graphics category and identification B295
Cutting parameters B609
Non-standard customization B652-B653

2-flute ball nose end mills with straight shank

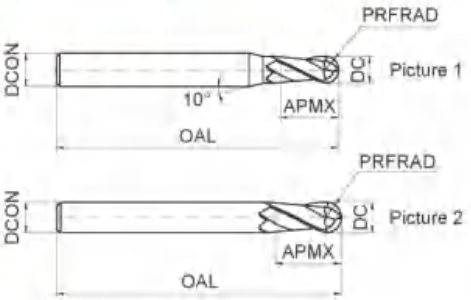

Profile

Cavity

Ball nose slot

HMX-2B





- For profile milling.
- Very suitable for high speed cutting and dry cutting.











Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
HMX-2B-R0.5S	1.0	0.5	4	2	50	2	Picture 1	●
HMX-2B-R0.5	1.0	0.5	6	2	50	2	Picture 1	●
HMX-2B-R0.75S	1.5	0.75	4	3	50	2	Picture 1	●
HMX-2B-R0.75	1.5	0.75	6	3	50	2	Picture 1	●
HMX-2B-R1.0S	2.0	1.0	4	4	50	2	Picture 1	●
HMX-2B-R1.0	2.0	1.0	6	4	50	2	Picture 1	●
HMX-2B-R1.25S	2.5	1.25	4	5	50	2	Picture 1	●
HMX-2B-R1.25	2.5	1.25	6	5	50	2	Picture 1	●
HMX-2B-R1.5S	3.0	1.5	4	6	50	2	Picture 1	●
HMX-2B-R1.5	3.0	1.5	6	6	50	2	Picture 1	●
HMX-2B-R1.75	3.5	1.75	6	8	50	2	Picture 1	●
HMX-2B-R2.0S	4.0	2.0	4	8	50	2	Picture 2	●
HMX-2B-R2.0	4.0	2.0	6	8	50	2	Picture 1	●
HMX-2B-R2.5	5.0	2.5	6	10	50	2	Picture 1	●
HMX-2B-R2.75	5.5	2.75	6	12	50	2	Picture 1	●
HMX-2B-R3.0	6.0	3.0	6	12	50	2	Picture 2	●
HMX-2B-R3.5	7.0	3.5	8	14	60	2	Picture 1	●
HMX-2B-R4.0	8.0	4.0	8	16	60	2	Picture 2	●
HMX-2B-R4.5	9.0	4.5	10	18	75	2	Picture 1	●
HMX-2B-R5.0	10.0	5.0	10	20	75	2	Picture 2	●
HMX-2B-R6.0	12.0	6.0	12	24	75	2	Picture 2	●
HMX-2B-R7.0	14.0	7.0	14	28	75	2	Picture 2	●
HMX-2B-R8.0	16.0	8.0	16	32	100	2	Picture 2	●
HMX-2B-R10.0	20.0	10.0	20	40	100	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

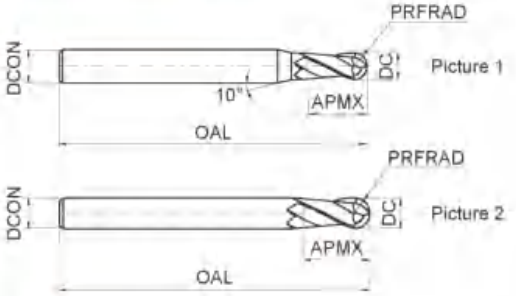
Code key B294 · Graphics category and identification B295 · Cutting parameters B610 · Non-standard customization B652-B653

2-flute ball nose end mills with straight shank



HMX-2BL/M/X





● HMX-2B series with long shank.

35° | Coated NaNo TiAlXN | DC DC<12 0~-0.020 12<DC 0~-0.030 | PRFRAD PRFRAD±0.01

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
HMX-2BL-R1.0S	2.0	1.0	4	4	75	2	Picture 1	●
HMX-2BL-R1.0	2.0	1.0	6	4	75	2	Picture 1	●
HMX-2BL-R1.25S	2.5	1.25	4	5	75	2	Picture 1	●
HMX-2BL-R1.25	2.5	1.25	6	6	75	2	Picture 1	●
HMX-2BL-R1.5S	3.0	1.5	4	6	75	2	Picture 1	●
HMX-2BL-R1.5	3.0	1.5	6	6	75	2	Picture 1	●
HMX-2BL-R1.75S	3.5	1.75	4	8	75	2	Picture 1	●
HMX-2BL-R1.75	3.5	1.75	6	8	75	2	Picture 1	●
HMX-2BL-R2.0S	4.0	2.0	4	8	75	2	Picture 2	●
HMX-2BL-R2.0	4.0	2.0	6	8	75	2	Picture 1	●
HMX-2BL-R2.5	5.0	2.5	6	10	75	2	Picture 1	●
HMX-2BL-R2.75	5.5	2.75	6	12	75	2	Picture 1	●
HMX-2BL-R3.0	6.0	3.0	6	12	75	2	Picture 2	●
HMX-2BX-R3.0	6.0	3.0	6	12	100	2	Picture 2	●
HMX-2BL-R3.5	7.0	3.5	8	14	75	2	Picture 1	●
HMX-2BM-R4.0	8.0	4.0	8	16	75	2	Picture 2	●
HMX-2BL-R4.0	8.0	4.0	8	16	100	2	Picture 2	●
HMX-2BL-R4.5	9.0	4.5	10	18	100	2	Picture 1	●
HMX-2BL-R5.0	10.0	5.0	10	20	100	2	Picture 2	●
HMX-2BX-R5.0	10.0	5.0	10	20	150	2	Picture 2	●
HMX-2BL-R6.0	12.0	6.0	12	24	100	2	Picture 2	●
HMX-2BX-R6.0	12.0	6.0	12	24	150	2	Picture 2	●
HMX-2BL-R7.0	14.0	7.0	14	28	100	2	Picture 2	●
HMX-2BL-R8.0	16.0	8.0	16	32	150	2	Picture 2	●
HMX-2BL-R10.0	20.0	10.0	20	40	150	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294 Graphics category and identification B295 Cutting parameters B610 Non-standard customization B652-B653

2-flute ball nose end mills with straight shank, long neck and short cutting edge

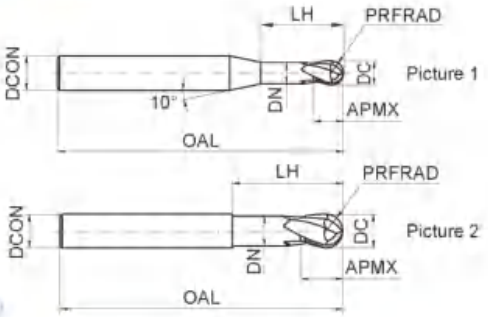

Profile


Cavity


Ball nose slot

HMX-2BFP





- Short cutting edge and high rigidity designed, applicable for heavy cutting.

35° | Casted | Nano TiAlN | DC: DC≤12 0~-0.020, 12<DC 0~-0.030 | PRFRAD: PRFRAD±0.01

Type	Basic dimension(mm)							Number of teeth Z	Geometry	Stock
	DC	PRFRAD	APMX	DN	LH	DCON	OAL			
HMX-2BFP-R0.5	1.0	0.5	1	0.95	2.5	6	75	2	Picture 1	●
HMX-2BFP-R0.75	1.5	0.75	1.5	1.45	3.0	6	75	2	Picture 1	●
HMX-2BFP-R1.0	2.0	1.0	2	1.95	4.0	6	75	2	Picture 1	●
HMX-2BFP-R1.5	3.0	1.5	3	2.85	6.0	6	75	2	Picture 1	●
HMX-2BFP-R2.0	4.0	2.0	4	3.85	8.0	6	75	2	Picture 1	●
HMX-2BFP-R2.5	5.0	2.5	5	4.85	10.0	6	75	2	Picture 1	●
HMX-2BFP-R3.0	6.0	3.0	6	5.8	12.0	6	75	2	Picture 2	●
HMX-2BFP-R4.0	8.0	4.0	8	7.8	16.0	8	100	2	Picture 2	●
HMX-2BFP-R5.0	10.0	5.0	10	9.6	20.0	10	100	2	Picture 2	●
HMX-2BFP-R6.0	12.0	6.0	12	11.5	24.0	12	100	2	Picture 2	●
HMX-2BFP-R8.0	16.0	8.0	16	15.5	32.0	16	150	2	Picture 2	●
HMX-2BFP-R10.0	20.0	10.0	20	19.5	40.0	20	150	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material										
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

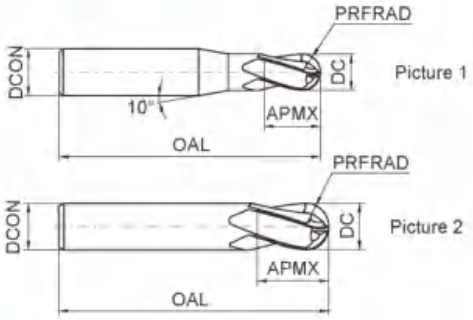
Code key B294 | Graphics category and identification B295 | Cutting parameters B610 | Non-standard customization B652-B653

4-flute ball nose end mills with straight shank

Profile | Cavity | Ball nose slot

HMX-4B





- 4-flute ball nose end mills can operate with higher feed speed and machining efficiency, extending too life in machining high-hardness workpiece.

35° | Coated Nano TiAlXN | DC: DC≤12 0~-0.020, 12<DC 0~-0.030 | PRFRAD: PRFRAD±0.01

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
HMX-4B-R1.5	3.0	1.5	6	6	50	4	Picture 1	●
HMX-4B-R2.0	4.0	2.0	6	8	50	4	Picture 1	●
HMX-4B-R2.5	5.0	2.5	6	10	50	4	Picture 1	●
HMX-4B-R3.0	6.0	3.0	6	12	50	4	Picture 2	●
HMX-4B-R4.0	8.0	4.0	8	16	60	4	Picture 2	●
HMX-4B-R5.0	10.0	5.0	10	20	75	4	Picture 2	●
HMX-4B-R6.0	12.0	6.0	12	24	75	4	Picture 2	●
HMX-4B-R7.0	14.0	7.0	14	28	75	4	Picture 2	●
HMX-4B-R8.0	16.0	8.0	16	32	100	4	Picture 2	●
HMX-4B-R9.0	18.0	9.0	18	36	100	4	Picture 2	●
HMX-4B-R10.0	20.0	10.0	20	40	100	4	Picture 2	●

● Stock available ○ Make-to-order



Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294 | Graphics category and identification B295 | Cutting parameters B611 | Non-standard customization B652-B653

4-flute ball nose end mills with straight and long shank


Profile

Cavity

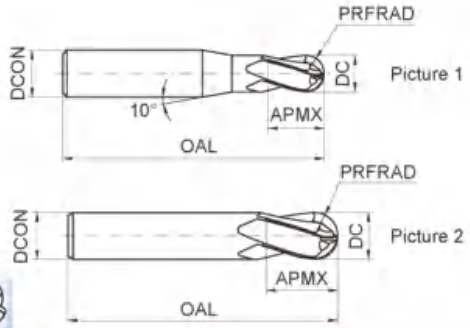
Ball nose slot

HMX-4BL



- HMX-4B series with long shank.

35° | Coated NaNo TiAlXN | DC: DC≤12 0~-0.020, 12<DC 0~-0.030 | PRFRAD: PRFRAD±0.01



Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
HMX-4BL-R1.5	3.0	1.5	6	6	75	4	Picture 1	○
HMX-4BL-R2.0	4.0	2.0	6	8	75	4	Picture 1	○
HMX-4BL-R2.5	5.0	2.5	6	10	75	4	Picture 1	○
HMX-4BL-R3.0	6.0	3.0	6	12	75	4	Picture 2	○
HMX-4BL-R4.0	8.0	4.0	8	16	100	4	Picture 2	○
HMX-4BL-R5.0	10.0	5.0	10	20	100	4	Picture 2	○
HMX-4BL-R6.0	12.0	6.0	12	24	100	4	Picture 2	○
HMX-4BL-R7.0	14.0	7.0	14	28	100	4	Picture 2	○
HMX-4BL-R8.0	16.0	8.0	16	32	150	4	Picture 2	○
HMX-4BL-R9.0	18.0	9.0	18	36	150	4	Picture 2	○
HMX-4BL-R10.0	20.0	10.0	20	40	150	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material										
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminium alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294 | Graphics category and identification B295 | Cutting parameters B611 | Non-standard customization B652-B653

2-flute ball nose end mills with straight shank and tiny diameter

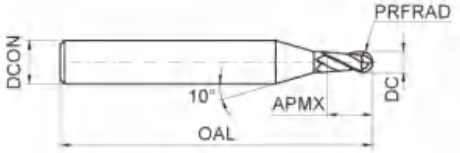

Profile

Cavity

Ball nose slot

HMX-2BS





- Tiny diameter end mills can fully display high speed and high precision performances of machining center, often used for machining of precision components such as electronic part, etc.

35° | Coated NaNo TiAlN | DC 0~-0.015 | PRFRAD PRFRAD±0.005 PRFRAD<0.5 PRFRAD±0.01 PRFRAD≥0.5

Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	PRFRAD	DCON	APMX	OAL		
HMX-2BS-R0.15	0.30	0.15	4	0.5	50	2	●
HMX-2BS-R0.20	0.40	0.20	4	0.6	50	2	●
HMX-2BS-R0.25	0.50	0.25	4	0.8	50	2	●
HMX-2BS-R0.30	0.60	0.30	4	0.9	50	2	●
HMX-2BS-R0.35	0.70	0.35	4	1.0	50	2	●
HMX-2BS-R0.40	0.80	0.40	4	1.2	50	2	●
HMX-2BS-R0.45	0.90	0.45	4	1.3	50	2	●
HMX-2BS-R0.50	1.00	0.50	4	1.5	50	2	●
HMX-2BS-R0.60	1.20	0.60	4	1.8	50	2	●
HMX-2BS-R0.70	1.40	0.70	4	2.0	50	2	●
HMX-2BS-R0.75	1.50	0.75	4	2.3	50	2	●
HMX-2BS-R0.80	1.60	0.80	4	2.5	50	2	●
HMX-2BS-R0.90	1.80	0.90	4	2.7	50	2	●
HMX-2BS-R1.00	2.00	1.00	4	3.0	50	2	●
HMX-2BS-R1.25	2.50	1.25	4	3.7	50	2	●
HMX-2BS-R1.50	3.00	1.50	4	4.5	50	2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

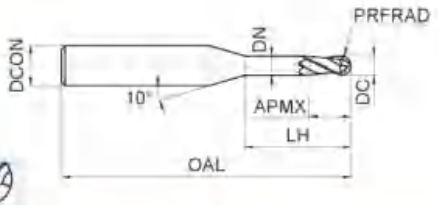
Code key B294 | Graphics category and identification B295 | Cutting parameters B612 | Non-standard customization B652-B653

2-flute ball nose end mills with straight shank, long neck and short cutting edge

Deep ball nose slot

HMX-2BP





- Applicable for machining narrow slot and free-form surface.

35° | Coating: AlTiN | DC: 0~-0.015 | PRFRAD: PRFRAD ±0.005 PRFRAD=0.5, PRFRAD ±0.01 PRFRAD >0.5

Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	PRFRAD	APMX	DN	LH	DCON	OAL		
HMX-2BP-R0.15-M02	0.3	0.15	0.4	0.25	2	4	50	2	●
HMX-2BP-R0.15-M04	0.3	0.15	0.4	0.25	4	4	50	2	●
HMX-2BP-R0.2-M02	0.4	0.2	0.6	0.35	2	4	50	2	●
HMX-2BP-R0.2-M04	0.4	0.2	0.6	0.35	4	4	50	2	●
HMX-2BP-R0.25-M04	0.5	0.25	0.7	0.45	4	4	50	2	●
HMX-2BP-R0.25-M06	0.5	0.25	0.7	0.45	6	4	50	2	●
HMX-2BP-R0.3-M04	0.6	0.3	0.9	0.55	4	4	50	2	●
HMX-2BP-R0.3-M06	0.6	0.3	0.9	0.55	6	4	50	2	●
HMX-2BP-R0.3-M08	0.6	0.3	0.9	0.55	8	4	50	2	●
HMX-2BP-R0.4-M04	0.8	0.4	1.2	0.75	4	4	50	2	●
HMX-2BP-R0.4-M06	0.8	0.4	1.2	0.75	6	4	50	2	●
HMX-2BP-R0.4-M08	0.8	0.4	1.2	0.75	8	4	50	2	●
HMX-2BP-R0.4-M10	0.8	0.4	1.2	0.75	10	4	50	2	●
HMX-2BP-R0.5-M04	1.0	0.5	1.5	0.95	4	4	50	2	●
HMX-2BP-R0.5-M06	1.0	0.5	1.5	0.95	6	4	50	2	●
HMX-2BP-R0.5-M08	1.0	0.5	1.5	0.95	8	4	50	2	●
HMX-2BP-R0.5-M10	1.0	0.5	1.5	0.95	10	4	50	2	●
HMX-2BP-R0.5-M12	1.0	0.5	1.5	0.95	12	4	50	2	●
HMX-2BP-R0.6-M06	1.2	0.6	1.8	1.15	6	4	50	2	●
HMX-2BP-R0.6-M08	1.2	0.6	1.8	1.15	8	4	50	2	●
HMX-2BP-R0.6-M12	1.2	0.6	1.8	1.15	12	4	50	2	●
HMX-2BP-R0.6-M16	1.2	0.6	1.8	1.15	16	4	50	2	●
HMX-2BP-R0.75-M08	1.5	0.75	2.3	1.45	8	4	50	2	●
HMX-2BP-R0.75-M12	1.5	0.75	2.3	1.45	12	4	50	2	●
HMX-2BP-R0.75-M16	1.5	0.75	2.3	1.45	16	4	50	2	●
HMX-2BP-R1.0-M06	2.0	1.0	3.0	1.95	6	4	50	2	●
HMX-2BP-R1.0-M08	2.0	1.0	3.0	1.95	8	4	50	2	●
HMX-2BP-R1.0-M10	2.0	1.0	3.0	1.95	10	4	50	2	●
HMX-2BP-R1.0-M12	2.0	1.0	3.0	1.95	12	4	50	2	●
HMX-2BP-R1.0-M16	2.0	1.0	3.0	1.95	16	4	50	2	●
HMX-2BP-R1.0-M20	2.0	1.0	3.0	1.95	20	4	50	2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material										
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

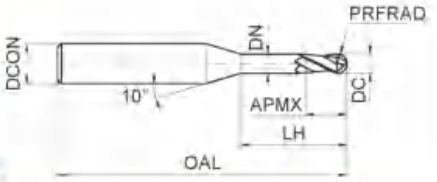
Code key B294 | Graphics category and identification B295 | Cutting parameters B613-B614 | Non-standard customization B652-B653

2-flute ball nose end mills with straight shank, long neck and short cutting edge



HMX-2BP





- Applicable for machining narrow slot and free-form surface.

35° | Coated: NaNo TiAlN | DC 0~-0.015 | PRFRAD: PRFRAD ±0.005 PRFRAD<0.5, PRFRAD ±0.01 PRFRAD>0.5

Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	PRFRAD	APMX	DN	LH	DCON	OAL		
HMX-2BP-R1.25-M08	2.5	1.25	3.7	2.4	8	4	50	2	●
HMX-2BP-R1.25-M12	2.5	1.25	3.7	2.4	12	4	50	2	●
HMX-2BP-R1.25-M16	2.5	1.25	3.7	2.4	16	4	60	2	●
HMX-2BP-R1.25-M20	2.5	1.25	3.7	2.4	20	4	60	2	●
HMX-2BP-R1.5-M08	3.0	1.5	4.5	2.85	8	6	50	2	●
HMX-2BP-R1.5-M10	3.0	1.5	4.5	2.85	10	6	50	2	●
HMX-2BP-R1.5-M12	3.0	1.5	4.5	2.85	12	6	50	2	●
HMX-2BP-R1.5-M16	3.0	1.5	4.5	2.85	16	6	60	2	●
HMX-2BP-R1.5-M20	3.0	1.5	4.5	2.85	20	6	60	2	●
HMX-2BP-R2.0-M10	4.0	2.0	6.0	3.85	10	6	60	2	●
HMX-2BP-R2.0-M16	4.0	2.0	6.0	3.85	16	6	60	2	●
HMX-2BP-R2.0-M20	4.0	2.0	6.0	3.85	20	6	60	2	●
HMX-2BP-R2.0-M25	4.0	2.0	6.0	3.85	25	6	60	2	●
HMX-2BP-R2.5-M16	5.0	2.5	7.5	4.85	16	6	60	2	●
HMX-2BP-R2.5-M25	5.0	2.5	7.5	4.85	25	6	70	2	●

● Stock available ○ Make-to-order

Tool type: HMX-2BP-R0.3-M08
Dimensions: R0.3mm
Workpiece material: S136(52HRC)
Rotating speed: 30000r/min
Feed speed: 200mm/min
Axial cutting depth: a_p=0.02mm
Radial cutting depth: a_e=0.04mm
Cutting style: contour machining (mould of car light)
Cooling system: air blow
Machine tool: MIKRON HSM 800



End mill	HMX-2BP-R0.3-M08	Similar product of company A
Cutting time	300min	180min
Abrasion value	0.025mm	0.048mm
Abrasion condition		

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294 | Graphics category and identification B295 | Cutting parameters B613-B614 | Non-standard customization B652-B653

4-flute R end mills with straight shank


Radius shoulder


Profile


Radius corner slot

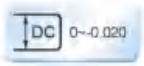
HMX-4R



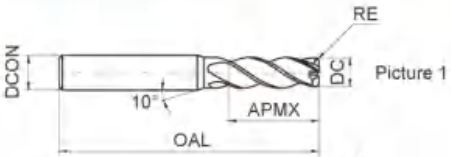
- Wide application, applicable for several machining forms.

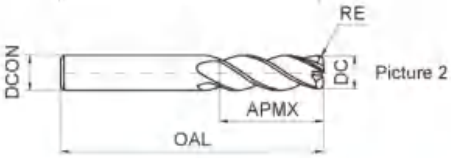












Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
HMX-4R-D1.0R0.2	1.0	0.2	4	3	50	4	Picture 1	●
HMX-4R-D1.5R0.2	1.5	0.2	4	4	50	4	Picture 1	●
HMX-4R-D2.0R0.2	2.0	0.2	4	6	50	4	Picture 1	●
HMX-4R-D2.0R0.5	2.0	0.5	4	6	50	4	Picture 1	●
HMX-4R-D2.5R0.2	2.5	0.2	4	8	50	4	Picture 1	●
HMX-4R-D2.5R0.5	2.5	0.5	4	8	50	4	Picture 1	●
HMX-4R-D3.0R0.2	3.0	0.2	4	8	50	4	Picture 1	●
HMX-4R-D3.0R0.5	3.0	0.5	4	8	50	4	Picture 1	●
HMX-4R-D4.0R0.2	4.0	0.2	4	10	50	4	Picture 2	●
HMX-4R-D4.0R0.3	4.0	0.3	4	10	50	4	Picture 2	●
HMX-4R-D4.0R0.5	4.0	0.5	4	10	50	4	Picture 2	●
HMX-4R-D5.0R0.2	5.0	0.2	6	13	50	4	Picture 2	●
HMX-4R-D5.0R0.5	5.0	0.5	6	13	50	4	Picture 1	●
HMX-4R-D5.0R1.0	5.0	1.0	6	13	50	4	Picture 1	●
HMX-4R-D6.0R0.2	6.0	0.2	6	16	50	4	Picture 2	●
HMX-4R-D6.0R0.5	6.0	0.5	6	16	50	4	Picture 2	●
HMX-4R-D6.0R1.0	6.0	1.0	6	16	50	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material										
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

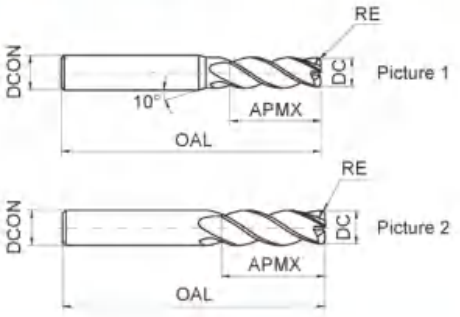
Code key B294 · Graphics category and identification B295 · Cutting parameters B615 · Non-standard customization B652-B653

4-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

HMX-4R





- Wide application, applicable for several machining forms.

35° | Coated NaNo TiAlXN | DC 0~-0.020

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
HMX-4R-D8.0R0.2	8.0	0.2	8	20	60	4	Picture 2	●
HMX-4R-D8.0R0.5	8.0	0.5	8	20	60	4	Picture 2	●
HMX-4R-D8.0R1.0	8.0	1.0	8	20	60	4	Picture 2	●
HMX-4R-D10.0R0.2	10.0	0.2	10	25	75	4	Picture 2	●
HMX-4R-D10.0R0.5	10.0	0.5	10	25	75	4	Picture 2	●
HMX-4R-D10.0R1.0	10.0	1.0	10	25	75	4	Picture 2	●
HMX-4R-D10.0R2.0	10.0	2.0	10	25	75	4	Picture 2	●
HMX-4R-D10.0R3.0	10.0	3.0	10	25	75	4	Picture 2	●
HMX-4R-D12.0R0.2	12.0	0.2	12	30	75	4	Picture 2	●
HMX-4R-D12.0R0.5	12.0	0.5	12	30	75	4	Picture 2	●
HMX-4R-D12.0R1.0	12.0	1.0	12	30	75	4	Picture 2	●
HMX-4R-D12.0R2.0	12.0	2.0	12	30	75	4	Picture 2	●
HMX-4R-D12.0R3.0	12.0	3.0	12	30	75	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294 | Graphics category and identification B295 | Cutting parameters B615 | Non-standard customization B652-B653

4-flute R end mills with long shank


Radius shoulder


Profile

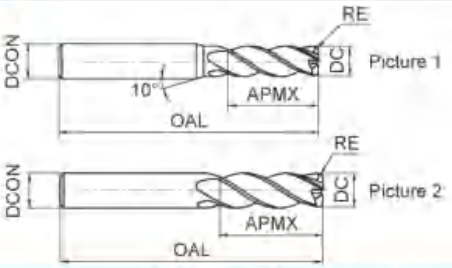

Radius corner slot

HMX-4RBL/M/X



- HMX-4R series with long shank.

35° | Coated AlCrN TiAlN | DC 0~-0.020



Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
HMX-4RBL-D4.0R0.2S	4.0	0.2	4	10	75	4	Picture 2	●
HMX-4RBL-D4.0R0.2	4.0	0.2	6	10	75	4	Picture 1	●
HMX-4RBL-D4.0R0.5S	4.0	0.5	4	10	75	4	Picture 2	●
HMX-4RBL-D4.0R0.5	4.0	0.5	6	10	75	4	Picture 1	●
HMX-4RBL-D6.0R0.2	6.0	0.2	6	16	75	4	Picture 2	●
HMX-4RBX-D6.0R0.2	6.0	0.2	6	16	100	4	Picture 2	●
HMX-4RBL-D6.0R0.5	6.0	0.5	6	16	75	4	Picture 2	●
HMX-4RBX-D6.0R0.5	6.0	0.5	6	16	100	4	Picture 2	●
HMX-4RBL-D6.0R1.0	6.0	1.0	6	16	75	4	Picture 2	●
HMX-4RBX-D6.0R1.0	6.0	1.0	6	16	100	4	Picture 2	●
HMX-4RBM-D8.0R0.2	8.0	0.2	8	20	75	4	Picture 2	●
HMX-4RBL-D8.0R0.2	8.0	0.2	8	20	100	4	Picture 2	●
HMX-4RBM-D8.0R0.5	8.0	0.5	8	20	75	4	Picture 2	●
HMX-4RBL-D8.0R0.5	8.0	0.5	8	20	100	4	Picture 2	●
HMX-4RBM-D8.0R1.0	8.0	1.0	8	20	75	4	Picture 2	●
HMX-4RBL-D8.0R1.0	8.0	1.0	8	20	100	4	Picture 2	●
HMX-4RBL-D10.0R0.2	10.0	0.2	10	25	100	4	Picture 2	●
HMX-4RBX-D10.0R0.2	10.0	0.2	10	25	150	4	Picture 2	●
HMX-4RBL-D10.0R0.5	10.0	0.5	10	25	100	4	Picture 2	●
HMX-4RBX-D10.0R0.5	10.0	0.5	10	25	150	4	Picture 2	●
HMX-4RBL-D10.0R1.0	10.0	1.0	10	25	100	4	Picture 2	●
HMX-4RBX-D10.0R1.0	10.0	1.0	10	25	150	4	Picture 2	●
HMX-4RBL-D10.0R2.0	10.0	2.0	10	25	100	4	Picture 2	●
HMX-4RBX-D10.0R2.0	10.0	2.0	10	25	150	4	Picture 2	●
HMX-4RBL-D12.0R0.2	12.0	0.2	12	30	100	4	Picture 2	●
HMX-4RBX-D12.0R0.2	12.0	0.2	12	30	150	4	Picture 2	●
HMX-4RBL-D12.0R0.5	12.0	0.5	12	30	100	4	Picture 2	●
HMX-4RBX-D12.0R0.5	12.0	0.5	12	30	150	4	Picture 2	●
HMX-4RBL-D12.0R1.0	12.0	1.0	12	30	100	4	Picture 2	●
HMX-4RBX-D12.0R1.0	12.0	1.0	12	30	150	4	Picture 2	●
HMX-4RBL-D12.0R2.0	12.0	2.0	12	30	100	4	Picture 2	●
HMX-4RBX-D12.0R2.0	12.0	2.0	12	30	150	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material										
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

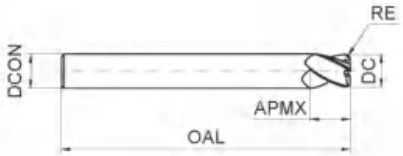
Code key B294 | Graphics category and identification B295 | Cutting parameters B615 | Non-standard customization B652-B653

4-flute R end mills with straight shank and short cutting edge

Radius shoulder | Profile | Radius corner slot

HMX-4RF



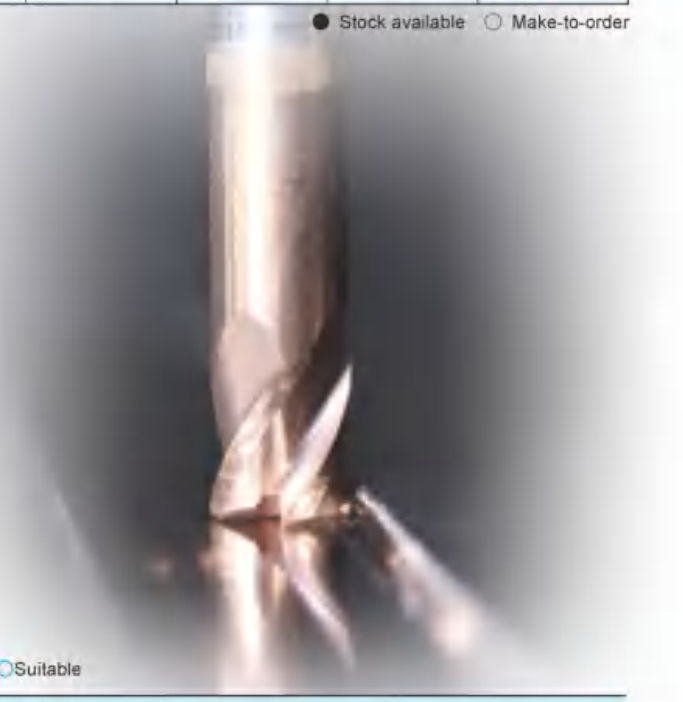


- High-rigidity short edge design, for cutting with high feed rate at high speed.

35° | Coated NaNo TiAlN | DC 0~-0.020

Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
HMX-4RF-D6.0R0.5	6.0	0.5	6	6	50	4	●
HMX-4RF-D6.0R1.0	6.0	1.0	6	6	50	4	●
HMX-4RF-D8.0R0.5	8.0	0.5	8	8	60	4	●
HMX-4RF-D8.0R1.0	8.0	1.0	8	8	60	4	●
HMX-4RF-10.0R0.5	10.0	0.5	10	10	75	4	●
HMX-4RF-D10.0R1.0	10.0	1.0	10	10	75	4	●
HMX-4RF-D10.0R2.0	10.0	2.0	10	10	75	4	●
HMX-4RF-D12.0R0.5	12.0	0.5	12	12	75	4	●
HMX-4RF-D12.0R1.0	12.0	1.0	12	12	75	4	●
HMX-4RF-D12.0R2.0	12.0	2.0	12	12	75	4	●

● Stock available ○ Make-to-order



Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294 | Graphics category and identification B295 | Cutting parameters B615 | Non-standard customization B652-B653

4-flute R end mills with straight shank, long neck and short cutting edge

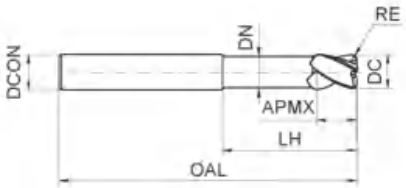

Radius shoulder


Profile


Radius corner slot

HMX-4RP





- Long shank and short cutting edge designed for deep cavity milling.

35° | Coated NANO TiAlXN | DC DC≤12 0~-0.020 12<DC 0~-0.030

Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	RE	DCON	DN	APMX	LH	OAL		
HMX-4RP-D6.0R0.5	6.0	0.5	6	5.8	6	18	75	4	●
HMX-4RP-D6.0R1.0	6.0	1.0	6	5.8	6	18	75	4	●
HMX-4RP-D8.0R0.5	8.0	0.5	8	7.8	8	24	100	4	●
HMX-4RP-D8.0R1.0	8.0	1.0	8	7.8	8	24	100	4	●
HMX-4RP-10.0R0.5	10.0	0.5	10	9.6	10	30	100	4	●
HMX-4RP-10.0R1.0	10.0	1.0	10	9.6	10	30	100	4	●
HMX-4RP-10.0R2.0	10.0	2.0	10	9.6	10	30	100	4	●
HMX-4RP-12.0R0.5	12.0	0.5	12	11.5	12	36	100	4	●
HMX-4RP-12.0R1.0	12.0	1.0	12	11.5	12	36	100	4	●
HMX-4RP-12.0R2.0	12.0	2.0	12	11.5	12	36	100	4	●
HMX-4RP-D16.0R1.0	16.0	1.0	16	15.5	16	40	150	4	●
HMX-4RP-D16.0R2.0	16.0	2.0	16	15.5	16	40	150	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminium alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

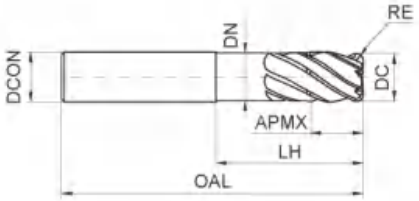
Code key B294 | Graphics category and identification B295 | Cutting parameters B615 | Non-standard customization B652-B653

6-flute R end mills with straight shank and high rigidity

Radius shoulder Profile Radius corner slot

HMX-6R-MAX





- High rigidity short cutting edge designed for high cutting speed, high feed, high efficient machining.

20° Coated NaNo TiAlXN DC DC≤12 0~-0.020 12<DC 0~-0.030

Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	RE	DCON	APMX	DN	LH	OAL		
HMX-6R-D6R0.5-MAX	6.0	0.5	6	6	5.8	16	50	6	○
HMX-6R-D8R1.0-MAX	8.0	1.0	8	8	7.8	24	60	6	○
HMX-6R-D10R1.0-MAX	10.0	1.0	10	10	9.8	30	75	6	○
HMX-6R-D12R1.0-MAX	12.0	1.0	12	12	11.5	36	75	6	○
HMX-6R-D16R1.0-MAX	16.0	1.0	16	16	15.5	48	100	6	○
HMX-6R-D20R1.0-MAX	20.0	1.0	20	20	19.5	50	100	6	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

Code key B294 Graphics category and identification B295 Cutting parameters B616 Non-standard customization B652-B653

RM series
End mills for super alloy machining



Typical application

Aircraft engine parts, aviation rocket driving parts, all kinds of missile driving devices, pump truck and ship booster parts
Aircraft engine parts, aviation rocket driving parts, all kinds of missile driving devices, pump truck and ship booster parts

Unequal teeth pitch structure

New passivation process strengthens the edge

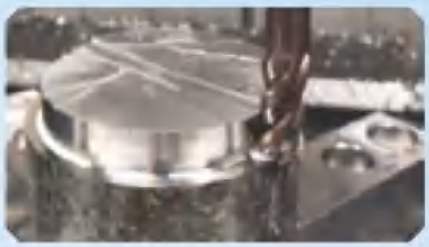
Mirror-like grinding quality of rear face

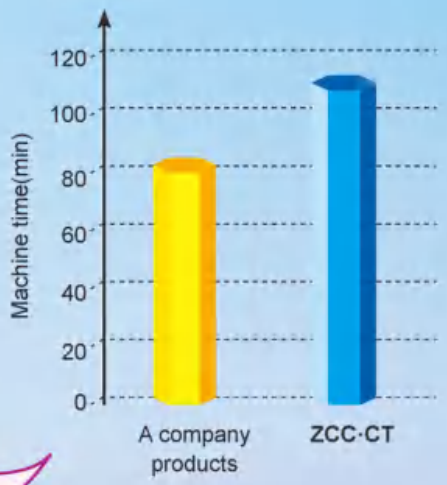
Special geometry design, taking into account tool rigidity and chip space

Adopt super fine grain mitrax+special coating for super alloy machining effectively postpones the tools wearance and improves the breakage resistance

Application case 1

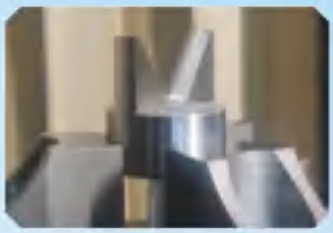
Workpiece material: incol718
Processing: side milling
Tool: RM-4R-D10.0R1.5
Cutting parameters: S=1000r/min, F=150mm/min
Ap=12mm, Ae=1.0mm



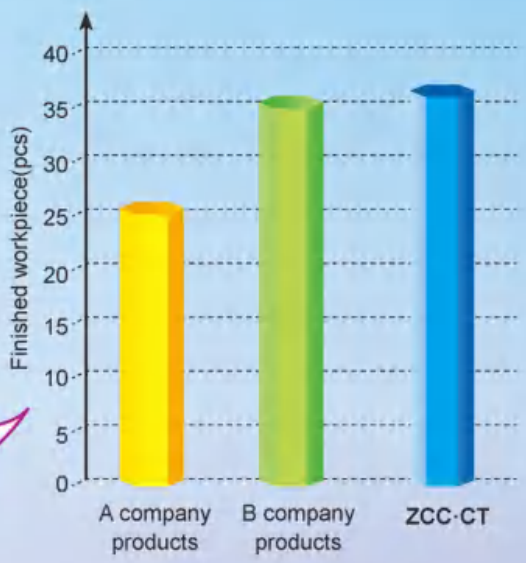


Conclusion: RM-4R-D10.0R1.5 has better wear resistance, longer tool life and less burrs on workpiece.

Application case 2



Workpiece material: GH4169
Processing: side milling
Tool: RM-4R-D12.0R1.5
Cutting parameters: S=1000r/min, F=200mm/min
Ap=5.5-7.5mm, Ae=1.5-2mm



Conclusion: RM-4R-D12.0R1.5 cuts lightly with less burrs and longer tool life. Customer is very satisfied.

4-flute flattened end mills with straight shank

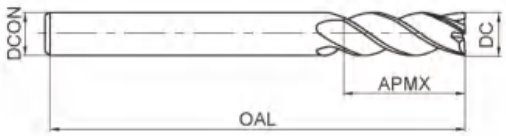

Side face


Step shoulder


Straight slot

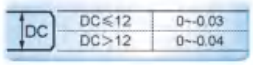
RM-4E













Type	Basic dimension(mm)				Number of teeth Z	Stock
	DC	DCON	APMX	OAL		
RM-4E-D6.0	6	6	16	50	4	●
RM-4E-D8.0	8	8	20	60	4	●
RM-4E-D10.0	10	10	25	75	4	●
RM-4E-D12.0	12	12	30	75	4	●
RM-4E-D14.0	14	14	35	90	4	●
RM-4E-D16.0	16	16	35	90	4	●
RM-4E-D20.0	20	20	45	100	4	●
RM-4E-D25.0	25	25	50	110	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

Code key B294
Graphics category and identification B295
Cutting parameters B617
Non-standard customization B652-B653


Side face

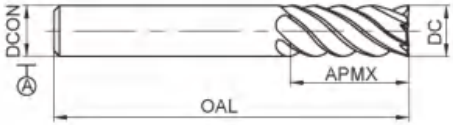
Step shoulder

Straight slot

5-flute flattened end mills with straight shank

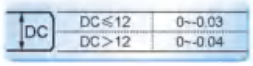
RM-5E













Type	Basic dimension(mm)				Number of teeth Z	Stock
	DC	DCON	APMX	OAL		
RM-5E-D10.0	10	10	25	75	5	●
RM-5E-D12.0	12	12	30	75	5	●
RM-5E-D14.0	14	14	35	90	5	●
RM-5E-D16.0	16	16	35	90	5	●
RM-5E-D20.0	20	20	45	100	5	●
RM-5E-D25.0	25	25	50	110	5	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

Code key B294
Graphics category and identification B295
Cutting parameters B617
Non-standard customization B652-B653

6-flute flattened end mills with straight shank

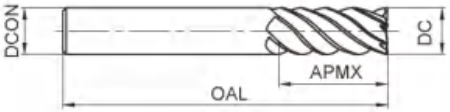

Side face


Step shoulder


Straight slot

RM-6E





45°

Coated TiALXN

DC	DC≤12	0~-0.03
	DC>12	0~-0.04

Type	Basic dimension(mm)				Number of teeth Z	Stock
	DC	DCON	APMX	OAL		
RM-6E-D10.0	10	10	25	75	6	●
RM-6E-D12.0	12	12	30	75	6	●
RM-6E-D14.0	14	14	35	90	6	●
RM-6E-D16.0	16	16	35	90	6	●
RM-6E-D20.0	20	20	45	100	6	●
RM-6E-D25.0	25	25	50	110	6	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

Code key B294
Graphics category and identification B295
Cutting parameters B618
Non-standard customization B652-B653

4-flute ball nose end mills with straight shank

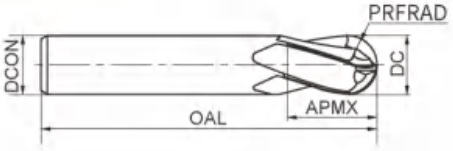

Profile

Cavity

Ball nose slot

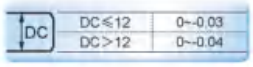
RM-4B













Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	PRFRAD	DCON	APMX	OAL		
RM-4B-R3.0	6	3	6	9	50	4	●
RM-4B-R4.0	8	4	8	12	60	4	●
RM-4B-R5.0	10	5	10	15	75	4	●
RM-4B-R6.0	12	6	12	18	75	4	●
RM-4B-R8.0	16	8	16	24	85	4	●
RM-4B-R10.0	20	10	20	30	100	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

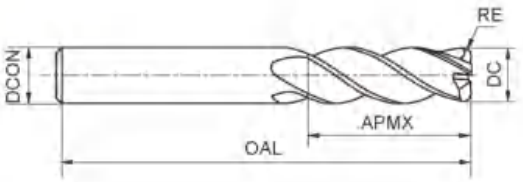
Code key B294
Graphics category and identification B295
Cutting parameters B621
Non-standard customization B652-B653

4-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

RM-4R





42°,44° | Coating: TIALXN | DC: DC≤12 0~-0.03, DC>12 0~-0.04

Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
RM-4R-D6.0R0.2	6	0.2	6	16	50	4	●
RM-4R-D6.0R0.3	6	0.3	6	16	50	4	●
RM-4R-D6.0R0.5	6	0.5	6	16	50	4	●
RM-4R-D6.0R0.75	6	0.75	6	16	50	4	●
RM-4R-D6.0R1.0	6	1.0	6	16	50	4	●
RM-4R-D8.0R0.2	8	0.2	8	20	60	4	●
RM-4R-D8.0R0.3	8	0.3	8	20	60	4	●
RM-4R-D8.0R0.5	8	0.5	8	20	60	4	●
RM-4R-D8.0R0.75	8	0.75	8	20	60	4	●
RM-4R-D8.0R1.0	8	1.0	8	20	60	4	●
RM-4R-D8.0R2.0	8	2.0	8	20	60	4	●
RM-4R-D10.0R0.2	10	0.2	10	25	75	4	●
RM-4R-D10.0R0.3	10	0.3	10	25	75	4	●
RM-4R-D10.0R0.5	10	0.5	10	25	75	4	●
RM-4R-D10.0R0.75	10	0.75	10	25	75	4	●
RM-4R-D10.0R1.0	10	1.0	10	25	75	4	●
RM-4R-D10.0R1.5	10	1.5	10	25	75	4	●
RM-4R-D10.0R2.0	10	2.0	10	25	75	4	●
RM-4R-D12.0R0.2	12	0.2	12	30	75	4	●
RM-4R-D12.0R0.3	12	0.3	12	30	75	4	●
RM-4R-D12.0R0.5	12	0.5	12	30	75	4	●
RM-4R-D12.0R0.75	12	0.75	12	30	75	4	●
RM-4R-D12.0R1.0	12	1.0	12	30	75	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

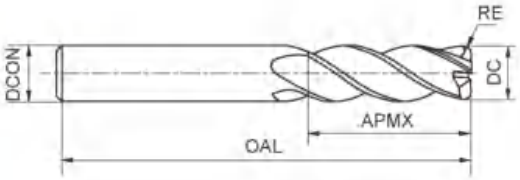
Code key B294 | Graphics category and identification B295 | Cutting parameters B619 | Non-standard customization B652-B653

4-flute R end mills with straight shank


Radius shoulder
Profile
Radius corner slot

RM-4R





42° 44°

Content TiALXN

DC		
	DC≤12	0~-0.03
	DC>12	0~-0.04

Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
RM-4R-D12.0R1.5	12	1.5	12	30	75	4	●
RM-4R-D12.0R2.0	12	2.0	12	30	75	4	●
RM-4R-D12.0R2.5	12	2.5	12	30	75	4	●
RM-4R-D12.0R3.0	12	3.0	12	30	75	4	●
RM-4R-D14.0R0.2	14	0.2	14	35	90	4	●
RM-4R-D14.0R0.3	14	0.3	14	35	90	4	●
RM-4R-D14.0R0.5	14	0.5	14	35	90	4	●
RM-4R-D14.0R0.75	14	0.75	14	35	90	4	●
RM-4R-D14.0R1.0	14	1.0	14	35	90	4	●
RM-4R-D14.0R1.5	14	1.5	14	35	90	4	●
RM-4R-D14.0R2.0	14	2.0	14	35	90	4	●
RM-4R-D14.0R2.5	14	2.5	14	35	90	4	●
RM-4R-D14.0R3.0	14	3.0	14	35	90	4	●
RM-4R-D16.0R0.2	16	0.2	16	35	90	4	●
RM-4R-D16.0R0.3	16	0.3	16	35	90	4	●
RM-4R-D16.0R0.5	16	0.5	16	35	90	4	●
RM-4R-D16.0R0.75	16	0.75	16	35	90	4	●
RM-4R-D16.0R1.0	16	1.0	16	35	90	4	●
RM-4R-D16.0R1.5	16	1.5	16	35	90	4	●
RM-4R-D16.0R2.0	16	2.0	16	35	90	4	●
RM-4R-D16.0R2.5	16	2.5	16	35	90	4	●
RM-4R-D16.0R3.0	16	3.0	16	35	90	4	●
RM-4R-D16.0R4.0	16	4.0	16	35	90	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

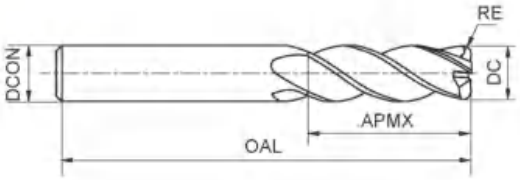
Code key B294
Graphics category and identification B295
Cutting parameters B619
Non-standard customization B652-B653

4-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

RM-4R





42°,44° | Coated TiALXN | DC: DC≤12 0~-0.03, DC>12 0~-0.04

Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
RM-4R-D20.0R0.2	20	0.2	20	45	100	4	●
RM-4R-D20.0R0.3	20	0.3	20	45	100	4	●
RM-4R-D20.0R0.5	20	0.5	20	45	100	4	●
RM-4R-D20.0R0.75	20	0.75	20	45	100	4	●
RM-4R-D20.0R1.0	20	1.0	20	45	100	4	●
RM-4R-D20.0R1.5	20	1.5	20	45	100	4	●
RM-4R-D20.0R2.0	20	2.0	20	45	100	4	●
RM-4R-D20.0R2.5	20	2.5	20	45	100	4	●
RM-4R-D20.0R3.0	20	3.0	20	45	100	4	●
RM-4R-D20.0R4.0	20	4.0	20	45	100	4	●
RM-4R-D25.0R1.0	25	1.0	25	50	110	4	●
RM-4R-D25.0R2.0	25	2.0	25	50	110	4	●
RM-4R-D25.0R3.0	25	3.0	25	50	110	4	●
RM-4R-D25.0R4.0	25	4.0	25	50	110	4	●
RM-4R-D25.0R5.0	25	5.0	25	50	110	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

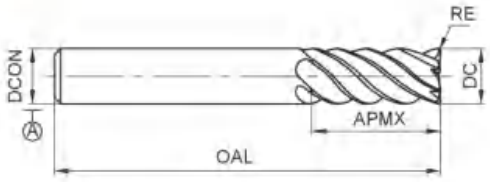
Code key B294 | Graphics category and identification B295 | Cutting parameters B619 | Non-standard customization B652-B653

5-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

RM-5R





42° | Coated TiALXN | DC: DC≤12 0~-0.03, DC>12 0~-0.04

Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
RM-5R-D6.0R0.2	6	0.2	6	16	50	5	●
RM-5R-D6.0R0.3	6	0.3	6	16	50	5	●
RM-5R-D6.0R0.5	6	0.5	6	16	50	5	●
RM-5R-D6.0R0.75	6	0.75	6	16	50	5	●
RM-5R-D6.0R1.0	6	1.0	6	16	50	5	●
RM-5R-D8.0R0.2	8	0.2	8	20	60	5	●
RM-5R-D8.0R0.3	8	0.3	8	20	60	5	●
RM-5R-D8.0R0.5	8	0.5	8	20	60	5	●
RM-5R-D8.0R0.75	8	0.75	8	20	60	5	●
RM-5R-D8.0R1.0	8	1.0	8	20	60	5	●
RM-5R-D8.0R2.0	8	2.0	8	20	60	5	●
RM-5R-D10.0R0.2	10	0.2	10	25	75	5	●
RM-5R-D10.0R0.3	10	0.3	10	25	75	5	●
RM-5R-D10.0R0.5	10	0.5	10	25	75	5	●
RM-5R-D10.0R0.75	10	0.75	10	25	75	5	●
RM-5R-D10.0R1.0	10	1.0	10	25	75	5	●
RM-5R-D10.0R1.5	10	1.5	10	25	75	5	●
RM-5R-D10.0R2.0	10	2.0	10	25	75	5	●
RM-5R-D12.0R0.2	12	0.2	12	30	75	5	●
RM-5R-D12.0R0.3	12	0.3	12	30	75	5	●
RM-5R-D12.0R0.5	12	0.5	12	30	75	5	●
RM-5R-D12.0R0.75	12	0.75	12	30	75	5	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

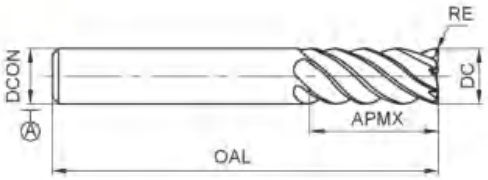
Code key B294 | Graphics category and identification B295 | Cutting parameters B619 | Non-standard customization B652-B653

5-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

RM-5R





42° | Coated TiALXN | DC: DC≤12 0~-0.03, DC>12 0~-0.04

Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
RM-5R-D12.0R1.0	12	1.0	12	30	75	5	●
RM-5R-D12.0R1.5	12	1.5	12	30	75	5	●
RM-5R-D12.0R2.0	12	2.0	12	30	75	5	●
RM-5R-D12.0R2.5	12	2.5	12	30	75	5	●
RM-5R-D12.0R3.0	12	3.0	12	30	75	5	●
RM-5R-D14.0R0.2	14	0.2	14	35	90	5	●
RM-5R-D14.0R0.3	14	0.3	14	35	90	5	●
RM-5R-D14.0R0.5	14	0.5	14	35	90	5	●
RM-5R-D14.0R0.75	14	0.75	14	35	90	5	●
RM-5R-D14.0R1.0	14	1.0	14	35	90	5	●
RM-5R-D14.0R1.5	14	1.5	14	35	90	5	●
RM-5R-D14.0R2.0	14	2.0	14	35	90	5	●
RM-5R-D14.0R2.5	14	2.5	14	35	90	5	●
RM-5R-D14.0R3.0	14	3.0	14	35	90	5	●
RM-5R-D16.0R0.2	16	0.2	16	35	90	5	●
RM-5R-D16.0R0.3	16	0.3	16	35	90	5	●
RM-5R-D16.0R0.5	16	0.5	16	35	90	5	●
RM-5R-D16.0R0.75	16	0.75	16	35	90	5	●
RM-5R-D16.0R1.0	16	1.0	16	35	90	5	●
RM-5R-D16.0R1.5	16	1.5	16	35	90	5	●
RM-5R-D16.0R2.0	16	2.0	16	35	90	5	●
RM-5R-D16.0R2.5	16	2.5	16	35	90	5	●
RM-5R-D16.0R3.0	16	3.0	16	35	90	5	●
RM-5R-D16.0R4.0	16	4.0	16	35	90	5	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

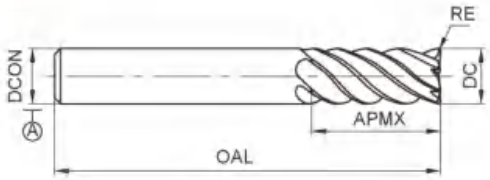
Code key B294 | Graphics category and identification B295 | Cutting parameters B619 | Non-standard customization B652-B653

5-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

RM-5R





42° | Coated TIALXN | DC: DC≤12 0~-0.03, DC>12 0~-0.04

Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
RM-5R-D20.0R0.2	20	0.2	20	45	100	5	●
RM-5R-D20.0R0.3	20	0.3	20	45	100	5	●
RM-5R-D20.0R0.5	20	0.5	20	45	100	5	●
RM-5R-D20.0R0.75	20	0.75	20	45	100	5	●
RM-5R-D20.0R1.0	20	1.0	20	45	100	5	●
RM-5R-D20.0R1.5	20	1.5	20	45	100	5	●
RM-5R-D20.0R2.0	20	2.0	20	45	100	5	●
RM-5R-D20.0R2.5	20	2.5	20	45	100	5	●
RM-5R-D20.0R3.0	20	3.0	20	45	100	5	●
RM-5R-D20.0R4.0	20	4.0	20	45	100	5	●
RM-5R-D25.0R1.0	25	1.0	25	50	110	5	●
RM-5R-D25.0R2.0	25	2.0	25	50	110	5	●
RM-5R-D25.0R3.0	25	3.0	25	50	110	5	●
RM-5R-D25.0R4.0	25	4.0	25	50	110	5	●
RM-5R-D25.0R5.0	25	5.0	25	50	110	5	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

Code key B294 | Graphics category and identification B295 | Cutting parameters B619 | Non-standard customization B652-B653

6-flute R end mills with straight shank

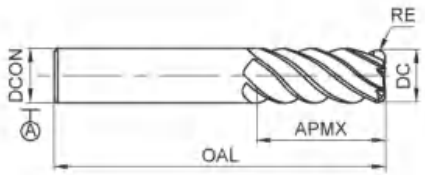

Radius shoulder


Profile


Radius corner slot

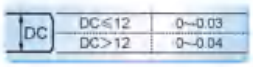
RM-6R













Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
RM-6R-D10.0R1.0	10	1.0	10	25	75	6	●
RM-6R-D10.0R2.0	10	2.0	10	25	75	6	●
RM-6R-D12.0R1.0	12	1.0	12	30	75	6	●
RM-6R-D12.0R2.0	12	2.0	12	30	75	6	●
RM-6R-D12.0R3.0	12	3.0	12	30	75	6	●
RM-6R-D14.0R1.0	14	1.0	14	35	90	6	●
RM-6R-D14.0R2.0	14	2.0	14	35	90	6	●
RM-6R-D14.0R3.0	14	3.0	14	35	90	6	●
RM-6R-D16.0R1.0	16	1.0	16	35	90	6	●
RM-6R-D16.0R2.5	16	2.5	16	35	90	6	●
RM-6R-D16.0R4.0	16	4.0	16	35	90	6	●
RM-6R-D20.0R1.0	20	1.0	20	45	100	6	●
RM-6R-D20.0R2.5	20	2.5	20	45	100	6	●
RM-6R-D20.0R4.0	20	4.0	20	45	100	6	●
RM-6R-D25.0R1.0	25	1.0	25	50	110	6	●
RM-6R-D25.0R2.5	25	2.5	25	50	110	6	●
RM-6R-D25.0R4.0	25	4.0	25	50	110	6	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

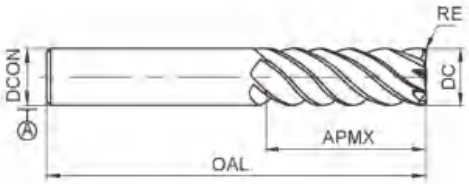
Code key B294 · Graphics category and identification B295 · Cutting parameters B620 · Non-standard customization B652-B653

7-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

RM-7R





45° | Coated TiALXN | DC: DC≤12 0~-0.03, DC>12 0~-0.04

Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
RM-7R-D10.0R0.2	10	0.2	10	25	75	7	●
RM-7R-D10.0R0.3	10	0.3	10	25	75	7	●
RM-7R-D10.0R0.5	10	0.5	10	25	75	7	●
RM-7R-D10.0R0.75	10	0.75	10	25	75	7	●
RM-7R-D10.0R1.0	10	1.0	10	25	75	7	●
RM-7R-D10.0R1.5	10	1.5	10	25	75	7	●
RM-7R-D10.0R2.0	10	2.0	10	25	75	7	●
RM-7R-D12.0R0.2	12	0.2	12	30	75	7	●
RM-7R-D12.0R0.3	12	0.3	12	30	75	7	●
RM-7R-D12.0R0.5	12	0.5	12	30	75	7	●
RM-7R-D12.0R0.75	12	0.75	12	30	75	7	●
RM-7R-D12.0R1.0	12	1.0	12	30	75	7	●
RM-7R-D12.0R1.5	12	1.5	12	30	75	7	●
RM-7R-D12.0R2.0	12	2.0	12	30	75	7	●
RM-7R-D12.0R2.5	12	2.5	12	30	75	7	●
RM-7R-D12.0R3.0	12	3.0	12	30	75	7	●
RM-7R-D14.0R0.2	14	0.2	14	35	90	7	●
RM-7R-D14.0R0.3	14	0.3	14	35	90	7	●
RM-7R-D14.0R0.5	14	0.5	14	35	90	7	●
RM-7R-D14.0R0.75	14	0.75	14	35	90	7	●
RM-7R-D14.0R1.0	14	1.0	14	35	90	7	●
RM-7R-D14.0R1.5	14	1.5	14	35	90	7	●
RM-7R-D14.0R2.0	14	2.0	14	35	90	7	●
RM-7R-D14.0R2.5	14	2.5	14	35	90	7	●
RM-7R-D14.0R3.0	14	3.0	14	35	90	7	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

Code key B294 | Graphics category and identification B295 | Cutting parameters B620 | Non-standard customization B652-B653

7-flute R end mills with straight shank

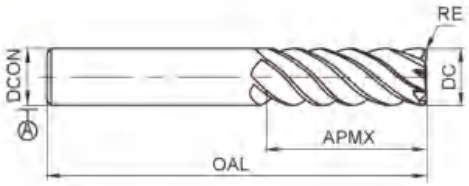

Radius shoulder


Profile


Radius corner slot

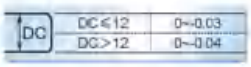
RM-7R













Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
RM-7R-D16.0R0.2	16	0.2	16	35	90	7	●
RM-7R-D16.0R0.3	16	0.3	16	35	90	7	●
RM-7R-D16.0R0.5	16	0.5	16	35	90	7	●
RM-7R-D16.0R0.75	16	0.75	16	35	90	7	●
RM-7R-D16.0R1.0	16	1.0	16	35	90	7	●
RM-7R-D16.0R1.5	16	1.5	16	35	90	7	●
RM-7R-D16.0R2.0	16	2.0	16	35	90	7	●
RM-7R-D16.0R2.5	16	2.5	16	35	90	7	●
RM-7R-D16.0R3.0	16	3.0	16	35	90	7	●
RM-7R-D16.0R4.0	16	4.0	16	35	90	7	●
RM-7R-D20.0R0.2	20	0.2	20	45	100	7	●
RM-7R-D20.0R0.3	20	0.3	20	45	100	7	●
RM-7R-D20.0R0.5	20	0.5	20	45	100	7	●
RM-7R-D20.0R0.75	20	0.75	20	45	100	7	●
RM-7R-D20.0R1.0	20	1.0	20	45	100	7	●
RM-7R-D20.0R1.5	20	1.5	20	45	100	7	●
RM-7R-D20.0R2.0	20	2.0	20	45	100	7	●
RM-7R-D20.0R2.5	20	2.5	20	45	100	7	●
RM-7R-D20.0R3.0	20	3.0	20	45	100	7	●
RM-7R-D20.0R4.0	20	4.0	20	45	100	7	●
RM-7R-D25.0R1.0	25	1.0	25	50	110	7	●
RM-7R-D25.0R2.0	25	2.0	25	50	110	7	●
RM-7R-D25.0R3.0	25	3.0	25	50	110	7	●
RM-7R-D25.0R4.0	25	4.0	25	50	110	7	●
RM-7R-D25.0R5.0	25	5.0	25	50	110	7	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

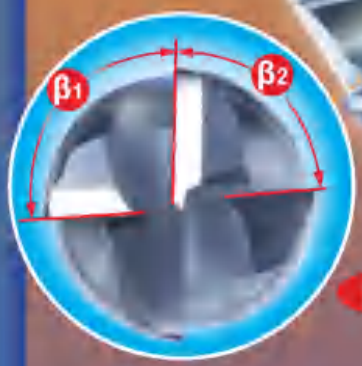
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

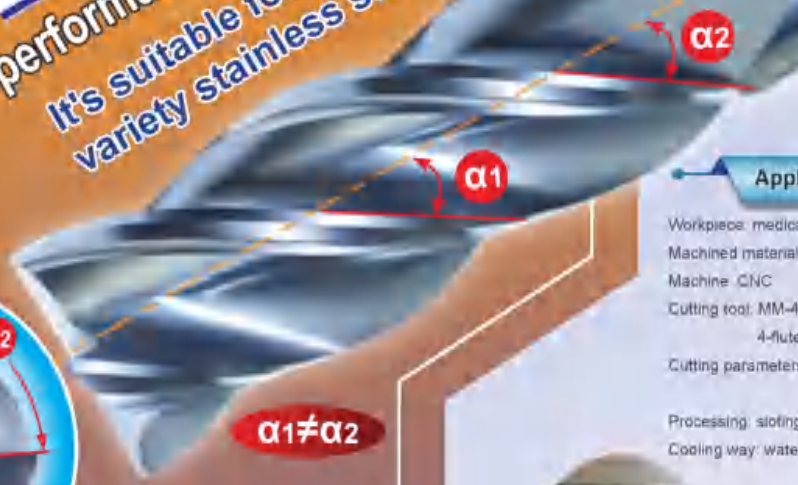
Code key B294 · Graphics category and identification B295 · Cutting parameters B620 · Non-standard customization B652-B653

MM Sries

High performance universal end mills for stainless steel

It's suitable for high-efficiency and universal machining for variety stainless steel and steel.





β1≠β2

- Unequal teeth pitch and unequal helical structure improve tools vibration resistance largely and improve the smoothness of machined surface.
- Unique flute design, taking the tool rigidity account with chip space, can meet the work conditions of high feed milling and cycloid curve milling.
- Unique edge treatment technics effectively reduce processing stick, postpone the tool wearance and improve the tool service life greatly.



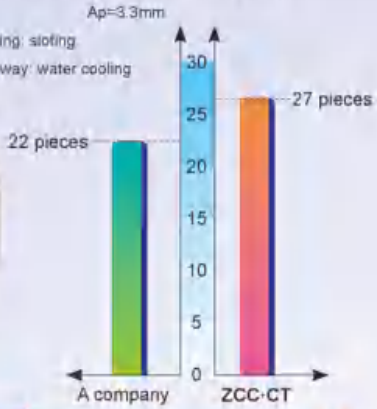
- Matrix and coating with better universalty and wear resistance.



Application case 1

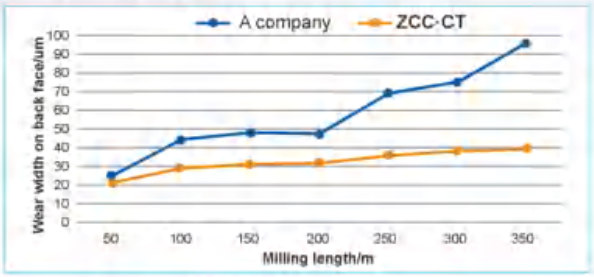
Workpiece: medical devices
Machined material: SUS304
Machine: CNC
Cutting tool: MM-4R-D8.0R0.5,
4-flute coating R end mills
Cutting parameters: S=2500rpm, F=250mm/min,
Ap=3.3mm
Processing: slotting
Cooling way: water cooling



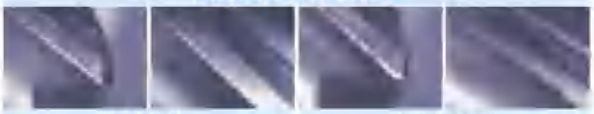


Application case 2

Machined material: SUS304
Machine: CNC
Cutting tool: MM-4E-D6.0
Cutting parameters: S=5300rpm, F=2120mm/min,
Ap=9mm, Ae=0.6mm
Cooling way: water cooling



Picture of tool wear



ZCC·CT A company

4-flute flattened end mills with straight shank

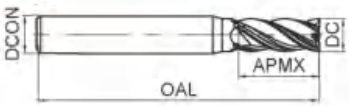

Side face


Step shoulder

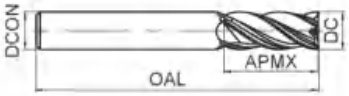

Straight slot

MM-4E





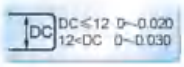
Picture 1



Picture 2











Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
MM-4E-D1.0S	1.0	4	3	50	4	Picture 1	●
MM-4E-D1.5S	1.5	4	4	50	4	Picture 1	●
MM-4E-D2.0S	2.0	4	6	50	4	Picture 1	●
MM-4E-D2.5S	2.5	4	8	50	4	Picture 1	●
MM-4E-D3.0S	3.0	4	8	50	4	Picture 1	●
MM-4E-D3.0	3.0	6	8	50	4	Picture 1	●
MM-4E-D4.0S	4.0	4	11	50	4	Picture 2	●
MM-4E-D4.0	4.0	6	11	50	4	Picture 1	●
MM-4E-D5.0	5.0	6	13	50	4	Picture 1	●
MM-4E-D6.0	6.0	6	16	50	4	Picture 2	●
MM-4E-D7.0	7.0	8	20	60	4	Picture 1	●
MM-4E-D8.0	8.0	8	20	60	4	Picture 2	●
MM-4E-D9.0	9.0	10	22	75	4	Picture 1	●
MM-4E-D10.0	10.0	10	25	75	4	Picture 2	●
MM-4E-D12.0	12.0	12	30	75	4	Picture 2	●
MM-4E-D14.0	14.0	14	32	75	4	Picture 2	●
MM-4E-D16.0	16.0	16	45	100	4	Picture 2	●
MM-4E-D18.0	18.0	18	45	100	4	Picture 2	●
MM-4E-D20.0	20.0	20	45	100	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					◎				○	○

Code key B294 · Graphics category and identification B295 · Cutting parameters B622 · Non-standard customization B652-B653

4-flute flattened end mills with long shank

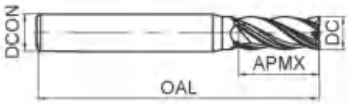

Side face


Step shoulder

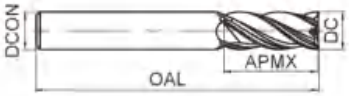

Straight slot

MM-4EF





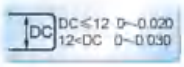
Picture 1



Picture 2











Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
MM-4EF-D1.0S	1.0	4	2	50	4	Picture 1	●
MM-4EF-D1.5S	1.5	4	3	50	4	Picture 1	●
MM-4EF-D2.0S	2.0	4	4	50	4	Picture 1	●
MM-4EF-D2.5S	2.5	4	5	50	4	Picture 1	●
MM-4EF-D3.0S	3.0	4	6	50	4	Picture 1	●
MM-4EF-D3.0	3.0	6	6	50	4	Picture 1	●
MM-4EF-D4.0S	4.0	4	8	50	4	Picture 2	●
MM-4EF-D4.0	4.0	6	8	50	4	Picture 1	●
MM-4EF-D5.0	5.0	6	10	50	4	Picture 1	●
MM-4EF-D6.0	6.0	6	12	50	4	Picture 2	●
MM-4ES-D7.0	7.0	8	14	60	4	Picture 1	●
MM-4EF-D8.0	8.0	8	16	60	4	Picture 2	●
MM-4EF-D9.0	9.0	10	18	75	4	Picture 1	●
MM-4EF-D10.0	10.0	10	20	75	4	Picture 2	●
MM-4EF-D12.0	12.0	12	24	75	4	Picture 2	●
MM-4EF-D14.0	14.0	14	28	75	4	Picture 2	●
MM-4EF-D16.0	16.0	16	32	100	4	Picture 2	●
MM-4EF-D18.0	18.0	18	36	100	4	Picture 2	●
MM-4EF-D20.0	20.0	20	40	100	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					◎				○	○

Code key B294
Graphics category and identification B295
Cutting parameters B622
Non-standard customization B652-B653

4-flute R end mills with straight shank

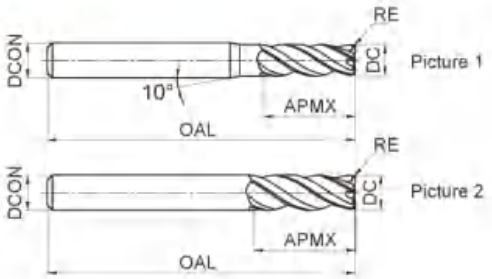

Radius shoulder


Profile


Radius corner slot

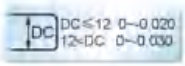
MM-4R















Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
MM-4R-D1.0R0.1S	1.0	0.1	4	3	50	4	Picture 1	●
MM-4R-D1.5R0.2S	1.5	0.2	4	4	50	4	Picture 1	●
MM-4R-D2.0R0.2S	2.0	0.2	4	6	50	4	Picture 1	●
MM-4R-D3.0R0.2S	3.0	0.2	4	8	50	4	Picture 1	●
MM-4R-D3.0R0.3S	3.0	0.3	4	8	50	4	Picture 1	●
MM-4R-D4.0R0.2S	4.0	0.2	4	10	50	4	Picture 2	●
MM-4R-D4.0R0.3S	4.0	0.3	4	10	50	4	Picture 2	●
MM-4R-D4.0R0.5S	4.0	0.5	4	10	50	4	Picture 2	●
MM-4R-D6.0R0.5	6.0	0.5	6	16	50	4	Picture 2	●
MM-4R-D6.0R1.0	6.0	1.0	6	16	50	4	Picture 2	●
MM-4R-D8.0R0.5	8.0	0.5	8	20	60	4	Picture 2	●
MM-4R-D8.0R1.0	8.0	1.0	8	20	60	4	Picture 2	●
MM-4R-D10.0R0.5	10.0	0.5	10	25	75	4	Picture 2	●
MM-4R-D10.0R1.0	10.0	1.0	10	25	75	4	Picture 2	●
MM-4R-D10.0R2.0	10.0	2.0	10	25	75	4	Picture 2	●
MM-4R-D12.0R1.0	12.0	1.0	12	30	75	4	Picture 2	●
MM-4R-D12.0R2.0	12.0	2.0	12	30	75	4	Picture 2	●
MM-4R-D12.0R3.0	12.0	3.0	12	30	75	4	Picture 2	●
MM-4R-D16.0R1.0	16.0	1.0	16	45	100	4	Picture 2	●
MM-4R-D16.0R2.0	16.0	2.0	16	45	100	4	Picture 2	●
MM-4R-D16.0R3.0	16.0	3.0	16	45	100	4	Picture 2	●
MM-4R-D20.0R1.0	20.0	1.0	20	45	100	4	Picture 2	●
MM-4R-D20.0R2.0	20.0	2.0	20	45	100	4	Picture 2	●
MM-4R-D20.0R3.0	20.0	3.0	20	45	100	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					◎				○	○

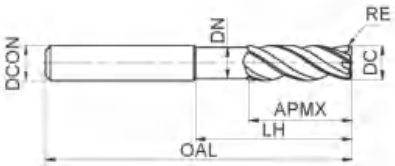
Code key B294 · Graphics category and identification B295 · Cutting parameters B623 · Non-standard customization B652-B653

4-flute R end mills with long shank and straight shank

Radius shoulder | Profile | Radius corner slot

MM-4RFP





35°/37° | Coated: nano TiAlN | DC: DC≤12 0~-0.020, 12<DC 0~-0.030 | Shank tolerance: h5

Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	RE	DCON	DN	APMX	LH	OAL		
MM-4RFP-D6.0R0.5	6.0	0.5	6	5.8	6	18	75	4	●
MM-4RFP-D6.0R1.0	6.0	1.0	6	5.8	6	18	75	4	●
MM-4RFP-D8.0R0.5	8.0	0.5	8	7.8	8	24	100	4	●
MM-4RFP-D8.0R1.0	8.0	1.0	8	7.8	8	24	100	4	●
MM-4RFP-D10.0R0.5	10.0	0.5	10	9.5	10	30	100	4	●
MM-4RFP-D10.0R1.0	10.0	1.0	10	9.5	10	30	100	4	●
MM-4RFP-D10.0R2.0	10.0	2.0	10	9.5	10	30	100	4	●
MM-4RFP-D12.0R1.0	12.0	1.0	12	11.5	12	36	120	4	●
MM-4RFP-D12.0R2.0	12.0	2.0	12	11.5	12	36	120	4	●
MM-4RFP-D12.0R3.0	12.0	3.0	12	11.5	12	36	120	4	●
MM-4RFP-D16.0R1.0	16.0	1.0	16	15.5	16	40	150	4	●
MM-4RFP-D16.0R2.0	16.0	2.0	16	15.5	16	40	150	4	●
MM-4RFP-D16.0R3.0	16.0	3.0	16	15.5	16	40	150	4	●
MM-4RFP-D20.0R1.0	20.0	1.0	20	19	20	60	150	4	●
MM-4RFP-D20.0R2.0	20.0	2.0	20	19	20	60	150	4	●
MM-4RFP-D20.0R3.0	20.0	3.0	20	19	20	60	150	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					◎				○	○

Code key B294 | Graphics category and identification B295 | Cutting parameters B623 | Non-standard customization B652-B653



TM series

end mills for titanium machining



- High flexural strength, can significantly avoids the risks of premature chipping, suitable for titanium alloy materials milling machining.



- Polished finish for both flank and rake face improves the surface smoothness, reduces friction, reduces cutting force and temperature, reduces abrasive wear caused by smearing.



- Adopting unequal pitch structure leads to high-efficiency milling with low vibration.

$\alpha \neq \beta$

Application field

Suitable for Aerospace industries applications or machining titanium alloy parts, improve machining efficiency for the customers;

Suitable for finishing titanium alloy parts in Aerospace industries to improve the dimensional accuracy of the parts.



Longer tool life

Machining component: Housings and casings

Workpiece material: TC4

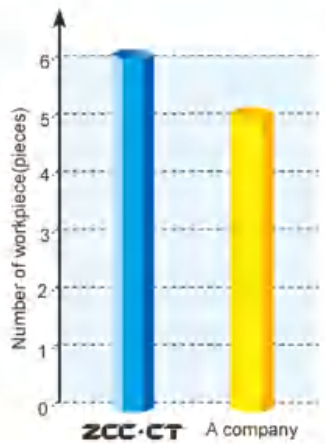
Cutting tool: TM-5R-D16.0R0.5

Cutting parameters: S=720r/min,
F=128~160mm/min,
ap=13~15.3mm,
ae=8~16mm

CNC Machine type: planomiller

Method: Slot milling, Side face milling

Cooling method: Emulsion





Test result: **ZCC-CT** product processed 6 components, product from A company only processed 5 components.

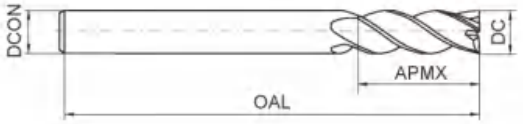
4-flute flattened end mills with straight shank


Side face


Step shoulder

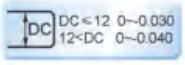
TM-4E













Type	Basic dimension(mm)				Number of teeth Z	Stock
	DC	DCON	APMX	OAL		
TM-4E-D6.0	6.0	6	16	50	4	●
TM-4E-D8.0	8.0	8	20	60	4	●
TM-4E-D10.0	10.0	10	25	75	4	●
TM-4E-D12.0	12.0	12	30	75	4	●
TM-4E-D14.0	14.0	14	35	90	4	●
TM-4E-D16.0	16.0	16	35	90	4	●
TM-4E-D20.0	20.0	20	45	100	4	●
TM-4E-D25.0	25.0	25	50	110	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

Code key B294
Graphics category and identification B295
Cutting parameters B624
Non-standard customization B652-B653

4-flute ball nose end mills

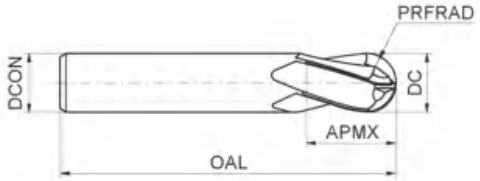

Profile


Cavity


Ball nose slot

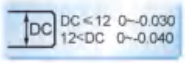
TM-4B

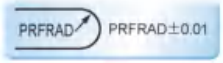














Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	PRFRAD	DCON	APMX	OAL		
TM-4B-R3.0	6.0	3.0	6	9	50	4	●
TM-4B-R4.0	8.0	4.0	8	12	60	4	●
TM-4B-R5.0	10.0	5.0	10	15	75	4	●
TM-4B-R6.0	12.0	6.0	12	18	75	4	●
TM-4B-R8.0	16.0	8.0	16	24	85	4	●
TM-4B-R10.0	20.0	10.0	20	30	100	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

Code key B294 Graphics category and identification B295 Cutting parameters B624 Non-standard customization B652-B653

4-flute R end mills with straight shank

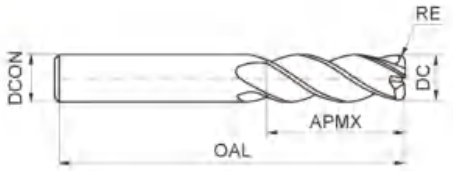

Radius shoulder


Profile


Radius corner slot

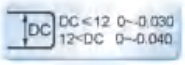
TM-4R













Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
TM-4R-D6.0R0.2	6.0	0.2	6	16	50	4	●
TM-4R-D6.0R0.3	6.0	0.3	6	16	50	4	●
TM-4R-D6.0R0.5	6.0	0.5	6	16	50	4	●
TM-4R-D6.0R0.75	6.0	0.75	6	16	50	4	●
TM-4R-D6.0R1.0	6.0	1.0	6	16	50	4	●
TM-4R-D8.0R0.2	8.0	0.2	8	20	60	4	●
TM-4R-D8.0R0.3	8.0	0.3	8	20	60	4	●
TM-4R-D8.0R0.5	8.0	0.5	8	20	60	4	●
TM-4R-D8.0R0.75	8.0	0.75	8	20	60	4	●
TM-4R-D8.0R1.0	8.0	1.0	8	20	60	4	●
TM-4R-D8.0R2.0	8.0	2.0	8	20	60	4	●
TM-4R-D10.0R0.2	10.0	0.2	10	25	75	4	●
TM-4R-D10.0R0.3	10.0	0.3	10	25	75	4	●
TM-4R-D10.0R0.5	10.0	0.5	10	25	75	4	●
TM-4R-D10.0R0.75	10.0	0.75	10	25	75	4	●
TM-4R-D10.0R1.0	10.0	1.0	10	25	75	4	●
TM-4R-D10.0R1.5	10.0	1.5	10	25	75	4	●
TM-4R-D10.0R2.0	10.0	2.0	10	25	75	4	●
TM-4R-D12.0R0.2	12.0	0.2	12	30	75	4	●
TM-4R-D12.0R0.3	12.0	0.3	12	30	75	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

Code key B294
Graphics category and identification B295
Cutting parameters B624
Non-standard customization B652-B653

4-flute R end mills with straight shank

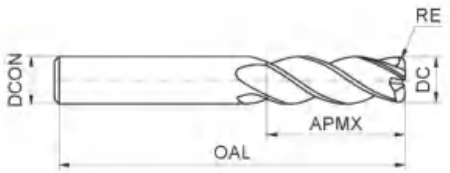

Radius shoulder


Profile


Radius corner slot

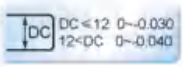
TM-4R













Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
TM-4R-D12.0R0.5	12.0	0.5	12	30	75	4	●
TM-4R-D12.0R0.75	12.0	0.75	12	30	75	4	●
TM-4R-D12.0R1.0	12.0	1.0	12	30	75	4	●
TM-4R-D12.0R1.5	12.0	1.5	12	30	75	4	●
TM-4R-D12.0R2.0	12.0	2.0	12	30	75	4	●
TM-4R-D12.0R2.5	12.0	2.5	12	30	75	4	●
TM-4R-D12.0R3.0	12.0	3.0	12	30	75	4	●
TM-4R-D14.0R0.2	14.0	0.2	14	35	90	4	●
TM-4R-D14.0R0.3	14.0	0.3	14	35	90	4	●
TM-4R-D14.0R0.5	14.0	0.5	14	35	90	4	●
TM-4R-D14.0R0.75	14.0	0.75	14	35	90	4	●
TM-4R-D14.0R1.0	14.0	1.0	14	35	90	4	●
TM-4R-D14.0R1.5	14.0	1.5	14	35	90	4	●
TM-4R-D14.0R2.0	14.0	2.0	14	35	90	4	●
TM-4R-D14.0R2.5	14.0	2.5	14	35	90	4	●
TM-4R-D14.0R3.0	14.0	3.0	14	35	90	4	●
TM-4R-D16.0R0.2	16.0	0.2	16	35	90	4	●
TM-4R-D16.0R0.3	16.0	0.3	16	35	90	4	●
TM-4R-D16.0R0.5	16.0	0.5	16	35	90	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

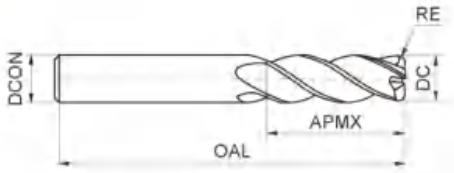
Code key B294 Graphics category and identification B295 Cutting parameters B624 Non-standard customization B652-B653

4-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

TM-4R





38° | Coated AlCrXN | DC DC≤12 0~-0.030 12<DC 0~-0.040

Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
TM-4R-D16.0R0.75	16.0	0.75	16	35	90	4	●
TM-4R-D16.0R1.0	16.0	1.0	16	35	90	4	●
TM-4R-D16.0R1.5	16.0	1.5	16	35	90	4	●
TM-4R-D16.0R2.0	16.0	2.0	16	35	90	4	●
TM-4R-D16.0R2.5	16.0	2.5	16	35	90	4	●
TM-4R-D16.0R3.0	16.0	3.0	16	35	90	4	●
TM-4R-D16.0R4.0	16.0	4.0	16	35	90	4	●
TM-4R-D20.0R0.2	20.0	0.2	20	45	100	4	●
TM-4R-D20.0R0.3	20.0	0.3	20	45	100	4	●
TM-4R-D20.0R0.5	20.0	0.5	20	45	100	4	●
TM-4R-D20.0R0.75	20.0	0.75	20	45	100	4	●
TM-4R-D20.0R1.0	20.0	1.0	20	45	100	4	●
TM-4R-D20.0R1.5	20.0	1.5	20	45	100	4	●
TM-4R-D20.0R2.0	20.0	2.0	20	45	100	4	●
TM-4R-D20.0R2.5	20.0	2.5	20	45	100	4	●
TM-4R-D20.0R3.0	20.0	3.0	20	45	100	4	●
TM-4R-D20.0R4.0	20.0	4.0	20	45	100	4	●
TM-4R-D25.0R1.0	25.0	1.0	25	50	110	4	●
TM-4R-D25.0R2.0	25.0	2.0	25	50	110	4	●
TM-4R-D25.0R3.0	25.0	3.0	25	50	110	4	●
TM-4R-D25.0R4.0	25.0	4.0	25	50	110	4	●
TM-4R-D25.0R5.0	25.0	5.0	25	50	110	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

Code key B294 | Graphics category and identification B295 | Cutting parameters B624 | Non-standard customization B652-B653

4-flute R end mills with long neck, straight shank

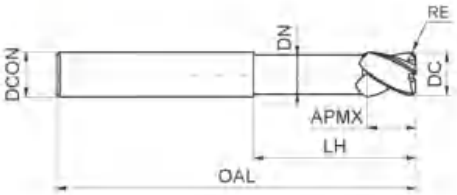

Radius shoulder


Profile


Radius corner slot

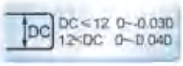
TM-4RP













Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	RE	DCON	DN	APMX	LH	OAL		
TM-4RP-D8.0R0.5	8.0	0.5	8	7.4	16	25	75	4	●
TM-4RP-D8.0R1.0	8.0	1.0	8	7.4	16	25	75	4	●
TM-4RP-D10.0R0.5	10.0	0.5	10	9.4	20	32	75	4	●
TM-4RP-D10.0R1.0	10.0	1.0	10	9.4	20	32	75	4	●
TM-4RP-D10.0R2.0	10.0	2.0	10	9.4	20	32	75	4	●
TM-4RP-D10.0R3.0	10.0	3.0	10	9.4	20	32	75	4	●
TM-4RP-D12.0R0.5	12.0	0.5	12	11.4	24	40	90	4	●
TM-4RP-D12.0R1.0	12.0	1.0	12	11.4	24	40	90	4	●
TM-4RP-D12.0R2.0	12.0	2.0	12	11.4	24	40	90	4	●
TM-4RP-D12.0R3.0	12.0	3.0	12	11.4	24	40	90	4	●
TM-4RP-D16.0R0.5	16.0	0.5	16	15.0	32	50	100	4	●
TM-4RP-D16.0R1.0	16.0	1.0	16	15.0	32	50	100	4	●
TM-4RP-D16.0R2.0	16.0	2.0	16	15.0	32	50	100	4	●
TM-4RP-D16.0R3.0	16.0	3.0	16	15.0	32	50	100	4	●
TM-4RP-D20.0R0.5	20.0	0.5	20	19.0	35	60	110	4	●
TM-4RP-D20.0R1.0	20.0	1.0	20	19.0	35	60	110	4	●
TM-4RP-D20.0R2.0	20.0	2.0	20	19.0	35	60	110	4	●
TM-4RP-D20.0R3.0	20.0	3.0	20	19.0	35	60	110	4	●
TM-4RP-D25.0R1.0	25.0	1.0	25	24.0	45	75	150	4	●
TM-4RP-D25.0R2.0	25.0	2.0	25	24.0	45	75	150	4	●
TM-4RP-D25.0R3.0	25.0	3.0	25	24.0	45	75	150	4	●
TM-4RP-D25.0R4.0	25.0	4.0	25	24.0	45	75	150	4	●
TM-4RP-D25.0R5.0	25.0	5.0	25	24.0	45	75	150	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

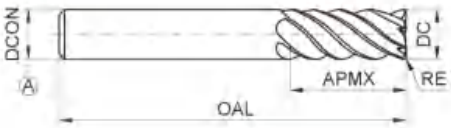
Code key B294 · Graphics category and identification B295 · Cutting parameters B624 · Non-standard customization B652-B653

5-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

TM-5R





42° | Coated AlCrXN | DC DC<12 0~-0.030 12<DC 0~-0.040

Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
TM-5R-D6.0R0.2	6.0	0.2	6	16	50	5	○
TM-5R-D6.0R0.3	6.0	0.3	6	16	50	5	○
TM-5R-D6.0R0.5	6.0	0.5	6	16	50	5	○
TM-5R-D6.0R0.75	6.0	0.75	6	16	50	5	○
TM-5R-D6.0R1.0	6.0	1.0	6	16	50	5	○
TM-5R-D8.0R0.2	8.0	0.2	8	20	60	5	○
TM-5R-D8.0R0.3	8.0	0.3	8	20	60	5	○
TM-5R-D8.0R0.5	8.0	0.5	8	20	60	5	○
TM-5R-D8.0R0.75	8.0	0.75	8	20	60	5	○
TM-5R-D8.0R1.0	8.0	1.0	8	20	60	5	○
TM-5R-D8.0R2.0	8.0	2.0	8	20	60	5	○
TM-5R-D10.0R0.2	10.0	0.2	10	25	75	5	○
TM-5R-D10.0R0.3	10.0	0.3	10	25	75	5	○
TM-5R-D10.0R0.5	10.0	0.5	10	25	75	5	○
TM-5R-D10.0R0.75	10.0	0.75	10	25	75	5	○
TM-5R-D10.0R1.0	10.0	1.0	10	25	75	5	○
TM-5R-D10.0R1.5	10.0	1.5	10	25	75	5	○
TM-5R-D10.0R2.0	10.0	2.0	10	25	75	5	○
TM-5R-D12.0R0.2	12.0	0.2	12	30	75	5	○
TM-5R-D12.0R0.3	12.0	0.3	12	30	75	5	○
TM-5R-D12.0R0.5	12.0	0.5	12	30	75	5	○
TM-5R-D12.0R0.75	12.0	0.75	12	30	75	5	○
TM-5R-D12.0R1.0	12.0	1.0	12	30	75	5	○
TM-5R-D12.0R1.5	12.0	1.5	12	30	75	5	○
TM-5R-D12.0R2.0	12.0	2.0	12	30	75	5	○
TM-5R-D12.0R2.5	12.0	2.5	12	30	75	5	○
TM-5R-D12.0R3.0	12.0	3.0	12	30	75	5	○
TM-5R-D14.0R0.2	14.0	0.2	14	35	90	5	○
TM-5R-D14.0R0.3	14.0	0.3	14	35	90	5	○
TM-5R-D14.0R0.5	14.0	0.5	14	35	90	5	○
TM-5R-D14.0R0.75	14.0	0.75	14	35	90	5	○

Applicable workpiece material table

◎Very suitable ○Suitable ● Stock available ○ Make-to-order

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

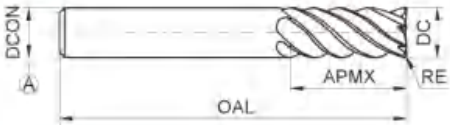
Code key B294 | Graphics category and identification B295 | Cutting parameters B625 | Non-standard customization B652-B653

5-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

TM-5R





42° | Coated AlCrXN | DC DC≤12 0~-0.030 12<DC 0~-0.040

Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
TM-5R-D14.0R1.0	14.0	1.0	14	35	90	5	○
TM-5R-D14.0R1.5	14.0	1.5	14	35	90	5	○
TM-5R-D14.0R2.0	14.0	2.0	14	35	90	5	●
TM-5R-D14.0R2.5	14.0	2.5	14	35	90	5	○
TM-5R-D14.0R3.0	14.0	3.0	14	35	90	5	○
TM-5R-D16.0R0.2	16.0	0.2	16	35	90	5	○
TM-5R-D16.0R0.3	16.0	0.3	16	35	90	5	○
TM-5R-D16.0R0.5	16.0	0.5	16	35	90	5	○
TM-5R-D16.0R0.75	16.0	0.75	16	35	90	5	○
TM-5R-D16.0R1.0	16.0	1.0	16	35	90	5	●
TM-5R-D16.0R1.5	16.0	1.5	16	35	90	5	○
TM-5R-D16.0R2.0	16.0	2.0	16	35	90	5	○
TM-5R-D16.0R2.5	16.0	2.5	16	35	90	5	○
TM-5R-D16.0R3.0	16.0	3.0	16	35	90	5	○
TM-5R-D16.0R4.0	16.0	4.0	16	35	90	5	○
TM-5R-D20.0R0.2	20.0	0.2	20	45	100	5	○
TM-5R-D20.0R0.3	20.0	0.3	20	45	100	5	●
TM-5R-D20.0R0.5	20.0	0.5	20	45	100	5	○
TM-5R-D20.0R0.75	20.0	0.75	20	45	100	5	○
TM-5R-D20.0R1.0	20.0	1.0	20	45	100	5	●
TM-5R-D20.0R1.5	20.0	1.5	20	45	100	5	○
TM-5R-D20.0R2.0	20.0	2.0	20	45	100	5	○
TM-5R-D20.0R2.5	20.0	2.5	20	45	100	5	○
TM-5R-D20.0R3.0	20.0	3.0	20	45	100	5	●
TM-5R-D20.0R4.0	20.0	4.0	20	45	100	5	○
TM-5R-D25.0R1.0	25.0	1.0	25	50	110	5	○
TM-5R-D25.0R2.0	25.0	2.0	25	50	110	5	●
TM-5R-D25.0R3.0	25.0	3.0	25	50	110	5	○
TM-5R-D25.0R4.0	25.0	4.0	25	50	110	5	○
TM-5R-D25.0R5.0	25.0	5.0	25	50	110	5	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

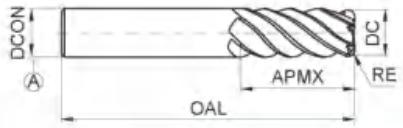
Code key B294 | Graphics category and identification B295 | Cutting parameters B625 | Non-standard customization B652-B653

6-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

TM-6R







Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
TM-6R-D10.0R1.0	10.0	1.0	10	25	75	6	○
TM-6R-D10.0R2.0	10.0	2.0	10	25	75	6	○
TM-6R-D12.0R1.0	12.0	1.0	12	30	75	6	○
TM-6R-D12.0R2.0	12.0	2.0	12	30	75	6	○
TM-6R-D12.0R3.0	12.0	3.0	12	30	75	6	○
TM-6R-D14.0R1.0	14.0	1.0	14	35	90	6	○
TM-6R-D14.0R2.0	14.0	2.0	14	35	90	6	○
TM-6R-D14.0R3.0	14.0	3.0	14	35	90	6	○
TM-6R-D16.0R1.0	16.0	1.0	16	35	90	6	○
TM-6R-D16.0R2.5	16.0	2.5	16	35	90	6	○
TM-6R-D16.0R4.0	16.0	4.0	16	35	90	6	○
TM-6R-D20.0R1.0	20.0	1.0	20	45	100	6	○
TM-6R-D20.0R2.5	20.0	2.5	20	45	100	6	○
TM-6R-D20.0R4.0	20.0	4.0	20	45	100	6	○
TM-6R-D25.0R1.0	25.0	1.0	25	50	110	6	○
TM-6R-D25.0R2.5	25.0	2.5	25	50	110	6	○
TM-6R-D25.0R4.0	25.0	4.0	25	50	110	6	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○					○				◎	◎

Code key B294 | Graphics category and identification B295 | Cutting parameters B626 | Non-standard customization B652-B653

NM series for copper machining

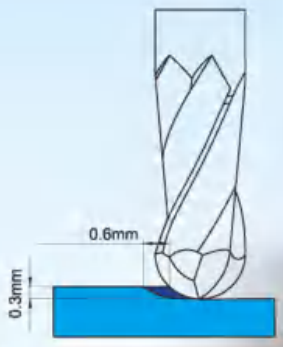
Outstanding NM series end mills bring you a gorgerous machining experience for copper & copper alloy

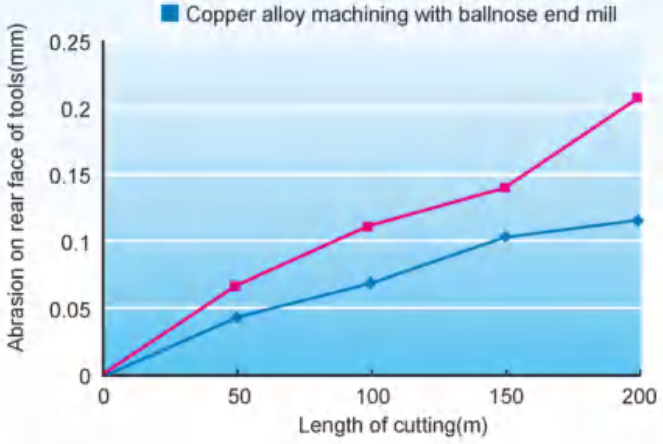
- With super sharp edge, most suitable for high precision machining of copper&alloy of copper.
- With CrN coating which own small fiction coefficient, can realize light cutting processing, long tool life and high quality machined surface.

Coat	Hardness(HV)	Fiction coefficient	Oxidizing temperature(C°)	Strengthness combined with substrate
CrN	1800	0.25	700	◎
TiN	2200	0.4	500	○
TiCN	2700	0.3	400	△
TiAlN	2800	0.3	800	◎

◎Excellent ○Normal

Tool: NM-2B-R3.0
Dimension: R3.0mm
workpiece material: C1100
Rotating speed: 8000r/min (150m/min)
Feed speed: 1200mm/min (0.15mm/r)
Axial cutting depth: a_p=0.3mm
Radial cutting depth: a_e=0.6mm
Cutting style: face milling(down milling)
Cooling system: air cooling
Machine: MIKRON UCP 1000





2-flute flattened end mills with straight shank

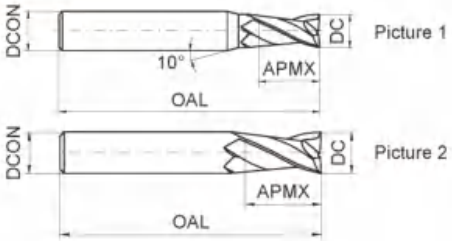

Side face


Step shoulder


Straight slot

NM-2E

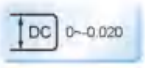




- Very suitable for slotting.
- Sharp edge, can realize high quality surface.









Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
NM-2E-D1.0	1.0	4	3	50	2	Picture 1	○
NM-2E-D2.0	2.0	4	6	50	2	Picture 1	○
NM-2E-D3.0	3.0	6	8	50	2	Picture 1	○
NM-2E-D4.0	4.0	6	11	50	2	Picture 1	○
NM-2E-D5.0	5.0	6	13	50	2	Picture 1	○
NM-2E-D6.0	6.0	6	16	50	2	Picture 2	○
NM-2E-D8.0	8.0	8	20	60	2	Picture 2	○
NM-2E-D10.0	10.0	10	25	75	2	Picture 2	○
NM-2E-D12.0	12.0	12	30	75	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
								◎	○		

Code key B294
Graphics category and identification B295
Cutting parameters B627
Non-standard customization B652-B653

4-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

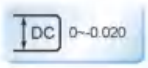
NM-4E



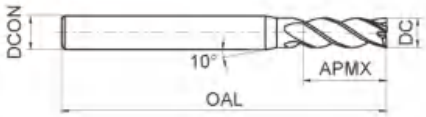
- Long edge design, suitable for precision milling of copper electrodes on the side.



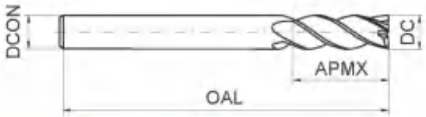








Picture 1



Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
NM-4E-D3.0	3.0	6	8	50	4	Picture 1	○
NM-4E-D4.0	4.0	6	11	50	4	Picture 1	○
NM-4E-D5.0	5.0	6	13	50	4	Picture 1	○
NM-4E-D6.0	6.0	6	16	50	4	Picture 2	○
NM-4E-D8.0	8.0	8	20	60	4	Picture 2	○
NM-4E-D10.0	10.0	10	25	75	4	Picture 2	○
NM-4E-D12.0	12.0	12	30	75	4	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
								◎	○		

Code key B294
Graphics category and identification B295
Cutting parameters B628
Non-standard customization B652-B653

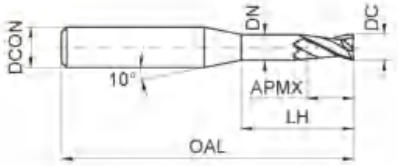
2-flute flattened end mills with straight shank, long neck and short cutting edge


Deep flattened slot

NM-2EP



- Long neck, short edge structure can avoid tool interference issues in deep cavity machining.



35° Coated AlTiN DC 0~-0.015 DC<1mm 1mm≤DC

Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	DCON	APMX	LH	DN	OAL		
NM-2EP-D0.5-M04	0.5	4	0.7	4	0.45	50	2	○
NM-2EP-D0.5-M06	0.5	4	0.7	6	0.45	50	2	○
NM-2EP-D0.5-M08	0.5	4	0.7	8	0.45	50	2	○
NM-2EP-D0.8-M04	0.8	4	1.2	4	0.75	50	2	○
NM-2EP-D0.8-M06	0.8	4	1.2	6	0.75	50	2	○
NM-2EP-D0.8-M08	0.8	4	1.2	8	0.75	50	2	○
NM-2EP-D0.8-M10	0.8	4	1.2	10	0.75	50	2	○
NM-2EP-D1.0-M04	1.0	4	1.5	4	0.95	50	2	○
NM-2EP-D1.0-M06	1.0	4	1.5	6	0.95	50	2	○
NM-2EP-D1.0-M08	1.0	4	1.5	8	0.95	50	2	○
NM-2EP-D1.0-M10	1.0	4	1.5	10	0.95	50	2	○
NM-2EP-D1.0-M12	1.0	4	1.5	12	0.95	50	2	○
NM-2EP-D1.0-M14	1.0	4	1.5	14	0.95	50	2	○
NM-2EP-D1.5-M08	1.5	4	2.3	8	1.45	50	2	○
NM-2EP-D1.5-M16	1.5	4	2.3	16	1.45	50	2	○
NM-2EP-D2.0-M06	2.0	4	3.0	6	1.95	50	2	○
NM-2EP-D2.0-M08	2.0	4	3.0	8	1.95	50	2	○
NM-2EP-D2.0-M10	2.0	4	3.0	10	1.95	50	2	○
NM-2EP-D2.0-M12	2.0	4	3.0	12	1.95	50	2	○
NM-2EP-D2.0-M14	2.0	4	3.0	14	1.95	50	2	○
NM-2EP-D2.0-M16	2.0	4	3.0	16	1.95	50	2	○
NM-2EP-D2.5-M10	2.5	4	3.7	10	2.4	50	2	○
NM-2EP-D2.5-M20	2.5	4	3.7	20	2.4	60	2	○
NM-2EP-D3.0-M10	3.0	6	4.5	10	2.85	50	2	○
NM-2EP-D3.0-M20	3.0	6	4.5	20	2.85	60	2	○
NM-2EP-D4.0-M16	4.0	6	6.0	16	3.85	60	2	○
NM-2EP-D4.0-M25	4.0	6	6.0	25	3.85	60	2	○
NM-2EP-D5.0-M16	5.0	6	7.5	16	4.85	60	2	○
NM-2EP-D5.0-M25	5.0	6	7.5	25	4.85	70	2	○

Applicable workpiece material table

◎Very suitable ○Suitable ● Stock available ○ Make-to-order

Workpiece material										
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
								◎	○		

Code key B294 Graphics category and identification B295 Cutting parameters B629 Non-standard customization B652-B653

2-flute ball nose end mills with straight shank


Profile


Cavity

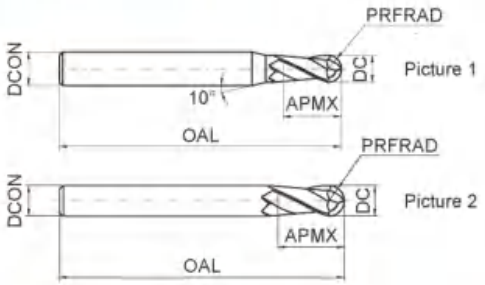

Ball nose slot

NM-2B



- Suitable for profile milling.
- Workpiece surface is excellent after machining.





Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
NM-2B-R0.5	1.0	0.5	4	2	50	2	Picture 1	○
NM-2B-R0.75	1.5	0.75	4	3	50	2	Picture 1	○
NM-2B-R1.0	2.0	1.0	4	4	50	2	Picture 1	○
NM-2B-R1.25	2.5	1.25	4	5	50	2	Picture 1	○
NM-2B-R1.5	3.0	1.5	6	6	50	2	Picture 1	○
NM-2B-R1.75	3.5	1.75	6	8	50	2	Picture 1	○
NM-2B-R2.0	4.0	2.0	6	8	50	2	Picture 1	○
NM-2B-R2.5	5.0	2.5	6	10	50	2	Picture 1	○
NM-2B-R3.0	6.0	3.0	6	12	50	2	Picture 2	○
NM-2B-R4.0	8.0	4.0	8	16	60	2	Picture 2	○
NM-2B-R5.0	10.0	5.0	10	20	75	2	Picture 2	○
NM-2B-R6.0	12.0	6.0	12	24	75	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
								◎	○		

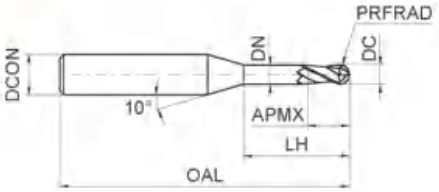
Code key B294 | Graphics category and identification B295 | Cutting parameters B630 | Non-standard customization B652-B653

2-flute ball nose end mills with straight shank, long neck and short cutting edge


Deep ball nose slot

NM-2BP





● Very suitable for copper electrode three dimensional machining.

35° Coated CrN DC 0~-0.015 PRFRAD PRFRAD ±0.005 PRFRAD<0.5 PRFRAD ±0.01 PRFRAD>0.5

Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	PRFRAD	APMX	DN	LH	DCON	OAL		
NM-2BP-R0.25-M04	0.5	0.25	0.7	0.45	4	4	50	2	○
NM-2BP-R0.25-M06	0.5	0.25	0.7	0.45	6	4	50	2	○
NM-2BP-R0.3-M04	0.6	0.3	0.9	0.55	4	4	50	2	○
NM-2BP-R0.3-M06	0.6	0.3	0.9	0.55	6	4	50	2	○
NM-2BP-R0.3-M08	0.6	0.3	0.9	0.55	8	4	50	2	○
NM-2BP-R0.4-M04	0.8	0.4	1.2	0.75	4	4	50	2	○
NM-2BP-R0.4-M06	0.8	0.4	1.2	0.75	6	4	50	2	○
NM-2BP-R0.4-M08	0.8	0.4	1.2	0.75	8	4	50	2	○
NM-2BP-R0.4-M10	0.8	0.4	1.2	0.75	10	4	50	2	○
NM-2BP-R0.5-M04	1.0	0.5	1.5	0.95	4	4	50	2	○
NM-2BP-R0.5-M06	1.0	0.5	1.5	0.95	6	4	50	2	○
NM-2BP-R0.5-M08	1.0	0.5	1.5	0.95	8	4	50	2	○
NM-2BP-R0.5-M10	1.0	0.5	1.5	0.95	10	4	50	2	○
NM-2BP-R0.5-M12	1.0	0.5	1.5	0.95	12	4	50	2	○
NM-2BP-R0.75-M08	1.5	0.75	2.3	1.45	8	4	50	2	○
NM-2BP-R0.75-M16	1.5	0.75	2.3	1.45	16	4	50	2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
								◎	○		

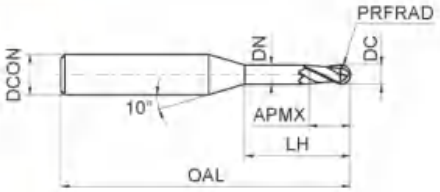
Code key B294 Graphics category and identification B295 Cutting parameters B631 Non-standard customization B652-B653

2-flute ball nose end mills with straight shank, long neck and short cutting edge

Deep ball nose slot

NM-2BP





- Very suitable for copper electrode three dimensional machining.

35° | Coated CrN | DC 0~-0.015 | PRFRAD PRFRAD±0.005 PRFRAD<0.5 PRFRAD±0.01 PRFRAD>0.5

Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	PRFRAD	APMX	DN	LH	DCON	OAL		
NM-2BP-R1.0-M06	2.0	1.0	3.0	1.95	6	4	50	2	○
NM-2BP-R1.0-M08	2.0	1.0	3.0	1.95	8	4	50	2	○
NM-2BP-R1.0-M10	2.0	1.0	3.0	1.95	10	4	50	2	○
NM-2BP-R1.0-M12	2.0	1.0	3.0	1.95	12	4	50	2	○
NM-2BP-R1.0-M16	2.0	1.0	3.0	1.95	16	4	50	2	○
NM-2BP-R1.0-M20	2.0	1.0	3.0	1.95	20	4	60	2	○
NM-2BP-R1.5-M10	3.0	1.5	4.5	2.85	10	6	50	2	○
NM-2BP-R1.5-M20	3.0	1.5	4.5	2.85	20	6	60	2	○
NM-2BP-R2.0-M10	4.0	2.0	6.0	3.85	10	6	60	2	○
NM-2BP-R2.0-M16	4.0	2.0	6.0	3.85	16	6	60	2	○
NM-2BP-R2.0-M20	4.0	2.0	6.0	3.85	20	6	60	2	○
NM-2BP-R2.0-M25	4.0	2.0	6.0	3.85	25	6	60	2	○
NM-2BP-R2.5-M16	5.0	2.5	7.5	4.85	16	6	60	2	○
NM-2BP-R2.5-M25	5.0	2.5	7.5	4.85	25	6	70	2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
								◎	○		

Code key B294 | Graphics category and identification B295 | Cutting parameters B631 | Non-standard customization B652-B653

ALU series

High-efficiency end mills for aluminium



$\alpha_1 \neq \alpha_2 \neq \alpha_3$



High speed machining, roughing and finishing

- Special C-type chipbreaker
  Large chip space make Al chips curve quickly
- Small core diameter and big edge blade design is able to achieve the perfect combination of roughing to finishing
- Big cutting depth slotting can reach cutting speed over 450m/min

Good vibration resistance

Unequal teeth pitch structure reduces the vibrasion when machining, so high speed machining is more stable.

Low coefficient of friction and high hardness iridescent coating improves machining efficiency and tool durability

keep good edge sharpness
Super thin coating，0.2-0.5um，can keep good edge sharpness

Low friction coefficient
High resistance to sticking, low cutting forces

Strong binding force
Strong resistance to coating peeling, good processing stability

High hardness
Over HV6000

Iridescent coating
Has a bright appearance and is easy to identify



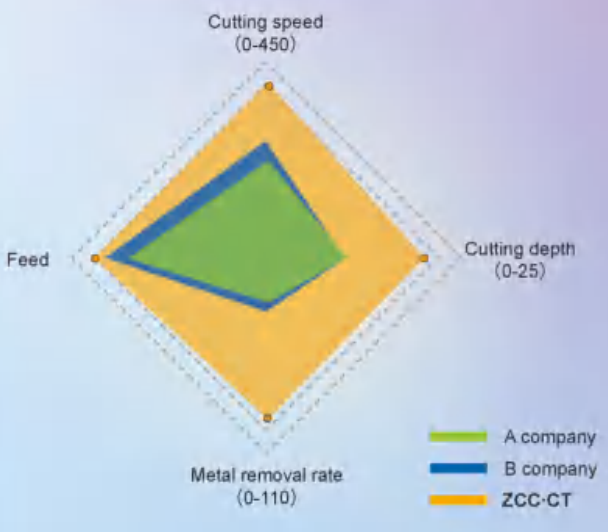
High speed and large cutting depth machining

Processing: sloting
Machined material: LC4, HB90
Machine: 5 axis CNC
Cutting tool: Φ10*25*75
3-flutes flat end mills
Cooling way: water cooling



Cutting parameters	A company	B company	ZCC·CT
Cutting speed(m/min)	250	300	450
Cutting depth(mm)	10	10	20
Metal removal rate (cm^3/min)	28.5	34.2	103
Feed (mm/z)	0.12	0.12	0.12

Comparision after Maximal slotting



Dry cut aluminium alloy

Cutting tool: Φ12*30*75 3-flutes flat end mills
Machined material: Al 7075, HB120
Cutting parameters: Vc=150m/min, fz=0.07mm/z,
Ap=10mm
Machine: CNC
Processing: sloting
Cooling way: gas cooling and dry cut



A company
Chip blocking

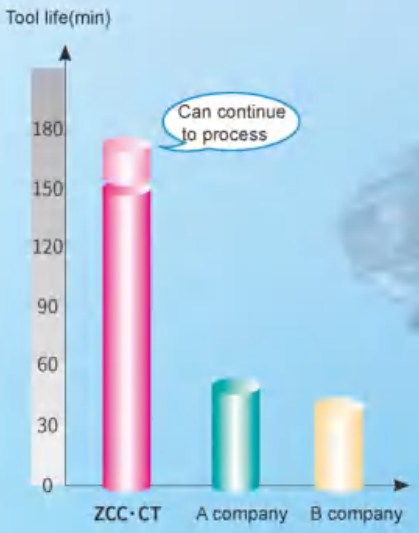
ZCC·CT
Cut ligtly
normal processing

B company
Tool broken

High speed dynamic milling

ALU serie is very suitable for dynamic Al-alloy milling. It greatly improves efficiency, ensures good surface quality of workpiece at the same time and realizes long tool life also.

Tool type: Φ10*25*75 3-flute flattened end mills
Machined material: LC4, HB90
Cutting parameters: Vc=400m/min, fz=0.12mm/z
Machine: 5 axis CNC UCP1000
Proceesing: dynamic milling Ap=15mm, Ae=3mm
Cooling way: Emulsion coolant



3-flute flattened end mills with straight shank

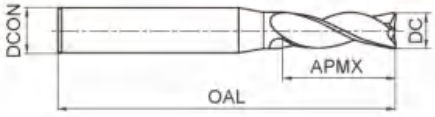

Side face


Step shoulder

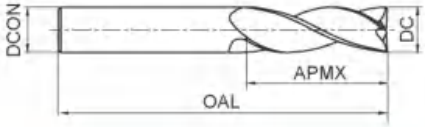

Straight slot

ALU-3E

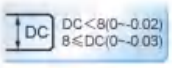




Picture 1



Picture 2





Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
ALU-3E-D3.0S	3	4	8	50	3	Picture 1	○
ALU-3E-D4.0S	4	4	10	50	3	Picture 2	○
ALU-3E-D5.0	5	6	13	50	3	Picture 1	○
ALU-3E-D6.0	6	6	16	50	3	Picture 2	○
ALU-3E-D8.0	8	8	20	60	3	Picture 2	○
ALU-3E-D10.0	10	10	25	75	3	Picture 2	○
ALU-3E-D12.0	12	12	30	75	3	Picture 2	○
ALU-3E-D16.0	16	16	40	100	3	Picture 2	○
ALU-3E-D20.0	20	20	45	100	3	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
								○	◎		

Code key B294
Graphics category and identification B295
Cutting parameters B623
Non-standard customization B652-B653

AL series end mills for Al machining

- Chip pocket with unique shape exerts excellent performances even in slot and cavity machining.
- Sharp cutting edge and large helical angle design effectively prevent built-up edge.
- Anti-vibration design of whole edge can suppress the chattering during machining and improve surface quality.

Tool type: AL-3E-D6.0
Dimensions: Ø6.0mm
Workpiece material: LC4
Rotating speed: 13000r/min (250m/min)
Feed speed: 1950mm/min (0.15mm/r)
Axial cutting depth: a_p=9.0mm
Radial cutting depth: a_e=1.0mm
Cutting style: Complicated cavity machining
Cooling system: air blow
Machine tool: MIKRON UCP 1000



Even the complicated machining of thin-wall cavity parts can be achieved easily.



2-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

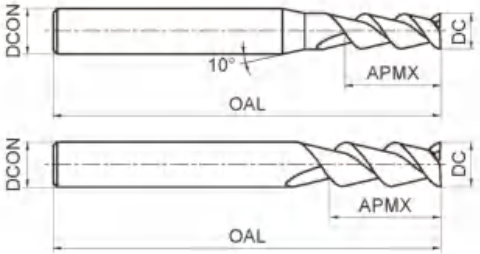
AL-2E



- Good chip removal performance, high machining efficiency.

55°

DC DC≤12 0~-0.020
12<DC 0~-0.030



Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
AL-2E-D1.0	1.0	4	3	50	2	Picture 1	●
AL-2E-D1.5	1.5	4	4	50	2	Picture 1	●
AL-2E-D2.0	2.0	4	6	50	2	Picture 1	●
AL-2E-D2.5	2.5	4	7	50	2	Picture 1	●
AL-2E-D3.0	3.0	6	9	50	2	Picture 1	●
AL-2E-D4.0	4.0	6	12	50	2	Picture 1	●
AL-2E-D5.0	5.0	6	15	50	2	Picture 1	●
AL-2E-D6.0	6.0	6	18	60	2	Picture 2	●
AL-2E-D8.0	8.0	8	20	60	2	Picture 2	●
AL-2E-D10.0	10.0	10	30	75	2	Picture 2	●
AL-2E-D12.0	12.0	12	32	75	2	Picture 2	●
AL-2E-D16.0	16.0	16	45	100	2	Picture 2	●
AL-2E-D20.0	20.0	20	45	100	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
									◎		

Code key B294
Graphics category and identification B295
Cutting parameters B633
Non-standard customization B652-B653

2-flute flattened end mills with straight shank and long cutting edge

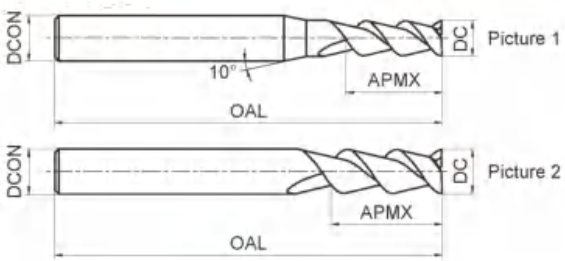

Side face


Step shoulder


Straight slot

AL-2EL





● AL-2E series with long cutting edge.

55° | DC | DC≤12 0~-0.020 12<DC 0~-0.030

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
AL-2EL-D3.0	3.0	6	12	60	2	Picture 1	●
AL-2EL-D4.0	4.0	6	16	60	2	Picture 1	●
AL-2EL-D5.0	5.0	6	20	60	2	Picture 1	●
AL-2EL-D6.0	6.0	6	25	75	2	Picture 2	●
AL-2EL-D8.0	8.0	8	32	75	2	Picture 2	●
AL-2EL-D10.0	10.0	10	45	100	2	Picture 2	●
AL-2EL-D12.0	12.0	12	45	100	2	Picture 2	●
AL-2EL-D16.0	16.0	16	65	150	2	Picture 2	●
AL-2EL-D20.0	20.0	20	75	150	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
									◎		

Code key B294 | Graphics category and identification B295 | Cutting parameters B633 | Non-standard customization B652-B653

3-flute flattened end mills with straight shank


Side face


Step shoulder

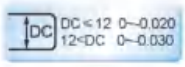

Straight slot

AL-3E

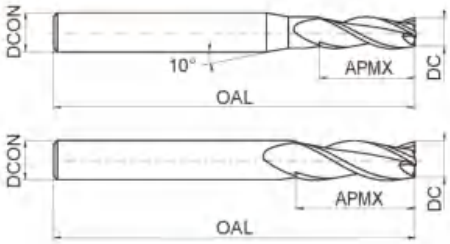


● Outstanding cutting performance with no chattering, achieving high-precision machining.









Picture 1

Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
AL-3E-D1.0	1.0	4	3	50	3	Picture 1	●
AL-3E-D1.5	1.5	4	4	50	3	Picture 1	●
AL-3E-D2.0	2.0	4	6	50	3	Picture 1	●
AL-3E-D2.5	2.5	4	7	50	3	Picture 1	●
AL-3E-D3.0	3.0	6	9	50	3	Picture 1	●
AL-3E-D4.0	4.0	6	12	50	3	Picture 1	●
AL-3E-D5.0	5.0	6	15	50	3	Picture 1	●
AL-3E-D6.0	6.0	6	18	60	3	Picture 2	●
AL-3E-D8.0	8.0	8	20	60	3	Picture 2	●
AL-3E-D10.0	10.0	10	30	75	3	Picture 2	●
AL-3E-D12.0	12.0	12	32	75	3	Picture 2	●
AL-3E-D16.0	16.0	16	45	100	3	Picture 2	●
AL-3E-D20.0	20.0	20	45	100	3	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material										
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
									◎		

Code key B294
Graphics category and identification B295
Cutting parameters B634
Non-standard customization B652-B653

3-flute flattened end mills with straight shank and long cutting edge

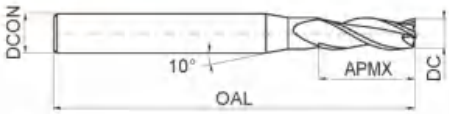

Side face


Step shoulder

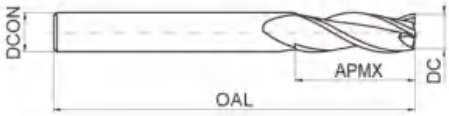

Straight slot

AL-3EL





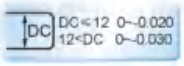
Picture 1



Picture 2

● AL-3E series with long cutting edge.







Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
AL-3EL-D3.0	3.0	6	12	60	3	Picture 1	●
AL-3EL-D4.0	4.0	6	16	60	3	Picture 1	●
AL-3EL-D5.0	5.0	6	20	60	3	Picture 1	●
AL-3EL-D6.0	6.0	6	25	75	3	Picture 2	●
AL-3EL-D8.0	8.0	8	32	75	3	Picture 2	●
AL-3EL-D10.0	10.0	10	45	100	3	Picture 2	●
AL-3EL-D12.0	12.0	12	45	100	3	Picture 2	●
AL-3EL-D16.0	16.0	16	65	150	3	Picture 2	●
AL-3EL-D20.0	20.0	20	75	150	3	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
									◎		

Code key B294
Graphics category and identification B295
Cutting parameters B634
Non-standard customization B652-B653

2-flute ball nose end mills with straight shank

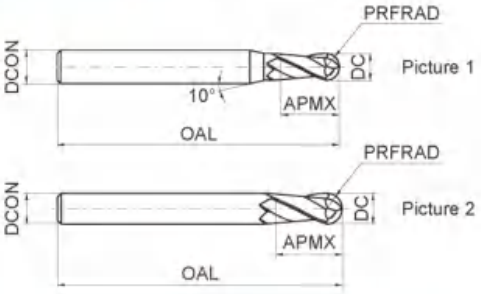

Profile

Cavity

Ball nose slot

AL-2B





- Suitable for profile milling aluminum alloy.



Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	PRFRAD	DCON	APMX	OAL			
AL-2B-R1.0	2.0	1.0	6	4	60	2	Picture 1	●
AL-2B-R1.5	3.0	1.5	6	6	60	2	Picture 1	●
AL-2B-R2.0	4.0	2.0	6	8	60	2	Picture 1	●
AL-2B-R2.5	5.0	2.5	6	10	60	2	Picture 1	●
AL-2B-R3.0	6.0	3.0	6	12	60	2	Picture 2	●
AL-2B-R4.0	8.0	4.0	8	16	75	2	Picture 2	●
AL-2B-R5.0	10.0	5.0	10	20	75	2	Picture 2	●
AL-2B-R6.0	12.0	6.0	12	24	75	2	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
									◎		

Code key B294
Graphics category and identification B295
Cutting parameters B635
Non-standard customization B652-B653

3-flute flattened end mills with straight shank and corrugated edges

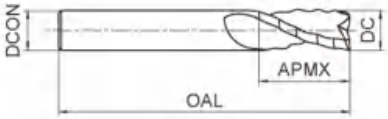

Side face


Step shoulder


Straight slot

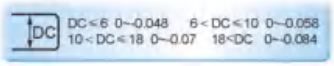
AL-3W





- For rough machining of Al alloy.

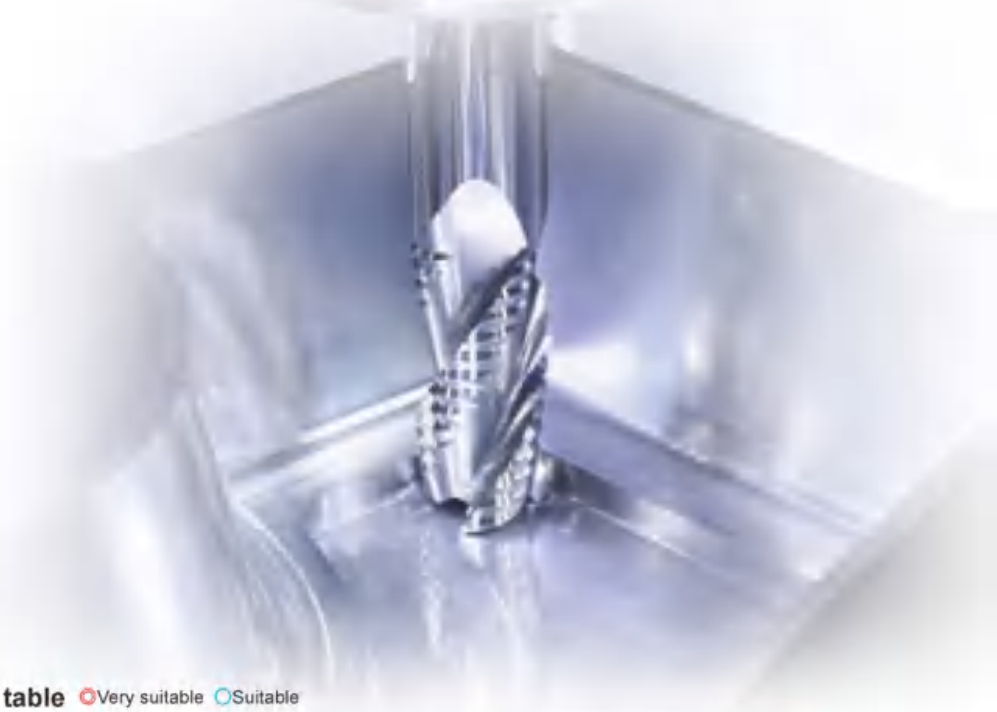






Type	Basic dimension(mm)				Number of teeth Z	Stock
	DC	DCON	APMX	OAL		
AL-3W-D6.0	6.0	6	16	50	3	●
AL-3W-D8.0	8.0	8	20	60	3	●
AL-3W-D10.0	10.0	10	25	75	3	●
AL-3W-D12.0	12.0	12	30	75	3	●
AL-3W-D16.0	16.0	16	45	100	3	●
AL-3W-D20.0	20.0	20	45	100	3	●

● Stock available ○ Make-to-order



Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
									◎		

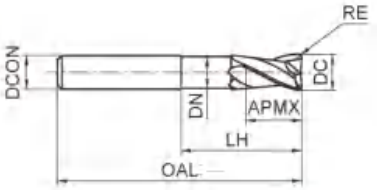
Code key B294 Graphics category and identification B295 Cutting parameters B636 Non-standard customization B652-B653

2-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

super high speed **AL-2R-AIR**





- Very suitable for super high speed milling of Al workpiece.

30° | DC: DC≤12 0~-0.020, 12<DC 0~-0.030

Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	RE	DCON	DN	APMX	LH	OAL		
AL-2R-D6.0R1.0- AIR	6.0	1.0	6	5.5	7	20	57	2	○
AL-2R-D8.0R1.0- AIR	8.0	1.0	8	7.4	9	26	63	2	○
AL-2R-D10.0R1.0- AIR	10.0	1.0	10	9.2	11	31	72	2	○
AL-2R-D10.0R2.0- AIR	10.0	2.0	10	9.2	11	31	72	2	○
AL-2R-D12.0R1.0- AIR	12.0	1.0	12	11.0	12	37	83	2	○
AL-2R-D12.0R2.0- AIR	12.0	2.0	12	11.0	12	37	83	2	○
AL-2R-D12.0R3.0- AIR	12.0	3.0	12	11.0	12	37	83	2	○
AL-2R-D16.0R1.0- AIR	16.0	1.0	16	15.0	16	43	92	2	○
AL-2R-D16.0R2.0- AIR	16.0	2.0	16	15.0	16	43	92	2	○
AL-2R-D16.0R3.0- AIR	16.0	3.0	16	15.0	16	43	92	2	○
AL-2R-D16.0R4.0- AIR	16.0	4.0	16	15.0	16	43	92	2	○
AL-2R-D20.0R1.0- AIR	20.0	1.0	20	19.0	20	53	104	2	○
AL-2R-D20.0R2.0- AIR	20.0	2.0	20	19.0	20	53	104	2	○
AL-2R-D20.0R3.0- AIR	20.0	3.0	20	19.0	20	53	104	2	○
AL-2R-D20.0R4.0- AIR	20.0	4.0	20	19.0	20	53	104	2	○
AL-2R-D20.0R5.0- AIR	20.0	5.0	20	19.0	20	53	104	2	○
AL-2R-D20.0R6.0- AIR	20.0	6.0	20	19.0	20	53	104	2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
									◎		

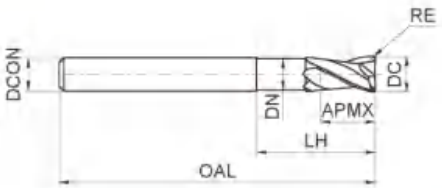
Code key B294 | Graphics category and identification B295 | Cutting parameters B637 | Non-standard customization B652-B653

2-flute R end mills with straight and long shank

Radius shoulder | Profile | Radius corner slot

super high speed **AL-2RL-AIR**





- Very suitable for super high speed milling of Al workpiece.

30° | DC: DC≤12 0~-0.020, 12<DC 0~-0.030

Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	RE	DCON	DN	APMX	LH	OAL		
AL-2RL-D6.0R1.0- AIR	6.0	1.0	6	5.5	7	43	80	2	○
AL-2RL-D8.0R1.0- AIR	8.0	1.0	8	7.4	9	53	90	2	○
AL-2RL-D10.0R1.0- AIR	10.0	1.0	10	9.2	11	59	100	2	○
AL-2RL-D10.0R2.0- AIR	10.0	2.0	10	9.2	11	59	100	2	○
AL-2RL-D12.0R1.0- AIR	12.0	1.0	12	11.0	12	74	120	2	○
AL-2RL-D12.0R2.0- AIR	12.0	2.0	12	11.0	12	74	120	2	○
AL-2RL-D12.0R3.0- AIR	12.0	3.0	12	11.0	12	74	120	2	○
AL-2RL-D16.0R1.0- AIR	16.0	1.0	16	15.0	16	84	140	2	○
AL-2RL-D16.0R2.0- AIR	16.0	2.0	16	15.0	16	84	140	2	○
AL-2RL-D16.0R3.0- AIR	16.0	3.0	16	15.0	16	84	140	2	○
AL-2RL-D16.0R4.0- AIR	16.0	4.0	16	15.0	16	84	140	2	○
AL-2RL-D20.0R1.0- AIR	20.0	1.0	20	19.0	20	89	140	2	○
AL-2RL-D20.0R2.0- AIR	20.0	2.0	20	19.0	20	89	140	2	○
AL-2RL-D20.0R3.0- AIR	20.0	3.0	20	19.0	20	89	140	2	○
AL-2RL-D20.0R4.0- AIR	20.0	4.0	20	19.0	20	89	140	2	○
AL-2RL-D20.0R5.0- AIR	20.0	5.0	20	19.0	20	89	140	2	○
AL-2RL-D20.0R6.0- AIR	20.0	6.0	20	19.0	20	89	140	2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
									◎		

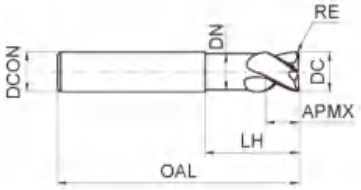
Code key B294 | Graphics category and identification B295 | Cutting parameters B637 | Non-standard customization B652-B653

3-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

super high speed **AL-3R-AIR**





- Very suitable for super high speed milling of Al workpiece.

30° | DC 0~-0.030

Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	RE	DCON	DN	APMX	LH	OAL		
AL-3R-D12.0R1.0- AIR	12.0	1.0	12	11.0	12	37	83	3	○
AL-3R-D12.0R2.0- AIR	12.0	2.0	12	11.0	12	37	83	3	○
AL-3R-D12.0R3.0- AIR	12.0	3.0	12	11.0	12	37	83	3	○
AL-3R-D16.0R1.0- AIR	16.0	1.0	16	15.0	16	43	92	3	○
AL-3R-D16.0R2.0- AIR	16.0	2.0	16	15.0	16	43	92	3	○
AL-3R-D16.0R3.0- AIR	16.0	3.0	16	15.0	16	43	92	3	○
AL-3R-D16.0R4.0- AIR	16.0	4.0	16	15.0	16	43	92	3	○
AL-3R-D20.0R1.0- AIR	20.0	1.0	20	19.0	20	53	104	3	○
AL-3R-D20.0R2.0- AIR	20.0	2.0	20	19.0	20	53	104	3	○
AL-3R-D20.0R3.0- AIR	20.0	3.0	20	19.0	20	53	104	3	○
AL-3R-D20.0R4.0- AIR	20.0	4.0	20	19.0	20	53	104	3	○
AL-3R-D20.0R5.0- AIR	20.0	5.0	20	19.0	20	53	104	3	○
AL-3R-D20.0R6.0- AIR	20.0	6.0	20	19.0	20	53	104	3	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
									◎		

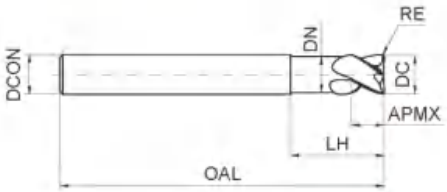
Code key B294 | Graphics category and identification B295 | Cutting parameters B638 | Non-standard customization B652-B653

3-flute R end mills with straight and long shank

Radius shoulder | Profile | Radius corner slot

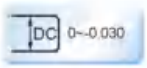
super high speed AL-3RL-AIR





- Very suitable for super high speed milling of Al workpiece.







Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	RE	DCON	DN	APMX	LH	OAL		
AL-3RL-D12.0R1.0- AIR	12.0	1.0	12	11.0	12	74	120	3	○
AL-3RL-D12.0R2.0- AIR	12.0	2.0	12	11.0	12	74	120	3	○
AL-3RL-D12.0R3.0- AIR	12.0	3.0	12	11.0	12	74	120	3	○
AL-3RL-D16.0R1.0- AIR	16.0	1.0	16	15.0	16	84	140	3	○
AL-3RL-D16.0R2.0- AIR	16.0	2.0	16	15.0	16	84	140	3	○
AL-3RL-D16.0R3.0- AIR	16.0	3.0	16	15.0	16	84	140	3	○
AL-3RL-D16.0R4.0- AIR	16.0	4.0	16	15.0	16	84	140	3	○
AL-3RL-D20.0R1.0- AIR	20.0	1.0	20	19.0	20	89	140	3	○
AL-3RL-D20.0R2.0- AIR	20.0	2.0	20	19.0	20	89	140	3	○
AL-3RL-D20.0R3.0- AIR	20.0	3.0	20	19.0	20	89	140	3	○
AL-3RL-D20.0R4.0- AIR	20.0	4.0	20	19.0	20	89	140	3	○
AL-3RL-D20.0R5.0- AIR	20.0	5.0	20	19.0	20	89	140	3	○
AL-3RL-D20.0R6.0- AIR	20.0	6.0	20	19.0	20	89	140	3	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
									◎		

Code key B294 | Graphics category and identification B295 | Cutting parameters B638 | Non-standard customization B652-B653

ALG series

Aluminum machining end mills

ALG series aluminum machining end mills are highly versatile and can achieve efficient cutting of aluminum alloy in various working conditions, with sharp edge design, light and fast cutting, excellent anti-bonding wear performance and high surface quality.

- Super fine grain carbide matrix, perfect combination of tool wear resistance and cutting edge strength;
- Special design of the chip pocket realizes the perfect unification of tool strength and chip removal performance, which greatly improves the cutting stability;
- Large rake angle and sharp cutting edge design, effectively avoiding the generation of chip tumors;
- Optimized design of the rear surface and special surface treatment, the parts are machined with excellent surface quality.



Two cutting edges



Three cutting edges

Application examples

Tool: ALG-3E-D8.0
Processing material: Aluminum alloy(HB110)
Machine: Machining center
Machining type: Side milling
Clamping type: Hydraulic toolholder
Cooling type: Emulsion
Cutting parameters: n=13000r/min, f=900mm/min, a_p=8mm, a_e=0.5mm

Machining surface quality comparison



ZCC•CT product

Company A's product



2-flute flattened end mills with straight shank


Side face

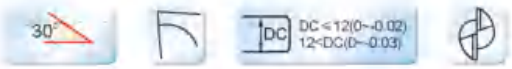

Step shoulder

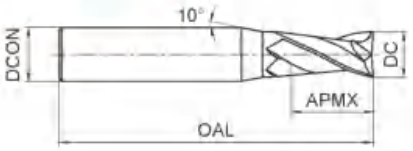

Straight slot

ALG-2E

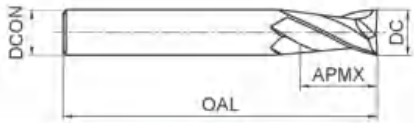


- Good chip removal performance, high machining efficiency





Picture 1



Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
ALG-2E-D1.0	1.0	4	3	50	2	Picture 1	○
ALG-2E-D1.5	1.5	4	4	50	2	Picture 1	○
ALG-2E-D2.0	2.0	4	6	50	2	Picture 1	○
ALG-2E-D2.5	2.5	4	8	50	2	Picture 1	○
ALG-2E-D3.0S	3.0	4	8	50	2	Picture 1	○
ALG-2E-D3.0	3.0	6	8	50	2	Picture 1	○
ALG-2E-D3.5S	3.5	4	10	50	2	Picture 1	○
ALG-2E-D3.5	3.5	6	10	50	2	Picture 1	○
ALG-2E-D4.0S	4.0	4	11	50	2	Picture 2	○
ALG-2E-D4.0	4.0	6	11	50	2	Picture 1	○
ALG-2E-D4.5	4.5	6	11	50	2	Picture 1	○
ALG-2E-D5.0	5.0	6	13	50	2	Picture 1	○
ALG-2E-D5.5	5.5	6	16	50	2	Picture 1	○
ALG-2E-D6.0	6.0	6	16	50	2	Picture 2	○
ALG-2E-D7.0	7.0	8	20	60	2	Picture 1	○
ALG-2E-D8.0	8.0	8	20	60	2	Picture 2	○
ALG-2E-D9.0	9.0	10	22	75	2	Picture 1	○
ALG-2E-D10.0	10.0	10	25	75	2	Picture 2	○
ALG-2E-D11.0	11.0	12	26	75	2	Picture 1	○
ALG-2E-D12.0	12.0	12	30	75	2	Picture 2	○
ALG-2E-D14.0	14.0	14	32	75	2	Picture 2	○
ALG-2E-D16.0	16.0	16	45	100	2	Picture 2	○
ALG-2E-D18.0	18.0	18	45	100	2	Picture 2	○
ALG-2E-D20.0	20.0	20	45	100	2	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
								◎	◎		

Code key B294 · Graphics category and identification B295 · Cutting parameters B639 · Non-standard customization B652-B653

3-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

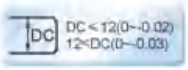
ALG-3E



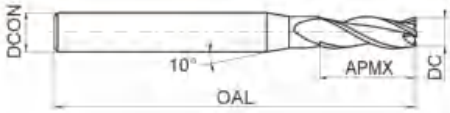
- Good cutting performance, can achieve high-precision machining.



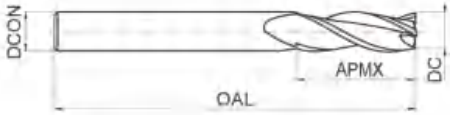








Picture 1



Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
ALG-3E-D1.0	1.0	4	3	50	3	Picture 1	○
ALG-3E-D1.5	1.5	4	4	50	3	Picture 1	○
ALG-3E-D2.0	2.0	4	6	50	3	Picture 1	○
ALG-3E-D2.5	2.5	4	8	50	3	Picture 1	○
ALG-3E-D3.0S	3.0	4	8	50	3	Picture 1	○
ALG-3E-D3.0	3.0	6	8	50	3	Picture 1	○
ALG-3E-D4.0S	4.0	4	11	50	3	Picture 2	○
ALG-3E-D4.0	4.0	6	11	50	3	Picture 1	○
ALG-3E-D4.5	4.5	6	11	50	3	Picture 1	○
ALG-3E-D5.0	5.0	6	13	50	3	Picture 1	○
ALG-3E-D5.5	5.5	6	16	50	3	Picture 1	○
ALG-3E-D6.0	6.0	6	16	50	3	Picture 2	○
ALG-3E-D7.0	7.0	8	20	60	3	Picture 1	○
ALG-3E-D8.0	8.0	8	20	60	3	Picture 2	○
ALG-3E-D9.0	9.0	10	22	75	3	Picture 1	○
ALG-3E-D10.0	10.0	10	25	75	3	Picture 2	○
ALG-3E-D11.0	11.0	12	26	75	3	Picture 1	○
ALG-3E-D12.0	12.0	12	30	75	3	Picture 2	○
ALG-3E-D14.0	14.0	14	32	75	3	Picture 2	○
ALG-3E-D16.0	16.0	16	45	100	3	Picture 2	○
ALG-3E-D18.0	18.0	18	45	100	3	Picture 2	○
ALG-3E-D20.0	20.0	20	45	100	3	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
								◎	◎		

Code key B294
Graphics category and identification B295
Cutting parameters B640
Non-standard customization B652-B653

2-flute R end mills with straight shank

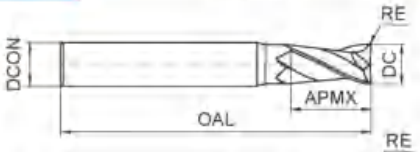


ALG-2R

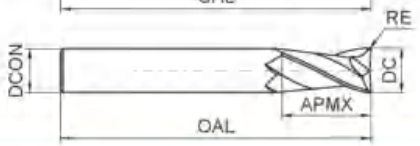


- Very suitable for super high speed milling of Al workpiece.

30° | DC 0~-0.020



Picture 1



Picture 2

Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
ALG-2R-D1.0R0.2S	1.0	0.2	4	3	50	2	Picture 1	○
ALG-2R-D1.5R0.2S	1.5	0.2	4	4	50	2	Picture 1	○
ALG-2R-D2.0R0.2S	2.0	0.2	4	6	50	2	Picture 1	○
ALG-2R-D2.0R0.5S	2.0	0.5	4	6	50	2	Picture 1	○
ALG-2R-D2.5R0.2S	2.5	0.2	4	8	50	2	Picture 1	○
ALG-2R-D2.5R0.5S	2.5	0.5	4	8	50	2	Picture 1	○
ALG-2R-D3.0R0.2S	3.0	0.2	4	8	50	2	Picture 1	○
ALG-2R-D3.0R0.5S	3.0	0.5	4	8	50	2	Picture 1	○
ALG-2R-D3.5R0.2S	3.5	0.2	4	10	50	2	Picture 1	○
ALG-2R-D3.5R0.5S	3.5	0.5	4	10	50	2	Picture 1	○
ALG-2R-D4.0R0.2S	4.0	0.2	4	11	50	2	Picture 2	○
ALG-2R-D4.0R0.5S	4.0	0.5	4	11	50	2	Picture 2	○
ALG-2R-D4.0R1.0S	4.0	1.0	4	11	50	2	Picture 2	○
ALG-2R-D6.0R0.3	6.0	0.3	6	16	50	2	Picture 2	○
ALG-2R-D6.0R0.5	6.0	0.5	6	16	50	2	Picture 2	○
ALG-2R-D6.0R1.0	6.0	1.0	6	16	50	2	Picture 2	○
ALG-2R-D8.0R0.3	8.0	0.3	8	20	60	2	Picture 2	○
ALG-2R-D8.0R0.5	8.0	0.5	8	20	60	2	Picture 2	○
ALG-2R-D8.0R1.0	8.0	1.0	8	20	60	2	Picture 2	○
ALG-2R-D10.0R0.3	10.0	0.3	10	25	75	2	Picture 2	○
ALG-2R-D10.0R0.5	10.0	0.5	10	25	75	2	Picture 2	○
ALG-2R-D10.0R1.0	10.0	1.0	10	25	75	2	Picture 2	○
ALG-2R-D10.0R1.5	10.0	1.5	10	25	75	2	Picture 2	○
ALG-2R-D10.0R2.0	10.0	2.0	10	25	75	2	Picture 2	○
ALG-2R-D12.0R0.3	12.0	0.3	12	30	75	2	Picture 2	○
ALG-2R-D12.0R0.5	12.0	0.5	12	30	75	2	Picture 2	○
ALG-2R-D12.0R1.0	12.0	1.0	12	30	75	2	Picture 2	○
ALG-2R-D12.0R1.5	12.0	1.5	12	30	75	2	Picture 2	○
ALG-2R-D12.0R2.0	12.0	2.0	12	30	75	2	Picture 2	○

Applicable workpiece material table

◎Very suitable ○Suitable

● Stock available ○ Make-to-order

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
								◎	◎		

Code key B294 | Graphics category and identification B295 | Cutting parameters B641 | Non-standard customization B652-B653

3-flute R end mills with straight shank

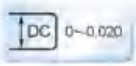
Radius shoulder | Profile | Radius corner slot

ALG-3R

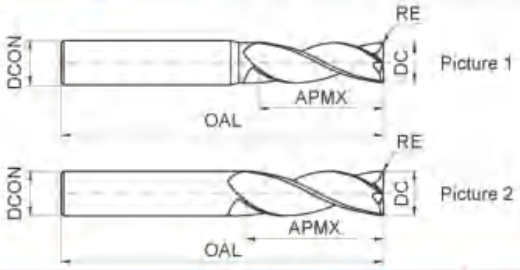


- Very suitable for super high speed milling of Al workpiece.









Type	Basic dimension(mm)					Number of teeth Z	Geometry	Stock
	DC	RE	DCON	APMX	OAL			
ALG-3R-D1.0R0.2S	1.0	0.2	4	3	50	3	Picture 1	○
ALG-3R-D1.5R0.2S	1.5	0.2	4	4	50	3	Picture 1	○
ALG-3R-D2.0R0.2S	2.0	0.2	4	6	50	3	Picture 1	○
ALG-3R-D2.0R0.5S	2.0	0.5	4	6	50	3	Picture 1	○
ALG-3R-D2.5R0.2S	2.5	0.2	4	8	50	3	Picture 1	○
ALG-3R-D2.5R0.5S	2.5	0.5	4	8	50	3	Picture 1	○
ALG-3R-D3.0R0.2S	3.0	0.2	4	8	50	3	Picture 1	○
ALG-3R-D3.0R0.5S	3.0	0.5	4	8	50	3	Picture 1	○
ALG-3R-D3.5R0.2S	3.5	0.2	4	10	50	3	Picture 1	○
ALG-3R-D3.5R0.5S	3.5	0.5	4	10	50	3	Picture 1	○
ALG-3R-D4.0R0.2S	4.0	0.2	4	11	50	3	Picture 2	○
ALG-3R-D4.0R0.5S	4.0	0.5	4	11	50	3	Picture 2	○
ALG-3R-D4.0R1.0S	4.0	1.0	4	11	50	3	Picture 2	○
ALG-3R-D6.0R0.3	6.0	0.3	6	16	50	3	Picture 2	○
ALG-3R-D6.0R0.5	6.0	0.5	6	16	50	3	Picture 2	○
ALG-3R-D6.0R1.0	6.0	1.0	6	16	50	3	Picture 2	○
ALG-3R-D8.0R0.3	8.0	0.3	8	20	60	3	Picture 2	○
ALG-3R-D8.0R0.5	8.0	0.5	8	20	60	3	Picture 2	○
ALG-3R-D8.0R1.0	8.0	1.0	8	20	60	3	Picture 2	○
ALG-3R-D10.0R0.3	10.0	0.3	10	25	75	3	Picture 2	○
ALG-3R-D10.0R0.5	10.0	0.5	10	25	75	3	Picture 2	○
ALG-3R-D10.0R1.0	10.0	1.0	10	25	75	3	Picture 2	○
ALG-3R-D10.0R1.5	10.0	1.5	10	25	75	3	Picture 2	○
ALG-3R-D10.0R2.0	10.0	2.0	10	25	75	3	Picture 2	○
ALG-3R-D12.0R0.3	12.0	0.3	12	30	75	3	Picture 2	□
ALG-3R-D12.0R0.5	12.0	0.5	12	30	75	3	Picture 2	□
ALG-3R-D12.0R1.0	12.0	1.0	12	30	75	3	Picture 2	□
ALG-3R-D12.0R1.5	12.0	1.5	12	30	75	3	Picture 2	□
ALG-3R-D12.0R2.0	12.0	2.0	12	30	75	3	Picture 2	○

Applicable workpiece material table

◎Very suitable ○Suitable

● Stock available ○ Make-to-order

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
								◎	◎		

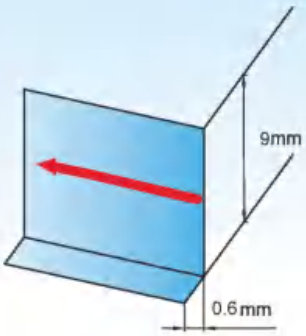
Code key B294 | Graphics category and identification B295 | Cutting parameters B642 | Non-standard customization B652-B653



SM series end mills for machining of hard-to-cut materials such as stainless steel, heat-resistant alloy, etc.

- Large helical and rake angle, sharp cutting edge, unique edge geometry can restrain cutting-heat's influence on tool nose, and greatly improve wear resistance and heat resistance.
- The coating with good heat resistance can achieve stable machining even at high temperature.
- Very suitable for machining of hard-to-cut materials such as stainless steel, Ni substrate high temperature alloy, etc.

Tool type: SM-3E-D6.0
Dimensions: Ø6mm
Workpiece material: 1Cr18Ni9Ti
Rotating speed: 3700r/min (70m/min)
Feed speed: 555mm/min(0.15mm/r)
Axial cutting depth: a_p=9mm
Radial cutting depth: a_e=0.6mm
Cutting style: side milling (down milling)
Cooling system: air blow
Machine tool: MIKRON UCP 1000



End mills	SM-3E-D6.0	Similar product of company A
Cutting length	100m	100m
Abrasion of peripheral edge	Even abrasion on cutting edge, value is 0.08 mm	Cutting edge is flaked fully, value is 0.135mm

Abrasion condition of peripheral edge





VSM series

End mills with unequal pitch and variable inclined angle; Revolution on machining materials hard to cut: stainless steel, heat resistant alloy, etc.



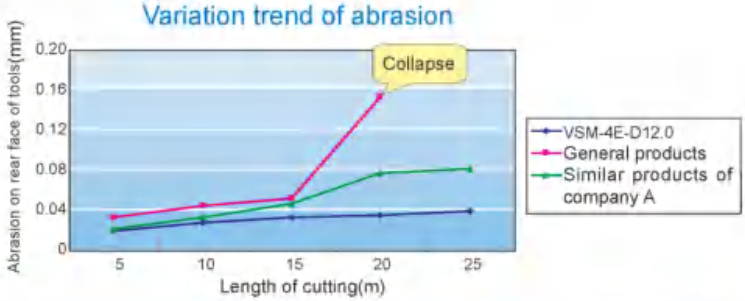
VSM-4E VSM-4R
VSM-4EFP VSM-4RFP

VSM-4E-D12.0 slotting stainless steel

Machine: MIKRON UCP1000
Chuck: HSK63-A
Machined material: 1Cr18Ni9Ti
Cutting speed: 80m/min
Feed per tooth: 0.05mm/z
Axial cutting depth: 6mm
Radial cutting depth: 12mm
Cooling system: air cooling
Cutting style: slotting
Overhang: 35mm



Variation trend of abrasion



Note: ◆Compared with competitor's, VSM end mills can perform better on wear resistance and tool life.
◆Compared with common tools, unequal pitch end mills perform stronger on resisting broken.

3-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

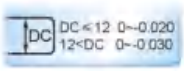
SM-3E



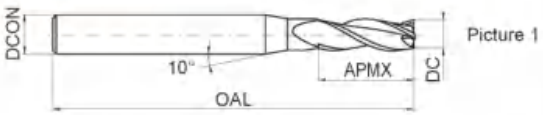
- Large helical angle, for machining of hard-to-cut materials such as Austenite stainless steel, heat-resistant alloy, etc.



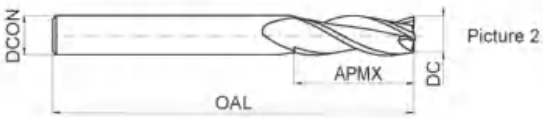








Picture 1



Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
SM-3E-D3.0	3.0	6	8	50	3	Picture 1	○
SM-3E-D4.0	4.0	6	11	50	3	Picture 1	○
SM-3E-D5.0	5.0	6	13	50	3	Picture 1	○
SM-3E-D6.0	6.0	6	16	50	3	Picture 2	○
SM-3E-D7.0	7.0	8	20	60	3	Picture 1	○
SM-3E-D8.0	8.0	8	20	60	3	Picture 2	○
SM-3E-D9.0	9.0	10	22	75	3	Picture 1	○
SM-3E-D10.0	10.0	10	25	75	3	Picture 2	○
SM-3E-D11.0	11.0	12	26	75	3	Picture 1	○
SM-3E-D12.0	12.0	12	30	75	3	Picture 2	○
SM-3E-D16.0	16.0	16	45	100	3	Picture 2	○
SM-3E-D20.0	20.0	20	45	100	3	Picture 2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎					◎					

Code key B294
Graphics category and identification B295
Cutting parameters B643
Non-standard customization B652-B653

4-flute unequal pitch end mills with straight shank


Side face


Step shoulder


Straight slot

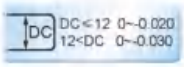
VSM-4E



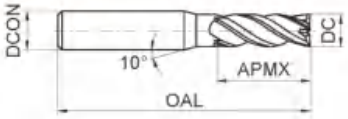
- With variable helical angle design, great improved vibration resistance and surface quality after machining.
- Very suitable for machining materials hard to cut: such as stainless steel, heat resist alloy and Ti-base alloy.



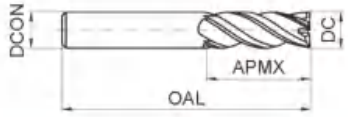








Picture 1



Picture 2

Type	Basic dimension(mm)				Number of teeth Z	Geometry	Stock
	DC	DCON	APMX	OAL			
VSM-4E-D4.0	4.0	6	11	50	4	Picture 1	●
VSM-4E-D5.0	5.0	6	13	50	4	Picture 1	●
VSM-4E-D6.0	6.0	6	16	50	4	Picture 2	●
VSM-4E-D8.0	8.0	8	20	60	4	Picture 2	●
VSM-4E-D10.0	10.0	10	25	75	4	Picture 2	●
VSM-4E-D12.0	12.0	12	30	75	4	Picture 2	●
VSM-4E-D16.0	16.0	16	45	100	4	Picture 2	●
VSM-4E-D20.0	20.0	20	45	100	4	Picture 2	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎					◎				◎	◎

Code key B294
Graphics category and identification B295
Cutting parameters B644
Non-standard customization B652-B653

4-flute flattened end mills with straight shank, unequal pitch, long neck and short cutting edges

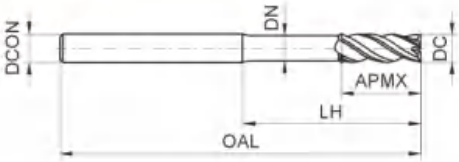

Side face


Step shoulder


Straight slot

VSM-4EFP

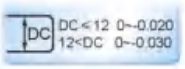




- With high rigidity short cutting edges design, suitable for deep cavity machining.
- With variable helical angle design, great improved vibration resistance and surface quality after machining.









Type	Basic dimension(mm)						Number of teeth Z	Stock
	DC	DCON	APMX	LH	DN	OAL		
VSM-4EFP-D6.0	6.0	6	9	27	5.7	75	4	●
VSM-4EFP-D8.0	8.0	8	12	36	7.7	100	4	●
VSM-4EFP-D10.0	10.0	10	14	42	9.5	100	4	●
VSM-4EFP-D12.0	12.0	12	16	48	11.5	100	4	●
VSM-4EFP-D16.0	16.0	16	20	60	15.5	150	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎					◎				◎	◎

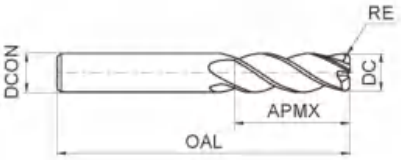
Code key B294
Graphics category and identification B295
Cutting parameters B644
Non-standard customization B652-B653

4-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

SM-4R





● Large helical angle and strong nose, for machining of hard-to-cut materials such as austenitic stainless steel, heat-resistant alloy, etc.

45° | Coated AlTiN | DC: DC≤12 0~-0.020, 12<DC 0~-0.030

Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
SM-4R-D6.0R0.5	6.0	0.5	6	16	50	4	○
SM-4R-D6.0R1.0	6.0	1.0	6	16	50	4	○
SM-4R-D8.0R0.5	8.0	0.5	8	20	60	4	○
SM-4R-D8.0R1.0	8.0	1.0	8	20	60	4	○
SM-4R-D10.0R0.5	10.0	0.5	10	25	75	4	○
SM-4R-D10.0R1.0	10.0	1.0	10	25	75	4	○
SM-4R-D12.0R0.5	12.0	0.5	12	30	75	4	○
SM-4R-D12.0R1.0	12.0	1.0	12	30	75	4	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎					◎					

Code key B294 | Graphics category and identification B295 | Cutting parameters B645 | Non-standard customization B652-B653

4-flute R end mills with straight shank and unequal pitch

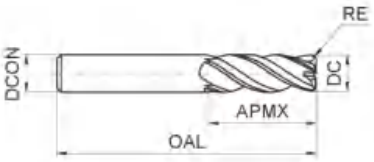

Radius shoulder


Profile


Radius corner slot

VSM-4R

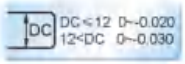




- With variable helical angle design, great improved vibration resistance and surface quality after machining.
- Very suitable for machining materials hard to cut: such as stainless steel, heat resist alloy and Ti-base alloy.









Type	Basic dimension(mm)					Number of teeth Z	Stock
	DC	RE	DCON	APMX	OAL		
VSM-4R-D6.0R0.5	6.0	0.5	6	16	50	4	●
VSM-4R-D6.0R1.0	6.0	1.0	6	16	50	4	●
VSM-4R-D8.0R0.5	8.0	0.5	8	20	60	4	●
VSM-4R-D8.0R1.0	8.0	1.0	8	20	60	4	●
VSM-4R-D10.0R0.5	10.0	0.5	10	25	75	4	●
VSM-4R-D10.0R1.0	10.0	1.0	10	25	75	4	●
VSM-4R-D10.0R2.0	10.0	2.0	10	25	75	4	●
VSM-4R-D12.0R0.5	12.0	0.5	12	30	75	4	●
VSM-4R-D12.0R1.0	12.0	1.0	12	30	75	4	●
VSM-4R-D12.0R2.0	12.0	2.0	12	30	75	4	●
VSM-4R-D16.0R1.0	16.0	1.0	16	45	100	4	●
VSM-4R-D16.0R2.0	16.0	2.0	16	45	100	4	●
VSM-4R-D16.0R3.0	16.0	3.0	16	45	100	4	●
VSM-4R-D20.0R1.0	20.0	1.0	20	45	100	4	●
VSM-4R-D20.0R2.0	20.0	2.0	20	45	100	4	●
VSM-4R-D20.0R3.0	20.0	3.0	20	45	100	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎					◎				◎	◎

Code key B294 · Graphics category and identification B295 · Cutting parameters B646 · Non-standard customization B652-B653

4-flute R end mills with straight shank, unequal pitch, long neck and short cutting edges

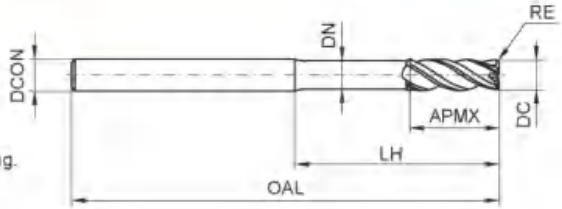

Radius shoulder


Profile


Radius corner slot

VSM-4RFP

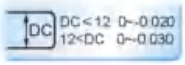




- With high rigidity short cutting edges design, suitable for deep cavity machining.
- With variable helical angle design, great improved vibration resistance and surface quality after machining.









Type	Basic dimension(mm)							Number of teeth Z	Stock
	DC	RE	DCON	DN	APMX	M	OAL		
VSM-4RFP-D6.0R0.5	6.0	0.5	6	5.7	9	27	75	4	●
VSM-4RFP-D6.0R1.0	6.0	1.0	6	5.7	9	27	75	4	●
VSM-4RFP-D8.0R0.5	8.0	0.5	8	7.7	12	36	100	4	●
VSM-4RFP-D8.0R1.0	8.0	1.0	8	7.7	12	36	100	4	●
VSM-4RFP-D10.0R0.5	10.0	0.5	10	9.5	14	42	100	4	●
VSM-4RFP-D10.0R1.0	10.0	1.0	10	9.5	14	42	100	4	●
VSM-4RFP-D10.0R2.0	10.0	2.0	10	9.5	14	42	100	4	●
VSM-4RFP-D12.0R0.5	12.0	0.5	12	11.5	16	48	100	4	●
VSM-4RFP-D12.0R1.0	12.0	1.0	12	11.5	16	48	100	4	●
VSM-4RFP-D12.0R2.0	12.0	2.0	12	11.5	16	48	100	4	●
VSM-4RFP-D16.0R1.0	16.0	1.0	16	15.5	20	60	150	4	●
VSM-4RFP-D16.0R2.0	16.0	2.0	16	15.5	20	60	150	4	●

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎					◎				◎	◎

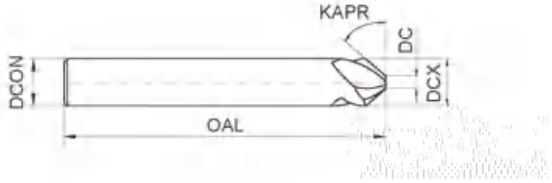
Code key B294
Graphics category and identification B295
Cutting parameters B646
Non-standard customization B652-B653

2-flute helical flute chamfer end mills with straight shank

Chamfering

CM-2E







Type	Basic dimension(mm)					Number of teeth Z	Stock
	KAPR	DC	DCX	DCON	OAL		
CM-2E-D3.0-A60	60°	0.2	3	3	50	2	○
CM-2E-D4.0-A60	60°	0.2	4	4	50	2	○
CM-2E-D6.0-A60	60°	0.2	6	6	50	2	○
CM-2E-D8.0-A60	60°	0.5	8	8	60	2	○
CM-2E-D10.0-A60	60°	0.5	10	10	75	2	○
CM-2E-D12.0-A60	60°	0.5	12	12	75	2	○
CM-2E-D16.0-A60	60°	0.7	16	16	100	2	○
CM-2E-D3.0-A90	45°	0.2	3	3	50	2	○
CM-2E-D4.0-A90	45°	0.2	4	4	50	2	○
CM-2E-D6.0-A90	45°	0.2	6	6	50	2	○
CM-2E-D8.0-A90	45°	0.5	8	8	60	2	○
CM-2E-D10.0-A90	45°	0.5	10	10	75	2	○
CM-2E-D12.0-A90	45°	0.5	12	12	75	2	○
CM-2E-D16.0-A90	45°	0.7	16	16	100	2	○
CM-2E-D3.0-A120	30°	0.2	3	3	50	2	○
CM-2E-D4.0-A120	30°	0.2	4	4	50	2	○
CM-2E-D6.0-A120	30°	0.2	6	6	50	2	○
CM-2E-D8.0-A120	30°	0.5	8	8	60	2	○
CM-2E-D10.0-A120	30°	0.5	10	10	75	2	○
CM-2E-D12.0-A120	30°	0.5	12	12	75	2	○
CM-2E-D16.0-A120	30°	0.7	16	16	100	2	○

● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	○		○	◎	◎	◎	○	○

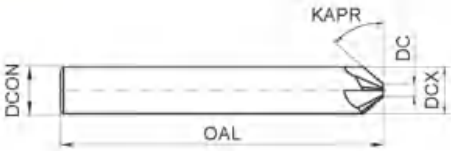
Code key B294
Graphics category and identification B295
Non-standard customization B652-B653

4-flute helical flute chamfer end mills with straight shank

Chamfering

CM-4E





30° | Coated NaNo TiAlN | KAPR KAPR±30'

Type	Basic dimension(mm)					Number of teeth Z	Stock
	KAPR	DC	DCX	DCON(h6)	OAL		
CM-4E-D3.0-B60	60°	0.2	3	3	50	4	○
CM-4E-D4.0-B60	60°	0.2	4	4	50	4	○
CM-4E-D6.0-B60	60°	0.2	6	6	50	4	○
CM-4E-D8.0-B60	60°	0.5	8	8	60	4	○
CM-4E-D10.0-B60	60°	0.5	10	10	75	4	○
CM-4E-D12.0-B60	60°	0.5	12	12	75	4	○
CM-4E-D16.0-B60	60°	0.7	16	16	100	4	○
CM-4E-D3.0-B90	45°	0.2	3	3	50	4	○
CM-4E-D4.0-B90	45°	0.2	4	4	50	4	○
CM-4E-D6.0-B90	45°	0.2	6	6	50	4	○
CM-4E-D8.0-B90	45°	0.5	8	8	60	4	○
CM-4E-D10.0-B90	45°	0.5	10	10	75	4	○
CM-4E-D12.0-B90	45°	0.5	12	12	75	4	○
CM-4E-D16.0-B90	45°	0.7	16	16	100	4	○
CM-4E-D3.0-B120	30°	0.2	3	3	50	4	○
CM-4E-D4.0-B120	30°	0.2	4	4	50	4	○
CM-4E-D6.0-B120	30°	0.2	6	6	50	4	○
CM-4E-D8.0-B120	30°	0.5	8	8	60	4	○
CM-4E-D10.0-B120	30°	0.5	10	10	75	4	○
CM-4E-D12.0-B120	30°	0.5	12	12	75	4	○
CM-4E-D16.0-B120	30°	0.7	16	16	100	4	○

● Stock available ○ Make-to-order

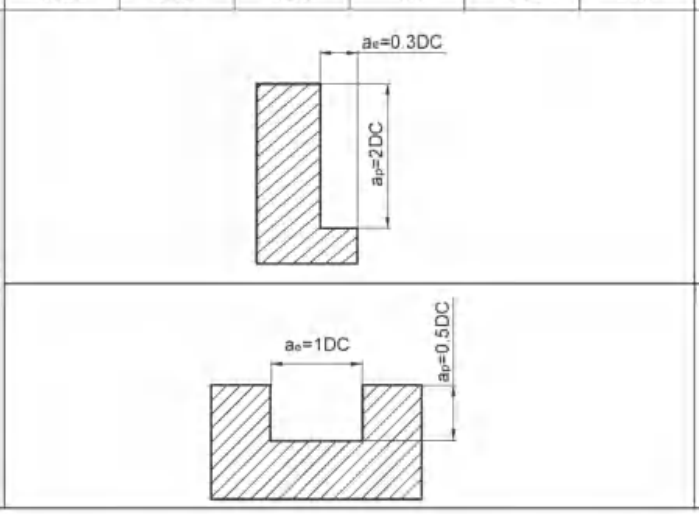
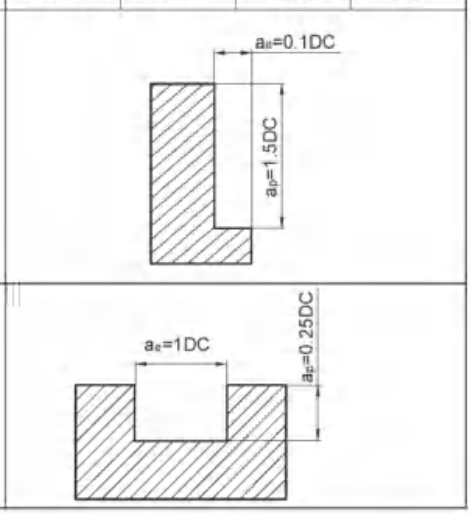
Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	○		○	◎	◎	◎	○	○

Code key B294 | Graphics category and identification B295 | Non-standard customization B652-B653

Cutting parameters for VPM series end mills

VPM-4E★VPM-4EBL/X★VPM-4EFP

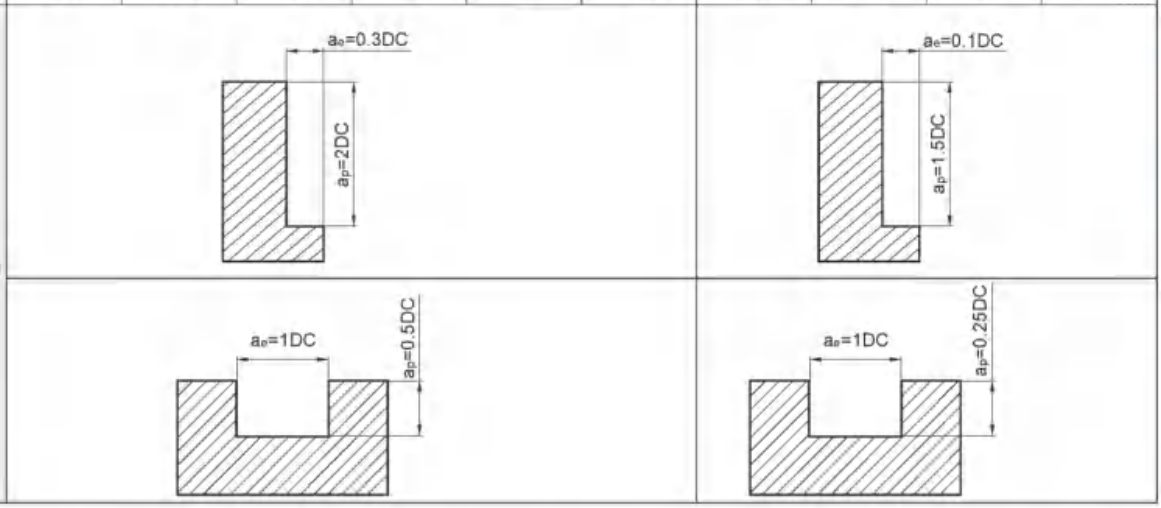
Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
3	15900	1220	8500	180	13270	950	10600	630	7430	360
4	11900	1260	6370	190	9950	970	8000	645	570	370
5	9500	1350	5060	190	7960	1010	6400	675	4460	390
6	7900	1330	4250	210	6630	1030	5300	690	3710	390
8	5900	1330	3180	210	4970	1020	4000	680	2785	405
10	4700	1310	2550	210	3980	1010	3200	675	2230	375
12	4000	1310	2120	210	3310	1010	2650	675	1855	375
14	3400	1220	1820	180	2840	945	2300	630	1590	360
16	3000	1220	1590	180	2480	945	2000	630	1390	360
18	2600	1200	1410	160	2210	930	1800	620	1240	350
20	2400	1200	1270	160	1990	930	1600	620	1115	350
Maximum cutting depth										

1. The above table shows the standard value of side milling. When milling slot, 60%~80% of rotating speed and 50%~70% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

VPM-4R★VPM-4RBL/X★VPM-4RFP

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
3	15900	1460	8500	215	13270	1140	10600	755	7430	430
4	11900	1510	6370	225	9950	1160	8000	770	570	440
5	9500	1620	5060	225	7960	1210	6400	810	4460	465
6	7900	1590	4250	250	6630	1235	5300	825	3710	465
8	5900	1590	3180	250	4970	1220	4000	815	2785	485
10	4700	1570	2550	250	3980	1210	3200	810	2230	450
12	4000	1570	2120	250	3310	1210	2650	810	1855	450
14	3400	1460	1820	215	2840	1130	2300	755	1590	430
16	3000	1460	1590	215	2480	1130	2000	755	1390	430
18	2600	1440	1410	190	2210	1115	1800	740	1240	420
20	2400	1440	1270	190	1990	1115	1600	740	1115	420

Maximum cutting depth



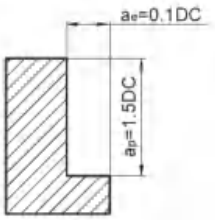
1. The above table shows the standard value of side milling. When milling slot, 60%~80% of rotating speed and 50%~70% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

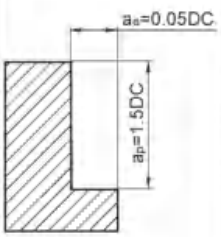
Cutting parameters for UM series end mills

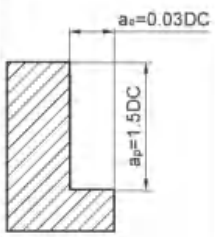
UM-4E★UM-4EL(general cutting)

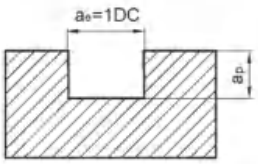
Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
4	10800	1000	5500	180	8000	770	6500	605	5570	440
5	8200	1050	4500	180	6400	810	5000	635	4460	465
6	7000	1080	3700	195	5300	825	4200	645	3710	465
8	5200	1065	2800	195	4000	815	3200	665	2785	485
10	4200	1050	2200	195	3200	810	2500	630	2230	450
12	3500	1050	1850	195	2650	810	2100	630	1855	450
14	3000	975	1600	180	2300	755	1800	595	1590	430
16	2600	975	1400	170	2000	755	1600	595	1390	430
18	2300	960	1250	150	1800	745	1400	580	1240	420
20	2050	960	1100	150	1600	745	1250	580	1115	420

Maximum cutting depth







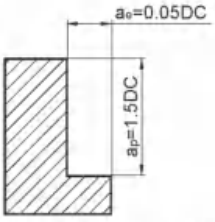
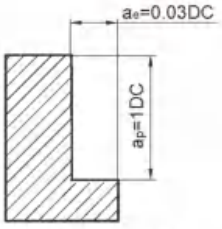


Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.15DC
Ø3≤DC<Ø6	0.3DC
Ø6≤DC≤Ø20	0.5DC

Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.1DC
Ø3≤DC	0.2DC

1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

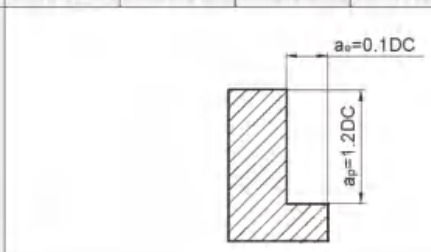
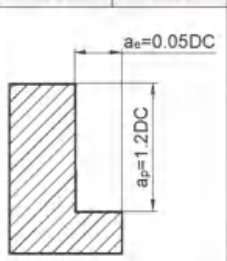
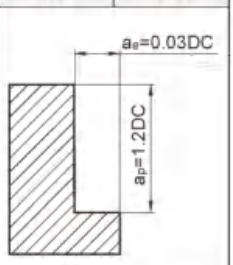
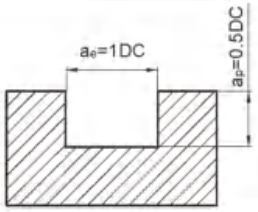
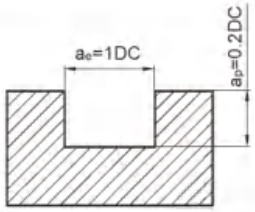
UM-4E★UM-4EL(high speed side milling)

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Carbon steel, Alloy steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~45HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Cutting speed	300m/min		250 m/min		200 m/min		150 m/min		100 m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	15915	2045	13260	1700	10600	1360	7960	1020	5300	680
8	11935	2040	9950	1680	7960	1355	5970	1020	3980	680
10	9550	1990	7960	1655	6370	1330	4775	995	3180	660
12	7960	1990	6630	1655	5300	1330	3980	995	2650	660
14	6820	1850	5685	1545	4550	1235	3410	1080	2275	615
16	5970	1850	4975	1545	3980	1235	2985	1080	1990	615
18	5305	1850	4420	1545	3540	1235	2650	1080	1770	615
20	4775	1850	3980	1545	3180	1235	2390	1080	1590	615
Maximum cutting depth	 Maximum a_e=1.0mm						 Maximum a_e=0.5mm			

1.Please select high-precision machine and tool holder.
2.Please use air blow or MQL(minimum oil mist cooling).
3.Down milling is recommended in the case of side milling.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.

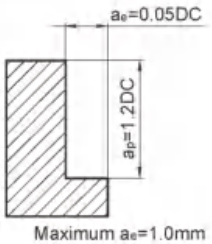
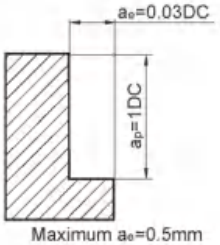
Cutting parameters for UM series end mills

UM-4EFP(general cutting)

Workpiece material	Cast Iron, Nodular cast iron		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	7000	1400	3700	250	5300	1080	4200	845	3710	610
8	5200	1385	2800	250	4000	1060	3200	865	2785	630
10	4200	1365	2200	250	3200	1050	2500	815	2230	585
12	3500	1365	1850	250	2650	1050	2100	815	1855	585
16	2600	1270	1400	220	2000	975	1600	770	1390	560
20	2050	1255	1100	195	1600	965	1250	755	1115	545
Maximum cutting depth										
										

1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

UM-4EFP(high speed side milling)

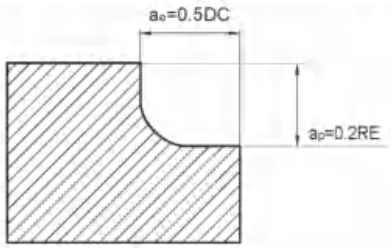
Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Carbon steel, Alloy steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Cutting speed	300m/min		250 m/min		200 m/min		150 m/min		100 m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	15915	2655	13260	2210	10600	1770	7960	1325	5300	885
8	11935	2650	9950	2180	7960	1760	5970	1295	3980	885
10	9550	2590	7960	2150	6370	1730	4775	1295	3180	855
12	7960	2590	6630	2150	5300	1730	3980	1400	2650	855
16	5970	2410	4975	2015	3980	1605	2985	1400	1990	800
20	4775	2410	3980	2375	3180	1605	2390	1325	1590	800
Maximum cutting depth	 Maximum ae=1.0mm						 Maximum ae=0.5mm			

1.Please select high-precision machine and tool holder.
2.Please use air blow or MQL(minimum oil mist cooling).
3.Down milling is recommended in the case of side milling.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.

Cutting parameters for UM series end mills

UM-4R★UM-4RL(Standard)

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Quenched and tempered steel ~40HRC		Quenched and tempered steel ~45HRC		Quenched and tempered steel ~50HRC		Quenched and tempered steel ~55HRC	
Diameter× Corner radius	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
4.0×R0.3 4.0×R0.5	7950	3960	6350	2880	5550	2520	4000	1650	2400	755
5.0×R0.5 5.0×R1.0	6350	4200	5100	3060	4450	2670	3200	1710	1900	690
6.0×R0.5 6.0×R1.0	5300	4200	4250	3060	3700	2670	2650	1710	1600	690
8.0×R0.5 8.0×R1.0	4550	4200	3200	3060	2800	2670	2000	1710	1200	690
10.0×R0.5 10.0×R1.0 10.0×R2.0 10.0×R3.0	3200	4200	2550	3060	2250	2670	1600	1710	955	690
12.0×R0.5 12.0×R1.0 12.0×R2.0 12.0×R3.0	2650	4200	2100	3060	1850	2670	1350	1710	795	690
16.0×R1.0 16.0×R2.0 16.0×R3.0	2200	3485	1745	2540	1535	2215	1140	1420	660	570
20.0×R1.0 20.0×R2.0 20.0×R3.0	1825	2895	1450	2110	1275	1840	960	1180	550	475
Maximum cutting depth	Maximum a_p=0.5mm						Maximum a_p=0.4mm		Maximum a_p=0.2mm	



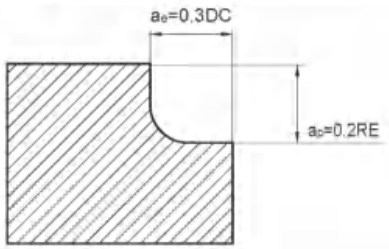
1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Down milling is recommended.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.
6.The above cutting parameters are based on contour machining when overhang L/D≤4. Please make adjustments according to the table below when overhang is different.

Different cutting parameters under different overhang of tool:

Overhang	Cutting speed(m/min)	Axial cutting depth (mm)	Feed speed (mm/min)
L/D≤4	100%	100%	100%
L/D=5	60% ~ 80%	60% ~ 80%	60% ~ 80%
L/D=6	40% ~ 60%	40% ~ 60%	40% ~ 60%

UM-4R★UM-4RL(High speed)

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Quenched and tempered steel ~40HRC		Quenched and tempered steel ~45HRC		Quenched and tempered steel ~50HRC		Quenched and tempered steel ~55HRC	
Diameter× Corner radius	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
4.0×R0.3 4.0×R0.5	16000	7800	16000	7200	12000	5400	12000	4920	7950	2130
5.0×R0.5 5.0×R1.0	12500	8400	12500	7500	9550	5730	9550	5160	6350	2280
6.0×R0.5 6.0×R1.0	10600	8400	10600	7620	7950	5730	7950	5160	5300	2280
8.0×R0.5 8.0×R1.0	7950	8400	7950	7620	5950	5730	5950	5160	4000	2280
10.0×R0.5 10.0×R1.0 10.0×R2.0 10.0×R3.0	6350	8400	6350	7620	4750	5730	4750	5160	3200	2280
12.0×R0.5 12.0×R1.0 12.0×R2.0 12.0×R3.0	5300	8400	5300	7620	4000	5730	4000	5160	2650	2280
16.0×R1.0 16.0×R2.0 16.0×R3.0	3980	6970	3980	6320	2985	4755	2985	4280	1990	1890
20.0×R1.0 20.0×R2.0 20.0×R3.0	3185	5785	3185	5245	2385	3945	2385	3550	1590	1570
Maximum cutting depth	Maximum a_p=0.4mm						Maximum a_p=0.2mm		Maximum a_p=0.1mm	



1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Down milling is recommended.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.
6.The above cutting parameters are based on contour machining when overhang L/D≤4. Please make adjustments according to the table below when overhang is different.

Different cutting parameters under different overhang of tool:

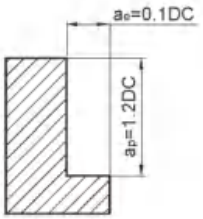
Ratio of neck length to diameter	Cutting speed(m/min)	Axial cutting depth(mm)	Feed speed (mm/min)
L/D≤4	100%	100%	100%
L/D=5	60% ~ 80%	60% ~ 80%	60% ~ 80%
L/D=6	40% ~ 60%	40% ~ 60%	40% ~ 60%

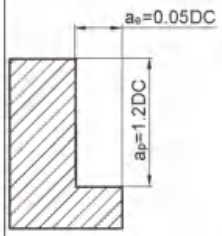
Cutting parameters for UM series end mills

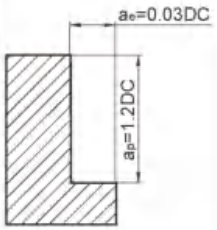
UM-4RFP

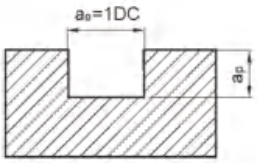
Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
4	10800	1210	5500	210	8000	925	6500	720	5570	530
5	8200	1265	4500	210	6400	965	5000	765	4460	560
6	7000	1295	3700	235	5300	995	4200	780	3710	560
8	5200	1285	2800	235	4000	975	3200	790	2785	580
10	4200	1265	2200	235	3200	965	2500	750	2230	540
12	3500	1265	1850	235	2650	965	2100	750	1855	540
16	2600	1180	1400	210	2000	925	1600	705	1390	520

Maximum cutting depth







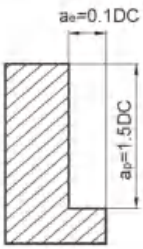
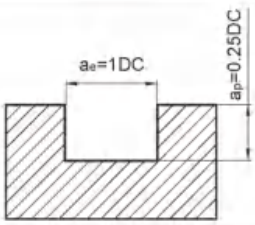


Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.15DC
Ø3≤DC<Ø6	0.3DC
Ø6≤DC≤Ø20	0.5DC

Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.1DC
Ø3≤DC	0.2DC

1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

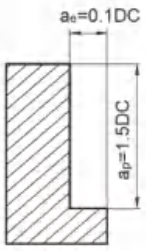
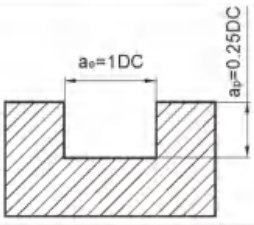
PMX-4E ★ PMX-4EBL/X ★ PMX-4EFP

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	20000	300	20000	240	20000	180	20000	135
2	15000	480	15000	420	13000	270	11140	195
3	15900	1220	13270	950	10600	630	7430	360
4	11900	1260	9950	970	8000	645	570	370
5	9500	1350	7960	1010	6400	675	4460	390
6	7900	1330	6630	1030	5300	690	3710	390
8	5900	1330	4970	1020	4000	680	2785	405
10	4700	1310	3980	1010	3200	675	2230	375
12	4000	1310	3310	1010	2650	675	1855	375
14	3400	1220	2840	945	2300	630	1590	360
16	3000	1220	2480	945	2000	630	1390	360
18	2600	1200	2210	930	1800	620	1240	350
20	2400	1200	1990	930	1600	620	1115	350
Maximum cutting depth								
								

1. The above table shows the standard value of side milling. When milling slot, 60%~80% of rotating speed and 50%~70% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

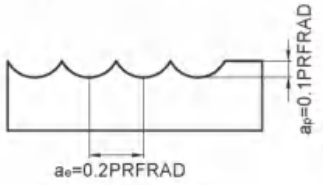
Cutting parameters for PMX series end mills

PMX-4R★PMX-4RBL/X★PMX-4RFP

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
3	15900	1460	13270	1140	10600	755	7430	430
4	11900	1510	9950	1160	8000	770	570	440
5	9500	1620	7960	1210	6400	810	4460	465
6	7900	1590	6630	1235	5300	825	3710	465
8	5900	1590	4970	1220	4000	815	2785	485
10	4700	157	3980	1210	3200	810	2230	450
12	4000	1570	3310	1210	2650	810	1855	450
14	3400	1460	2840	1130	2300	755	1590	430
16	3000	1460	2480	1130	2000	755	1390	430
18	2600	1440	2210	1115	1800	740	1240	420
20	2400	1440	1990	1115	1600	740	1115	420
Maximum cutting depth								
								

1. The above table shows the standard value of side milling. When milling slot, 60%~80% of rotating speed and 50%~70% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

PMX-2B★PMX-2BL/M/X★PMX-2BFP

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Bullnose radius (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
R0.5	40000	960	32000	385	25000	330	22280	295
R1.0	24000	1080	16000	480	13000	330	11140	295
R1.5	15500	1150	10600	545	8500	335	7430	295
R2.0	11500	1150	8000	665	6500	450	5570	385
R2.5	9500	1270	6400	665	5000	455	4455	405
R3.0	8000	1270	5300	700	4200	470	3715	420
R4.0	6000	1575	4000	850	3200	535	2785	465
R5.0	4800	1455	3200	785	2500	535	2230	465
R6.0	4000	1330	2650	740	2100	505	1855	450
R8.0	3000	1270	2000	725	1600	455	1395	395
R10.0	2400	1150	1600	675	1250	400	1115	360
Maximum cutting depth								

1.Please select high-precision machine and tool holder. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.

2.Please use air blow or MQL(minimum oil mist cooling).

3.Make overhang of tool as short as possible in conditions of non-interference.

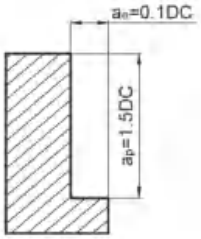
4.When cutting speed is small, rotating speed and feed can increase according same ratio.

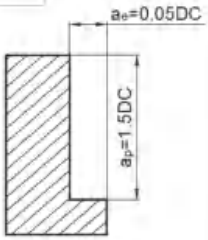
Cutting parameters for PML/PM series end mills

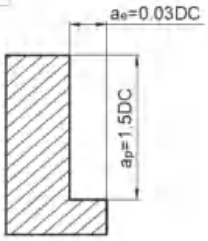
PML-2E★PM-2E★PML-2EL★PM-2EL★PM-2EBL/X

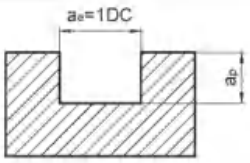
Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	20000	200	20000	60	20000	165	20000	120	20000	90
2	15000	320	11150	85	15000	285	13000	180	11140	130
3	14000	545	7500	120	10600	420	8500	330	7430	240
4	10800	560	5500	135	8000	425	6500	335	5570	245
5	8200	585	4500	135	6400	445	5000	355	4460	260
6	7000	600	3700	140	5300	465	4200	360	3710	260
8	5200	595	2800	140	4000	455	3200	365	2785	270
10	4200	585	2200	140	3200	445	2500	350	2230	250
12	3500	585	1850	140	2650	445	2100	350	1855	250
14	3000	545	1600	135	2300	420	1800	330	1590	240
16	2600	545	1400	120	2000	420	1600	330	1390	240
18	2300	535	1250	120	1800	415	1400	325	1240	235
20	2050	535	1100	120	1600	415	1250	325	1115	235

Maximum cutting depth









Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.15DC
Ø3≤DC<Ø6	0.3DC
Ø6≤DC<Ø20	0.5DC

Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.1DC
Ø3≤DC	0.2DC

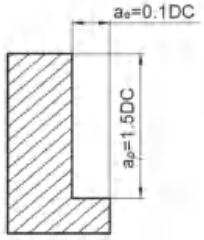
1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

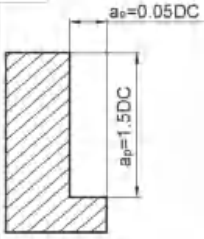
Cutting parameters for PML/PM series end mills

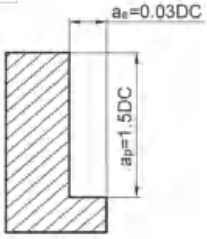
PML-2F★PM-2F★PML-2FL★PM-2FL

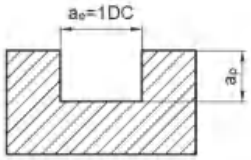
Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	20000	140	20000	45	20000	115	20000	85	20000	65
2	15000	225	11150	60	15000	200	13000	125	11140	90
3	14000	385	7500	85	10600	295	8500	230	7430	170
4	10800	390	5500	95	8000	300	6500	235	5570	170
5	8200	410	4500	95	6400	315	5000	245	4460	180
6	7000	420	3700	95	5300	325	4200	255	3710	180
8	5200	415	2800	95	4000	320	3200	255	2785	190
10	4200	410	2200	95	3200	315	2500	240	2230	175
12	3500	410	1850	95	2650	315	2100	240	1855	175
14	3000	385	1600	95	2300	295	1800	230	1590	170
16	2600	385	1400	85	2000	295	1600	230	1390	170
18	2300	375	1250	85	1800	290	1400	230	1240	165
20	2050	375	1100	85	1600	290	1250	230	1115	165

Maximum cutting depth









Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.15DC
Ø3≤DC<Ø6	0.3DC
Ø6≤DC<Ø20	0.5DC

Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.1DC
Ø3≤DC	0.2DC

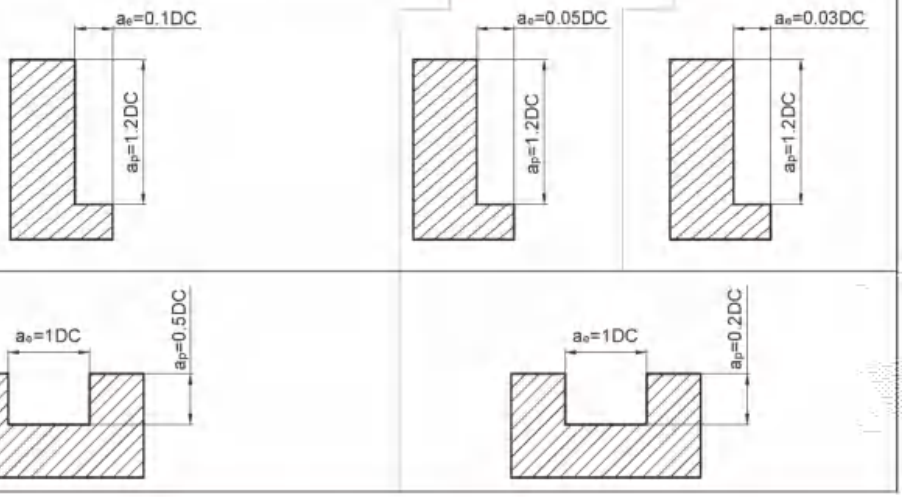
1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

Cutting parameters for PML/PM series end mills

PML-2EFP★PM-2EFP

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	7000	780	3700	180	5300	600	4200	470	3710	340
8	5200	775	2800	180	4000	595	3200	475	2785	350
10	4200	755	2200	180	3200	575	2500	455	2230	325
12	3500	755	1850	180	2650	575	2100	455	1855	325
16	2600	710	1400	155	2000	545	1600	425	1390	310
20	2050	700	1100	155	1600	540	1250	420	1115	305

Maximum cutting depth

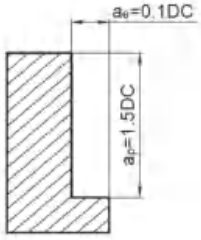


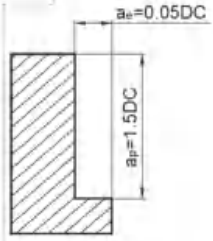
1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

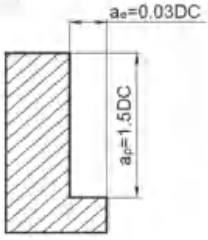
PML-3E-H★PM-3E-H★PML-3EL-H★PM-3EL-H

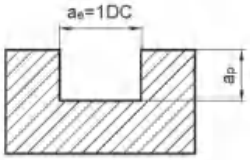
Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	20000	200	20000	75	20000	160	20000	100	20000	90
2	15000	325	11150	80	15000	285	13000	150	11140	130
3	14000	550	7500	100	10600	425	8500	280	7430	245
4	10800	565	5500	105	8000	430	6500	285	5570	250
5	8200	600	4500	105	6400	455	5000	300	4460	260
6	7000	605	3700	110	5300	465	4200	305	3710	260
8	5200	600	2800	110	4000	460	3200	310	2785	275
10	4200	600	2200	110	3200	455	2500	290	2230	255
12	3500	600	1850	110	2650	455	2100	290	1855	255
14	3000	550	1600	105	2300	425	1800	280	1590	245
16	2600	550	1400	100	2000	425	1600	280	1390	245
18	2300	540	1250	85	1800	415	1400	275	1240	240
20	2050	540	1100	85	1600	415	1250	275	1115	240

Maximum cutting depth









Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.15DC
Ø3≤DC<Ø6	0.3DC
Ø6≤DC<Ø20	0.5DC

Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.1DC
Ø3≤DC	0.2DC

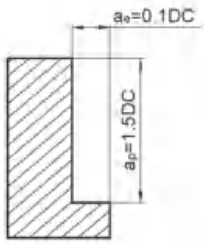
1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

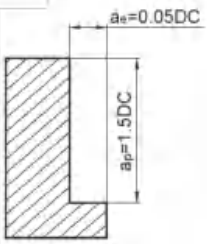
Cutting parameters for PML/PM series end mills

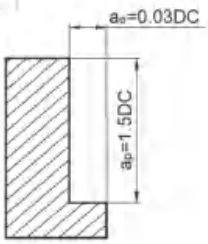
PML-4E-G★PM-4E-G★PML-4EL-G★PM-4EL-G★PM-4EBL/X-G
PML-4E-H★PM-4E-H★PML-4EL-H★PM-4EL-H(general cutting)

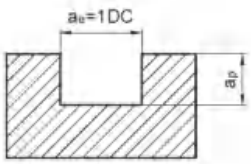
Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	20000	270	20000	95	20000	215	20000	135	20000	120
2	15000	435	11150	110	15000	380	13000	200	11140	175
3	14000	735	7500	135	10600	565	8500	370	7430	325
4	10800	755	5500	140	8000	575	6500	380	5570	335
5	8200	795	4500	140	6400	605	5000	400	4460	350
6	7000	810	3700	145	5300	620	4200	405	3710	350
8	5200	800	2800	145	4000	615	3200	415	2785	365
10	4200	795	2200	145	3200	605	2500	390	2230	340
12	3500	795	1850	145	2650	605	2100	390	1855	340
14	3000	735	1600	140	2300	565	1800	370	1590	325
16	2600	735	1400	135	2000	565	1600	370	1390	325
18	2300	720	1250	115	1800	555	1400	365	1240	315
20	2050	720	1100	115	1600	555	1250	365	1115	315

Maximum cutting depth









Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.15DC
Ø3≤DC<Ø6	0.3DC
Ø6≤DC<Ø20	0.5DC

Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.1DC
Ø3≤DC	0.2DC

1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

PML-4E-G★PM-4E-G★PML-4EL-G★PM-4EL-G★PM-4EBL/X-G
PML-4E-H★PM-4E-H★PML-4EL-H★PM-4EL-H(high speed side milling)

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Carbon steel, Alloy steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~45HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Cutting speed	300m/min		250 m/min		200 m/min		150 m/min		100 m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	15915	1535	13260	1280	10600	1020	7960	765	5300	515
8	11935	1530	9950	1260	7960	1020	5970	765	3980	515
10	9550	1450	7960	1245	6370	1000	4775	750	3180	495
12	7960	1450	6630	1245	5300	1000	3980	750	2650	495
14	6820	1390	5685	1160	4550	930	3410	810	2275	465
16	5970	1390	4975	1160	3980	930	2985	810	1990	465
18	5305	1390	4420	1160	3540	930	2650	810	1770	465
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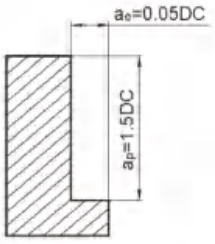
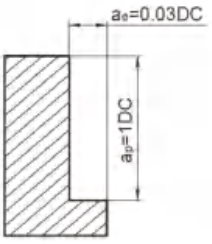
Maximum cutting depth	 Maximum a_e=1.0mm						 Maximum a_e=0.5mm			

1.Please select high-precision machine and tool holder.
2.Please use air blow or MQL(minimum oil mist cooling).
3.Down milling is recommended in the case of side milling.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.

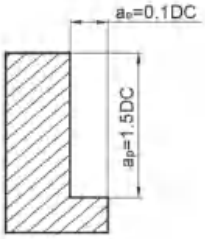


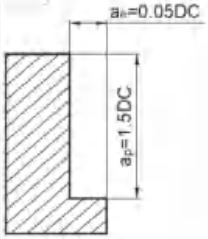
Cutting parameters for PML/PM series end mills

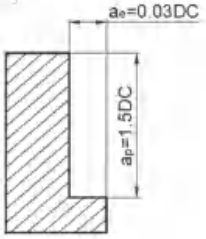
PML-4F-G★PM-4F-G★PML-4FL-G★PM-4FL-G(general cutting)

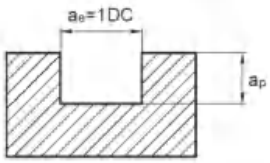
Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~45HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	20000	190	20000	70	20000	150	20000	95	20000	85
2	15000	305	11150	80	15000	265	13000	140	11140	125
3	14000	515	7500	95	10600	395	8500	260	7430	230
4	10800	530	5500	100	8000	4055	6500	265	5570	235
5	8200	555	4500	100	6400	425	5000	280	4460	245
6	7000	570	3700	100	5300	435	4200	283	3710	245
8	5200	560	2800	100	4000	430	3200	290	2785	255
10	4200	555	2200	100	3200	425	2500	275	2230	240
12	3500	555	1850	100	2650	425	2100	275	1855	240
14	3000	515	1600	100	2300	395	1800	260	1590	230
16	2600	515	1400	95	2000	395	1600	260	1390	230
18	2300	505	1250	80	1800	390	1400	255	1240	220
20	2050	505	1100	80	1600	390	1250	255	1115	220

Maximum cutting depth







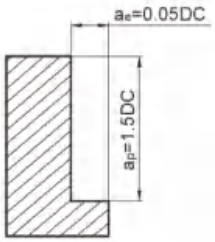
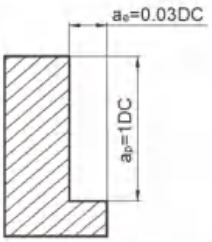


Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.15DC
Ø3≤DC<Ø6	0.3DC
Ø6≤DC<Ø20	0.5DC

Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.1DC
Ø3≤DC	0.2DC

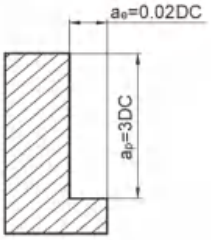
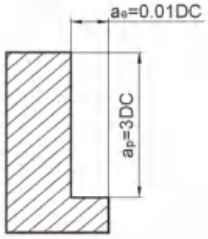
1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

PML-4F-G★PM-4F-G★PML-4FL-G★PM-4FL-G(high speed side milling)

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Carbon steel, Alloy steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~45HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Cutting speed	300m/min		250 m/min		200 m/min		150 m/min		100 m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	15915	1075	13260	900	10600	715	7960	535	5300	360
8	11935	1070	9950	885	7960	715	5970	535	3980	360
10	9550	1015	7960	870	6370	700	4775	525	3180	345
12	7960	1015	6630	870	5300	700	3980	525	2650	345
14	6820	975	5685	815	4550	650	3410	570	2275	325
16	5970	975	4975	815	3980	650	2985	570	1990	325
18	5305	975	4420	815	3540	650	2650	570	1770	325
20	4775	975	3980	815	3180	650	2390	570	1590	325
Maximum cutting depth	 Maximum a_e=1.0mm						 Maximum a_e=0.5mm			

1.Please select high-precision machine and tool holder.
2.Please use air blow or MQL(minimum oil mist cooling).
3.Down milling is recommended in the case of side milling.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.

PML-4EX-G★PM-4EX-G

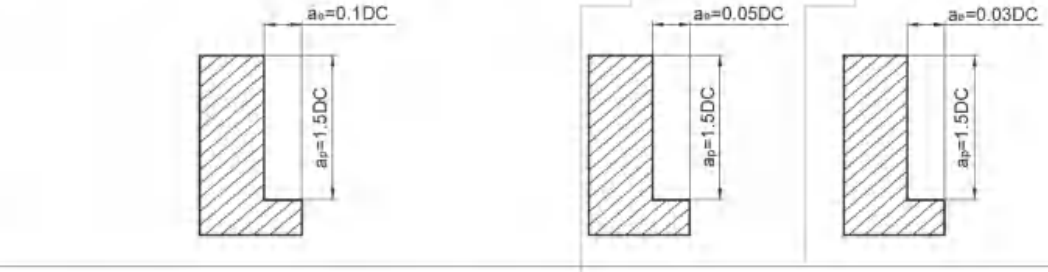
Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	5800	570	2650	85	4250	410	3600	345	3180	305
8	4400	570	2000	85	3180	410	2700	350	2390	310
10	3500	555	1600	85	2550	400	2150	340	1910	300
12	2900	555	1350	85	2120	400	1800	340	1590	300
16	2200	520	1000	80	1590	380	1350	315	1195	280
20	1750	510	800	75	1270	375	1050	310	955	280
Maximum cutting depth										

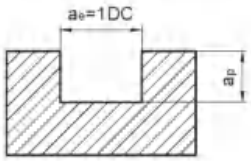
1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Down milling is recommended in the case of side milling.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.

PML-4E★PM-4E★PML-4EL★PM-4EL★PM-4EBL/X(general cutting)

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	20000	300	20000	108	20000	240	20000	180	20000	135
2	15000	480	11150	120	15000	420	13000	270	11140	195
3	14000	815	7500	145	10600	630	8500	495	7430	360
4	10800	840	5500	150	8000	645	6500	505	5570	370
5	8200	875	4500	150	6400	675	5000	530	4460	390
6	7000	900	3700	165	5300	690	4200	540	3710	390
8	5200	890	2800	165	4000	680	3200	555	2785	405
10	4200	875	2200	165	3200	675	2500	525	2230	375
12	3500	875	1850	165	2650	675	2100	525	1855	375
14	3000	815	1600	150	2300	630	1800	495	1590	360
16	2600	815	1400	145	2000	630	1600	495	1390	360
18	2300	805	1250	125	1800	620	1400	485	1240	350
20	2050	805	1100	125	1600	620	1250	485	1115	350

Maximum cutting depth





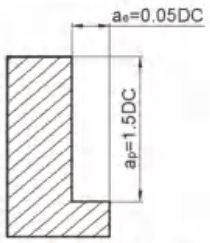
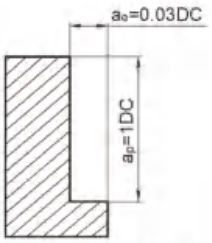
Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.15DC
Ø3≤DC<Ø6	0.3DC
Ø6≤DC≤Ø20	0.5DC

Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.1DC
Ø3≤DC	0.2DC

1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

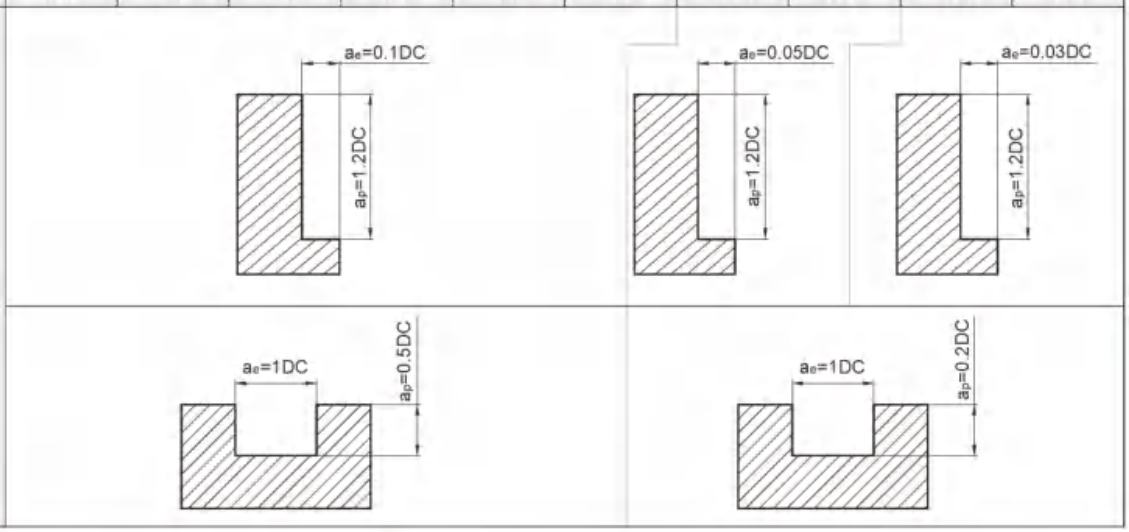
Cutting parameters for PML/PM series end mills

PML-4E★PM-4E★PML-4EL★PM-4EL★PM-4EBL/X(high speed side milling)

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Carbon steel, Alloy steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~45HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Cutting speed	300m/min		250 m/min		200 m/min		150 m/min		100 m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	15915	1705	13260	1420	10600	1135	7960	850	5300	570
8	11935	1700	9950	1400	7960	1130	5970	850	3980	570
10	9550	1660	7960	1380	6370	1110	4775	830	3180	550
12	7960	1660	6630	1380	5300	1110	3980	830	2650	550
14	6820	1545	5685	1290	4550	1030	3410	900	2275	515
16	5970	1545	4975	1290	3980	1030	2985	900	1990	515
18	5305	1545	4420	1290	3540	1030	2650	900	1770	515
20	4775	1545	3980	1290	3180	1030	2390	900	1590	515
Maximum cutting depth	 Maximum ae=1.0mm						 Maximum ae=0.5mm			

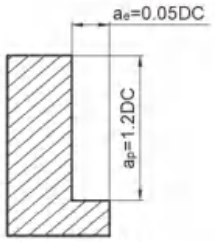
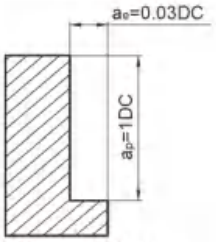
1.Please select high-precision machine and tool holder.
2.Please use air blow or MQL(minimum oil mist cooling).
3.Down milling is recommended in the case of side milling.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.

PML-4EFP★PM-4EFP(general cutting)

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	7000	1170	3700	210	5300	900	4200	705	3710	510
8	5200	1155	2800	210	4000	885	3200	720	2785	525
10	4200	1140	2200	210	3200	875	2500	680	2230	490
12	3500	1140	1850	210	2650	875	2100	680	1855	490
16	2600	1065	1400	185	2000	815	1600	645	1390	470
20	2050	1045	1100	165	1600	805	1250	630	1115	455
Maximum cutting depth										

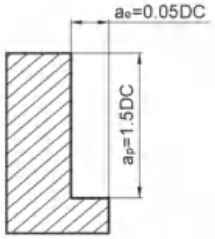
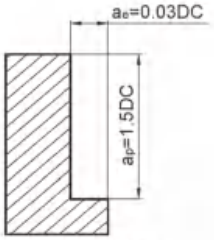
1.The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2.Please select high-precision machine and tool holder.
3.Please use air blow or cutting liquid with high mist retardant property.
4.Down milling is recommended in the case of side milling.
5.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6.Make overhang of tool as short as possible in conditions of non-interference.

PML-4EFP★PM-4EFP(high speed side milling)

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Carbon steel, Alloy steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~45HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Cutting speed	300m/min		250 m/min		200 m/min		150 m/min		100 m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	15915	2215	13260	1845	10600	1475	7960	1105	5300	740
8	11935	2210	9950	1820	7960	1470	5970	1080	3980	740
10	9550	2160	7960	1795	6370	1445	4775	1080	3180	715
12	7960	2160	6630	1795	5300	1445	3980	1170	2650	715
16	5970	2010	4975	1680	3980	1340	2985	1170	1990	670
20	4775	2010	3980	1980	3180	1340	2390	1105	1590	670
Maximum cutting depth	 Maximum ae=1.0mm						 Maximum ae=0.5mm			

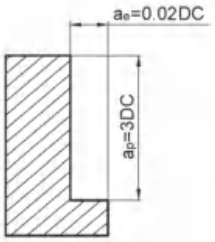
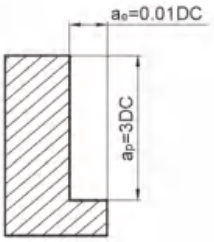
1.Please select high-precision machine and tool holder.
2.Please use air blow or MQL(minimum oil mist cooling).
3.Down milling is recommended in the case of side milling.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.

PML-6E★PM-6E

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	7000	1070	3700	195	5300	815	4200	650	3710	470
8	5200	1070	2800	195	4000	815	3200	660	2785	485
10	4200	1035	2200	195	3200	800	2500	630	2230	450
12	3500	1035	1850	195	2650	800	2100	630	1855	450
16	2600	975	1400	180	2000	750	1600	590	1390	435
20	2050	960	1100	150	1600	740	1250	580	1115	420
Maximum cutting depth	 Maximum a_e=1.0mm						 Maximum a_e=0.5mm			

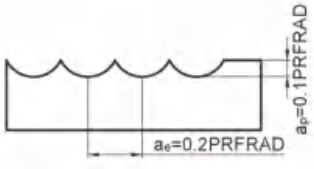
1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Down milling is recommended in the case of side milling.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.

PML-6EL★PM-6EL

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	5800	900	2650	140	4250	655	3600	555	3180	490
8	4400	900	2000	140	3180	655	2700	560	2390	495
10	3500	875	1600	140	2550	635	2150	530	1910	470
12	2900	875	1350	140	2120	635	1800	530	1590	470
16	2200	825	1000	125	1590	600	1350	500	1195	445
20	1750	810	800	110	1270	590	1050	495	955	440
Maximum cutting depth										

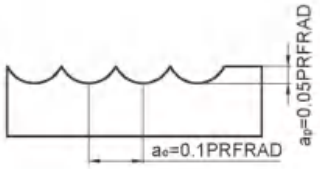
1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Down milling is recommended in the case of side milling.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.

PML-2B★PM-2B★PML-2BL★PM-2BL/M/X★ PML-2BFP★PM-2BFP(general cutting)

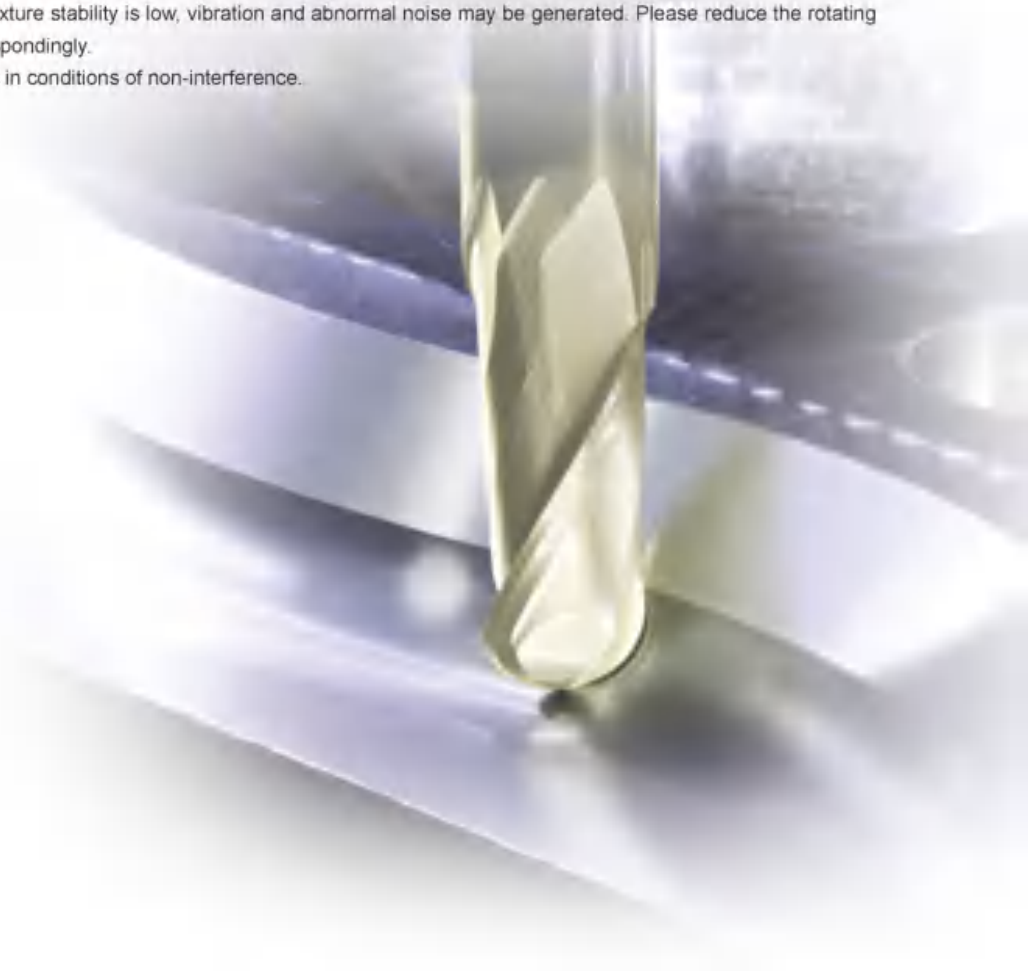
Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Bullnose radius (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
R0.5	40000	960	22300	240	32000	385	25000	330	22280	295
R1.0	24000	1080	11150	275	16000	480	13000	330	11140	295
R1.5	15500	1150	7400	350	10600	545	8500	335	7430	295
R2.0	11500	1150	5550	445	8000	665	6500	450	5570	385
R2.5	9500	1270	4450	445	6400	665	5000	455	4455	405
R3.0	8000	1270	3700	470	5300	700	4200	470	3715	420
R4.0	6000	1575	2750	550	4000	850	3200	535	2785	465
R5.0	4800	1455	2200	520	3200	785	2500	535	2230	465
R6.0	4000	1330	1850	520	2650	740	2100	505	1855	450
R8.0	3000	1270	1350	455	2000	725	1600	455	1395	395
R10.0	2400	1150	1100	445	1600	675	1250	400	1115	360
Maximum cutting depth										

1. Please select high-precision machine and tool holder.
2. Please use air blow or cutting liquid with high mist retardant property.
3. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
4. Make overhang of tool as short as possible in conditions of non-interference.

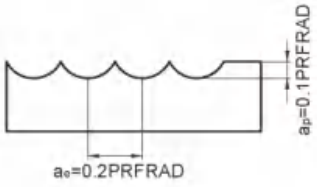
PML-2B★PM-2B★PML-2BL★PM-2BL/M/X★ PML-2BFP★PM-2BFP(high speed cutting)

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Carbon steel, Alloy steel ~400HRC		Pre-hardened steel, quenched and tempered steel ~45HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Bullnose radius (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
R3.0	15000	4800	11500	2750	9500	2250	7960	1885	6370	1510
R4.0	11500	3650	8950	2100	7150	1700	5970	1420	4775	1135
R5.0	9500	3000	7150	1700	5700	1350	4775	1130	3820	905
R6.0	7950	2500	5950	1400	4750	1100	3980	920	3180	735
R8.0	5950	1900	4450	1050	3550	850	2985	760	2390	610
R10.0	4750	1500	3550	850	2850	680	2390	570	1910	455
Maximum cutting depth										

1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
4.Make overhang of tool as short as possible in conditions of non-interference.



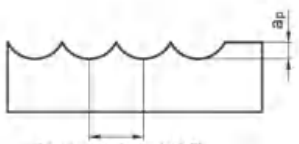
PML-4B★PM-4B★PML-4BL★PM-4BL/M/X

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Bullnose radius (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
R1.5	15500	2055	7400	625	10600	975	8500	600	7430	525
R2.0	11500	2055	5550	795	8000	1190	6500	800	5570	685
R2.5	9500	2270	4450	795	6400	1190	5000	810	4455	720
R3.0	8000	2270	3700	840	5300	1245	4200	840	3715	745
R4.0	6000	2810	2750	985	4000	1515	3200	950	2785	825
R5.0	4800	2595	2200	925	3200	1405	2500	950	2230	825
R6.0	4000	2375	1850	925	2650	1320	2100	905	1855	800
R8.0	3000	2270	1350	815	2000	1295	1600	810	1395	705
R10.0	2400	2055	1100	795	1600	1200	1250	715	1115	640
Maximum cutting depth										

1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
4.Make overhang of tool as short as possible in conditions of non-interference.

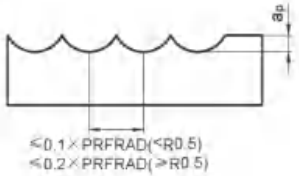
Cutting parameters for PML/PM series end mills

PM-2BC

Workpiece material			Pre-hardened steel, quenched and tempered steel ~40HRC			Pre-hardened steel, quenched and tempered steel ~50HRC			Hardened steel ~55HRC		
Bullnose radius (mm)	Taper half angle (°)	Effective length (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)
R0.25	0.5°	3	30000	300	0.03	30000	270	0.03	30000	240	0.03
		5	30000	250	0.02	30000	225	0.02	30000	200	0.02
	1.0°	3	30000	330	0.03	30000	300	0.03	30000	265	0.03
		5	30000	270	0.02	30000	245	0.02	30000	215	0.02
	1.5°	3	30000	350	0.03	30000	315	0.03	30000	280	0.03
		5	30000	300	0.02	30000	270	0.02	30000	240	0.02
R0.30	0.5°	5	30000	300	0.03	30000	270	0.03	30000	240	0.03
		8	30000	250	0.02	30000	225	0.02	30000	200	0.02
	1.0°	5	30000	350	0.03	30000	315	0.03	30000	280	0.03
		8	30000	300	0.02	30000	270	0.02	30000	240	0.02
		10	30000	270	0.02	30000	245	0.02	30000	215	0.02
		12	30000	250	0.015	30000	225	0.015	30000	200	0.015
		15	30000	250	0.01	30000	225	0.01	30000	200	0.01
	1.5°	8	30000	350	0.03	30000	315	0.03	30000	280	0.03
		15	30000	300	0.01	30000	270	0.01	30000	240	0.01
R0.40	0.5°	8	30000	350	0.05	30000	315	0.05	30000	280	0.05
		12	30000	300	0.04	30000	270	0.04	30000	240	0.04
	1.0°	8	30000	400	0.05	30000	360	0.05	30000	320	0.05
		12	30000	350	0.04	30000	315	0.04	30000	280	0.04
	1.5°	8	30000	450	0.05	30000	405	0.05	30000	360	0.05
		12	30000	400	0.04	30000	360	0.04	30000	320	0.04
R0.50	0.5°	10	22000	450	0.05	22000	405	0.05	22000	360	0.05
		15	22000	400	0.04	22000	360	0.04	22000	320	0.04
		20	22000	370	0.03	22000	335	0.03	22000	295	0.03
		25	22000	350	0.01	22000	315	0.01	22000	280	0.01
		30	22000	320	0.005	22000	290	0.005	22000	255	0.005
	1.0°	10	22000	500	0.05	22000	450	0.05	22000	400	0.05
		15	22000	450	0.04	22000	405	0.04	22000	360	0.04
		20	22000	430	0.02	22000	390	0.02	22000	345	0.02
		25	22000	400	0.015	22000	360	0.015	22000	320	0.015
		30	22000	360	0.01	22000	325	0.01	22000	290	0.01
		35	22000	320	0.005	22000	290	0.005	22000	255	0.005
Maximum cutting depth			 ≤0.1×PRFRAD(<R0.5) ≤0.2×PRFRAD(≥R0.5)								

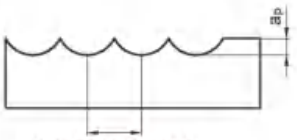
Cutting parameters for PML/PM series end mills

PM-2BC

Workpiece material			Pre-hardened steel, quenched and tempered steel ~40HRC			Pre-hardened steel, quenched and tempered steel ~50HRC			Hardened steel ~55HRC		
Bullnose radius (mm)	Taper half angle (°)	Effective length (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)
R0.50	1.5°	10	22000	530	0.05	22000	475	0.05	22000	425	0.05
		15	22000	500	0.04	22000	450	0.04	22000	400	0.04
		20	22000	460	0.02	22000	415	0.02	22000	370	0.02
	2°	15	22000	600	0.04	22000	540	0.04	22000	480	0.04
		20	22000	500	0.02	22000	450	0.02	22000	400	0.02
	3°	20	22000	550	0.03	22000	495	0.03	22000	440	0.03
	5°	20	22000	600	0.03	22000	540	0.03	22000	480	0.03
R0.60	0.5°	12	22000	500	0.05	22000	450	0.05	22000	400	0.05
		24	22000	400	0.02	22000	360	0.02	22000	320	0.02
	1.0°	12	22000	550	0.05	22000	495	0.05	22000	440	0.05
		24	22000	450	0.02	22000	405	0.02	22000	360	0.02
	1.5°	12	22000	600	0.05	22000	540	0.05	22000	480	0.05
		24	22000	550	0.02	22000	495	0.02	22000	440	0.02
R0.75	0.5°	10	20000	600	0.1	20000	540	0.1	20000	480	0.1
		15	20000	550	0.08	20000	495	0.08	20000	440	0.08
		30	20000	500	0.02	20000	450	0.02	20000	400	0.02
	1.0°	10	20000	650	0.1	20000	585	0.1	20000	520	0.1
		15	20000	600	0.08	20000	540	0.08	20000	480	0.08
		20	20000	550	0.05	20000	495	0.05	20000	440	0.05
		30	20000	530	0.02	20000	480	0.02	20000	425	0.02
	1.5°	10	20000	700	0.1	20000	630	0.1	20000	560	0.1
		15	20000	650	0.08	20000	585	0.08	20000	520	0.08
		30	20000	600	0.02	20000	540	0.02	20000	480	0.02
R1.0	0.5°	20	18000	800	0.05	18000	720	0.05	18000	640	0.05
		30	18000	650	0.03	18000	585	0.03	18000	520	0.03
		40	18000	500	0.02	18000	450	0.02	18000	400	0.02
	1.0°	20	18000	900	0.05	18000	810	0.05	18000	720	0.05
		25	18000	850	0.04	18000	765	0.04	18000	680	0.04
		30	18000	800	0.03	18000	720	0.03	18000	640	0.03
		35	18000	750	0.03	18000	675	0.03	18000	600	0.03
		40	18000	600	0.02	18000	540	0.02	18000	480	0.02
		50	18000	550	0.02	18000	495	0.02	18000	440	0.02
Maximum cutting depth											

Cutting parameters for PML/PM series end mills

PM-2BC

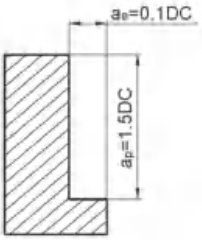
Workpiece material			Pre-hardened steel, quenched and tempered steel ~40HRC			Pre-hardened steel, quenched and tempered steel ~50HRC			Hardened steel ~55HRC		
Bullnose radius (mm)	Taper half angle (°)	Effective length (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)
R1.0	1.5°	20	18000	1000	0.05	18000	900	0.05	18000	800	0.05
		30	18000	900	0.03	18000	810	0.03	18000	720	0.03
		40	18000	750	0.03	18000	675	0.03	18000	600	0.03
	2°	30	18000	900	0.04	18000	810	0.04	18000	720	0.04
		40	18000	850	0.03	18000	765	0.03	18000	680	0.03
	3°	30	18000	1000	0.04	18000	900	0.04	18000	800	0.04
		40	18000	900	0.03	18000	810	0.03	18000	720	0.03
R1.5	0.5°	30	16000	1100	0.1	16000	990	0.1	16000	880	0.1
		40	16000	950	0.06	16000	855	0.06	16000	760	0.06
		50	16000	800	0.03	16000	720	0.03	16000	640	0.03
	1.0°	30	16000	1200	0.1	16000	1080	0.1	16000	960	0.1
		40	16000	1000	0.06	16000	900	0.06	16000	800	0.06
		50	16000	850	0.03	16000	765	0.03	16000	680	0.03
R1.5	1.5°	30	16000	1300	0.1	16000	1170	0.1	16000	1040	0.1
		40	16000	1100	0.06	16000	990	0.06	16000	880	0.06
		50	16000	950	0.03	16000	855	0.03	16000	760	0.03
R2.0	0.5°	60	14000	1100	0.1	14000	990	0.1	14000	880	0.1
	1.0°	60	14000	1100	0.1	14000	990	0.1	14000	880	0.1
Maximum cutting depth			 ≤0.1×PRFRAD(<R0.5) ≤0.2×PRFRAD(≥R0.5)								

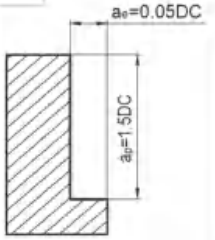
1. Please select high-precision machine and tool holder. When vibration and abnormal noise occur during machining, please reduce axial cutting depth ap.
2. Please use air blow or cutting liquid with high mist retardant property.
3. Reduce feed speed correspondingly when rotating speed is low.
4. Due to the differences of machines, allowance of machining and other working conditions, please adjust the parameters in above list according to your specific requirements.

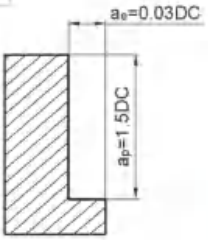
PML-2R★PM-2R

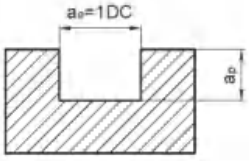
Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	20000	240	20000	75	20000	195	20000	145	20000	95
2	15000	385	11150	100	15000	335	13000	215	11140	130
3	14000	655	7500	145	10600	505	8500	395	7430	245
4	10800	675	5500	155	8000	515	6500	405	5570	245
5	8200	695	4500	155	6400	540	5000	425	4460	260
6	7000	720	3700	170	5300	555	4200	435	3710	260
8	5200	720	2800	170	4000	555	3200	440	2785	275
10	4200	695	2200	170	3200	535	2500	420	2230	255
12	3500	695	1850	170	2650	535	2100	420	1855	255

Maximum cutting depth









Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.15DC
Ø3≤DC<Ø6	0.3DC
Ø6≤DC<Ø20	0.5DC

Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.1DC
Ø3≤DC	0.2DC

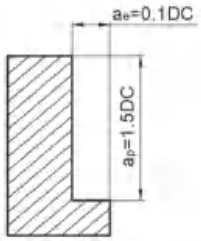
1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

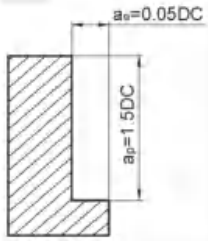
Cutting parameters for PML/PM series end mills

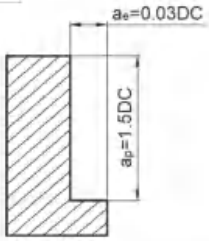
PML-4R★PML-4R-H★PM-4R★PM-4R-H★PML-4RFP PM-4RFP★PM-4RBL/M/X★PM-4RBL/M/X-H

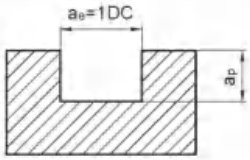
Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~40HRC		Pre-hardened steel, quenched and tempered steel ~50HRC		Hardened steel ~55HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
3	14000	985	7500	175	10600	755	8500	590	7430	435
4	10800	1010	5500	175	8000	770	6500	600	5570	445
5	8200	1055	4500	175	6400	805	5000	640	4460	470
6	7000	1080	3700	195	5300	830	4200	650	3710	470
8	5200	1070	2800	195	4000	815	3200	660	2785	485
10	4200	1055	2200	195	3200	805	2500	625	2230	450
12	3500	1055	1850	195	2650	805	2100	625	1855	450
16	2600	985	1400	175	2000	755	1600	590	1390	435

Maximum cutting depth









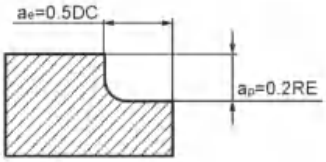
Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.15DC
Ø3≤DC<Ø6	0.3DC
Ø6≤DC<Ø20	0.5DC

Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.1DC
Ø3≤DC	0.2DC

1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

PM-4H★PM-4HL

Standard:

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Quenched and tempered steel ~40HRC		Quenched and tempered steel ~45HRC		Quenched and tempered steel ~50HRC		Quenched and tempered steel ~55HRC	
Diameter× Corner radius	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
3.0×R0.8	10500	6250	8500	4500	7450	3900	5300	2600	3200	995
4.0×R1.0	7950	6600	6350	4800	5550	4200	4000	2750	2400	1050
5.0×R1.2	6350	7000	5100	5100	4450	4450	3200	2850	1900	1150
6.0×R1.0 6.0×R1.5	5300	7000	4250	5100	3700	4450	2650	2850	1600	1150
8.0×R1.0 8.0×R2.0	4550	7000	3200	5100	2800	4450	2000	2850	1200	1150
10.0×R1.0 10.0×R2.0	3200	7000	2550	5100	2250	4450	1600	2850	955	1150
12.0×R2.0 12.0×R3.0	2650	7000	2100	5100	1850	4450	1350	2850	795	1150
Maximum cutting depth	Maximum a_p=0.5mm						Maximum a_p=0.4mm		Maximum a_p=0.2mm	
										

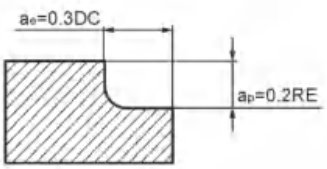
1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Down milling is recommended.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.
6.The above cutting parameters are based on contour machining when overhang L/D≤4. Please make adjustments according to the table below when overhang is different.

Different cutting parameters under different overhang of tool:

Overhang	Cutting speed(m/min)	Axial cutting depth (mm)	Feed speed (mm/min)
L/D≤4	100%	100%	100%
L/D=5	80%~90%	70%~90%	80%~90%
L/D=6	60%~80%	50%~70%	60%~80%

PM-4H★PM-4HL

High speed:

Workpiece material	Cast iron, Carbon steel, Alloy steel ~30HRC		Quenched and tempered steel ~40HRC		Quenched and tempered steel ~45HRC		Quenched and tempered steel ~50HRC		Quenched and tempered steel ~55HRC	
Diameter× Corner radius	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
3.0×R0.8	21000	12500	21000	12000	16000	8400	16000	7850	10500	3300
4.0×R1.0	16000	13000	16000	12000	12000	9000	12000	8200	7950	3550
5.0×R1.2	12500	14000	12500	12500	9550	9550	9550	8600	6350	3800
6.0×R1.0 6.0×R1.5	10600	14000	10600	12700	7950	9550	7950	8600	5300	3800
8.0×R1.0 8.0×R2.0	7950	14000	7950	12700	5950	9550	5950	8600	4000	3800
10.0×R1.0 10.0×R2.0	6350	14000	6350	12700	4750	9550	4750	8600	3200	3800
12.0×R2.0 12.0×R3.0	5300	14000	5300	12700	4000	9550	4000	8600	2650	3800
Maximum cutting depth	Maximum a_p=0.4mm						Maximum a_p=0.2mm		Maximum a_p=0.1mm	
										

1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Down milling is recommended.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.
6.The above cutting parameters are based on contour machining when overhang L/D≤4. Please make adjustments according to the table below when overhang is different.

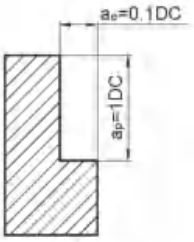
Different cutting parameters under different overhang of tool:

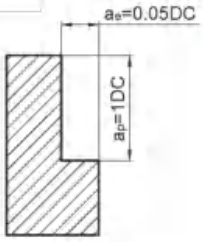
Ratio of neck length to diameter	Cutting speed(m/min)	Axial cutting depth(mm)	Feed speed (mm/min)
L/D≤4	100%	100%	100%
L/D=5	60%~80%	60%~80%	60%~80%
L/D=6	40%~60%	40%~60%	40%~60%

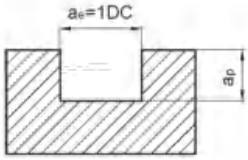
GM-2E★GM-2EL★GM-2EBL/X

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	20000	165	20000	165	20000	135	20000	135	20000	50	20000	100
2	15000	265	15000	265	15000	240	15000	235	11150	70	13000	150
3	14000	455	14000	455	13000	420	10600	350	7500	100	8500	275
4	10800	465	10800	465	10000	430	8000	355	5500	110	6500	280
5	8200	485	8200	485	7600	450	6400	370	4500	110	5000	295
6	7000	500	7000	500	6400	460	5300	385	3700	115	4200	300
8	5200	495	5200	495	4800	455	4000	380	2800	115	3200	305
10	4200	485	4200	485	3800	450	3200	370	2200	115	2500	290
12	3500	485	3500	485	3200	450	2650	370	1850	115	2100	290
14	3000	455	3000	455	2700	420	2300	350	1600	110	1800	275
16	2600	455	2600	455	2400	420	2000	350	1400	100	1600	275
18	2300	445	2300	445	2100	410	1800	345	1250	100	1400	270
20	2050	445	2050	445	1900	410	1600	345	1100	100	1250	270

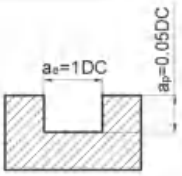
Maximum cutting depth







Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.15DC
Ø3≤DC	0.3DC



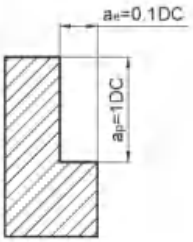
1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

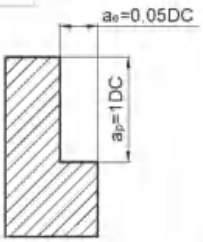
Cutting parameters for GM series end mills

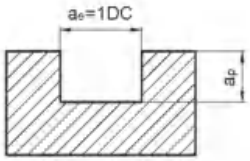
GM-2F★GM-2FL

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	20000	115	20000	115	20000	95	20000	95	20000	35	20000	70
2	15000	185	15000	185	15000	170	15000	165	11150	50	13000	105
3	14000	320	14000	320	13000	295	10600	245	7500	70	8500	190
4	10800	325	10800	325	10000	300	8000	250	5500	80	6500	195
5	8200	340	8200	340	7600	315	6400	260	4500	80	5000	205
6	7000	350	7000	350	6400	320	5300	270	3700	80	4200	210
8	5200	345	5200	345	4800	320	4000	265	2800	80	3200	210
10	4200	340	4200	340	3800	315	3200	260	2200	80	2500	200
12	3500	340	3500	340	3200	315	2650	260	1850	80	2100	200
14	3000	320	3000	320	2700	295	2300	245	1600	80	1800	190
16	2600	320	2600	320	2400	295	2000	245	1400	70	1600	190
18	2300	310	2300	310	2100	290	1800	240	1250	70	1400	190
20	2050	310	2050	310	1900	290	1600	240	1100	70	1250	190

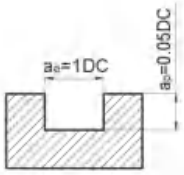
Maximum cutting depth





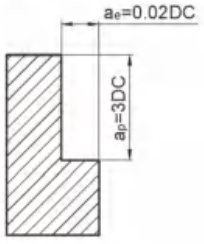


Diameter range	Cutting depth ap
Ø1≤DC<Ø3	0.15DC
Ø3≤DC	0.3DC



1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

GM-2EX

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	5800	375	5800	375	5300	345	4250	275	2650	60	3600	230
8	4400	375	4400	375	4000	345	3180	275	2000	60	2700	235
10	3500	365	3500	365	3200	330	2550	265	1600	60	2150	220
12	2900	365	2900	365	2650	330	2120	265	1350	60	1800	220
16	2200	345	2200	345	2000	315	1590	250	1000	50	1350	210
20	1750	340	1750	340	1600	310	1270	245	800	45	1050	205
Maximum cutting depth												

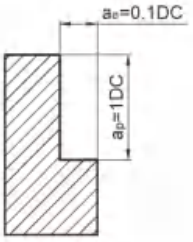
1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Down milling is recommended in the case of side milling.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.

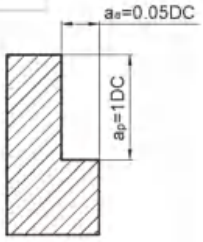
Cutting parameters for GM series end mills

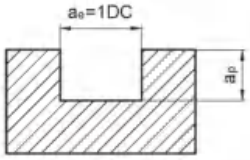
GM-2EFP

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	7000	650	7000	650	6400	600	5300	500	3700	150	4200	390
8	5200	645	5200	645	4800	590	4000	495	2800	150	3200	395
10	4200	630	4200	630	3800	585	3200	480	2200	150	2500	380
12	3500	630	3500	630	3200	585	2650	480	1850	150	2100	380
16	2600	590	2600	590	2400	545	2000	455	1400	130	1600	355
20	2050	580	2050	580	1900	530	1600	450	1100	130	1250	350

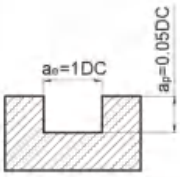
Maximum cutting depth







Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.15DC
Ø3≤DC	0.3DC

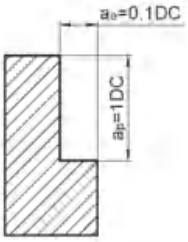


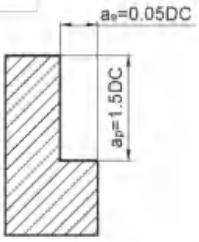
1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

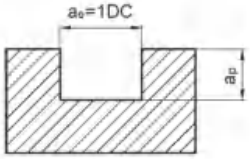
GM-3E★GM-3EL

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	20000	215	20000	215	20000	175	20000	175	20000	65	20000	130
2	15000	345	15000	345	15000	310	15000	305	11150	90	13000	195
3	14000	590	14000	590	13000	546	10600	455	7500	130	8500	360
4	10800	600	10800	605	10000	560	8000	460	5500	145	6500	365
5	8200	630	8200	630	7600	585	6400	480	4500	145	5000	380
6	7000	650	7000	650	6400	600	5300	500	3700	150	4200	390
8	5200	645	5200	645	4800	590	4000	495	2800	150	3200	400
10	4200	630	4200	630	3800	585	3200	480	2200	150	2500	380
12	3500	630	3500	630	3200	585	2650	480	1850	150	2100	380
14	3000	590	3000	590	2700	545	2300	455	1600	145	1800	360
16	2600	590	2600	590	2400	545	2000	455	1400	130	1600	360
18	2300	580	2300	580	2100	530	1800	450	1250	130	1400	350
20	2050	580	2050	580	1900	530	1600	450	1100	130	1250	350

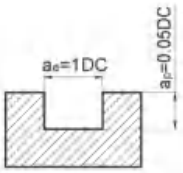
Maximum cutting depth







Diameter range	Cutting depth ap
Ø1≤DC<Ø3	0.15DC
Ø3≤DC	0.3DC



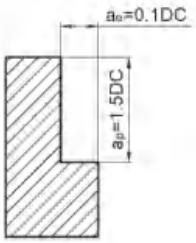
1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

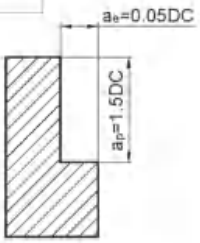
Cutting parameters for GM series end mills

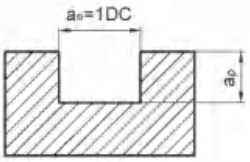
GM-4E-G★GM-4EL-G★GM-4EBL/X-G

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	20000	225	20000	225	20000	180	20000	180	20000	80	20000	135
2	15000	360	15000	360	15000	325	15000	315	11150	90	13000	200
3	14000	610	14000	610	13000	570	10600	470	7500	110	8500	370
4	10800	630	10800	630	10000	575	8000	480	5500	115	6500	380
5	8200	660	8200	660	7600	600	6400	505	4500	115	5000	400
6	7000	675	7000	675	6400	620	5300	515	3700	120	4200	405
8	5200	665	5200	665	4800	610	4000	510	2800	120	3200	415
10	4200	660	4200	660	3800	600	3200	505	2200	120	2500	390
12	3500	660	3500	660	3200	600	2650	505	1850	120	2100	390
14	3000	610	3000	610	2700	570	2300	470	1600	115	1800	370
16	2600	610	2600	610	2400	570	2000	470	1400	110	1600	370
18	2300	600	2300	600	2100	560	1800	460	1250	95	1400	365
20	2050	600	2050	600	1900	560	1600	460	1100	95	1250	365

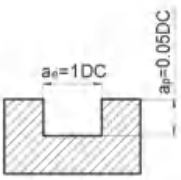
Maximum cutting depth







Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.15DC
Ø3≤DC	0.3DC



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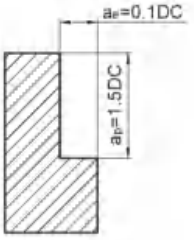
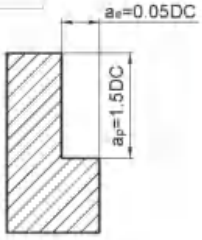
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

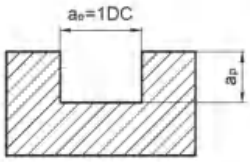
GM-4F-G★GM-4FL-G

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	20000	160	20000	160	20000	125	20000	125	20000	55	20000	95
2	15000	250	15000	250	15000	230	15000	220	11150	65	13000	140
3	14000	430	14000	430	13000	400	10600	330	7500	80	8500	260
4	10800	440	10800	440	10000	400	8000	335	5500	80	6500	265
5	8200	460	8200	460	7600	420	6400	355	4500	80	5000	280
6	7000	470	7000	470	6400	435	5300	360	3700	85	4200	285
8	5200	465	5200	465	4800	430	4000	360	2800	85	3200	290
10	4200	460	4200	460	3800	420	3200	355	2200	85	2500	275
12	3500	460	3500	460	3200	420	2650	355	1850	80	2100	275
14	3000	430	3000	430	2700	400	2300	330	1600	80	1800	260
16	2600	430	2600	430	2400	400	2000	330	1400	80	1600	260
18	2300	420	2300	420	2100	390	1800	325	1250	70	1400	255
20	2050	420	2050	420	1900	390	1600	325	1100	70	1250	255

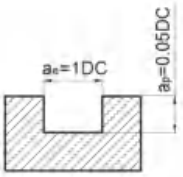
Maximum cutting depth







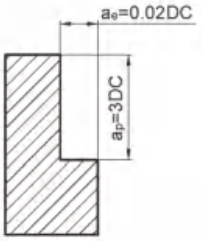
Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.15DC
Ø3≤DC	0.3DC



1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

Cutting parameters for GM series end mills

GM-4EX-G

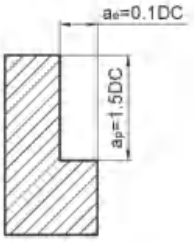
Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	5800	475	5800	475	5300	430	4250	340	2650	70	3600	290
8	4400	475	4400	475	4000	430	3180	340	2000	70	2700	290
10	3500	460	3500	460	3200	420	2550	330	1600	70	2150	280
12	2900	460	2900	460	2650	420	2120	330	1350	70	1800	280
16	2200	430	2200	430	2000	390	1590	315	1000	65	1350	260
20	1750	430	1750	430	1600	385	1270	310	800	60	1050	255
Maximum cutting depth												

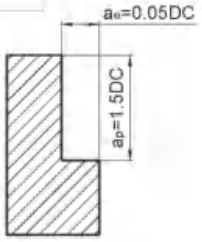
1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Down milling is recommended in the case of side milling.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.

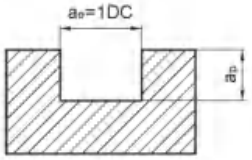
GM-4E★GM-4EL★GM-4EBL/X

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	20000	250	20000	250	20000	200	20000	200	20000	90	20000	150
2	15000	400	15000	400	15000	360	15000	350	11150	100	13000	225
3	14000	680	14000	680	13000	630	10600	525	7500	120	8500	410
4	10800	700	10800	700	10000	640	8000	535	5500	125	6500	420
5	8200	730	8200	730	7600	670	6400	560	4500	125	5000	440
6	7000	750	7000	750	6400	690	5300	575	3700	135	4200	450
8	5200	740	5200	740	4800	680	4000	565	2800	135	3200	460
10	4200	730	4200	730	3800	670	3200	560	2200	135	2500	435
12	3500	730	3500	730	3200	670	2650	560	1850	135	2100	435
14	3000	680	3000	680	2700	630	2300	525	1600	125	1800	410
16	2600	680	2600	680	2400	630	2000	525	1400	120	1600	410
18	2300	670	2300	670	2100	620	1800	515	1250	105	1400	405
20	2050	670	2050	670	1900	620	1600	515	1100	105	1250	405

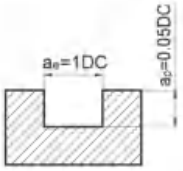
Maximum cutting depth







Diameter range	Cutting depth a_p
Ø1≤DC<Ø3	0.15DC
Ø3≤DC	0.3DC



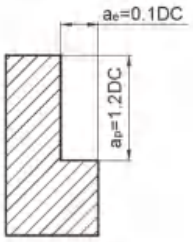
1.The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2.Please select high-precision machine and tool holder.
3.Please use air blow or cutting liquid with high mist retardant property.
4.Down milling is recommended in the case of side milling.
5.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6.Make overhang of tool as short as possible in conditions of non-interference.

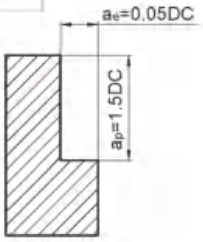
Cutting parameters for GM series end mills

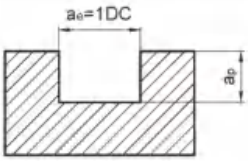
GM-4EFP

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	7000	975	7000	975	6400	900	5300	750	3700	175	4200	585
8	5200	960	5200	960	4800	995	4000	735	2800	175	3200	600
10	4200	950	4200	950	3800	970	3200	730	2200	175	2500	565
12	3500	950	3500	950	3200	970	2650	730	1850	175	2100	565
16	2600	885	2600	885	2400	820	2000	680	1400	155	1600	535
20	2050	870	2050	870	1900	805	1600	670	1100	135	1250	525

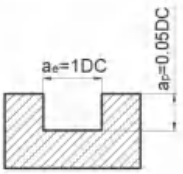
Maximum cutting depth





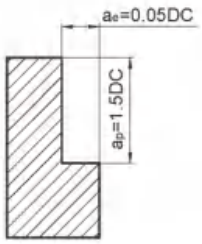


Diameter range	Cutting depth ap
Ø1≤DC<Ø3	0.15DC
Ø3≤DC	0.3DC



1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

GM-6E

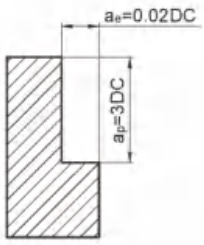
Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	7000	890	7000	890	6400	820	5300	680	3700	160	4200	540
8	5200	890	5200	890	4800	820	4000	680	2800	160	3200	550
10	4200	860	4200	860	3800	800	3200	665	2200	160	2500	520
12	3500	860	3500	860	3200	800	2650	665	1850	160	2100	520
14	3000	810	3000	810	2700	750	2300	625	1600	150	1800	490
16	2600	810	2600	810	2400	750	2000	625	1400	150	1600	490
18	2300	800	2300	800	2100	740	1800	615	1250	125	1400	485
20	2050	800	2050	800	1900	740	1600	615	1100	125	1250	485
Maximum cutting depth												

1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Down milling is recommended in the case of side milling.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.



Cutting parameters for GM series end mills

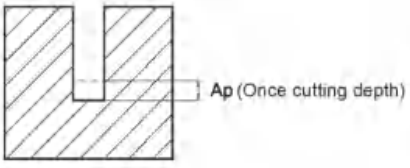
GM-6EL

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	5800	750	5800	750	5300	685	4250	545	2650	115	3600	460
8	4400	750	4400	750	4000	685	3180	545	2000	115	2700	465
10	3500	730	3500	730	3200	665	2550	530	1600	115	2150	440
12	2900	730	2900	730	2650	665	2120	530	1350	115	1800	440
14	2500	685	2500	685	2300	625	1820	500	1150	105	1550	415
16	2200	685	2200	685	2000	625	1590	500	1000	105	1350	415
18	1950	675	1950	675	1800	615	1420	490	900	90	1200	410
20	1750	675	1750	675	1600	615	1270	490	800	90	1050	410
Maximum cutting depth												

1. Please select high-precision machine and tool holder.
2. Please use air blow or cutting liquid with high mist retardant property.
3. Down milling is recommended in the case of side milling.
4. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5. Make overhang of tool as short as possible in conditions of non-interference.

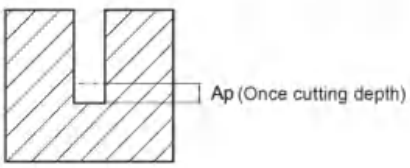
Cutting parameters for GM series end mills

GM-2EP

Workpiece material		Cast iron, Carbon steel, Alloy steel ~750N/mm²			Carbon steel, Alloy steel ~30HRC			Pre-hardened steel, quenched and tempered steel ~40HRC			Stainless steel		
Diameter (mm)	Effective length (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)
0.5	4	28000	500	0.023	28000	400	0.021	28000	250	0.018	25000	200	0.014
	6	22000	400	0.007	22000	350	0.06	22000	150	0.005	20000	150	0.004
	8	18000	300	0.005	18000	300	0.005	18000	150	0.004	20000	150	0.003
0.8	4	32000	900	0.057	32000	600	0.053	32000	600	0.044	25000	400	0.035
	6	26000	700	0.036	26000	450	0.034	26000	400	0.028	21000	300	0.022
	8	22000	500	0.026	22000	350	0.024	22000	300	0.02	18000	200	0.016
	10	22000	500	0.01	22000	350	0.01	22000	300	0.008	18000	200	0.006
1.0	4	2900	1300	0.08	27000	1000	0.08	26000	900	0.07	20000	600	0.05
	6	29000	1300	0.07	27000	1000	0.07	26000	900	0.06	20000	600	0.04
	8	24000	900	0.05	23000	800	0.04	22000	700	0.04	18000	400	0.03
	10	20000	700	0.03	19000	600	0.03	18000	500	0.03	15000	300	0.02
	12	20000	700	0.02	19000	600	0.02	18000	500	0.02	15000	300	0.01
	14	18000	500	0.015	15000	400	0.01	15000	360	0.01	12000	200	0.008
1.2	6	25000	1100	0.09	23000	1000	0.08	22000	900	0.07	17000	600	0.05
	8	21000	900	0.07	20000	700	0.07	19000	700	0.05	14000	400	0.04
	10	21000	900	0.06	20000	700	0.05	19000	700	0.04	14000	400	0.03
	12	18000	700	0.04	17000	600	0.04	16000	500	0.03	11000	300	0.02
1.5	6	20000	1200	0.15	18000	1000	0.14	18000	900	0.11	14000	600	0.09
	8	19000	900	0.11	16000	800	0.1	15000	700	0.08	12000	400	0.07
	10	19000	900	0.09	16000	800	0.08	15000	700	0.06	12000	400	0.05
	12	19000	900	0.07	16000	800	0.06	15000	700	0.05	12000	400	0.04
	14	19000	700	0.06	16000	650	0.05	15000	630	0.04	12000	360	0.03
2.0	6	16000	1300	0.34	15000	1100	0.31	14000	1000	0.26	11000	700	0.21
	8	16000	1300	0.29	15000	1100	0.26	14000	1000	0.22	11000	700	0.18
	10	14000	900	0.26	1300	800	0.24	12000	700	0.20	9000	500	0.16
	12	14000	900	0.14	13000	800	0.13	12000	700	0.11	9000	500	0.09
	14	14000	900	0.10	13000	800	0.11	12000	700	0.09	9000	500	0.07
	16	14000	900	0.08	13000	800	0.08	12000	700	0.07	9000	500	0.06
Maximum cutting depth		 Ap (Once cutting depth)											

Cutting parameters for GM series end mills

GM-2EP

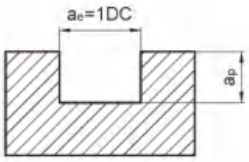
Workpiece material		Cast iron, Carbon steel, Alloy steel ~750N/mm²			Carbon steel, Alloy steel ~30HRC			Pre-hardened steel, quenched and tempered steel ~40HRC			Stainless steel		
Diameter (mm)	Effective length (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)
2.5	8	13000	1300	0.42	12000	1100	0.39	11000	1000	0.33	9000	700	0.26
	10	13000	1300	0.36	12000	1100	0.33	11000	1000	0.28	9000	700	0.22
	12	13000	1300	0.24	12000	1100	0.23	11000	1000	0.19	9000	700	0.15
	14	12000	900	0.18	10000	800	0.17	9000	700	0.14	7000	500	0.11
	16	12000	900	0.13	10000	800	0.12	9000	700	0.09	7000	500	0.08
	18	12000	800	0.11	10000	720	0.10	9000	630	0.07	7000	450	0.07
	20	12000	800	0.09	10000	720	0.08	9000	630	0.05	7000	450	0.05
3.0	6	11000	1300	0.42	10000	1100	0.39	10000	1000	0.32	8000	700	0.27
	8	11000	1300	0.39	10000	1100	0.36	10000	1000	0.30	8000	700	0.24
	10	11000	1300	0.31	10000	1100	0.29	10000	1000	0.24	8000	700	0.19
	12	11000	1100	0.29	10000	1000	0.27	10000	900	0.22	8000	650	0.16
	14	11000	1100	0.27	10000	1000	0.25	10000	900	0.20	8000	650	0.15
	16	10000	850	0.22	10000	750	0.20	9000	650	0.17	6000	450	0.13
	18	10000	850	0.16	10000	750	0.14	9000	650	0.12	6000	450	0.10
	20	10000	850	0.12	10000	750	0.10	9000	650	0.08	6000	450	0.07
4.0	12	8000	1300	0.42	7000	1100	0.38	7000	1000	0.32	6000	700	0.26
	16	8000	1100	0.39	7000	1000	0.35	7000	900	0.30	6000	650	0.24
	20	7000	900	0.34	7000	800	0.30	6000	700	0.27	5000	500	0.20
	25	7000	900	0.30	7000	800	0.27	6000	700	0.24	5000	500	0.15
5.0	16	6000	1200	0.49	6000	1000	0.45	5000	1000	0.38	5000	600	0.30
	25	5000	800	0.45	5000	720	0.42	5000	700	0.35	5000	600	0.25
Maximum cutting depth													

1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Make overhang of tool as short as possible in conditions of non-interference.
4.Reduce feed speed correspondingly when rotating speed is low.

GM-2ES

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
0.3	32000	115	32000	115	32000	115	32000	80	32000	40
0.4	32000	125	32000	125	32000	125	32000	90	27500	50
0.5	32000	125	32000	125	29500	125	25000	90	22000	50
0.6	32000	125	32000	125	24500	125	21000	90	18500	50
0.7	32000	125	32000	125	24500	125	21000	90	18500	50
0.8	24500	125	24500	125	18500	125	15500	90	13500	50
0.9	24500	125	24500	125	18500	125	15500	90	13500	50
1.0	21000	140	25000	165	16800	130	14500	90	10000	50
1.5	13000	140	15000	165	11800	130	10000	90	7000	50
2.0	13000	160	15000	185	11800	145	10000	100	7000	60
2.5	8700	200	10000	240	8200	185	6600	100	4700	60
3.0	8700	235	10000	270	8200	220	6600	100	4700	75

Maximum cutting depth

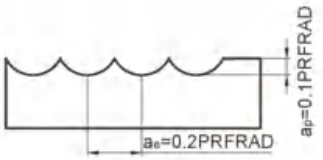
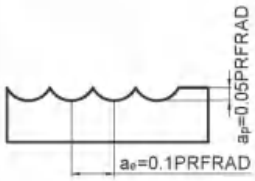


Diameter range	Cutting depth a_p
DC<Ø1	0.05DC
Ø1≤DC≤Ø3	0.15DC

1. Please select high-precision machine and tool holder.
2. Please use air blow or cutting liquid with high mist retardant property.
3. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
4. Make overhang of tool as short as possible in conditions of non-interference.

Cutting parameters for GM series end mills

GM-2B★GM-2BL/M/X★GM-2BFP

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Bullnose radius (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
R0.5	40000	800	40000	800	38000	700	32000	320	22300	200	25000	275
R1.0	24000	900	24000	900	19000	760	16000	400	11150	230	13000	275
R1.5	15500	950	15500	950	12750	760	10600	450	7400	290	8500	280
R2.0	11500	950	11500	950	9550	760	8000	550	5550	370	6500	370
R2.5	9500	1050	9500	1050	7650	800	6400	550	4450	370	5000	375
R3.0	8000	1050	8000	1050	6400	800	5300	580	3700	390	4200	390
R4.0	6000	1300	6000	1300	4800	950	4000	700	2750	455	3200	440
R5.0	4800	1200	4800	1200	3800	900	3200	650	2200	430	2500	440
R6.0	4000	1100	4000	1100	3200	840	2650	610	1850	430	2100	420
R8.0	3000	1050	3000	1050	2400	800	2000	600	1350	380	1600	375
R10.0	2400	950	2400	950	1900	680	1600	560	1100	370	1250	330
Maximum cutting depth												

1.Please select high-precision machine and tool holder.

2.Please use air blow or cutting liquid with high mist retardant property.

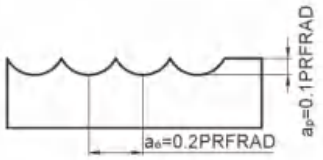
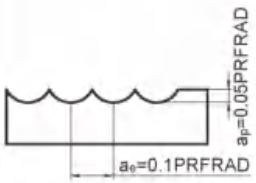
3.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.

4.Make overhang of tool as short as possible in conditions of non-interference.



Cutting parameters for GM series end mills

GM-4B★GM-4BL/M/X

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Cutting speed	150 m/min		150m/min		120m/min		100m/min		70m/min		80m/min	
Bullnose radius (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
R1.5	15500	1710	15500	1710	12750	1340	10600	810	7400	520	8500	500
R2.0	11500	1710	11500	1710	9550	1340	8000	990	5550	660	6500	665
R2.5	9500	1890	9500	1890	7650	1440	6400	990	4450	660	5000	675
R3.0	8000	1890	8000	1890	6400	1440	5300	1040	3700	700	4200	700
R4.0	6000	2340	6000	2340	4800	1710	4000	1260	2750	820	3200	790
R5.0	4800	2160	4800	2160	3800	1620	3200	1170	2200	770	2500	790
R6.0	4000	1980	4000	1980	3200	1510	2650	1100	1850	770	2100	755
R8.0	3000	1890	3000	1890	2400	1440	2000	1080	1350	680	1600	675
R10.0	2400	1710	2400	1710	1900	1220	1600	1000	1100	660	1250	595
Maximum cutting depth												

1.Please select high-precision machine and tool holder.

2.Please use air blow or cutting liquid with high mist retardant property.

3.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.

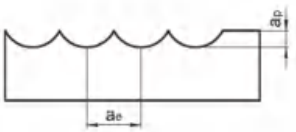
4.Make overhang of tool as short as possible in conditions of non-interference.

Cutting parameters for GM series end mills

GM-2BS

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel	
Bullnose radius (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
R0.15	32000	300	32000	300	32000	270	32000	250	32000	150
R0.2	32000	380	32000	380	32000	320	32000	300	32000	175
R0.25	32000	460	32000	460	32000	410	32000	330	32000	205
R0.3	32000	535	32000	535	32000	500	32000	420	32000	265
R0.35	32000	550	32000	550	32000	520	32000	440	32000	270
R0.4	32000	610	32000	610	32000	560	32000	460	27500	285
R0.45	32000	700	32000	700	32000	600	25000	400	27500	285
R0.5	32000	765	32000	765	32000	640	25000	400	22000	285
R1.0	24000	900	24000	900	19000	760	16000	400	11150	230
R1.5	15500	950	15500	950	12750	760	10600	450	7400	290

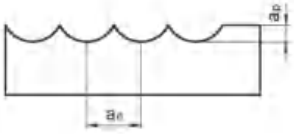
Maximum cutting depth



Diameter range	Cutting depth a_p	Cutting width a_e
DC<Ø1	0.05PRFRAD	0.2PRFRAD
Ø1≤DC≤Ø3	0.1PRFRAD	0.2PRFRAD

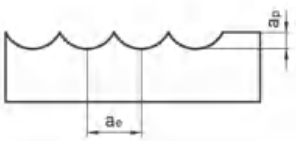
1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Make overhang of tool as short as possible in conditions of non-interference.
4.Reduce feed speed correspondingly when rotating speed is low.

GM-2BP

Workpiece material		Cast iron, Carbon steel Alloy steel ~750N/mm²				Carbon steel, Alloy steel ~30HRC				Pre-hardened steel, quenched and tempered steel ~40HRC				Stainless steel			
Bullnose radius (mm)	Effective length (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)
R0.25	4	27000	400	0.02	0.025	27000	380	0.02	0.025	27000	300	0.02	0.025	27000	200	0.02	0.025
	6	21000	200	0.01	0.015	21000	180	0.01	0.015	21000	160	0.01	0.015	21000	150	0.01	0.015
R0.3	4	27000	400	0.03	0.12	27000	380	0.03	0.12	25000	250	0.03	012	24000	200	0.03	0.12
	6	25000	300	0.03	0.12	25000	280	0.03	0.12	20000	150	0.03	0.12	20000	140	0.03	0.12
	8	25000	240	0.03	0.12	25000	225	0.03	0.12	20000	120	0.03	0.12	20000	110	0.03	0.12
R0.4	4	27000	600	0.04	0.16	27000	550	0.04	0.16	23000	450	0.04	0.16	21000	300	0.04	0.16
	6	24000	400	0.04	0.12	24000	360	0.04	0.12	21000	250	0.04	0.12	19000	200	0.04	0.12
	8	22000	300	0.04	0.12	22000	270	0.04	0.12	19000	150	0.04	0.12	19000	140	0.04	0.12
	10	22000	270	0.03	0.09	22000	250	0.03	0.09	19000	135	0.03	0.09	19000	120	0.03	0.09
R0.5	4	28000	600	0.05	0.20	28000	550	0.05	0.20	25000	500	0.05	0.20	21000	300	0.05	0.20
	6	21000	400	0.05	0.20	21000	360	0.05	0.20	19000	300	0.05	0.20	16000	200	0.05	0.2
	8	21000	360	0.05	0.15	21000	320	0.05	0.15	19000	270	0.05	0.15	16000	180	0.05	0.15
	10	18000	300	0.03	0.10	18000	270	0.03	0.10	17000	200	0.03	0.10	14000	150	0.03	0.10
	12	18000	270	0.03	0.10	18000	250	0.03	0.10	17000	180	0.03	0.10	14000	135	0.03	0.10
R0.6	6	20000	600	0.06	0.24	20000	540	0.06	0.24	17000	300	0.06	0.24	14000	200	0.06	0.24
	8	20000	540	0.06	0.24	20000	500	0.06	0.24	17000	270	0.06	0.24	14000	170	0.06	0.24
	12	16000	300	0.06	0.18	16000	270	0.06	0.18	14000	200	0.06	0.18	11000	150	0.06	0.18
	16	16000	270	0.03	0.12	16000	230	0.03	0.12	14000	175	0.03	0.12	11000	135	0.03	0.12
R0.75	8	17000	600	0.08	0.30	17000	540	0.08	0.30	15000	300	0.08	0.30	12000	250	0.08	0.30
	12	17000	540	0.06	0.24	17000	500	0.06	0.24	15000	275	0.06	0.24	12000	225	0.06	0.24
	16	13000	300	0.04	0.16	13000	275	0.04	0.16	12000	200	0.04	0.16	9500	150	0.04	0.16
R1.0	6	16500	800	0.10	0.40	16500	750	0.10	0.40	16500	560	0.10	0.40	13500	450	0.10	0.40
	8	16500	800	0.10	0.32	16500	750	0.10	0.32	16500	560	0.10	0.32	13500	450	0.10	0.32
	10	14000	630	0.08	0.30	14000	600	0.08	0.30	13000	450	0.08	0.30	10000	270	0.08	0.30
	12	14000	630	0.06	0.30	14000	600	0.06	0.30	13000	450	0.06	0.30	10000	270	0.06	0.30
	16	14000	550	0.06	0.24	14000	530	0.06	0.24	13000	400	0.06	0.24	10000	270	0.06	0.24
	20	11000	360	0.06	0.16	11000	330	0.06	0.16	10000	225	0.06	0.16	8000	175	0.06	0.16
Maximum cutting depth																	

Cutting parameters for GM series end mills

GM-2BP

Workpiece material		Cast iron, Carbon steel, Alloy steel ~750N/mm²				Carbon steel, Alloy steel ~30HRC				Pre-hardened steel, quenched and tempered steel ~40HRC				Stainless steel			
Bullnose radius (mm)	Effective length (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)
R1.25	8	14000	800	0.10	0.32	14000	750	0.10	0.32	14000	560	0.10	0.32	12500	450	0.10	0.32
	12	13000	630	0.06	0.30	13000	600	0.06	0.30	12000	450	0.06	0.30	10000	270	0.06	0.30
	16	13000	550	0.06	0.24	13000	530	0.06	0.24	12000	400	0.06	0.24	10000	270	0.06	0.24
	20	10000	360	0.06	0.16	10000	330	0.06	0.16	8000	225	0.06	0.16	7000	175	0.06	0.16
R1.5	10	12000	800	0.15	0.40	12000	720	0.15	0.40	9500	600	0.15	0.40	7500	400	0.15	0.40
	12	12000	720	0.15	0.40	12000	650	0.15	0.40	9500	540	0.15	0.40	7500	360	0.15	0.40
	16	10000	600	0.15	0.40	10000	540	0.15	0.40	8500	300	0.15	0.40	6500	250	0.15	0.40
	20	10000	600	0.10	0.32	10000	540	0.10	0.32	8500	300	0.10	0.32	6500	250	0.10	0.32
R2.0	10	9000	800	0.20	0.80	9000	720	0.20	0.80	7500	600	0.20	0.80	6000	400	0.20	0.80
	16	9000	800	0.20	0.60	9000	720	0.20	0.60	7500	600	0.20	0.60	6000	400	0.20	0.60
	20	7000	600	0.20	0.40	7000	540	0.20	0.40	6000	400	0.20	0.40	5000	250	0.20	0.40
	25	7000	600	0.15	0.40	7000	540	0.15	0.40	6000	400	0.15	0.40	5000	250	0.15	0.40
R2.5	16	7000	600	0.25	1.00	7000	540	0.25	0.10	6500	500	0.25	1.0	5000	400	0.25	1.00
	25	6000	500	0.25	1.00	6000	450	0.25	1.00	5000	500	0.25	1.00	4000	250	0.25	1.00
Maximum cutting depth																	

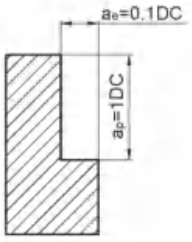
1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Make overhang of tool as short as possible in conditions of non-interference.
4.Reduce feed speed correspondingly when rotating speed is low.

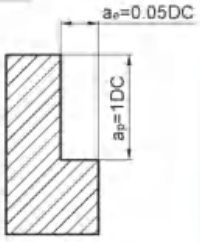


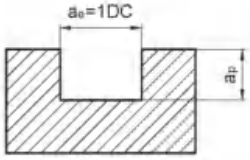
GM-2R

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	20000	200	20000	200	20000	160	20000	160	20000	60	20000	120
2	15000	320	15000	320	15000	290	15000	280	11150	84	13000	180
3	14000	545	14000	545	13000	510	10600	420	7500	120	8500	330
4	10800	560	10800	560	10000	520	8000	430	5500	130	6500	335
5	8200	580	8200	580	7600	540	6400	450	4500	130	5000	355
6	7000	600	7000	600	6400	550	5300	460	3700	140	4200	360
8	5200	600	5200	600	4800	550	4000	460	2800	140	3200	365
10	4200	580	4200	580	3800	540	3200	445	2200	140	2500	350
12	3500	580	3500	580	3200	540	2650	445	1850	140	2100	350

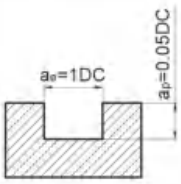
Maximum cutting depth







Diameter range	Cutting depth ap
Ø1≤DC<Ø3	0.15DC
Ø3≤DC	0.3DC



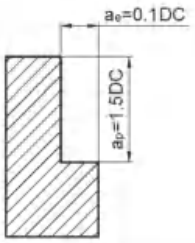
1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

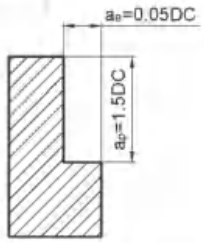
Cutting parameters for GM series end mills

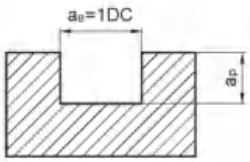
GM-4R★GM-4RL/M/X

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel		Pre-hardened steel, quenched and tempered steel ~50HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
3	14000	820	14000	820	13000	755	10600	630	7500	145	8500	490
4	10800	840	10800	840	10000	770	8000	640	5500	145	6500	500
5	8200	880	8200	880	7600	810	6400	670	4500	145	5000	530
6	7000	900	7000	900	6400	830	5300	690	3700	160	4200	540
8	5200	890	5200	890	4800	815	4000	680	2800	160	3200	550
10	4200	880	4200	880	3800	810	3200	670	2200	160	2500	520
12	3500	880	3500	880	3200	810	2650	670	1850	160	2100	520
16	2600	680	2600	680	2400	630	2000	525	1400	120	1600	490

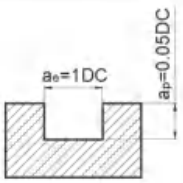
Maximum cutting depth





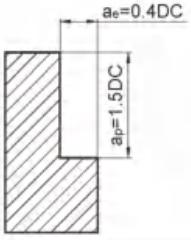
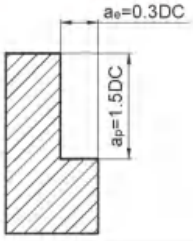


Diameter range	Cutting depth ap
Ø1≤DC<Ø3	0.15DC
Ø3≤DC	0.3DC



1. The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in the case of side milling.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

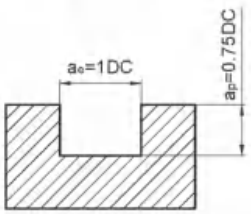
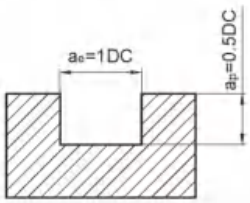
GM-4W—side cutting

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	6350	760	5300	640	4500	360	3450	280	2650	210
7	5460	760	4550	640	3650	360	3000	280	2250	310
8	4750	760	4000	640	3400	410	2650	310	2000	240
9	4250	760	3540	640	2850	410	2300	310	1750	240
10	3800	760	3200	640	2700	430	2050	330	1600	260
11	3470	760	2900	640	2400	430	1850	330	1450	260
12	3200	770	2250	650	1950	470	1500	360	1150	280
16	2400	770	2000	640	1700	480	1300	360	1000	280
20	1900	760	1600	610	1350	470	1050	350	800	260
Maximum cutting depth										

1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Down milling is recommended in the case of side milling.
4.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
5.Make overhang of tool as short as possible in conditions of non-interference.

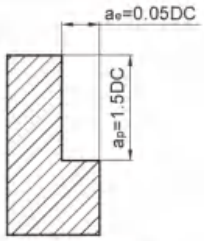
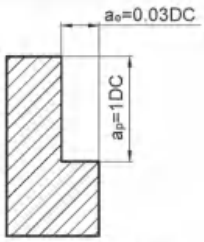
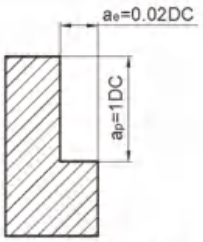
Cutting parameters for GM series end mills

GM-4W — slot cutting

Workpiece material	Cast iron, Nodular cast iron		Carbon steel, Alloy steel ~750N/mm²		Carbon steel, Alloy steel ~30HRC		Pre-hardened steel, quenched and tempered steel ~40HRC		Stainless steel	
Cutting speed	80~120 m/min		70~100m/min		60~90m/min		40~70m/min		30~60m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	5300	640	4500	540	3700	300	2900	230	2400	190
7	4500	630	3800	540	3200	300	2500	230	2050	190
8	4000	640	3400	540	2800	340	2200	260	1800	220
9	3500	630	3000	540	2450	340	1950	260	1600	220
10	3200	640	2700	540	2250	360	1750	280	1450	230
11	3000	630	2450	540	2050	360	1600	280	1300	230
12	2650	640	2250	540	1850	370	1450	290	1200	240
16	2000	640	1700	540	1400	390	1100	310	900	250
20	1600	640	1350	510	1100	390	900	300	700	230
Maximum cutting depth	 Maximum a_p=12mm									

1. Please select high-precision machine and tool holder.
2. Please use air blow or cutting liquid with high mist retardant property.
3. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
4. Make overhang of tool as short as possible in conditions of non-interference.

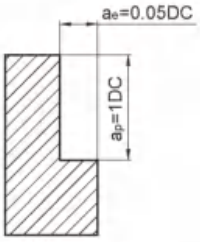
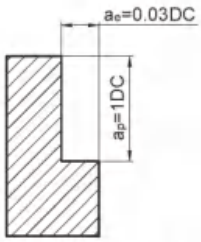
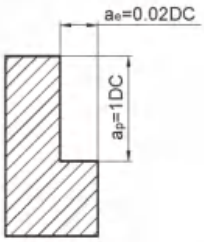
HMX-2E★HMX-2EBL/X

Workpiece material	Pre-hardened steel, Hardened steel 40~50HRC		Hardened steel 50~60HRC		Hardened steel 60~68HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	40000	160	40000	160	32000	130
2	40000	400	24000	240	16000	160
3	32000	510	16000	255	11000	175
4	24000	625	12000	310	8000	210
5	19000	685	9500	340	6400	230
6	16000	770	8000	385	5300	255
8	12000	770	6000	385	4000	255
10	9600	770	4800	385	3200	255
12	8000	800	4000	400	2700	270
14	6800	680	3400	340	2300	230
16	6000	600	3000	300	2000	200
18	5300	530	2700	270	1800	180
20	4800	480	2400	240	1600	160
Maximum cutting depth	 Maximum a_e=1.0mm		 Maximum a_e=0.5mm		 Maximum a_e=0.3mm	

1.Please select high-precision and rigidity machine and tool holder.
2.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
3.Please use air blow or MQL(minimum oil mist cooling).
4.Down milling is recommended in the case of side milling.
5.Make overhang of tool as short as possible in conditions of non-interference.

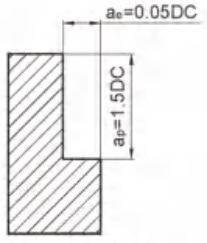
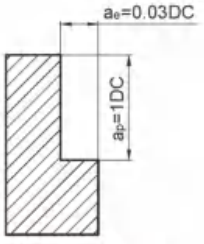
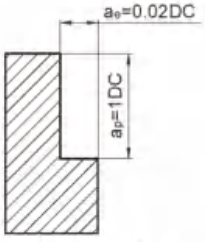
Cutting parameters for HMX series end mills

HMX-2EFP

Workpiece material	Pre-hardened steel, Hardened steel 40~50HRC		Hardened steel 50~60HRC		Hardened steel 60~68HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	16000	1155	8000	460	5300	305
8	12000	1155	6000	460	4000	305
10	9600	1155	4800	460	3200	305
12	8000	1200	4000	480	2700	325
16	6000	900	3000	360	2000	240
20	4800	720	2400	285	1600	195
Maximum cutting depth	 Maximum a_e=1.0mm		 Maximum a_e=0.5mm		 Maximum a_e=0.3mm	

1. Please select high-precision and rigidity machine and tool holder.
2. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
3. Please use air blow or MQL(minimum oil mist cooling).
4. Down milling is recommended in the case of side milling.
5. Make overhang of tool as short as possible in conditions of non-interference.

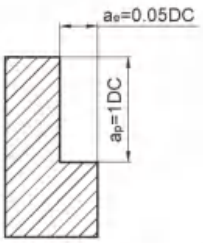
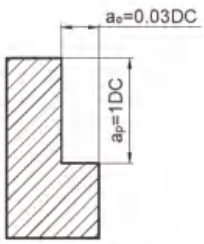
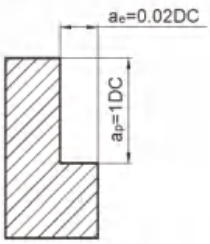
HMX-4E★HMX-4EL★HMX-4EBL/X

Workpiece material	Pre-hardened steel, Hardened steel 40~50HRC		Hardened steel 50~60HRC		Hardened steel 60~68HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	40000	320	40000	320	32000	260
2	40000	800	24000	480	16000	320
3	32000	1020	16000	510	11000	350
4	24000	1250	12000	620	8000	420
5	19000	1360	9500	680	6400	460
6	16000	1540	8000	770	5300	510
8	12000	1540	6000	770	4000	510
10	9600	1540	4800	770	3200	510
12	8000	1600	4000	800	2700	540
14	6800	1340	3400	680	2300	460
16	6000	1200	3000	600	2000	400
18	5300	1060	2700	530	1800	360
20	4800	960	2400	480	1600	320
Maximum cutting depth	 Maximum ae=1.0mm		 Maximum ae=0.5mm		 Maximum ae=0.3mm	

1.Please select high-precision and rigidity machine and tool holder.
2.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
3.Please use air blow or MQL(minimum oil mist cooling).
4.Down milling is recommended in the case of side milling.
5.Make overhang of tool as short as possible in conditions of non-interference.

Cutting parameters for HMX series end mills

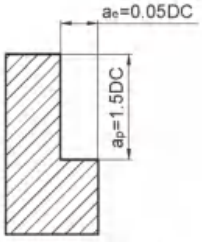
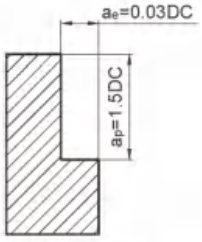
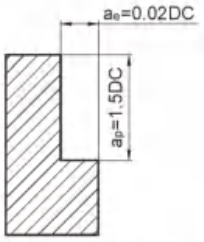
HMX-4EFP

Workpiece material	Pre-hardened steel, Hardened steel 40~50HRC		Hardened steel 50~60HRC		Hardened steel 60~68HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	16000	1730	8000	920	5300	610
8	12000	1730	6000	920	4000	610
10	9600	1730	4800	920	3200	610
12	8000	1800	4000	960	2700	650
16	6000	1350	3000	720	2000	480
20	4800	1080	2400	570	1600	390
Maximum cutting depth	 Maximum ae=1.0mm		 Maximum ae=0.5mm		 Maximum ae=0.3mm	

1.Please select high-precision and rigidity machine and tool holder.
2.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
3.Please use air blow or MQL(minimum oil mist cooling).
4.Down milling is recommended in the case of side milling.
5.Make overhang of tool as short as possible in conditions of non-interference



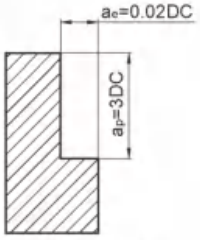
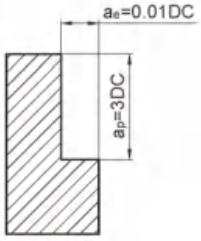
HMX-6E

Workpiece material	Pre-hardened steel, Hardened steel 40~50HRC		Hardened steel 50~60HRC		Hardened steel 60~68HRC	
Cutting speed	300m/min		150m/min		100m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	16000	1850	8000	925	5300	610
8	12000	1850	6000	925	4000	610
10	9600	1850	4800	925	3200	610
12	8000	1920	4000	960	2700	650
14	6800	1600	3400	815	2300	550
16	6000	1440	3000	720	2000	480
18	5300	1270	2700	635	1800	430
20	4800	1150	2400	575	1600	385
Maximum cutting depth	 Maximum a_e=1.0mm		 Maximum a_e=0.5mm		 Maximum a_e=0.3mm	

1.Please select high-precision and rigidity machine and tool holder.
2.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
3.Please use air blow or MQL(minimum oil mist cooling).
4.Down milling is recommended in the case of side milling.
5.Make overhang of tool as short as possible in conditions of non-interference.

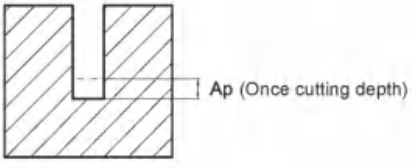
Cutting parameters for HMX series end mills

HMX-6EL

Workpiece material	Pre-hardened steel, Hardened steel 40~50HRC		Hardened steel 50~60HRC		Hardened steel 60~68HRC	
Cutting speed	300m/min		150m/min		100m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	16000	1300	8000	650	5300	430
8	12000	1300	6000	650	4000	430
10	9600	1300	4800	650	3200	430
12	8000	1350	4000	670	2700	460
14	6800	1150	3400	570	2300	380
16	6000	1000	3000	500	2000	340
18	5300	890	2700	450	1800	300
20	4800	800	2400	400	1600	270
Maximum cutting depth	 Maximum ae=0.3mm					

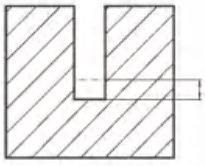
1.Please select high-precision and rigidity machine and tool holder.
2.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
3.Please use air blow or MQL(minimum oil mist cooling).
4.Down milling is recommended in the case of side milling.
5.Make overhang of tool as short as possible in conditions of non-interference.

HMX-2EP

Workpiece material		Pre-hardened steel, Hardened steel 40~50HRC			Hardened steel 50~60HRC		
Diameter (mm)	Effective length (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)
0.5	4	21000	100	0.009	17000	50	0.009
	6	20000	75	0.006	15000	35	0.007
	8	20000	50	0.002	15000	20	0.003
0.8	4	20000	200	0.022	14000	100	0.011
	6	18000	150	0.014	14000	75	0.009
	8	18000	100	0.01	14000	50	0.006
	10	18000	75	0.007	14000	30	0.004
1.0	4	17000	400	0.035	12000	100	0.016
	6	17000	400	0.03	12000	100	0.014
	8	15000	300	0.02	10000	75	0.01
	10	15000	250	0.015	10000	50	0.008
	12	12000	150	0.01	10000	50	0.006
	14	12000	100	0.007	10000	30	0.004
1.2	6	14000	400	0.03	10000	100	0.017
	8	12000	300	0.03	10000	100	0.014
	10	12000	300	0.02	10000	75	0.01
	12	10000	200	0.01	10000	50	0.00
1.5	6	12000	400	0.06	8000	200	0.028
	8	10000	300	0.04	7000	150	0.021
	10	10000	300	0.03	7000	150	0.017
	12	10000	300	0.025	7000	100	0.01
	14	10000	250	0.02	7000	75	0.005
2.0	6	9000	400	0.13	6000	300	0.07
	8	9000	400	0.11	6000	300	0.06
	10	7000	300	0.10	6000	200	0.05
	12	7000	300	0.06	6000	200	0.03
	14	7000	250	0.04	6000	150	0.015
	16	7000	200	0.02	6000	100	0.008
Maximum cutting depth							

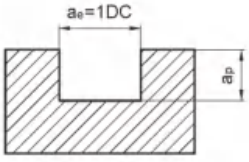
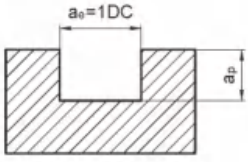
Cutting parameters for HMX series end mills

HMX-2EP

Workpiece material		Pre-hardened steel, Hardened steel 40~50HRC			Hardened steel 50~60HRC		
Diameter (mm)	Effective length (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)
2.5	8	8000	400	0.16	5000	300	0.08
	10	8000	400	0.14	5000	300	0.07
	12	8000	400	0.09	5000	300	0.05
	14	6000	300	0.07	5000	200	0.03
	16	6000	300	0.05	5000	200	0.025
	18	6000	300	0.04	5000	150	0.02
	20	6000	300	0.02	5000	100	0.01
3.0	6	7000	400	0.18	5000	300	0.10
	8	7000	400	0.15	5000	300	0.08
	10	7000	400	0.12	5000	300	0.06
	12	7000	400	0.10	5000	300	0.05
	14	6000	300	0.08	5000	200	0.04
	16	6000	300	0.06	5000	200	0.03
	18	6000	300	0.05	5000	200	0.025
	20	6000	250	0.04	5000	150	0.01
4.0	12	4500	400	0.16	4000	300	0.08
	16	4500	400	0.14	4000	300	0.06
	20	4500	300	0.10	4000	300	0.04
	25	4500	300	0.08	4000	300	0.03
5.0	16	4000	400	0.19	3000	300	0.09
	25	4000	400	0.15	3000	300	0.06
Maximum cutting depth		 Ap (Once cutting depth)					

1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Make overhang of tool as short as possible in conditions of non-interference.
4.Reduce feed speed correspondingly when rotating speed is low.

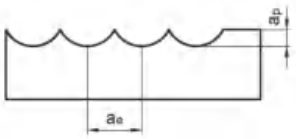
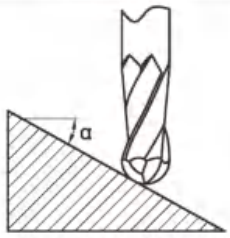
HMX-2ES

Workpiece material	Pre-hardened steel, Hardened steel 40~50HRC		Hardened steel 50~60HRC	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
0.3	23000	30	16500	25
0.4	17500	30	12500	25
0.5	14000	30	10000	25
0.6	11500	30	8450	25
0.7	10000	30	7500	25
0.8	8750	30	6350	25
0.9	8000	30	5500	25
1.0	7000	30	5050	25
1.5	5050	40	3550	25
2.0	3950	40	2750	25
2.5	3500	45	2500	30
3.0	2750	45	2000	30
Maximum cutting depth		Diameter range / Cutting depth a_p: DC<Ø1: 0.02DC; Ø1≤DC≤Ø3: 0.05DC		Diameter range / Cutting depth a_p: DC<Ø1: 0.01DC; Ø1≤DC≤Ø3: 0.02DC

1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Make overhang of tool as short as possible in conditions of non-interference.
4.Reduce feed speed correspondingly when rotating speed is low.

Cutting parameters for HMX series end mills

HMX-2B★HMX-2BL/M/X★HMX-2BFP

Workpiece material	Pre-hardened steel, Hardened steel 40~50HRC				Hardened steel 50~60HRC				Hardened steel 60~68HRC			
Bullnose radius (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)
R0.5	40000	1900	0.01	0.05	36000	1500	0.01	0.05	32000	1400	0.01	0.05
R1.0	33000	3100	0.02	0.075	26000	2100	0.02	0.075	24000	2000	0.02	0.075
R1.5	29000	4100	0.03	0.1	23000	2900	0.03	0.1	21000	2600	0.03	0.1
R2.0	22000	3900	0.04	0.15	17000	2500	0.04	0.15	15500	2100	0.04	0.15
R2.5	17500	3500	0.05	0.15	13500	2200	0.05	0.15	13000	2000	0.05	0.15
R3.0	15000	3100	0.06	0.2	11500	1700	0.06	0.2	10500	1500	0.06	0.2
R4.0	11000	2500	0.08	0.25	8600	1600	0.08	0.25	8000	1400	0.08	0.25
R5.0	9000	2000	0.1	0.3	7000	1400	0.1	0.3	6000	1200	0.1	0.3
R6.0	7500	1800	0.1	0.35	5700	1300	0.1	0.35	5300	1200	0.1	0.35
R8.0	5500	1800	0.1	0.4	4300	1300	0.1	0.4	4000	1200	0.1	0.4
R10.0	4500	1800	0.1	0.5	3500	1300	0.1	0.5	3200	1200	0.1	0.5
Maximum cutting depth												

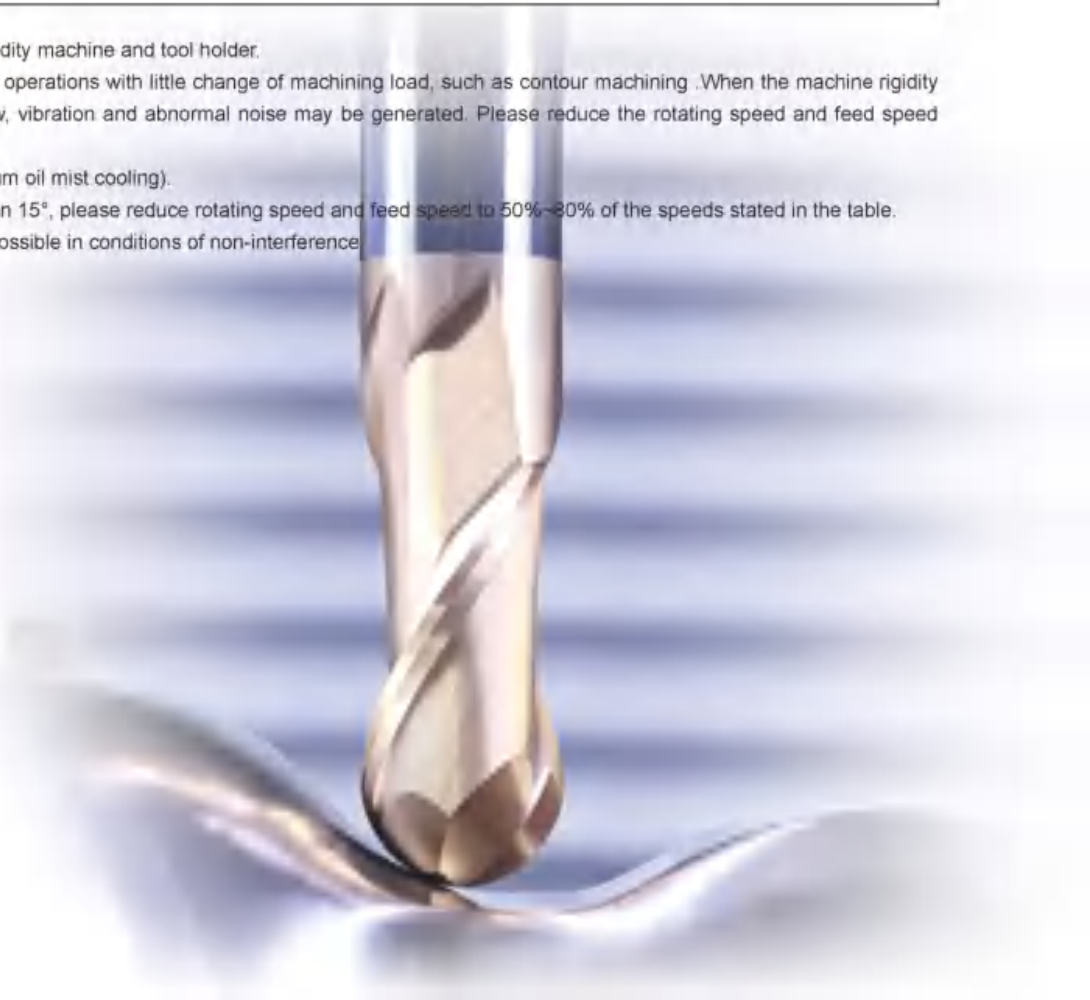
1.Please select high-precision and rigidity machine and tool holder.

2.Above table shows the standard for operations with little change of machining load, such as contour machining .When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.

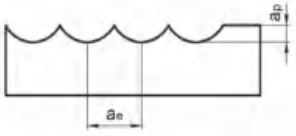
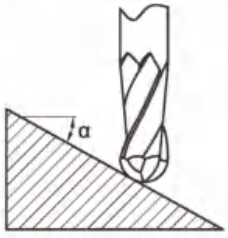
3.Please use air blow or MQL(minimum oil mist cooling).

4.When inclination angle α is more than 15°, please reduce rotating speed and feed speed to 50%~80% of the speeds stated in the table.

5.Make overhang of tool as short as possible in conditions of non-interference.



HMX-4B★HMX-4BL

Workpiece material	Pre-hardened steel, Hardened steel 40~50HRC				Hardened steel 50~60HRC				Hardened steel 60~68HRC			
Bullnose radius (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)
R1.5	29000	6560	0.03	0.1	22800	4560	0.03	0.1	21100	4240	0.03	0.1
R2.0	22000	6250	0.04	0.15	17100	4000	0.04	0.15	15800	3520	0.04	0.15
R2.5	17400	5600	0.05	0.15	13600	3520	0.05	0.15	12700	3200	0.05	0.15
R3.0	14500	5000	0.06	0.2	11400	3000	0.06	0.2	10600	2500	0.06	0.2
R4.0	10900	4200	0.08	0.25	8550	2500	0.08	0.25	7950	2250	0.08	0.25
R5.0	8700	3500	0.1	0.3	6850	2200	0.1	0.3	6350	2000	0.1	0.3
R6.0	7250	3000	0.1	0.35	5700	2000	0.1	0.35	5300	1900	0.1	0.35
R8.0	5450	3000	0.1	0.4	4280	2000	0.1	0.4	4000	1900	0.1	0.4
R10.0	4350	3000	0.1	0.5	3425	2000	0.1	0.5	3200	1900	0.1	0.5
Maximum cutting depth												

1.Please select high-precision and rigidity machine and tool holder.

2.Above table shows the standard for operations with little change of machining load, such as contour machining .When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.

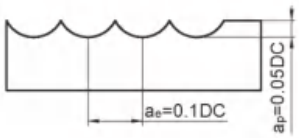
3.Please use air blow or MQL(minimum oil mist cooling).

4.When inclination angle α is more than 15°, please reduce rotating speed and feed speed to 50%~80% of the speeds stated in the table.

5.Make overhang of tool as short as possible in conditions of non-interference.

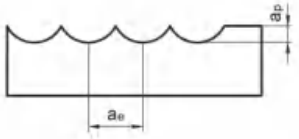
Cutting parameters for HMX series end mills

HMX-2BS

Workpiece material	Pre-hardened steel, Hardened steel 40~50HRC		Hardened steel 50~60HRC	
Bullnose radius (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
R0.15	25000	135	25000	115
R0.2	25000	140	25000	120
R0.25	25000	150	25000	130
R0.3	25000	175	24000	150
R0.35	25000	190	24000	150
R0.4	24000	210	18000	140
R0.45	21000	210	15000	140
R0.5	19000	210	14000	140
R1.0	9500	210	7200	140
R1.5	6400	210	4800	140
Maximum cutting depth				

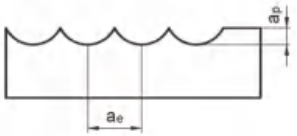
1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Make overhang of tool as short as possible in conditions of non-interference.
4.Reduce feed speed correspondingly when rotating speed is low.

HMX-2BP

Workpiece material		Pre-hardened steel, Hardened steel 40~50HRC				Hardened steel 50~60HRC			
Bullnose radius (mm)	Effective length (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)
R0.25	4	27000	200	0.01	0.01	27000	100	0.01	0.01
	6	20000	150	0.005	0.01	20000	75	0.005	0.005
R0.3	4	24000	200	0.03	0.06	17000	150	0.02	0.04
	6	20000	150	0.02	0.03	17000	150	0.01	0.02
	8	20000	120	0.02	0.03	17000	120	0.01	0.02
R0.4	4	21000	300	0.04	0.08	14500	200	0.03	0.08
	6	19000	200	0.02	0.04	12000	150	0.02	0.04
	8	17000	150	0.02	0.04	12000	100	0.02	0.04
	10	17000	135	0.02	0.03	12000	75	0.01	0.02
R0.5	4	21000	300	0.05	0.10	14500	200	0.05	0.10
	6	16000	200	0.05	0.10	11500	150	0.05	0.10
	8	16000	180	0.03	0.05	11500	135	0.03	0.05
	10	14000	150	0.01	0.03	9800	100	0.01	0.03
	12	14000	135	0.01	0.03	9800	75	0.01	0.03
R0.6	6	14000	200	0.06	0.12	9500	175	0.06	0.12
	8	14000	180	0.06	0.12	9500	150	0.06	0.12
	12	11000	150	0.04	0.06	7500	100	0.03	0.06
	16	11000	135	0.02	0.04	7500	75	0.02	0.03
R0.75	8	12000	250	0.08	0.15	8000	200	0.08	0.15
	12	12000	225	0.06	0.15	8000	175	0.06	0.15
	16	9500	150	0.01	0.05	6500	100	0.01	0.03
R1.0	6	13500	400	0.10	0.20	7500	225	0.10	0.20
	8	13500	400	0.10	0.16	7500	225	0.10	0.16
	10	10000	275	0.08	0.16	5500	175	0.08	0.16
	12	10000	275	0.06	0.16	5500	175	0.06	0.16
	16	10000	250	0.02	0.10	5500	150	0.02	0.10
	20	8000	175	0.02	0.05	5500	125	0.01	0.05
Maximum cutting depth									

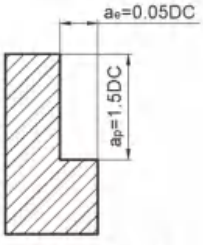
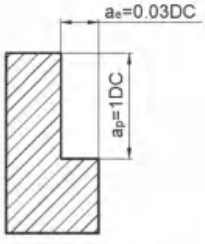
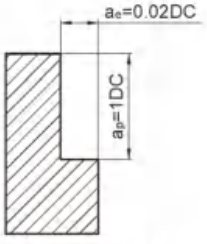
Cutting parameters for HMX series end mills

HMX-2BP

Workpiece material		Pre-hardened steel, Hardened steel 40~50HRC				Hardened steel 50~60HRC			
Bullnose radius (mm)	Effective length (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)
R1.25	8	12500	400	0.10	0.16	7000	225	0.10	0.16
	12	9000	275	0.06	0.16	5000	175	0.06	0.16
	16	9000	250	0.02	0.10	5000	150	0.02	0.10
	20	5500	175	0.02	0.05	5000	125	0.01	0.05
R1.5	10	7500	400	0.10	0.30	4000	200	0.10	0.30
	12	7500	360	0.10	0.30	4000	180	0.10	0.30
	16	6500	250	0.05	0.20	3000	150	0.05	0.20
	20	6500	250	0.02	0.10	3000	150	0.02	0.05
R2.0	10	6000	400	0.20	0.40	3000	200	0.20	0.40
	16	6000	400	0.10	0.32	3000	200	0.20	0.20
	20	5000	250	0.10	0.20	2500	100	0.10	0.20
	25	5000	250	0.10	0.20	2500	100	0.10	0.10
R2.5	16	5000	400	0.25	0.50	3000	200	0.2	0.2
	25	4000	250	0.25	0.50	3000	100	0.20	0.2
Maximum cutting depth									

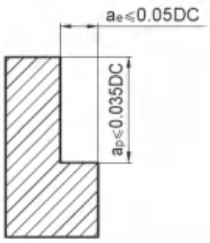
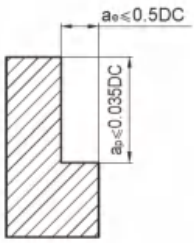
1.Please select high-precision machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Make overhang of tool as short as possible in conditions of non-interference.
4.Reduce feed speed correspondingly when rotating speed is low.

HMX-4R★HMX-4RBL/M/X★HMX-4RP★HMX-4RF

Workpiece material	Pre-hardened steel, Hardened steel 40~50HRC		Hardened steel 50~60HRC		Hardened steel 60~68HRC	
Cutting speed	300m/min		150m/min		100m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
3	32000	1225	16000	610	11000	420
4	24000	1500	12000	745	8000	500
5	19000	1630	9500	815	6400	550
6	16000	1850	8000	925	5300	610
8	12000	1850	6000	925	4000	610
10	9600	1850	4800	925	3200	610
12	8000	1920	4000	960	2700	648
16	6000	1440	3000	720	2000	480
Maximum cutting depth	 Maximum ae=1.0mm		 Maximum ae=0.5mm		 Maximum ae=0.3mm	

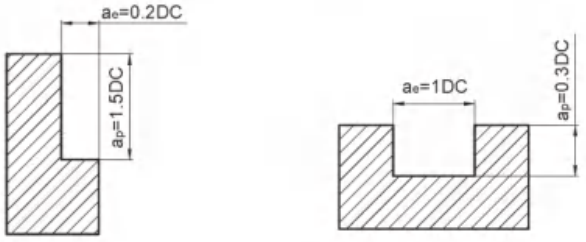
1.Please select high-precision and rigidity machine and tool holder.
2.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
3.Please use air blow or MQL(minimum oil mist cooling).
4.Down milling is recommended in the case of side milling.
5.Make overhang of tool as short as possible in conditions of non-interference.

HMX-6R-MAX

Workpiece material	Pre-hardened steel, Hardened steel 40~50HRC		Hardened steel 50~60HRC	
Cutting speed	100m/min		80m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	5300	3200	4200	2600
8	4000	3200	3200	2600
10	3200	3200	2600	2600
12	2600	3200	2200	2600
16	2000	3600	1600	2800
20	1600	3600	1300	2800
Maximum cutting depth				

1.Please select high-precision and rigidity machine and tool holder.
2.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
3.Please use air blow or MQL(minimum oil mist cooling).
4.Make overhang of tool as short as possible in conditions of non-interference.

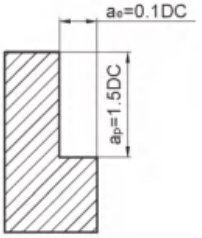
RM-4E★RM-5E

Workpiece material	Heat resistant alloy	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/z)
6	1592	0.012~0.025
8	1195	0.013~0.029
10	955	0.016~0.035
12	796	0.016~0.038
14	682	0.018~0.041
16	597	0.018~0.045
20	478	0.018~0.049
25	382	0.019~0.051
Maximum cutting depth		

1.The above table shows the standard value of side milling. When milling slot, 80%~100% of rotating speed and 60%~80% of feed speed stated above are recommended as standard.
2.Please select high rigidity and precision machine and tool holder, please use non-water-soluble cutting liquid.
3.Please adjust rotating speed and feed speed according to the cutting depth and machine rigidity, down milling is recommended.
4.Make overhang of tool as short as possible in conditions of non-interference.

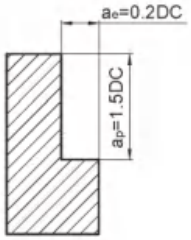
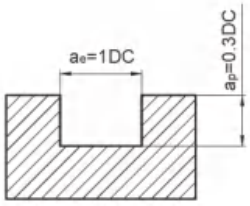
Cutting parameters for RM series end mills

RM-6E

Workpiece material	Heat resistant alloy	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/z)
10	955	0.015~0.035
12	796	0.016~0.038
14	682	0.018~0.041
16	597	0.018~0.045
20	478	0.018~0.049
25	382	0.019~0.051
Maximum cutting depth		

1.The above table shows the standard value of side milling. When milling slot, please apply end mills with 4 flutes or 5 flutes.
2.Please select high rigidity and precision machine and tool holder, please use non-water-soluble cutting liquid.
3.Please adjust rotating speed and feed speed according to the cutting depth and machine rigidity, down milling is recommended.
4.Make overhang of tool as short as possible in conditions of non-interference.

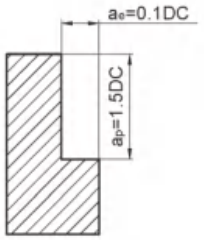
RM-4R★RM-5R

Workpiece material	Heat resistant alloy	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/z)
6	1592	0.012~0.025
8	1195	0.013~0.029
10	955	0.016~0.035
12	796	0.016~0.038
14	682	0.018~0.041
16	597	0.018~0.045
20	478	0.018~0.049
25	382	0.019~0.051
Maximum cutting depth	 	

1.The above table shows the standard value of side milling. When milling slot, 80%~100% of rotating speed and 60%~80% of feed speed stated above are recommended as standard.
2.Please select high rigidity and precision machine and tool holder, please use non-water-soluble cutting liquid.
3.Please adjust rotating speed and feed speed according to the cutting depth and machine rigidity, down milling is recommended.
4.Make overhang of tool as short as possible in conditions of non-interference.

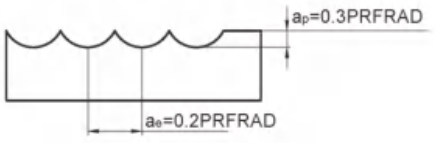
Cutting parameters for RM series end mills

RM-6R★RM-7R

Workpiece material	Heat resistant alloy	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/z)
10	955	0.015~0.035
12	796	0.016~0.038
14	682	0.018~0.041
16	597	0.018~0.045
20	478	0.018~0.049
25	382	0.019~0.051
Maximum cutting depth		

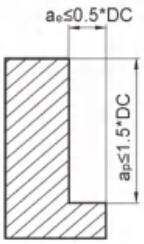
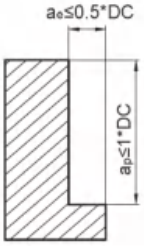
1.The above table shows the standard value of side milling. When milling slot, please apply end mills with 4 flutes or 5 flutes.
2.Please select high rigidity and precision machine and tool holder, please use non-water-soluble cutting liquid.
3.Please adjust rotating speed and feed speed according to the cutting depth and machine rigidity, down milling is recommended.
4.Make overhang of tool as short as possible in conditions of non-interference.

RM-4B

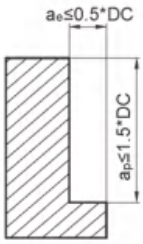
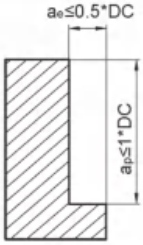
Workpiece material	Heat resistant alloy	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/z)
6	1858	0.02~0.05
8	1393	0.025~0.07
10	1115	0.03~0.08
12	928	0.032~0.085
16	696	0.04~0.12
20	557	0.041~0.13
Maximum cutting depth		

1.The above table shows the standard value of side milling. When milling slot, 80%~100% of rotating speed and 60%~80% of feed speed stated above are recommended as standard.
2.Please select high rigidity and precision machine and tool holder, please use non-water-soluble cutting liquid.
3.Please adjust rotating speed and feed speed according to the cutting depth and machine rigidity, down milling is recommended.
4.Make overhang of tool as short as possible in conditions of non-interference.

MM-4E★MM-4EF

Workpiece material	Carbon steel, alloy steel		Stainles steel	
Cutting parameters	80~250		70~120	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/z)	Rotating speed (min^{-1})	Feed speed (mm/z)
1	20000	800	20000	800
2	12700	760	12700	760
4	7960	800	7960	800
6	6400	830	5300	640
8	4800	810	4000	640
10	3800	800	3200	600
12	3200	800	2650	600
16	2400	760	2000	550
20	1900	740	1600	500
20	1900	400	1600	270
Maximum cutting depth				

MM-4R★MM-4RFP

Workpiece material	Carbon steel, alloy steel		Stainles steel	
Cutting parameters	80~250		70~120	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/z)	Rotating speed (min^{-1})	Feed speed (mm/z)
1	20000	1000	20000	1000
2	12700	950	12700	950
4	7960	1000	7960	1000
6	6400	1000	5300	800
8	4800	1000	4000	800
10	3800	1000	3200	750
12	3200	1000	2650	750
16	2400	950	2000	680
20	1900	900	1600	620
Maximum cutting depth				

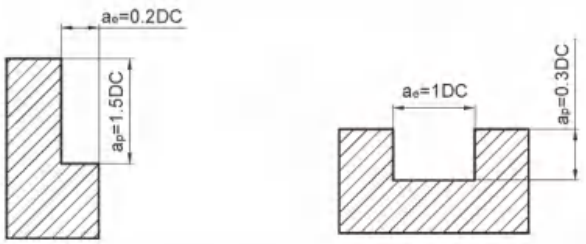
Cutting parameters for TM series end mills

TM-4R★TM-4RP★TM-4B

Workpiece material	α phase titanium alloy(TA)		α+β phase titanium alloy(TC)		β phase titanium alloy(TB)	
Diameter (mm)	Cutting speed (m/min)	Feed (mm/r)	Cutting speed (m/min)	Feed (mm/r)	Cutting speed (m/min)	Feed (mm/r)
DC6.0~DC10.0	40~120	0.16~0.36	30~100	0.16~0.36	30~60	0.12~0.28
DC10.0~DC14.0		0.20~0.40		0.20~0.40		0.16~0.32
DC14.0~DC20.0		0.30~0.48		0.30~0.48		0.20~0.40
DC20.0~DC25.0		0.32~0.60		0.32~0.60		0.24~0.48

Note: High temperature alloy end mills' cutting data please referring to β phase titanium alloy recommended cutting data.

TM-4E

Workpiece material	Titanium alloy	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/z)
6	2654	0.03~0.05
8	1990	0.035~0.058
10	1592	0.036~0.061
12	1327	0.038~0.065
14	1137	0.038~0.065
16	995	0.04~0.072
20	796	0.041~0.09
25	637	0.043~0.10
Maximum cutting depth		

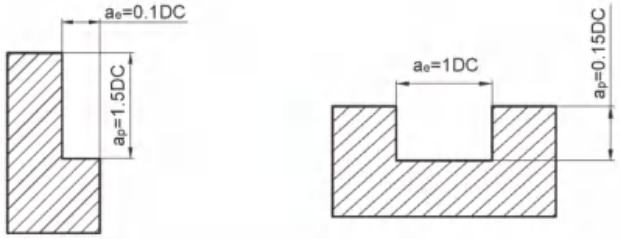
1.The above table shows the standard value of side milling. When milling slot, 80%~100% of rotating speed and 60%~80% of feed speed stated above are recommended as standard.

2.Please select high rigidity and precision machine and tool holder, please use non-water-soluble cutting liquid.

3.Please adjust rotating speed and feed speed according to the cutting depth and machine rigidity, down milling is recommended.

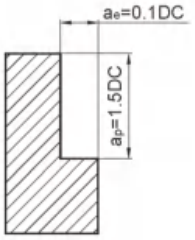
4.Make overhang of tool as short as possible in conditions of non-interference.

TM-5R

Workpiece material	Titanium alloy	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/z)
6	4246	0.03~0.05
8	3185	0.035~0.058
10	2548	0.036~0.061
12	2123	0.038~0.065
14	1820	0.038~0.065
16	1592	0.04~0.072
20	1274	0.041~0.09
25	1019	0.043~0.10
Maximum cutting depth		

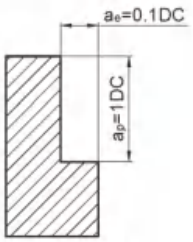
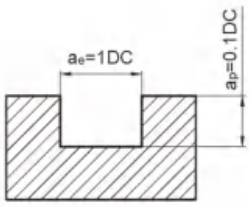
1.The above table shows the standard value of side milling. When milling slot, 80%~100% of rotating speed and 60%~80% of feed speed stated above are recommended as standard.
2.Please select high rigidity and precision machine and tool holder, please use non-water-soluble cutting liquid.
3.Please adjust rotating speed and feed speed according to the cutting depth and machine rigidity, down milling is recommended.
4.Make overhang of tool as short as possible in conditions of non-interference.

TM-6R

Workpiece material	Titanium alloy	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/z)
10	1273	0.02~0.045
12	1061	0.028~0.048
14	910	0.03~0.055
16	796	0.04~0.07
20	636	0.042~0.08
25	510	0.045~0.09
Maximum cutting depth		

1.The above table shows the standard value of side milling. When milling slot, please apply end mills with 4 flutes or 5 flutes.
2.Please select high rigidity and precision machine and tool holder, please use non-water-soluble cutting liquid.
3.Please adjust rotating speed and feed speed according to the cutting depth and machine rigidity, down milling is recommended.
4.Make overhang of tool as short as possible in conditions of non-interference.

NM-2E

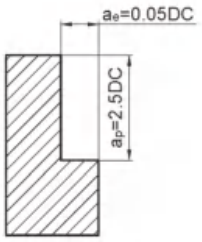
Workpiece material	Copper，Alloy of copper	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	40000	1800
2	30000	2500
3	20000	2300
4	15000	2000
5	12000	1500
6	10000	1400
8	8000	1000
10	6500	900
12	5500	850
Maximum cutting depth	 Maximum a_e=1.0mm  Maximum a_p=1.0mm	

1.The above table shows the standard value of side milling. When milling slot,70% of feed speed stated above are recommend as standard.
2.Please select high-rigidity and high-precision machine and tool holder. When the machine rigidity and workpiece fixture stability is low,vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed above correspondingly.
3.When cutting depth is smaller, rotating speed and feed speed can be increased correspondingly.
4.Please select water-soluble cutting liquid.
5.Down milling is recommended in the case of side milling.
6.Make overhang of tool as short as possible in condition of non-interference.



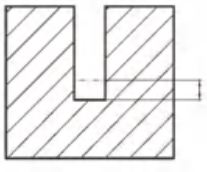
Cutting parameters for NM series end mills

NM-4E

Workpiece material	Copper，Alloy of copper	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)
3	10600	250
4	8000	300
5	6500	400
6	5300	400
8	4000	450
10	3500	450
12	3000	450
Maximum cutting depth	 Maximum a_p=0.5mm	

1.Please select high-precision and rigidity machine and tool holder. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed above correspondingly.
2.When cutting depth is small, rotating speed and feed speed can be increased correspondingly.
3.Please select water-soluble cutting liquid.
4.Down milling is recommended in the case of side milling.
5.Make overhang of tool as short as possible in condition of non-interference.

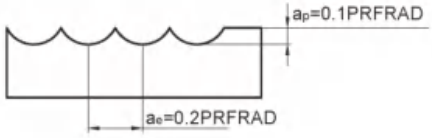
NM-2EP

Workpiece material		Copper、Alloy of copper		
Diameter (mm)	Effective length(mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)
0.5	4	40000	800	0.004
	6	40000	700	0.002
	8	40000	500	0.001
0.8	4	40000	1000	0.02
	6	40000	1000	0.015
	8	40000	800	0.01
	10	40000	600	0.005
1.0	4	40000	1800	0.04
	6	40000	1500	0.04
	8	40000	1500	0.03
	10	30000	1000	0.02
	12	30000	800	0.015
	14	30000	600	0.01
1.5	8	40000	2000	0.09
	16	20000	1000	0.03
2.0	6	40000	2400	0.18
	8	40000	2200	0.15
	10	40000	2000	0.12
	12	30000	1500	0.10
	14	30000	1200	0.08
	16	30000	1000	0.06
2.5	10	40000	2500	0.15
	20	20000	1000	0.08
3.0	10	20000	2500	0.20
	20	20000	2000	0.12
4.0	16	15000	1800	0.25
	25	15000	1200	0.15
5.0	16	12000	2000	0.40
	25	12000	1500	0.35
Maximum cutting depth		 Ap（once cutting depth）		

1.Please select high-precision machine and tool holder.
2.Please select water-soluble cutting liquid.
3.Make overhang of tool as short as possible in condition of non-interference.
4.Reduce feed speed correspondingly when rotating speed is low.

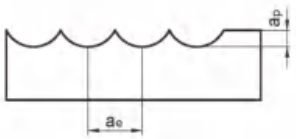
Cutting parameters for NM series end mills

NM-2B

Workpiece material	Copper，Alloy of copper	
Bullnose radius (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)
R0.5	40000	900
R0.75	32000	800
R1.0	24000	870
R1.25	19000	800
R1.5	16000	850
R1.75	14000	850
R2.0	12000	900
R2.5	9600	900
R3.0	8000	1200
R4.0	7000	1500
R5.0	4800	1300
R6.0	4000	1200
Maximum cutting depth		

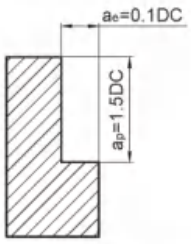
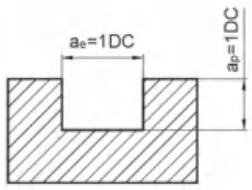
1.Please select high-precision and rigidity machine and tool holder. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed above correspondingly.
2.When cutting depth is small, rotating speed and feed speed can be increased correspondingly.
3.Please select water-soluble cutting liquid.
4.Make overhang of tool as short as possible in condition of non-interference.

NM-2BP

Workpiece material		Copper，Alloy of copper			
Bullnose radius (mm)	Effective length(mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	a_p (mm)	a_e (mm)
R0.25	4	40000	750	0.01	0.025
	6	36000	500	0.008	0.02
R0.3	4	40000	900	0.012	0.03
	6	40000	750	0.010	0.02
	8	30000	400	0.008	0.01
R0.4	4	40000	1050	0.016	0.04
	6	40000	800	0.012	0.03
	8	40000	500	0.01	0.02
	10	30000	400	0.008	0.01
R0.5	4	40000	1050	0.02	0.05
	6	40000	800	0.016	0.04
	8	40000	500	0.014	0.03
	10	33000	400	0.012	0.02
	12	35000	300	0.010	0.010
R0.75	8	40000	900	0.03	0.075
	16	20000	400	0.015	0.04
R1.0	6	40000	1100	0.04	0.10
	8	40000	900	0.034	0.08
	10	40000	750	0.028	0.065
	12	40000	500	0.022	0.05
	16	30000	400	0.018	0.04
	20	20000	300	0.012	0.03
R1.5	10	40000	1100	0.06	0.15
	20	32000	600	0.03	0.08
R2.0	10	32000	1100	0.08	0.20
	16	32000	900	0.06	0.16
	20	32000	600	0.04	0.12
	25	20000	400	0.02	0.08
R2.5	16	25000	1250	0.10	0.25
	25	20000	900	0.06	0.12
Maximum cutting depth					

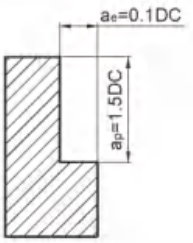
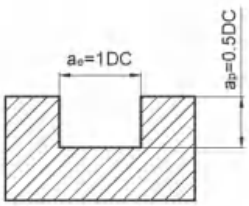
1.Please select high-precision machine and tool holder.
2.Please select water-soluble cutting liquid.
3.Make overhang of tool as short as possible in condition of non-interference.
4.Reduce feed speed correspondingly when rotating speed is low.

ALU-3E (water cooling)

Workpiece material	Aluminum alloy		Silicon aluminum alloy	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	50000	800	50000	625
1.5	50000	1000	50000	920
2	40000	950	40000	930
2.5	31500	785	31500	720
3	29500	2000	23000	1420
4	21500	2150	18000	1680
5	18000	1960	14500	1450
6	14500	1670	11600	1310
8	11000	1815	9000	1450
10	9000	2100	7500	1730
12	7100	2050	5800	1680
16	5500	2100	4500	1700
20	4400	2150	3500	1730
Maximum cutting depth				

2. Please select high-precision machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
5. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6. Make overhang of tool as short as possible in conditions of non-interference.

AL-2E★AL-2EL

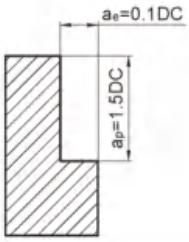
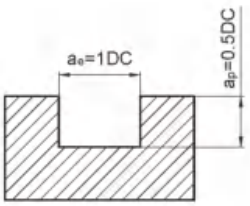
Workpiece material	Aluminum alloy		Silicon aluminum alloy Si≤10%	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	40000	650	40000	500
2	40000	950	32000	750
3	26500	1500	21000	1100
4	20000	1600	16000	1250
5	16000	1500	13000	1100
6	13000	1250	10600	1000
8	10000	1400	8000	1100
10	8000	1600	6500	1250
12	6600	1650	5300	1300
14	5700	1700	4600	1350
16	5000	1700	4000	1350
18	4400	1700	3500	1350
20	4000	1700	3200	1350
Maximum cutting depth				

1.The above table shows the reference value of side milling. The feed speed in slot milling is 70% of the reference value stated in the table.
2.Please select high rigidity and precision machine and tool holder. Vibration and abnormal noise may be generated if the machine rigidity and workpiece fixture stability is low. Please reduce the rotating speed and feed speed stated above correspondingly.
3.It is possible to increase the rotating speed and feed speed correspondingly if the cutting depth is low.
4.Please use water-soluble cutting liquid.
5.Down milling is recommended in the case of side milling.
6.Make overhang of tool as short as possible in conditions of non-interference.



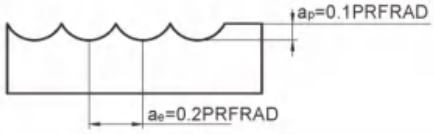
Cutting parameters for AL series end mills

AL-3E★AL-3EL

Workpiece material	Aluminum alloy		Silicon aluminum alloy Si≤10%	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	40000	800	40000	600
2	40000	1200	32000	900
3	26500	1800	21000	1300
4	20000	2000	16000	1500
5	16000	1750	13000	1300
6	13000	1500	10600	1200
8	10000	1650	8000	1300
10	8000	1900	6500	1500
12	6600	1950	5300	1550
14	5700	2000	4600	1600
16	5000	2000	4000	1600
18	4400	2000	3500	1600
20	4000	2000	3200	1600
Maximum cutting depth				

1.The above table shows the reference value of side milling. The feed speed in slot milling is 70% of the reference value stated in the table.
2.Please select high rigidity and precision machine and tool holder. Vibration and abnormal noise may be generated if the machine rigidity and workpiece fixture stability is low. Please reduce the rotating speed and feed speed stated above correspondingly.
3.It is possible to increase the rotating speed and feed speed correspondingly if the cutting depth is low.
4.Please use water-soluble cutting liquid.
5.Down milling is recommended in the case of side milling.
6.Make overhang of tool as short as possible in conditions of non-interference.

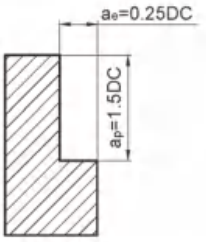
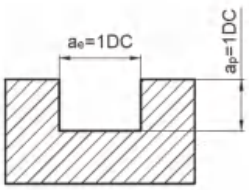
AL-2B

Workpiece material	Aluminum alloy		Silicon aluminum alloy Si≤10%	
Bullnose radius (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
R1.0	40000	2000	32000	1600
R1.5	26500	1950	21000	1550
R2.0	20000	1950	16000	1550
R2.5	16000	1950	13000	1550
R3.0	13000	2000	10600	1600
R4.0	10000	2450	8000	2000
R5.0	8000	2200	6500	1750
R6.0	6600	2050	5300	1650
Maximum cutting depth				

1.Please select high rigidity and precision machine and tool holder. Vibration and abnormal noise may be generated if the machine rigidity and workpiece fixture stability is low. Please reduce the rotating speed and feed speed stated above correspondingly.
2.If the cutting depth is low, it is possible to increase the rotating speed and feed speed correspondingly.
3.Please use water-soluble cutting liquid.
4.Make overhang of tool as short as possible in conditions of non-interference.

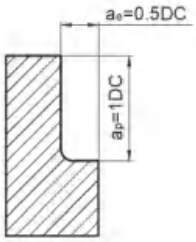
Cutting parameters for AL series end mills

AL-3W

Workpiece material	Aluminum alloy		Silicon aluminum alloy Si≤10%	
Cutting speed	250m/min		200m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	13000	3000	10600	1900
8	10000	3000	8000	1900
10	8000	2900	6500	1850
12	6600	2700	5300	1700
14	5700	2600	4600	1650
16	5000	2550	4000	1600
18	4400	2500	3500	1550
20	4000	2400	3200	1500
Maximum cutting depth				

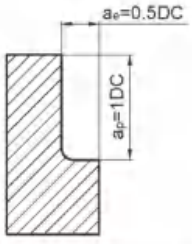
1. The above table shows the reference value of side milling. The feed speed in slot milling is 70% of the reference value stated in the table, and feed rate 50%.
2. Please select high rigidity and precision machine and tool holder. Vibration and abnormal noise may be generated if the machine rigidity and workpiece fixture stability is low. Please reduce the rotating speed and feed speed stated above correspondingly.
3. It is possible to increase the rotating speed and feed speed correspondingly if the cutting depth is low.
4. Please use water-soluble cutting liquid.
5. Down milling is recommended in the case of side milling.
6. Make overhang of tool as short as possible in conditions of non-interference.

AL-2R-AIR

Workpiece material	Aluminum alloy		Silicon aluminum alloy Si≤10%	
Cutting speed	500~800m/min		500~800m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	35000	3500	35000	3500
8	26000	3800	26000	3800
10	21000	4000	21000	4000
12	18000	4300	18000	4300
16	15000	4800	15000	4800
20	12000	5500	12000	5500
Maximum cutting depth				

1.Above cutting parameters are suitable for aluminium high speed machining specific CNC.
2.Please select cutting liquid or strong air cooling system for chip flowing out.
3.The sparkle by machining or heat caused by breakage might result in fire or conflagration.Please pay attention to fire prevention.
4.Dynamic balance detection should be done before machining.

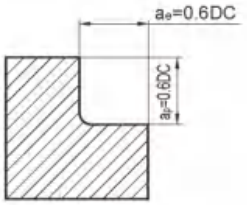
AL-2RL-AIR

Workpiece material	Aluminum alloy		Silicon aluminum alloy Si≤10%	
Cutting speed	500~800m/min		500~800m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	30000	3000	30000	3000
8	24000	3200	24000	3200
10	20000	3500	20000	3500
12	16000	3800	16000	3800
16	12000	4000	12000	4000
20	10000	4600	10000	4600
Maximum cutting depth				

1.Above cutting parameters are suitable for aluminium high speed machining specific CNC.
2.Please select cutting liquid or strong air cooling system for chip flowing out.
3.The sparkle by machining or heat caused by breakage might result in fire or conflagration. Please pay attention to fire prevention.
4.Dynamic balance detection should be done before machining.

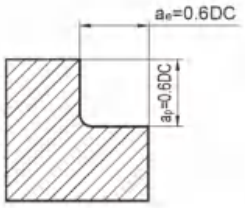
Cutting parameters for AL series end mills

AL-3R-AIR

Workpiece material	Aluminum alloy		Silicon aluminum alloy Si≤10%	
Cutting speed	800~1200m/min		800~1200m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
12	25000	6000	25000	6000
16	20000	6400	20000	6400
20	15000	7000	15000	7000
Maximum cutting depth				

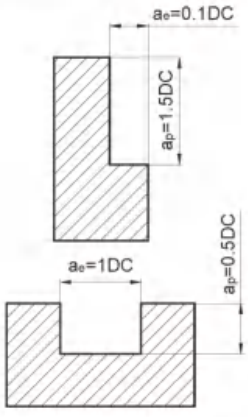
1.Above cutting parameters are suitable for aluminium high speed machining specific CNC.
2.Please select cutting liquid or strong air cooling system for chip flowing out.
3.The sparkle by machining or heat caused by breakage might result in fire or conflagration. Please pay attention to fire prevention.
4.Dynamic balance detection should be done before machining.

AL-3RL-AIR

Workpiece material	Aluminum alloy		Silicon aluminum alloy Si≤10%	
Cutting speed	800~1200m/min		800~1200m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
12	22000	5300	22000	5300
16	18000	5700	18000	5700
20	13000	6000	13000	6000
Maximum cutting depth				

1.Above cutting parameters are suitable for aluminium high speed machining specific CNC.
2.Please select cutting liquid or strong air cooling system for chip flowing out.
3.The sparkle by machining or heat caused by breakage might result in fire or conflagration. Please pay attention to fire prevention.
4.Dynamic balance detection should be done before machining.

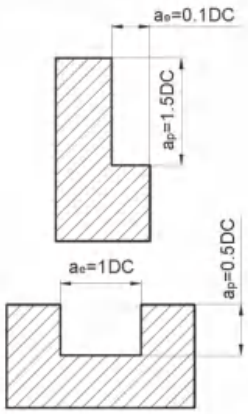
ALG-2E

Workpiece material	Aluminum alloy		Silicon aluminum alloy Si≤10%	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	40000	650	40000	500
2	40000	950	32000	750
3	26500	1500	21000	1100
4	20000	1600	16000	1250
5	16000	1500	13000	1100
6	13000	1250	10600	1000
8	10000	1400	8000	1100
10	8000	1600	6500	1250
12	6600	1650	5300	1300
14	5700	1700	4600	1350
16	5000	1700	4000	1350
18	4400	1700	3500	1350
20	4000	1700	3200	1350
Maximum cutting depth				

1.The above table shows the standard value of side milling. When milling slot,70% of feed speed stated above are recommend as standard.
2.Please select high-rigidity and high-precision machine and tool holder. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed above correspondingly.
3.When cutting depth is smaller,rotating speed and feed speed can be increased correspondingly.
4.Please select water-soluble cutting liquid.
5.Down milling is recommended in the case of side milling.
6.Make overhang of tool as short as possible in condition of non-interference.

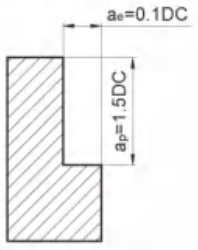
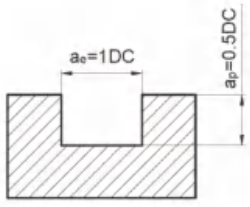
Cutting parameters for ALG series end mills

ALG-3E

Workpiece material	Aluminum alloy		Silicon aluminum alloy Si≤10%	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	40000	800	40000	600
2	40000	1200	32000	900
3	26500	1800	21000	1300
4	20000	2000	16000	1500
5	16000	1750	13000	1300
6	13000	1500	10600	1200
8	10000	1650	8000	1300
10	8000	1900	6500	1500
12	6600	1950	5300	1550
14	5700	2000	4600	1600
16	5000	2000	4000	1600
18	4400	2000	3500	1600
20	4000	2000	3200	1600
Maximum cutting depth				

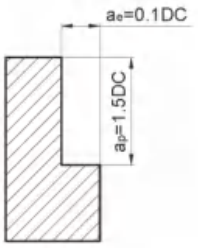
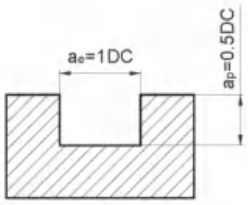
1.The above table shows the standard value of side milling. When milling slot, 70% of feed speed stated above are recommend as standard.
2.Please select high-rigidity and high-precision machine and tool holder. When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed above correspondingly.
3.When cutting depth is smaller, rotating speed and feed speed can be increased correspondingly.
4.Please select water-soluble cutting liquid.
5.Down milling is recommended in the case of side milling.
6.Make overhang of tool as short as possible in condition of non-interference.

ALG-2R

Workpiece material	Aluminum alloy		Silicon aluminum alloy Si≤10%	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	40000	710	40000	550
2	40000	1040	32000	820
3	26500	1650	21000	1210
4	20000	1760	16000	1370
6	13000	1370	10600	1100
8	10000	1540	8000	1210
10	8000	1760	6500	1370
12	6600	1810	5300	1430
Maximum cutting depth				

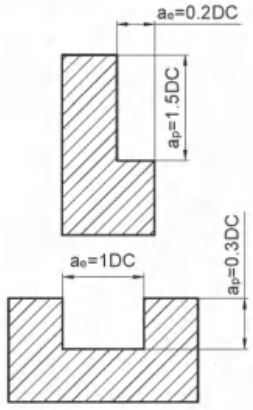
1.The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2.Please select high-precision machine and tool holder.
3.Please use air blow or cutting liquid with high mist retardant property.
4.Down milling is recommended in the case of side milling.
5.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6.Make overhang of tool as short as possible in conditions of non-interference.

ALG-3R

Workpiece material	Aluminum alloy		Silicon aluminum alloy Si≤10%	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
1	40000	880	40000	660
2	40000	1320	32000	990
3	26500	1980	21000	1430
4	20000	2200	16000	1650
6	13000	1650	10600	1320
8	10000	1810	8000	1430
10	8000	2090	6500	1650
12	6600	2140	5300	1700
Maximum cutting depth				

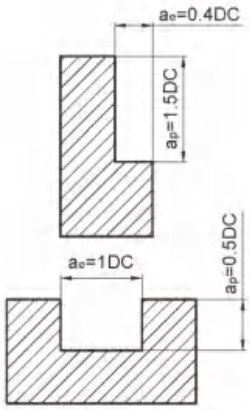
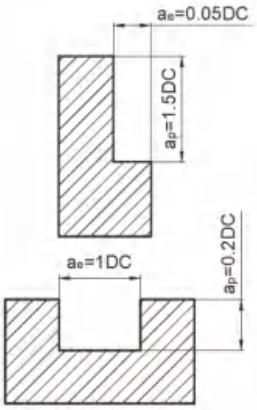
1.The above table shows the standard value of side milling. When milling slot, 50%~70% of rotating speed and 40%~60% of feed speed stated above are recommended as standard.
2.Please select high-precision machine and tool holder.
3.Please use air blow or cutting liquid with high mist retardant property.
4.Down milling is recommended in the case of side milling.
5.When the machine rigidity and workpiece fixture stability is low, vibration and abnormal noise may be generated. Please reduce the rotating speed and feed speed stated above correspondingly.
6.Make overhang of tool as short as possible in conditions of non-interference.

SM-3E

Workpiece material	Carbon steel, Alloy steel		Stainless steel	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
3	8500	660	4400	100
4	6400	690	3700	160
5	5800	710	3000	190
6	5300	750	2700	200
8	3900	700	2000	210
10	3100	640	1600	210
12	2600	600	1300	170
16	1900	520	1000	130
20	1500	445	800	140
Maximum cutting depth				

1. The above table shows the standard value of side milling. When milling slot, rotating speed is around 80%~100% of the stated value, and feed speed around 60%~80%.
2. Non water-soluble cutting liquid is recommended in machining of stainless steel and heat-resistant alloy.
3. Please select high rigid and precise machine and tool holder.
4. Adjust rotating speed and feed speed according to cutting depth and machine rigidity.
5. Down milling is recommended in the case of side milling.
6. Make overhang of tool as short as possible in conditions of non-interference.

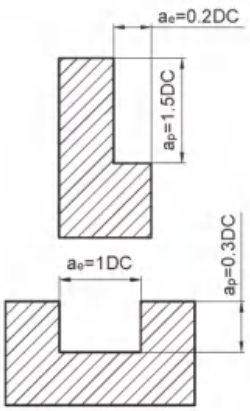
VSM-4E★VSM-4EFP

Workpiece material	Carbon steel, Alloy steel		Stainless steel		Heat resistant alloy, Titanium alloy	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
4	6400	690	3700	160	3055	90
5	5800	710	3000	190	2470	90
6	5300	750	2700	200	2470	120
8	3900	700	2000	210	1820	130
10	3100	640	1600	210	1430	130
12	2600	600	1300	170	1235	110
16	1900	520	1000	150	935	90
20	1500	445	800	140	740	90
Maximum cutting depth						

1.The above table shows the standard value of side milling. When milling slot, rotating speed is around 80%~100% of the stated value, and feed speed around 60%~80%.
2.Non water-soluble cutting liquid is recommended in machining of stainless steel and heat-resistant alloy.
3.Please select high rigid and precise machine and tool holder.
4.Adjust rotating speed and feed speed according to cutting depth and machine rigidity.
5.Down milling is recommended.
6.Make overhang of tool as short as possible in condition of non-interference.
7.The above table is recommended data based on L/D≤4.When L/D>4, please reduce 70% of rotating speed and feed speed correspondingly.

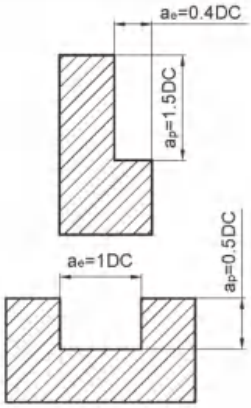
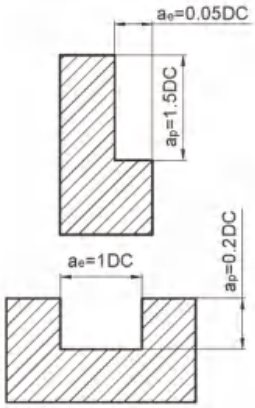


SM-4R

Workpiece material	Carbon steel, Alloy steel		Stainless steel	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	5300	900	2700	240
8	3900	840	2000	255
10	3100	770	1600	255
12	2600	720	1300	205
Maximum cutting depth				

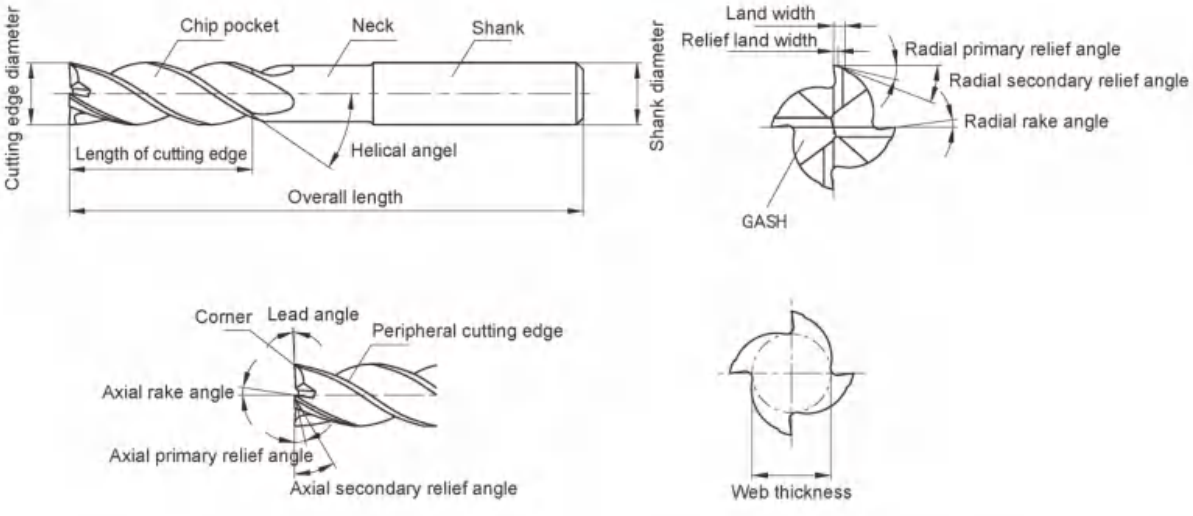
1.The above table shows the standard value of side milling. When milling slot, rotating speed is around 80%~100% of the stated value, and feed speed around 60%~80%.
2.Non water-soluble cutting liquid is recommended in machining of stainless steel and heat-resistant alloy.
3.Please select high rigid and precise machine and tool holder.
4.Adjust rotating speed and feed speed according to cutting depth and machine rigidity.
5.Down milling is recommended in the case of side milling.
6.Make overhang of tool as short as possible in conditions of non-interference.

VSM-4R★VSM-4RFP

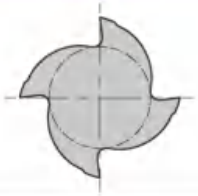
Workpiece material	Carbon steel, Alloy steel		Stainless steel		Heat resistant alloy, Titanium alloy	
Diameter (mm)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)	Rotating speed (min^{-1})	Feed speed (mm/min)
6	5300	900	2700	240	2470	145
8	3900	840	2000	255	1820	155
10	3100	770	1600	255	1430	155
12	2600	720	1300	205	1235	135
16	1900	625	1000	180	935	110
Maximum cutting depth						

1. The above table shows the standard value of side milling. When milling slot, rotating speed is around 80%~100% of the stated value, and feed speed around 60%~80%.
2. Non water-soluble cutting liquid is recommended in machining of stainless steel and heat-resistant alloy.
3. Please select high rigid and precise machine and tool holder.
4. Adjust rotating speed and feed speed according to cutting depth and machine rigidity.
5. Down milling is recommended.
6. Make overhang of tool as short as possible in condition of non-interference.
7. The above table is recommended data based on L/D≤4. When L/D>4, please reduce 70% of rotating speed and feed speed correspondingly.

Parts terminology of end mill

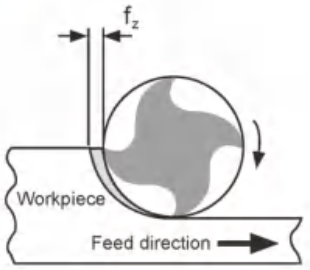


Number of teeth, chip pocket and tool rigidity

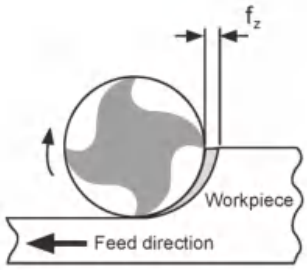
Number of teeth		2 Flutes	3 Flutes	4 Flutes
Profile of cross section				
Proportion of cross section		54%	56%	60%
Features	Advantages	● Large chip pocket ● Easy chip removal	● Easy chip removal ● Perfect surface finish	● Good rigidity ● Perfect surface finish
	Disadvantages	Low rigidity	Difficult to measure external diameter	Chip removal is not smooth
Functions		1. Slot machining 2. Side face machining 3. Hole machining	1. Slot machining 2. Side face machining 3. Heavy cutting 4. For finishing	1. Shallow slot machining 2. Side face machining 3. For finishing

Down milling and up milling

Side milling

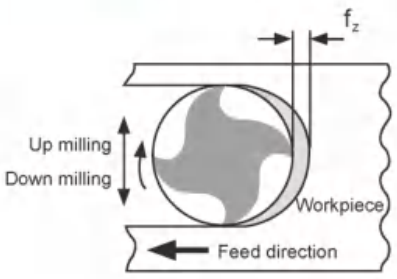


(a) up milling



(b) Down milling

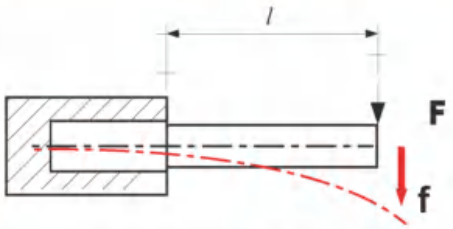
Slot milling



Length of cutting edge (overhang) and cutting edge diameter

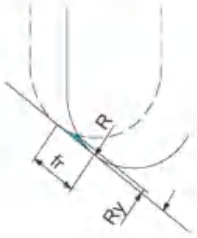
The shorter of overhang is, the higher the rigidity is. Thus it is not easy to bend or vibrate in the cutting process, and machining precision is improved. When length of cutting edge (overhang) doubles, the Deflection degree (f) will be 8 times of the original.

When the overhang is reduced by 20%, the Deflection degree (f) will decrease by 50%.
When the diameter increases by 20%, the Deflection degree (f) will decrease by 50%.



$$f = \frac{F \cdot l^3}{3 \cdot E \cdot I} = \frac{F \cdot l^3 \cdot 64}{3 \cdot E \cdot d^4 \cdot \pi}$$

Feed rate selection table in profile machining by ball nose and R end mills



$$Ry=R\times\{1-\cos[\arcsin(fr/2R)]\}$$

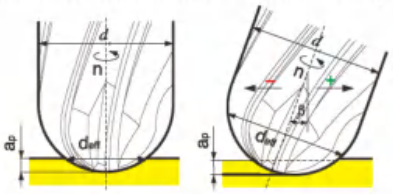
Ry: Theoretical value of surface roughness
fr: Feed rate
R: Ball nose radius or corner radius

Table of theoretical roughness formed by ball nose of end mill (corner radius of R end mill) and feed rate(mm)

Ry / RE	Feed rate fr									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
0.5	0.003	0.010	0.023	0.042	0.067	0.100				
1.0	0.001	0.005	0.011	0.020	0.032	0.046	0.063	0.083	0.107	
1.5	0.001	0.003	0.008	0.013	0.021	0.030	0.041	0.054	0.069	0.086
2.0	0.001	0.003	0.006	0.010	0.015	0.023	0.031	0.040	0.051	0.064
2.5	0.001	0.002	0.005	0.008	0.013	0.018	0.025	0.032	0.041	0.051
3.0		0.001	0.004	0.007	0.010	0.015	0.020	0.027	0.034	0.042
4.0		0.001	0.003	0.005	0.008	0.011	0.015	0.020	0.025	0.031
5.0		0.001	0.002	0.004	0.006	0.009	0.012	0.016	0.020	0.025
6.0			0.002	0.003	0.005	0.008	0.010	0.013	0.017	0.021
8.0			0.001	0.003	0.004	0.006	0.008	0.010	0.013	0.016
10.0			0.001	0.002	0.003	0.005	0.006	0.008	0.010	0.013
12.5			0.001	0.002	0.003	0.004	0.005	0.006	0.008	0.010

Ry / RE	Feed rate fr									
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
0.5										
1.0										
1.5	0.104									
2.0	0.077	0.092	0.109							
2.5	0.061	0.073	0.086	0.100						
3.0	0.051	0.061	0.071	0.083	0.095	0.109				
4.0	0.038	0.045	0.053	0.062	0.071	0.081	0.091	0.103		
5.0	0.030	0.036	0.042	0.049	0.057	0.064	0.073	0.082	0.091	0.101
6.0	0.025	0.030	0.035	0.041	0.047	0.054	0.061	0.068	0.076	0.084
8.0	0.019	0.023	0.026	0.031	0.035	0.040	0.045	0.051	0.057	0.063
10.0	0.015	0.018	0.021	0.025	0.028	0.032	0.036	0.041	0.045	0.050
12.5	0.012	0.014	0.017	0.020	0.023	0.026	0.029	0.032	0.036	0.040

Cutting parameters calculation

Symbol	Description	Formula
n	Rotating speed per minute n[min^{-1}]r/min	$n=\frac{v_c \cdot 1000}{d \cdot \pi}$
v_c	Cutting speed Vc[m/min]	$v_c=\frac{d \cdot \pi \cdot n}{1000}$
f_z	Amount of feed per tooth fz[mm/tooth]	$f_z=\frac{V_f}{z \cdot n}$
f	Amount of feed per rotation fz[mm/rev.]	$f=f_z \cdot z$
V_f	Feed rate Vf[mm/min]	$V_f=f_z \cdot z \cdot n=f \cdot n$
Q	Removal rate Q[cm^3/min]	$Q=\frac{a_e \cdot a_p \cdot v_f}{1000}$
d_{eff}	Effective diameter of ball nose end mill deff[mm] 	$\beta = 0$ $d_{eff}=2 \cdot \sqrt{d \cdot a_p - a_p^2}$ $\beta \neq 0$ $d_{eff}=d \cdot sin[\beta \pm arccos(\frac{d-2a_p}{d})]$
V_{eff}	Effective cutting speed of end mill Veff[m/min]	$V_{eff}=\frac{d_{eff} \cdot \pi \cdot n}{1000}$
a_e	Radial cutting width ae[mm]	
a_p	Axial cutting depth ap[mm]	
d	Milling diameter[mm]	
z	Number of teeth	
β	Inclined angle	

Common problems and solutions for end mill

Solutions / Common problems		Tool material	Cutting condition							Tool shape			Machine clamping				
							Cutting liquid										
		Select coated end mill	Cutting speed	Feed rate	Cutting depth	Cutting direction (down / up milling)	Increase the amount of cutting liquid	Water-insoluble cutting liquid	Dry or wet machining	Helical angle	Number of tooth	Milling diameter	Reduce the overhang length	Improve tool clamping precision	Change collet	Increase clamping force	Improve workpiece clamping rigidity
Tool fracture	Fracture of end mill			↓	↓						↓	↑	✓		✓	✓	
Damage of cutting edge	Rapid wear of cutting edge	✓	↓	↑		down		✓				↑					
	Breakage		↓	↓	↓	down			dry				✓		✓		✓
	Severe chips bond	✓					✓		wet	↑							
Machining precision	Poor surface quality		↑	↓	↓			✓	wet					✓			
	Uneven			↓	↓					↓	↑	↑		✓	✓		
	Uneven side face of workpiece			↓	↓	up		✓		↑	↑	↑	✓				
	Burrs, breakage and slice frittering			↓	↓					↓							
	Large vibration		↓	↑						↑	↓	↑	✓		✓	✓	✓
Chip control	obstructed chip removal			↓	↓		✓				↓						
Others		1.Large abrasion of cutting edge is easy to cause fracture of end mill or poor surface quality, so it is recommended to regrind the end mills. 2.Make overhang of tool as short as possible.															

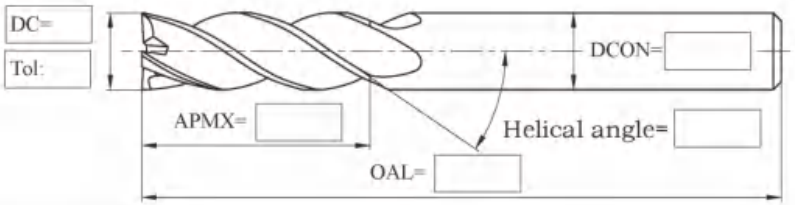
Customer name: Fax: Tel: E-MAIL:	ZCC·CT Huanghe south road, Tianyuan Zone, Zhuzhou, Hunan,P.R.China Fax: 0731-22882721 22885420 22887878 Post code: 412007 E-Mail:zccct@zccct.com

When the diameter specification or length specification on the catalogue cannot meet your requirements, we provide more professional and more accurate non-standard customization, you just need to choose the series the customization based on.

End mill series selection	
VPM series	
UM series	
PMX series	
PML series	
PM series	
GM series	
HMX series	
RM series	
TM series	
NM series	
ALU series	
AL/ALG series	
SM/VSM series	
CM series	

Diameter specification	Ø0.3~20.0mm
Number of teeth	

Selection of end mill types		
		
☐ Flattened end mill	☐ Ball nose end mill	☐ R end mill



Remark/Note:

Ordering quantities: pieces Expecting delivery date:

Quotation of supplier: Buyer confirmation:

Date:

Customer name:

Fax:

Tel:

E-MAIL:

ZCC·CT

Huanghe south road, Tianyuan Zone,
Zhuzhou, Hunan,P.R.China

Fax: 0731-22882721 22885420 22887878

Post code: 412007 E-Mail:zccct@zccct.com

Workpiece material information

☐ Carbon steel
☐ Alloy steel
☐ Pre-hardened steel
☐ Hardened steel
☐ Stainless steel
☐ Grey cast iron
☐ Nodular cast iron
☐ Copper alloy
☐ Aluminum alloy
☐ Titanium alloy
☐ Heat-resistant alloy

Workpiece material grade:

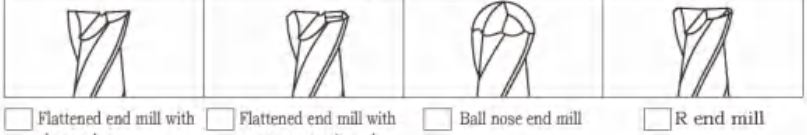
Tensile strength= N/mm²

Hardness= Unit: (HRC,HB etc)

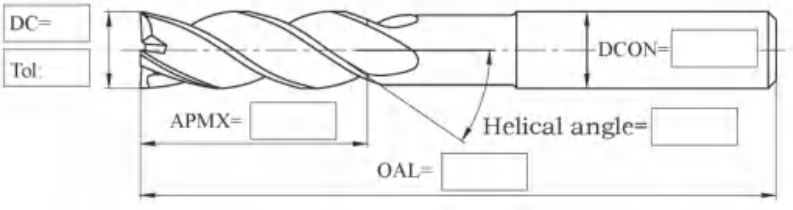
Diameter specification	Ø0.2~25.0mm	
Number of teeth		
Cutting edge cross the center of the end mill	☐ Yes	☐ No

End mill information

Selection of end mill types



☐ Flattened end mill with sharp edge ☐ Flattened end mill with corner protection edge ☐ Ball nose end mill ☐ R end mill



DIN6535

Shank type

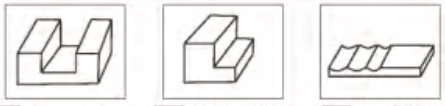
☐ Form HA

☐ Form HB

☐ Straight shank

Special design

Machining method



☐ Slot milling ☐ Side milling ☐ Profiling

Coating

Yes ☐

No ☐

Remark/Note:

Ordering quantities: pieces Expecting delivery date:

Quotation of supplier: Buyer confirmation:

Date:

Selections of interchangeable modular end mills

Products picture

Product name

Product category

Processing type

Products drawing

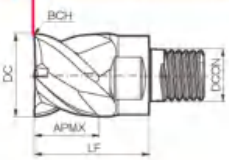
Interchangeable modular end mills
PM sries interchangeable modular end mills

4-flute unequal pitch flattened end mills with straight shank



PM-4E







Type	Basic dimension(mm)					Interface	Number of teeth Z	Wrench specifications		Stock
	DC	DCON	LF	APMX	BCH					
Q07-PM-4E-D10.0	10	7.5	16.0	6.5	0.10×45°	Q07	4	QCH-7.5X8		●
Q08-PM-4E-D12.0	12	8.5	17.0	7.0	0.10×45°	Q08	4	QCH-10X13		●
Q10-PM-4E-D16.0	16	10.65	21.5	9.0	0.10×45°	Q10	4	QCH-10X13		●
Q12-PM-4E-D20.0	20	12.65	25.5	11.0	0.15×45°	Q12	4	QCH-16X20		●
Q14-PM-4E-D25.0	25	14.65	31.5	13.5	0.15×45°	Q14	4	QCH-16X20		●
Q18-PM-4E-D32.0	32	18.65	36.0	17.0	0.15×45°	Q18	4	QCH-26		●

● Stock available ○ Make-to-order

Applicable workpiece material table ○Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
○	○	○	○	○		○	○			○	○

The corresponding toolholder B673-B676 Code key B658 Graphics category and identification B657 Cutting parameters B677

Applicable material table

Helical angle, coating, flute diameter tolerance

Products Specifications showing order number,basic dimensions, teeth number, stock

Code key, cutting parametersPicture types and indentification, order to customerize



MILLING

Interchangeable modular end mills

Interchangeable modular end mills overview	B656
Interchangeable modular end mills picture types and indentification	B657
Code key of interchangeable modular end mills	B658
PM series interchangeable modular end mills	B660-B662
VPM series interchangeable modular end mills	B663-B664
HMX series interchangeable modular end mills	B665-B667
XM series interchangeable modular end mills	B668-B672
Interchangeable straight shank holder	B673-B674
Interchangeable taper shank milling holder	B675
Interchangeable HSK shank milling holder	B676
Recommended cutting parameters for interchangeable module end mills	B677-B679
Technical information of interchangeable module end mills	B680







Interchangeable module end mills overview

Machining application	Geometry	Number of teeth	Type	Shape	Size range	Workpiece material									Page	
						P		M	K	N		S	H			
						Carbon steel, alloy steel	Pre-hardened steel	Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Heat resistant alloy, Titanium alloy	High hardness steel		Specification	Cutting parameters
													Below 55HRC	Above 55HRC		
High-performance general milling	Flattened	4	PM-4E		Ø10~Ø32	◎	◎	○	◎			○	◎		B660	B677
	Ball nose	2/4	PM-2B/4B		R5.0~R16.0	◎	◎	○	◎			○	◎		B661	B677
	Radius	4	PM-4R		Ø10~Ø32	◎	◎	○	◎			○	◎		B662	B677
	Flattened	4	VPM-4E		Ø10~Ø32	◎	◎	○	◎			○	◎		B663	B677
	Radius		VPM-4R		Ø10~Ø32	◎	◎	○	◎			○	◎		B664	B677
Machining high hardness steel	Flattened	4	HMX-4E		Ø10~Ø32				○				◎	◎	B665	B678
	Ball nose	2/4	HMX-2B/4B		R5.0~R16.0				○				◎	◎	B666	B678
	Radius	4	HMX-4R		Ø10~Ø32				○				◎	◎	B667	B678
Economical general machining	Flattened	2	XM-2E		Ø10~Ø16	◎	◎	○	◎			○	◎		B668	B679
	Radius		XM-2R		Ø10~Ø16	◎	◎	○	◎			○	◎		B669	B679
	Ball nose		XM-2B		R5.0~R8.0	◎	◎	○	◎			○	◎		B670	B678
	Chamfer type		XM-2C		Ø10~Ø16	◎	◎	○	◎			○	◎		B671	B678
	Honing and chamfer type		XM-2CR		Ø10~Ø16	◎	◎	○	◎			○	◎		B672	B678

◎Very suitable ○Suitable

Interchangeable modular end mills picture types and indentification

Coating of mills

Coated AlCrXN	AlCrXN coating
Coated NaNo TiAlXN	Heat resistant super crystal nano TiAlXN base coating
Coated NaNo TiAlN	Nano TiAlN coating

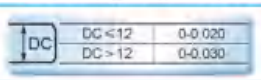
End tooth type of mills

	2-flute flattened end mills
	2-flute ball nose end mills
	2-flute ball nose end mills
	2-flute R end mills
	4-flute flattened end mills
	4-flute ball nose end mills
	4-flute R end mills
	Chamfer mills
	Chamfer mills with radius
	High feed mills

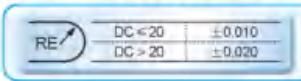
Helical angle

	β is helical angle: 30° ,35° ,38° ,45°

Cutting diameter tolerance

	Cutting diameter tolerance

Radius tolerance of ball nose end mills

	Radius tolerance

Machining operation

 Side face	Flattened end mills for side machining
 Step shoulder	Flattened end mills for shoulder machining
 Straight slot	Flattened end mills for straight slot machining
 Profile	Ball nose end mills for profile machining
 Cavity	Ball nose end mills for cavity machining
 Ball nose slot	Ball nose end mills for slot machining
 Radius shoulder	R end mills for side machining
 Radius corner slot	R end mills for slot machining
 Profile	R end mills for profile machining
 Chamfering	Chamfering by chamfer mills
 Radial chamfering	Chamfering mills with radius processing radiu chamfer
 Pilot hole machining	High feed mills machining pilot hole

Interchangeable

modular end mills series

New series of interchangeable modular end mill combines the advantages of both solid carbide end mills and indexable toolholders together to achieve high-precision, high-rigidity, and high-efficiency machining.

- Solid carbide cutting head with high precision and consistency;
- The self-centering screw thread ensures the quick replacement, high security and high strength;
- Double positioning from both radial and axial direction guarantees the high rigidity, high stablity and high-precision coupling;
- Quick mounting on the machine tool would reduce the non-cutting time which would increase the productivity significantly;
- Three cutting head series can share the shanks with the indexable inserts interchangeable series which can satisfy face milling, slot milling, shoulder milling, profile milling, ramping and plunging from roughing to finishing different working conditions.



Interchangeable milling cutter

G - **16** - **QCH** - **Q10** - **150** **C** - **ZJ32**

- **G** — Round shank
- **16** — Shank diameter: 10-32mm
- **QCH** — Interchangeable milling series
- **Q10** — Corresponding tool bit connector code

Q07	Q08
Q10	Q12
Q14	Q18

- **150** — Overall length
- **C** — Material

C	Cemented Carbide
S	Steel

- **ZJ32** — Length of taper

Interchangeable milling bits code

Q10 - **XM** - **2** **E** - **D16.0** **R3.0**

- **Q10**

Connector code	Diameter
Q07	10mm
Q08	12mm
Q10	16mm
Q12	20mm
Q14	25mm
Q18	32mm

- **XM**

Chip breaker	Applications
PM	General machining
HMX	High hardness machining
XM	Economical machining

- **2** — Number of flutes
- **E**

Nose shape code	Types of cutter
E	Flat
R	Circular
B	Ball
C	Chamfered
CR	Fillet
H	Deep-feed

Chamfer code	Chamfer angle
C60	60°
C90	90°
C120	120°

- **D16.0** — Bit diameter (10-32mm)
- **R3.0**

R	Radius
H	Length of chamfer

Tungsten carbide interchangeable cutting heads
Flattened end mills, Ball end mills, Radius end mills.

Interchangeable shank
Selections of steel shank, carbide shank, and tooling system are suitable for long overhang, high feed rate and other working conditions.

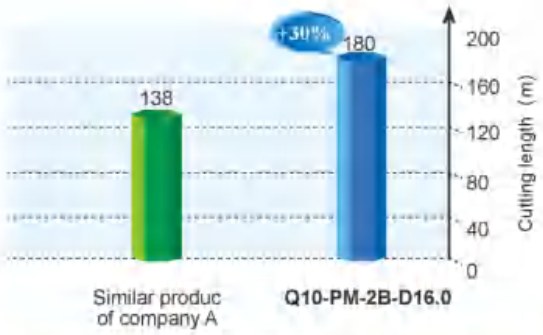
Screw thread
The screw thread with abundant surface contact at the curved surface with high precision which provides the outstanding precision performance and stablity.

High-precision positioning surface
Assurance of the perfect combination of the shank and cutting heads.



Good rigidity, longer tool life

Workpiece material: NAK80(HRC40)
Machining methods: Profile milling
Interchangeable head: Q10-PM-2B-D16.0
Toolholder: G16-QCH-Q10-150C
Cutting method: Down milling, wet cut
Machining requirement: Ra≤0.6μm,
When Ra > 0.6μm tool failure.
Machine tool: Vertical Machining Center
Cutting parameters: Vc=250m/min, fz=0.06mm/z,
ap=0.5mm, ae=0.5mm

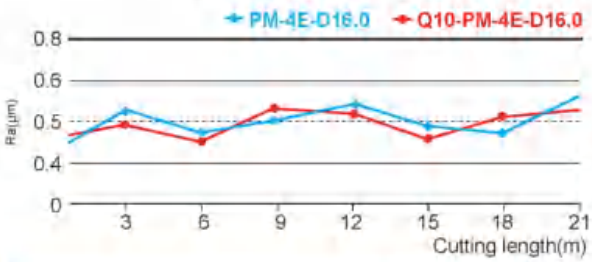


Result: The interchangeable modular end mill has good rigidity and anti-vibration performance. Comparing with the similar product from company A, it has longer tool life and better efficiency.

High-precision and extraodinary surface quality



Workpiece material: 718H(HRC35)
Machining methods: Side milling
Interchangeable head: Q10-PM-4E-D16.0
Toolholder: G16-QCH-Q10-120C
Cutting method: Down milling, wet cut
Machine tool: Vertical Machining Center
Cutting parameters: V_c=200m/min, f_z=0.06mm/z,
a_p=8mm, a_e=0.4mm



New series of interchangeable modular end mill with high precision and surface quality which has almost the same performance as the solid carbide end mill.

4-flute unequal pitch flattened end mills with straight shank

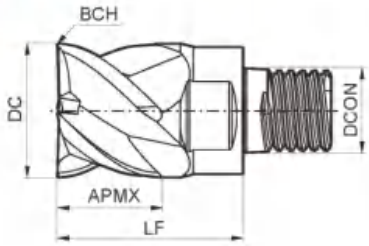

Side face


Step shoulder


Straight slot

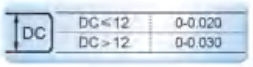
PM-4E













Type	Basic dimension(mm)					Interface	Number of teeth Z	Wrench specifications		Stock
	DC	DCON	LF	APMX	BCH					
Q07-PM-4E-D10.0	10	7.5	16.0	6.5	0.10×45°	Q07	4	QCH-7.5X8		●
Q08-PM-4E-D12.0	12	8.5	17.0	7.0	0.10×45°	Q08	4	QCH-10X13		●
Q10-PM-4E-D16.0	16	10.65	21.5	9.0	0.10×45°	Q10	4	QCH-10X13		●
Q12-PM-4E-D20.0	20	12.65	25.5	11.0	0.15×45°	Q12	4	QCH-16X20		●
Q14-PM-4E-D25.0	25	14.65	31.5	13.5	0.15×45°	Q14	4	QCH-16X20		●
Q18-PM-4E-D32.0	32	18.65	36.0	17.0	0.15×45°	Q18	4	QCH-26		●

● Stock available ○ Make-to-order

Remark:The wrench need to be purchased separately

Illustration

1. APMX, if the number of teeth, radius and size in the table are different, can be customized.
2. APMX is smaller than or equal to the size in the table and has better cost performance.

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

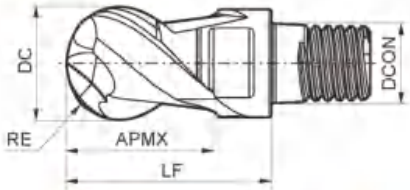
The corresponding toolholder B673-B676
Code key B658
Graphics category and identification B657
Cutting parameters B677

2/4-flute ball nose end mills with straight shank

Profile | Cavity | Ball nose slot

PM-2B/4B





38° | 30° | Coated NaNo TiAlN

DC	DC<12	0-0.020
	DC>12	0-0.030

RE	DC≤20	±0.010
	DC>20	±0.020

Type	Basic dimension(mm)					Interface	Number of teeth Z	Wrench specifications		Stock
	DC	DCON	LF	APMX	RE					
Q07-PM-2B-D10.0	10	7.5	16.0	6.0	5.0	Q07	2	QCH-7.5X8		●
Q07-PM-4B-D10.0	10	7.5	16.0	6.5	5.0		4			●
Q08-PM-2B-D12.0	12	8.5	17.0	7.0	6.0	Q08	2	QCH-10X13		●
Q08-PM-4B-D12.0	12	8.5	17.0	7.0	6.0		4			●
Q10-PM-2B-D16.0	16	10.65	21.5	9.0	8.0	Q10	2			●
Q10-PM-4B-D16.0	16	10.65	21.5	9.0	8.0		4			●
Q12-PM-2B-D20.0	20	12.65	25.5	11.0	10.0	Q12	2	QCH-16X20		●
Q12-PM-4B-D20.0	20	12.65	25.5	11.0	10.0		4			●
Q14-PM-2B-D25.0	25	14.65	31.5	13.5	12.5	Q14	2			●
Q14-PM-4B-D25.0	25	14.65	31.5	13.5	12.5		4			●
Q18-PM-2B-D32.0	32	18.65	36.0	17.0	16.0	Q18	2	QCH-26		●
Q18-PM-4B-D32.0	32	18.65	36.0	17.0	16.0		4			●

● Stock available ○ Make-to-order

Remark:The wrench need to be purchased separately

Illustration

1. APMX, if the number of teeth, radius and size in the table are different, can be customized.
2. APMX is smaller than or equal to the size in the table and has better cost performance.

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

The corresponding toolholder B673-B676 | Code key B658 | Graphics category and identification B657 | Cutting parameters B677

4-flute R end mills with straight shank

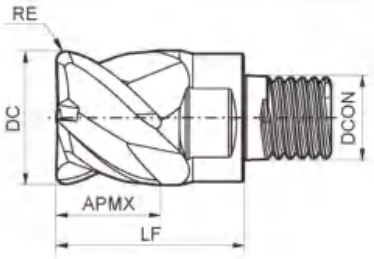

Radius shoulder


Profile


Radius corner slot

PM-4R













Type	Basic dimension(mm)					Interface	Number of teeth Z	Wrench specifications		Stock
	DC	DCON	LF	APMX	RE					
Q07-PM-4R-D10.0R1.0	10	7.5	16.0	6.5	1.0	Q07	4	QCH-7.5X8		●
Q08-PM-4R-D12.0R1.0	12	8.5	17.0	7.0	1.0	Q08	4	QCH-10X13		●
Q10-PM-4R-D16.0R1.5	16	10.65	21.5	9.0	1.5	Q10	4	QCH-10X13		●
Q12-PM-4R-D20.0R2.0	20	12.65	25.5	11.0	2.0	Q12	4	QCH-16X20		●
Q14-PM-4R-D25.0R2.5	25	14.65	31.5	13.5	2.5	Q14	4	QCH-16X20		●
Q18-PM-4R-D32.0R3.0	32	18.65	36.0	17.0	3.0	Q18	4	QCH-26		●

● Stock available ○ Make-to-order

Remark:The wrench need to be purchased separately

Illustration

1. APMX, if the number of teeth, radius and size in the table are different, can be customized.
2. APMX is smaller than or equal to the size in the table and has better cost performance.

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

The corresponding toolholder B673-B676
Code key B658
Graphics category and identification B657
Cutting parameters B677

4-flute unequal pitch flattened end mills with straight shank

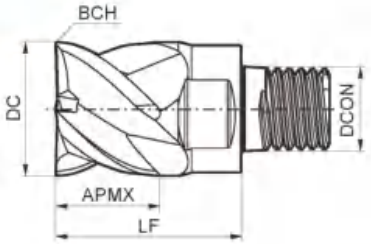

Side face


Step shoulder


Straight slot

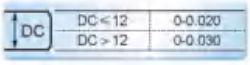
VPM-4E













Type	Basic dimension(mm)					Interface	Number of teeth Z	Wrench specifications		Stock
	DC	DCON	LF	APMX	BCH					
Q07-VPM-4E-D10.0	10	7.5	16.0	6.0	0.10×45°	Q07	4	QCH-7.5X8		●
Q08-VPM-4E-D12.0	12	8.5	17.0	7.0	0.10×45°	Q08	4	QCH-10X13		●
Q10-VPM-4E-D16.0	16	10.65	21.5	9.0	0.10×45°	Q10	4	QCH-10X13		●
Q12-VPM-4E-D20.0	20	12.65	25.5	11.0	0.15×45°	Q12	4	QCH-16X20		●
Q14-VPM-4E-D25.0	25	14.65	31.5	13.5	0.15×45°	Q14	4	QCH-16X20		●
Q18-VPM-4E-D32.0	32	18.65	36.0	17.0	0.15×45°	Q18	4	QCH-26		●

● Stock available ○ Make-to-order

Remark:The wrench need to be purchased separately

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

The corresponding toolholder B673-B676
Code key B658
Graphics category and identification B657
Cutting parameters B677

4-flute R end mills with straight shank

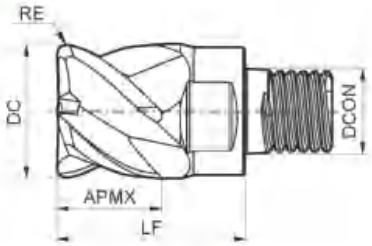

Radius shoulder


Profile


Radius corner slot

VPM-4R













Type	Basic dimension(mm)					Interface	Number of teeth Z	Wrench specifications		Stock
	DC	DCON	LF	APMX	RE					
Q07-VPM-4R-D10.0R0.3	10	7.5	16.0	6.0	0.3	Q07	4	QCH-7.5X8		○
Q07-VPM-4R-D10.0R0.5	10	7.5	16.0	6.0	0.5	Q07	4			●
Q07-VPM-4R-D10.0R1.0	10	7.5	16.0	6.0	1.0	Q07	4			●
Q07-VPM-4R-D10.0R1.5	10	7.5	16.0	6.0	1.5	Q07	4			○
Q08-VPM-4R-D12.0R0.3	12	8.5	17.0	7.0	0.3	Q08	4	QCH-10X13		○
Q08-VPM-4R-D12.0R0.5	12	8.5	17.0	7.0	0.5	Q08	4			●
Q08-VPM-4R-D12.0R1.0	12	8.5	17.0	7.0	1.0	Q08	4			●
Q08-VPM-4R-D12.0R1.5	12	8.5	17.0	7.0	1.5	Q08	4			○
Q08-VPM-4R-D12.0R2.0	12	8.5	17.0	7.0	2.0	Q08	4			○
Q10-VPM-4R-D16.0R0.5	16	10.65	21.5	9.0	0.5	Q10	4			○
Q10-VPM-4R-D16.0R1.0	16	10.65	21.5	9.0	1.0	Q10	4			●
Q10-VPM-4R-D16.0R1.5	16	10.65	21.5	9.0	1.5	Q10	4			●
Q10-VPM-4R-D16.0R2.0	16	10.65	21.5	9.0	2.0	Q10	4			○
Q10-VPM-4R-D16.0R3.0	16	10.65	21.5	9.0	3.0	Q10	4			○
Q12-VPM-4R-D20.0R1.0	20	12.65	25.5	11.0	1.0	Q12	4	QCH-16X20		●
Q12-VPM-4R-D20.0R1.5	20	12.65	25.5	11.0	1.5	Q12	4			●
Q12-VPM-4R-D20.0R2.0	20	12.65	25.5	11.0	2.0	Q12	4			●
Q12-VPM-4R-D20.0R3.0	20	12.65	25.5	11.0	3.0	Q12	4			○
Q14-VPM-4R-D25.0R1.5	25	14.65	31.5	13.5	1.5	Q14	4			●
Q14-VPM-4R-D25.0R2.0	25	14.65	31.5	13.5	2.0	Q14	4			●
Q14-VPM-4R-D25.0R2.5	25	14.65	31.5	13.5	2.5	Q14	4			●
Q14-VPM-4R-D25.0R3.0	25	14.65	31.5	13.5	3.0	Q14	4			○
Q18-VPM-4R-D32.0R2.0	32	18.65	36.0	17.0	2.0	Q18	4	QCH-26		●
Q18-VPM-4R-D32.0R2.5	32	18.65	36.0	17.0	2.5	Q18	4			○
Q18-VPM-4R-D32.0R3.0	32	18.65	36.0	17.0	3.0	Q18	4			●
Q18-VPM-4R-D32.0R4.0	32	18.65	36.0	17.0	4.0	Q18	4			○

● Stock available ○ Make-to-order

Remark:The wrench need to be purchased separately

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

The corresponding toolholder B673-B676
Code key B658
Graphics category and identification B657
Cutting parameters B677

4-flute unequal pitch flattened end mills with straight shank

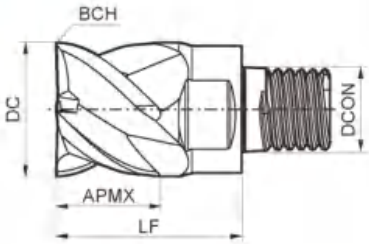

Side face


Step shoulder


Straight slot

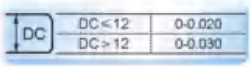
HMX-4E













Type	Basic dimension(mm)					Interface	Number of teeth Z	Wrench specifications		Stock
	DC	DCON	LF	APMX	BCH					
Q07-HMX-4E-D10.0	10	7.5	16.0	6.5	0.06×45°	Q07	4	QCH-7.5X8		●
Q08-HMX-4E-D12.0	12	8.5	17.0	7.0	0.1×45°	Q08	4	QCH-10X13		●
Q10-HMX-4E-D16.0	16	10.65	21.5	9.0	0.1×45°	Q10	4			●
Q12-HMX-4E-D20.0	20	12.65	25.5	11.0	0.15×45°	Q12	4	QCH-16X20		●
Q14-HMX-4E-D25.0	25	14.65	31.5	13.5	0.15×45°	Q14	4			●
Q18-HMX-4E-D32.0	32	18.65	36.0	17.0	0.15×45°	Q18	4	QCH-26		●

● Stock available ○ Make-to-order

Remark:The wrench need to be purchased separately

Illustration

1. APMX, if the number of teeth, radius and size in the table are different, can be customized.
2. APMX is smaller than or equal to the size in the table and has better cost performance.

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

The corresponding toolholder B673-B676
Code key B658
Graphics category and identification B657
Cutting parameters B678

2/4-flute ball nose end mills with straight shank

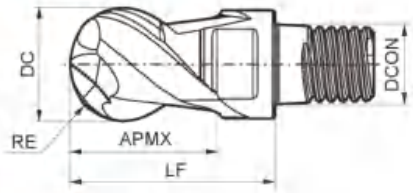

Profile

Cavity

Ball nose slot

HMX-2B/4B





35°

Coated NaNo TiAlN

DC		
DC≤12	0-0.020	
DC>12	0-0.030	

RE		
DC≤20	±0.010	
DC>20	±0.020	

Type	Basic dimension(mm)					Interface	Number of teeth Z	Wrench specifications		Stock
	DC	DCON	LF	APMX	RE					
Q07-HMX-2B-D10.0	10	7.5	16.0	6.0	5.0	Q07	2	QCH-7.5X8		●
Q07-HMX-4B-D10.0	10	7.5	16.0	6.5	5.0		4			●
Q08-HMX-2B-D12.0	12	8.5	17.0	7.0	6.0	Q08	2	QCH-10X13		●
Q08-HMX-4B-D12.0	12	8.5	17.0	7.0	6.0		4			●
Q10-HMX-2B-D16.0	16	10.65	21.5	9.0	8.0	Q10	2			●
Q10-HMX-4B-D16.0	16	10.65	21.5	9.0	8.0		4			●
Q12-HMX-2B-D20.0	20	12.65	25.5	11.0	10.0	Q12	2	QCH-16X20		●
Q12-HMX-4B-D20.0	20	12.65	25.5	11.0	10.0		4			●
Q14-HMX-2B-D25.0	25	14.65	31.5	13.5	12.5	Q14	2			●
Q14-HMX-4B-D25.0	25	14.65	31.5	13.5	12.5		4			●
Q18-HMX-2B-D32.0	32	18.65	36.0	17.0	16.0	Q18	2	QCH-26		●
Q18-HMX-4B-D32.0	32	18.65	36.0	17.0	16.0		4			●

● Stock available ○ Make-to-order

Remark:The wrench need to be purchased separately

Illustration

1. APMX, if the number of teeth, radius and size in the table are different, can be customized.
2. APMX is smaller than or equal to the size in the table and has better cost performance.

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

The corresponding toolholder B673-B676
Code key B658
Graphics category and identification B657
Cutting parameters B678

4-flute R end mills with straight shank

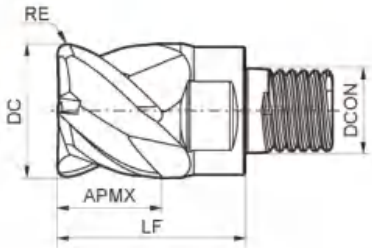

Radius shoulder


Profile


Radius corner slot

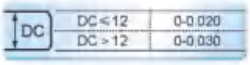
HMX-4R













Type	Basic dimension(mm)					Interface	Number of teeth Z	Wrench specifications		Stock
	DC	DCON	LF	APMX	RE					
Q07-HMX-4R-D10.0R1.0	10	7.5	16	6.5	1.0	Q07	4	QCH-7.5X8		●
Q08-HMX-4R-D12.0R1.0	12	8.5	17.0	7.0	1.0	Q08	4	QCH-10X13		●
Q10-HMX-4R-D16.0R1.5	16	10.65	21.5	9.0	1.5	Q10	4			●
Q12-HMX-4R-D20.0R2.0	20	12.65	25.5	11.0	2.0	Q12	4	QCH-16X20		●
Q14-HMX-4R-D25.0R2.5	25	14.65	31.5	13.5	2.5	Q14	4			●
Q18-HMX-4R-D32.0R3.0	32	18.65	36.0	17.0	3.0	Q18	4	QCH-26		●

● Stock available ○ Make-to-order

Remark:The wrench need to be purchased separately

Illustration

1. APMX, if the number of teeth, radius and size in the table are different, can be customized.
2. APMX is smaller than or equal to the size in the table and has better cost performance.

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
			○	◎	◎		○				

The corresponding toolholder B673-B676
Code key B658
Graphics category and identification B657
Cutting parameters B678

XM series of interchangeable flat end mills

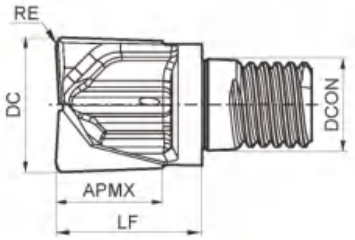

Side face


Step shoulder


Straight slot

XM-2E





Coated NaNo TiAlN

DC	
DC≤12	0-0.020
DC>12	0-0.030

Type	Basic dimension(mm)					Interface	Number of teeth Z	Wrench specifications		Stock
	DC	DCON	LF	APMX	RE					
Q07-XM-2E-D10.0R0.3	10	7.5	12.5	9.0	R0.3	Q07	2	QCH-5X6.5		●
Q08-XM-2E-D12.0R0.4	12	8.5	15.3	11.5	R0.4	Q08	2			●
Q10-XM-2E-D16.0R0.5	16	10.65	18.0	14.0	R0.5	Q10	2	QCH-7.5X8		●

● Stock available ○ Make-to-order

Remark:The wrench need to be purchased separately

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

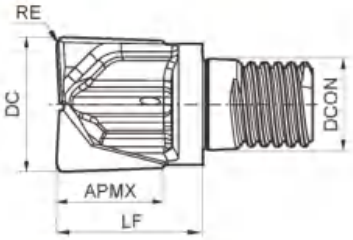
The corresponding toolholder B673-B676
Code key B658
Graphics category and identification B657
Cutting parameters B679

XM series of interchangeable R end mills

Radius shoulder | Profile | Radius corner slot

XM-2R





Coated AlCrXN

DC	
DC≤12	0-0.020
DC>12	0-0.030

Type	Basic dimension(mm)					Interface	Number of teeth Z	Wrench specifications		Stock
	DC	DCON	LF	APMX	RE					
Q07-XM-2R-D10.0R1.0	10	7.5	12.5	9.0	1	Q07	2	QCH-5X6.5		●
Q07-XM-2R-D10.0R2.0	10	7.5	12.5	9.0	2	Q07	2			○
Q08-XM-2R-D12.0R1.0	12	8.5	15.3	11.5	1	Q08	2			●
Q08-XM-2R-D12.0R2.0	12	8.5	15.3	11.5	2	Q08	2			○
Q08-XM-2R-D12.0R3.0	12	8.5	15.3	11.5	3	Q08	2			○
Q10-XM-2R-D16.0R1.0	16	10.65	18	14	1	Q10	2	QCH-7.5X8		●
Q10-XM-2R-D16.0R2.0	16	10.65	18	14	2	Q10	2			○
Q10-XM-2R-D16.0R3.0	16	10.65	18	14	3	Q10	2			○
Q10-XM-2R-D16.0R4.0	16	10.65	18	14	4	Q10	2			○

● Stock available ○ Make-to-order

Remark:The wrench need to be purchased separately

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

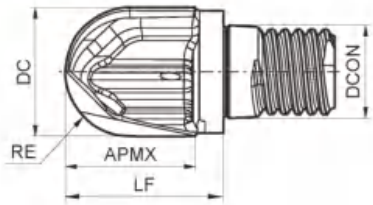
The corresponding toolholder B673-B676 | Code key B658 | Graphics category and identification B657 | Cutting parameters B679

XM series of interchangeable ball nose end mills

Profile Cavity Ball nose slot

XM-2B





Coated AlCrXN

DC	
DC≤12	0-0.020
DC>12	0-0.030

Type	Basic dimension(mm)					Interface	Number of teeth Z	Wrench specifications		Stock
	DC	DCON	LF	APMX	RE					
Q07-XM-2B-D10.0	10	8.5	12.5	10.2	5	Q07	2	QCH-5X6.5		●
Q08-XM-2B-D12.0	12	8.5	15.3	11.5	6	Q08	2			●
Q10-XM-2B-D16.0	16	8.5	18.0	14.0	8	Q10	2	QCH-7.5X8		●

● Stock available ○ Make-to-order

Remark:The wrench need to be purchased separately

Applicable workpiece material table ◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

The corresponding toolholder B673-B676
Code key B658
Graphics category and identification B657
Cutting parameters B678

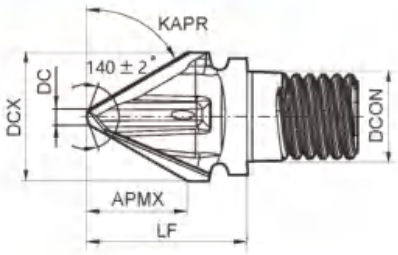
XM series of interchangeable chamfered end mills


Chamfering


Centering hole processing

XM-2C





Coated NaNo TiAlN

DC	
DC≤12	0-0.020
DC>12	0-0.030

Type	Basic dimension(mm)						Interface	Number of teeth Z	Wrench specifications		Stock
	DCX	DCON	DC	LF	APMX	KAPR					
Q07-XM-2C60-D10H7.6	10	7.5	1.5	12.0	7.6	60°	Q07	2	QCH-5X6.5		○
Q07-XM-2C90-D10H4.5	10	7.5	1.5	12.0	4.5	45°	Q07	2			○
Q07-XM-2C120-D10H2.7	10	7.5	1.5	12.0	2.7	30°	Q07	2			○
Q08-XM-2C60-D12H9.2	12	8.5	1.5	16.0	9.2	60°	Q08	2			○
Q08-XM-2C90-D12H5.3	12	8.5	1.5	16.0	5.3	45°	Q08	2			○
Q08-XM-2C120-D12H3.5	12	8.5	1.5	16.0	3.5	30°	Q08	2			○
Q10-XM-2C60-D16H12.1	16	10.65	2.5	18.0	12.1	60°	Q10	2	QCH-7.5X8		○
Q10-XM-2C90-D16H7.4	16	10.65	1.5	18.0	7.4	45°	Q10	2			○
Q10-XM-2C120-D16H4.4	16	10.65	1.5	18.0	4.4	30°	Q10	2			○

● Stock available ○ Make-to-order

Remark:The wrench need to be purchased separately

Applicable workpiece material table ◎Very suitable ○Suitable

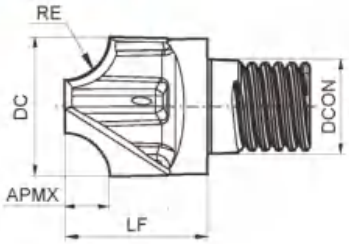
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

The corresponding toolholder B673-B676
Code key B658
Graphics category and identification B657
Cutting parameters B678

XM series of interchangeable fillet end mills

XM-2CR





Coated NaNo TiALN

DC		
DC	DC≤12	0-0.020
	DC>12	0-0.030

Type	Basic dimension(mm)					Interface	Number of teeth Z	Wrench specifications		Stock
	DC	DCON	RE	LF	APMX					
Q07-XM-2CR-D10.0R1.0	10	7.5	1	14.0	1.0	Q07	2	QCH-5X6.5		○
Q07-XM-2CR-D10.0R2.0	10	7.5	2	14.0	2.0	Q07	2	QCH-5X6.5		○
Q08-XM-2CR-D12.0R1.0	12	8.5	1	16.0	1.0	Q07	2	QCH-5X6.5		○
Q08-XM-2CR-D12.0R3.0	12	8.5	3	16.0	3.0	Q07	2	QCH-5X6.5		○
Q08-XM-2CR-D12.0R4.0	12	8.5	4	16.0	4.0	Q08	2	QCH-5X6.5		○
Q10-XM-2CR-D16.0R1.0	16	10.65	1	18.0	1.0	Q08	2	QCH-5X6.5		○
Q10-XM-2CR-D16.0R3.0	16	10.65	3	18.0	3.0	Q08	2	QCH-5X6.5		○
Q10-XM-2CR-D16.0R4.0	16	10.65	4	18.0	4.0	Q10	2	QCH-7.5X8		○
Q10-XM-2CR-D16.0R5.0	16	10.65	5	18.0	5.0	Q10	2	QCH-7.5X8		○

Remark:The wrench need to be purchased separately

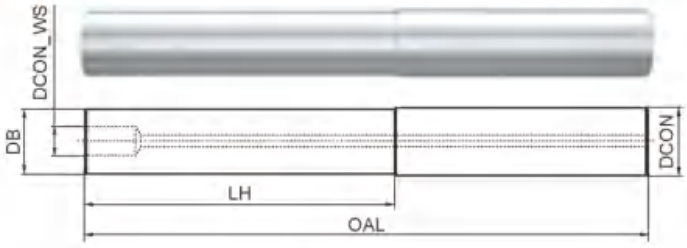
● Stock available ○ Make-to-order

Applicable workpiece material table ◎Very suitable ○Suitable

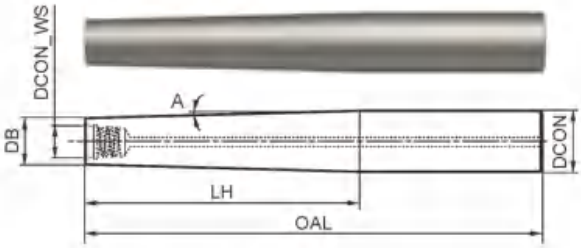
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel, Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~55HRC	~68HRC						
◎	◎	◎	◎	◎		○	◎			○	○

The corresponding toolholder B673-B676
Code key B658
Graphics category and identification B657
Cutting parameters B678

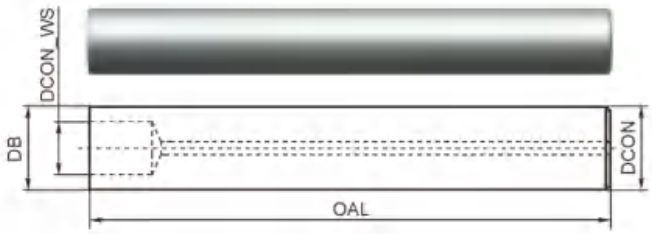
Selections of interchangeable straight shank



Picture 1



Picture 2



Picture 3

h6	12≤D4≤16	20≤D4≤25	25≤D4≤32
	0-0.011	0-0.013	0-0.016

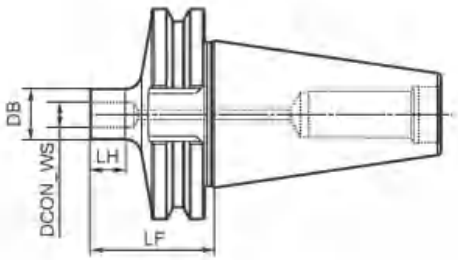
Steel holder

Inteface DCON_WS	Type	Stock	Weight	Basic dimension(mm)					Picture
				OAL	LH	DCON	DB	DCON_WS	
Q07	G10-QCH-Q07-65S	●	0.04	65	14	10	9.5	7.5	Picture 1
	G10-QCH-Q07-75S	●	0.05	75	24				
	G10-QCH-Q07-85S	●	0.06	85	34				
Q08	G12-QCH-Q08-65S	●	0.05	65	20	12	11.5	8.5	
	G12-QCH-Q08-80S	●	0.06	80	35				
	G12-QCH-Q08-90S	●	0.07	90	45				
	G16-QCH-Q08-60S	●	0.08	60	7	16			
Q10	G16-QCH-Q10-80S	●	0.11	80	26.5	16	15.2	10.65	
	G16-QCH-Q10-100S	●	0.14	100	42.5				
	G16-QCH-Q10-110S	●	0.15	110	58.5				
	G20-QCH-Q10-65S	●	0.14	65	10.5	20			
Q12	G20-QCH-Q12-90S	●	0.19	90	34.5	20	19	12.65	
	G20-QCH-Q12-110S	●	0.23	110	54.5				
	G20-QCH-Q12-125S	●	0.26	125	74.5				
	G25-QCH-Q12-75S	●	0.24	75	14.5	25			
Q14	G25-QCH-Q14-100S	●	0.34	100	43.5	25	24	14.65	
	G25-QCH-Q14-125S	●	0.42	125	68.5				
	G25-QCH-Q14-150S	●	0.5	150	93.5				
	G32-QCH-Q14-80S	●	0.42	80	18.5	32			
Q18	G32-QCH-Q18-125S	●	0.69	125	60	32	30	18.65	
	G32-QCH-Q18-160S	●	0.88	160	92				
	G32-QCH-Q18-185S	●	1.01	185	124				
	G40-QCH-Q18-100S	●	0.81	100	28	40			

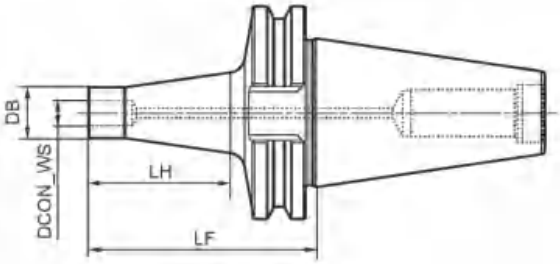
Carbide holder

Inteface DCON_WS	Type	Stock	Weight	Basic dimension(mm)					Picture
				OAL	LH	DCON	DB	DCON_WS	
Q07	G10-QCH-Q07-55C	●	0.06	55	5	10	9.5	7.5	Picture 1
	G10-QCH-Q07-75C	●	0.1	75	25				
	G10-QCH-Q07-85C	●	0.13	85	35				
	G10-QCH-Q07-105C	●	0.19	105	55				
	G10-QCH-Q07-125C	●	0.25	125	75		10		Picture 3
	G10-QCH-Q07-145C	●	0.17	145	–				
	G12-QCH-Q07-120C-ZJ70	●	0.18	120	70	12	9.5		Picture 2
Q08	G12-QCH-Q08-55C	●	0.08	55	5	12	11.5	8.5	Picture 2
	G12-QCH-Q08-80C	●	0.11	80	30				
	G12-QCH-Q08-100C	●	0.14	100	50				
	G12-QCH-Q08-120C	●	0.17	120	70		11.5		Picture 1
	G12-QCH-Q08-155C	●	0.22	155	–	12	12		Picture 3
	G12-QCH-Q08-165C	●	0.24	165	–				
	G16-QCH-Q08-140C-ZJ90	●	0.25	140	90	16	11.5		Picture 2
Q10	G16-QCH-Q10-55C	●	0.13	55	5	16	15.2	10.65	Picture 1
	G16-QCH-Q10-90C	●	0.22	90	40				
	G16-QCH-Q10-120C	●	0.3	120	70				
	G16-QCH-Q10-150C	●	0.37	150	100				
	G16-QCH-Q10-190C	●	0.46	190	–		16		Picture 3
	G16-QCH-Q10-205C	●	0.5	205	–				
	G20-QCH-Q10-200C-ZJ140	●	0.69	200	140	20	15.2		Picture 2
Q12	G20-QCH-Q12-65C	●	0.25	65	5	20	19	12.65	Picture 1
	G20-QCH-Q12-100C	●	0.38	100	40				
	G20-QCH-Q12-140C	●	0.53	140	80				
	G20-QCH-Q12-180C	●	0.68	180	120				
	G20-QCH-Q12-235C	●	0.87	235	–		20		Picture 3
	G20-QCH-Q12-255C	●	0.94	255	–				
	G25-QCH-Q12-250C-ZJ180	●	1.323	250	180	–	19		Picture 2
Q14	G25-QCH-Q14-75C	●	0.47	75	5	25	24	14.65	Picture 1
	G25-QCH-Q14-120C	●	0.74	120	50				
	G25-QCH-Q14-170C	●	1.04	170	100				
	G25-QCH-Q14-220C	●	1.35	220	150				
	G25-QCH-Q14-290C	●	1.78	290	–		25		Picture 3
	G25-QCH-Q14-310C	●	1.91	310	–				
	G32-QCH-Q14-270C-ZJ200	●	2.38	270	200	32	24		Picture 2
Q18	G32-QCH-Q18-75C	●	0.77	75	5	32	30	18.65	Picture 1
	G32-QCH-Q18-140C	●	1.39	140	70				
	G32-QCH-Q18-200C	●	1.96	200	130				
	G32-QCH-Q18-260C	●	2.55	260	190				
	G32-QCH-Q18-320C	●	3.13	320	250				
	G32-QCH-Q18-355C	●	3.47	355	–		32		Picture 3
	G32-QCH-Q18-385C	●	3.76	385	–				

Selections of interchangeable taper shank



Picture 1

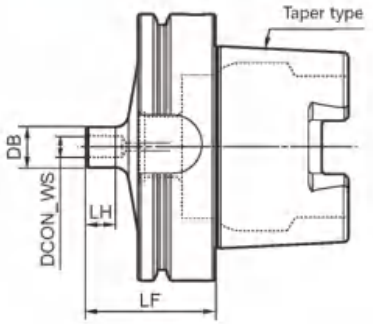


Picture 2

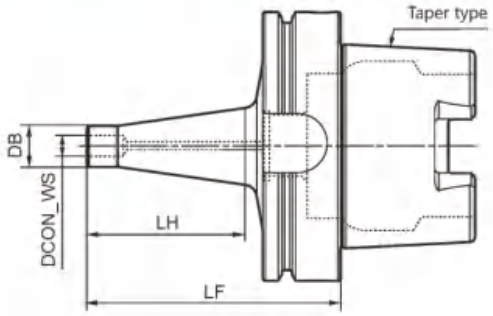
Inteface DCON_WS	Specification	LF	LH	BD	Picture	Weight (Kg)
Q08	BT30-QCH-Q08-35S	35.63	7	11.5	Picture 1	0.4
	BT40-QCH-Q08-42S	42.13	7		Picture 1	1.01
	BT50-QCH-Q08-56S	56.3	7		Picture 1	3.8
	BT30-QCH-Q08-46S	46.66	19		Picture 2	0.41
	BT40-QCH-Q08-64S	64.86	31		Picture 2	1.05
	BT50-QCH-Q08-90S	90.73	43		Picture 2	3.86
Q10	BT30-QCH-Q10-38S	38.8	10.5	15.2	Picture 1	0.41
	BT40-QCH-Q10-45S	45.3	10.5		Picture 1	1.02
	BT50-QCH-Q10-59S	59.48	10.5		Picture 1	3.8
	BT30-QCH-Q10-53S	53.73	26.5		Picture 2	0.44
	BT40-QCH-Q10-75S	75.83	42.5		Picture 2	1.1
	BT50-QCH-Q10-105S	105.61	58.5		Picture 2	3.96
Q12	BT30-QCH-Q12-42S	42.47	14.5	19	Picture 1	0.42
	BT40-QCH-Q12-48S	48.97	14.5		Picture 1	1.03
	BT50-QCH-Q12-63S	63.14	14.5		Picture 1	3.81
	BT30-QCH-Q12-61S	61.3	34.5		Picture 2	0.48
	BT40-QCH-Q12-87S	87.3	54.5		Picture 2	1.18
	BT50-QCH-Q12-120S	120.98	74.5		Picture 2	4.1
Q14	BT30-QCH-Q14-46S	46.03	18.5	24	Picture 1	0.45
	BT40-QCH-Q14-52S	52.53	18.5		Picture 1	1.06
	BT50-QCH-Q14-66S	66.7	18.5		Picture 1	3.84
	BT30-QCH-Q14-69S	69.8	43.5		Picture 2	0.57
	BT40-QCH-Q14-100S	100.61	68.5		Picture 2	1.37
	BT50-QCH-Q14-139S	139.16	93.5		Picture 2	4.41
Q18	BT40-QCH-Q18-61S	61.5	28	30	Picture 1	1.14
	BT50-QCH-Q18-75S	75.67	28		Picture 1	3.92
	BT40-QCH-Q18-122S	122.44	92		Picture 2	1.74
	BT50-QCH-Q18-168S	168.62	124		Picture 2	5.07

Inteface DCON_WS	Specification	LF	LH	BD	Picture	Weight (Kg)
Q08	JT30-QCH-Q08-33S	33.26	7	11.5	Picture 1	0.4
	JT40-QCH-Q08-34S	34.49	7		Picture 1	0.87
	JT50-QCH-Q08-37S	37.32	7		Picture 1	2.79
	JT30-QCH-Q08-44S	44.28	19		Picture 2	0.41
	JT40-QCH-Q08-57S	57.22	31		Picture 2	0.9
	JT50-QCH-Q08-71S	71.74	43		Picture 2	2.85
Q10	JT30-QCH-Q10-36S	36.43	10.5	15.2	Picture 1	0.41
	JT40-QCH-Q10-37S	37.67	10.5		Picture 1	0.88
	JT50-QCH-Q10-40S	40.49	10.5		Picture 1	2.79
	JT30-QCH-Q10-51S	51.36	26.5		Picture 2	0.43
	JT40-QCH-Q10-68S	68.2	42.5		Picture 2	0.96
	JT50-QCH-Q10-86S	86.62	58.5		Picture 2	2.95
Q12	JT30-QCH-Q12-40S	40.1	14.5	19	Picture 1	0.42
	JT40-QCH-Q12-41S	41.33	14.5		Picture 1	0.89
	JT50-QCH-Q12-44S	44.15	14.5		Picture 1	2.8
	JT30-QCH-Q12-58S	58.92	34.5		Picture 2	0.48
	JT40-QCH-Q12-79S	79.66	54.5		Picture 2	1.04
	JT50-QCH-Q12-101S	101.99	74.5		Picture 2	3.09
Q14	JT30-QCH-Q14-43S	43.66	18.5	24	Picture 1	0.45
	JT40-QCH-Q14-44S	44.89	18.5		Picture 1	0.92
	JT50-QCH-Q14-47S	47.71	18.5		Picture 1	2.84
	JT30-QCH-Q14-67S	67.36	43.5		Picture 2	0.57
	JT40-QCH-Q14-92S	92.97	68.5		Picture 2	1.22
	JT50-QCH-Q14-120S	120.18	93.5		Picture 2	3.4
Q18	JT40-QCH-Q18-53S	53.86	28	30	Picture 1	1.0
	JT50-QCH-Q18-56S	56.68	28		Picture 1	2.91
	JT40-QCH-Q18-115S	115.6	92		Picture 2	1.61
	JT50-QCH-Q18-149S	149.63	124		Picture 2	4.07

Selections of interchangeable HSK shank



Picture 1



Picture 2

Inteface DCON_WS	Specification	Basic dimension(mm)			Picture	quality
		LF	LH	DB		
Q08	HSK63-QCH-Q08-40S	40	7	11.5	Picture 1	0.66
	HSK63-QCH-Q08-64S	64	31		Picture 2	0.71
	HSK100-QCH-Q08-43S	43	7		Picture 1	2.0
	HSK100-QCH-Q08-82S	82	43		Picture 2	2.16
Q10	HSK63-QCH-Q10-43S	43	10.5	15.2	Picture 1	0.64
	HSK63-QCH-Q10-74S	74	42.5		Picture 2	0.75
	HSK100-QCH-Q10-48S	48	10.5		Picture 1	2.05
	HSK100-QCH-Q10-94S	94	58.5		Picture 2	2.2
Q12	HSK63-QCH-Q12-46S	46	14.5	19	Picture 1	0.69
	HSK63-QCH-Q12-86S	86	54.5		Picture 2	0.84
	HSK100-QCH-Q12-48S	48	14.5		Picture 1	2.02
	HSK100-QCH-Q12-112S	112	74.5		Picture 2	2.42
Q14	HSK63-QCH-Q14-51S	51	18.5	24	Picture 1	0.74
	HSK63-QCH-Q14-100S	100	68.5		Picture 2	1.03
	HSK100-QCH-Q14-55S	55	18.5		Picture 1	2.13
	HSK100-QCH-Q14-130S	130	93.5		Picture 2	2.73
Q18	HSK63-QCH-Q18-59S	59	28	30	Picture 1	0.79
	HSK63-QCH-Q18-120S	120	92		Picture 2	1.38
	HSK100-QCH-Q18-60S	60	28		Picture 1	2.15
	HSK100-QCH-Q18-155S	155	124		Picture 2	3.28

Recommended cutting parameters for interchangeable module end mills

PM-4E★PM-2B★PM-4B★PM-4R

Recommended cutting speed

Workpiece material / Cutting speed Vc	P	M	K	N	S	H
Vc(m/min)	70 ~ 280	60 ~ 160	80 ~ 280	270 ~ 840	20 ~ 70	30 ~ 80

Cutting parameters: (mm)

Machining methods / Edge diameter	Slotting			Side, Face milling			Profiling		
	f_z(mm/z)	Cutting width a_e	Cutting depth a_p	f_z(mm/z)	Cutting width a_e	Cutting depth a_p	f_z(mm/z)	Cutting width a_e	Cutting depth a_p
10	0.03 ~ 0.09	1D	0.1 ~ 0.5D	0.03 ~ 0.09	0.03~ 0.05D	0.1 ~ 0.5D	0.03 ~ 0.09	0.1 ~ 0.3R	0.05 ~ 0.15R
12	0.04 ~ 0.10			0.03 ~ 0.11			0.03 ~ 0.11		
16	0.05 ~ 0.12			0.05 ~ 0.13			0.05 ~ 0.13		
20	0.05 ~ 0.15			0.05 ~ 0.17			0.05 ~ 0.17		
25	0.06 ~ 0.15			0.06 ~ 0.18			0.06 ~ 0.18		
32	0.06 ~ 0.18			0.06 ~ 0.22			0.06 ~ 0.22		

Adjustments of the cutting parameters for different xD shanks

Cutting parameters / Overhang xD	Cutting speed (%)	Feed rate (%)	Cutting width (%)
2	100	100	100
3	100	100	100
4	80	90	70
5	60	80	40
7	30	60	20
9	20	50	10
>9	10	40	10

VPM-4E★VPM-4R

Recommended cutting speed

Workpiece material / Cutting speed Vc	P	M	K	N	S	H
Vc(m/min)	75 ~ 290	65~ 170	85 ~ 290	285 ~ 880	20 ~ 70	30 ~ 80

Cutting parameters: (mm)

Machining methods / Edge diameter	Slotting			Side, Face milling			Profiling		
	f_z(mm/z)	Cutting width a_e	Cutting depth a_p	f_z(mm/z)	Cutting width a_e	Cutting depth a_p	f_z(mm/z)	Cutting width a_e	Cutting depth a_p
10	0.03 ~ 0.09	1D	0.1 ~ 0.5D	0.03 ~ 0.09	0.03~ 0.05D	0.1 ~ 0.5D	0.03 ~ 0.09	0.1 ~ 0.3R	0.05 ~ 0.15R
12	0.04 ~ 0.10			0.03 ~ 0.11			0.03 ~ 0.11		
16	0.05 ~ 0.12			0.05 ~ 0.13			0.05 ~ 0.13		
20	0.05 ~ 0.15			0.05 ~ 0.17			0.05 ~ 0.17		
25	0.06 ~ 0.15			0.06 ~ 0.18			0.06 ~ 0.18		
32	0.06 ~ 0.18			0.06 ~ 0.22			0.06 ~ 0.22		

Adjustments of the cutting parameters for different xD shanks

Cutting parameters / Overhang xD	Cutting speed (%)	Feed rate (%)	Cutting width (%)
2	100	100	100
3	100	100	100
4	80	90	70
5	60	80	40
7	30	60	20
9	20	50	10
>9	10	40	10

Recommended cutting parameters for interchangeable module end mills

HMX-4E★HMX-2B★HMX-4B★HMX-4R

Recommended cutting speed

Workpiece material / Cutting speed Vc	H（40 - 50HRC）	H（50 - 60HRC）	H（60 - 68HRC）
Vc(m/min)	260 ~ 320	150 ~ 220	100 ~ 200

Cutting parameters: (mm)

Machining methods / Edge diameter	Side, Face milling			Profiling		
	f_z(mm/z)	Cutting width a_e	Cutting depth a_p	f_z(mm/z)	Cutting width a_e	Cutting depth a_p
10	0.025-0.06	0.02 ~ 0.05D	0.1 ~ 0.5D	0.04-0.10	0.25R	0.1R
12	0.03 ~ 0.07			0.05 ~ 0.15	0.3R	0.1R
16	0.03 ~ 0.07			0.08 ~ 0.18	0.35R	0.1R
20	0.04 ~ 0.08			0.10 ~ 0.22	0.4R	0.1R
25	0.04 ~ 0.08			0.12 ~ 0.25	0.5R	0.12R
32	0.05 ~ 0.10			0.15 ~ 0.30	0.6R	0.12R

Adjustments of the cutting parameters for different xD shanks

Cutting parameters / Overhang xD	Cutting speed（%）	Feed rate（%）	Cutting width（%）
2	100	100	100
3	100	100	100
4	80	90	70
5	60	80	40
7	30	60	20
9	20	50	10
>9	10	40	10

XM-2B★XM-2H★XM-2C/2CR

Recommended cutting speed

Workpiece material / Cutting speed Vc	P	M	K	N	S	H
Vc(m/min)	70 ~ 280	60 ~ 160	80 ~ 280	270 ~ 840	20 ~ 70	30 ~ 80

Cutting parameters: (mm)

Machining methods / Edge diameter	XM-2B			XM-2H			XM-2C/2CR		
	f_z(mm/z)	Cutting width a_e	Cutting depth a_p	f_z(mm/z)	Cutting width a_e	Cutting depth a_p	f_z(mm/z)	Cutting width a_e	Cutting depth a_p
10	0.03 ~ 0.11	0.3R	0.1R	0.4 ~ 0.8	0.65D	0.25R	0.07 ~ 0.12	0.1D	0.1D
12	0.04 ~ 0.12			0.5 ~ 0.9			0.08 ~ 0.12		
16	0.05 ~ 0.13			0.6 ~ 1.0			0.1 ~ 0.12		

1. Please adopt high precision machining center and shank holder.
2. Climb milling is recommended on side milling.
3. Please reduce the rev and feed rate if there are vibrations and abnormal noise under the circumstances of the bad rigidity of machine.
4. In the condition of interference-free, the extended length of milling cutter should be short as much as possible.

Adjustments of the cutting parameters for different xD shanks

Cutting parameters / Overhang xD	Cutting speed（%）	Feed rate（%）	Cutting width（%）
2	100	100	100
3	100	100	100
4	80	90	70
5	60	80	40
7	30	60	20
9	20	50	10
>9	10	40	10

Recommended cutting parameters for interchangeable module end mills

XM-2E★XM-2R

Recommended cutting speed

Workpiece material / Cutting speed Vc	P	M	K	N	S	H
Vc(m/min)	70 ~ 280	60 ~ 160	80 ~ 280	270 ~ 840	20 ~ 70	30 ~ 80

Cutting parameters: (mm)

Machining methods / Edge diameter	Side, Face milling						Slotting					
	XM-2E			XM-2R			XM-2E			XM-2R		
	f_z(mm/z)	Cutting width a_e	Cutting depth a_p	f_z(mm/z)	Cutting width a_e	Cutting depth a_p	f_z(mm/z)	Cutting width a_e	Cutting depth a_p	f_z(mm/z)	Cutting width a_e	Cutting depth a_p
10	0.035-0.09	0.1-0.15D	0.75D	0.035-0.09	0.2D	0.4D	0.02-0.045	1D	0.3D	0.02-0.045	1D	0.3D
12	0.04-0.1			0.04-0.1			0.02-0.05			0.02-0.05		
16	0.05-0.12			0.05-0.12			0.025-0.06			0.025-0.06		

1.The cutting speed should be 50%~70% of above recommenddations when doing slot milling.

2. Please adopt high precision machining center and shank holder.

4. Climb milling is recommended on side milling.

4. Please reduce the rev and feed rate if there are vibrations and abnormal noise under the circumstances of the bad rigidity of machine.

5. In the condition of interference-free, the extended length of milling cutter should be short as much as possible.

Adjustments of the cutting parameters for different xD shanks

Cutting parameters / Overhang xD	Cutting speed (%)	Feed rate (%)	Cutting width (%)
2	100	100	100
3	100	100	100
4	80	90	70
5	60	80	40
7	30	60	20
9	20	50	10
>9	10	40	10

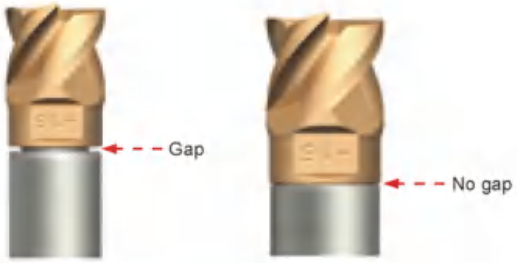
Tolerance of shank (mm)

Diameter (mm)	10	12/16	20	25	32
radial runout	0.015	0.015	0.015	0.02	0.02
total runout	0.01	0.01	0.01	0.01	0.01

Cutting head installation instructions



- 1.Use the clean cotton to remove the oil and dust on the interface cone, end face, and threads.
- 2.While you are using your hands directly contact the cutting edges during clamping. It may cause injury, please use protective equipment.
- 3.After installing the cutting head, if there is a gap between the cutting head and the end face of the shank, please use the wrench to tighten it until it fits completely.
- 4.For strict operation requirements, please use the recommended torque to install the cutting head.



Interface type	Installation torque（NM）
Q07	10N•M
Q08	16N•M
Q10	20N•M
Q12	30N•M
Q14	40N•M
Q18	50N•M




GD series
Twist Drills for
General Machining





Holemaking Tools

Drills
Reamers
Threading tools



ZSD

Indexable drill new series



Holemaking Tools

C

Drills	C2-C231
Solid carbide drills	C2-C176
Indexable drills	C177-C216
Interchangeable head drills	C217-C231
Reamers	C232-C243
Solid carbide reamers	C232-C243
Threading tools	C244-C272
Solid carbide taps	C250-C261
Solid carbide threading end mills	C262-C263
Recommended cutting parameters of solid carbide threading tools	C264
Technical information	C265-C270
Non-standard customization for solid carbide taps	C271
Non-standard customization for solid carbide thread milling cutters	C272



How to choose the right solid carbide drills

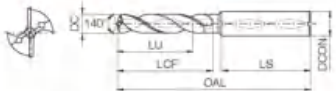
Shape

Product category

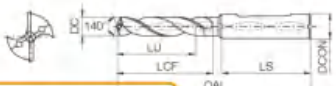
Size

ST series For machining of mild steel, stainless steel









- First choice for drilling mild steel and stainless steel.
- Sharp cutting edge can avoid build-up edge, suitable for drilling hole with high performance.

Drill diameter DC(m/)	Drilling depth (UL/DR)	Cooling mode	Shank type	Type	Basic dimension(mm) Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Recommended grade KDG303
3.0	3	Internal coolant	Straight shank	1534ST03C-0300	6	62	20	14	36	☆
	5			1536ST05C-0300	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0300	6	66	28	23	36	☆
3.1	3		Straight shank	1534ST03C-0310	6	62	20	14	36	☆
	5			1536ST05C-0310	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0310	6	66	28	23	36	☆
3.2	3		Straight shank	1534ST03C-0320	6	62	20	14	36	☆
	5			1536ST05C-0320	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0320	6	66	28	23	36	☆
3.25	3		Straight shank	1534ST03C-0325	6	62	20	14	36	☆
	5			1536ST05C-0325	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0325	6	66	28	23	36	☆
3.3	3		Straight shank	1534ST03C-0330	6	62	20	14	36	☆
	5			1536ST05C-0330	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0330	6	66	28	23	36	☆
3.4	3		Straight shank	1534ST03C-0340	6	62	20	14	36	☆
	5			1536ST05C-0340	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0340	6	66	28	23	36	☆
3.5	3		Straight shank	1534ST03C-0350	6	62	20	14	36	☆
	5			1536ST05C-0350	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0350	6	66	28	23	36	☆

☆Recommended grade (produce according to order)

Applicable material table ○Very suitable □Suitable

Grade	Workpiece material: Mild steel HB≤160	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel ~40HRC	~50HRC	~60HRC	Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
KDG303	○	□				○					□

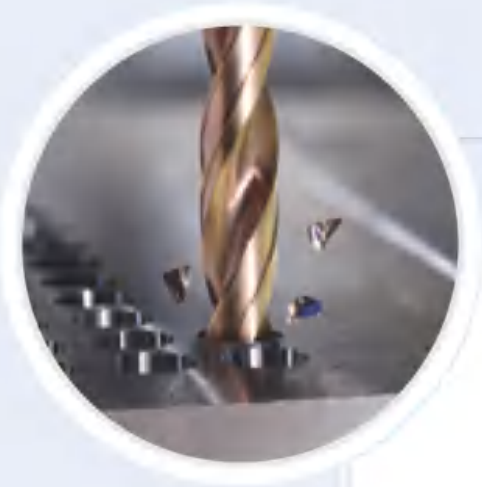
Code key C6 | Cutting parameters C160 | Technical information C165-C171 | Non-standard customization tools C172-C176

Specifications
Type, depth of drilling, cooling system, type of shank, basic dimensions and grade.

Applicable workpiece material range

Product features

Code key, cutting parameters, technical information, non-standard customization



HOLEMAKING TOOLS

C

Drills

Drilling tools overview C4

Solid carbide drills C5-C176

Grade introduction for solid carbide drills C5
Solid carbide drills code key C6
Solid carbide drills overview C9-C150
Recommended cutting parameters for solid carbide drills C151-C164
Technical information for solid carbide drills C165-C171
Non-standard customization tools C172-C176

Indexable drills C177-C216

Indexable drills code key C178
Indexable drills overview C181-C207
Indexable drills inserts code key C208-C209
Indexable drills inserts overview C210-C213
Technical information for indexable drills C214
Recommended cutting parameters for indexable drills C215-C216

Interchangeable head drills C217-C231

Interchangeable head drills code key C218
Interchangeable head drill tool holders overview C219-C223
Interchangeable head drills overview C224-C228
Technical information for interchangeable head drills C229-C230
Recommended cutting parameters for interchangeable head drills C231







Drilling tools overview

Application	Type of drills	Type	Shape of drills	Coolant mode	Diameter range	Workpiece material							Page	
						P		M	K	N	S	H	Specification	Cutting parameters
						Soft steel	Common steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy	High hardness steel		
General machining	Twist drill	GD03		External cooling	Ø2-Ø25	○	○	○	○	○	○		C9-C44	C151-C152
		GD03C		Internal cooling	Ø3-Ø25	○	○	○	○	○	○			
		GD05		External cooling	Ø2-Ø25	○	○	○	○	○	○			
		GD05C		Internal cooling	Ø3-Ø25	○	○	○	○	○	○			
		GD08C		Internal cooling	Ø3-Ø18	○	○	○	○	○	○			
	Twist drill	UD03		External cooling	Ø2-Ø25	○	○	○	○	○	○		C47-C82	C153-C158
		UD03C		Internal cooling	Ø3-Ø25	○	○	○	○	○	○			
		UD05		External cooling	Ø2-Ø25	○	○	○	○	○	○			
		UD05C		Internal cooling	Ø3-Ø25	○	○	○	○	○	○			
	Twist drill	1534SU03		External cooling	Ø2-Ø20	○	○	○	○	○	○		C84-C113	C155-C158
		1534SU03C		Internal cooling	Ø3-Ø20	○	○	○	○	○	○			
		1734SU03C		Internal cooling	Ø3-Ø20	○	○	○	○	○	○			
		1536SU05		External cooling	Ø2-Ø20	○	○	○	○	○	○			
		1536SU05C		Internal cooling	Ø3-Ø20	○	○	○	○	○	○			
		1736SU05C		Internal cooling	Ø3-Ø20	○	○	○	○	○	○			
		1538SU08C		Internal cooling	Ø3-Ø18	○	○	○	○	○	○			
	Twist drill	1557SU03		External cooling	Ø3.3-Ø14.5	○	○	○	○	○	○		C114	
Deep drilling	Twist drill	1588SL 12/20/30C		Internal cooling	Ø3-Ø20	○	○	○	○	○	○		C118-C121	C159
Guide hole drilling	Twist drill	1534SP		Internal cooling	Ø3-Ø14	○	○	○	○	○	○		C122-C123	C160
For soft steel, stainless steel	Twist drill	1534ST03C		Internal cooling	Ø3-Ø20	○	○	○			○		C125-C137	C160
		1536ST05C		Internal cooling	Ø3-Ø20	○	○	○			○			
		1736ST05C		Internal cooling	Ø3-Ø20	○	○	○			○			
For high hardness steel machining	Twist drill	1534SH03		External cooling	Ø3-Ø16							○	C139	C161
For aluminum, cast iron	Twist drill	1105SC03		External cooling	Ø2-Ø16				○	○			C140-C143	C61
		1101SC05		External cooling	Ø2-Ø16				○	○				
	Three flute drill	1165PA03		External cooling	Ø3-Ø20			○	○	○	○		C144-C147	C162
	Straight flute drill	1576PC05		External cooling	Ø4-Ø20				○	○			C148-C149	C163
		1579PC15C		Internal cooling	Ø5-Ø14				○	○				
	Centering drill	1143SC90		External cooling	Ø5-Ø20				○	○			C150	C164
		1143SC120		External cooling	Ø5-Ø20				○	○				
Indexable drills series	Indexable drill	ZSD 02/03/04/05		Internal cooling	Ø12-Ø50	○	○	○	○	○	○		C181-C192	C215
		ZTD 02/03/04/05		Internal cooling	Ø13-Ø50	○	○	○	○	○			C196-C199	C216
		ZD 02/03/04/05		Internal cooling	Ø16-Ø58	○	○	○	○	○			C200-C207	C216
Interchangeable head drills, drilling series	Interchangeable head drills	ZTK 015/03/04/05/08		Internal cooling	Ø12-Ø25	○	○	○	○	○			C219-C223	C231

○ Very suitable ○ Suitable

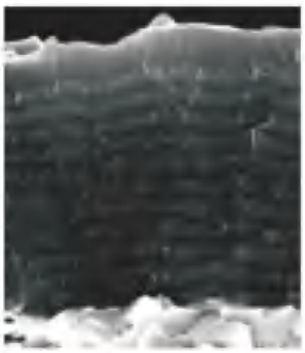
Grade introduction of solid carbide drills

Coated grade

KDG3013

New AlCrN substrate composite coating, with excellent wear resistance and bonding resistance, improves the stability of the insert edge.

Unique coating post-treatment technology effectively reduces the cutting resistance for smoother chip evacuation and higher security.



AlCrN substrate composite coating



KDG3013



Conventional coating

KDG303

Ultra-fine carbide substrate with high strength, toughness and wear resistance, in combination with nano-structured nc-TiAlN coating aiming at optimizing drilling operations, makes sure the tools have very high toughness and hardness. Unique coating technology gives the tools smooth surface and excellent wear resistance, and outstanding thermal stability and chemical stability provide effective protection for the cutting edge.



Common TiAlN coating



nc-TiAlN coating

Uncoated grade

YK20F

Ultra-fine grain carbide substrate with high hardness, outstanding wear resistance, and long tool life.

YK30F

Ultra-fine carbide substrate with high strength, toughness and wear resistance gives the cutting edge perfect strength.

Solid carbide drills code key

Type to tool
GD ▶ Twist Drills for General Machining
UD ▶ Twist Drills for General Machining

Mode of cooling
C ▶ Intrnal cooling
Default ▶ External cooling

Type of shank
S ▶ slim shank
Default ▶ meet DIN6535HA standard

GD 03 C -0600 S

Length code
03 ▶ 3d
05 ▶ 5d
08 ▶ 8d

Specification
0600 ▶ Nominal diameter

Code	Description
1	As per DIN338
2	As per DIN1897
3	As per QJ/ZZQ(TO)01.001.002
4	As per DIN6537K
5	As per DIN6537K
6	As per DIN6537K
7	As per the rule ZZC-C in QJ/ZZQ(TO)01.001.002
8	As per the rule ZZC-D in QJ/ZZQ(TO)01.001.002
9	As per the rule ZZC-E in QJ/ZZQ(TO)01.001.002

Length code

Code	Description
SU	Twist drill for general machining
SL	Deep twist drills
ST	Twist drill for soft steel, stainless steel
SH	Twist drill for high hardness steel
SC	Twist drill for AL alloy and cast iron
PA	Three flute drill for AL alloy and cast iron
PC	Straight flute drill for aluminum, cast iron

Geometry

Code	Description
1	Drills

Type to tool

Code	Description
C	Internal coolant
Default	External coolant

Mode of cooling

1 5 8 8 SL 12 C -0850

Type of shank

Code	Description
1	Straight shank
2	Square head straight shank as per DIN10
3	Double flattened straight shank as per DIN1809
5	Straight shank as per DIN6535HA
7	Whistle notch shank as per DIN6535HE
9	Tapered shank

Type of drill

Code	Description
0	Twist drill
3	Multiple functions twist drill
4	Centering drill
5	Step drill
6	Three flute drill
7	Straight flute drill
8	Deep drill

Specification

Code	Description
0850	Nominal diameter of drill

Identification of drilling depth

Cutting depth shown when the tool is non-pilot drill		Point angle identification shown when tool is pilot drill	
Code	Description	Code	Description
03	(2~3) d	90	pilot drill with 90° point angle
05	(4~5) d		
08	(7~8) d	120	pilot drill with 120° point angle
12	(12) d		
15	(15) d		
20	(20) d		
30	(30) d		



GD series
Twist Drills for General Machining

Application range

Versatile, for high efficiency machining in a variety of material e.g. P(steel), M(stainless steel), K (Cast iron).



- Linear cutting edge with high strength.
  Optimized drill point structure for better cutting performance.



- Simulation in combination with testing for superior overall performance.



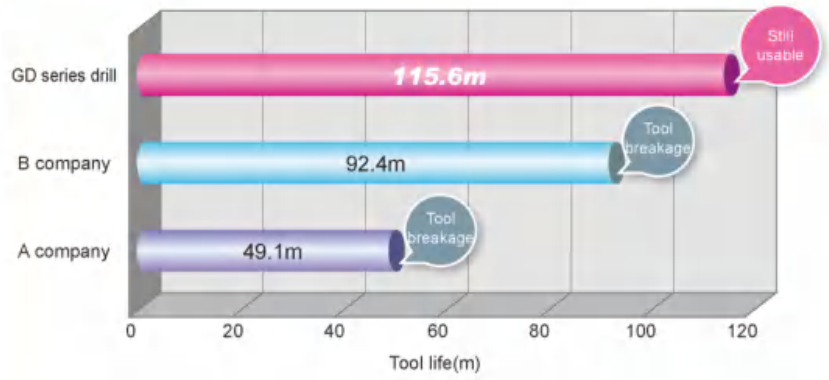
- Professional post-treatment for coating ensures low-resistance high-efficiency machining.



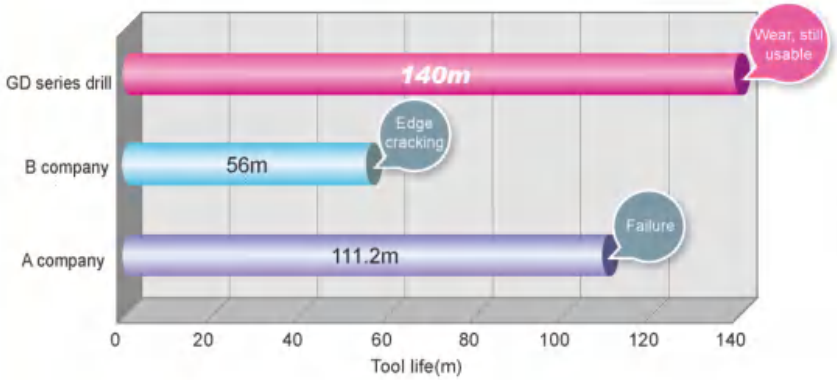
- Double edge-line design for improved machining stability.



Long and stable tool life



Tool: GD05C-0560
Workpiece material: C70S6(HRC30)
Vc=100m/min; f= 0.15mm/r; H=27mm
Cooling system: water soluble cooling



Tool: GD05C-1000
Workpiece material: 45#steel(HB180)
Vc=150m/min; f=0.25mm/r; H=40mm
Cooling system: water soluble cooling

Outstanding machining precision

Quality of hole wall:

Tool: GD03C-0820
Workpiece material: C70S6(HRC30)
Vc=120m/min; f=0.23mm/r; H=30mm;
Cooling system: water soluble cooling



GD series drill



A company

Excellent chip breaking performance

Chip breaking performance:

Tool: GD05C-0600
Workpiece material: 1Cr18Ni9Ti(HB180)
Vc=75m/min; f=0.2mm/r; H=30mm;
Cooling system: water soluble cooling



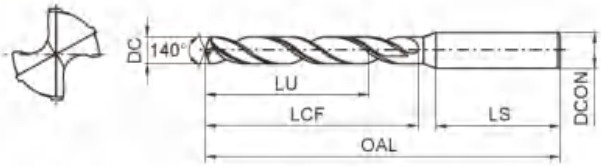
GD series drill



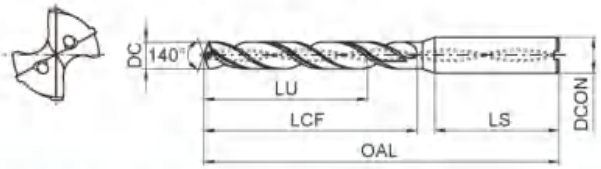
A company

GD series General machining


External coolant Straight shank




Internal coolant Straight shank



● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
2.0	3	External coolant	Straight shank	GD03-0200S	3	58	13	9	28		NO.2-64UNF	○
	5			GD05-0200S	3	58	18	14	28			○
	3			GD03-0200	4	58	13	9	28			●
	5			GD05-0200	4	58	18	14	28			●
2.1	3			GD03-0210S	3	58	13	9	28	NO.3-48UNC		○
	5			GD05-0210S	3	58	18	14	28			○
	3			GD03-0210	4	58	13	9	28			●
	5			GD05-0210	4	58	18	14	28			●
2.15	3			GD03-0215S	3	58	13	9	28	NO.3-56UNF		○
	5			GD05-0215S	3	58	18	14	28			○
	3			GD03-0215	4	58	13	9	28			●
	5			GD05-0215	4	58	18	14	28			●
2.2	3			GD03-0220S	3	58	13	9	28			○
	5			GD05-0220S	3	58	18	14	28			○
	3			GD03-0220	4	58	13	9	28			●
	5			GD05-0220	4	58	18	14	28			●
2.3	3			GD03-0230S	3	58	13	9	28		M2.5×0.45 NO.3-56UNF	○
	5			GD05-0230S	3	58	18	14	28			○
	3			GD03-0230	4	58	13	9	28			●
	5			GD05-0230	4	58	18	14	28			●

● Stock available ○ Make-to-order

Applicable material table

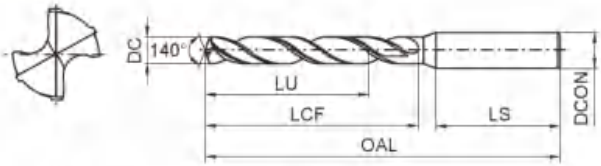
◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	◎	◎			○	◎	◎			○

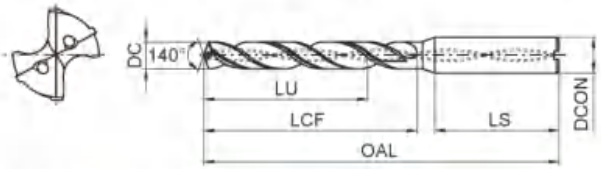
Code key C6
Cutting parameters C151-C152
Technical information C165-C171
Non-standard customization tools C172-C176

GD series General machining


External coolant Straight shank




Internal coolant Straight shank



● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
2.35	3	External coolant	Straight shank	GD03-0235S	3	58	17	12	28	NO.4-40UNC		○
	5			GD05-0235S	3	58	22	17	28			○
	3			GD03-0235	4	58	17	12	28			●
	5			GD05-0235	4	58	22	17	28			●
2.4	3			GD03-0240S	3	58	17	12	28	NO.4-48UNF		○
	5			GD05-0240S	3	58	22	17	28			○
	3			GD03-0240	4	58	17	12	28			●
	5			GD05-0240	4	58	22	17	28			●
2.5	3			GD03-0250S	3	58	17	12	28	M3×0.5		○
	5			GD05-0250S	3	58	22	17	28			○
	3			GD03-0250	4	58	17	12	28			●
	5			GD05-0250	4	58	22	17	28			●
2.55	3			GD03-0255S	3	58	17	12	28		NO.4-40UNC	○
	5			GD05-0255S	3	58	22	17	28			○
	3			GD03-0255	4	58	17	12	28			●
	5			GD05-0255	4	58	22	17	28			●
2.6	3			GD03-0260S	3	58	17	12	28		NO.4-48UNF	○
	5			GD05-0260S	3	58	22	17	28			○
	3			GD03-0260	4	58	17	12	28			●
	5			GD05-0260	4	58	22	17	28			●
2.65	3			GD03-0265S	3	58	17	12	28	NO.5-40UNC		○
	5			GD05-0265S	3	58	22	17	28			○
	3			GD03-0265	4	58	17	12	28			●
	5			GD05-0265	4	58	22	17	28			●
2.7	3			GD03-0270S	3	58	17	12	28	NO.5-44UNF		○
	5			GD05-0270S	3	58	22	17	28			○
	3			GD03-0270	4	58	17	12	28			●
	5			GD05-0270	4	58	22	17	28			●

● Stock available ○ Make-to-order

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
2.8	3	External coolant	Straight shank	GD03-0280S	3	58	17	12	28		M3×0.5	○
	5			GD05-0280S	3	58	22	17	28			○
	3			GD03-0280	4	58	17	12	28			●
	5			GD05-0280	4	58	22	17	28			●
2.85	3			GD03-0285S	3	58	17	12	28	NO.6-32UNC		○
	5			GD05-0285S	3	58	22	17	28			○
	3			GD03-0285	4	58	17	12	28			●
	5			GD05-0285	4	58	22	17	28			●
2.9	3			GD03-0290S	3	58	17	12	28		NO.5-40UNC NO.5-44UNF	○
	5			GD05-0290S	3	58	22	17	28			○
	3			GD03-0290	4	58	17	12	28			●
	5			GD05-0290	4	58	22	17	28			●
2.95	3			GD03-0295S	3	58	17	12	28	NO.6-40UNF		○
	5			GD05-0295S	3	58	22	17	28			○
	3			GD03-0295	4	58	17	12	28			●
	5			GD05-0295	4	58	22	17	28			●
3.0	3			GD03-0300S	3	62	20	14	36			○
	5			GD05-0300S	3	66	28	23	36			○
	3	Internal coolant		GD03C-0300S	3	62	20	14	36			○
	5			GD05C-0300S	3	66	28	23	36			○
	3	External coolant		GD03-0300	6	62	20	14	36			●
	5			GD05-0300	6	66	28	23	36			●
	3	Internal coolant		GD03C-0300	6	62	20	14	36			●
	5			GD05C-0300	6	66	28	23	36			●
	8			GD08C-0300	6	72	34	29	36			
3.1	3	External coolant		GD03-0310S	4	62	20	14	36			●
	5			GD05-0310S	4	66	28	23	36			●
	3	Internal coolant		GD03C-0310S	4	62	20	14	36			●
	5			GD05C-0310S	4	66	28	23	36			●
	3	External coolant		GD03-0310	6	62	20	14	36			○
	5			GD05-0310	6	66	28	23	36			○
	3	Internal coolant		GD03C-0310	6	62	20	14	36			○
	5			GD05C-0310	6	66	28	23	36			○
	8			GD08C-0310	6	72	34	29	36			

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h_5. ● Stock available ○ Make-to-order

Applicable material table

○ Very suitable ○ Suitable

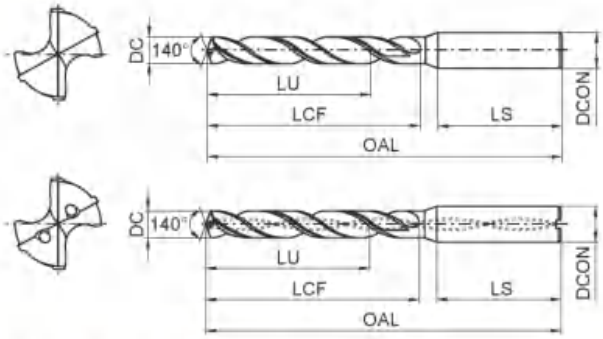
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	○	○			○	○	○			○

Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining


External coolant Straight shank


Internal coolant Straight shank



● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
3.15	3	External coolant	Straight shank	GD03-0315S	4	62	20	14	36		NO.6-32UNC	●
	5			GD05-0315S	4	66	28	23	36			●
	3	Internal coolant		GD03C-0315S	4	62	20	14	36			●
	5			GD05C-0315S	4	66	28	23	36			●
	3	External coolant		GD03-0315	6	62	20	14	36			○
	5			GD05-0315	6	66	28	23	36			○
	3	Internal coolant		GD03C-0315	6	62	20	14	36			○
	5			GD05C-0315	6	66	28	23	36			○
3.2	3	External coolant		GD03-0320S	4	62	20	14	36		NO.6-40UNF	●
	5			GD05-0320S	4	66	28	23	36			●
	3	Internal coolant		GD03C-0320S	4	62	20	14	36			●
	5			GD05C-0320S	4	66	28	23	36			●
	3	External coolant		GD03-0320	6	62	20	14	36			○
	5			GD05-0320	6	66	28	23	36			○
	3	Internal coolant		GD03C-0320	6	62	20	14	36			○
	5			GD05C-0320	6	66	28	23	36			○
	8			GD08C-0320	6	72	34	29	36			○
3.25	3	External coolant		GD03-0325S	4	62	20	14	36			●
	5			GD05-0325S	4	66	28	23	36			●
	3	Internal coolant		GD03C-0325S	4	62	20	14	36			●
	5			GD05C-0325S	4	66	28	23	36			●
	3	External coolant		GD03-0325	6	62	20	14	36			○
	5			GD05-0325	6	66	28	23	36			○
	3	Internal coolant		GD03C-0325	6	62	20	14	36			○
	5			GD05C-0325	6	66	28	23	36			○

● Stock available ○ Make-to-order

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
3.3	3	External coolant	Straight shank	GD03-0330S	4	62	20	14	36	M4×0.7		●
	5			GD05-0330S	4	66	28	23	36			●
	3	Internal coolant		GD03C-0330S	4	62	20	14	36			●
	5			GD05C-0330S	4	66	28	23	36			●
	3	External coolant		GD03-0330	6	62	20	14	36			○
	5			GD05-0330	6	66	28	23	36			○
	3	Internal coolant		GD03C-0330	6	62	20	14	36			○
	5			GD05C-0330	6	66	28	23	36			○
	8			GD08C-0330	6	72	34	29	36			○
3.4	3	External coolant		GD03-0340S	4	62	20	14	36			●
	5			GD05-0340S	4	66	28	23	36			●
	3	Internal coolant		GD03C-0340S	4	62	20	14	36			●
	5			GD05C-0340S	4	66	28	23	36			●
	3	External coolant		GD03-0340	6	62	20	14	36			○
	5			GD05-0340	6	66	28	23	36			○
	3	Internal coolant		GD03C-0340	6	62	20	14	36			○
	5			GD05C-0340	6	66	28	23	36			○
	8			GD08C-0340	6	72	34	29	36			○
3.5	3	External coolant		GD03-0350S	4	62	20	14	36	M4×0.5 NO.6-32UNC NO.8-36UNF		●
	5			GD05-0350S	4	66	28	23	36			●
	3	Internal coolant		GD03C-0350S	4	62	20	14	36			●
	5			GD05C-0350S	4	66	28	23	36			●
	3	External coolant		GD03-0350	6	62	20	14	36			○
	5			GD05-0350	6	66	28	23	36			○
	3	Internal coolant		GD03C-0350	6	62	20	14	36			○
	5			GD05C-0350	6	66	28	23	36			○
	8			GD08C-0350	6	72	34	29	36			○
3.6	3	External coolant		GD03-0360S	4	62	20	14	36			●
	5			GD05-0360S	4	66	28	23	36			●
	3	Internal coolant		GD03C-0360S	4	62	20	14	36			●
	5			GD05C-0360S	4	66	28	23	36			●
	3	External coolant		GD03-0360	6	62	20	14	36			○
	5			GD05-0360	6	66	28	23	36			○
	3	Internal coolant		GD03C-0360	6	62	20	14	36			○
	5			GD05C-0360	6	66	28	23	36			○
	8			GD08C-0360	6	72	34	29	36			○

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h5. ● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

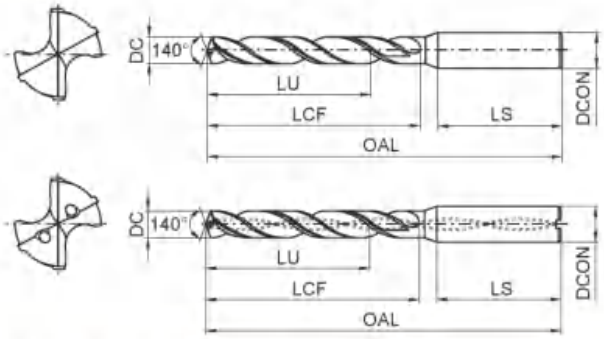
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	◎	◎			○	◎	◎			○

Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining


External coolant Straight shank


Internal coolant Straight shank



● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
3.7	3	External coolant	Straight shank	GD03-0370S	4	62	20	14	36		M4×0.7	●
	5			GD05-0370S	4	66	28	23	36			●
	3	Internal coolant		GD03C-0370S	4	62	20	14	36			●
	5			GD05C-0370S	4	66	28	23	36			●
	3	External coolant		GD03-0370	6	62	20	14	36			○
	5			GD05-0370	6	66	28	23	36			○
	3	Internal coolant		GD03C-0370	6	62	20	14	36			○
	5			GD05C-0370	6	66	28	23	36			○
	8			GD08C-0370	6	72	34	29	36			○
3.8	3	External coolant		GD03-0380S	4	66	24	17	36		M4×0.5 NO.8-32UNC	●
	5			GD05-0380S	4	74	36	29	36			●
	3	Internal coolant		GD03C-0380S	4	66	24	17	36			●
	5			GD05C-0380S	4	74	36	29	36			●
	3	External coolant		GD03-0380	6	66	24	17	36			○
	5			GD05-0380	6	74	36	29	36			○
	3	Internal coolant		GD03C-0380	6	66	24	17	36			○
	5			GD05C-0380	6	74	36	29	36			○
	8			GD08C-0380	6	81	43	36	36			○
3.85	3	External coolant		GD03-0385S	4	66	24	17	36		NO.8-36UNF	●
	5			GD05-0385S	4	74	36	29	36			●
	3	Internal coolant		GD03C-0385S	4	66	24	17	36			●
	5			GD05C-0385S	4	74	36	29	36			●
	3	External coolant		GD03-0385	6	66	24	17	36			○
	5			GD05-0385	6	74	36	29	36			○
	3	Internal coolant		GD03C-0385	6	66	24	17	36			○
	5			GD05C-0385	6	74	36	29	36			○

● Stock available ○ Make-to-order

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
	3	External coolant		GD03-0390S	4	66	24	17	36			●
	5			GD05-0390S	4	74	36	29	36			●
	3	Internal coolant		GD03C-0390S	4	66	24	17	36			●
	5			GD05C-0390S	4	74	36	29	36			●
3.9	3	External coolant		GD03-0390	6	66	24	17	36	NO.10-24UNC		○
	5			GD05-0390	6	74	36	29	36			○
	3	Internal coolant		GD03C-0390	6	66	24	17	36			○
	5			GD05C-0390	6	74	36	29	36			○
	8			GD08C-0390	6	81	43	36	36			○
	3	External coolant		GD03-0400S	4	66	24	17	36			●
	5			GD05-0400S	4	74	36	29	36			●
	3	Internal coolant		GD03C-0400S	4	66	24	17	36			●
	5			GD05C-0400S	4	74	36	29	36			●
4.0	3	External coolant		GD03-0400	6	66	24	17	36			○
	5			GD05-0400	6	74	36	29	36			○
	3	Internal coolant		GD03C-0400	6	66	24	17	36			○
	5			GD05C-0400	6	74	36	29	36			○
	8		Straight shank	GD08C-0400	6	81	43	36	36			○
	3	External coolant		GD03-0410S	5	66	24	17	36			○
	5			GD05-0410S	5	74	36	29	36			○
	3	Internal coolant		GD03C-0410S	5	66	24	17	36			○
	5			GD05C-0410S	5	74	36	29	36			○
4.1	3	External coolant		GD03-0410	6	66	24	17	36	NO 10-32UNF		●
	5			GD05-0410	6	74	36	29	36			●
	3	Internal coolant		GD03C-0410	6	66	24	17	36			●
	5			GD05C-0410	6	74	36	29	36			●
	8			GD08C-0410	6	81	43	36	36			○
	3	External coolant		GD03-0420S	5	66	24	17	36			○
	5			GD05-0420S	5	74	36	29	36			○
	3	Internal coolant		GD03C-0420S	5	66	24	17	36			○
	5			GD05C-0420S	5	74	36	29	36			○
4.2	3	External coolant		GD03-0420	6	66	24	17	36	M5×0.8		●
	5			GD05-0420	6	74	36	29	36			●
	3	Internal coolant		GD03C-0420	6	66	24	17	36			●
	5			GD05C-0420	6	74	36	29	36			●
	8			GD08C-0420	6	81	43	36	36			○

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h5. ● Stock available ○ Make-to-order

Applicable material table

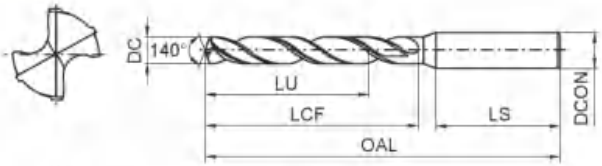
◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	◎	◎			○	◎	◎			○

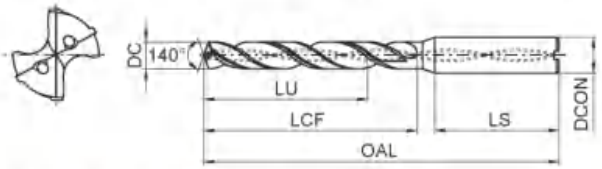
Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining









● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
4.3	3	External coolant	Straight shank	GD03-0430S	5	66	24	17	36			○
	5			GD05-0430S	5	74	36	29	36			○
	3	Internal coolant		GD03C-0430S	5	66	24	17	36			○
	5			GD05C-0430S	5	74	36	29	36			○
	3	External coolant		GD03-0430	6	66	24	17	36			●
	5			GD05-0430	6	74	36	29	36			●
	3	Internal coolant		GD03C-0430	6	66	24	17	36			●
	5			GD05C-0430	6	74	36	29	36			●
	8			GD08C-0430	6	81	43	36	36			○
4.35	3	External coolant		GD03-0435S	5	66	24	17	36			○
	5			GD05-0435S	5	74	36	29	36			○
	3	Internal coolant		GD03C-0435S	5	66	24	17	36			○
	5			GD05C-0435S	5	74	36	29	36			○
	3	External coolant		GD03-0435	6	66	24	17	36		NO.10-24UNC	●
	5			GD05-0435	6	74	36	29	36			●
	3	Internal coolant		GD03C-0435	6	66	24	17	36			●
	5			GD05C-0435	6	74	36	29	36			●
4.4	3	External coolant		GD03-0440S	5	66	24	17	36			○
	5			GD05-0440S	5	74	36	29	36			○
	3	Internal coolant		GD03C-0440S	5	66	24	17	36			○
	5			GD05C-0440S	5	74	36	29	36			○
	3	External coolant		GD03-0440	6	66	24	17	36			●
	5			GD05-0440	6	74	36	29	36			●
	3	Internal coolant		GD03C-0440	6	66	24	17	36			●
	5			GD05C-0440	6	74	36	29	36			●
	8			GD08C-0440	6	81	43	36	36			○

● Stock available ○ Make-to-order

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
4.45	3	External coolant	Straight shank	GD03-0445S	5	66	24	17	36		NO.10-32UNF	○
	5			GD05-0445S	5	74	36	29	36			○
	3	Internal coolant		GD03C-0445S	5	66	24	17	36			○
	5			GD05C-0445S	5	74	36	29	36			○
	3	External coolant		GD03-0445	6	66	24	17	36			●
	5			GD05-0445	6	74	36	29	36			●
	3	Internal coolant		GD03C-0445	6	66	24	17	36			●
	5			GD05C-0445	6	74	36	29	36			●
4.5	3	External coolant		GD03-0450S	5	66	24	17	36	NO.12-24UNC M5×0.5		○
	5			GD05-0450S	5	74	36	29	36			○
	3	Internal coolant		GD03C-0450S	5	66	24	17	36			○
	5			GD05C-0450S	5	74	36	29	36			○
	3	External coolant		GD03-0450	6	66	24	17	36			●
	5			GD05-0450	6	74	36	29	36			●
	3	Internal coolant		GD03C-0450	6	66	24	17	36			●
	5			GD05C-0450	6	74	36	29	36			●
	8			GD08C-0450	6	81	43	36	36			○
4.6	3	External coolant		GD03-0460S	5	66	24	17	36			○
	5			GD05-0460S	5	74	36	29	36			○
	3	Internal coolant		GD03C-0460S	5	66	24	17	36			○
	5			GD05C-0460S	5	74	36	29	36			○
	3	External coolant		GD03-0460	6	66	24	17	36			●
	5			GD05-0460	6	74	36	29	36			●
	3	Internal coolant		GD03C-0460	6	66	24	17	36			●
	5			GD05C-0460	6	74	36	29	36			●
	8			GD08C-0460	6	81	43	36	36			○
4.65	3	External coolant		GD03-0465S	5	66	24	17	36		M5×0.8	○
	5			GD05-0465S	5	74	36	29	36			○
	3	Internal coolant		GD03C-0465S	5	66	24	17	36			○
	5			GD05C-0465S	5	74	36	29	36			○
	3	External coolant		GD03-0465	6	66	24	17	36			●
	5			GD05-0465	6	74	36	29	36			●
	3	Internal coolant		GD03C-0465	6	66	24	17	36			●
	5			GD05C-0465	6	74	36	29	36			●

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h_5. ● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

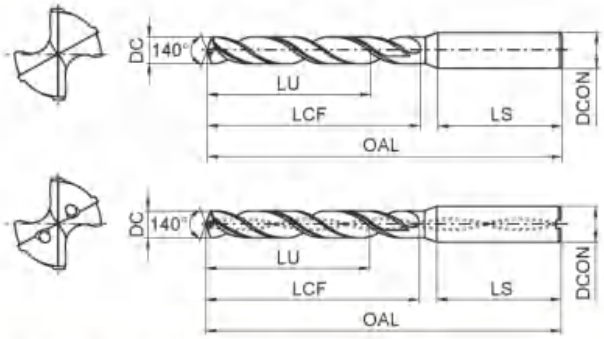
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	◎	◎			○	◎	◎			○

Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining


External coolant Straight shank


Internal coolant Straight shank



● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
4.7	3	External coolant	Straight shank	GD03-0470S	5	66	24	17	36	NO.12-28UNF		○
	5			GD05-0470S	5	74	36	29	36			○
	3	Internal coolant		GD03C-0470S	5	66	24	17	36			○
	5			GD05C-0470S	5	74	36	29	36			○
	3	External coolant		GD03-0470	6	66	24	17	36			●
	5			GD05-0470	6	74	36	29	36			●
	3	Internal coolant		GD03C-0470	6	66	24	17	36			●
	5			GD05C-0470	6	74	36	29	36			●
	8			GD08C-0470	6	81	43	36	36			○
4.8	3	External coolant		GD03-0480S	5	66	28	20	36		M5×0.5	○
	5			GD05-0480S	5	82	44	35	36			○
	3	Internal coolant		GD03C-0480S	5	66	28	20	36			○
	5			GD05C-0480S	5	82	44	35	36			○
	3	External coolant		GD03-0480	6	66	28	20	36			●
	5			GD05-0480	6	82	44	35	36			●
	3	Internal coolant		GD03C-0480	6	66	28	20	36			●
	5			GD05C-0480	6	82	44	35	36			●
	8			GD08C-0480	6	95	57	48	36			○
4.9	3	External coolant		GD03-0490S	5	66	28	20	36			○
	5			GD05-0490S	5	82	44	35	36			○
	3	Internal coolant		GD03C-0490S	5	66	28	20	36			○
	5			GD05C-0490S	5	82	44	35	36			○
	3	External coolant		GD03-0490	6	66	28	20	36			●
	5			GD05-0490	6	82	44	35	36			●
	3	Internal coolant		GD03C-0490	6	66	28	20	36			●
	5			GD05C-0490	6	82	44	35	36			●
	8			GD08C-0490	6	95	57	48	36			○

● Stock available ○ Make-to-order

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
5.0	3	External coolant	Straight shank	GD03-0500S	5	66	28	20	36	M6×1	NO.12-24UNC	○
	5			GD05-0500S	5	82	44	35	36			○
	3	Internal coolant		GD03C-0500S	5	66	28	20	36			○
	5			GD05C-0500S	5	82	44	35	36			○
	3	External coolant		GD03-0500	6	66	28	20	36			●
	5			GD05-0500	6	82	44	35	36			●
	3	Internal coolant		GD03C-0500	6	66	28	20	36			●
	5			GD05C-0500	6	82	44	35	36			●
	8			GD08C-0500	6	95	57	48	36			○
5.1	3	External coolant		GD03-0510	6	66	28	20	36	1/4-20UNC	NO.12-28UNF	●
	5			GD05-0510	6	82	44	35	36			●
	3	Internal coolant		GD03C-0510	6	66	28	20	36			●
	5			GD05C-0510	6	82	44	35	36			●
	8			GD08C-0510	6	95	57	48	36			○
5.2	3	External coolant		GD03-0520	6	66	28	20	36			●
	5			GD05-0520	6	82	44	35	36			●
	3	Internal coolant		GD03C-0520	6	66	28	20	36			●
	5			GD05C-0520	6	82	44	35	36			●
	8			GD08C-0520	6	95	57	48	36			○
5.25	3	External coolant		GD03-0525	6	66	28	20	36	M6×0.75		●
	5			GD05-0525	6	82	44	35	36			●
	3	Internal coolant		GD03C-0525	6	66	28	20	36			●
	5			GD05C-0525	6	82	44	35	36			●
5.3	3	External coolant		GD03-0530	6	66	28	20	36			●
	5			GD05-0530	6	82	44	35	36			●
	3	Internal coolant		GD03C-0530	6	66	28	20	36			●
	5			GD05C-0530	6	82	44	35	36			●
	8			GD08C-0530	6	95	57	48	36			○
5.4	3	External coolant		GD03-0540	6	66	28	20	36			●
	5			GD05-0540	6	82	44	35	36			●
	3	Internal coolant		GD03C-0540	6	66	28	20	36			●
	5			GD05C-0540	6	82	44	35	36			●
	8			GD08C-0540	6	95	57	48	36			○

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h5. ● Stock available ○ Make-to-order

Applicable material table

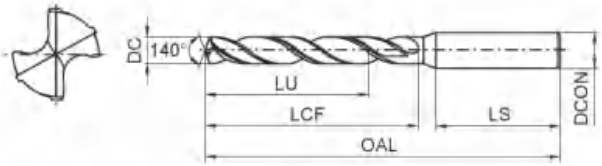
○ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	○	○			○	○	○			○

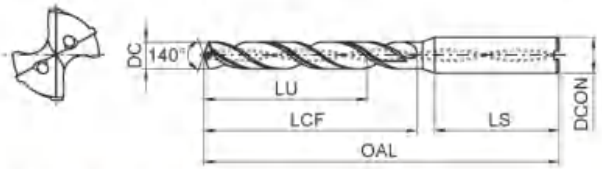
Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining









● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
5.5	3	External coolant	Straight shank	GD03-0550	6	66	28	20	36	1/4-28UNF		●
	5			GD05-0550	6	82	44	35	36			●
	3	Internal coolant		GD03C-0550	6	66	28	20	36			●
	5			GD05C-0550	6	82	44	35	36			●
	8			GD08C-0550	6	95	57	48	36			○
5.55	3	External coolant		GD03-0555	6	66	28	20	36			●
	5			GD05-0555	6	82	44	35	36			●
	3	Internal coolant		GD03C-0555	6	66	28	20	36			●
	5			GD05C-0555	6	82	44	35	36			●
5.6	3	External coolant		GD03-0560	6	66	28	20	36		M6×1	●
	5			GD05-0560	6	82	44	35	36			●
	3	Internal coolant		GD03C-0560	6	66	28	20	36			●
	5			GD05C-0560	6	82	44	35	36			●
	8			GD08C-0560	6	95	57	48	36			○
5.7	3	External coolant		GD03-0570	6	66	28	20	36		M6×0.75	●
	5			GD05-0570	6	82	44	35	36			●
	3	Internal coolant		GD03C-0570	6	66	28	20	36			●
	5			GD05C-0570	6	82	44	35	36			●
	8			GD08C-0570	6	95	57	48	36			○
5.75	3	External coolant		GD03-0575	6	66	28	20	36		1/4-20UNC	●
	5			GD05-0575	6	82	44	35	36			●
	3	Internal coolant		GD03C-0575	6	66	28	20	36			●
	5			GD05C-0575	6	82	44	35	36			●
5.8	3	External coolant		GD03-0580	6	66	28	20	36			●
	5			GD05-0580	6	82	44	35	36			●
	3	Internal coolant		GD03C-0580	6	66	28	20	36			●
	5			GD05C-0580	6	82	44	35	36			●
	8			GD08C-0580	6	95	57	48	36			○

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
5.9	3	External coolant	Straight shank	GD03-0590	6	66	28	20	36			●
	5			GD05-0590	6	82	44	35	36			●
	3	Internal coolant		GD03C-0590	6	66	28	20	36			●
	5			GD05C-0590	6	82	44	35	36			●
	8			GD08C-0590	6	95	57	48	36			○
5.95	3	External coolant		GD03-0595	6	66	28	20	36		1/4-28UNF	●
	5			GD05-0595	6	82	44	35	36			●
	3	Internal coolant		GD03C-0595	6	66	28	20	36			●
	5			GD05C-0595	6	82	44	35	36			●
6.0	3	External coolant		GD03-0600	6	66	28	20	36	M7×1		●
	5			GD05-0600	6	82	44	35	36			●
	3	Internal coolant		GD03C-0600	6	66	28	20	36			●
	5			GD05C-0600	6	82	44	35	36			●
	8			GD08C-0600	6	95	57	48	36			○
6.1	3	External coolant		GD03-0610S	7	79	34	24	36			○
	5			GD05-0610S	7	91	53	43	36			○
	3	Internal coolant		GD03C-0610S	7	79	34	24	36			○
	5			GD05C-0610S	7	91	53	43	36			○
	3	External coolant		GD03-0610	8	79	34	24	36			●
	5			GD05-0610	8	91	53	43	36			●
	3	Internal coolant		GD03C-0610	8	79	34	24	36			●
	5			GD05C-0610	8	91	53	43	36			●
	8			GD08C-0610	8	114	76	66	36			○
6.2	3	External coolant		GD03-0620S	7	79	34	24	36			○
	5			GD05-0620S	7	91	53	43	36			○
	3	Internal coolant		GD03C-0620S	7	79	34	24	36			○
	5			GD05C-0620S	7	91	53	43	36			○
	3	External coolant		GD03-0620	8	79	34	24	36			●
	5			GD05-0620	8	91	53	43	36			●
	3	Internal coolant		GD03C-0620	8	79	34	24	36			●
	5			GD05C-0620	8	91	53	43	36			●
	8			GD08C-0620	8	114	76	66	36			○

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h5. ● Stock available ○ Make-to-order

Applicable material table

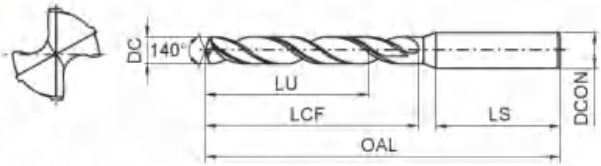
○ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	○	○			○	○	○			○

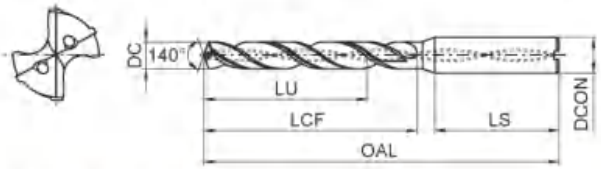
Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining


External coolant Straight shank




Internal coolant Straight shank



● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
6.3	3	External coolant	Straight shank	GD03-0630S	7	79	34	24	36			○
	5			GD05-0630S	7	91	53	43	36			○
	3	Internal coolant		GD03C-0630S	7	79	34	24	36			○
	5			GD05C-0630S	7	91	53	43	36			○
	3	External coolant		GD03-0630	8	79	34	24	36			●
	5			GD05-0630	8	91	53	43	36			●
	3	Internal coolant		GD03C-0630	8	79	34	24	36			●
	5			GD05C-0630	8	91	53	43	36			●
	8			GD08C-0630	8	114	76	66	36			○
6.4	3	External coolant		GD03-0640S	7	79	34	24	36			○
	5			GD05-0640S	7	91	53	43	36			○
	3	Internal coolant		GD03C-0640S	7	79	34	24	36			○
	5			GD05C-0640S	7	91	53	43	36			○
	3	External coolant		GD03-0640	8	79	34	24	36			●
	5			GD05-0640	8	91	53	43	36			●
	3	Internal coolant		GD03C-0640	8	79	34	24	36			●
	5			GD05C-0640	8	91	53	43	36			●
	8			GD08C-0640	8	114	76	66	36			○
6.5	3	External coolant		GD03-0650S	7	79	34	24	36			○
	5			GD05-0650S	7	91	53	43	36			○
	3	Internal coolant		GD03C-0650S	7	79	34	24	36			○
	5			GD05C-0650S	7	91	53	43	36			○
	3	External coolant		GD03-0650	8	79	34	24	36			●
	5			GD05-0650	8	91	53	43	36			●
	3	Internal coolant		GD03C-0650	8	79	34	24	36			●
	5			GD05C-0650	8	91	53	43	36			●
	8			GD08C-0650	8	114	76	66	36			○

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
6.6	3	External coolant	Straight shank	GD03-0660S	7	79	34	24	36	5/16-18UNC	M7×1	○
	5			GD05-0660S	7	91	53	43	36			○
	3	Internal coolant		GD03C-0660S	7	79	34	24	36			○
	5			GD05C-0660S	7	91	53	43	36			○
	3	External coolant		GD03-0660	8	79	34	24	36			●
	5			GD05-0660	8	91	53	43	36			●
	3	Internal coolant		GD03C-0660	8	79	34	24	36			●
	5			GD05C-0660	8	91	53	43	36			●
	8			GD08C-0660	8	114	76	66	36			○
6.7	3	External coolant		GD03-0670S	7	79	34	24	36			○
	5			GD05-0670S	7	91	53	43	36			○
	3	Internal coolant		GD03C-0670S	7	79	34	24	36			○
	5			GD05C-0670S	7	91	53	43	36			○
	3	External coolant		GD03-0670	8	79	34	24	36			●
	5			GD05-0670	8	91	53	43	36			●
	3	Internal coolant		GD03C-0670	8	79	34	24	36			●
	5			GD05C-0670	8	91	53	43	36			●
	8			GD08C-0670	8	114	76	66	36			○
6.75	3	External coolant		GD03-0675S	7	79	34	24	36	M8×1.25		○
	5			GD05-0675S	7	91	53	43	36			○
	3	Internal coolant		GD03C-0675S	7	79	34	24	36			○
	5			GD05C-0675S	7	91	53	43	36			○
	3	External coolant		GD03-0675	8	79	34	24	36			●
	5			GD05-0675	8	91	53	43	36			●
	3	Internal coolant		GD03C-0675	8	79	34	24	36			●
	5			GD05C-0675	8	91	53	43	36			●
6.8	3	External coolant		GD03-0680S	7	79	34	24	36			○
	5			GD05-0680S	7	91	53	43	36			○
	3	Internal coolant		GD03C-0680S	7	79	34	24	36			○
	5			GD05C-0680S	7	91	53	43	36			○
	3	External coolant		GD03-0680	8	79	34	24	36			●
	5			GD05-0680	8	91	53	43	36			●
	3	Internal coolant		GD03C-0680	8	79	34	24	36			●
	5			GD05C-0680	8	91	53	43	36			●
	8			GD08C-0680	8	114	76	66	36			○

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h5. ● Stock available ○ Make-to-order

Applicable material table

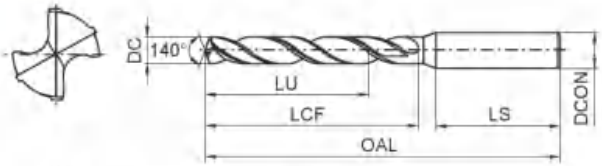
○ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	○	○			○	○	○			○

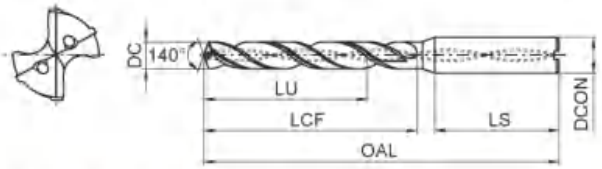
Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining









● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
6.9	3	External coolant	Straight shank	GD03-0690S	7	79	34	24	36			○
	5			GD05-0690S	7	91	53	43	36			○
	3	Internal coolant		GD03C-0690S	7	79	34	24	36			○
	5			GD05C-0690S	7	91	53	43	36			○
	3	External coolant		GD03-0690	8	79	34	24	36	5/16-24UNF		●
	5			GD05-0690	8	91	53	43	36			●
	3	Internal coolant		GD03C-0690	8	79	34	24	36			●
	5			GD05C-0690	8	91	53	43	36			●
	8			GD08C-0690	8	114	76	66	36			○
7.0	3	External coolant		GD03-0700S	7	79	34	24	36			○
	5			GD05-0700S	7	91	53	43	36			○
	3	Internal coolant		GD03C-0700S	7	79	34	24	36			○
	5			GD05C-0700S	7	91	53	43	36			○
	3	External coolant		GD03-0700	8	79	34	24	36	M8×1		●
	5			GD05-0700	8	91	53	43	36			●
	3	Internal coolant		GD03C-0700	8	79	34	24	36			●
	5			GD05C-0700	8	91	53	43	36			●
	8			GD08C-0700	8	116	76	66	36			○
7.1	3	External coolant		GD03-0710	8	79	41	29	36			●
	5			GD05-0710	8	91	53	43	36			●
	3	Internal coolant		GD03C-0710	8	79	41	29	36			●
	5			GD05C-0710	8	91	53	43	36			●
	8			GD08C-0710	8	116	76	66	36			○
7.2	3	External coolant		GD03-0720	8	79	41	29	36			●
	5			GD05-0720	8	91	53	43	36			●
	3	Internal coolant		GD03C-0720	8	79	41	29	36			●
	5			GD05C-0720	8	91	53	43	36			●
	8			GD08C-0720	8	116	76	66	36			○

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
7.3	3	External coolant	Straight shank	GD03-0730	8	79	41	29	36		5/16-18UNC	●
	5			GD05-0730	8	91	53	43	36			●
	3	Internal coolant		GD03C-0730	8	79	41	29	36			●
	5			GD05C-0730	8	91	53	43	36			●
	8			GD08C-0730	8	116	76	66	36			○
7.4	3	External coolant		GD03-0740	8	79	41	29	36			●
	5			GD05-0740	8	91	53	43	36			●
	3	Internal coolant		GD03C-0740	8	79	41	29	36			●
	5			GD05C-0740	8	91	53	43	36			●
	8			GD08C-0740	8	116	76	66	36			○
7.45	3	External coolant		GD03-0745	8	79	41	29	36		M8×1.25 5/16-24UNF	●
	5			GD05-0745	8	91	53	43	36			●
	3	Internal coolant		GD03C-0745	8	79	41	29	36			●
	5			GD05C-0745	8	91	53	43	36			●
7.5	3	External coolant		GD03-0750	8	79	41	29	36			●
	5			GD05-0750	8	91	53	43	36			●
	3	Internal coolant		GD03C-0750	8	79	41	29	36			●
	5			GD05C-0750	8	91	53	43	36			●
	8			GD08C-0750	8	116	76	66	36			○
7.6	3	External coolant		GD03-0760	8	79	41	29	36		M8×1	●
	5			GD05-0760	8	91	53	43	36			●
	3	Internal coolant		GD03C-0760	8	79	41	29	36			●
	5			GD05C-0760	8	91	53	43	36			●
	8			GD08C-0760	8	116	76	66	36			○
7.7	3	External coolant		GD03-0770	8	79	41	29	36			●
	5			GD05-0770	8	91	53	43	36			●
	3	Internal coolant		GD03C-0770	8	79	41	29	36			●
	5			GD05C-0770	8	91	53	43	36			●
	8			GD08C-0770	8	116	76	66	36			○
7.8	3	External coolant		GD03-0780	8	79	41	29	36			●
	5			GD05-0780	8	91	53	43	36			●
	3	Internal coolant		GD03C-0780	8	79	41	29	36			●
	5			GD05C-0780	8	91	53	43	36			●
	8			GD08C-0780	8	116	76	66	36			○

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h_5. ● Stock available ○ Make-to-order

Applicable material table

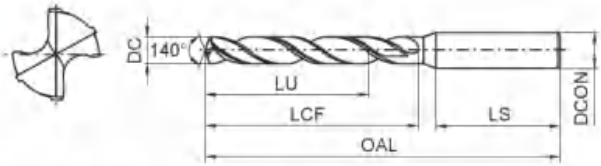
○ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	○	○			○	○	○			○

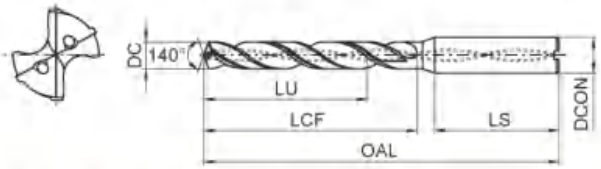
Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining


External coolant Straight shank




Internal coolant Straight shank



● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
7.9	3	External coolant	Straight shank	GD03-0790	8	79	41	29	36			●
	5			GD05-0790	8	91	53	43	36			●
	3	Internal coolant		GD03C-0790	8	79	41	29	36			●
	5			GD05C-0790	8	91	53	43	36			●
	8			GD08C-0790	8	116	76	66	36			○
8.0	3	External coolant		GD03-0800	8	79	41	29	36	3/8-16UNC		●
	5			GD05-0800	8	91	53	43	36			●
	3	Internal coolant		GD03C-0800	8	79	41	29	36			●
	5			GD05C-0800	8	91	53	43	36			●
	8			GD08C-0800	8	116	76	66	36			○
8.1	3	External coolant		GD03-0810S	9	89	47	35	40			○
	5			GD05-0810S	9	103	61	49	40			○
	3	Internal coolant		GD03C-0810S	9	89	47	35	40			○
	5			GD05C-0810S	9	103	61	49	40			○
	3	External coolant		GD03-0810	10	89	47	35	40			●
	5			GD05-0810	10	103	61	49	40			●
	3	Internal coolant		GD03C-0810	10	89	47	35	40			●
	5			GD05C-0810	10	103	61	49	40			●
	8			GD08C-0810	10	142	95	83	40			○
8.2	3	External coolant		GD03-0820S	9	89	47	35	40			○
	5			GD05-0820S	9	103	61	49	40			○
	3	Internal coolant		GD03C-0820S	9	89	47	35	40			○
	5			GD05C-0820S	9	103	61	49	40			○
	3	External coolant		GD03-0820	10	89	47	35	40			●
	5			GD05-0820	10	103	61	49	40			●
	3	Internal coolant		GD03C-0820	10	89	47	35	40			●
	5			GD05C-0820	10	103	61	49	40			●
	8			GD08C-0820	10	142	95	83	40			○

● Stock available ○ Make-to-order

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
8.3	3	External coolant	Straight shank	GD03-0830S	9	89	47	35	40			○
	5			GD05-0830S	9	103	61	49	40			○
	3	Internal coolant		GD03C-0830S	9	89	47	35	40			○
	5			GD05C-0830S	9	103	61	49	40			○
	3	External coolant		GD03-0830	10	89	47	35	40			●
	5			GD05-0830	10	103	61	49	40			●
	3	Internal coolant		GD03C-0830	10	89	47	35	40			●
	5			GD05C-0830	10	103	61	49	40			●
	8			GD08C-0830	10	142	95	83	40			○
8.4	3	External coolant		GD03-0840S	9	89	47	35	40			○
	5			GD05-0840S	9	103	61	49	40			○
	3	Internal coolant		GD03C-0840S	9	89	47	35	40			○
	5			GD05C-0840S	9	103	61	49	40			○
	3	External coolant		GD03-0840	10	89	47	35	40			●
	5			GD05-0840	10	103	61	49	40			●
	3	Internal coolant		GD03C-0840	10	89	47	35	40			●
	5			GD05C-0840	10	103	61	49	40			●
	8			GD08C-0840	10	142	95	83	40			○
8.5	3	External coolant		GD03-0850S	9	89	47	35	40	M10×1.5 3/8-24UNF		○
	5			GD05-0850S	9	103	61	49	40			○
	3	Internal coolant		GD03C-0850S	9	89	47	35	40			○
	5			GD05C-0850S	9	103	61	49	40			○
	3	External coolant		GD03-0850	10	89	47	35	40			●
	5			GD05-0850	10	103	61	49	40			●
	3	Internal coolant		GD03C-0850	10	89	47	35	40			●
	5			GD05C-0850	10	103	61	49	40			●
	8			GD08C-0850	10	142	95	83	40			○
8.6	3	External coolant		GD03-0860S	9	89	47	35	40			○
	5			GD05-0860S	9	103	61	49	40			○
	3	Internal coolant		GD03C-0860S	9	89	47	35	40			○
	5			GD05C-0860S	9	103	61	49	40			○
	3	External coolant		GD03-0860	10	89	47	35	40			●
	5			GD05-0860	10	103	61	49	40			●
	3	Internal coolant		GD03C-0860	10	89	47	35	40			●
	5			GD05C-0860	10	103	61	49	40			●
	8			GD08C-0860	10	142	95	83	40			○

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h5. ● Stock available ○ Make-to-order

Applicable material table

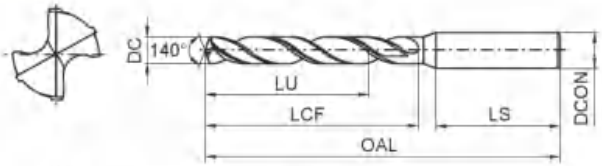
◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	◎	◎			○	◎	◎			○

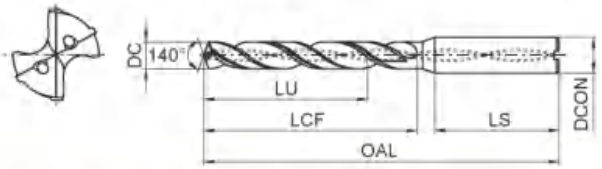
Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining









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Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
8.7	3	External coolant	Straight shank	GD03-0870S	9	89	47	35	40			○
	5			GD05-0870S	9	103	61	49	40			○
	3	Internal coolant		GD03C-0870S	9	89	47	35	40			○
	5			GD05C-0870S	9	103	61	49	40			○
	3	External coolant		GD03-0870	10	89	47	35	40			●
	5			GD05-0870	10	103	61	49	40			●
	3	Internal coolant		GD03C-0870	10	89	47	35	40			●
	5			GD05C-0870	10	103	61	49	40			●
	8			GD08C-0870	10	142	95	83	40			○
8.75	3	External coolant		GD03-0875S	9	89	47	35	40	M10×1.25		○
	5			GD05-0875S	9	103	61	49	40			○
	3	Internal coolant		GD03C-0875S	9	89	47	35	40			○
	5			GD05C-0875S	9	103	61	49	40			○
	3	External coolant		GD03-0875	10	89	47	35	40			●
	5			GD05-0875	10	103	61	49	40			●
	3	Internal coolant		GD03C-0875	10	89	47	35	40			●
	5			GD05C-0875	10	103	61	49	40			●
8.8	3	External coolant		GD03-0880S	9	89	47	35	40		3/8-16UNC	○
	5			GD05-0880S	9	103	61	49	40			○
	3	Internal coolant		GD03C-0880S	9	89	47	35	40			○
	5			GD05C-0880S	9	103	61	49	40			○
	3	External coolant		GD03-0880	10	89	47	35	40			●
	5			GD05-0880	10	103	61	49	40			●
	3	Internal coolant		GD03C-0880	10	89	47	35	40			●
	5			GD05C-0880	10	103	61	49	40			●
	8			GD08C-0880	10	142	95	83	40			○

● Stock available ○ Make-to-order

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
8.9	3	External coolant	Straight shank	GD03-0890S	9	89	47	35	40			○
	5			GD05-0890S	9	103	61	49	40			○
	3	Internal coolant		GD03C-0890S	9	89	47	35	40			○
	5			GD05C-0890S	9	103	61	49	40			○
	3	External coolant		GD03-0890	10	89	47	35	40			●
	5			GD05-0890	10	103	61	49	40			●
	3	Internal coolant		GD03C-0890	10	89	47	35	40			●
	5			GD05C-0890	10	103	61	49	40			●
	8			GD08C-0890	10	142	95	83	40			○
9.0	3	External coolant		GD03-0900S	9	89	47	35	40	M10×1	3/8-24UNF	○
	5			GD05-0900S	9	103	61	49	40			○
	3	Internal coolant		GD03C-0900S	9	89	47	35	40			○
	5			GD05C-0900S	9	103	61	49	40			○
	3	External coolant		GD03-0900	10	89	47	35	40			●
	5			GD05-0900	10	103	61	49	40			●
	3	Internal coolant		GD03C-0900	10	89	47	35	40			●
	5			GD05C-0900	10	103	61	49	40			●
	8			GD08C-0900	10	142	95	83	40			○
9.1	3	External coolant		GD03-0910	10	89	47	35	40			●
	5			GD05-0910	10	103	61	49	40			●
	3	Internal coolant		GD03C-0910	10	89	47	35	40			●
	5			GD05C-0910	10	103	61	49	40			●
	8			GD08C-0910	10	142	95	83	40			○
9.2	3	External coolant		GD03-0920	10	89	47	35	40			●
	5			GD05-0920	10	103	61	49	40			●
	3	Internal coolant		GD03C-0920	10	89	47	35	40			●
	5			GD05C-0920	10	103	61	49	40			●
	8			GD08C-0920	10	142	95	83	40			○
9.3	3	External coolant		GD03-0930	10	89	47	35	40			●
	5			GD05-0930	10	103	61	49	40			●
	3	Internal coolant		GD03C-0930	10	89	47	35	40			●
	5			GD05C-0930	10	103	61	49	40			●
	8			GD08C-0930	10	142	95	83	40			○

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h5. ● Stock available ○ Make-to-order

Applicable material table

○ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	○	○			○	○	○			○

Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

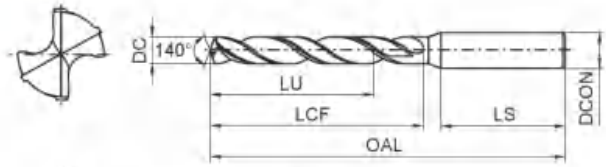
GD series General machining

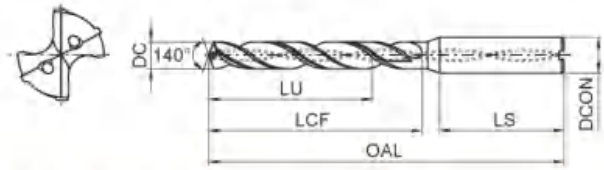


External coolant Straight shank



Internal coolant Straight shank





● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm) Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Suitable for thread Cutting taps / Thread milling cutters	Forming taps	Grade KDG3013
9.35	3	External coolant	Straight shank	GD03-0935	10	89	47	35	40		M10×1.5	●
	5			GD05-0935	10	103	61	49	40			●
	3	Internal coolant		GD03C-0935	10	89	47	35	40			●
	5			GD05C-0935	10	103	61	49	40			●
9.4	3	External coolant		GD03-0940	10	89	47	35	40	7/16-14UNC		●
	5			GD05-0940	10	103	61	49	40			●
	3	Internal coolant		GD03C-0940	10	89	47	35	40			●
	5			GD05C-0940	10	103	61	49	40			●
	8			GD08C-0940	10	142	95	83	40			○
9.45	3	External coolant		GD03-0945	10	89	47	35	40		M10×1.25	●
	5			GD05-0945	10	103	61	49	40			●
	3	Internal coolant		GD03C-0945	10	89	47	35	40			●
	5			GD05C-0945	10	103	61	49	40			●
9.5	3	External coolant		GD03-0950	10	89	47	35	40			●
	5			GD05-0950	10	103	61	49	40			●
	3	Internal coolant		GD03C-0950	10	89	47	35	40			●
	5			GD05C-0950	10	103	61	49	40			●
	8			GD08C-0950	10	142	95	83	40			○
9.6	3	External coolant		GD03-0960	10	89	47	35	40		M10×1	●
	5			GD05-0960	10	103	61	49	40			●
	3	Internal coolant		GD03C-0960	10	89	47	35	40			●
	5			GD05C-0960	10	103	61	49	40			●
	8			GD08C-0960	10	142	95	83	40			○
9.7	3	External coolant		GD03-0970	10	89	47	35	40			●
	5			GD05-0970	10	103	61	49	40			●
	3	Internal coolant		GD03C-0970	10	89	47	35	40			●
	5			GD05C-0970	10	103	61	49	40			●
	8			GD08C-0970	10	142	95	83	40			○

● Stock available ○ Make-to-order

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
9.8	3	External coolant	Straight shank	GD03-0980	10	89	47	35	40			●
	5			GD05-0980	10	103	61	49	40			●
	3	Internal coolant		GD03C-0980	10	89	47	35	40			●
	5			GD05C-0980	10	103	61	49	40			●
	8			GD08C-0980	10	142	95	83	40			○
9.9	3	External coolant		GD03-0990	10	89	47	35	40	7/16-20UNF		●
	5			GD05-0990	10	103	61	49	40			●
	3	Internal coolant		GD03C-0990	10	89	47	35	40			●
	5			GD05C-0990	10	103	61	49	40			●
	8			GD08C-0990	10	142	95	83	40			○
10.0	3	External coolant		GD03-1000	10	89	47	35	40			●
	5			GD05-1000	10	103	61	49	40			●
	3	Internal coolant		GD03C-1000	10	89	47	35	40			●
	5			GD05C-1000	10	103	61	49	40			●
	8			GD08C-1000	10	142	95	83	40			○
10.1	3	External coolant		GD03-1010S	11	102	55	40	45			○
	5			GD05-1010S	11	118	71	56	45			○
	3	Internal coolant		GD03C-1010S	11	102	55	40	45			○
	5			GD05C-1010S	11	118	71	56	45			○
	3	External coolant		GD03-1010	12	102	55	40	45			●
	5			GD05-1010	12	118	71	56	45			●
	3	Internal coolant		GD03C-1010	12	102	55	40	45			●
	5			GD05C-1010	12	118	71	56	45			●
	8			GD08C-1010	12	162	114	99	45			○
10.2	3	External coolant		GD03-1020S	11	102	55	40	45			○
	5			GD05-1020S	11	118	71	56	45			○
	3	Internal coolant		GD03C-1020S	11	102	55	40	45			○
	5			GD05C-1020S	11	118	71	56	45			○
	3	External coolant		GD03-1020	12	102	55	40	45			●
	5			GD05-1020	12	118	71	56	45			●
	3	Internal coolant		GD03C-1020	12	102	55	40	45			●
	5			GD05C-1020	12	118	71	56	45			●
	8			GD08C-1020	12	162	114	99	45			○

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h5. ● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

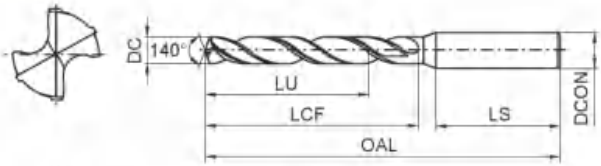
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	◎	◎			○	◎	◎			○

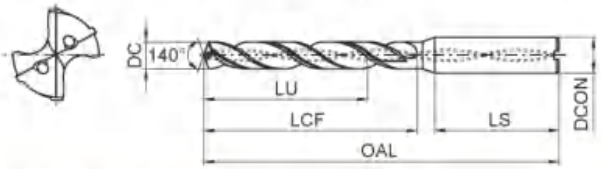
Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining


External coolant Straight shank


Internal coolant Straight shank





● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
10.25	3	External coolant	Straight shank	GD03-1025S	11	102	55	40	45	M12×1.75		○
	5			GD05-1025S	11	118	71	56	45			○
	3	Internal coolant		GD03C-1025S	11	102	55	40	45			○
	5			GD05C-1025S	11	118	71	56	45			○
	3	External coolant		GD03-1025	12	102	55	40	45			●
	5			GD05-1025	12	118	71	56	45			●
	3	Internal coolant		GD03C-1025	12	102	55	40	45			●
	5			GD05C-1025	12	118	71	56	45			●
10.3	3	External coolant		GD03-1030S	11	102	55	40	45		7/16-14UNC	○
	5			GD05-1030S	11	118	71	56	45			○
	3	Internal coolant		GD03C-1030S	11	102	55	40	45			○
	5			GD05C-1030S	11	118	71	56	45			○
	3	External coolant		GD03-1030	12	102	55	40	45			●
	5			GD05-1030	12	118	71	56	45			●
	3	Internal coolant		GD03C-1030	12	102	55	40	45			●
	5			GD05C-1030	12	118	71	56	45			●
	8			GD08C-1030	12	162	114	99	45			○
10.4	3	External coolant		GD03-1040S	11	102	55	40	45			○
	5			GD05-1040S	11	118	71	56	45			○
	3	Internal coolant		GD03C-1040S	11	102	55	40	45			○
	5			GD05C-1040S	11	118	71	56	45			○
	3	External coolant		GD03-1040	12	102	55	40	45			●
	5			GD05-1040	12	118	71	56	45			●
	3	Internal coolant		GD03C-1040	12	102	55	40	45			●
	5			GD05C-1040	12	118	71	56	45			●
	8			GD08C-1040	12	162	114	99	45			○

● Stock available ○ Make-to-order

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
10.5	3	External coolant	Straight shank	GD03-1050S	11	102	55	40	45	M12×1.5	7/16-20UNF	○
	5			GD05-1050S	11	118	71	56	45			○
	3	Internal coolant		GD03C-1050S	11	102	55	40	45			○
	5			GD05C-1050S	11	118	71	56	45			○
	3	External coolant		GD03-1050	12	102	55	40	45			●
	5			GD05-1050	12	118	71	56	45			●
	3	Internal coolant		GD03C-1050	12	102	55	40	45			●
	5			GD05C-1050	12	118	71	56	45			●
	8			GD08C-1050	12	162	114	99	45			○
10.6	3	External coolant		GD03-1060S	11	102	55	40	45			○
	5			GD05-1060S	11	118	71	56	45			○
	3	Internal coolant		GD03C-1060S	11	102	55	40	45			○
	5			GD05C-1060S	11	118	71	56	45			○
	3	External coolant		GD03-1060	12	102	55	40	45			●
	5			GD05-1060	12	118	71	56	45			●
	3	Internal coolant		GD03C-1060	12	102	55	40	45			●
	5			GD05C-1060	12	118	71	56	45			●
	8			GD08C-1060	12	162	114	99	45			○
10.7	3	External coolant		GD03-1070S	11	102	55	40	45			○
	5			GD05-1070S	11	118	71	56	45			○
	3	Internal coolant		GD03C-1070S	11	102	55	40	45			○
	5			GD05C-1070S	11	118	71	56	45			○
	3	External coolant		GD03-1070	12	102	55	40	45			●
	5			GD05-1070	12	118	71	56	45			●
	3	Internal coolant		GD03C-1070	12	102	55	40	45			●
	5			GD05C-1070	12	118	71	56	45			●
	8			GD08C-1070	12	162	114	99	45			○
10.75	3	External coolant		GD03-1075S	11	102	55	40	45	M12×1.25		○
	5			GD05-1075S	11	118	71	56	45			○
	3	Internal coolant		GD03C-1075S	11	102	55	40	45			○
	5			GD05C-1075S	11	118	71	56	45			○
	3	External coolant		GD03-1075	12	102	55	40	45			●
	5			GD05-1075	12	118	71	56	45			●
	3	Internal coolant		GD03C-1075	12	102	55	40	45			●
	5			GD05C-1075	12	118	71	56	45			●

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h5. ● Stock available ○ Make-to-order

Applicable material table

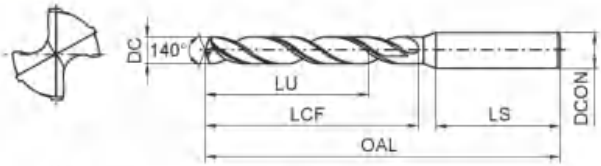
◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	◎	◎			○	◎	◎			○

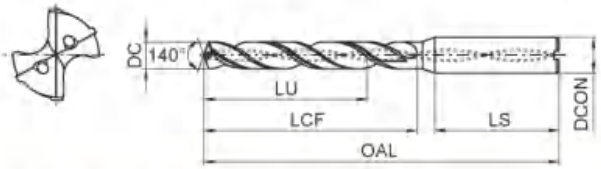
Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining









● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
10.8	3	External coolant	Straight shank	GD03-1080S	11	102	55	40	45	1/2-13UNC		○
	5			GD05-1080S	11	118	71	56	45			○
	3	Internal coolant		GD03C-1080S	11	102	55	40	45			○
	5			GD05C-1080S	11	118	71	56	45			○
	3	External coolant		GD03-1080	12	102	55	40	45			●
	5			GD05-1080	12	118	71	56	45			●
	3	Internal coolant		GD03C-1080	12	102	55	40	45			●
	5			GD05C-1080	12	118	71	56	45			●
	8			GD08C-1080	12	162	114	99	45			○
10.9	3	External coolant		GD03-1090S	11	102	55	40	45			○
	5			GD05-1090S	11	118	71	56	45			○
	3	Internal coolant		GD03C-1090S	11	102	55	40	45			○
	5			GD05C-1090S	11	118	71	56	45			○
	3	External coolant		GD03-1090	12	102	55	40	45			●
	5			GD05-1090	12	118	71	56	45			●
	3	Internal coolant		GD03C-1090	12	102	55	40	45			●
	5			GD05C-1090	12	118	71	56	45			●
	8			GD08C-1090	12	162	114	99	45			○
11.0	3	External coolant		GD03-1100S	11	102	55	40	45			○
	5			GD05-1100S	11	118	71	56	45			○
	3	Internal coolant		GD03C-1100S	11	102	55	40	45			○
	5			GD05C-1100S	11	118	71	56	45			○
	3	External coolant		GD03-1100	12	102	55	40	45			●
	5			GD05-1100	12	118	71	56	45			●
	3	Internal coolant		GD03C-1100	12	102	55	40	45			●
	5			GD05C-1100	12	118	71	56	45			●
	8			GD08C-1100	12	162	114	99	45			○

● Stock available ○ Make-to-order

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
11.1	3	External coolant	Straight shank	GD03-1110	12	102	55	40	45			●
	5			GD05-1110	12	118	71	56	45			●
	3	Internal coolant		GD03C-1110	12	102	55	40	45			●
	5			GD05C-1110	12	118	71	56	45			●
	8			GD08C-1110	12	162	114	99	45			○
11.2	3	External coolant		GD03-1120	12	102	55	40	45			●
	5			GD05-1120	12	118	71	56	45			●
	3	Internal coolant		GD03C-1120	12	102	55	40	45			●
	5			GD05C-1120	12	118	71	56	45			●
	8			GD08C-1120	12	162	114	99	45			○
11.25	3	External coolant		GD03-1125	12	102	55	40	45		M12×1.75	●
	5			GD05-1125	12	118	71	56	45			●
	3	Internal coolant		GD03C-1125	12	102	55	40	45			●
	5			GD05C-1125	12	118	71	56	45			●
11.3	3	External coolant		GD03-1130	12	102	55	40	45			●
	5			GD05-1130	12	118	71	56	45			●
	3	Internal coolant		GD03C-1130	12	102	55	40	45			●
	5			GD05C-1130	12	118	71	56	45			●
	8			GD08C-1130	12	162	114	99	45			○
11.35	3	External coolant		GD03-1135	12	102	55	40	45			●
	5			GD05-1135	12	118	71	56	45		M12×1.5	●
	3	Internal coolant		GD03C-1135	12	102	55	40	45			●
	5			GD05C-1135	12	118	71	56	45			●
11.4	3	External coolant		GD03-1140	12	102	55	40	45			●
	5			GD05-1140	12	118	71	56	45			●
	3	Internal coolant		GD03C-1140	12	102	55	40	45			●
	5			GD05C-1140	12	118	71	56	45			●
	8			GD08C-1140	12	162	114	99	45			○
11.45	3	External coolant		GD03-1145	12	102	55	40	45			●
	5			GD05-1145	12	118	71	56	45		M12×1.25	●
	3	Internal coolant		GD03C-1145	12	102	55	40	45			●
	5			GD05C-1145	12	118	71	56	45			●

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h5. ● Stock available ○ Make-to-order

Applicable material table

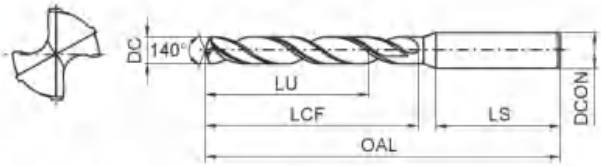
◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	◎	◎			○	◎	◎			○

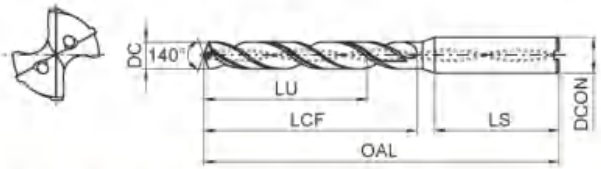
Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining









● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
11.5	3	External coolant	Straight shank	GD03-1150	12	102	55	40	45	1/2-20UNF		●
	5			GD05-1150	12	118	71	56	45			●
	3	Internal coolant		GD03C-1150	12	102	55	40	45			●
	5			GD05C-1150	12	118	71	56	45			●
	8			GD08C-1150	12	162	114	99	45			○
11.6	3	External coolant		GD03-1160	12	102	55	40	45			●
	5			GD05-1160	12	118	71	56	45			●
	3	Internal coolant		GD03C-1160	12	102	55	40	45			●
	5			GD05C-1160	12	118	71	56	45			●
	8			GD08C-1160	12	162	114	99	45			○
11.7	3	External coolant		GD03-1170	12	102	55	40	45			●
	5			GD05-1170	12	118	71	56	45			●
	3	Internal coolant		GD03C-1170	12	102	55	40	45			●
	5			GD05C-1170	12	118	71	56	45			●
	8			GD08C-1170	12	162	114	99	45			○
11.8	3	External coolant		GD03-1180	12	102	55	40	45			●
	5			GD05-1180	12	118	71	56	45			●
	3	Internal coolant		GD03C-1180	12	102	55	40	45		1/2-13UNC	●
	5			GD05C-1180	12	118	71	56	45			●
	8			GD08C-1180	12	162	114	99	45			○
11.9	3	External coolant		GD03-1190	12	102	55	40	45			●
	5			GD05-1190	12	118	71	56	45			●
	3	Internal coolant		GD03C-1190	12	102	55	40	45			●
	5			GD05C-1190	12	118	71	56	45			●
	8			GD08C-1190	12	162	114	99	45			○
12.0	3	External coolant		GD03-1200	12	102	55	40	45			●
	5			GD05-1200	12	118	71	56	45			●
	3	Internal coolant		GD03C-1200	12	102	55	40	45	M14×2		●
	5			GD05C-1200	12	118	71	56	45			●
	8			GD08C-1200	12	162	114	99	45			○

● Stock available ○ Make-to-order

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
12.1	3	External coolant	Straight shank	GD03-1210	14	107	60	43	45		1/2-20UNF	●
	5			GD05-1210	14	124	77	60	45			●
	3	Internal coolant		GD03C-1210	14	107	60	43	45			●
	5			GD05C-1210	14	124	77	60	45			●
12.2	3	External coolant		GD03-1220	14	107	60	43	45	9/16-12UNC		●
	5			GD05-1220	14	124	77	60	45			●
	3	Internal coolant		GD03C-1220	14	107	60	43	45			●
	5			GD05C-1220	14	124	77	60	45			●
12.25	3	External coolant		GD03-1225	14	107	60	43	45			●
	5			GD05-1225	14	124	77	60	45			●
	3	Internal coolant		GD03C-1225	14	107	60	43	45			●
	5			GD05C-1225	14	124	77	60	45			●
12.3	3	External coolant		GD03-1230	14	107	60	43	45			●
	5			GD05-1230	14	124	77	60	45			●
	3	Internal coolant		GD03C-1230	14	107	60	43	45			●
	5			GD05C-1230	14	124	77	60	45			●
12.5	3	External coolant		GD03-1250	14	107	60	43	45	M14×1.5		●
	5			GD05-1250	14	124	77	60	45			●
	3	Internal coolant		GD03C-1250	14	107	60	43	45			●
	5			GD05C-1250	14	124	77	60	45			●
	8			GD08C-1250	14	178	133	116	45			○
12.7	3	External coolant		GD03-1270	14	107	60	43	45			●
	5			GD05-1270	14	124	77	60	45			●
	3	Internal coolant		GD03C-1270	14	107	60	43	45			●
	5			GD05C-1270	14	124	77	60	45			●
	8			GD08C-1270	14	178	133	116	45			○
12.75	3	External coolant		GD03-1275	14	107	60	43	45			●
	5			GD05-1275	14	124	77	60	45			●
	3	Internal coolant		GD03C-1275	14	107	60	43	45			●
	5			GD05C-1275	14	124	77	60	45			●
12.8	3	External coolant		GD03-1280	14	107	60	43	45			●
	5			GD05-1280	14	124	77	60	45			●
	3	Internal coolant		GD03C-1280	14	107	60	43	45			●
	5			GD05C-1280	14	124	77	60	45			●
	8			GD08C-1280	14	178	133	116	45			○

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h5. ● Stock available ○ Make-to-order

Applicable material table

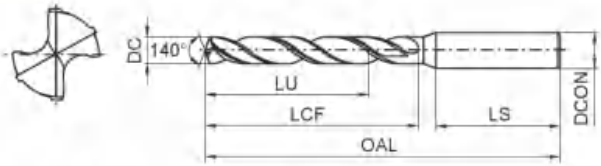
○ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	○	○			○	○	○			○

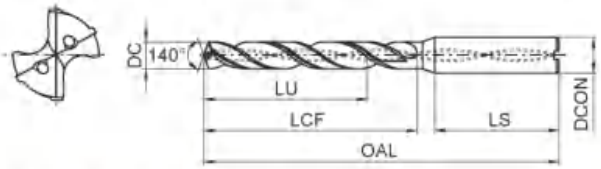
Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining









● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
12.9	3	External coolant	Straight shank	GD03-1290	14	107	60	43	45	9/16-18UNF		●
	5			GD05-1290	14	124	77	60	45			●
	3	Internal coolant		GD03C-1290	14	107	60	43	45			●
	5			GD05C-1290	14	124	77	60	45			●
13.0	3	External coolant		GD03-1300	14	107	60	43	45			●
	5			GD05-1300	14	124	77	60	45			●
	3	Internal coolant		GD03C-1300	14	107	60	43	45			●
	5			GD05C-1300	14	124	77	60	45			●
	8			GD08C-1300	14	178	133	116	45			○
13.1	3	External coolant		GD03-1310	14	107	60	43	45		M14×2	●
	5			GD05-1310	14	124	77	60	45			●
	3	Internal coolant		GD03C-1310	14	107	60	43	45			●
	5			GD05C-1310	14	124	77	60	45			●
13.35	3	External coolant		GD03-1335	14	107	60	43	45		M14×1.5 9/16-12UNC	●
	5			GD05-1335	14	124	77	60	45			●
	3	Internal coolant		GD03C-1335	14	107	60	43	45			●
	5			GD05C-1335	14	124	77	60	45			●
13.5	3	External coolant		GD03-1350	14	107	60	43	45	5/8-11UNC		●
	5			GD05-1350	14	124	77	60	45			●
	3	Internal coolant		GD03C-1350	14	107	60	43	45			●
	5			GD05C-1350	14	124	77	60	45			●
	8			GD08C-1350	14	178	133	116	45			○
13.65	3	External coolant		GD03-1365	14	107	60	43	45		9/16-18UNF	●
	5			GD05-1365	14	124	77	60	45			●
	3	Internal coolant		GD03C-1365	14	107	60	43	45			●
	5			GD05C-1365	14	124	77	60	45			●

● Stock available ○ Make-to-order

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3013
13.8	3	External coolant	Straight shank	GD03-1380	14	107	60	43	45			●
	5			GD05-1380	14	124	77	60	45			●
	3	Internal coolant		GD03C-1380	14	107	60	43	45			●
	5			GD05C-1380	14	124	77	60	45			●
14.0	3	External coolant		GD03-1400	14	107	60	43	45	M16×2		●
	5			GD05-1400	14	124	77	60	45			●
	3	Internal coolant		GD03C-1400	14	107	60	43	45			●
	5			GD05C-1400	14	124	77	60	45			●
	8			GD08C-1400	14	178	133	116	45			○
14.25	3	External coolant		GD03-1425	16	115	65	45	48			●
	5			GD05-1425	16	133	83	63	48			●
	3	Internal coolant		GD03C-1425	16	115	65	45	48			●
	5			GD05C-1425	16	133	83	63	48			●
14.3	3	External coolant		GD03-1430	16	115	65	45	48			●
	5			GD05-1430	16	133	83	63	48			●
	3	Internal coolant		GD03C-1430	16	115	65	45	48			●
	5			GD05C-1430	16	133	83	63	48			●
14.5	3	External coolant		GD03-1450	16	115	65	45	48	M16×1.5 5/8-18UNF		●
	5			GD05-1450	16	133	83	63	48			●
	3	Internal coolant		GD03C-1450	16	115	65	45	48			●
	5			GD05C-1450	16	133	83	63	48			●
	8			GD08C-1450	16	204	152	132	48			○
14.75	3	External coolant		GD03-1475	16	115	65	45	48			●
	5			GD05-1475	16	133	83	63	48			●
	3	Internal coolant		GD03C-1475	16	115	65	45	48			●
	5			GD05C-1475	16	133	83	63	48			●
14.8	3	External coolant		GD03-1480	16	115	65	45	48		5/8-11UNC	●
	5			GD05-1480	16	133	83	63	48			●
	3	Internal coolant		GD03C-1480	16	115	65	45	48			●
	5			GD05C-1480	16	133	83	63	48			●
	8			GD08C-1480	16	204	152	132	48			○
15.0	3	External coolant		GD03-1500	16	115	65	45	48			●
	5			GD05-1500	16	133	83	63	48			●
	3	Internal coolant		GD03C-1500	16	115	65	45	48			●
	5			GD05C-1500	16	133	83	63	48			●
	8			GD08C-1500	16	204	152	132	48			○

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h5. ● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

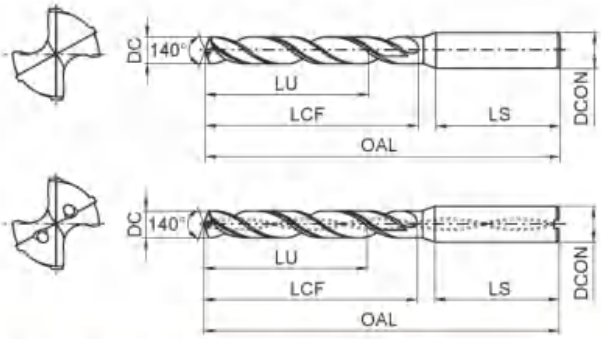
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	◎	◎			○	◎	◎			○

Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining


External coolant Straight shank


Internal coolant Straight shank



● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
15.1	3	External coolant	Straight shank	GD03-1510	16	115	65	45	48		M16×2	●
	5			GD05-1510	16	133	83	63	48			●
	3	Internal coolant		GD03C-1510	16	115	65	45	48			●
	5			GD05C-1510	16	133	83	63	48			●
15.25	3	External coolant		GD03-1525	16	115	65	45	48		5/8-18UNF	●
	5			GD05-1525	16	133	83	63	48			●
	3	Internal coolant		GD03C-1525	16	115	65	45	48			●
	5			GD05C-1525	16	133	83	63	48			●
15.35	3	External coolant		GD03-1535	16	115	65	45	48		M16×1.5	●
	5			GD05-1535	16	133	83	63	48			●
	3	Internal coolant		GD03C-1535	16	115	65	45	48			●
	5			GD05C-1535	16	133	83	63	48			●
15.5	3	External coolant		GD03-1550	16	115	65	45	48	M18×2.5		●
	5			GD05-1550	16	133	83	63	48			●
	3	Internal coolant		GD03C-1550	16	115	65	45	48			●
	5			GD05C-1550	16	133	83	63	48			●
	8			GD08C-1550	16	204	152	132	48			○
15.8	3	External coolant		GD03-1580	16	115	65	45	48			●
	5			GD05-1580	16	133	83	63	48			●
	3	Internal coolant		GD03C-1580	16	115	65	45	48			●
	5			GD05C-1580	16	133	83	63	48			●
16.0	3	External coolant		GD03-1600	16	115	65	45	48			●
	5			GD05-1600	16	133	83	63	48			●
	3	Internal coolant		GD03C-1600	16	115	65	45	48	M18×2		●
	5			GD05C-1600	16	133	83	63	48			●
	8			GD08C-1600	16	204	152	132	48			○

● Stock available ○ Make-to-order

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3013
16.5	3	External coolant	Straight shank	GD03-1650	18	123	73	51	48	3/4-10UNC		●
	5			GD05-1650	18	143	93	71	48			●
	3	Internal coolant		GD03C-1650	18	123	73	51	48			●
	5			GD05C-1650	18	143	93	71	48			●
	8			GD08C-1650	18	223	171	149	48			○
16.75	3	External coolant		GD03-1675	18	123	73	51	48			●
	5			GD05-1675	18	143	93	71	48			●
	3	Internal coolant		GD03C-1675	18	123	73	51	48			●
	5			GD05C-1675	18	143	93	71	48			●
16.8	3	External coolant		GD03-1680	18	123	73	51	48		M18×2.5	●
	5			GD05-1680	18	143	93	71	48			●
	3	Internal coolant		GD03C-1680	18	123	73	51	48			●
	5			GD05C-1680	18	143	93	71	48			●
17.0	3	External coolant		GD03-1700	18	123	73	51	48			●
	5			GD05-1700	18	143	93	71	48			●
	3	Internal coolant		GD03C-1700	18	123	73	51	48			●
	5			GD05C-1700	18	143	93	71	48			●
	8			GD08C-1700	18	223	171	149	48			○
17.5	3	External coolant		GD03-1750	18	123	73	51	48	M20×2.5 3/4-16UNF		●
	5			GD05-1750	18	143	93	71	48			●
	3	Internal coolant		GD03C-1750	18	123	73	51	48			●
	5			GD05C-1750	18	143	93	71	48			●
	8			GD08C-1750	18	223	171	149	48			○
17.8	3	External coolant		GD03-1780	18	123	73	51	48			●
	5			GD05-1780	18	143	93	71	48			●
	3	Internal coolant		GD03C-1780	18	123	73	51	48			●
	5			GD05C-1780	18	143	93	71	48			●
17.9	3	External coolant		GD03-1790	18	123	73	51	48		3/4-10UNC	●
	5			GD05-1790	18	143	93	71	48			●
	3	Internal coolant		GD03C-1790	18	123	73	51	48			●
	5			GD05C-1790	18	143	93	71	48			●
18.0	3	External coolant		GD03-1800	18	123	73	51	48	M20×2		●
	5			GD05-1800	18	143	93	71	48			●
	3	Internal coolant		GD03C-1800	18	123	73	51	48			●
	5			GD05C-1800	18	143	93	71	48			●
	8			GD08C-1800	18	223	171	149	48			○

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h5. ● Stock available ○ Make-to-order

Applicable material table

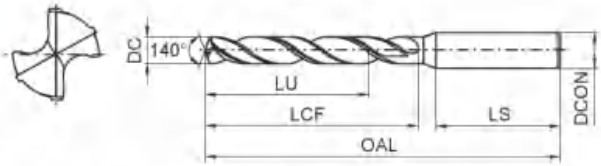
◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	◎	◎			○	◎	◎			○

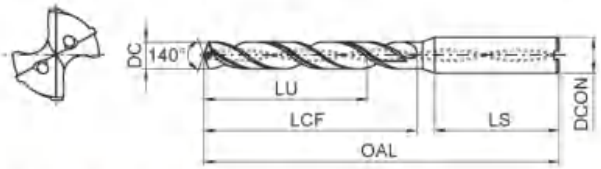
Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining









● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
18.3	3	External coolant	Straight shank	GD03-1830	20	131	79	55	50		3/4-16UNF	●
	5			GD05-1830	20	153	101	77	50			●
	3	Internal coolant		GD03C-1830	20	131	79	55	50			●
	5			GD05C-1830	20	153	101	77	50			●
18.5	3	External coolant		GD03-1850	20	131	79	55	50			●
	5			GD05-1850	20	153	101	77	50			●
	3	Internal coolant		GD03C-1850	20	131	79	55	50			●
	5			GD05C-1850	20	153	101	77	50			●
18.8	3	External coolant		GD03-1880	20	131	79	55	50		M20×2.5	●
	5			GD05-1880	20	153	101	77	50			●
	3	Internal coolant		GD03C-1880	20	131	79	55	50			●
	5			GD05C-1880	20	153	101	77	50			●
19.0	3	External coolant		GD03-1900	20	131	79	55	50			●
	5			GD05-1900	20	153	101	77	50			●
	3	Internal coolant		GD03C-1900	20	131	79	55	50			●
	5			GD05C-1900	20	153	101	77	50			●
19.5	3	External coolant		GD03-1950	20	131	79	55	50			●
	5			GD05-1950	20	153	101	77	50	M22×2.5		●
	3	Internal coolant		GD03C-1950	20	131	79	55	50	7/8-9UNC		●
	5			GD05C-1950	20	153	101	77	50			●
19.8	3	External coolant		GD03-1980	20	131	79	55	50			●
	5			GD05-1980	20	153	101	77	50			●
	3	Internal coolant		GD03C-1980	20	131	79	55	50			●
	5			GD05C-1980	20	153	101	77	50			●
20.0	3	External coolant		GD03-2000	20	131	79	55	50			●
	5			GD05-2000	20	153	101	77	50	M22×2		●
	3	Internal coolant		GD03C-2000	20	131	79	55	50			●
	5			GD05C-2000	20	153	101	77	50			●

● Stock available ○ Make-to-order

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
20.4	3	External coolant	Straight shank	GD03-2040	20	141	86	60	50	7/8-14UNF		○
	5			GD05-2040	20	167	112	85	50			○
	3	Internal coolant		GD03C-2040	20	141	86	60	50			○
	5			GD05C-2040	20	167	112	85	50			○
20.5	3	External coolant		GD03-2050	20	141	86	60	50			○
	5			GD05-2050	20	167	112	85	50			○
	3	Internal coolant		GD03C-2050	20	141	86	60	50			○
	5			GD05C-2050	20	167	112	85	50			○
21.0	3	External coolant		GD03-2100	20	141	86	60	50	M24×3	7/8-9UNC	○
	5			GD05-2100	20	167	112	85	50			○
	3	Internal coolant		GD03C-2100	20	141	86	60	50			○
	5			GD05C-2100	20	167	112	85	50			○
21.4	3	External coolant		GD03-2140	20	141	86	60	50		7/8-14UNF	○
	5			GD05-2140	20	167	112	85	50			○
	3	Internal coolant		GD03C-2140	20	141	86	60	50			○
	5			GD05C-2140	20	167	112	85	50			○
21.5	3	External coolant		GD03-2150	20	141	86	60	50			○
	5			GD05-2150	20	167	112	85	50			○
	3	Internal coolant		GD03C-2150	20	141	86	60	50			○
	5			GD05C-2150	20	167	112	85	50			○
22.0	3	External coolant		GD03-2200	20	141	86	60	50	M24×2		○
	5			GD05-2200	20	167	112	85	50			○
	3	Internal coolant		GD03C-2200	20	141	86	60	50			○
	5			GD05C-2200	20	167	112	85	50			○
22.25	3	External coolant		GD03-2225	25	153	95	65	56	1-8UNC		○
	5			GD05-2225	25	184	126	98	56			○
	3	Internal coolant		GD03C-2225	25	153	95	65	56			○
	5			GD05C-2225	25	184	126	98	56			○
22.5	3	External coolant		GD03-2250	25	153	95	65	56			○
	5			GD05-2250	25	184	126	98	56			○
	3	Internal coolant		GD03C-2250	25	153	95	65	56			○
	5			GD05C-2250	25	184	126	98	56			○
23.0	3	External coolant		GD03-2300	25	153	95	65	56	M25×2		○
	5			GD05-2300	25	184	126	98	56			○
	3	Internal coolant		GD03C-2300	25	153	95	65	56			○
	5			GD05C-2300	25	184	126	98	56			○

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h5. ● Stock available ○ Make-to-order

Applicable material table

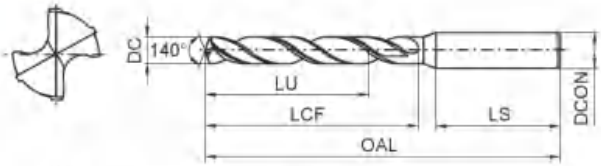
◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	◎	◎			○	◎	◎			○

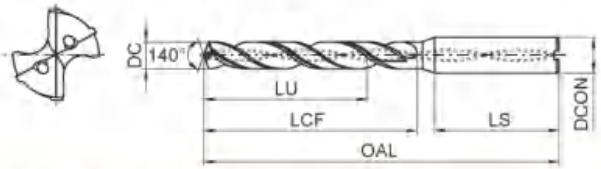
Code key C6 Cutting parameters C151-C152 Technical information C165-C171 Non-standard customization tools C172-C176

GD series General machining









● Suitable for high efficiency drilling in a variety of materials e.g steel, stainless steel, cast iron.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3013
					DCON	OAL	LCF	LU	LS			
23.25	3	External coolant	Straight shank	GD03-2325	25	153	95	65	56	1-12UNF		○
	5			GD05-2325	25	184	126	98	56			○
	3	Internal coolant		GD03C-2325	25	153	95	65	56			○
	5			GD05C-2325	25	184	126	98	56			○
23.5	3	External coolant		GD03-2350	25	153	95	65	56			○
	5			GD05-2350	25	184	126	98	56			○
	3	Internal coolant		GD03C-2350	25	153	95	65	56			○
	5			GD05C-2350	25	184	126	98	56			○
24.0	3	External coolant		GD03-2400	25	153	95	65	56	M27×3	1-8UNC	○
	5			GD05-2400	25	184	126	98	56			○
	3	Internal coolant		GD03C-2400	25	153	95	65	56			○
	5			GD05C-2400	25	184	126	98	56			○
24.5	3	External coolant		GD03-2450	25	153	95	65	56		1-12UNF	○
	5			GD05-2450	25	184	126	98	56			○
	3	Internal coolant		GD03C-2450	25	153	95	65	56			○
	5			GD05C-2450	25	184	126	98	56			○
25.0	3	External coolant		GD03-2500	25	153	95	65	56	M27×2 11/8-7UNC		○
	5			GD05-2500	25	184	126	98	56			○
	3	Internal coolant		GD03C-2500	25	153	95	65	56			○
	5			GD05C-2500	25	184	126	98	56			○

Note: For drilling depth (ULDR) of 8, namely GD08C series, tolerance of shank diameter is h5. ● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3013	○	◎	◎			○	◎	◎			○

Code key C6
Cutting parameters C151-C152
Technical information C165-C171
Non-standard customization tools C172-C176

- New developed curve edge flutes take into account edge strength, tool rigidity, and chip flowing space.



- The new design on regrinding parameters of the chisel edge can improve cutting performance effectively.



- Optimized treatment on cutting edge to improve flutes strength and chipbreaking performance.

- Optimized coating post-treatment technology to significantly improve wear resistance.





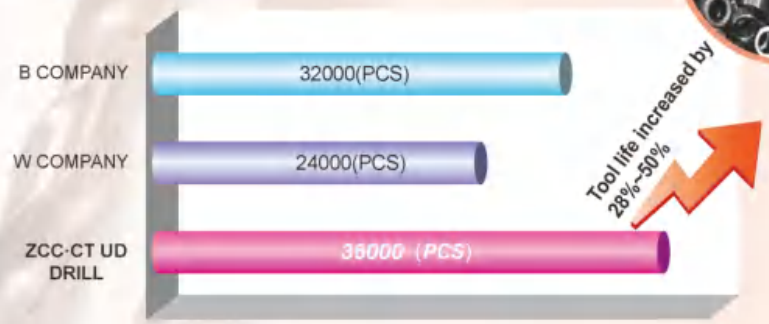
UD Series
Twist drill for general machining

Performance Advantages

UD drills have excellent rigidity, performance stability ,and good general machining application. It is widely used in machining of mild steel, stainless steel, alloy steel and cast iron. Special drill nose design brings lower cutting force.

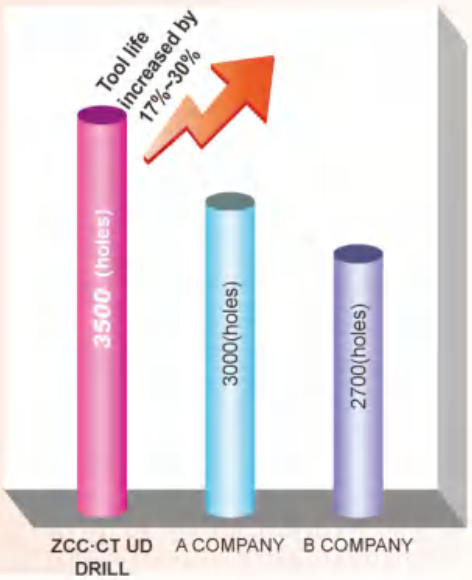
CASE 1





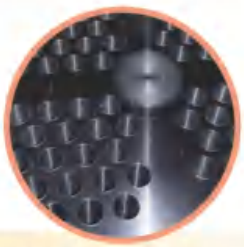
Industry: Automotive parts
Workpiece: Inner ring of bearing
Machined material: 100Cr6 HB185~235
Drill's type: D11.23*61*D10*120
Cutting Parameters: S=3100rpm, f=600mm/min, H=40mm(one cutting depth is 40mm, total 8 pcs workpiece)
Equipment: Composite Turning center, 8 station machine at same time
Coolant method: Oil water emulsion

CASE 2



Industry: Automotive Parts
Workpiece: Hinge
Machined material: Q345B HB280
Drill's type: D14.2*50*D14*135
Cutting Parameters: S=3365rpm, f=673mm/min, H=25mm
Cooling method: External coolant with Oil water emulsion

CASE 3



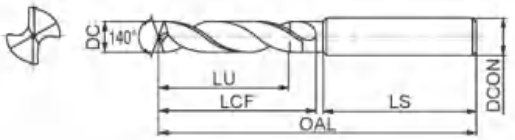


Workpiece: Plates of condenser pipe
Machined Material: 304 stainless steel, HB180
Drill's dimension: D9.7*55*D10*100
Cutting Parameters: S=2298rpm, f=344mm/min, H=36mm
Equipment: Vertical CNC
Cooling way: Internal coolant with Oil water emulsion

UD series General machining

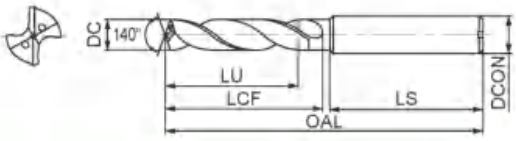


External coolant Straight shank





Internal coolant Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3023
					DCON	OAL	LCF	LU	LS			
2	3	External coolant	Straight shank	UD03-0200S	3	46	13	9	30		NO.2-64UNF	○
	5			UD05-0200S	3	50	18	14	30			○
	3			UD03-0200	4	46	13	9	30			●
	5			UD05-0200	4	50	18	14	30			●
2.1	3			UD03-0210S	3	46	13	9	30	NO.3-48UNC		○
	5			UD05-0210S	3	50	18	14	30			○
	3			UD03-0210	4	46	13	9	30			●
	5			UD05-0210	4	50	18	14	30			●
2.15	3			UD03-0215S	3	46	13	9	30	NO.3-56UNF		○
	5			UD05-0215S	3	50	18	14	30			○
	3			UD03-0215	4	46	13	9	30			●
	5			UD05-0215	4	50	18	14	30			●
2.2	3			UD03-0220S	3	46	13	9	30			○
	5			UD05-0220S	3	50	18	14	30			○
	3			UD03-0220	4	46	13	9	30			●
	5			UD05-0220	4	50	18	14	30			●
2.3	3			UD03-0230S	3	46	13	9	30		M2.5*0.45; NO.3-56UNF	○
	5			UD05-0230S	3	50	18	14	30			○
	3			UD03-0230	4	46	13	9	30			●
	5			UD05-0230	4	50	18	14	30			●

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	◎	◎	◎	○		◎	◎	◎			○

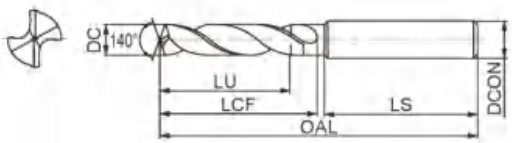
Code key C6 Cutting parameters C153-C154 Technical information C165-C171 Non-standard customization tools C172-C176

UD series General machining



External coolant

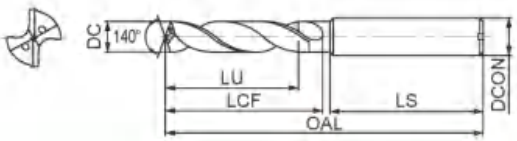
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3023
					DCON	OAL	LCF	LU	LS			
2.35	3	External coolant	Straight shank	UD03-0235S	3	46	13	9	30	NO.4-40UNC		○
	5			UD05-0235S	3	50	18	14	30			○
	3			UD03-0235	4	46	13	9	30			●
	5			UD05-0235	4	50	18	14	30			●
2.4	3			UD03-0240S	3	50	17	12	30	NO.4-48UNF		○
	5			UD05-0240S	3	55	22	17	30			○
	3			UD03-0240	4	50	17	12	30			●
	5			UD05-0240	4	55	22	17	30			●
2.5	3			UD03-0250S	3	50	17	12	30	M3*0.5		○
	5			UD05-0250S	3	55	22	17	30			○
	3			UD03-0250	4	50	17	12	30			●
	5			UD05-0250	4	55	22	17	30			●
2.55	3			UD03-0255S	3	50	17	12	30		NO.4-40UNC	○
	5			UD05-0255S	3	55	22	17	30			○
	3			UD03-0255	4	50	17	12	30			●
	5			UD05-0255	4	55	22	17	30			●
2.6	3			UD03-0260S	3	50	17	12	30		NO.4-48UNF	○
	5			UD05-0260S	3	55	22	17	30			○
	3			UD03-0260	4	50	17	12	30			●
	5			UD05-0260	4	55	22	17	30			●
2.65	3			UD03-0265S	3	50	17	12	30	NO.5-40UNC		○
	5			UD05-0265S	3	55	22	17	30			○
	3			UD03-0265	4	50	17	12	30			●
	5			UD05-0265	4	55	22	17	30			●
2.7	3			UD03-0270S	3	50	17	12	30	NO.5-44UNF		○
	5			UD05-0270S	3	55	22	17	30			○
	3			UD03-0270	4	50	17	12	30			●
	5			UD05-0270	4	55	22	17	30			●

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
2.8	3	External coolant	Straight shank	UD03-0280S	3	50	17	12	30		M3*0.5	○
	5			UD05-0280S	3	55	22	17	30			○
	3			UD03-0280	4	50	17	12	30			●
	5			UD05-0280	4	55	22	17	30			●
2.85	3			UD03-0285S	3	50	17	12	30	NO.6-32UNC		○
	5			UD05-0285S	3	55	22	17	30			○
	3			UD03-0285	4	50	17	12	30			●
	5			UD05-0285	4	55	22	17	30			●
2.9	3			UD03-0290S	3	50	17	12	30		NO.5-40UNC NO.5-44UNF	○
	5			UD05-0290S	3	55	22	17	30			○
	3			UD03-0290	4	50	17	12	30			●
	5			UD05-0290	4	55	22	17	30			●
2.95	3			UD03-0295S	3	50	17	12	30	NO.6-40UNF		○
	5			UD05-0295S	3	55	22	17	30			○
	3			UD03-0295	4	50	17	12	30			●
	5			UD05-0295	4	55	22	17	30			●
3	3	External coolant		UD03-0300S	3	62	20	14	36			○
	5			UD05-0300S	3	66	28	23	36			○
	3	Internal coolant		UD03C-0300S	3	62	20	14	36			○
	5			UD05C-0300S	3	66	28	23	36			○
	3	External coolant		UD03-0300	6	62	20	14	36			●
	5			UD05-0300	6	66	28	23	36			●
	3	Internal coolant		UD03C-0300	6	62	20	14	36			●
	5			UD05C-0300	6	66	28	23	36			●
3.1	3	External coolant		UD03-0310S	4	62	20	14	36			○
	5			UD05-0310S	4	66	28	23	36			○
	3	Internal coolant		UD03C-0310S	4	62	20	14	36			○
	5			UD05C-0310S	4	66	28	23	36			○
	3	External coolant		UD03-0310	6	62	20	14	36			●
	5			UD05-0310	6	66	28	23	36			●
	3	Internal coolant		UD03C-0310	6	62	20	14	36			●
	5			UD05C-0310	6	66	28	23	36			●

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	◎	◎	◎	○		◎	◎	◎			○

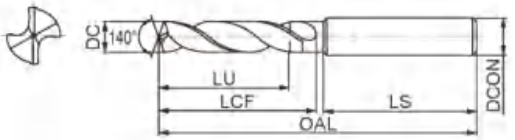
Code key C6
Cutting parameters C153-C154
Technical information C165-C171
Non-standard customization tools C172-C176

UD series General machining



External coolant

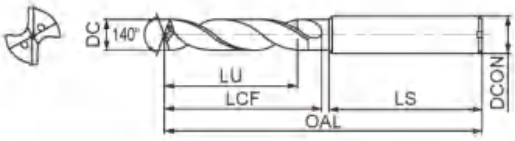
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm) Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Suitable for thread Cutting taps / Thread milling cutters	Forming taps	Grade KDG3023
3.15	3	External coolant	Straight shank	UD03-0315S	4	62	20	14	36		NO.6-32UNC	○
	5			UD05-0315S	4	66	28	23	36			○
	3	Internal coolant		UD03C-0315S	4	62	20	14	36			○
	5			UD05C-0315S	4	66	28	23	36			○
	3	External coolant		UD03-0315	6	62	20	14	36			●
	5			UD05-0315	6	66	28	23	36			●
	3	Internal coolant		UD03C-0315	6	62	20	14	36			●
	5			UD05C-0315	6	66	28	23	36			●
3.2	3	External coolant		UD03-0320S	4	62	20	14	36		NO.6-40UNF	○
	5			UD05-0320S	4	66	28	23	36			○
	3	Internal coolant		UD03C-0320S	4	62	20	14	36			○
	5			UD05C-0320S	4	66	28	23	36			○
	3	External coolant		UD03-0320	6	62	20	14	36			●
	5			UD05-0320	6	66	28	23	36			●
	3	Internal coolant		UD03C-0320	6	62	20	14	36			●
	5			UD05C-0320	6	66	28	23	36			●
3.25	3	External coolant		UD03-0325S	4	62	20	14	36			○
	5			UD05-0325S	4	66	28	23	36			○
	3	Internal coolant		UD03C-0325S	4	62	20	14	36			○
	5			UD05C-0325S	4	66	28	23	36			○
	3	External coolant		UD03-0325	6	62	20	14	36			●
	5			UD05-0325	6	66	28	23	36			●
	3	Internal coolant		UD03C-0325	6	62	20	14	36			●
	5			UD05C-0325	6	66	28	23	36			●
3.3	3	External coolant		UD03-0330S	4	62	20	14	36	M4*0.7		○
	5			UD05-0330S	4	66	28	23	36			○
	3	Internal coolant		UD03C-0330S	4	62	20	14	36			○
	5			UD05C-0330S	4	66	28	23	36			○

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
3.3	3	External coolant	Straight shank	UD03-0330	6	62	20	14	36	M4*0.7		●
	5			UD05-0330	6	66	28	23	36			●
	3	Internal coolant		UD03C-0330	6	62	20	14	36			●
	5			UD05C-0330	6	66	28	23	36			●
3.4	3	External coolant		UD03-0340S	4	62	20	14	36			○
	5			UD05-0340S	4	66	28	23	36			○
	3	Internal coolant		UD03C-0340S	4	62	20	14	36			○
	5			UD05C-0340S	4	66	28	23	36			○
	3	External coolant		UD03-0340	6	62	20	14	36			●
	5			UD05-0340	6	66	28	23	36			●
	3	Internal coolant		UD03C-0340	6	62	20	14	36			●
	5			UD05C-0340	6	66	28	23	36			●
3.5	3	External coolant		UD03-0350S	4	62	20	14	36	M4*0.5 NO.8-32UNC NO.8-36UNF		○
	5			UD05-0350S	4	66	28	23	36			○
	3	Internal coolant		UD03C-0350S	4	62	20	14	36			○
	5			UD05C-0350S	4	66	28	23	36			○
	3	External coolant		UD03-0350	6	62	20	14	36			●
	5			UD05-0350	6	66	28	23	36			●
	3	Internal coolant		UD03C-0350	6	62	20	14	36			●
	5			UD05C-0350	6	66	28	23	36			●
3.6	3	External coolant		UD03-0360S	4	62	20	14	36			○
	5			UD05-0360S	4	66	28	23	36			○
	3	Internal coolant		UD03C-0360S	4	62	20	14	36			○
	5			UD05C-0360S	4	66	28	23	36			○
	3	External coolant		UD03-0360	6	62	20	14	36			●
	5			UD05-0360	6	66	28	23	36			●
	3	Internal coolant		UD03C-0360	6	62	20	14	36			●
	5			UD05C-0360	6	66	28	23	36			●
3.7	3	External coolant		UD03-0370S	4	62	20	14	36		M4*0.7	○
	5			UD05-0370S	4	66	28	23	36			○
	3	Internal coolant		UD03C-0370S	4	62	20	14	36			○
	5			UD05C-0370S	4	66	28	23	36			○

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	○	○	○	○		○	◎	○			○

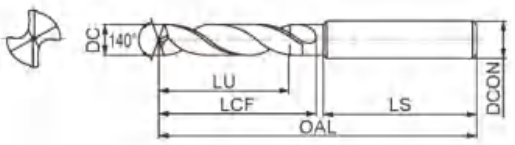
Code key C6
Cutting parameters C153-C154
Technical information C165-C171
Non-standard customization tools C172-C176

UD series General machining



External coolant

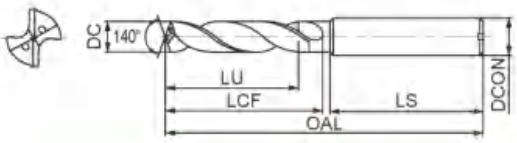
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3023
					DCON	OAL	LCF	LU	LS			
3.7	3	External coolant	Straight shank	UD03-0370	6	62	20	14	36		M4*0.7	●
	5			UD05-0370	6	66	28	23	36			●
	3	Internal coolant		UD03C-0370	6	62	20	14	36			●
	5			UD05C-0370	6	66	28	23	36			●
3.8	3	External coolant		UD03-0380S	4	66	24	17	36		M4*0.5 NO.8-32UNC	○
	5			UD05-0380S	4	74	36	29	36			○
	3	Internal coolant		UD03C-0380S	4	66	24	17	36			○
	5			UD05C-0380S	4	74	36	29	36			○
	3	External coolant		UD03-0380	6	66	24	17	36			●
	5			UD05-0380	6	74	36	29	36			●
	3	Internal coolant		UD03C-0380	6	66	24	17	36			●
	5			UD05C-0380	6	74	36	29	36			●
3.85	3	External coolant		UD03-0385S	4	66	24	17	36		NO.8-36UNF	○
	5			UD05-0385S	4	74	36	29	36			○
	3	Internal coolant		UD03C-0385S	4	66	24	17	36			○
	5			UD05C-0385S	4	74	36	29	36			○
	3	External coolant		UD03-0385	6	66	24	17	36			●
	5			UD05-0385	6	74	36	29	36			●
	3	Internal coolant		UD03C-0385	6	66	24	17	36			●
	5			UD05C-0385	6	74	36	29	36			●
3.9	3	External coolant		UD03-0390S	4	66	24	17	36	NO.10-24UNC		○
	5			UD05-0390S	4	74	36	29	36			○
	3	Internal coolant		UD03C-0390S	4	66	24	17	36			○
	5			UD05C-0390S	4	74	36	29	36			○
	3	External coolant		UD03-0390	6	66	24	17	36			●
	5			UD05-0390	6	74	36	29	36			●
	3	Internal coolant		UD03C-0390	6	66	24	17	36			●
	5			UD05C-0390	6	74	36	29	36			●

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
4	3	External coolant	Straight shank	UD03-0400S	4	66	24	17	36			○
	5			UD05-0400S	4	74	36	29	36			○
	3	Internal coolant		UD03C-0400S	4	66	24	17	36			○
	5			UD05C-0400S	4	74	36	29	36			○
	3	External coolant		UD03-0400	6	66	24	17	36			●
	5			UD05-0400	6	74	36	29	36			●
	3	Internal coolant		UD03C-0400	6	66	24	17	36			●
	5			UD05C-0400	6	74	36	29	36			●
4.1	3	External coolant		UD03-0410S	5	66	24	17	36	NO.10-32UNF		○
	5			UD05-0410S	5	74	36	29	36			○
	3	Internal coolant		UD03C-0410S	5	66	24	17	36			○
	5			UD05C-0410S	5	74	36	29	36			○
	3	External coolant		UD03-0410	6	66	24	17	36			●
	5			UD05-0410	6	74	36	29	36			●
	3	Internal coolant		UD03C-0410	6	66	24	17	36			●
	5			UD05C-0410	6	74	36	29	36			●
4.2	3	External coolant		UD03-0420S	5	66	24	17	36	M5*0.8		○
	5			UD05-0420S	5	74	36	29	36			○
	3	Internal coolant		UD03C-0420S	5	66	24	17	36			○
	5			UD05C-0420S	5	74	36	29	36			○
	3	External coolant		UD03-0420	6	66	24	17	36			●
	5			UD05-0420	6	74	36	29	36			●
	3	Internal coolant		UD03C-0420	6	66	24	17	36			●
	5			UD05C-0420	6	74	36	29	36			●
4.3	3	External coolant		UD03-0430S	5	66	24	17	36			○
	5			UD05-0430S	5	74	36	29	36			○
	3	Internal coolant		UD03C-0430S	5	66	24	17	36			○
	5			UD05C-0430S	5	74	36	29	36			○
	3	External coolant		UD03-0430	6	66	24	17	36			●
	5			UD05-0430	6	74	36	29	36			●
	3	Internal coolant		UD03C-0430	6	66	24	17	36			●
	5			UD05C-0430	6	74	36	29	36			●

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	○	◎	◎	○		○	◎	○			○

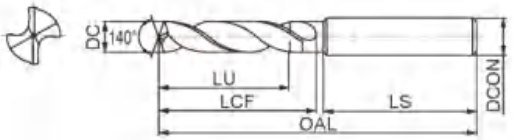
Code key C6
Cutting parameters C153-C154
Technical information C165-C171
Non-standard customization tools C172-C176

UD series General machining



External coolant

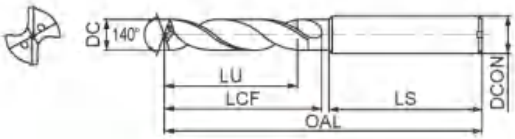
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
4.35	3	External coolant	Straight shank	UD03-0435S	5	66	24	17	36		NO.10-24UNC	○
	5			UD05-0435S	5	74	36	29	36			○
	3	Internal coolant		UD03C-0435S	5	66	24	17	36			○
	5			UD05C-0435S	5	74	36	29	36			○
	3	External coolant		UD03-0435	6	66	24	17	36			●
	5			UD05-0435	6	74	36	29	36			●
	3	Internal coolant		UD03C-0435	6	66	24	17	36			●
	5			UD05C-0435	6	74	36	29	36			●
4.4	3	External coolant		UD03-0440S	5	66	24	17	36			○
	5			UD05-0440S	5	74	36	29	36			○
	3	Internal coolant		UD03C-0440S	5	66	24	17	36			○
	5			UD05C-0440S	5	74	36	29	36			○
	3	External coolant		UD03-0440	6	66	24	17	36			●
	5			UD05-0440	6	74	36	29	36			●
	3	Internal coolant		UD03C-0440	6	66	24	17	36			●
	5			UD05C-0440	6	74	36	29	36			●
4.45	3	External coolant		UD03-0445S	5	66	24	17	36		NO.10-32UNF	○
	5			UD05-0445S	5	74	36	29	36			○
	3	Internal coolant		UD03C-0445S	5	66	24	17	36			○
	5			UD05C-0445S	5	74	36	29	36			○
	3	External coolant		UD03-0445	6	66	24	17	36			●
	5			UD05-0445	6	74	36	29	36			●
	3	Internal coolant		UD03C-0445	6	66	24	17	36			●
	5			UD05C-0445	6	74	36	29	36			●
4.5	3	External coolant		UD03-0450S	5	66	24	17	36	NO.12-24UNC		○
	5			UD05-0450S	5	74	36	29	36			○
	3	Internal coolant		UD03C-0450S	5	66	24	17	36			○
	5			UD05C-0450S	5	74	36	29	36			○

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
4.5	3	External coolant	Straight shank	UD03-0450	6	66	24	17	36	NO.12-24UNC		●
	5			UD05-0450	6	74	36	29	36			●
	3	Internal coolant		UD03C-0450	6	66	24	17	36			●
	5			UD05C-0450	6	74	36	29	36			●
4.6	3	External coolant		UD03-0460S	5	66	24	17	36			○
	5			UD05-0460S	5	74	36	29	36			○
	3	Internal coolant		UD03C-0460S	5	66	24	17	36			○
	5			UD05C-0460S	5	74	36	29	36			○
	3	External coolant		UD03-0460	6	66	24	17	36			●
	5			UD05-0460	6	74	36	29	36			●
	3	Internal coolant		UD03C-0460	6	66	24	17	36			●
	5			UD05C-0460	6	74	36	29	36			●
4.65	3	External coolant		UD03-0465S	5	66	24	17	36		M5*0.8	○
	5			UD05-0465S	5	74	36	29	36			○
	3	Internal coolant		UD03C-0465S	5	66	24	17	36			○
	5			UD05C-0465S	5	74	36	29	36			○
	3	External coolant		UD03-0465	6	66	24	17	36			●
	5			UD05-0465	6	74	36	29	36			●
	3	Internal coolant		UD03C-0465	6	66	24	17	36			●
	5			UD05C-0465	6	74	36	29	36			●
4.7	3	External coolant		UD03-0470S	5	66	24	17	36	NO.12-28UNF		○
	5			UD05-0470S	5	74	36	29	36			○
	3	Internal coolant		UD03C-0470S	5	66	24	17	36			○
	5			UD05C-0470S	5	74	36	29	36			○
	3	External coolant		UD03-0470	6	66	24	17	36			●
	5			UD05-0470	6	74	36	29	36			●
	3	Internal coolant		UD03C-0470	6	66	24	17	36			●
	5			UD05C-0470	6	74	36	29	36			●
4.8	3	External coolant		UD03-0480S	5	66	28	20	36		M5*0.5	○
	5			UD05-0480S	5	82	44	35	36			○
	3	Internal coolant		UD03C-0480S	5	66	28	20	36			○
	5			UD05C-0480S	5	82	44	35	36			○

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	○	◎	◎	○		○	◎	○			○

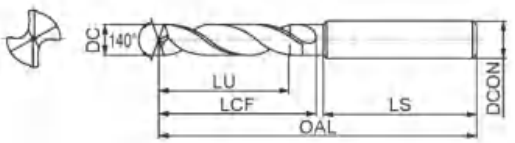
Code key C6 Cutting parameters C153-C154 Technical information C165-C171 Non-standard customization tools C172-C176

UD series General machining



External coolant

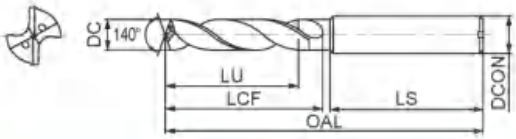
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3023
					DCON	OAL	LCF	LU	LS			
4.8	3	External coolant	Straight shank	UD03-0480	6	66	28	20	36		M5*0.5	●
	5			UD05-0480	6	82	44	35	36			●
	3	Internal coolant		UD03C-0480	6	66	28	20	36			●
	5			UD05C-0480	6	82	44	35	36			●
4.9	3	External coolant		UD03-0490S	5	66	28	20	36			○
	5			UD05-0490S	5	82	44	35	36			○
	3	Internal coolant		UD03C-0490S	5	66	28	20	36			○
	5			UD05C-0490S	5	82	44	35	36			○
	3	External coolant		UD03-0490	6	66	28	20	36			●
	5			UD05-0490	6	82	44	35	36			●
	3	Internal coolant		UD03C-0490	6	66	28	20	36			●
	5			UD05C-0490	6	82	44	35	36			●
5	3	External coolant		UD03-0500S	5	66	28	20	36	M6*1	NO.12-24UNC	○
	5			UD05-0500S	5	82	44	35	36			○
	3	Internal coolant		UD03C-0500S	5	66	28	20	36			○
	5			UD05C-0500S	5	82	44	35	36			○
	3	External coolant		UD03-0500	6	66	28	20	36			●
	5			UD05-0500	6	82	44	35	36			●
	3	Internal coolant		UD03C-0500	6	66	28	20	36			●
	5			UD05C-0500	6	82	44	35	36			●
5.1	3	External coolant		UD03-0510	6	66	28	20	36	1/4-20UNC	NO.12-28UNF	●
	5			UD05-0510	6	82	44	35	36			●
	3	Internal coolant		UD03C-0510	6	66	28	20	36			●
	5			UD05C-0510	6	82	44	35	36			●
5.2	3	External coolant		UD03-0520	6	66	28	20	36			●
	5			UD05-0520	6	82	44	35	36			●
	3	Internal coolant		UD03C-0520	6	66	28	20	36			●
	5			UD05C-0520	6	82	44	35	36			●

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
5.25	3	External coolant	Straight shank	UD03-0525	6	66	28	20	36	M6*0.75		●
	5			UD05-0525	6	82	44	35	36			●
	3	Internal coolant		UD03C-0525	6	66	28	20	36			●
	5			UD05C-0525	6	82	44	35	36			●
5.3	3	External coolant		UD03-0530	6	66	28	20	36			●
	5			UD05-0530	6	82	44	35	36			●
	3	Internal coolant		UD03C-0530	6	66	28	20	36			●
	5			UD05C-0530	6	82	44	35	36			●
5.4	3	External coolant		UD03-0540	6	66	28	20	36			●
	5			UD05-0540	6	82	44	35	36			●
	3	Internal coolant		UD03C-0540	6	66	28	20	36			●
	5			UD05C-0540	6	82	44	35	36			●
5.5	3	External coolant		UD03-0550	6	66	28	20	36	1/4-28UNF		●
	5			UD05-0550	6	82	44	35	36			●
	3	Internal coolant		UD03C-0550	6	66	28	20	36			●
	5			UD05C-0550	6	82	44	35	36			●
5.55	3	External coolant		UD03-0555	6	66	28	20	36			●
	5			UD05-0555	6	82	44	35	36			●
	3	Internal coolant		UD03C-0555	6	66	28	20	36			●
	5			UD05C-0555	6	82	44	35	36			●
5.6	3	External coolant		UD03-0560	6	66	28	20	36		M6*1	●
	5			UD05-0560	6	82	44	35	36			●
	3	Internal coolant		UD03C-0560	6	66	28	20	36			●
	5			UD05C-0560	6	82	44	35	36			●
5.7	3	External coolant		UD03-0570	6	66	28	20	36		M6*0.75	●
	5			UD05-0570	6	82	44	35	36			●
	3	Internal coolant		UD03C-0570	6	66	28	20	36			●
	5			UD05C-0570	6	82	44	35	36			●
5.75	3	External coolant		UD03-0575	6	66	28	20	36		1/4-20UNC	●
	5			UD05-0575	6	82	44	35	36			●
	3	Internal coolant		UD03C-0575	6	66	28	20	36			●
	5			UD05C-0575	6	82	44	35	36			●

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel ~40HRC	~50HRC	~60HRC	Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
KDG3023	○	◎	◎	○		○	◎	○			○

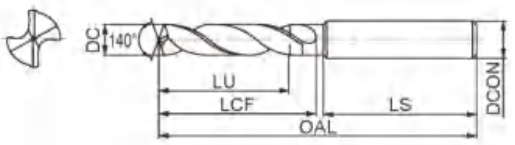
Code key C6
Cutting parameters C153-C154
Technical information C165-C171
Non-standard customization tools C172-C176

UD series General machining



External coolant

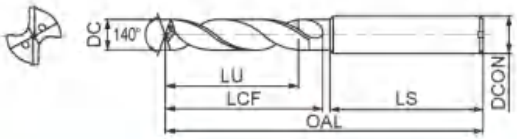
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3023
					DCON	OAL	LCF	LU	LS			
5.8	3	External coolant	Straight shank	UD03-0580	6	66	28	20	36			●
	5			UD05-0580	6	82	44	35	36			●
	3	Internal coolant		UD03C-0580	6	66	28	20	36			●
	5			UD05C-0580	6	82	44	35	36			●
5.9	3	External coolant		UD03-0590	6	66	28	20	36			●
	5			UD05-0590	6	82	44	35	36			●
	3	Internal coolant		UD03C-0590	6	66	28	20	36			●
	5			UD05C-0590	6	82	44	35	36			●
5.95	3	External coolant		UD03-0595	6	66	28	20	36		1/4-28UNF	●
	5			UD05-0595	6	82	44	35	36			●
	3	Internal coolant		UD03C-0595	6	66	28	20	36			●
	5			UD05C-0595	6	82	44	35	36			●
6	3	External coolant		UD03-0600	6	66	28	20	36	M7*1		●
	5			UD05-0600	6	82	44	35	36			●
	3	Internal coolant		UD03C-0600	6	66	28	20	36			●
	5			UD05C-0600	6	82	44	35	36			●
6.1	3	External coolant		UD03-0610S	7	79	34	24	36			○
	5			UD05-0610S	7	91	53	43	36			○
	3	Internal coolant		UD03C-0610S	7	79	34	24	36			○
	5			UD05C-0610S	7	91	53	43	36			○
	3	External coolant		UD03-0610	8	79	34	24	36			●
	5			UD05-0610	8	91	53	43	36			●
	3	Internal coolant		UD03C-0610	8	79	34	24	36			●
	5			UD05C-0610	8	91	53	43	36			●
6.2	3	External coolant		UD03-0620S	7	79	34	24	36			○
	5			UD05-0620S	7	91	53	43	36			○
	3	Internal coolant		UD03C-0620S	7	79	34	24	36			○
	5			UD05C-0620S	7	91	53	43	36			○

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
6.2	3	External coolant	Straight shank	UD03-0620	8	79	34	24	36			●
	5			UD05-0620	8	91	53	43	36			●
	3	Internal coolant		UD03C-0620	8	79	34	24	36			●
	5			UD05C-0620	8	91	53	43	36			●
6.3	3	External coolant		UD03-0630S	7	79	34	24	36			○
	5			UD05-0630S	7	91	53	43	36			○
	3	Internal coolant		UD03C-0630S	7	79	34	24	36			○
	5			UD05C-0630S	7	91	53	43	36			○
	3	External coolant		UD03-0630	8	79	34	24	36			●
	5			UD05-0630	8	91	53	43	36			●
	3	Internal coolant		UD03C-0630	8	79	34	24	36			●
	5			UD05C-0630	8	91	53	43	36			●
6.4	3	External coolant		UD03-0640S	7	79	34	24	36			○
	5			UD05-0640S	7	91	53	43	36			○
	3	Internal coolant		UD03C-0640S	7	79	34	24	36			○
	5			UD05C-0640S	7	91	53	43	36			○
	3	External coolant		UD03-0640	8	79	34	24	36			●
	5			UD05-0640	8	91	53	43	36			●
	3	Internal coolant		UD03C-0640	8	79	34	24	36			●
	5			UD05C-0640	8	91	53	43	36			●
6.5	3	External coolant		UD03-0650S	7	79	34	24	36			○
	5			UD05-0650S	7	91	53	43	36			○
	3	Internal coolant		UD03C-0650S	7	79	34	24	36			○
	5			UD05C-0650S	7	91	53	43	36			○
	3	External coolant		UD03-0650	8	79	34	24	36			●
	5			UD05-0650	8	91	53	43	36			●
	3	Internal coolant		UD03C-0650	8	79	34	24	36			●
	5			UD05C-0650	8	91	53	43	36			●
6.6	3	External coolant		UD03-0660S	7	79	34	24	36	5/16-18UNC	M7*1	○
	5			UD05-0660S	7	91	53	43	36			○
	3	Internal coolant		UD03C-0660S	7	79	34	24	36			○
	5			UD05C-0660S	7	91	53	43	36			○

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	◎	◎	◎	○		◎	◎	◎			○

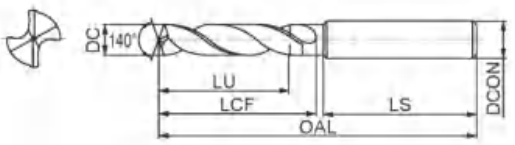
Code key C6 Cutting parameters C153-C154 Technical information C165-C171 Non-standard customization tools C172-C176

UD series General machining



External coolant

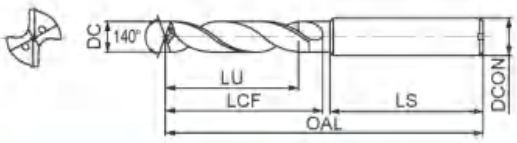
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3023
					DCON	OAL	LCF	LU	LS			
6.6	3	External coolant	Straight shank	UD03-0660	8	79	34	24	36	5/16-18UNC	M7*1	●
	5			UD05-0660	8	91	53	43	36			●
	3	Internal coolant		UD03C-0660	8	79	34	24	36			●
	5			UD05C-0660	8	91	53	43	36			●
6.7	3	External coolant		UD03-0670S	7	79	34	24	36			○
	5			UD05-0670S	7	91	53	43	36			○
	3	Internal coolant		UD03C-0670S	7	79	34	24	36			○
	5			UD05C-0670S	7	91	53	43	36			○
	3	External coolant		UD03-0670	8	79	34	24	36			●
	5			UD05-0670	8	91	53	43	36			●
	3	Internal coolant		UD03C-0670	8	79	34	24	36			●
	5			UD05C-0670	8	91	53	43	36			●
6.75	3	External coolant		UD03-0675S	7	79	34	24	36	M8*1.25		○
	5			UD05-0675S	7	91	53	43	36			○
	3	Internal coolant		UD03C-0675S	7	79	34	24	36			○
	5			UD05C-0675S	7	91	53	43	36			○
	3	External coolant		UD03-0675	8	79	34	24	36			●
	5			UD05-0675	8	91	53	43	36			●
	3	Internal coolant		UD03C-0675	8	79	34	24	36			●
	5			UD05C-0675	8	91	53	43	36			●
6.8	3	External coolant		UD03-0680S	7	79	34	24	36			○
	5			UD05-0680S	7	91	53	43	36			○
	3	Internal coolant		UD03C-0680S	7	79	34	24	36			○
	5			UD05C-0680S	7	91	53	43	36			○
	3	External coolant		UD03-0680	8	79	34	24	36			●
	5			UD05-0680	8	91	53	43	36			●
	3	Internal coolant		UD03C-0680	8	79	34	24	36			●
	5			UD05C-0680	8	91	53	43	36			●

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
6.9	3	External coolant	Straight shank	UD03-0690S	7	79	34	24	36	5/16-24UNF		○
	5			UD05-0690S	7	91	53	43	36			○
	3	Internal coolant		UD03C-0690S	7	79	34	24	36			○
	5			UD05C-0690S	7	91	53	43	36			○
	3	External coolant		UD03-0690	8	79	34	24	36			●
	5			UD05-0690	8	91	53	43	36			●
	3	Internal coolant		UD03C-0690	8	79	34	24	36			●
	5			UD05C-0690	8	91	53	43	36			●
7	3	External coolant		UD03-0700S	7	79	34	24	36	M8*1		○
	5			UD05-0700S	7	91	53	43	36			○
	3	Internal coolant		UD03C-0700S	7	79	34	24	36			○
	5			UD05C-0700S	7	91	53	43	36			○
	3	External coolant		UD03-0700	8	79	34	24	36			●
	5			UD05-0700	8	91	53	43	36			●
	3	Internal coolant		UD03C-0700	8	79	34	24	36			●
	5			UD05C-0700	8	91	53	43	36			●
7.1	3	External coolant		UD03-0710	8	79	41	29	36			●
	5			UD05-0710	8	91	53	43	36			●
	3	Internal coolant		UD03C-0710	8	79	41	29	36			●
	5			UD05C-0710	8	91	53	43	36			●
7.2	3	External coolant		UD03-0720	8	79	41	29	36			●
	5			UD05-0720	8	91	53	43	36			●
	3	Internal coolant		UD03C-0720	8	79	41	29	36			●
	5			UD05C-0720	8	91	53	43	36			●
7.3	3	External coolant		UD03-0730	8	79	41	29	36		5/16-18UNC	●
	5			UD05-0730	8	91	53	43	36			●
	3	Internal coolant		UD03C-0730	8	79	41	29	36			●
	5			UD05C-0730	8	91	53	43	36			●
7.4	3	External coolant		UD03-0740	8	79	41	29	36			●
	5			UD05-0740	8	91	53	43	36			●
	3	Internal coolant		UD03C-0740	8	79	41	29	36			●
	5			UD05C-0740	8	91	53	43	36			●

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	○	○	○	○		○	◎	○			○

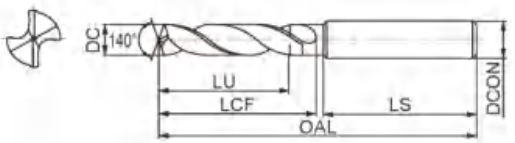
Code key C6
Cutting parameters C153-C154
Technical information C165-C171
Non-standard customization tools C172-C176

UD series General machining



External coolant

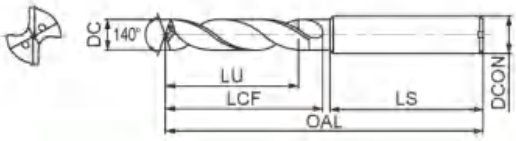
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm) Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Suitable for thread Cutting taps / Thread milling cutters	Forming taps	Grade KDG3023
7.45	3	External coolant	Straight shank	UD03-0745	8	79	41	29	36		M8*1.25 5/16-24UNF	●
	5			UD05-0745	8	91	53	43	36			●
	3	Internal coolant		UD03C-0745	8	79	41	29	36			●
	5			UD05C-0745	8	91	53	43	36			●
7.5	3	External coolant		UD03-0750	8	79	41	29	36			●
	5			UD05-0750	8	91	53	43	36			●
	3	Internal coolant		UD03C-0750	8	79	41	29	36			●
	5			UD05C-0750	8	91	53	43	36			●
7.6	3	External coolant		UD03-0760	8	79	41	29	36		M8*1	●
	5			UD05-0760	8	91	53	43	36			●
	3	Internal coolant		UD03C-0760	8	79	41	29	36			●
	5			UD05C-0760	8	91	53	43	36			●
7.7	3	External coolant		UD03-0770	8	79	41	29	36			●
	5			UD05-0770	8	91	53	43	36			●
	3	Internal coolant		UD03C-0770	8	79	41	29	36			●
	5			UD05C-0770	8	91	53	43	36			●
7.8	3	External coolant		UD03-0780	8	79	41	29	36			●
	5			UD05-0780	8	91	53	43	36			●
	3	Internal coolant		UD03C-0780	8	79	41	29	36			●
	5			UD05C-0780	8	91	53	43	36			●
7.9	3	External coolant		UD03-0790	8	79	41	29	36			●
	5			UD05-0790	8	91	53	43	36			●
	3	Internal coolant		UD03C-0790	8	79	41	29	36			●
	5			UD05C-0790	8	91	53	43	36			●
8	3	External coolant		UD03-0800	8	79	41	29	36	3/8-16UNC		●
	5			UD05-0800	8	91	53	43	36			●
	3	Internal coolant		UD03C-0800	8	79	41	29	36			●
	5			UD05C-0800	8	91	53	43	36			●

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
8.1	3	External coolant	Straight shank	UD03-0810S	9	89	47	35	40			○
	5			UD05-0810S	9	103	61	49	40			○
	3	Internal coolant		UD03C-0810S	9	89	47	35	40			○
	5			UD05C-0810S	9	103	61	49	40			○
	3	External coolant		UD03-0810	10	89	47	35	40			●
	5			UD05-0810	10	103	61	49	40			●
	3	Internal coolant		UD03C-0810	10	89	47	35	40			●
	5			UD05C-0810	10	103	61	49	40			●
8.2	3	External coolant		UD03-0820S	9	89	47	35	40			○
	5			UD05-0820S	9	103	61	49	40			○
	3	Internal coolant		UD03C-0820S	9	89	47	35	40			○
	5			UD05C-0820S	9	103	61	49	40			○
	3	External coolant		UD03-0820	10	89	47	35	40			●
	5			UD05-0820	10	103	61	49	40			●
	3	Internal coolant		UD03C-0820	10	89	47	35	40			●
	5			UD05C-0820	10	103	61	49	40			●
8.3	3	External coolant		UD03-0830S	9	89	47	35	40			○
	5			UD05-0830S	9	103	61	49	40			○
	3	Internal coolant		UD03C-0830S	9	89	47	35	40			○
	5			UD05C-0830S	9	103	61	49	40			○
	3	External coolant		UD03-0830	10	89	47	35	40			●
	5			UD05-0830	10	103	61	49	40			●
	3	Internal coolant		UD03C-0830	10	89	47	35	40			●
	5			UD05C-0830	10	103	61	49	40			●
8.4	3	External coolant		UD03-0840S	9	89	47	35	40			○
	5			UD05-0840S	9	103	61	49	40			○
	3	Internal coolant		UD03C-0840S	9	89	47	35	40			○
	5			UD05C-0840S	9	103	61	49	40			○
	3	External coolant		UD03-0840	10	89	47	35	40			●
	5			UD05-0840	10	103	61	49	40			●
	3	Internal coolant		UD03C-0840	10	89	47	35	40			●
	5			UD05C-0840	10	103	61	49	40			●

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	○	○	○	○		○	◎	○			○

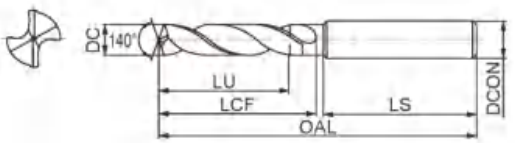
Code key C6
Cutting parameters C153-C154
Technical information C165-C171
Non-standard customization tools C172-C176

UD series General machining



External coolant

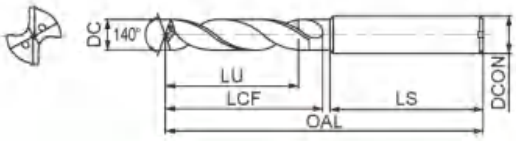
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
8.5	3	External coolant	Straight shank	UD03-0850S	9	89	47	35	40	M10*1.5; 3/8-24UNF		○
	5			UD05-0850S	9	103	61	49	40			○
	3	Internal coolant		UD03C-0850S	9	89	47	35	40			○
	5			UD05C-0850S	9	103	61	49	40			○
	3	External coolant		UD03-0850	10	89	47	35	40			●
	5			UD05-0850	10	103	61	49	40			●
	3	Internal coolant		UD03C-0850	10	89	47	35	40			●
	5			UD05C-0850	10	103	61	49	40			●
8.6	3	External coolant		UD03-0860S	9	89	47	35	40			○
	5			UD05-0860S	9	103	61	49	40			○
	3	Internal coolant		UD03C-0860S	9	89	47	35	40			○
	5			UD05C-0860S	9	103	61	49	40			○
	3	External coolant		UD03-0860	10	89	47	35	40			●
	5			UD05-0860	10	103	61	49	40			●
	3	Internal coolant		UD03C-0860	10	89	47	35	40			●
	5			UD05C-0860	10	103	61	49	40			●
8.7	3	External coolant		UD03-0870S	9	89	47	35	40			○
	5			UD05-0870S	9	103	61	49	40			○
	3	Internal coolant		UD03C-0870S	9	89	47	35	40			○
	5			UD05C-0870S	9	103	61	49	40			○
	3	External coolant		UD03-0870	10	89	47	35	40			●
	5			UD05-0870	10	103	61	49	40			●
	3	Internal coolant		UD03C-0870	10	89	47	35	40			●
	5			UD05C-0870	10	103	61	49	40			●
8.75	3	External coolant		UD03-0875S	9	89	47	35	40	M10*1.25		○
	5			UD05-0875S	9	103	61	49	40			○
	3	Internal coolant		UD03C-0875S	9	89	47	35	40			○
	5			UD05C-0875S	9	103	61	49	40			○

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
8.75	3	External coolant	Straight shank	UD03-0875	10	89	47	35	40	M10*1.25		●
	5			UD05-0875	10	103	61	49	40			●
	3	Internal coolant		UD03C-0875	10	89	47	35	40			●
	5			UD05C-0875	10	103	61	49	40			●
8.8	3	External coolant		UD03-0880S	9	89	47	35	40		3/8-16UNC	○
	5			UD05-0880S	9	103	61	49	40			○
	3	Internal coolant		UD03C-0880S	9	89	47	35	40			○
	5			UD05C-0880S	9	103	61	49	40			○
	3	External coolant		UD03-0880	10	89	47	35	40			●
	5			UD05-0880	10	103	61	49	40			●
	3	Internal coolant		UD03C-0880	10	89	47	35	40			●
	5			UD05C-0880	10	103	61	49	40			●
8.9	3	External coolant		UD03-0890S	9	89	47	35	40			○
	5			UD05-0890S	9	103	61	49	40			○
	3	Internal coolant		UD03C-0890S	9	89	47	35	40			○
	5			UD05C-0890S	9	103	61	49	40			○
	3	External coolant		UD03-0890	10	89	47	35	40			●
	5			UD05-0890	10	103	61	49	40			●
	3	Internal coolant		UD03C-0890	10	89	47	35	40			●
	5			UD05C-0890	10	103	61	49	40			●
9	3	External coolant		UD03-0900S	9	89	47	35	40	M10*1	3/8-24UNF	○
	5			UD05-0900S	9	103	61	49	40			○
	3	Internal coolant		UD03C-0900S	9	89	47	35	40			○
	5			UD05C-0900S	9	103	61	49	40			○
	3	External coolant		UD03-0900	10	89	47	35	40			●
	5			UD05-0900	10	103	61	49	40			●
	3	Internal coolant		UD03C-0900	10	89	47	35	40			●
	5			UD05C-0900	10	103	61	49	40			●
9.1	3	External coolant		UD03-0910	10	89	47	35	40			●
	5			UD05-0910	10	103	61	49	40			●
	3	Internal coolant		UD03C-0910	10	89	47	35	40			●
	5			UD05C-0910	10	103	61	49	40			●

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	○	○	○	○		○	◎	○			○

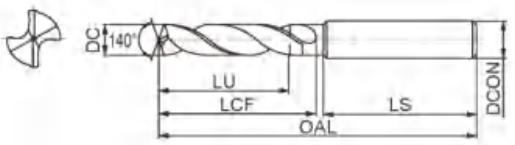
Code key C6 Cutting parameters C153-C154 Technical information C165-C171 Non-standard customization tools C172-C176

UD series General machining



External coolant

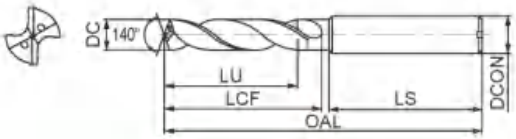
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3023
					DCON	OAL	LCF	LU	LS			
9.2	3	External coolant	Straight shank	UD03-0920	10	89	47	35	40			●
	5			UD05-0920	10	103	61	49	40			●
	3	Internal coolant		UD03C-0920	10	89	47	35	40			●
	5			UD05C-0920	10	103	61	49	40			●
9.3	3	External coolant		UD03-0930	10	89	47	35	40			●
	5			UD05-0930	10	103	61	49	40			●
	3	Internal coolant		UD03C-0930	10	89	47	35	40			●
	5			UD05C-0930	10	103	61	49	40			●
9.35	3	External coolant		UD03-0935	10	89	47	35	40			●
	5			UD05-0935	10	103	61	49	40		M10*1.5	●
	3	Internal coolant		UD03C-0935	10	89	47	35	40			●
	5			UD05C-0935	10	103	61	49	40			●
9.4	3	External coolant		UD03-0940	10	89	47	35	40			●
	5			UD05-0940	10	103	61	49	40	7/16-14UNC		●
	3	Internal coolant		UD03C-0940	10	89	47	35	40			●
	5			UD05C-0940	10	103	61	49	40			●
9.45	3	External coolant		UD03-0945	10	89	47	35	40			●
	5			UD05-0945	10	103	61	49	40		M10*1.25	●
	3	Internal coolant		UD03C-0945	10	89	47	35	40			●
	5			UD05C-0945	10	103	61	49	40			●
9.5	3	External coolant		UD03-0950	10	89	47	35	40			●
	5			UD05-0950	10	103	61	49	40			●
	3	Internal coolant		UD03C-0950	10	89	47	35	40			●
	5			UD05C-0950	10	103	61	49	40			●
9.6	3	External coolant		UD03-0960	10	89	47	35	40			●
	5			UD05-0960	10	103	61	49	40		M10*1	●
	3	Internal coolant		UD03C-0960	10	89	47	35	40			●
	5			UD05C-0960	10	103	61	49	40			●

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
9.7	3	External coolant	Straight shank	UD03-0970	10	89	47	35	40			●
	5			UD05-0970	10	103	61	49	40			●
	3	Internal coolant		UD03C-0970	10	89	47	35	40			●
	5			UD05C-0970	10	103	61	49	40			●
9.8	3	External coolant		UD03-0980	10	89	47	35	40			●
	5			UD05-0980	10	103	61	49	40			●
	3	Internal coolant		UD03C-0980	10	89	47	35	40			●
	5			UD05C-0980	10	103	61	49	40			●
9.9	3	External coolant		UD03-0990	10	89	47	35	40			●
	5			UD05-0990	10	103	61	49	40			●
	3	Internal coolant		UD03C-0990	10	89	47	35	40	7/16-20UNF		●
	5			UD05C-0990	10	103	61	49	40			●
10	3	External coolant		UD03-1000	10	89	47	35	40			●
	5			UD05-1000	10	103	61	49	40			●
	3	Internal coolant		UD03C-1000	10	89	47	35	40			●
	5			UD05C-1000	10	103	61	49	40			●
10.1	3	External coolant		UD03-1010S	11	102	55	40	45			○
	5			UD05-1010S	11	118	71	56	45			○
	3	Internal coolant		UD03C-1010S	11	102	55	40	45			○
	5			UD05C-1010S	11	118	71	56	45			○
	3	External coolant		UD03-1010	12	102	55	40	45			●
	5			UD05-1010	12	118	71	56	45			●
	3	Internal coolant		UD03C-1010	12	102	55	40	45			●
	5			UD05C-1010	12	118	71	56	45			●
10.2	3	External coolant		UD03-1020S	11	102	55	40	45			○
	5			UD05-1020S	11	118	71	56	45			○
	3	Internal coolant		UD03C-1020S	11	102	55	40	45			○
	5			UD05C-1020S	11	118	71	56	45			○
	3	External coolant		UD03-1020	12	102	55	40	45			●
	5			UD05-1020	12	118	71	56	45			●
	3	Internal coolant		UD03C-1020	12	102	55	40	45			●
	5			UD05C-1020	12	118	71	56	45			●

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	○	◎	◎	○		○	◎	○			○

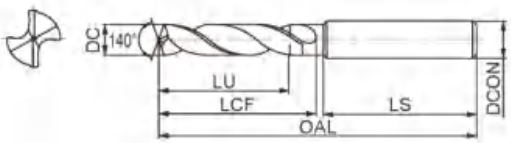
Code key C6
Cutting parameters C153-C154
Technical information C165-C171
Non-standard customization tools C172-C176

UD series General machining



External coolant

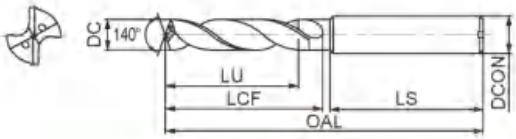
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3023
					DCON	OAL	LCF	LU	LS			
10.25	3	External coolant	Straight shank	UD03-1025S	11	102	55	40	45	M12*1.75		○
	5			UD05-1025S	11	118	71	56	45			○
	3	Internal coolant		UD03C-1025S	11	102	55	40	45			○
	5			UD05C-1025S	11	118	71	56	45			○
	3	External coolant		UD03-1025	12	102	55	40	45			●
	5			UD05-1025	12	118	71	56	45			●
	3	Internal coolant		UD03C-1025	12	102	55	40	45			●
	5			UD05C-1025	12	118	71	56	45			●
10.3	3	External coolant		UD03-1030S	12	102	55	40	45		7/16-14UNC	○
	5			UD05-1030S	12	118	71	56	45			○
	3	Internal coolant		UD03C-1030S	12	102	55	40	45			○
	5			UD05C-1030S	12	118	71	56	45			○
	3	External coolant		UD03-1030	12	102	55	40	45			●
	5			UD05-1030	12	118	71	56	45			●
	3	Internal coolant		UD03C-1030	12	102	55	40	45			●
	5			UD05C-1030	12	118	71	56	45			●
10.4	3	External coolant		UD03-1040S	11	102	55	40	45			○
	5			UD05-1040S	11	118	71	56	45			○
	3	Internal coolant		UD03C-1040S	11	102	55	40	45			○
	5			UD05C-1040S	11	118	71	56	45			○
	3	External coolant		UD03-1040	12	102	55	40	45			●
	5			UD05-1040	12	118	71	56	45			●
	3	Internal coolant		UD03C-1040	12	102	55	40	45			●
	5			UD05C-1040	12	118	71	56	45			●
10.5	3	External coolant		UD03-1050S	11	102	55	40	45	M12*1.5	7/16-20UNF	○
	5			UD05-1050S	11	118	71	56	45			○
	3	Internal coolant		UD03C-1050S	11	102	55	40	45			○
	5			UD05C-1050S	11	118	71	56	45			○

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
10.5	3	External coolant	Straight shank	UD03-1050	12	102	55	40	45	M12*1.5	7/16-20UNF	●
	5			UD05-1050	12	118	71	56	45			●
	3	Internal coolant		UD03C-1050	12	102	55	40	45			●
	5			UD05C-1050	12	118	71	56	45			●
10.6	3	External coolant		UD03-1060S	11	102	55	40	45			○
	5			UD05-1060S	11	118	71	56	45			○
	3	Internal coolant		UD03C-1060S	11	102	55	40	45			○
	5			UD05C-1060S	11	118	71	56	45			○
	3	External coolant		UD03-1060	12	102	55	40	45			●
	5			UD05-1060	12	118	71	56	45			●
	3	Internal coolant		UD03C-1060	12	102	55	40	45			●
	5			UD05C-1060	12	118	71	56	45			●
10.7	3	External coolant		UD03-1070S	11	102	55	40	45			○
	5			UD05-1070S	11	118	71	56	45			○
	3	Internal coolant		UD03C-1070S	11	102	55	40	45			○
	5			UD05C-1070S	11	118	71	56	45			○
	3	External coolant		UD03-1070	12	102	55	40	45			●
	5			UD05-1070	12	118	71	56	45			●
	3	Internal coolant		UD03C-1070	12	102	55	40	45			●
	5			UD05C-1070	12	118	71	56	45			●
10.75	3	External coolant		UD03-1075S	11	102	55	40	45	M12*1.25		○
	5			UD05-1075S	11	118	71	56	45			○
	3	Internal coolant		UD03C-1075S	11	102	55	40	45			○
	5			UD05C-1075S	11	118	71	56	45			○
	3	External coolant		UD03-1075	12	102	55	40	45			●
	5			UD05-1075	12	118	71	56	45			●
	3	Internal coolant		UD03C-1075	12	102	55	40	45			●
	5			UD05C-1075	12	118	71	56	45			●
10.8	3	External coolant		UD03-1080S	11	102	55	40	45	1/2-13UNC		○
	5			UD05-1080S	11	118	71	56	45			○
	3	Internal coolant		UD03C-1080S	11	102	55	40	45			○
	5			UD05C-1080S	11	118	71	56	45			○

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	○	○	○	○		○	◎	○			○

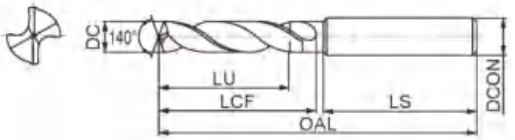
Code key C6 Cutting parameters C153-C154 Technical information C165-C171 Non-standard customization tools C172-C176

UD series General machining



External coolant

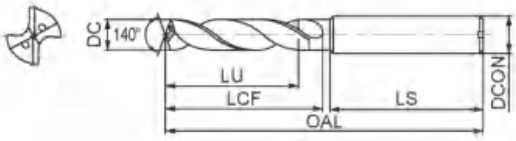
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm) Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Suitable for thread Cutting taps / Thread milling cutters	Forming taps	Grade KDG3023
10.8	3	External coolant	Straight shank	UD03-1080	12	102	55	40	45	1/2-13UNC		●
	5			UD05-1080	12	118	71	56	45			●
	3	Internal coolant		UD03C-1080	12	102	55	40	45			●
	5			UD05C-1080	12	118	71	56	45			●
10.9	3	External coolant		UD03-1090S	11	102	55	40	45			○
	5			UD05-1090S	11	118	71	56	45			○
	3	Internal coolant		UD03C-1090S	11	102	55	40	45			○
	5			UD05C-1090S	11	118	71	56	45			○
	3	External coolant		UD03-1090	12	102	55	40	45			●
	5			UD05-1090	12	118	71	56	45			●
	3	Internal coolant		UD03C-1090	12	102	55	40	45			●
	5			UD05C-1090	12	118	71	56	45			●
11	3	External coolant		UD03-1100S	11	102	55	40	45			○
	5			UD05-1100S	11	118	71	56	45			○
	3	Internal coolant		UD03C-1100S	11	102	55	40	45			○
	5			UD05C-1100S	11	118	71	56	45			○
	3	External coolant		UD03-1100	12	102	55	40	45			●
	5			UD05-1100	12	118	71	56	45			●
	3	Internal coolant		UD03C-1100	12	102	55	40	45			●
	5			UD05C-1100	12	118	71	56	45			●
11.1	3	External coolant		UD03-1110	12	102	55	40	45			●
	5			UD05-1110	12	118	71	56	45			●
	3	Internal coolant		UD03C-1110	12	102	55	40	45			●
	5			UD05C-1110	12	118	71	56	45			●
11.2	3	External coolant		UD03-1120	12	102	55	40	45			●
	5			UD05-1120	12	118	71	56	45			●
	3	Internal coolant		UD03C-1120	12	102	55	40	45			●
	5			UD05C-1120	12	118	71	56	45			●

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
11.25	3	External coolant	Straight shank	UD03-1125	12	102	55	40	45		M12*1.75	●
	5			UD05-1125	12	118	71	56	45			●
	3	Internal coolant		UD03C-1125	12	102	55	40	45			●
	5			UD05C-1125	12	118	71	56	45			●
11.3	3	External coolant		UD03-1130	12	102	55	40	45			●
	5			UD05-1130	12	118	71	56	45			●
	3	Internal coolant		UD03C-1130	12	102	55	40	45			●
	5			UD05C-1130	12	118	71	56	45			●
11.35	3	External coolant		UD03-1135	12	102	55	40	45		M12*1.5	●
	5			UD05-1135	12	118	71	56	45			●
	3	Internal coolant		UD03C-1135	12	102	55	40	45			●
	5			UD05C-1135	12	118	71	56	45			●
11.4	3	External coolant		UD03-1140	12	102	55	40	45			●
	5			UD05-1140	12	118	71	56	45			●
	3	Internal coolant		UD03C-1140	12	102	55	40	45			●
	5			UD05C-1140	12	118	71	56	45			●
11.45	3	External coolant		UD03-1145	12	102	55	40	45		M12*1.25	●
	5			UD05-1145	12	118	71	56	45			●
	3	Internal coolant		UD03C-1145	12	102	55	40	45			●
	5			UD05C-1145	12	118	71	56	45			●
11.5	3	External coolant		UD03-1150	12	102	55	40	45	1/2-20UNF		●
	5			UD05-1150	12	118	71	56	45			●
	3	Internal coolant		UD03C-1150	12	102	55	40	45			●
	5			UD05C-1150	12	118	71	56	45			●
11.6	3	External coolant		UD03-1160	12	102	55	40	45			●
	5			UD05-1160	12	118	71	56	45			●
	3	Internal coolant		UD03C-1160	12	102	55	40	45			●
	5			UD05C-1160	12	118	71	56	45			●
11.7	3	External coolant		UD03-1170	12	102	55	40	45			●
	5			UD05-1170	12	118	71	56	45			●
	3	Internal coolant		UD03C-1170	12	102	55	40	45			●
	5			UD05C-1170	12	118	71	56	45			●

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	○	○	○	○		○	◎	○			○

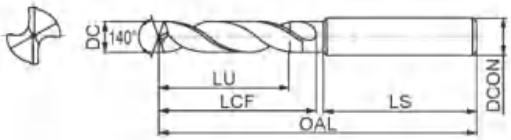
Code key C6 Cutting parameters C153-C154 Technical information C165-C171 Non-standard customization tools C172-C176

UD series General machining



External coolant

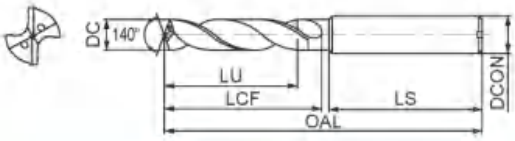
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm) Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Suitable for thread Cutting taps / Thread milling cutters	Forming taps	Grade KDG3023
11.8	3	External coolant	Straight shank	UD03-1180	12	102	55	40	45		1/2-13UNC	●
	5			UD05-1180	12	118	71	56	45			●
	3	Internal coolant		UD03C-1180	12	102	55	40	45			●
	5			UD05C-1180	12	118	71	56	45			●
11.9	3	External coolant		UD03-1190	12	102	55	40	45			●
	5			UD05-1190	12	118	71	56	45			●
	3	Internal coolant		UD03C-1190	12	102	55	40	45			●
	5			UD05C-1190	12	118	71	56	45			●
12	3	External coolant		UD03-1200	12	102	55	40	45	M14*2		●
	5			UD05-1200	12	118	71	56	45			●
	3	Internal coolant		UD03C-1200	12	102	55	40	45			●
	5			UD05C-1200	12	118	71	56	45			●
12.1	3	External coolant		UD03-1210	14	107	60	43	45		1/2-20UNF	●
	5			UD05-1210	14	124	77	60	45			●
	3	Internal coolant		UD03C-1210	14	107	60	43	45			●
	5			UD05C-1210	14	124	77	60	45			●
12.2	3	External coolant		UD03-1220	14	107	60	43	45	9/16-12UNC		●
	5			UD05-1220	14	124	77	60	45			●
	3	Internal coolant		UD03C-1220	14	107	60	43	45			●
	5			UD05C-1220	14	124	77	60	45			●
12.25	3	External coolant		UD03-1225	14	107	60	43	45			●
	5			UD05-1225	14	124	77	60	45			●
	3	Internal coolant		UD03C-1225	14	107	60	43	45			●
	5			UD05C-1225	14	124	77	60	45			●
12.3	3	External coolant		UD03-1230	14	107	60	43	45			●
	5			UD05-1230	14	124	77	60	45			●
	3	Internal coolant		UD03C-1230	14	107	60	43	45			●
	5			UD05C-1230	14	124	77	60	45			●

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3023
					DCON	OAL	LCF	LU	LS			
12.4	3	External coolant	Straight shank	UD03-1240	14	107	60	43	45			○
	5			UD05-1240	14	124	77	60	45			○
	3	Internal coolant		UD03C-1240	14	107	60	43	45			○
	5			UD05C-1240	14	124	77	60	45			○
12.5	3	External coolant		UD03-1250	14	107	60	43	45	M14*1.5		●
	5			UD05-1250	14	124	77	60	45			●
	3	Internal coolant		UD03C-1250	14	107	60	43	45			●
	5			UD05C-1250	14	124	77	60	45			●
12.6	3	External coolant		UD03-1260	14	107	60	43	45			○
	5			UD05-1260	14	124	77	60	45			○
	3	Internal coolant		UD03C-1260	14	107	60	43	45			○
	5			UD05C-1260	14	124	77	60	45			○
12.7	3	External coolant		UD03-1270	14	107	60	43	45			●
	5			UD05-1270	14	124	77	60	45			●
	3	Internal coolant		UD03C-1270	14	107	60	43	45			●
	5			UD05C-1270	14	124	77	60	45			●
12.75	3	External coolant		UD03-1275	14	107	60	43	45			●
	5			UD05-1275	14	124	77	60	45			●
	3	Internal coolant		UD03C-1275	14	107	60	43	45			●
	5			UD05C-1275	14	124	77	60	45			●
12.8	3	External coolant		UD03-1280	14	107	60	43	45			●
	5			UD05-1280	14	124	77	60	45			●
	3	Internal coolant		UD03C-1280	14	107	60	43	45			●
	5			UD05C-1280	14	124	77	60	45			●
12.9	3	External coolant		UD03-1290	14	107	60	43	45	9/16-18UNF		●
	5			UD05-1290	14	124	77	60	45			●
	3	Internal coolant		UD03C-1290	14	107	60	43	45			●
	5			UD05C-1290	14	124	77	60	45			●
13	3	External coolant		UD03-1300	14	107	60	43	45			●
	5			UD05-1300	14	124	77	60	45			●
	3	Internal coolant		UD03C-1300	14	107	60	43	45			●
	5			UD05C-1300	14	124	77	60	45			●

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	○	◎	◎	○		○	◎	○			○

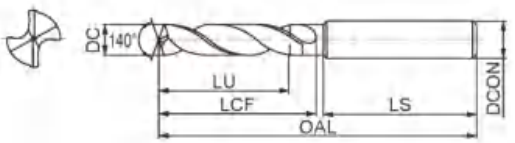
Code key C6
Cutting parameters C153-C154
Technical information C165-C171
Non-standard customization tools C172-C176

UD series General machining



External coolant

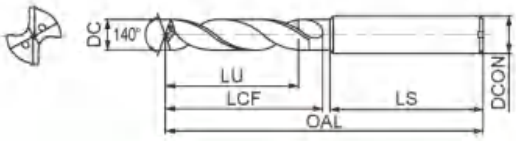
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm) Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Suitable for thread Cutting taps / Thread milling cutters	Forming taps	Grade KDG3023
13.1	3	External coolant	Straight shank	UD03-1310	14	107	60	43	45		M14*2	●
	5			UD05-1310	14	124	77	60	45			●
	3	Internal coolant		UD03C-1310	14	107	60	43	45			●
	5			UD05C-1310	14	124	77	60	45			●
13.2	3	External coolant		UD03-1320	14	107	60	43	45			○
	5			UD05-1320	14	124	77	60	45			○
	3	Internal coolant		UD03C-1320	14	107	60	43	45			○
	5			UD05C-1320	14	124	77	60	45			○
13.3	3	External coolant		UD03-1330	14	107	60	43	45			○
	5			UD05-1330	14	124	77	60	45			○
	3	Internal coolant		UD03C-1330	14	107	60	43	45			○
	5			UD05C-1330	14	124	77	60	45			○
13.35	3	External coolant		UD03-1335	14	107	60	43	45		M14*1.5 9/16-12UNC	●
	5			UD05-1335	14	124	77	60	45			●
	3	Internal coolant		UD03C-1335	14	107	60	43	45			●
	5			UD05C-1335	14	124	77	60	45			●
13.4	3	External coolant		UD03-1340	14	107	60	43	45			○
	5			UD05-1340	14	124	77	60	45			○
	3	Internal coolant		UD03C-1340	14	107	60	43	45			○
	5			UD05C-1340	14	124	77	60	45			○
13.5	3	External coolant		UD03-1350	14	107	60	43	45	5/8-11UNC		●
	5			UD05-1350	14	124	77	60	45			●
	3	Internal coolant		UD03C-1350	14	107	60	43	45			●
	5			UD05C-1350	14	124	77	60	45			●
13.6	3	External coolant		UD03-1360	14	107	60	43	45			○
	5			UD05-1360	14	124	77	60	45			○
	3	Internal coolant		UD03C-1360	14	107	60	43	45			○
	5			UD05C-1360	14	124	77	60	45			○

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
13.65	3	External coolant	Straight shank	UD03-1365	14	107	60	43	45		9/16-18UNF	●
	5			UD05-1365	14	124	77	60	45			●
	3	Internal coolant		UD03C-1365	14	107	60	43	45			●
	5			UD05C-1365	14	124	77	60	45			●
13.7	3	External coolant		UD03-1370	14	107	60	43	45			○
	5			UD05-1370	14	124	77	60	45			○
	3	Internal coolant		UD03C-1370	14	107	60	43	45			○
	5			UD05C-1370	14	124	77	60	45			○
13.8	3	External coolant		UD03-1380	14	107	60	43	45			●
	5			UD05-1380	14	124	77	60	45			●
	3	Internal coolant		UD03C-1380	14	107	60	43	45			●
	5			UD05C-1380	14	124	77	60	45			●
13.9	3	External coolant		UD03-1390	14	107	60	43	45			○
	5			UD05-1390	14	124	77	60	45			○
	3	Internal coolant		UD03C-1390	14	107	60	43	45			○
	5			UD05C-1390	14	124	77	60	45			○
14	3	External coolant		UD03-1400	14	107	60	43	45	M16*2		●
	5			UD05-1400	14	124	77	60	45			●
	3	Internal coolant		UD03C-1400	14	107	60	43	45			●
	5			UD05C-1400	14	124	77	60	45			●
14.1	3	External coolant		UD03-1410	16	115	65	45	48			○
	5			UD05-1410	16	133	83	63	48			○
	3	Internal coolant		UD03C-1410	16	115	65	45	48			○
	5			UD05C-1410	16	133	83	63	48			○
14.2	3	External coolant		UD03-1420	16	115	65	45	48			○
	5			UD05-1420	16	133	83	63	48			○
	3	Internal coolant		UD03C-1420	16	115	65	45	48			○
	5			UD05C-1420	16	133	83	63	48			○
14.25	3	External coolant		UD03-1425	16	115	65	45	48			●
	5			UD05-1425	16	133	83	63	48			●
	3	Internal coolant		UD03C-1425	16	115	65	45	48			●
	5			UD05C-1425	16	133	83	63	48			●

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	○	○	○	○		○	◎	○			○

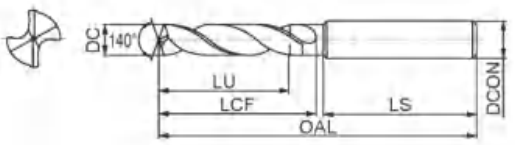
Code key C6 Cutting parameters C153-C154 Technical information C165-C171 Non-standard customization tools C172-C176

UD series General machining



External coolant

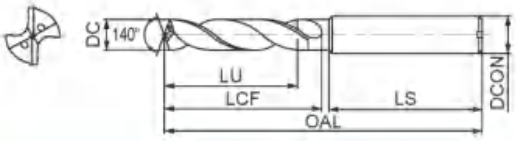
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3023
					DCON	OAL	LCF	LU	LS			
14.3	3	External coolant	Straight shank	UD03-1430	16	115	65	45	48			●
	5			UD05-1430	16	133	83	63	48			●
	3	Internal coolant		UD03C-1430	16	115	65	45	48			●
	5			UD05C-1430	16	133	83	63	48			●
14.4	3	External coolant		UD03-1440	16	115	65	45	48			○
	5			UD05-1440	16	133	83	63	48			○
	3	Internal coolant		UD03C-1440	16	115	65	45	48			○
	5			UD05C-1440	16	133	83	63	48			○
14.5	3	External coolant		UD03-1450	16	115	65	45	48	M16*1.5, 5/8-18UNF		●
	5			UD05-1450	16	133	83	63	48			●
	3	Internal coolant		UD03C-1450	16	115	65	45	48			●
	5			UD05C-1450	16	133	83	63	48			●
14.6	3	External coolant		UD03-1460	16	115	65	45	48			○
	5			UD05-1460	16	133	83	63	48			○
	3	Internal coolant		UD03C-1460	16	115	65	45	48			○
	5			UD05C-1460	16	133	83	63	48			○
14.7	3	External coolant		UD03-1470	16	115	65	45	48			○
	5			UD05-1470	16	133	83	63	48			○
	3	Internal coolant		UD03C-1470	16	115	65	45	48			○
	5			UD05C-1470	16	133	83	63	48			○
14.75	3	External coolant		UD03-1475	16	115	65	45	48			●
	5			UD05-1475	16	133	83	63	48			●
	3	Internal coolant		UD03C-1475	16	115	65	45	48			●
	5			UD05C-1475	16	133	83	63	48			●
14.8	3	External coolant		UD03-1480	16	115	65	45	48		5/8-11UNC	●
	5			UD05-1480	16	133	83	63	48			●
	3	Internal coolant		UD03C-1480	16	115	65	45	48			●
	5			UD05C-1480	16	133	83	63	48			●

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
14.9	3	External coolant	Straight shank	UD03-1490	16	115	65	45	48			○
	5			UD05-1490	16	133	83	63	48			○
	3	Internal coolant		UD03C-1490	16	115	65	45	48			○
	5			UD05C-1490	16	133	83	63	48			○
15	3	External coolant		UD03-1500	16	115	65	45	48			●
	5			UD05-1500	16	133	83	63	48			●
	3	Internal coolant		UD03C-1500	16	115	65	45	48			●
	5			UD05C-1500	16	133	83	63	48			●
15.1	3	External coolant		UD03-1510	16	115	65	45	48		M16*2	●
	5			UD05-1510	16	133	83	63	48			●
	3	Internal coolant		UD03C-1510	16	115	65	45	48			●
	5			UD05C-1510	16	133	83	63	48			●
15.2	3	External coolant		UD03-1520	16	115	65	45	48			○
	5			UD05-1520	16	133	83	63	48			○
	3	Internal coolant		UD03C-1520	16	115	65	45	48			○
	5			UD05C-1520	16	133	83	63	48			○
15.25	3	External coolant		UD03-1525	16	115	65	45	48			●
	5			UD05-1525	16	133	83	63	48		5/8-18UNF	●
	3	Internal coolant		UD03C-1525	16	115	65	45	48			●
	5			UD05C-1525	16	133	83	63	48			●
15.3	3	External coolant		UD03-1530	16	115	65	45	48			○
	5			UD05-1530	16	133	83	63	48			○
	3	Internal coolant		UD03C-1530	16	115	65	45	48			○
	5			UD05C-1530	16	133	83	63	48			○
15.35	3	External coolant		UD03-1535	16	115	65	45	48			●
	5			UD05-1535	16	133	83	63	48		M16*1.5	●
	3	Internal coolant		UD03C-1535	16	115	65	45	48			●
	5			UD05C-1535	16	133	83	63	48			●
15.4	3	External coolant		UD03-1540	16	115	65	45	48			○
	5			UD05-1540	16	133	83	63	48			○
	3	Internal coolant		UD03C-1540	16	115	65	45	48			○
	5			UD05C-1540	16	133	83	63	48			○

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

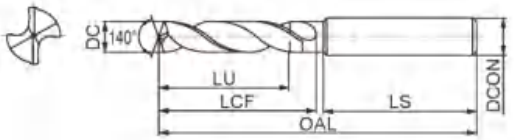
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	○	○	○	○		○	◎	○			○

Code key C6 Cutting parameters C153-C154 Technical information C165-C171 Non-standard customization tools C172-C176

UD series General machining

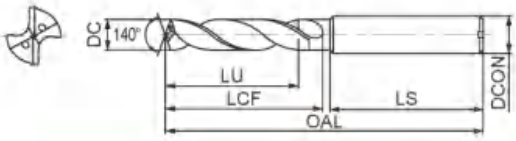

External coolant

Straight shank




Internal coolant


Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3023
					DCON	OAL	LCF	LU	LS			
15.5	3	External coolant	Straight shank	UD03-1550	16	115	65	45	48	M18*2.5		●
	5			UD05-1550	16	133	83	63	48			●
	3	Internal coolant		UD03C-1550	16	115	65	45	48			●
	5			UD05C-1550	16	133	83	63	48			●
15.6	3	External coolant		UD03-1560	16	115	65	45	48			○
	5			UD05-1560	16	133	83	63	48			○
	3	Internal coolant		UD03C-1560	16	115	65	45	48			○
	5			UD05C-1560	16	133	83	63	48			○
15.7	3	External coolant		UD03-1570	16	115	65	45	48			○
	5			UD05-1570	16	133	83	63	48			○
	3	Internal coolant		UD03C-1570	16	115	65	45	48			○
	5			UD05C-1570	16	133	83	63	48			○
15.8	3	External coolant		UD03-1580	16	115	65	45	48			●
	5			UD05-1580	16	133	83	63	48			●
	3	Internal coolant		UD03C-1580	16	115	65	45	48			●
	5			UD05C-1580	16	133	83	63	48			●
15.9	3	External coolant		UD03-1590	16	115	65	45	48			○
	5			UD05-1590	16	133	83	63	48			○
	3	Internal coolant		UD03C-1590	16	115	65	45	48			○
	5			UD05C-1590	16	133	83	63	48			○
16	3	External coolant		UD03-1600	16	115	65	45	48	M18*2		●
	5			UD05-1600	16	133	83	63	48			●
	3	Internal coolant		UD03C-1600	16	115	65	45	48			●
	5			UD05C-1600	16	133	83	63	48			●
16.5	3	External coolant		UD03-1650	18	123	73	51	48	3/4-10UNC		●
	5			UD05-1650	18	143	93	71	48			●
	3	Internal coolant		UD03C-1650	18	123	73	51	48			●
	5			UD05C-1650	18	143	93	71	48			●

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
16.75	3	External coolant	Straight shank	UD03-1675	18	123	73	51	48			●
	5			UD05-1675	18	143	93	71	48			●
	3	Internal coolant		UD03C-1675	18	123	73	51	48			●
	5			UD05C-1675	18	143	93	71	48			●
16.8	3	External coolant		UD03-1680	18	123	73	51	48		M18*2.5	●
	5			UD05-1680	18	143	93	71	48			●
	3	Internal coolant		UD03C-1680	18	123	73	51	48			●
	5			UD05C-1680	18	143	93	71	48			●
17	3	External coolant		UD03-1700	18	123	73	51	48			●
	5			UD05-1700	18	143	93	71	48			●
	3	Internal coolant		UD03C-1700	18	123	73	51	48			●
	5			UD05C-1700	18	143	93	71	48			●
17.5	3	External coolant		UD03-1750	18	123	73	51	48	M20*2.5; 3/4-16UNF		●
	5			UD05-1750	18	143	93	71	48			●
	3	Internal coolant		UD03C-1750	18	123	73	51	48			●
	5			UD05C-1750	18	143	93	71	48			●
17.8	3	External coolant		UD03-1780	18	123	73	51	48			●
	5			UD05-1780	18	143	93	71	48			●
	3	Internal coolant		UD03C-1780	18	123	73	51	48			●
	5			UD05C-1780	18	143	93	71	48			●
17.9	3	External coolant		UD03-1790	18	123	73	51	48		3/4-10UNC	●
	5			UD05-1790	18	143	93	71	48			●
	3	Internal coolant		UD03C-1790	18	123	73	51	48			●
	5			UD05C-1790	18	143	93	71	48			●
18	3	External coolant		UD03-1800	18	123	73	51	48	M20*2		●
	5			UD05-1800	18	143	93	71	48			●
	3	Internal coolant		UD03C-1800	18	123	73	51	48			●
	5			UD05C-1800	18	143	93	71	48			●
18.3	3	External coolant		UD03-1830	20	131	79	55	50		3/4-16UNF	●
	5			UD05-1830	20	153	101	77	50			●
	3	Internal coolant		UD03C-1830	20	131	79	55	50			●
	5			UD05C-1830	20	153	101	77	50			●

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	○	◎	◎	○		○	◎	○			○

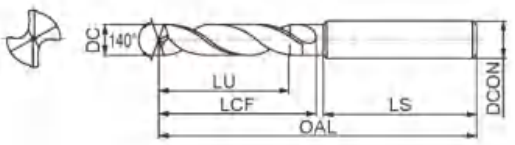
Code key C6
Cutting parameters C153-C154
Technical information C165-C171
Non-standard customization tools C172-C176

UD series General machining



External coolant

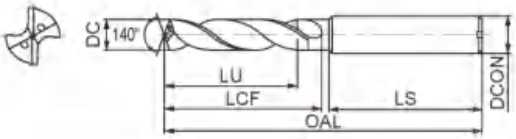
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	Cutting taps / Thread milling cutters	Forming taps	KDG3023
					DCON	OAL	LCF	LU	LS			
18.5	3	External coolant	Straight shank	UD03-1850	20	131	79	55	50			●
	5			UD05-1850	20	153	101	77	50			●
	3	Internal coolant		UD03C-1850	20	131	79	55	50			●
	5			UD05C-1850	20	153	101	77	50			●
18.8	3	External coolant		UD03-1880	20	131	79	55	50		M20*2.5	●
	5			UD05-1880	20	153	101	77	50			●
	3	Internal coolant		UD03C-1880	20	131	79	55	50			●
	5			UD05C-1880	20	153	101	77	50			●
19	3	External coolant		UD03-1900	20	131	79	55	50			●
	5			UD05-1900	20	153	101	77	50			●
	3	Internal coolant		UD03C-1900	20	131	79	55	50			●
	5			UD05C-1900	20	153	101	77	50			●
19.5	3	External coolant		UD03-1950	20	131	79	55	50	M22*2.5; 7/8-9UNC		●
	5			UD05-1950	20	153	101	77	50			●
	3	Internal coolant		UD03C-1950	20	131	79	55	50			●
	5			UD05C-1950	20	153	101	77	50			●
19.8	3	External coolant		UD03-1980	20	131	79	55	50			●
	5			UD05-1980	20	153	101	77	50			●
	3	Internal coolant		UD03C-1980	20	131	79	55	50			●
	5			UD05C-1980	20	153	101	77	50			●
20	3	External coolant		UD03-2000	20	131	79	55	50	M22*2		●
	5			UD05-2000	20	153	101	77	50			●
	3	Internal coolant		UD03C-2000	20	131	79	55	50			●
	5			UD05C-2000	20	153	101	77	50			●
20.4	3	External coolant		UD03-2040	20	141	86	60	50	7/8-14UNF		●
	5			UD05-2040	20	167	112	85	50			●
	3	Internal coolant		UD03C-2040	20	141	86	60	50			●
	5			UD05C-2040	20	167	112	85	50			●

● Stock available ○ Make-to-order

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Suitable for thread		Grade
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Cutting taps / Thread milling cutters	Forming taps	KDG3023
20.5	3	External coolant	Straight shank	UD03-2050	20	141	86	60	50			●
	5			UD05-2050	20	167	112	85	50			●
	3	Internal coolant		UD03C-2050	20	141	86	60	50			●
	5			UD05C-2050	20	167	112	85	50			●
21	3	External coolant		UD03-2100	20	141	86	60	50	M24*3	7/8-9UNC	●
	5			UD05-2100	20	167	112	85	50			●
	3	Internal coolant		UD03C-2100	20	141	86	60	50			●
	5			UD05C-2100	20	167	112	85	50			●
21.4	3	External coolant		UD03-2140	20	141	86	60	50		7/8-14UNF	●
	5			UD05-2140	20	167	112	85	50			●
	3	Internal coolant		UD03C-2140	20	141	86	60	50			●
	5			UD05C-2140	20	167	112	85	50			●
21.5	3	External coolant		UD03-2150	20	141	86	60	50			●
	5			UD05-2150	20	167	112	85	50			●
	3	Internal coolant		UD03C-2150	20	141	86	60	50			●
	5			UD05C-2150	20	167	112	85	50			●
22	3	External coolant		UD03-2200	20	141	86	60	50	M24*2		●
	5			UD05-2200	20	167	112	85	50			●
	3	Internal coolant		UD03C-2200	20	141	86	60	50			●
	5			UD05C-2200	20	167	112	85	50			●
22.25	3	External coolant		UD03-2225	25	153	95	65	56	1-8UNC		●
	5			UD05-2225	25	184	126	98	56			●
	3	Internal coolant		UD03C-2225	25	153	95	65	56			●
	5			UD05C-2225	25	184	126	98	56			●
22.5	3	External coolant		UD03-2250	25	153	95	65	56			●
	5			UD05-2250	25	184	126	98	56			●
	3	Internal coolant		UD03C-2250	25	153	95	65	56			●
	5			UD05C-2250	25	184	126	98	56			●
23	3	External coolant		UD03-2300	25	153	95	65	56	M25*2		●
	5			UD05-2300	25	184	126	98	56			●
	3	Internal coolant		UD03C-2300	25	153	95	65	56			●
	5			UD05C-2300	25	184	126	98	56			●

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG3023	○	○	○	○		○	◎	○			○

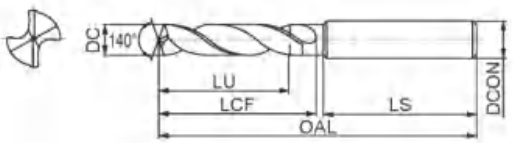
Code key C6
Cutting parameters C153-C154
Technical information C165-C171
Non-standard customization tools C172-C176

UD series General machining



External coolant

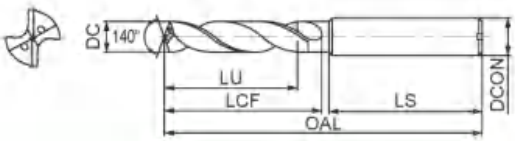
Straight shank





Internal coolant

Straight shank



Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm) Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS	Suitable for thread: Cutting taps / Thread milling cutters	Suitable for thread: Forming taps	Grade KDG3023
23.25	3	External coolant	Straight shank	UD03-2325	25	153	95	65	56	1-12UNF		●
	5			UD05-2325	25	184	126	98	56			●
	3	Internal coolant		UD03C-2325	25	153	95	65	56			●
	5			UD05C-2325	25	184	126	98	56			●
23.5	3	External coolant		UD03-2350	25	153	95	65	56			●
	5			UD05-2350	25	184	126	98	56			●
	3	Internal coolant		UD03C-2350	25	153	95	65	56			●
	5			UD05C-2350	25	184	126	98	56			●
24	3	External coolant		UD03-2400	25	153	95	65	56	M27*3	1-8UNC	●
	5			UD05-2400	25	184	126	98	56			●
	3	Internal coolant		UD03C-2400	25	153	95	65	56			●
	5			UD05C-2400	25	184	126	98	56			●
24.5	3	External coolant		UD03-2450	25	153	95	65	56		1-12UNF	●
	5			UD05-2450	25	184	126	98	56			●
	3	Internal coolant		UD03C-2450	25	153	95	65	56			●
	5			UD05C-2450	25	184	126	98	56			●
25	3	External coolant		UD03-2500	25	153	95	65	56	M27*2; 11/8-7UNC		●
	5			UD05-2500	25	184	126	98	56			●
	3	Internal coolant		UD03C-2500	25	153	95	65	56			●
	5			UD05C-2500	25	184	126	98	56			●

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material: Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel ~40HRC	~50HRC	~60HRC	Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
KDG3023	○	○	◎	○		○	◎	◎			○

Code key C6
Cutting parameters C153-C154
Technical information C165-C171
Non-standard customization tools C172-C176

SU series twist drill

General machining

★ Wide applications, for high efficient machining of various materials P (steel), M (stainless steel), K(cast iron), and S (heat-resistant alloy).

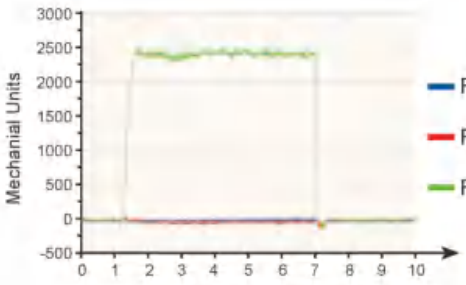
★ Optimized flute structure and corrugated cutting edge with outstanding sharpness and strength ensure unhampered chip flow.

★ 140° point angle reduces the feed force of drilling in the initial stage, achieving perfect self-centering capability and improving quality of hole machined.

★ Nano-structured TiAlN coating improves thermal hardness and avoids built-up edge.



Specially designed drill point makes cutting smooth.

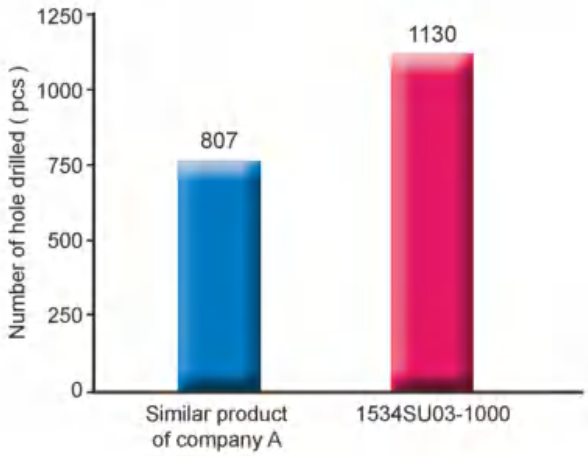


Cutting force chart of SU series

Drill diameter: Ø12mm
Workpiece material: 40Cr
Hardness: HB280
Cutting speed: 90m/min
Feed speed: 715mm/min
Drilling depth: 40mm
Cooling system: emulsion (internal coolant)

Comparison of SU series twist drills with similar product of overseas manufacturer A

Tool type: 1534SU03-1000
Size: Ø10mm
Workpiece material: 42CrMo(35HRC)
Cutting speed: 100m/min
Rotating speed: 3200r/min
Feed rate per revolution: 0.20mm/r
Feed speed: 640mm/min
Drilling depth: 30mm(L/D=3)
Cooling system: water soluble liquid (external coolant)
Machine tool: Mikron UCP 1000

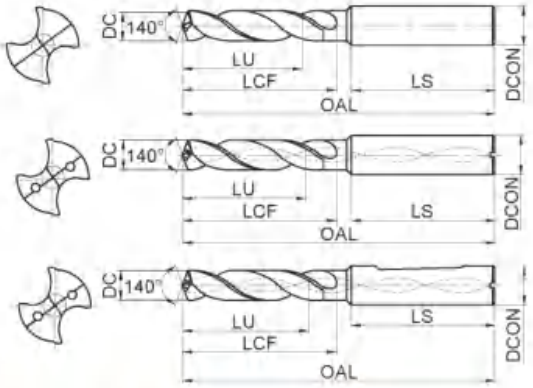


SU series General machining


External coolant — Straight shank


Internal coolant — Straight shank


Internal coolant — Whistle notch shank



- For high-efficiently drilling from common steel to hard-to-cut materials.
- Corrugated cutting edges achieve outstanding sharpness and strength, facilitating chip removal.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
2.0	3	External coolant	Straight shank	1534SU03-0200	6	62	20	14	36	☆
	5			1536SU05-0200	6	66	28	23	36	☆
2.1	3			1534SU03-0210	6	62	20	14	36	☆
	5			1536SU05-0210	6	66	28	23	36	☆
2.2	3			1534SU03-0220	6	62	20	14	36	☆
	5			1536SU05-0220	6	66	28	23	36	☆
2.3	3			1534SU03-0230	6	62	20	14	36	☆
	5			1536SU05-0230	6	66	28	23	36	☆
2.4	3			1534SU03-0240	6	62	20	14	36	☆
	5			1536SU05-0240	6	66	28	23	36	☆
2.5	3			1534SU03-0250	6	62	20	14	36	☆
	5			1536SU05-0250	6	66	28	23	36	☆
2.6	3			1534SU03-0260	6	62	20	14	36	☆
	5			1536SU05-0260	6	66	28	23	36	☆
2.7	3			1534SU03-0270	6	62	20	14	36	☆
	5			1536SU05-0270	6	66	28	23	36	☆
2.8	3			1534SU03-0280	6	62	20	14	36	☆
	5			1536SU05-0280	6	66	28	23	36	☆
2.9	3			1534SU03-0290	6	62	20	14	36	☆
	5			1536SU05-0290	6	66	28	23	36	☆
3.0	3	External coolant		1534SU03-0300	6	62	20	14	36	☆
	5			1536SU05-0300	6	66	28	23	36	☆
	3	Internal coolant		1534SU03C-0300	6	62	20	14	36	☆
	5			1536SU05C-0300	6	66	28	23	36	☆
	3		Whistle notch shank	1734SU03C-0300	6	62	20	14	36	☆
	5			1736SU05C-0300	6	66	28	23	36	☆
	8		Straight shank	1538SU08C-0300	6	72	34	29	36	☆

☆ Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
3.1	3	External coolant	Straight shank	1534SU03-0310	6	62	20	14	36	☆
	5			1536SU05-0310	6	66	28	23	36	☆
	3	Internal coolant		1534SU03C-0310	6	62	20	14	36	☆
	5			1536SU05C-0310	6	66	28	23	36	☆
	3		Whistle notch shank	1734SU03C-0310	6	62	20	14	36	☆
	5			1736SU05C-0310	6	66	28	23	36	☆
	8		Straight shank	1538SU08C-0310	6	72	34	29	36	☆
3.2	3	External coolant	Straight shank	1534SU03-0320	6	62	20	14	36	☆
	5			1536SU05-0320	6	66	28	23	36	☆
	3	Internal coolant		1534SU03C-0320	6	62	20	14	36	☆
	5			1536SU05C-0320	6	66	28	23	36	☆
	3		Whistle notch shank	1734SU03C-0320	6	62	20	14	36	☆
	5			1736SU05C-0320	6	66	28	23	36	☆
	8		Straight shank	1538SU08C-0320	6	72	34	29	36	☆
3.25	3	External coolant	Straight shank	1534SU03-0325	6	62	20	14	36	☆
	5			1536SU05-0325	6	66	28	23	36	☆
	3	Internal coolant		1534SU03C-0325	6	62	20	14	36	☆
	5			1536SU05C-0325	6	66	28	23	36	☆
	3		Whistle notch shank	1734SU03C-0325	6	62	20	14	36	☆
	5			1736SU05C-0325	6	66	28	23	36	☆
3.3	3	External coolant	Straight shank	1534SU03-0330	6	62	20	14	36	☆
	5			1536SU05-0330	6	66	28	23	36	☆
	3	Internal coolant		1534SU03C-0330	6	62	20	14	36	☆
	5			1536SU05C-0330	6	66	28	23	36	☆
	3		Whistle notch shank	1734SU03C-0330	6	62	20	14	36	☆
	5			1736SU05C-0330	6	66	28	23	36	☆
	8		Straight shank	1538SU08C-0330	6	72	34	29	36	☆
3.4	3	External coolant	Straight shank	1534SU03-0340	6	62	20	14	36	☆
	5			1536SU05-0340	6	66	28	23	36	☆
	3	Internal coolant		1534SU03C-0340	6	62	20	14	36	☆
	5			1536SU05C-0340	6	66	28	23	36	☆
	3		Whistle notch shank	1734SU03C-0340	6	62	20	14	36	☆
	5			1736SU05C-0340	6	66	28	23	36	☆
	8		Straight shank	1538SU08C-0340	6	72	34	29	36	☆

☆ Recommended grade (produce according to order)

Note: For drills with a drilling depth (ULDR) of 8, namely 1538SU08C series, tolerance of shank length is h5.

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

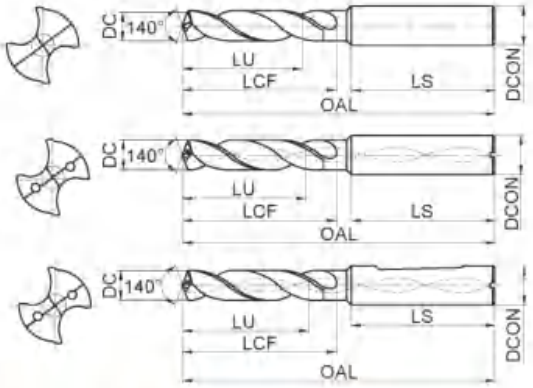
Code key C6 Cutting parameters C155-C158 Technical information C165-C171 Non-standard customization tools C172-C176

SU series General machining


External coolant — Straight shank


Internal coolant — Straight shank


Internal coolant — Whistle notch shank



- For high-efficiently drilling from common steel to hard-to-cut materials.
- Corrugated cutting edges achieve outstanding sharpness and strength, facilitating chip removal.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
3.5	3	External coolant	Straight shank	1534SU03-0350	6	62	20	14	36	☆
	5			1536SU05-0350	6	66	28	23	36	☆
	3	Internal coolant		1534SU03C-0350	6	62	20	14	36	☆
	5			1536SU05C-0350	6	66	28	23	36	☆
	3		Whistle notch shank	1734SU03C-0350	6	62	20	14	36	☆
	5			1736SU05C-0350	6	66	28	23	36	☆
	8		Straight shank	1538SU08C-0350	6	72	34	29	36	☆
3.6	3	External coolant	Straight shank	1534SU03-0360	6	62	20	14	36	☆
	5			1536SU05-0360	6	66	28	23	36	☆
	3	Internal coolant		1534SU03C-0360	6	62	20	14	36	☆
	5			1536SU05C-0360	6	66	28	23	36	☆
	3		Whistle notch shank	1734SU03C-0360	6	62	20	14	36	☆
	5			1736SU05C-0360	6	66	28	23	36	☆
	8		Straight shank	1538SU08C-0360	6	72	34	29	36	☆
3.7	3	External coolant	Straight shank	1534SU03-0370	6	62	20	14	36	☆
	5			1536SU05-0370	6	66	28	23	36	☆
	3	Internal coolant		1534SU03C-0370	6	62	20	14	36	☆
	5			1536SU05C-0370	6	66	28	23	36	☆
	3		Whistle notch shank	1734SU03C-0370	6	62	20	14	36	☆
	5			1736SU05C-0370	6	66	28	23	36	☆
	8		Straight shank	1538SU08C-0370	6	72	34	29	36	☆
3.8	3	External coolant	Straight shank	1534SU03-0380	6	66	24	17	36	☆
	5			1536SU05-0380	6	74	36	29	36	☆
	3	Internal coolant		1534SU03C-0380	6	66	24	17	36	☆
	5			1536SU05C-0380	6	74	36	29	36	☆
	3		Whistle notch shank	1734SU03C-0380	6	66	24	17	36	☆
	5			1736SU05C-0380	6	74	36	29	36	☆
	8		Straight shank	1538SU08C-0380	6	81	43	36	36	☆

☆ Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
3.9	3	External coolant	Straight shank	1534SU03-0390	6	66	24	17	36	☆
	5			1536SU05-0390	6	74	36	29	36	☆
	3	Internal coolant		1534SU03C-0390	6	66	24	17	36	☆
	5			1536SU05C-0390	6	74	36	29	36	☆
	3		Whistle notch shank	1734SU03C-0390	6	66	24	17	36	☆
	5			1736SU05C-0390	6	74	36	29	36	☆
	8		Straight shank	1538SU08C-0390	6	81	43	36	36	☆
4.0	3	External coolant	Straight shank	1534SU03-0400	6	66	24	17	36	☆
	5			1536SU05-0400	6	74	36	29	36	☆
	3	Internal coolant		1534SU03C-0400	6	66	24	17	36	☆
	5			1536SU05C-0400	6	74	36	29	36	☆
	3		Whistle notch shank	1734SU03C-0400	6	66	24	17	36	☆
	5			1736SU05C-0400	6	74	36	29	36	☆
	8		Straight shank	1538SU08C-0400	6	81	43	36	36	☆
4.1	3	External coolant	Straight shank	1534SU03-0410	6	66	24	17	36	☆
	5			1536SU05-0410	6	74	36	29	36	☆
	3	Internal coolant		1534SU03C-0410	6	66	24	17	36	☆
	5			1536SU05C-0410	6	74	36	29	36	☆
	3		Whistle notch shank	1734SU03C-0410	6	66	24	17	36	☆
	5			1736SU05C-0410	6	74	36	29	36	☆
	8		Straight shank	1538SU08C-0410	6	81	43	36	36	☆
4.2	3	External coolant	Straight shank	1534SU03-0420	6	66	24	17	36	☆
	5			1536SU05-0420	6	74	36	29	36	☆
	3	Internal coolant		1534SU03C-0420	6	66	24	17	36	☆
	5			1536SU05C-0420	6	74	36	29	36	☆
	3		Whistle notch shank	1734SU03C-0420	6	66	24	17	36	☆
	5			1736SU05C-0420	6	74	36	29	36	☆
	8		Straight shank	1538SU08C-0420	6	81	43	36	36	☆
4.3	3	External coolant	Straight shank	1534SU03-0430	6	66	24	17	36	☆
	5			1536SU05-0430	6	74	36	29	36	☆
	3	Internal coolant		1534SU03C-0430	6	66	24	17	36	☆
	5			1536SU05C-0430	6	74	36	29	36	☆
	3		Whistle notch shank	1734SU03C-0430	6	66	24	17	36	☆
	5			1736SU05C-0430	6	74	36	29	36	☆
	8		Straight shank	1538SU08C-0430	6	81	43	36	36	☆

Note: For drills with a drilling depth (ULDR) of 8, namely 1538SU08C series, tolerance of shank length is h_5.

☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

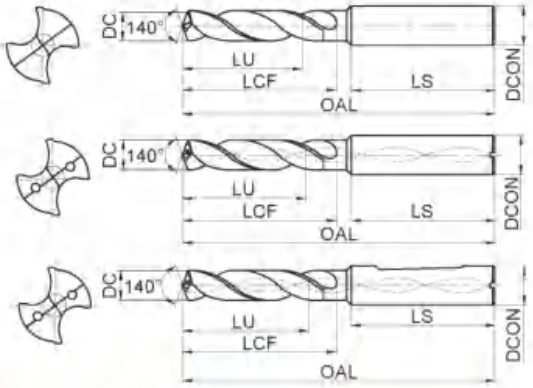
Code key C6 Cutting parameters C155-C158 Technical information C165-C171 Non-standard customization tools C172-C176

SU series General machining


External coolant — Straight shank


Internal coolant — Straight shank


Internal coolant — Whistle notch shank



- For high-efficiently drilling from common steel to hard-to-cut materials.
- Corrugated cutting edges achieve outstanding sharpness and strength, facilitating chip removal.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
4.4	3	External coolant	Straight shank	1534SU03-0440	6	66	24	17	36	☆
	5			1536SU05-0440	6	74	36	29	36	☆
	3	Internal coolant		1534SU03C-0440	6	66	24	17	36	☆
	5			1536SU05C-0440	6	74	36	29	36	☆
	3		Whistle notch shank	1734SU03C-0440	6	66	24	17	36	☆
	5			1736SU05C-0440	6	74	36	29	36	☆
	8		Straight shank	1538SU08C-0440	6	81	43	36	36	☆
4.5	3	External coolant	Straight shank	1534SU03-0450	6	66	24	17	36	☆
	5			1536SU05-0450	6	74	36	29	36	☆
	3	Internal coolant		1534SU03C-0450	6	66	24	17	36	☆
	5			1536SU05C-0450	6	74	36	29	36	☆
	3		Whistle notch shank	1734SU03C-0450	6	66	24	17	36	☆
	5			1736SU05C-0450	6	74	36	29	36	☆
	8		Straight shank	1538SU08C-0450	6	81	43	36	36	☆
4.6	3	External coolant	Straight shank	1534SU03-0460	6	66	24	17	36	☆
	5			1536SU05-0460	6	74	36	29	36	☆
	3	Internal coolant		1534SU03C-0460	6	66	24	17	36	☆
	5			1536SU05C-0460	6	74	36	29	36	☆
	3		Whistle notch shank	1734SU03C-0460	6	66	24	17	36	☆
	5			1736SU05C-0460	6	74	36	29	36	☆
	8		Straight shank	1538SU08C-0460	6	81	43	36	36	☆
4.65	3	External coolant	Straight shank	1534SU03-0465	6	66	24	17	36	☆
	5			1536SU05-0465	6	74	36	29	36	☆
	3	Internal coolant		1534SU03C-0465	6	66	24	17	36	☆
	5			1536SU05C-0465	6	74	36	29	36	☆
	3		Whistle notch shank	1734SU03C-0465	6	66	24	17	36	☆
	5			1736SU05C-0465	6	74	36	29	36	☆

☆ Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
4.7	3	External coolant	Straight shank	1534SU03-0470	6	66	24	17	36	☆
	5			1536SU05-0470	6	74	36	29	36	☆
	3	Internal coolant		1534SU03C-0470	6	66	24	17	36	☆
	5			1536SU05C-0470	6	74	36	29	36	☆
	3		Whistle notch shank	1734SU03C-0470	6	66	24	17	36	☆
	5			1736SU05C-0470	6	74	36	29	36	☆
	8		Straight shank	1538SU08C-0470	6	81	43	36	36	☆
4.8	3	External coolant	Straight shank	1534SU03-0480	6	66	28	20	36	☆
	5			1536SU05-0480	6	82	44	35	36	☆
	3	Internal coolant		1534SU03C-0480	6	66	28	20	36	☆
	5			1536SU05C-0480	6	82	44	35	36	☆
	3		Whistle notch shank	1734SU03C-0480	6	66	28	20	36	☆
	5			1736SU05C-0480	6	82	44	35	36	☆
	8		Straight shank	1538SU08C-0480	6	95	57	48	36	☆
4.9	3	External coolant	Straight shank	1534SU03-0490	6	66	28	20	36	☆
	5			1536SU05-0490	6	82	44	35	36	☆
	3	Internal coolant		1534SU03C-0490	6	66	28	20	36	☆
	5			1536SU05C-0490	6	82	44	35	36	☆
	3		Whistle notch shank	1734SU03C-0490	6	66	28	20	36	☆
	5			1736SU05C-0490	6	82	44	35	36	☆
	8		Straight shank	1538SU08C-0490	6	95	57	48	36	☆
5.0	3	External coolant	Straight shank	1534SU03-0500	6	66	28	20	36	☆
	5			1536SU05-0500	6	82	44	35	36	☆
	3	Internal coolant		1534SU03C-0500	6	66	28	20	36	☆
	5			1536SU05C-0500	6	82	44	35	36	☆
	3		Whistle notch shank	1734SU03C-0500	6	66	28	20	36	☆
	5			1736SU05C-0500	6	82	44	35	36	☆
	8		Straight shank	1538SU08C-0500	6	95	57	48	36	☆
5.1	3	External coolant	Straight shank	1534SU03-0510	6	66	28	20	36	☆
	5			1536SU05-0510	6	82	44	35	36	☆
	3	Internal coolant		1534SU03C-0510	6	66	28	20	36	☆
	5			1536SU05C-0510	6	82	44	35	36	☆
	3		Whistle notch shank	1734SU03C-0510	6	66	28	20	36	☆
	5			1736SU05C-0510	6	82	44	35	36	☆
	8		Straight shank	1538SU08C-0510	6	95	57	48	36	☆

Note: For drills with a drilling depth (ULDR) of 8, namely 1538SU08C series, tolerance of shank length is h_5.

☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

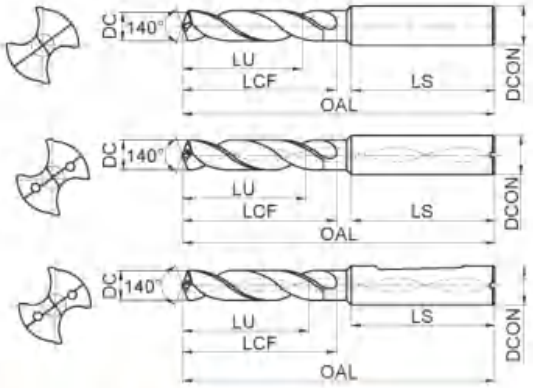
Code key C6 Cutting parameters C155-C158 Technical information C165-C171 Non-standard customization tools C172-C176

SU series General machining


External coolant — Straight shank


Internal coolant — Straight shank


Internal coolant — Whistle notch shank



- For high-efficiently drilling from common steel to hard-to-cut materials.
- Corrugated cutting edges achieve outstanding sharpness and strength, facilitating chip removal.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
5.2	3	External coolant	Straight shank	1534SU03-0520	6	66	28	20	36	☆
	5			1536SU05-0520	6	82	44	35	36	☆
	3	Internal coolant		1534SU03C-0520	6	66	28	20	36	☆
	5			1536SU05C-0520	6	82	44	35	36	☆
	3		Whistle notch shank	1734SU03C-0520	6	66	28	20	36	☆
	5			1736SU05C-0520	6	82	44	35	36	☆
	8		Straight shank	1538SU08C-0520	6	95	57	48	36	☆
5.3	3	External coolant	Straight shank	1534SU03-0530	6	66	28	20	36	☆
	5			1536SU05-0530	6	82	44	35	36	☆
	3	Internal coolant		1534SU03C-0530	6	66	28	20	36	☆
	5			1536SU05C-0530	6	82	44	35	36	☆
	3		Whistle notch shank	1734SU03C-0530	6	66	28	20	36	☆
	5			1736SU05C-0530	6	82	44	35	36	☆
	8		Straight shank	1538SU08C-0530	6	95	57	48	36	☆
5.4	3	External coolant	Straight shank	1534SU03-0540	6	66	28	20	36	☆
	5			1536SU05-0540	6	82	44	35	36	☆
	3	Internal coolant		1534SU03C-0540	6	66	28	20	36	☆
	5			1536SU05C-0540	6	82	44	35	36	☆
	3		Whistle notch shank	1734SU03C-0540	6	66	28	20	36	☆
	5			1736SU05C-0540	6	82	44	35	36	☆
	8		Straight shank	1538SU08C-0540	6	95	57	48	36	☆
5.5	3	External coolant	Straight shank	1534SU03-0550	6	66	28	20	36	☆
	5			1536SU05-0550	6	82	44	35	36	☆
	3	Internal coolant		1534SU03C-0550	6	66	28	20	36	☆
	5			1536SU05C-0550	6	82	44	35	36	☆
	3		Whistle notch shank	1734SU03C-0550	6	66	28	20	36	☆
	5			1736SU05C-0550	6	82	44	35	36	☆
	8		Straight shank	1538SU08C-0550	6	95	57	48	36	☆

☆ Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
5.55	3	External coolant	Straight shank	1534SU03-0555	6	66	28	20	36	☆
	5			1536SU05-0555	6	82	44	35	36	☆
	3	Internal coolant		1534SU03C-0555	6	66	28	20	36	☆
	5			1536SU05C-0555	6	82	44	35	36	☆
	3		Whistle notch shank	1734SU03C-0555	6	66	28	20	36	☆
	5			1736SU05C-0555	6	82	44	35	36	☆
5.6	3	External coolant	Straight shank	1534SU03-0560	6	66	28	20	36	☆
	5			1536SU05-0560	6	82	44	35	36	☆
	3	Internal coolant		1534SU03C-0560	6	66	28	20	36	☆
	5			1536SU05C-0560	6	82	44	35	36	☆
	3		Whistle notch shank	1734SU03C-0560	6	66	28	20	36	☆
	5			1736SU05C-0560	6	82	44	35	36	☆
	8		Straight shank	1538SU08C-0560	6	95	57	48	36	☆
5.7	3	External coolant	Straight shank	1534SU03-0570	6	66	28	20	36	☆
	5			1536SU05-0570	6	82	44	35	36	☆
	3	Internal coolant		1534SU03C-0570	6	66	28	20	36	☆
	5			1536SU05C-0570	6	82	44	35	36	☆
	3		Whistle notch shank	1734SU03C-0570	6	66	28	20	36	☆
	5			1736SU05C-0570	6	82	44	35	36	☆
	8		Straight shank	1538SU08C-0570	6	95	57	48	36	☆
5.8	3	External coolant	Straight shank	1534SU03-0580	6	66	28	20	36	☆
	5			1536SU05-0580	6	82	44	35	36	☆
	3	Internal coolant		1534SU03C-0580	6	66	28	20	36	☆
	5			1536SU05C-0580	6	82	44	35	36	☆
	3		Whistle notch shank	1734SU03C-0580	6	66	28	20	36	☆
	5			1736SU05C-0580	6	82	44	35	36	☆
	8		Straight shank	1538SU08C-0580	6	95	57	48	36	☆
5.9	3	External coolant	Straight shank	1534SU03-0590	6	66	28	20	36	☆
	5			1536SU05-0590	6	82	44	35	36	☆
	3	Internal coolant		1534SU03C-0590	6	66	28	20	36	☆
	5			1536SU05C-0590	6	82	44	35	36	☆
	3		Whistle notch shank	1734SU03C-0590	6	66	28	20	36	☆
	5			1736SU05C-0590	6	82	44	35	36	☆
	8		Straight shank	1538SU08C-0590	6	95	57	48	36	☆

Note: For drills with a drilling depth (ULDR) of 8, namely 1538SU08C series, tolerance of shank length is h8.

☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

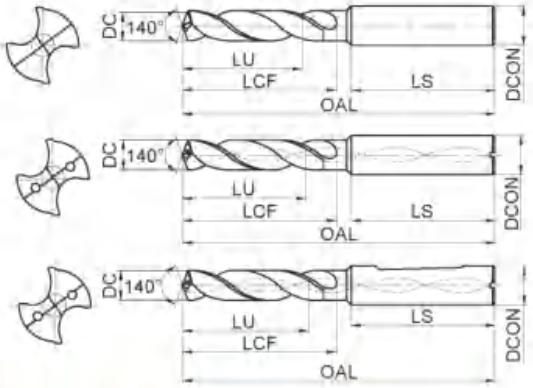
Code key C6 Cutting parameters C155-C158 Technical information C165-C171 Non-standard customization tools C172-C176

SU series General machining


External coolant — Straight shank


Internal coolant — Straight shank


Internal coolant — Whistle notch shank



- For high-efficiently drilling from common steel to hard-to-cut materials.
- Corrugated cutting edges achieve outstanding sharpness and strength, facilitating chip removal.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
6.0	3	External coolant	Straight shank	1534SU03-0600	6	66	28	20	36	☆
	5			1536SU05-0600	6	82	44	35	36	☆
	3	Internal coolant		1534SU03C-0600	6	66	28	20	36	☆
	5			1536SU05C-0600	6	82	44	35	36	☆
	3		Whistle notch shank	1734SU03C-0600	6	66	28	20	36	☆
	5			1736SU05C-0600	6	82	44	35	36	☆
	8		Straight shank	1538SU08C-0600	6	95	57	48	36	☆
6.1	3	External coolant	Straight shank	1534SU03-0610	8	79	34	24	36	☆
	5			1536SU05-0610	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0610	8	79	34	24	36	☆
	5			1536SU05C-0610	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0610	8	79	34	24	36	☆
	5			1736SU05C-0610	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0610	8	114	76	66	36	☆
6.2	3	External coolant	Straight shank	1534SU03-0620	8	79	34	24	36	☆
	5			1536SU05-0620	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0620	8	79	34	24	36	☆
	5			1536SU05C-0620	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0620	8	79	34	24	36	☆
	5			1736SU05C-0620	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0620	8	114	76	66	36	☆
6.3	3	External coolant	Straight shank	1534SU03-0630	8	79	34	24	36	☆
	5			1536SU05-0630	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0630	8	79	34	24	36	☆
	5			1536SU05C-0630	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0630	8	79	34	24	36	☆
	5			1736SU05C-0630	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0630	8	114	76	66	36	☆

☆ Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
6.4	3	External coolant	Straight shank	1534SU03-0640	8	79	34	24	36	☆
	5			1536SU05-0640	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0640	8	79	34	24	36	☆
	5			1536SU05C-0640	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0640	8	79	34	24	36	☆
	5			1736SU05C-0640	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0640	8	114	76	66	36	☆
6.5	3	External coolant	Straight shank	1534SU03-0650	8	79	34	24	36	☆
	5			1536SU05-0650	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0650	8	79	34	24	36	☆
	5			1536SU05C-0650	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0650	8	79	34	24	36	☆
	5			1736SU05C-0650	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0650	8	114	76	66	36	☆
6.6	3	External coolant	Straight shank	1534SU03-0660	8	79	34	24	36	☆
	5			1536SU05-0660	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0660	8	79	34	24	36	☆
	5			1536SU05C-0660	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0660	8	79	34	24	36	☆
	5			1736SU05C-0660	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0660	8	114	76	66	36	☆
6.7	3	External coolant	Straight shank	1534SU03-0670	8	79	34	24	36	☆
	5			1536SU05-0670	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0670	8	79	34	24	36	☆
	5			1536SU05C-0670	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0670	8	79	34	24	36	☆
	5			1736SU05C-0670	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0670	8	114	76	66	36	☆
6.75	3	External coolant	Straight shank	1534SU03-0675	8	79	34	24	36	☆
	5			1536SU05-0675	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0675	8	79	34	24	36	☆
	5			1536SU05C-0675	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0675	8	79	34	24	36	☆
	5			1736SU05C-0675	8	91	53	43	36	☆

Note: For drills with a drilling depth (ULDR) of 8, namely 1538SU08C series, tolerance of shank length is h5.

☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

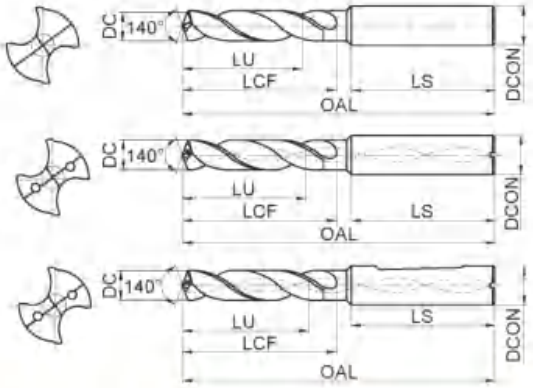
Code key C6
Cutting parameters C155-C158
Technical information C165-C171
Non-standard customization tools C172-C176

SU series General machining


External coolant — Straight shank


Internal coolant — Straight shank


Internal coolant — Whistle notch shank



- For high-efficiently drilling from common steel to hard-to-cut materials.
- Corrugated cutting edges achieve outstanding sharpness and strength, facilitating chip removal.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
6.8	3	External coolant	Straight shank	1534SU03-0680	8	79	34	24	36	☆
	5			1536SU05-0680	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0680	8	79	34	24	36	☆
	5			1536SU05C-0680	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0680	8	79	34	24	36	☆
	5			1736SU05C-0680	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0680	8	114	76	66	36	☆
6.9	3	External coolant	Straight shank	1534SU03-0690	8	79	34	24	36	☆
	5			1536SU05-0690	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0690	8	79	34	24	36	☆
	5			1536SU05C-0690	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0690	8	79	34	24	36	☆
	5			1736SU05C-0690	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0690	8	114	76	66	36	☆
7.0	3	External coolant	Straight shank	1534SU03-0700	8	79	34	24	36	☆
	5			1536SU05-0700	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0700	8	79	34	24	36	☆
	5			1536SU05C-0700	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0700	8	79	34	24	36	☆
	5			1736SU05C-0700	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0700	8	116	76	66	36	☆
7.1	3	External coolant	Straight shank	1534SU03-0710	8	79	41	29	36	☆
	5			1536SU05-0710	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0710	8	79	41	29	36	☆
	5			1536SU05C-0710	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0710	8	79	41	29	36	☆
	5			1736SU05C-0710	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0710	8	116	76	66	36	☆

☆ Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
7.2	3	External coolant	Straight shank	1534SU03-0720	8	79	41	29	36	☆
	5			1536SU05-0720	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0720	8	79	41	29	36	☆
	5			1536SU05C-0720	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0720	8	79	41	29	36	☆
	5			1736SU05C-0720	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0720	8	116	76	66	36	☆
7.3	3	External coolant	Straight shank	1534SU03-0730	8	79	41	29	36	☆
	5			1536SU05-0730	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0730	8	79	41	29	36	☆
	5			1536SU05C-0730	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0730	8	79	41	29	36	☆
	5			1736SU05C-0730	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0730	8	116	76	66	36	☆
7.4	3	External coolant	Straight shank	1534SU03-0740	8	79	41	29	36	☆
	5			1536SU05-0740	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0740	8	79	41	29	36	☆
	5			1536SU05C-0740	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0740	8	79	41	29	36	☆
	5			1736SU05C-0740	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0740	8	116	76	66	36	☆
7.5	3	External coolant	Straight shank	1534SU03-0750	8	79	41	29	36	☆
	5			1536SU05-0750	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0750	8	79	41	29	36	☆
	5			1536SU05C-0750	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0750	8	79	41	29	36	☆
	5			1736SU05C-0750	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0750	8	116	76	66	36	☆
7.6	3	External coolant	Straight shank	1534SU03-0760	8	79	41	29	36	☆
	5			1536SU05-0760	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0760	8	79	41	29	36	☆
	5			1536SU05C-0760	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0760	8	79	41	29	36	☆
	5			1736SU05C-0760	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0760	8	116	76	66	36	☆

Note: For drills with a drilling depth (ULDR) of 8, namely 1538SU08C series, tolerance of shank length is h_{15}.

☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

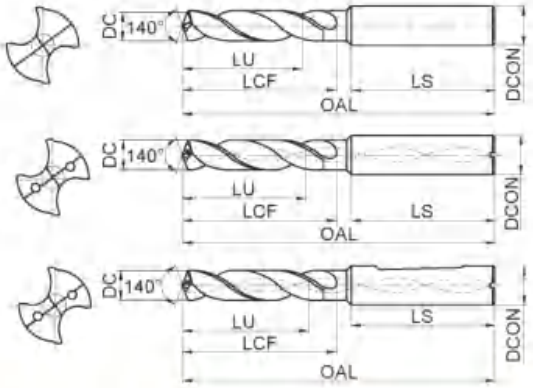
Code key C6 Cutting parameters C155-C158 Technical information C165-C171 Non-standard customization tools C172-C176

SU series General machining


External coolant — Straight shank


Internal coolant — Straight shank


Internal coolant — Whistle notch shank



- For high-efficiently drilling from common steel to hard-to-cut materials.
- Corrugated cutting edges achieve outstanding sharpness and strength, facilitating chip removal.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
7.7	3	External coolant	Straight shank	1534SU03-0770	8	79	41	29	36	☆
	5			1536SU05-0770	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0770	8	79	41	29	36	☆
	5			1536SU05C-0770	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0770	8	79	41	29	36	☆
	5			1736SU05C-0770	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0770	8	116	76	66	36	☆
7.8	3	External coolant	Straight shank	1534SU03-0780	8	79	41	29	36	☆
	5			1536SU05-0780	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0780	8	79	41	29	36	☆
	5			1536SU05C-0780	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0780	8	79	41	29	36	☆
	5			1736SU05C-0780	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0780	8	116	76	66	36	☆
7.9	3	External coolant	Straight shank	1534SU03-0790	8	79	41	29	36	☆
	5			1536SU05-0790	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0790	8	79	41	29	36	☆
	5			1536SU05C-0790	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0790	8	79	41	29	36	☆
	5			1736SU05C-0790	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0790	8	116	76	66	36	☆
8.0	3	External coolant	Straight shank	1534SU03-0800	8	79	41	29	36	☆
	5			1536SU05-0800	8	91	53	43	36	☆
	3	Internal coolant		1534SU03C-0800	8	79	41	29	36	☆
	5			1536SU05C-0800	8	91	53	43	36	☆
	3		Whistle notch shank	1734SU03C-0800	8	79	41	29	36	☆
	5			1736SU05C-0800	8	91	53	43	36	☆
	8		Straight shank	1538SU08C-0800	8	116	76	66	36	☆

☆ Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
8.1	3	External coolant	Straight shank	1534SU03-0810	10	89	47	35	40	☆
	5			1536SU05-0810	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0810	10	89	47	35	40	☆
	5			1536SU05C-0810	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0810	10	89	47	35	40	☆
	5			1736SU05C-0810	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0810	10	142	95	83	40	☆
8.2	3	External coolant	Straight shank	1534SU03-0820	10	89	47	35	40	☆
	5			1536SU05-0820	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0820	10	89	47	35	40	☆
	5			1536SU05C-0820	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0820	10	89	47	35	40	☆
	5			1736SU05C-0820	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0820	10	142	95	83	40	☆
8.3	3	External coolant	Straight shank	1534SU03-0830	10	89	47	35	40	☆
	5			1536SU05-0830	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0830	10	89	47	35	40	☆
	5			1536SU05C-0830	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0830	10	89	47	35	40	☆
	5			1736SU05C-0830	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0830	10	142	95	83	40	☆
8.4	3	External coolant	Straight shank	1534SU03-0840	10	89	47	35	40	☆
	5			1536SU05-0840	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0840	10	89	47	35	40	☆
	5			1536SU05C-0840	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0840	10	89	47	35	40	☆
	5			1736SU05C-0840	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0840	10	142	95	83	40	☆
8.5	3	External coolant	Straight shank	1534SU03-0850	10	89	47	35	40	☆
	5			1536SU05-0850	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0850	10	89	47	35	40	☆
	5			1536SU05C-0850	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0850	10	89	47	35	40	☆
	5			1736SU05C-0850	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0850	10	142	95	83	40	☆

Note: For drills with a drilling depth (ULDR) of 8, namely 1538SU08C series, tolerance of shank length is h_{15}.

☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

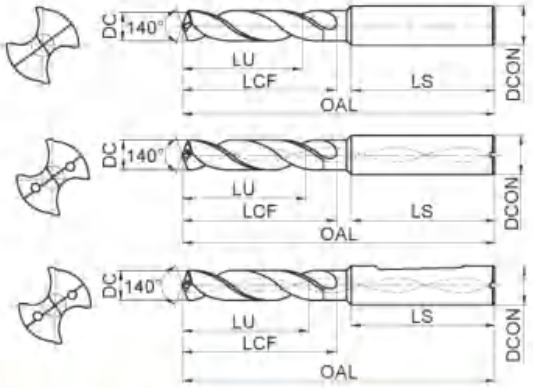
Code key C6 Cutting parameters C155-C158 Technical information C165-C171 Non-standard customization tools C172-C176

SU series General machining


External coolant — Straight shank


Internal coolant — Straight shank


Internal coolant — Whistle notch shank



- For high-efficiently drilling from common steel to hard-to-cut materials.
- Corrugated cutting edges achieve outstanding sharpness and strength, facilitating chip removal.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
8.6	3	External coolant	Straight shank	1534SU03-0860	10	89	47	35	40	☆
	5			1536SU05-0860	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0860	10	89	47	35	40	☆
	5			1536SU05C-0860	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0860	10	89	47	35	40	☆
	5			1736SU05C-0860	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0860	10	142	95	83	40	☆
8.7	3	External coolant	Straight shank	1534SU03-0870	10	89	47	35	40	☆
	5			1536SU05-0870	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0870	10	89	47	35	40	☆
	5			1536SU05C-0870	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0870	10	89	47	35	40	☆
	5			1736SU05C-0870	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0870	10	142	95	83	40	☆
8.8	3	External coolant	Straight shank	1534SU03-0880	10	89	47	35	40	☆
	5			1536SU05-0880	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0880	10	89	47	35	40	☆
	5			1536SU05C-0880	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0880	10	89	47	35	40	☆
	5			1736SU05C-0880	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0880	10	142	95	83	40	☆
8.9	3	External coolant	Straight shank	1534SU03-0890	10	89	47	35	40	☆
	5			1536SU05-0890	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0890	10	89	47	35	40	☆
	5			1536SU05C-0890	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0890	10	89	47	35	40	☆
	5			1736SU05C-0890	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0890	10	142	95	83	40	☆

☆ Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
9.0	3	External coolant	Straight shank	1534SU03-0900	10	89	47	35	40	☆
	5			1536SU05-0900	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0900	10	89	47	35	40	☆
	5			1536SU05C-0900	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0900	10	89	47	35	40	☆
	5			1736SU05C-0900	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0900	10	142	95	83	40	☆
9.1	3	External coolant	Straight shank	1534SU03-0910	10	89	47	35	40	☆
	5			1536SU05-0910	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0910	10	89	47	35	40	☆
	5			1536SU05C-0910	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0910	10	89	47	35	40	☆
	5			1736SU05C-0910	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0910	10	142	95	83	40	☆
9.2	3	External coolant	Straight shank	1534SU03-0920	10	89	47	35	40	☆
	5			1536SU05-0920	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0920	10	89	47	35	40	☆
	5			1536SU05C-0920	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0920	10	89	47	35	40	☆
	5			1736SU05C-0920	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0920	10	142	95	83	40	☆
9.3	3	External coolant	Straight shank	1534SU03-0930	10	89	47	35	40	☆
	5			1536SU05-0930	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0930	10	89	47	35	40	☆
	5			1536SU05C-0930	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0930	10	89	47	35	40	☆
	5			1736SU05C-0930	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0930	10	142	95	83	40	☆
9.4	3	External coolant	Straight shank	1534SU03-0940	10	89	47	35	40	☆
	5			1536SU05-0940	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0940	10	89	47	35	40	☆
	5			1536SU05C-0940	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0940	10	89	47	35	40	☆
	5			1736SU05C-0940	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0940	10	142	95	83	40	☆

Note: For drills with a drilling depth (ULDR) of 8, namely 1538SU08C series, tolerance of shank length is h_{15}.

☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

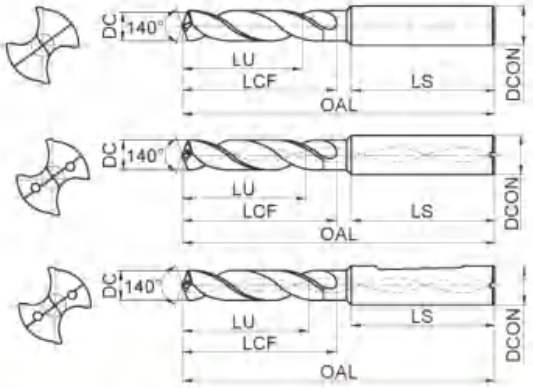
Code key C6 Cutting parameters C155-C158 Technical information C165-C171 Non-standard customization tools C172-C176

SU series General machining


External coolant — Straight shank


Internal coolant — Straight shank


Internal coolant — Whistle notch shank



- For high-efficiently drilling from common steel to hard-to-cut materials.
- Corrugated cutting edges achieve outstanding sharpness and strength, facilitating chip removal.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
9.5	3	External coolant	Straight shank	1534SU03-0950	10	89	47	35	40	☆
	5			1536SU05-0950	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0950	10	89	47	35	40	☆
	5			1536SU05C-0950	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0950	10	89	47	35	40	☆
	5			1736SU05C-0950	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0950	10	142	95	83	40	☆
9.6	3	External coolant	Straight shank	1534SU03-0960	10	89	47	35	40	☆
	5			1536SU05-0960	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0960	10	89	47	35	40	☆
	5			1536SU05C-0960	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0960	10	89	47	35	40	☆
	5			1736SU05C-0960	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0960	10	142	95	83	40	☆
9.7	3	External coolant	Straight shank	1534SU03-0970	10	89	47	35	40	☆
	5			1536SU05-0970	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0970	10	89	47	35	40	☆
	5			1536SU05C-0970	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0970	10	89	47	35	40	☆
	5			1736SU05C-0970	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0970	10	142	95	83	40	☆
9.8	3	External coolant	Straight shank	1534SU03-0980	10	89	47	35	40	☆
	5			1536SU05-0980	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0980	10	89	47	35	40	☆
	5			1536SU05C-0980	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0980	10	89	47	35	40	☆
	5			1736SU05C-0980	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0980	10	142	95	83	40	☆

☆ Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
9.9	3	External coolant	Straight shank	1534SU03-0990	10	89	47	35	40	☆
	5			1536SU05-0990	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-0990	10	89	47	35	40	☆
	5			1536SU05C-0990	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-0990	10	89	47	35	40	☆
	5			1736SU05C-0990	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-0990	10	142	95	83	40	☆
10.0	3	External coolant	Straight shank	1534SU03-1000	10	89	47	35	40	☆
	5			1536SU05-1000	10	103	61	49	40	☆
	3	Internal coolant		1534SU03C-1000	10	89	47	35	40	☆
	5			1536SU05C-1000	10	103	61	49	40	☆
	3		Whistle notch shank	1734SU03C-1000	10	89	47	35	40	☆
	5			1736SU05C-1000	10	103	61	49	40	☆
	8		Straight shank	1538SU08C-1000	10	142	95	83	40	☆
10.1	3	External coolant	Straight shank	1534SU03-1010	12	102	55	40	45	☆
	5			1536SU05-1010	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1010	12	102	55	40	45	☆
	5			1536SU05C-1010	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1010	12	102	55	40	45	☆
	5			1736SU05C-1010	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1010	12	162	114	99	45	☆
10.2	3	External coolant	Straight shank	1534SU03-1020	12	102	55	40	45	☆
	5			1536SU05-1020	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1020	12	102	55	40	45	☆
	5			1536SU05C-1020	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1020	12	102	55	40	45	☆
	5			1736SU05C-1020	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1020	12	162	114	99	45	☆
10.25	3	External coolant	Straight shank	1534SU03-1025	12	102	55	40	45	☆
	5			1536SU05-1025	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1025	12	102	55	40	45	☆
	5			1536SU05C-1025	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1025	12	102	55	40	45	☆
	5			1736SU05C-1025	12	118	71	56	45	☆

Note: For drills with a drilling depth (ULDR) of 8, namely 1538SU08C series, tolerance of shank length is h6.

☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

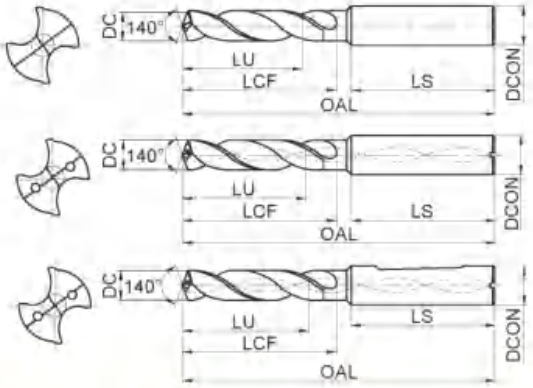
Code key C6 Cutting parameters C155-C158 Technical information C165-C171 Non-standard customization tools C172-C176

SU series General machining


External coolant — Straight shank


Internal coolant — Straight shank


Internal coolant — Whistle notch shank



- For high-efficiently drilling from common steel to hard-to-cut materials.
- Corrugated cutting edges achieve outstanding sharpness and strength, facilitating chip removal.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
10.3	3	External coolant	Straight shank	1534SU03-1030	12	102	55	40	45	☆
	5			1536SU05-1030	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1030	12	102	55	40	45	☆
	5			1536SU05C-1030	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1030	12	102	55	40	45	☆
	5			1736SU05C-1030	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1030	12	162	114	99	45	☆
10.4	3	External coolant	Straight shank	1534SU03-1040	12	102	55	40	45	☆
	5			1536SU05-1040	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1040	12	102	55	40	45	☆
	5			1536SU05C-1040	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1040	12	102	55	40	45	☆
	5			1736SU05C-1040	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1040	12	162	114	99	45	☆
10.5	3	External coolant	Straight shank	1534SU03-1050	12	102	55	40	45	☆
	5			1536SU05-1050	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1050	12	102	55	40	45	☆
	5			1536SU05C-1050	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1050	12	102	55	40	45	☆
	5			1736SU05C-1050	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1050	12	162	114	99	45	☆
10.6	3	External coolant	Straight shank	1534SU03-1060	12	102	55	40	45	☆
	5			1536SU05-1060	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1060	12	102	55	40	45	☆
	5			1536SU05C-1060	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1060	12	102	55	40	45	☆
	5			1736SU05C-1060	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1060	12	162	114	99	45	☆

☆ Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank lerigth	KDG303
					DCON	OAL	LCF	LU	LS	
10.7	3	External coolant	Straight shank	1534SU03-1070	12	102	55	40	45	☆
	5			1536SU05-1070	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1070	12	102	55	40	45	☆
	5			1536SU05C-1070	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1070	12	102	55	40	45	☆
	5			1736SU05C-1070	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1070	12	162	114	99	45	☆
10.8	3	External coolant	Straight shank	1534SU03-1080	12	102	55	40	45	☆
	5			1536SU05-1080	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1080	12	102	55	40	45	☆
	5			1536SU05C-1080	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1080	12	102	55	40	45	☆
	5			1736SU05C-1080	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1080	12	162	114	99	45	☆
10.9	3	External coolant	Straight shank	1534SU03-1090	12	102	55	40	45	☆
	5			1536SU05-1090	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1090	12	102	55	40	45	☆
	5			1536SU05C-1090	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1090	12	102	55	40	45	☆
	5			1736SU05C-1090	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1090	12	162	114	99	45	☆
11.0	3	External coolant	Straight shank	1534SU03-1100	12	102	55	40	45	☆
	5			1536SU05-1100	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1100	12	102	55	40	45	☆
	5			1536SU05C-1100	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1100	12	102	55	40	45	☆
	5			1736SU05C-1100	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1100	12	162	114	99	45	☆
11.1	3	External coolant	Straight shank	1534SU03-1110	12	102	55	40	45	☆
	5			1536SU05-1110	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1110	12	102	55	40	45	☆
	5			1536SU05C-1110	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1110	12	102	55	40	45	☆
	5			1736SU05C-1110	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1110	12	162	114	99	45	☆

Note: For drills with a drilling depth (ULDR) of 8, namely 1538SU08C series, tolerance of shank length is h_{15}.

☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

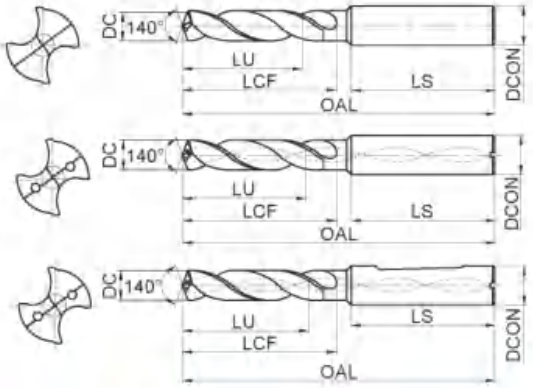
Code key C6 Cutting parameters C155-C158 Technical information C165-C171 Non-standard customization tools C172-C176

SU series General machining


External coolant — Straight shank


Internal coolant — Straight shank


Internal coolant — Whistle notch shank



- For high-efficiently drilling from common steel to hard-to-cut materials.
- Corrugated cutting edges achieve outstanding sharpness and strength, facilitating chip removal.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
11.2	3	External coolant	Straight shank	1534SU03-1120	12	102	55	40	45	☆
	5			1536SU05-1120	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1120	12	102	55	40	45	☆
	5			1536SU05C-1120	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1120	12	102	55	40	45	☆
	5			1736SU05C-1120	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1120	12	162	114	99	45	☆
11.3	3	External coolant	Straight shank	1534SU03-1130	12	102	55	40	45	☆
	5			1536SU05-1130	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1130	12	102	55	40	45	☆
	5			1536SU05C-1130	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1130	12	102	55	40	45	☆
	5			1736SU05C-1130	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1130	12	162	114	99	45	☆
11.4	3	External coolant	Straight shank	1534SU03-1140	12	102	55	40	45	☆
	5			1536SU05-1140	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1140	12	102	55	40	45	☆
	5			1536SU05C-1140	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1140	12	102	55	40	45	☆
	5			1736SU05C-1140	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1140	12	162	114	99	45	☆
11.5	3	External coolant	Straight shank	1534SU03-1150	12	102	55	40	45	☆
	5			1536SU05-1150	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1150	12	102	55	40	45	☆
	5			1536SU05C-1150	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1150	12	102	55	40	45	☆
	5			1736SU05C-1150	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1150	12	162	114	99	45	☆

☆ Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
11.6	3	External coolant	Straight shank	1534SU03-1160	12	102	55	40	45	☆
	5			1536SU05-1160	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1160	12	102	55	40	45	☆
	5			1536SU05C-1160	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1160	12	102	55	40	45	☆
	5			1736SU05C-1160	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1160	12	162	114	99	45	☆
11.7	3	External coolant	Straight shank	1534SU03-1170	12	102	55	40	45	☆
	5			1536SU05-1170	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1170	12	102	55	40	45	☆
	5			1536SU05C-1170	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1170	12	102	55	40	45	☆
	5			1736SU05C-1170	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1170	12	162	114	99	45	☆
11.8	3	External coolant	Straight shank	1534SU03-1180	12	102	55	40	45	☆
	5			1536SU05-1180	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1180	12	102	55	40	45	☆
	5			1536SU05C-1180	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1180	12	102	55	40	45	☆
	5			1736SU05C-1180	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1180	12	162	114	99	45	☆
11.9	3	External coolant	Straight shank	1534SU03-1190	12	102	55	40	45	☆
	5			1536SU05-1190	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1190	12	102	55	40	45	☆
	5			1536SU05C-1190	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1190	12	102	55	40	45	☆
	5			1736SU05C-1190	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1190	12	162	114	99	45	☆
12.0	3	External coolant	Straight shank	1534SU03-1200	12	102	55	40	45	☆
	5			1536SU05-1200	12	118	71	56	45	☆
	3	Internal coolant		1534SU03C-1200	12	102	55	40	45	☆
	5			1536SU05C-1200	12	118	71	56	45	☆
	3		Whistle notch shank	1734SU03C-1200	12	102	55	40	45	☆
	5			1736SU05C-1200	12	118	71	56	45	☆
	8		Straight shank	1538SU08C-1200	12	162	114	99	45	☆

Note: For drills with a drilling depth (ULDR) of 8, namely 1538SU08C series, tolerance of shank length is h_{6}.

☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

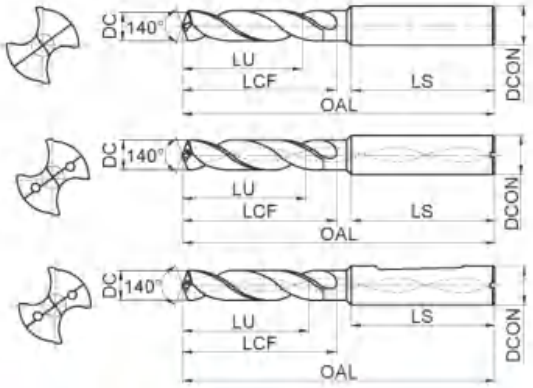
Code key C6
Cutting parameters C155-C158
Technical information C165-C171
Non-standard customization tools C172-C176

SU series General machining


External coolant — Straight shank


Internal coolant — Straight shank


Internal coolant — Whistle notch shank



- For high-efficiently drilling from common steel to hard-to-cut materials.
- Corrugated cutting edges achieve outstanding sharpness and strength, facilitating chip removal.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
12.25	3	External coolant	Straight shank	1534SU03-1225	14	107	60	43	45	☆
	5			1536SU05-1225	14	124	77	60	45	☆
	3	Internal coolant		1534SU03C-1225	14	107	60	43	45	☆
	5			1536SU05C-1225	14	124	77	60	45	☆
	3		Whistle notch shank	1734SU03C-1225	14	107	60	43	45	☆
	5			1736SU05C-1225	14	124	77	60	45	☆
12.3	3	External coolant	Straight shank	1534SU03-1230	14	107	60	43	45	☆
	5			1536SU05-1230	14	124	77	60	45	☆
	3	Internal coolant		1534SU03C-1230	14	107	60	43	45	☆
	5			1536SU05C-1230	14	124	77	60	45	☆
	3		Whistle notch shank	1734SU03C-1230	14	107	60	43	45	☆
	5			1736SU05C-1230	14	124	77	60	45	☆
12.5	3	External coolant	Straight shank	1534SU03-1250	14	107	60	43	45	☆
	5			1536SU05-1250	14	124	77	60	45	☆
	3	Internal coolant		1534SU03C-1250	14	107	60	43	45	☆
	5			1536SU05C-1250	14	124	77	60	45	☆
	3		Whistle notch shank	1734SU03C-1250	14	107	60	43	45	☆
	5			1736SU05C-1250	14	124	77	60	45	☆
	8		Straight shank	1538SU08C-1250	14	178	133	116	45	☆
12.7	3	External coolant	Straight shank	1534SU03-1270	14	107	60	43	45	☆
	5			1536SU05-1270	14	124	77	60	45	☆
	3	Internal coolant		1534SU03C-1270	14	107	60	43	45	☆
	5			1536SU05C-1270	14	124	77	60	45	☆
	3		Whistle notch shank	1734SU03C-1270	14	107	60	43	45	☆
	5			1736SU05C-1270	14	124	77	60	45	☆
	8		Straight shank	1538SU08C-1270	14	178	133	116	45	☆

☆ Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank lerigth	KDG303
					DCON	OAL	LCF	LU	LS	
12.75	3	External coolant	Straight shank	1534SU03-1275	14	107	60	43	45	☆
	5			1536SU05-1275	14	124	77	60	45	☆
	3	Internal coolant		1534SU03C-1275	14	107	60	43	45	☆
	5			1536SU05C-1275	14	124	77	60	45	☆
	3		Whistle notch shank	1734SU03C-1275	14	107	60	43	45	☆
	5			1736SU05C-1275	14	124	77	60	45	☆
12.8	3	External coolant	Straight shank	1534SU03-1280	14	107	60	43	45	☆
	5			1536SU05-1280	14	124	77	60	45	☆
	3	Internal coolant		1534SU03C-1280	14	107	60	43	45	☆
	5			1536SU05C-1280	14	124	77	60	45	☆
	3		Whistle notch shank	1734SU03C-1280	14	107	60	43	45	☆
	5			1736SU05C-1280	14	124	77	60	45	☆
	8		Straight shank	1538SU08C-1280	14	178	133	116	45	☆
13.0	3	External coolant	Straight shank	1534SU03-1300	14	107	60	43	45	☆
	5			1536SU05-1300	14	124	77	60	45	☆
	3	Internal coolant		1534SU03C-1300	14	107	60	43	45	☆
	5			1536SU05C-1300	14	124	77	60	45	☆
	3		Whistle notch shank	1734SU03C-1300	14	107	60	43	45	☆
	5			1736SU05C-1300	14	124	77	60	45	☆
	8		Straight shank	1538SU08C-1300	14	178	133	116	45	☆
13.1	3	External coolant	Straight shank	1534SU03-1310	14	107	60	43	45	☆
	5			1536SU05-1310	14	124	77	60	45	☆
	3	Internal coolant		1534SU03C-1310	14	107	60	43	45	☆
	5			1536SU05C-1310	14	124	77	60	45	☆
	3		Whistle notch shank	1734SU03C-1310	14	107	60	43	45	☆
	5			1736SU05C-1310	14	124	77	60	45	☆
13.5	3	External coolant	Straight shank	1534SU03-1350	14	107	60	43	45	☆
	5			1536SU05-1350	14	124	77	60	45	☆
	3	Internal coolant		1534SU03C-1350	14	107	60	43	45	☆
	5			1536SU05C-1350	14	124	77	60	45	☆
	3		Whistle notch shank	1734SU03C-1350	14	107	60	43	45	☆
	5			1736SU05C-1350	14	124	77	60	45	☆
	8		Straight shank	1538SU08C-1350	14	178	133	116	45	☆

Note: For drills with a drilling depth (ULDR) of 8, namely 1538SU08C series, tolerance of shank length is h5.

☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

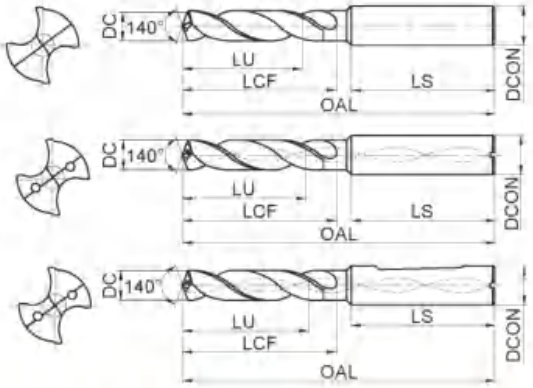
Code key C6
Cutting parameters C155-C158
Technical information C165-C171
Non-standard customization tools C172-C176

SU series General machining


External coolant — Straight shank


Internal coolant — Straight shank


Internal coolant — Whistle notch shank



- For high-efficiently drilling from common steel to hard-to-cut materials.
- Corrugated cutting edges achieve outstanding sharpness and strength, facilitating chip removal.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
13.8	3	External coolant	Straight shank	1534SU03-1380	14	107	60	43	45	☆
	5			1536SU05-1380	14	124	77	60	45	☆
	3	Internal coolant		1534SU03C-1380	14	107	60	43	45	☆
	5			1536SU05C-1380	14	124	77	60	45	☆
	3		Whistle notch shank	1734SU03C-1380	14	107	60	43	45	☆
	5			1736SU05C-1380	14	124	77	60	45	☆
14.0	3	External coolant	Straight shank	1534SU03-1400	14	107	60	43	45	☆
	5			1536SU05-1400	14	124	77	60	45	☆
	3	Internal coolant		1534SU03C-1400	14	107	60	43	45	☆
	5			1536SU05C-1400	14	124	77	60	45	☆
	3		Whistle notch shank	1734SU03C-1400	14	107	60	43	45	☆
	5			1736SU05C-1400	14	124	77	60	45	☆
	8		Straight shank	1538SU08C-1400	14	178	133	116	45	☆
14.25	3	External coolant	Straight shank	1534SU03-1425	16	115	65	45	48	☆
	5			1536SU05-1425	16	133	83	63	48	☆
	3	Internal coolant		1534SU03C-1425	16	115	65	45	48	☆
	5			1536SU05C-1425	16	133	83	63	48	☆
	3		Whistle notch shank	1734SU03C-1425	16	115	65	45	48	☆
	5			1736SU05C-1425	16	133	83	63	48	☆
14.3	3	External coolant	Straight shank	1534SU03-1430	16	115	65	45	48	☆
	5			1536SU05-1430	16	133	83	63	48	☆
	3	Internal coolant		1534SU03C-1430	16	115	65	45	48	☆
	5			1536SU05C-1430	16	133	83	63	48	☆
	3		Whistle notch shank	1734SU03C-1430	16	115	65	45	48	☆
	5			1736SU05C-1430	16	133	83	63	48	☆

☆ Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
14.5	3	External coolant	Straight shank	1534SU03-1450	16	115	65	45	48	☆
	5			1536SU05-1450	16	133	83	63	48	☆
	3	Internal coolant		1534SU03C-1450	16	115	65	45	48	☆
	5			1536SU05C-1450	16	133	83	63	48	☆
	3		Whistle notch shank	1734SU03C-1450	16	115	65	45	48	☆
	5			1736SU05C-1450	16	133	83	63	48	☆
	8		Straight shank	1538SU08C-1450	16	204	152	132	48	☆
14.75	3	External coolant	Straight shank	1534SU03-1475	16	115	65	45	48	☆
	5			1536SU05-1475	16	133	83	63	48	☆
	3	Internal coolant		1534SU03C-1475	16	115	65	45	48	☆
	5			1536SU05C-1475	16	133	83	63	48	☆
	3		Whistle notch shank	1734SU03C-1475	16	115	65	45	48	☆
	5			1736SU05C-1475	16	133	83	63	48	☆
14.8	3	External coolant	Straight shank	1534SU03-1480	16	115	65	45	48	☆
	5			1536SU05-1480	16	133	83	63	48	☆
	3	Internal coolant		1534SU03C-1480	16	115	65	45	48	☆
	5			1536SU05C-1480	16	133	83	63	48	☆
	3		Whistle notch shank	1734SU03C-1480	16	115	65	45	48	☆
	5			1736SU05C-1480	16	133	83	63	48	☆
	8		Straight shank	1538SU08C-1480	16	204	152	132	48	☆
15.0	3	External coolant	Straight shank	1534SU03-1500	16	115	65	45	48	☆
	5			1536SU05-1500	16	133	83	63	48	☆
	3	Internal coolant		1534SU03C-1500	16	115	65	45	48	☆
	5			1536SU05C-1500	16	133	83	63	48	☆
	3		Whistle notch shank	1734SU03C-1500	16	115	65	45	48	☆
	5			1736SU05C-1500	16	133	83	63	48	☆
	8		Straight shank	1538SU08C-1500	16	204	152	132	48	☆
15.1	3	External coolant	Straight shank	1534SU03-1510	16	115	65	45	48	☆
	5			1536SU05-1510	16	133	83	63	48	☆
	3	Internal coolant		1534SU03C-1510	16	115	65	45	48	☆
	5			1536SU05C-1510	16	133	83	63	48	☆
	3		Whistle notch shank	1734SU03C-1510	16	115	65	45	48	☆
	5			1736SU05C-1510	16	133	83	63	48	☆

Note: For drills with a drilling depth (ULDR) of 8, namely 1538SU08C series, tolerance of shank length is h5.

☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

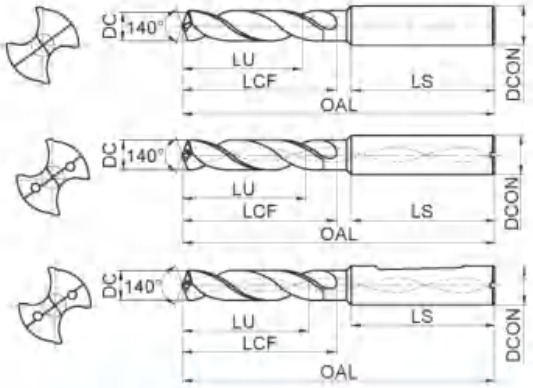
Code key C6
Cutting parameters C155-C158
Technical information C165-C171
Non-standard customization tools C172-C176

SU series General machining


External coolant — Straight shank


Internal coolant — Straight shank


Internal coolant — Whistle notch shank



- For high-efficiently drilling from common steel to hard-to-cut materials.
- Corrugated cutting edges achieve outstanding sharpness and strength, facilitating chip removal.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
15.5	3	External coolant	Straight shank	1534SU03-1550	16	115	65	45	48	☆
	5			1536SU05-1550	16	133	83	63	48	☆
	3	Internal coolant		1534SU03C-1550	16	115	65	45	48	☆
	5			1536SU05C-1550	16	133	83	63	48	☆
	3		Whistle notch shank	1734SU03C-1550	16	115	65	45	48	☆
	5			1736SU05C-1550	16	133	83	63	48	☆
	8		Straight shank	1538SU08C-1550	16	204	152	132	48	☆
15.8	3	External coolant	Straight shank	1534SU03-1580	16	115	65	45	48	☆
	5			1536SU05-1580	16	133	83	63	48	☆
	3	Internal coolant		1534SU03C-1580	16	115	65	45	48	☆
	5			1536SU05C-1580	16	133	83	63	48	☆
	3		Whistle notch shank	1734SU03C-1580	16	115	65	45	48	☆
	5			1736SU05C-1580	16	133	83	63	48	☆
16.0	3	External coolant	Straight shank	1534SU03-1600	16	115	65	45	48	☆
	5			1536SU05-1600	16	133	83	63	48	☆
	3	Internal coolant		1534SU03C-1600	16	115	65	45	48	☆
	5			1536SU05C-1600	16	133	83	63	48	☆
	3		Whistle notch shank	1734SU03C-1600	16	115	65	45	48	☆
	5			1736SU05C-1600	16	133	83	63	48	☆
	8		Straight shank	1538SU08C-1600	16	204	152	132	48	☆
16.5	3	External coolant	Straight shank	1534SU03-1650	18	123	73	51	48	☆
	5			1536SU05-1650	18	143	93	71	48	☆
	3	Internal coolant		1534SU03C-1650	18	123	73	51	48	☆
	5			1536SU05C-1650	18	143	93	71	48	☆
	3		Whistle notch shank	1734SU03C-1650	18	123	73	51	48	☆
	5			1736SU05C-1650	18	143	93	71	48	☆
	8		Straight shank	1538SU08C-1650	18	223	171	149	48	☆

☆ Recommended grade (produce according to order)

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
16.75	3	External coolant	Straight shank	1534SU03-1675	18	123	73	51	48	☆
	5			1536SU05-1675	18	143	93	71	48	☆
	3	Internal coolant		1534SU03C-1675	18	123	73	51	48	☆
	5			1536SU05C-1675	18	143	93	71	48	☆
	3		Whistle notch shank	1734SU03C-1675	18	123	73	51	48	☆
	5			1736SU05C-1675	18	143	93	71	48	☆
16.8	3	External coolant	Straight shank	1534SU03-1680	18	123	73	51	48	☆
	5			1536SU05-1680	18	143	93	71	48	☆
	3	Internal coolant		1534SU03C-1680	18	123	73	51	48	☆
	5			1536SU05C-1680	18	143	93	71	48	☆
	3		Whistle notch shank	1734SU03C-1680	18	123	73	51	48	☆
	5			1736SU05C-1680	18	143	93	71	48	☆
17.0	3	External coolant	Straight shank	1534SU03-1700	18	123	73	51	48	☆
	5			1536SU05-1700	18	143	93	71	48	☆
	3	Internal coolant		1534SU03C-1700	18	123	73	51	48	☆
	5			1536SU05C-1700	18	143	93	71	48	☆
	3		Whistle notch shank	1734SU03C-1700	18	123	73	51	48	☆
	5			1736SU05C-1700	18	143	93	71	48	☆
	8		Straight shank	1538SU08C-1700	18	223	171	149	48	☆
17.5	3	External coolant	Straight shank	1534SU03-1750	18	123	73	51	48	☆
	5			1536SU05-1750	18	143	93	71	48	☆
	3	Internal coolant		1534SU03C-1750	18	123	73	51	48	☆
	5			1536SU05C-1750	18	143	93	71	48	☆
	3		Whistle notch shank	1734SU03C-1750	18	123	73	51	48	☆
	5			1736SU05C-1750	18	143	93	71	48	☆
	8		Straight shank	1538SU08C-1750	18	223	171	149	48	☆
17.8	3	External coolant	Straight shank	1534SU03-1780	18	123	73	51	48	☆
	5			1536SU05-1780	18	143	93	71	48	☆
	3	Internal coolant		1534SU03C-1780	18	123	73	51	48	☆
	5			1536SU05C-1780	18	143	93	71	48	☆
	3		Whistle notch shank	1734SU03C-1780	18	123	73	51	48	☆
	5			1736SU05C-1780	18	143	93	71	48	☆

Note: For drills with a drilling depth (ULDR) of 8, namely 1538SU08C series, tolerance of shank length is h5.

☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

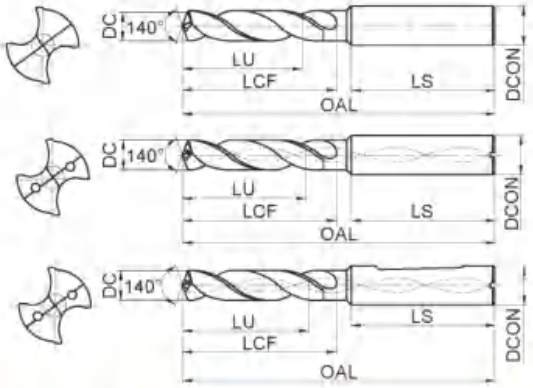
Code key C6
Cutting parameters C155-C158
Technical information C165-C171
Non-standard customization tools C172-C176

SU series General machining


External coolant — Straight shank


Internal coolant — Straight shank


Internal coolant — Whistle notch shank



- For high-efficiently drilling from common steel to hard-to-cut materials.
- Corrugated cutting edges achieve outstanding sharpness and strength, facilitating chip removal.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
18.0	3	External coolant	Straight shank	1534SU03-1800	18	123	73	51	48	☆
	5			1536SU05-1800	18	143	93	71	48	☆
	3	Internal coolant		1534SU03C-1800	18	123	73	51	48	☆
	5			1536SU05C-1800	18	143	93	71	48	☆
	3		Whistle notch shank	1734SU03C-1800	18	123	73	51	48	☆
	5			1736SU05C-1800	18	143	93	71	48	☆
	8		Straight shank	1538SU08C-1800	18	223	171	149	48	☆
18.5	3	External coolant	Straight shank	1534SU03-1850	20	131	79	55	50	☆
	5			1536SU05-1850	20	153	101	77	50	☆
	3	Internal coolant		1534SU03C-1850	20	131	79	55	50	☆
	5			1536SU05C-1850	20	153	101	77	50	☆
	3		Whistle notch shank	1734SU03C-1850	20	131	79	55	50	☆
	5			1736SU05C-1850	20	153	101	77	50	☆
18.8	3	External coolant	Straight shank	1534SU03-1880	20	131	79	55	50	☆
	5			1536SU05-1880	20	153	101	77	50	☆
	3	Internal coolant		1534SU03C-1880	20	131	79	55	50	☆
	5			1536SU05C-1880	20	153	101	77	50	☆
	3		Whistle notch shank	1734SU03C-1880	20	131	79	55	50	☆
	5			1736SU05C-1880	20	153	101	77	50	☆
19.0	3	External coolant	Straight shank	1534SU03-1900	20	131	79	55	50	☆
	5			1536SU05-1900	20	153	101	77	50	☆
	3	Internal coolant		1534SU03C-1900	20	131	79	55	50	☆
	5			1536SU05C-1900	20	153	101	77	50	☆
	3		Whistle notch shank	1734SU03C-1900	20	131	79	55	50	☆
	5			1736SU05C-1900	20	153	101	77	50	☆

☆ Recommended grade (produce according to order)

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
19.5	3	External coolant	Straight shank	1534SU03-1950	20	131	79	55	50	☆
	5			1536SU05-1950	20	153	101	77	50	☆
	3	Internal coolant		1534SU03C-1950	20	131	79	55	50	☆
	5			1536SU05C-1950	20	153	101	77	50	☆
	3		Whistle notch shank	1734SU03C-1950	20	131	79	55	50	☆
	5			1736SU05C-1950	20	153	101	77	50	☆
19.8	3	External coolant	Straight shank	1534SU03-1980	20	131	79	55	50	☆
	5			1536SU05-1980	20	153	101	77	50	☆
	3	Internal coolant		1534SU03C-1980	20	131	79	55	50	☆
	5			1536SU05C-1980	20	153	101	77	50	☆
	3		Whistle notch shank	1734SU03C-1980	20	131	79	55	50	☆
	5			1736SU05C-1980	20	153	101	77	50	☆
20.0	3	External coolant	Straight shank	1534SU03-2000	20	131	79	55	50	☆
	5			1536SU05-2000	20	153	101	77	50	☆
	3	Internal coolant		1534SU03C-2000	20	131	79	55	50	☆
	5			1536SU05C-2000	20	153	101	77	50	☆
	3		Whistle notch shank	1734SU03C-2000	20	131	79	55	50	☆
	5			1736SU05C-2000	20	153	101	77	50	☆

☆ Recommended grade (produce according to order)

Note: For drills with a drilling depth (ULDR) of 8, namely 1538SU08C series, tolerance of shank length is h5.

Applicable material table

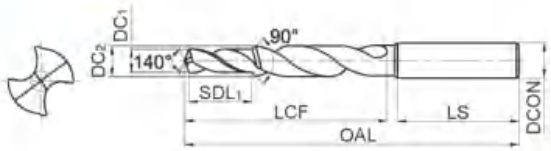
◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

Code key C6
Cutting parameters C155-C158
Technical information C165-C171
Non-standard customization tools C172-C176

SU series General machining(step drill)





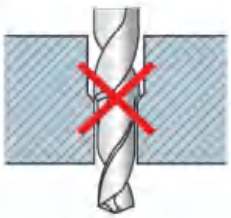
● For thread pre-hole, chamfering.

Drill diameter DC1(m8)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)							Recommended grade
					Thread size	DCON	DC2	OAL	LCF	LS	SDL1	KDG303
3.3	3	External coolant	Straight shank	1557SU03-M4	M4	6.0	4.5	66	28	36	11.4	☆
4.2	3			1557SU03-M5	M5	6.0	6.0	66	28	36	13.6	☆
5.0	3			1557SU03-M6	M6	8.0	7.0	79	41	36	16.5	☆
6.75	3			1557SU03-M8	M8	10.0	9.5	89	47	40	21.0	☆
8.5	3			1557SU03-M10	M10	12.0	12.0	102	55	45	25.5	☆
10.25	3			1557SU03-M12	M12	14.0	14.0	107	60	45	30.0	☆
12.0	3			1557SU03-M14	M14	16.0	16.0	115	65	48	34.5	☆
14.0	3			1557SU03-M16	M16	18.0	18.0	123	73	48	38.5	☆
7.0	3			1557SU03-M8×1.0	M8×1.0	10.0	9.8	89	47	40	21.0	☆
9.0	3			1557SU03-M10×1.0	M10×1.0	12.0	12.0	102	55	45	25.5	☆
10.5	3			1557SU03-M12×1.5	M12×1.5	14.0	14.0	107	60	45	30.0	☆
12.5	3			1557SU03-M14×1.5	M14×1.5	16.0	16.0	115	65	48	34.5	☆
14.5	3			1557SU03-M16×1.5	M16×1.5	18.0	18.0	123	73	48	38.5	☆

☆ Recommended grade (produce according to order)

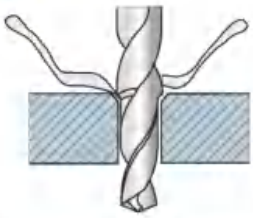
Notes for using step drill

A



Because of no grind on the large diameter, countersinking (shown above) is not possible.

B



Long chips during countersinking will wind around the drill and obstruct machining. Thus small feed is recommended in order to break the chips.

C



When countersinking, cutting force increases at initial stage. Please reduce the feed.

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

Code key C6 | Cutting parameters C155-C158 | Technical information C165-C171 | Non-standard customization tools C172-C176

Achieving the optimization of tool structure through analysis of simulated cutting.





Design with variable parameter helical flute, good rigidity and chip removal capability.

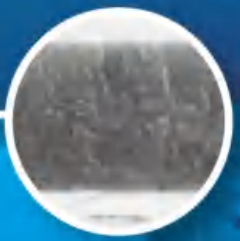
Double special guiding margin, more credible guiding and more stable machining.



Unique cutting edge design, good chip breaking capability even for sticky, softer materials, high versatility.



Special nano structure coating with better self-lubricating capability and superb wear resistance.



1588SL series

deep hole twist drills



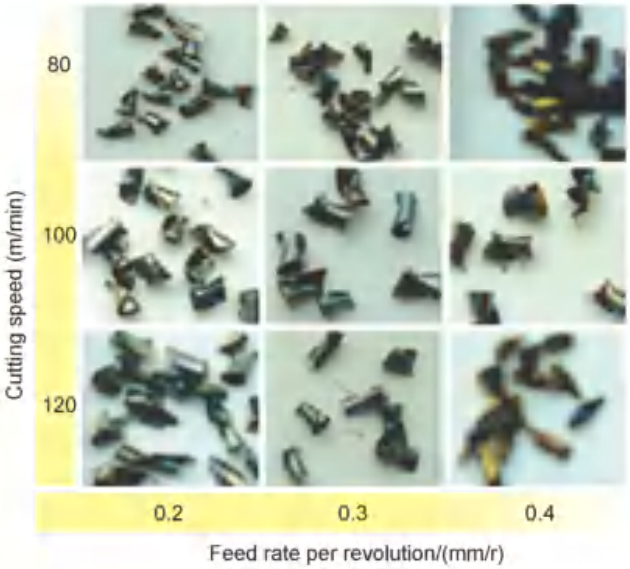
1588SL series deep hole twist drills

Outstandingly chip breaking capability





Workpiece: crank shaft
Workpiece material: 40Cr
Machining area: inclined oil hole
Tool type: 1588SL20C-0690/KDG303
Cutting parameters: V_c =80~120m/min
f_r=0.2~0.4mm/r
Cooling system: Water soluble liquid
Drilling depth: 105mm



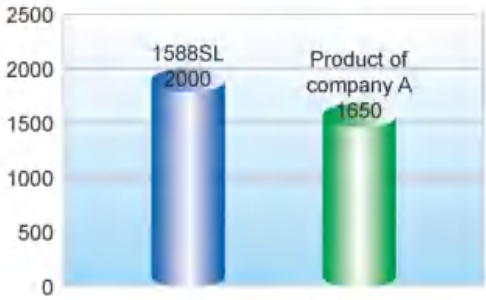
Good chip breaking capability and stable machining with different cutting speed and feed rate.

Extremely high efficiency and long tool life



Workpiece: cylinder
Workpiece material: HT300
Machined area: crank shaft joint surface drilling
Drilling depth: 30mm
Tool type: 1588SL12C-0850/KDG303
Recommend parameters: Vc=80m/min f_r=0.2mm/r
Cooling system: water-soluble liquid

Comparison of tool life(number of machined holes)



Comparison of tool life(tool wear)



1588SL(regular wear)

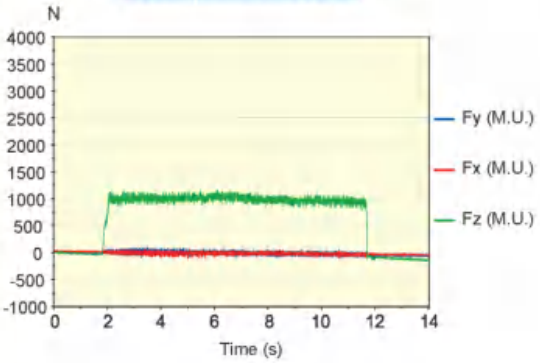
Product of company A(falling)



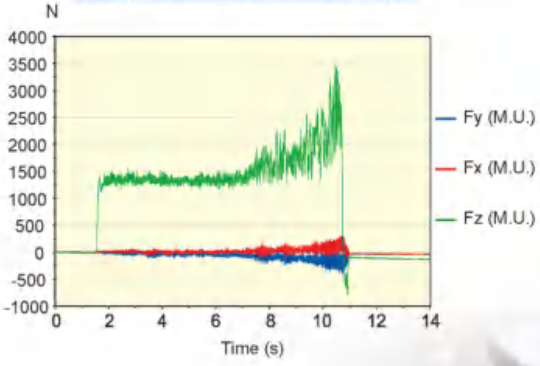
Good cutting performance

Tool type: 1588SL12C-0850/KDG303
Feed rate: 0.2mm/r Drilling depth: 72mm
Workpiece material: 42CrMo(HB250)
Cooling system: Emulsified liquid
Cutting speed: 80m/min
Machine equipment: Vertical machining center

Cutting force of 1588SL



Cutting force of Product of company A

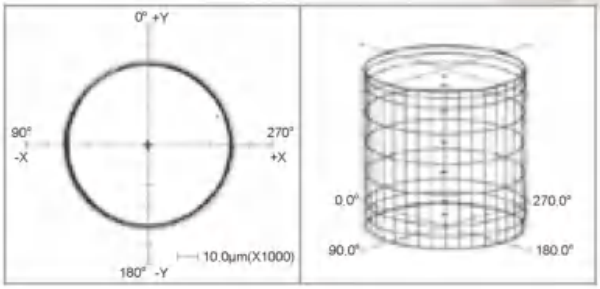


Stable machining precision

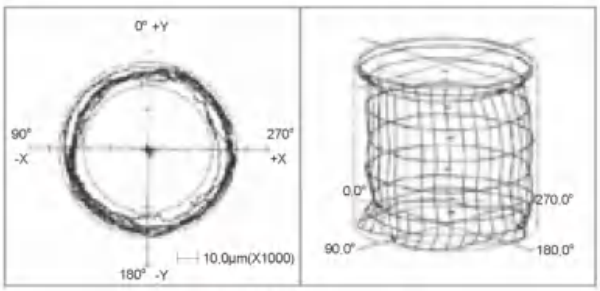


Workpiece: Die
Machined materials: 738H
Machined area: Hole of sidewall
Drilling depth: 70mm
Tool type: 1588SL12C-0600/KDG303
Recommended parameters: Vc=85m/min, f_r=0.2mm/r
Cooling system: Water-soluble liquid

Comparison of Machined Hole's Accuracy



1588SL



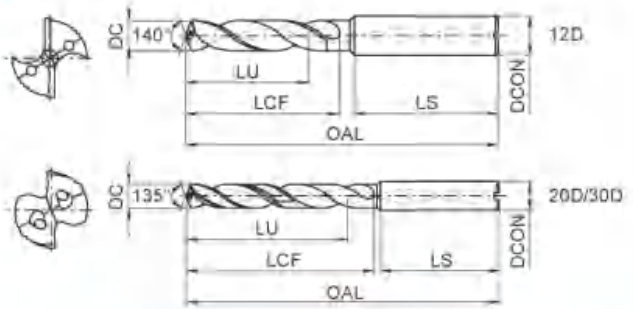
Product of company A

SL series Deep-hole machining



Internal coolant

Straight shank



● Suitable for deep-hole drilling of steel、cast iron etc.

Drill diameter DC 12D(m²) 20D/30D(h²)	Drilling depth (ULDR)	Type	Basic dimension(mm) Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS
3.0	12	1588SL12C-0300	6	90	50	40	36
	20	1588SL20C-0300	6	110	70	62	36
	30	1588SL30C-0300	6	140	100	92	36
3.1	12	1588SL12C-0310	6	90	50	40	36
	20	1588SL20C-0310	6	123	83	72	36
	30	1588SL30C-0310	6	160	120	108	36
3.2	12	1588SL12C-0320	6	90	50	40	36
	20	1588SL20C-0320	6	123	83	72	36
	30	1588SL30C-0320	6	160	120	108	36
3.3	12	1588SL12C-0330	6	90	50	40	36
	20	1588SL20C-0330	6	123	83	72	36
	30	1588SL30C-0330	6	160	120	108	36
3.4	12	1588SL12C-0340	6	90	50	40	36
	20	1588SL20C-0340	6	123	83	72	36
	30	1588SL30C-0340	6	160	120	108	36
3.5	12	1588SL12C-0350	6	90	50	40	36
	20	1588SL20C-0350	6	123	83	72	36
	30	1588SL30C-0350	6	160	120	108	36
3.6	12	1588SL12C-0360	6	90	50	40	36
	20	1588SL20C-0360	6	136	96	84	36
	30	1588SL30C-0360	6	176	136	124	36
3.7	12	1588SL12C-0370	6	90	50	46	36
	20	1588SL20C-0370	6	136	96	84	36
	30	1588SL30C-0370	6	176	136	124	36
3.8	12	1588SL12C-0380	6	90	50	46	36
	20	1588SL20C-0380	6	136	96	84	36
	30	1588SL30C-0380	6	176	136	124	36
3.9	12	1588SL12C-0390	6	90	50	46	36
	20	1588SL20C-0390	6	136	96	84	36
	30	1588SL30C-0390	6	176	136	124	36
4.0	12	1588SL12C-0400	6	102	64	56	36
	20	1588SL20C-0400	6	136	96	84	36
	30	1588SL30C-0400	6	176	136	124	36
4.1	12	1588SL12C-0410	6	102	64	56	36
	20	1588SL20C-0410	6	148	108	96	36
	30	1588SL30C-0410	6	192	152	140	36
4.2	12	1588SL12C-0420	6	102	64	56	36
	20	1588SL20C-0420	6	148	108	96	36
	30	1588SL30C-0420	6	192	152	140	36
4.3	12	1588SL12C-0430	6	102	64	56	36
	20	1588SL20C-0430	6	148	108	96	36
	30	1588SL30C-0430	6	192	152	140	36
4.4	12	1588SL12C-0440	6	102	64	56	36
	20	1588SL20C-0440	6	148	108	96	36
	30	1588SL30C-0440	6	192	152	140	36
4.5	12	1588SL12C-0450	6	102	64	56	36
	20	1588SL20C-0450	6	148	108	96	36
	30	1588SL30C-0450	6	192	152	140	36
4.6	12	1588SL12C-0460	6	102	64	56	36
	20	1588SL20C-0460	6	158	118	106	36
	30	1588SL30C-0460	6	208	168	156	36
4.7	12	1588SL12C-0470	6	102	64	56	36
	20	1588SL20C-0470	6	158	118	106	36
	30	1588SL30C-0470	6	208	168	156	36
4.8	12	1588SL12C-0480	6	102	64	56	36
	20	1588SL20C-0480	6	158	118	106	36
	30	1588SL30C-0480	6	208	168	156	36
4.9	12	1588SL12C-0490	6	102	64	56	36
	20	1588SL20C-0490	6	158	118	106	36
	30	1588SL30C-0490	6	208	168	156	36
5.0	12	1588SL12C-0500	6	116	78	72	36
	20	1588SL20C-0500	6	158	118	106	36
	30	1588SL30C-0500	6	208	168	156	36
5.1	12	1588SL12C-0510	6	116	78	72	36
	20	1588SL20C-0510	6	168	128	116	36
	30	1588SL30C-0510	6	228	188	170	36
5.2	12	1588SL12C-0520	6	116	78	72	36
	20	1588SL20C-0520	6	168	128	116	36
	30	1588SL30C-0520	6	228	188	170	36
5.3	12	1588SL12C-0530	6	116	78	72	36
	20	1588SL20C-0530	6	168	128	116	36
	30	1588SL30C-0530	6	228	188	170	36

Drill diameter DC 12D(m/) 20D/30D(hr)	Drilling depth (ULDR)	Type	Basic dimension(mm) Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS
5.4	12	1588SL12C-0540	6	116	78	72	36
	20	1588SL20C-0540	6	168	128	116	36
	30	1588SL30C-0540	6	228	188	170	36
5.5	12	1588SL12C-0550	6	116	78	72	36
	20	1588SL20C-0550	6	168	128	116	36
	30	1588SL30C-0550	6	228	188	170	36
5.6	12	1588SL12C-0560	6	116	78	72	36
	20	1588SL20C-0560	6	180	140	126	36
	30	1588SL30C-0560	6	240	200	182	36
5.7	12	1588SL12C-0570	6	116	78	72	36
	20	1588SL20C-0570	6	180	140	126	36
	30	1588SL30C-0570	6	240	200	182	36
5.8	12	1588SL12C-0580	6	116	78	72	36
	20	1588SL20C-0580	6	180	140	126	36
	30	1588SL30C-0580	6	240	200	182	36
5.9	12	1588SL12C-0590	6	116	78	72	36
	20	1588SL20C-0590	6	180	140	126	36
	30	1588SL30C-0590	6	240	200	182	36
6.0	12	1588SL12C-0600	6	116	78	72	36
	20	1588SL20C-0600	6	180	140	126	36
	30	1588SL30C-0600	6	240	200	182	36
6.1	12	1588SL12C-0610	8	131	93	84	36
	20	1588SL20C-0610	8	192	150	132	36
	30	1588SL30C-0610	8	260	220	202	36
6.2	12	1588SL12C-0620	8	131	93	84	36
	20	1588SL20C-0620	8	192	150	132	36
	30	1588SL30C-0620	8	260	220	202	36
6.3	12	1588SL12C-0630	8	131	93	84	36
	20	1588SL20C-0630	8	192	150	132	36
	30	1588SL30C-0630	8	260	220	202	36
6.4	12	1588SL12C-0640	8	131	93	84	36
	20	1588SL20C-0640	8	192	150	132	36
	30	1588SL30C-0640	8	260	220	202	36
6.5	12	1588SL12C-0650	8	131	93	84	36
	20	1588SL20C-0650	8	192	150	132	36
	30	1588SL30C-0650	8	260	220	202	36

Drill diameter DC 12D(m/) 20D/30D(hr)	Drilling depth (ULDR)	Type	Basic dimension(mm) Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS
6.6	12	1588SL12C-0660	8	131	93	84	36
	20	1588SL20C-0660	8	202	162	144	36
	30	1588SL30C-0660	8	272	232	214	36
6.7	12	1588SL12C-0670	8	131	93	84	36
	20	1588SL20C-0670	8	202	162	144	36
	30	1588SL30C-0670	8	272	232	214	36
6.8	12	1588SL12C-0680	8	131	93	84	36
	20	1588SL20C-0680	8	202	162	144	36
	30	1588SL30C-0680	8	272	232	214	36
6.9	12	1588SL12C-0690	8	131	93	84	36
	20	1588SL20C-0690	8	202	162	144	36
	30	1588SL30C-0690	8	272	232	214	36
7.0	12	1588SL12C-0700	8	131	93	84	36
	20	1588SL20C-0700	8	202	162	144	36
	30	1588SL30C-0700	8	272	232	214	36
7.1	12	1588SL12C-0710	8	146	108	96	36
	20	1588SL20C-0710	8	213	173	155	36
	30	1588SL30C-0710	8	290	250	232	36
7.2	12	1588SL12C-0720	8	146	108	96	36
	20	1588SL20C-0720	8	213	173	155	36
	30	1588SL30C-0720	8	290	250	232	36
7.3	12	1588SL12C-0730	8	146	108	96	36
	20	1588SL20C-0730	8	213	173	155	36
	30	1588SL30C-0730	8	290	250	232	36
7.4	12	1588SL12C-0740	8	146	108	96	36
	20	1588SL20C-0740	8	213	173	155	36
	30	1588SL30C-0740	8	290	250	232	36
7.5	12	1588SL12C-0750	8	146	108	96	36
	20	1588SL20C-0750	8	213	173	155	36
	30	1588SL30C-0750	8	290	250	232	36
7.6	12	1588SL12C-0760	8	146	108	96	36
	20	1588SL20C-0760	8	223	183	165	36
	30	1588SL30C-0760	8	305	265	246	36
7.7	12	1588SL12C-0770	8	146	108	96	36
	20	1588SL20C-0770	8	223	183	165	36
	30	1588SL30C-0770	8	305	265	246	36

Applicable material table

●Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel ~40HRC	~50HRC	~60HRC	Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
KDG303	○	●	●			○	●	●	○		○

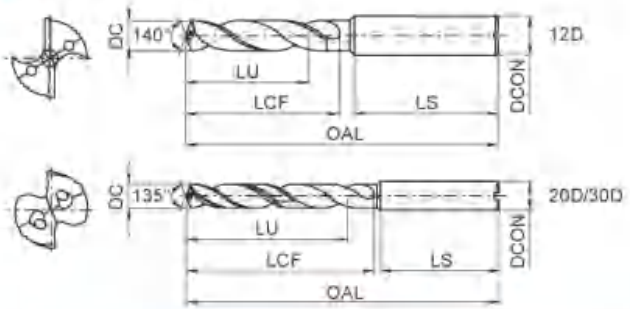
Code key C6 Cutting parameters C159 Technical information C165-C171 Non-standard customization tools C172-C176

SL series Deep-hole machining



Internal coolant

Straight shank



● Suitable for deep-hole drilling of steel、cast iron etc.

Drill diameter DC 12D(m²) 20D/30D(h²)	Drilling depth (ULDR)	Type	Basic dimension(mm)				
			Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length
			DCON	OAL	LCF	LU	LS
7.8	12	1588SL12C-0780	8	146	108	96	36
	20	1588SL20C-0780	8	223	183	165	36
	30	1588SL30C-0780	8	305	265	246	36
7.9	12	1588SL12C-0790	8	146	108	96	36
	20	1588SL20C-0790	8	223	183	165	36
	30	1588SL30C-0790	8	305	265	246	36
8.0	12	1588SL12C-0800	8	146	108	96	36
	20	1588SL20C-0800	8	223	183	165	36
	30	1588SL30C-0800	8	305	265	246	36
8.1	12	1588SL12C-0810	10	162	120	108	40
	20	1588SL20C-0810	10	239	195	176	40
	30	1588SL30C-0810	10	330	285	265	40
8.2	12	1588SL12C-0820	10	162	120	108	40
	20	1588SL20C-0820	10	239	195	176	40
	30	1588SL30C-0820	10	330	285	265	40
8.3	12	1588SL12C-0830	10	162	120	108	40
	20	1588SL20C-0830	10	239	195	176	40
	30	1588SL30C-0830	10	330	285	265	40
8.4	12	1588SL12C-0840	10	162	120	108	40
	20	1588SL20C-0840	10	239	195	176	40
	30	1588SL30C-0840	10	330	285	265	40
8.5	12	1588SL12C-0850	10	162	120	108	40
	20	1588SL20C-0850	10	239	195	176	40
	30	1588SL30C-0850	10	330	285	265	40
8.6	12	1588SL12C-0860	10	162	120	108	40
	20	1588SL20C-0860	10	249	205	186	40
	30	1588SL30C-0860	10	340	295	275	40
8.7	12	1588SL12C-0870	10	162	120	108	40
	20	1588SL20C-0870	10	249	205	186	40
	30	1588SL30C-0870	10	340	295	275	40
8.8	12	1588SL12C-0880	10	162	120	108	40
	20	1588SL20C-0880	10	249	205	186	40
	30	1588SL30C-0880	10	340	295	275	40
8.9	12	1588SL12C-0890	10	162	120	108	40
	20	1588SL20C-0890	10	249	205	186	40
	30	1588SL30C-0890	10	340	295	275	40

Drill diameter DC 12D(m²) 20D/30D(h²)	Drilling depth (ULDR)	Type	Basic dimension(mm)				
			Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length
			DCON	OAL	LCF	LU	LS
9.0	12	1588SL12C-0900	10	162	120	108	40
	20	1588SL20C-0900	10	249	205	186	40
	30	1588SL30C-0900	10	340	295	275	40
9.1	12	1588SL12C-0910	10	174	132	120	40
	20	1588SL20C-0910	10	262	218	196	40
	30	1588SL30C-0910	10	360	315	292	40
9.2	12	1588SL12C-0920	10	174	132	120	40
	20	1588SL20C-0920	10	262	218	196	40
	30	1588SL30C-0920	10	360	315	292	40
9.3	12	1588SL12C-0930	10	174	132	120	40
	20	1588SL20C-0930	10	262	218	196	40
	30	1588SL30C-0930	10	360	315	292	40
9.4	12	1588SL12C-0940	10	174	132	120	40
	20	1588SL20C-0940	10	262	218	196	40
	30	1588SL30C-0940	10	360	315	292	40
9.5	12	1588SL12C-0950	10	174	132	120	40
	20	1588SL20C-0950	10	262	218	196	40
	30	1588SL30C-0950	10	360	315	292	40
9.6	12	1588SL12C-0960	10	174	132	120	40
	20	1588SL20C-0960	10	272	228	206	40
	30	1588SL30C-0960	10	372	328	305	40
9.7	12	1588SL12C-0970	10	174	132	120	40
	20	1588SL20C-0970	10	272	228	206	40
	30	1588SL30C-0970	10	372	328	305	40
9.8	12	1588SL12C-0980	10	174	132	120	40
	20	1588SL20C-0980	10	272	228	206	40
	30	1588SL30C-0980	10	372	328	305	40
9.9	12	1588SL12C-0990	10	174	132	120	40
	20	1588SL20C-0990	10	272	228	206	40
	30	1588SL30C-0990	10	372	328	305	40
10.0	12	1588SL12C-1000	10	174	132	120	40
	20	1588SL20C-1000	10	272	228	206	40
	30	1588SL30C-1000	10	372	328	305	40
10.1	12	1588SL12C-1010	12	204	156	144	45
	20	1588SL20C-1010	12	292	242	220	45

Drill diameter DC 12D(m/) 20D/30D(h/)	Drilling depth (ULDR)	Type	Basic dimension(mm)				
			Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length
			DCON	OAL	LCF	LU	LS
10.2	12	1588SL12C-1020	12	204	156	144	45
	20	1588SL20C-1020	12	292	242	220	45
10.3	12	1588SL12C-1030	12	204	156	144	45
	20	1588SL20C-1030	12	292	242	220	45
10.4	12	1588SL12C-1040	12	204	156	144	45
	20	1588SL20C-1040	12	292	242	220	45
10.5	12	1588SL12C-1050	12	204	156	144	45
	20	1588SL20C-1050	12	292	242	220	45
10.6	12	1588SL12C-1060	12	204	156	144	45
	20	1588SL20C-1060	12	300	250	228	45
10.7	12	1588SL12C-1070	12	204	156	144	45
	20	1588SL20C-1070	12	300	250	228	45
10.8	12	1588SL12C-1080	12	204	156	144	45
	20	1588SL20C-1080	12	300	250	228	45
10.9	12	1588SL12C-1090	12	204	156	144	45
	20	1588SL20C-1090	12	300	250	228	45
11.0	12	1588SL12C-1100	12	204	156	144	45
	20	1588SL20C-1100	12	300	250	228	45
11.1	12	1588SL12C-1110	12	204	156	144	45
	20	1588SL20C-1110	12	315	265	240	45
11.2	12	1588SL12C-1120	12	204	156	144	45
	20	1588SL20C-1120	12	315	265	240	45
11.3	12	1588SL12C-1130	12	204	156	144	45
	20	1588SL20C-1130	12	315	265	240	45
11.4	12	1588SL12C-1140	12	204	156	144	45
	20	1588SL20C-1140	12	315	265	240	45
11.5	12	1588SL12C-1150	12	204	156	144	45
	20	1588SL20C-1150	12	315	265	240	45
11.6	12	1588SL12C-1160	12	204	156	144	45
	20	1588SL20C-1160	12	325	275	250	45

Drill diameter DC 12D(m/) 20D/30D(h/)	Drilling depth (ULDR)	Type	Basic dimension(mm)				
			Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length
			DCON	OAL	LCF	LU	LS
11.7	12	1588SL12C-1170	12	204	156	144	45
	20	1588SL20C-1170	12	325	275	250	45
11.8	12	1588SL12C-1180	12	204	156	144	45
	20	1588SL20C-1180	12	325	275	250	45
11.9	12	1588SL12C-1190	12	204	156	144	45
	20	1588SL20C-1190	12	325	275	250	45
12.0	12	1588SL12C-1200	12	204	156	144	45
	20	1588SL20C-1200	12	325	275	250	45
12.5	12	1588SL12C-1250	14	230	182	168	45
	20	1588SL20C-1250	14	323	275	250	45
12.7	12	1588SL12C-1270	14	230	182	168	45
12.8	12	1588SL12C-1280	14	230	182	168	45
13.0	12	1588SL12C-1300	14	230	182	168	45
	20	1588SL20C-1300	14	338	290	265	45
13.5	12	1588SL12C-1350	14	230	182	168	45
	20	1588SL20C-1350	14	338	290	265	45
14.0	12	1588SL12C-1400	14	230	182	168	45
	20	1588SL20C-1400	14	367	318	290	45
14.5	12	1588SL12C-1450	16	260	208	194	48
15.0	12	1588SL12C-1500	16	260	208	194	48
15.5	12	1588SL12C-1550	16	260	208	194	48
16.0	12	1588SL12C-1600	16	260	208	194	48
16.5	12	1588SL12C-1650	16	286	234	218	48
17.0	12	1588SL12C-1700	16	286	234	218	48
17.5	12	1588SL12C-1750	16	286	234	218	48
18.0	12	1588SL12C-1800	18	286	234	218	48
18.5	12	1588SL12C-1850	20	310	258	240	48
19.0	12	1588SL12C-1900	20	310	258	240	48
19.5	12	1588SL12C-1950	20	310	258	240	48
20.0	12	1588SL12C-2000	20	310	258	240	48

Applicable material table

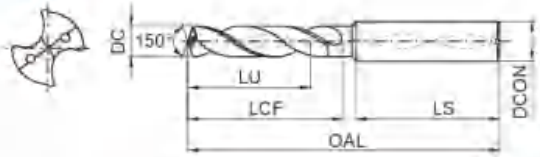
◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	○	◎	◎			○	◎	◎	○		○

Code key C6 Cutting parameters C159 Technical information C165-C171 Non-standard customization tools C172-C176

1534SP series Guide-hole machining





Drill diameter DC(h7)	Drilling depth (ULDR)	Type	Basic dimension(mm)				
			Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length
			DCON	OAL	LCF	LU	LS
3.03	3	1534SP03C-0303	6	62	20	14	36
3.13	3	1534SP03C-0313	6	62	20	14	36
3.23	3	1534SP03C-0323	6	62	20	14	36
3.33	3	1534SP03C-0333	6	62	20	14	36
3.43	3	1534SP03C-0343	6	62	20	14	36
3.53	3	1534SP03C-0353	6	62	20	14	36
3.63	3	1534SP03C-0363	6	62	20	14	36
3.73	3	1534SP03C-0373	6	62	20	14	36
3.83	3	1534SP03C-0383	6	66	24	17	36
3.93	3	1534SP03C-0393	6	66	24	17	36
4.03	3	1534SP03C-0403	6	66	24	17	36
4.13	3	1534SP03C-0413	6	66	24	17	36
4.23	3	1534SP03C-0423	6	66	24	17	36
4.33	3	1534SP03C-0433	6	66	24	17	36
4.43	3	1534SP03C-0443	6	66	24	17	36
4.53	3	1534SP03C-0453	6	66	24	17	36
4.63	3	1534SP03C-0463	6	66	24	17	36
4.73	3	1534SP03C-0473	6	66	24	17	36
4.83	3	1534SP03C-0483	6	66	28	20	36
4.93	3	1534SP03C-0493	6	66	28	20	36
5.03	3	1534SP03C-0503	6	66	28	20	36
5.13	3	1534SP03C-0513	6	66	28	20	36
5.23	3	1534SP03C-0523	6	66	28	20	36
5.33	3	1534SP03C-0533	6	66	28	20	36
5.43	3	1534SP03C-0543	6	66	28	20	36
5.53	3	1534SP03C-0553	6	66	28	20	36
5.63	3	1534SP03C-0563	6	66	28	20	36
5.73	3	1534SP03C-0573	6	66	28	20	36
5.83	3	1534SP03C-0583	6	66	28	20	36
5.93	3	1534SP03C-0593	6	66	28	20	36
6.03	3	1534SP03C-0603	6	66	28	20	36
6.13	3	1534SP03C-0613	8	79	34	24	36
6.23	3	1534SP03C-0623	8	79	34	24	36
6.33	3	1534SP03C-0633	8	79	34	24	36
6.43	3	1534SP03C-0643	8	79	34	24	36
6.53	3	1534SP03C-0653	8	79	34	24	36

Drill diameter DC(h7)	Drilling depth (ULDR)	Type	Basic dimension(mm)				
			Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length
			DCON	OAL	LCF	LU	LS
6.63	3	1534SP03C-0663	8	79	34	24	36
6.73	3	1534SP03C-0673	8	79	34	24	36
6.83	3	1534SP03C-0683	8	79	34	24	36
6.93	3	1534SP03C-0693	8	79	34	24	36
7.03	3	1534SP03C-0703	8	79	34	24	36
7.13	3	1534SP03C-0713	8	79	41	29	36
7.23	3	1534SP03C-0723	8	79	41	29	36
7.33	3	1534SP03C-0733	8	79	41	29	36
7.43	3	1534SP03C-0743	8	79	41	29	36
7.53	3	1534SP03C-0753	8	79	41	29	36
7.63	3	1534SP03C-0763	8	79	41	29	36
7.73	3	1534SP03C-0773	8	79	41	29	36
7.83	3	1534SP03C-0783	8	79	41	29	36
7.93	3	1534SP03C-0793	8	79	41	29	36
8.03	3	1534SP03C-0803	8	79	41	29	36
8.13	3	1534SP03C-0813	10	89	47	35	40
8.23	3	1534SP03C-0823	10	89	47	35	40
8.33	3	1534SP03C-0833	10	89	47	35	40
8.43	3	1534SP03C-0843	10	89	47	35	40
8.53	3	1534SP03C-0853	10	89	47	35	40
8.63	3	1534SP03C-0863	10	89	47	35	40
8.73	3	1534SP03C-0873	10	89	47	35	40
8.83	3	1534SP03C-0883	10	89	47	35	40
8.93	3	1534SP03C-0893	10	89	47	35	40
9.03	3	1534SP03C-0903	10	89	47	35	40
9.13	3	1534SP03C-0913	10	89	47	35	40
9.23	3	1534SP03C-0923	10	89	47	35	40
9.33	3	1534SP03C-0933	10	89	47	35	40
9.43	3	1534SP03C-0943	10	89	47	35	40
9.53	3	1534SP03C-0953	10	89	47	35	40
9.63	3	1534SP03C-0963	10	89	47	35	40
9.73	3	1534SP03C-0973	10	89	47	35	40
9.83	3	1534SP03C-0983	10	89	47	35	40
9.93	3	1534SP03C-0993	10	89	47	35	40
10.03	3	1534SP03C-1003	10	89	47	35	40
10.13	3	1534SP03C-1013	12	102	55	40	45

Drill diameter DC(h7)	Drilling depth (ULDR)	Type	Basic dimension(mm) Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS
10.23	3	1534SP03C-1023	12	102	55	40	45
10.33	3	1534SP03C-1033	12	102	55	40	45
10.43	3	1534SP03C-1043	12	102	55	40	45
10.53	3	1534SP03C-1053	12	102	55	40	45
10.63	3	1534SP03C-1063	12	102	55	40	45
10.73	3	1534SP03C-1073	12	102	55	40	45
10.83	3	1534SP03C-1083	12	102	55	40	45
10.93	3	1534SP03C-1093	12	102	55	40	45
11.03	3	1534SP03C-1103	12	102	55	40	45
11.13	3	1534SP03C-1113	12	102	55	40	45
11.23	3	1534SP03C-1123	12	102	55	40	45
11.33	3	1534SP03C-1133	12	102	55	40	45
11.43	3	1534SP03C-1143	12	102	55	40	45

Drill diameter DC(h7)	Drilling depth (ULDR)	Type	Basic dimension(mm) Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	Shank length LS
11.53	3	1534SP03C-1153	12	102	55	40	45
11.63	3	1534SP03C-1163	12	102	55	40	45
11.73	3	1534SP03C-1173	12	102	55	40	45
11.83	3	1534SP03C-1183	12	102	55	40	45
11.93	3	1534SP03C-1193	12	102	55	40	45
12.03	3	1534SP03C-1203	12	102	55	40	45
12.53	3	1534SP03C-1253	14	107	60	43	45
12.73	3	1534SP03C-1273	14	107	60	43	45
12.83	3	1534SP03C-1283	14	107	60	43	45
13.03	3	1534SP03C-1303	14	107	60	43	45
13.53	3	1534SP03C-1353	14	107	60	43	45
14.03	3	1534SP03C-1403	14	107	60	43	45

Recommended Machining Method of SL series Deep-hole Drills

1.Hole-guided Machining



- Apex angle of drills used for hole-guided machining has to be greater than the apex angle of deep-hole drills.
- Diameter of drills used for hole-guided machining has to be respectively greater than the diameter of deep-hole drills. Generally the diameter gap is between 0 and positive 0.1.
- Generally the depth of pre-drilling hole is 1-3D (D is the diameter of pre-drilling holes). Also, it basically needs to ensure the accuracy of pre-drilling holes at the same time.

2 Deep-hole Machining (Inserting into the Pre-drilling Holes)



- lower speed should be applied in the process of inserting deep-hole drills into the pre-drilling holes.
- Insert deep hole drill to the location 1-3mm away from the bottom of pre-drilling holes (Please make sure that the parts of drilling point are entirely inserted).

3.Deep-hole Machining (Beginning machining, to the end)



- Non-stopped machining with fixed speed and feed rates. (Completed at one time, not a "Step-by-Step" machining).

4.Deep-hole Machining (Retract from hole)



- Reduce speed located 1-2mm away from hole bottom at the end of machining.
- Quickly secedes the deep-hole drills back to the location where it begins to machine.
- Retract under the same conditions of inserting pre-drilling holes.

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material: Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel ~40HRC	~50HRC	~60HRC	Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
KDG303	○	◎	◎			○	◎	◎	○		○

Code key C6 Cutting parameters C160 Technical information C165-C171 Non-standard customization tools C172-C176

ST machining of mild steel and stainless steel series twist drill

ST series drills with superior performance will solve the difficulties in machining of high-elongation materials such as mild steel, stainless steel, etc.

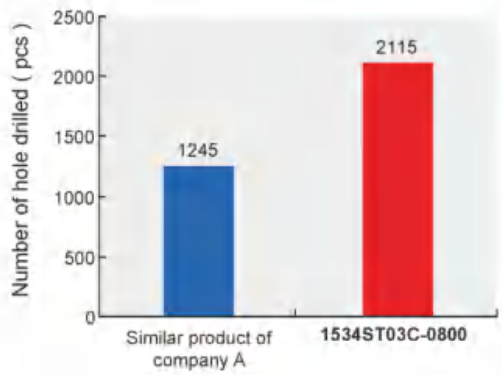
Optimized drill point design with strengthened chisel edge and ensures easy and fast cutting and excellent chip breaking.

Nano-structured TiAlN coating, outstanding wear resistance and heat resistance.

Special flute profile with large chip pocket ensures good chip evacuation and smooth drilling.

Application of ST series twist drills

Tool type: 1534ST03C-0800
Workpiece material: 1Cr18Ni9Ti
Cooling system: Oil water emulsion(internal cooling)
Cutting speed: Vc=85m/min
Feed rate: fr=0.16mm/r
Drilling depth: 24mm(blind hole)

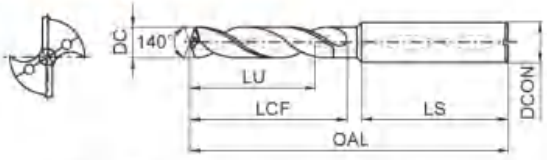




ST series For machining of mild steel, stainless steel

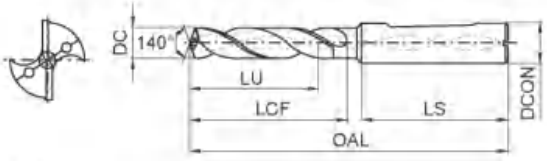


Internal coolant Straight shank





Internal coolant Whistle notch shank



- First choice for drilling mild steel and stainless steel.
- Sharp cutting edge can avoid build-up edge, suitable for drilling hole with high performance.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
3.0	3	Internal coolant	Straight shank	1534ST03C-0300	6	62	20	14	36	☆
	5			1536ST05C-0300	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0300	6	66	28	23	36	☆
3.1	3		Straight shank	1534ST03C-0310	6	62	20	14	36	☆
	5			1536ST05C-0310	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0310	6	66	28	23	36	☆
3.2	3		Straight shank	1534ST03C-0320	6	62	20	14	36	☆
	5			1536ST05C-0320	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0320	6	66	28	23	36	☆
3.25	3		Straight shank	1534ST03C-0325	6	62	20	14	36	☆
	5			1536ST05C-0325	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0325	6	66	28	23	36	☆
3.3	3		Straight shank	1534ST03C-0330	6	62	20	14	36	☆
	5			1536ST05C-0330	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0330	6	66	28	23	36	☆
3.4	3		Straight shank	1534ST03C-0340	6	62	20	14	36	☆
	5			1536ST05C-0340	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0340	6	66	28	23	36	☆
3.5	3		Straight shank	1534ST03C-0350	6	62	20	14	36	☆
	5			1536ST05C-0350	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0350	6	66	28	23	36	☆

☆Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

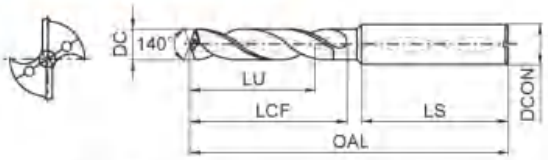
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	◎	○				◎					○

Code key C6 Cutting parameters C160 Technical information C165-C171 Non-standard customization tools C172-C176

ST series For machining of mild steel, stainless steel

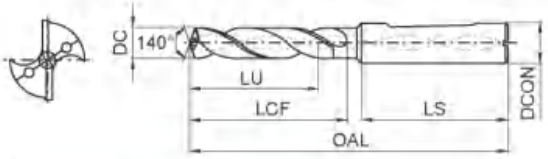


Internal coolant Straight shank





Internal coolant Whistle notch shank



- First choice for drilling mild steel and stainless steel.
- Sharp cutting edge can avoid build-up edge, suitable for drilling hole with high performance.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
3.6	3	Internal coolant	Straight shank	1534ST03C-0360	6	62	20	14	36	☆
	5			1536ST05C-0360	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0360	6	66	28	23	36	☆
3.7	3		Straight shank	1534ST03C-0370	6	62	20	14	36	☆
	5			1536ST05C-0370	6	66	28	23	36	☆
	5		Whistle notch shank	1736ST05C-0370	6	66	28	23	36	☆
3.8	3		Straight shank	1534ST03C-0380	6	66	24	17	36	☆
	5			1536ST05C-0380	6	74	36	29	36	☆
	5		Whistle notch shank	1736ST05C-0380	6	74	36	29	36	☆
3.9	3		Straight shank	1534ST03C-0390	6	66	24	17	36	☆
	5			1536ST05C-0390	6	74	36	29	36	☆
	5		Whistle notch shank	1736ST05C-0390	6	74	36	29	36	☆
4.0	3		Straight shank	1534ST03C-0400	6	66	24	17	36	☆
	5			1536ST05C-0400	6	74	36	29	36	☆
	5		Whistle notch shank	1736ST05C-0400	6	74	36	29	36	☆
4.1	3		Straight shank	1534ST03C-0410	6	66	24	17	36	☆
	5			1536ST05C-0410	6	74	36	29	36	☆
	5		Whistle notch shank	1736ST05C-0410	6	74	36	29	36	☆
4.2	3		Straight shank	1534ST03C-0420	6	66	24	17	36	☆
	5			1536ST05C-0420	6	74	36	29	36	☆
	5		Whistle notch shank	1736ST05C-0420	6	74	36	29	36	☆
4.3	3		Straight shank	1534ST03C-0430	6	66	24	17	36	☆
	5			1536ST05C-0430	6	74	36	29	36	☆
	5		Whistle notch shank	1736ST05C-0430	6	74	36	29	36	☆
4.4	3		Straight shank	1534ST03C-0440	6	66	24	17	36	☆
	5			1536ST05C-0440	6	74	36	29	36	☆
	5		Whistle notch shank	1736ST05C-0440	6	74	36	29	36	☆
4.5	3		Straight shank	1534ST03C-0450	6	66	24	17	36	☆
	5			1536ST05C-0450	6	74	36	29	36	☆
	5		Whistle notch shank	1736ST05C-0450	6	74	36	29	36	☆

☆Recommended grade (produce according to order)

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
4.6	3	Internal coolant	Straight shank	1534ST03C-0460	6	66	24	17	36	☆
	5			1536ST05C-0460	6	74	36	29	36	☆
	5		Whistle notch shank	1736ST05C-0460	6	74	36	29	36	☆
4.65	3		Straight shank	1534ST03C-0465	6	66	24	17	36	☆
	5			1536ST05C-0465	6	74	36	29	36	☆
	5		Whistle notch shank	1736ST05C-0465	6	74	36	29	36	☆
4.7	3		Straight shank	1534ST03C-0470	6	66	24	17	36	☆
	5			1536ST05C-0470	6	74	36	29	36	☆
	5		Whistle notch shank	1736ST05C-0470	6	74	36	29	36	☆
4.8	3		Straight shank	1534ST03C-0480	6	66	28	20	36	☆
	5			1536ST05C-0480	6	82	44	35	36	☆
	5		Whistle notch shank	1736ST05C-0480	6	82	44	35	36	☆
4.9	3		Straight shank	1534ST03C-0490	6	66	28	20	36	☆
	5			1536ST05C-0490	6	82	44	35	36	☆
	5		Whistle notch shank	1736ST05C-0490	6	82	44	35	36	☆
5.0	3		Straight shank	1534ST03C-0500	6	66	28	20	36	☆
	5			1536ST05C-0500	6	82	44	35	36	☆
	5		Whistle notch shank	1736ST05C-0500	6	82	44	35	36	☆
5.1	3		Straight shank	1534ST03C-0510	6	66	28	20	36	☆
	5			1536ST05C-0510	6	82	44	35	36	☆
	5		Whistle notch shank	1736ST05C-0510	6	82	44	35	36	☆
5.2	3		Straight shank	1534ST03C-0520	6	66	28	20	36	☆
	5			1536ST05C-0520	6	82	44	35	36	☆
	5		Whistle notch shank	1736ST05C-0520	6	82	44	35	36	☆
5.3	3		Straight shank	1534ST03C-0530	6	66	28	20	36	☆
	5			1536ST05C-0530	6	82	44	35	36	☆
	5		Whistle notch shank	1736ST05C-0530	6	82	44	35	36	☆
5.4	3		Straight shank	1534ST03C-0540	6	66	28	20	36	☆
	5			1536ST05C-0540	6	82	44	35	36	☆
	5		Whistle notch shank	1736ST05C-0540	6	82	44	35	36	☆
5.5	3		Straight shank	1534ST03C-0550	6	66	28	20	36	☆
	5			1536ST05C-0550	6	82	44	35	36	☆
	5		Whistle notch shank	1736ST05C-0550	6	82	44	35	36	☆

☆Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

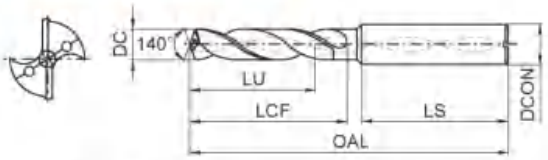
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	◎	○				◎					○

Code key C6 Cutting parameters C160 Technical information C165-C171 Non-standard customization tools C172-C176

ST series For machining of mild steel, stainless steel

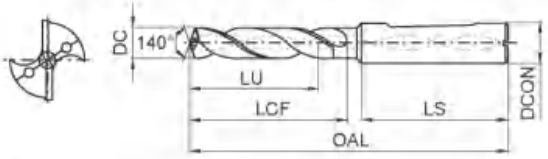


Internal coolant Straight shank





Internal coolant Whistle notch shank



- First choice for drilling mild steel and stainless steel.
- Sharp cutting edge can avoid build-up edge, suitable for drilling hole with high performance.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
5.55	3	Internal coolant	Straight shank	1534ST03C-0555	6	66	28	20	36	☆
	5			1536ST05C-0555	6	82	44	35	36	☆
	5		Whistle notch shank	1736ST05C-0555	6	82	44	35	36	☆
5.6	3		Straight shank	1534ST03C-0560	6	66	28	20	36	☆
	5			1536ST05C-0560	6	82	44	35	36	☆
	5		Whistle notch shank	1736ST05C-0560	6	82	44	35	36	☆
5.7	3		Straight shank	1534ST03C-0570	6	66	28	20	36	☆
	5			1536ST05C-0570	6	82	44	35	36	☆
	5		Whistle notch shank	1736ST05C-0570	6	82	44	35	36	☆
5.8	3		Straight shank	1534ST03C-0580	6	66	28	20	36	☆
	5			1536ST05C-0580	6	82	44	35	36	☆
	5		Whistle notch shank	1736ST05C-0580	6	82	44	35	36	☆
5.9	3		Straight shank	1534ST03C-0590	6	66	28	20	36	☆
	5			1536ST05C-0590	6	82	44	35	36	☆
	5		Whistle notch shank	1736ST05C-0590	6	82	44	35	36	☆
6.0	3		Straight shank	1534ST03C-0600	6	66	28	20	36	☆
	5			1536ST05C-0600	6	82	44	35	36	☆
	5		Whistle notch shank	1736ST05C-0600	6	82	44	35	36	☆
6.1	3		Straight shank	1534ST03C-0610	8	79	34	24	36	☆
	5			1536ST05C-0610	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0610	8	91	53	43	36	☆
6.2	3		Straight shank	1534ST03C-0620	8	79	34	24	36	☆
	5			1536ST05C-0620	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0620	8	91	53	43	36	☆
6.3	3		Straight shank	1534ST03C-0630	8	79	34	24	36	☆
	5			1536ST05C-0630	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0630	8	91	53	43	36	☆
6.4	3		Straight shank	1534ST03C-0640	8	79	34	24	36	☆
	5			1536ST05C-0640	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0640	8	91	53	43	36	☆

☆Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
6.5	3	Internal coolant	Straight shank	1534ST03C-0650	8	79	34	24	36	☆
	5			1536ST05C-0650	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0650	8	91	53	43	36	☆
6.6	3		Straight shank	1534ST03C-0660	8	79	34	24	36	☆
	5			1536ST05C-0660	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0660	8	91	53	43	36	☆
6.7	3		Straight shank	1534ST03C-0670	8	79	34	24	36	☆
	5			1536ST05C-0670	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0670	8	91	53	43	36	☆
6.75	3		Straight shank	1534ST03C-0675	8	79	34	24	36	☆
	5			1536ST05C-0675	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0675	8	91	53	43	36	☆
6.9	3		Straight shank	1534ST03C-0690	8	79	34	24	36	☆
	5			1536ST05C-0690	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0690	8	91	53	43	36	☆
7.0	3		Straight shank	1534ST03C-0700	8	79	34	24	36	☆
	5			1536ST05C-0700	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0700	8	91	53	43	36	☆
7.1	3		Straight shank	1534ST03C-0710	8	79	41	29	36	☆
	5			1536ST05C-0710	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0710	8	91	53	43	36	☆
7.2	3		Straight shank	1534ST03C-0720	8	79	41	29	36	☆
	5			1536ST05C-0720	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0720	8	91	53	43	36	☆
7.3	3		Straight shank	1534ST03C-0730	8	79	41	29	36	☆
	5			1536ST05C-0730	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0730	8	91	53	43	36	☆
7.4	3		Straight shank	1534ST03C-0740	8	79	41	29	36	☆
	5			1536ST05C-0740	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0740	8	91	53	43	36	☆
7.5	3		Straight shank	1534ST03C-0750	8	79	41	29	36	☆
	5			1536ST05C-0750	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0750	8	91	53	43	36	☆

☆Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

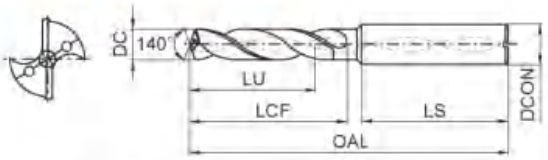
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	◎	○				◎					○

Code key C6 Cutting parameters C160 Technical information C165-C171 Non-standard customization tools C172-C176

ST series For machining of mild steel, stainless steel

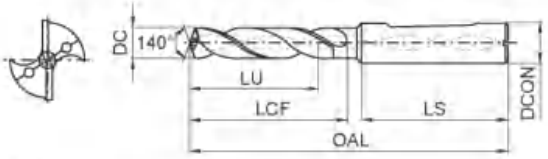


Internal coolant Straight shank





Internal coolant Whistle notch shank



- First choice for drilling mild steel and stainless steel.
- Sharp cutting edge can avoid build-up edge, suitable for drilling hole with high performance.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
7.6	3	Internal coolant	Straight shank	1534ST03C-0760	8	79	41	29	36	☆
	5			1536ST05C-0760	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0760	8	91	53	43	36	☆
7.7	3		Straight shank	1534ST03C-0770	8	79	41	29	36	☆
	5			1536ST05C-0770	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0770	8	91	53	43	36	☆
7.8	3		Straight shank	1534ST03C-0780	8	79	41	29	36	☆
	5			1536ST05C-0780	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0780	8	91	53	43	36	☆
7.9	3		Straight shank	1534ST03C-0790	8	79	41	29	36	☆
	5			1536ST05C-0790	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0790	8	91	53	43	36	☆
8.0	3		Straight shank	1534ST03C-0800	8	79	41	29	36	☆
	5			1536ST05C-0800	8	91	53	43	36	☆
	5		Whistle notch shank	1736ST05C-0800	8	91	53	43	36	☆
8.1	3		Straight shank	1534ST03C-0810	10	89	47	35	40	☆
	5			1536ST05C-0810	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0810	10	103	61	49	40	☆
8.2	3		Straight shank	1534ST03C-0820	10	89	47	35	40	☆
	5			1536ST05C-0820	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0820	10	103	61	49	40	☆
8.3	3		Straight shank	1534ST03C-0830	10	89	47	35	40	☆
	5			1536ST05C-0830	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0830	10	103	61	49	40	☆
8.4	3		Straight shank	1534ST03C-0840	10	89	47	35	40	☆
	5			1536ST05C-0840	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0840	10	103	61	49	40	☆
8.5	3		Straight shank	1534ST03C-0850	10	89	47	35	40	☆
	5			1536ST05C-0850	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0850	10	103	61	49	40	☆

☆Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
8.6	3	Internal coolant	Straight shank	1534ST03C-0860	10	89	47	35	40	☆
	5			1536ST05C-0860	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0860	10	103	61	49	40	☆
8.7	3		Straight shank	1534ST03C-0870	10	89	47	35	40	☆
	5			1536ST05C-0870	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0870	10	103	61	49	40	☆
8.8	3		Straight shank	1534ST03C-0880	10	89	47	35	40	☆
	5			1536ST05C-0880	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0880	10	103	61	49	40	☆
8.9	3		Straight shank	1534ST03C-0890	10	89	47	35	40	☆
	5			1536ST05C-0890	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0890	10	103	61	49	40	☆
9.0	3		Straight shank	1534ST03C-0900	10	89	47	35	40	☆
	5			1536ST05C-0900	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0900	10	103	61	49	40	☆
9.1	3		Straight shank	1534ST03C-0910	10	89	47	35	40	☆
	5			1536ST05C-0910	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0910	10	103	61	49	40	☆
9.3	3		Straight shank	1534ST03C-0930	10	89	47	35	40	☆
	5			1536ST05C-0930	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0930	10	103	61	49	40	☆
9.4	3		Straight shank	1534ST03C-0940	10	89	47	35	40	☆
	5			1536ST05C-0940	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0940	10	103	61	49	40	☆
9.5	3		Straight shank	1534ST03C-0950	10	89	47	35	40	☆
	5			1536ST05C-0950	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0950	10	103	61	49	40	☆
9.6	3		Straight shank	1534ST03C-0960	10	89	47	35	40	☆
	5			1536ST05C-0960	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0960	10	103	61	49	40	☆
9.7	3		Straight shank	1534ST03C-0970	10	89	47	35	40	☆
	5			1536ST05C-0970	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0970	10	103	61	49	40	☆

☆Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

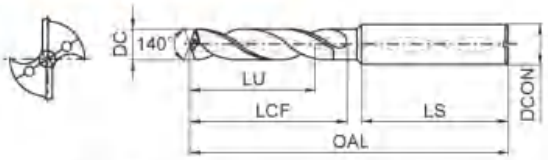
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	◎	○				◎					○

Code key C6 Cutting parameters C160 Technical information C165-C171 Non-standard customization tools C172-C176

ST series For machining of mild steel, stainless steel

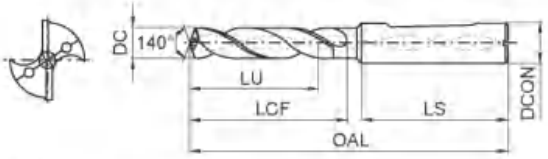


Internal coolant Straight shank





Internal coolant Whistle notch shank



- First choice for drilling mild steel and stainless steel.
- Sharp cutting edge can avoid build-up edge, suitable for drilling hole with high performance.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
9.8	3	Internal coolant	Straight shank	1534ST03C-0980	10	89	47	35	40	☆
	5			1536ST05C-0980	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0980	10	103	61	49	40	☆
9.9	3		Straight shank	1534ST03C-0990	10	89	47	35	40	☆
	5			1536ST05C-0990	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-0990	10	103	61	49	40	☆
10.0	3		Straight shank	1534ST03C-1000	10	89	47	35	40	☆
	5			1536ST05C-1000	10	103	61	49	40	☆
	5		Whistle notch shank	1736ST05C-1000	10	103	61	49	40	☆
10.1	3		Straight shank	1534ST03C-1010	12	102	55	40	45	☆
	5			1536ST05C-1010	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1010	12	118	71	56	45	☆
10.25	3		Straight shank	1534ST03C-1025	12	102	55	40	45	☆
	5			1536ST05C-1025	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1025	12	118	71	56	45	☆
10.3	3		Straight shank	1534ST03C-1030	12	102	55	40	45	☆
	5			1536ST05C-1030	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1030	12	118	71	56	45	☆
10.4	3		Straight shank	1534ST03C-1040	12	102	55	40	45	☆
	5			1536ST05C-1040	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1040	12	118	71	56	45	☆
10.5	3		Straight shank	1534ST03C-1050	12	102	55	40	45	☆
	5			1536ST05C-1050	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1050	12	118	71	56	45	☆
10.6	3		Straight shank	1534ST03C-1060	12	102	55	40	45	☆
	5			1536ST05C-1060	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1060	12	118	71	56	45	☆
10.7	3		Straight shank	1534ST03C-1070	12	102	55	40	45	☆
	5			1536ST05C-1070	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1070	12	118	71	56	45	☆

☆Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
10.8	3	Internal coolant	Straight shank	1534ST03C-1080	12	102	55	40	45	☆
	5			1536ST05C-1080	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1080	12	118	71	56	45	☆
10.9	3		Straight shank	1534ST03C-1090	12	102	55	40	45	☆
	5			1536ST05C-1090	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1090	12	118	71	56	45	☆
11.0	3		Straight shank	1534ST03C-1100	12	102	55	40	45	☆
	5			1536ST05C-1100	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1100	12	118	71	56	45	☆
11.1	3		Straight shank	1534ST03C-1110	12	102	55	40	45	☆
	5			1536ST05C-1110	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1110	12	118	71	56	45	☆
11.2	3		Straight shank	1534ST03C-1120	12	102	55	40	45	☆
	5			1536ST05C-1120	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1120	12	118	71	56	45	☆
11.3	3		Straight shank	1534ST03C-1130	12	102	55	40	45	☆
	5			1536ST05C-1130	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1130	12	118	71	56	45	☆
11.4	3		Straight shank	1534ST03C-1140	12	102	55	40	45	☆
	5			1536ST05C-1140	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1140	12	118	71	56	45	☆
11.5	3		Straight shank	1534ST03C-1150	12	102	55	40	45	☆
	5			1536ST05C-1150	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1150	12	118	71	56	45	☆
11.6	3		Straight shank	1534ST03C-1160	12	102	55	40	45	☆
	5			1536ST05C-1160	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1160	12	118	71	56	45	☆
11.7	3		Straight shank	1534ST03C-1170	12	102	55	40	45	☆
	5			1536ST05C-1170	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1170	12	118	71	56	45	☆
11.8	3		Straight shank	1534ST03C-1180	12	102	55	40	45	☆
	5			1536ST05C-1180	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1180	12	118	71	56	45	☆

☆Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

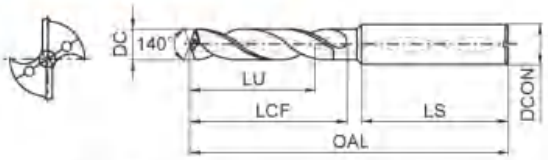
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	◎	○				◎					○

Code key C6 Cutting parameters C160 Technical information C165-C171 Non-standard customization tools C172-C176

ST series For machining of mild steel, stainless steel

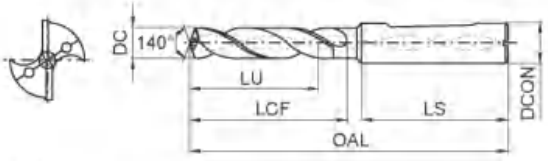


Internal coolant — Straight shank





Internal coolant — Whistle notch shank



- First choice for drilling mild steel and stainless steel.
- Sharp cutting edge can avoid build-up edge, suitable for drilling hole with high performance.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
11.9	3	Internal coolant	Straight shank	1534ST03C-1190	12	102	55	40	45	☆
	5			1536ST05C-1190	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1190	12	118	71	56	45	☆
12.0	3		Straight shank	1534ST03C-1200	12	102	55	40	45	☆
	5			1536ST05C-1200	12	118	71	56	45	☆
	5		Whistle notch shank	1736ST05C-1200	12	118	71	56	45	☆
12.25	3		Straight shank	1534ST03C-1225	14	107	60	43	45	☆
	5			1536ST05C-1225	14	124	77	60	45	☆
	5		Whistle notch shank	1736ST05C-1225	14	124	77	60	45	☆
12.3	3		Straight shank	1534ST03C-1230	14	107	60	43	45	☆
	5			1536ST05C-1230	14	124	77	60	45	☆
	5		Whistle notch shank	1736ST05C-1230	14	124	77	60	45	☆
12.5	3		Straight shank	1534ST03C-1250	14	107	60	43	45	☆
	5			1536ST05C-1250	14	124	77	60	45	☆
	5		Whistle notch shank	1736ST05C-1250	14	124	77	60	45	☆
12.7	3		Straight shank	1534ST03C-1270	14	107	60	43	45	☆
	5			1536ST05C-1270	14	124	77	60	45	☆
	5		Whistle notch shank	1736ST05C-1270	14	124	77	60	45	☆
12.75	3		Straight shank	1534ST03C-1275	14	107	60	43	45	☆
	5			1536ST05C-1275	14	124	77	60	45	☆
	5		Whistle notch shank	1736ST05C-1275	14	124	77	60	45	☆
12.8	3		Straight shank	1534ST03C-1280	14	107	60	43	45	☆
	5			1536ST05C-1280	14	124	77	60	45	☆
	5		Whistle notch shank	1736ST05C-1280	14	124	77	60	45	☆
13.0	3		Straight shank	1534ST03C-1300	14	107	60	43	45	☆
	5			1536ST05C-1300	14	124	77	60	45	☆
	5		Whistle notch shank	1736ST05C-1300	14	124	77	60	45	☆
13.1	3		Straight shank	1534ST03C-1310	14	107	60	43	45	☆
	5			1536ST05C-1310	14	124	77	60	45	☆
	5		Whistle notch shank	1736ST05C-1310	14	124	77	60	45	☆

☆Recommended grade (produce according to order)

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
13.5	3	Internal coolant	Straight shank	1534ST03C-1350	14	107	60	43	45	☆
	5			1536ST05C-1350	14	124	77	60	45	☆
	5		Whistle notch shank	1736ST05C-1350	14	124	77	60	45	☆
13.8	3		Straight shank	1534ST03C-1380	14	107	60	43	45	☆
	5			1536ST05C-1380	14	124	77	60	45	☆
	5		Whistle notch shank	1736ST05C-1380	14	124	77	60	45	☆
14.0	3		Straight shank	1534ST03C-1400	14	107	60	43	45	☆
	5			1536ST05C-1400	14	124	77	60	45	☆
	5		Whistle notch shank	1736ST05C-1400	14	124	77	60	45	☆
14.25	3		Straight shank	1534ST03C-1425	16	115	65	45	48	☆
	5			1536ST05C-1425	16	133	83	63	48	☆
	5		Whistle notch shank	1736ST05C-1425	16	133	83	63	48	☆
14.3	3		Straight shank	1534ST03C-1430	16	115	65	45	48	☆
	5			1536ST05C-1430	16	133	83	63	48	☆
	5		Whistle notch shank	1736ST05C-1430	16	133	83	63	48	☆
14.5	3		Straight shank	1534ST03C-1450	16	115	65	45	48	☆
	5			1536ST05C-1450	16	133	83	63	48	☆
	5		Whistle notch shank	1736ST05C-1450	16	133	83	63	48	☆
14.75	3		Straight shank	1534ST03C-1475	16	115	65	45	48	☆
	5			1536ST05C-1475	16	133	83	63	48	☆
	5		Whistle notch shank	1736ST05C-1475	16	133	83	63	48	☆
14.8	3		Straight shank	1534ST03C-1480	16	115	65	45	48	☆
	5			1536ST05C-1480	16	133	83	63	48	☆
	5		Whistle notch shank	1736ST05C-1480	16	133	83	63	48	☆
15.0	3		Straight shank	1534ST03C-1500	16	115	65	45	48	☆
	5			1536ST05C-1500	16	133	83	63	48	☆
	5		Whistle notch shank	1736ST05C-1500	16	133	83	63	48	☆
15.1	3		Straight shank	1534ST03C-1510	16	115	65	45	48	☆
	5			1536ST05C-1510	16	133	83	63	48	☆
	5		Whistle notch shank	1736ST05C-1510	16	133	83	63	48	☆
15.5	3		Straight shank	1534ST03C-1550	16	115	65	45	48	☆
	5			1536ST05C-1550	16	133	83	63	48	☆
	5		Whistle notch shank	1736ST05C-1550	16	133	83	63	48	☆

☆Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

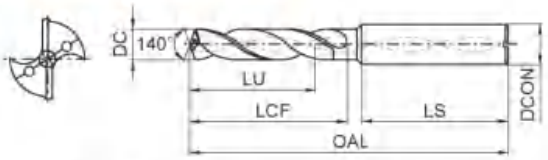
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	◎	○				◎					○

Code key C6 Cutting parameters C160 Technical information C165-C171 Non-standard customization tools C172-C176

ST series For machining of mild steel, stainless steel

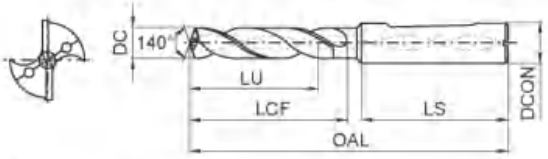


Internal coolant Straight shank





Internal coolant Whistle notch shank



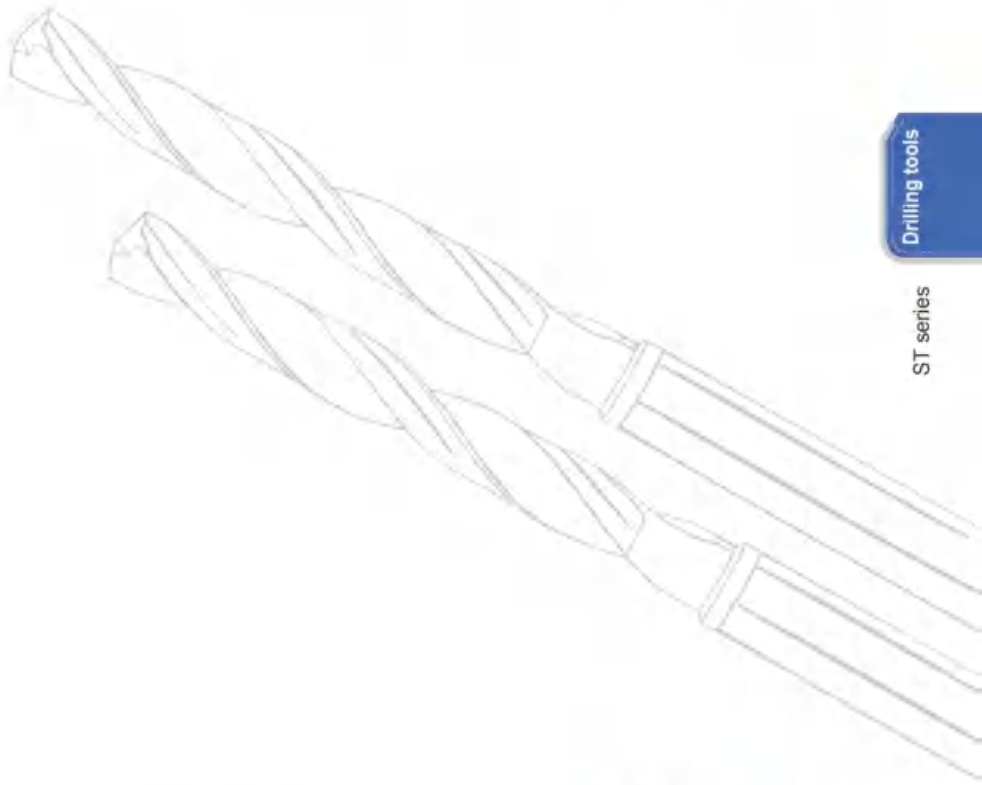
- First choice for drilling mild steel and stainless steel.
- Sharp cutting edge can avoid build-up edge, suitable for drilling hole with high performance.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
15.8	3	Internal coolant	Straight shank	1534ST03C-1580	16	115	65	45	48	☆
	5			1536ST05C-1580	16	133	83	63	48	☆
	5		Whistle notch shank	1736ST05C-1580	16	133	83	63	48	☆
16.0	3		Straight shank	1534ST03C-1600	16	115	65	45	48	☆
	5			1536ST05C-1600	16	133	83	63	48	☆
	5		Whistle notch shank	1736ST05C-1600	16	133	83	63	48	☆
16.5	3		Straight shank	1534ST03C-1650	18	123	73	51	48	☆
	5			1536ST05C-1650	18	143	93	71	48	☆
	5		Whistle notch shank	1736ST05C-1650	18	143	93	71	48	☆
16.75	3		Straight shank	1534ST03C-1675	18	123	73	51	48	☆
	5			1536ST05C-1675	18	143	93	71	48	☆
	5		Whistle notch shank	1736ST05C-1675	18	143	93	71	48	☆
16.8	3		Straight shank	1534ST03C-1680	18	123	73	51	48	☆
	5			1536ST05C-1680	18	143	93	71	48	☆
	5		Whistle notch shank	1736ST05C-1680	18	143	93	71	48	☆
17.0	3		Straight shank	1534ST03C-1700	18	123	73	51	48	☆
	5			1536ST05C-1700	18	143	93	71	48	☆
	5		Whistle notch shank	1736ST05C-1700	18	143	93	71	48	☆
17.5	3		Straight shank	1534ST03C-1750	18	123	73	51	48	☆
	5			1536ST05C-1750	18	143	93	71	48	☆
	5		Whistle notch shank	1736ST05C-1750	18	143	93	71	48	☆
17.8	3		Straight shank	1534ST03C-1780	18	123	73	51	48	☆
	5			1536ST05C-1780	18	143	93	71	48	☆
	5		Whistle notch shank	1736ST05C-1780	18	143	93	71	48	☆
18.0	3		Straight shank	1534ST03C-1800	18	123	73	51	48	☆
	5			1536ST05C-1800	18	143	93	71	48	☆
	5		Whistle notch shank	1736ST05C-1800	18	143	93	71	48	☆
18.5	3		Straight shank	1534ST03C-1850	20	131	79	55	50	☆
	5			1536ST05C-1850	20	153	101	77	50	☆
	5		Whistle notch shank	1736ST05C-1850	20	153	101	77	50	☆

☆Recommended grade (produce according to order)

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
18.8	3	Internal coolant	Straight shank	1534ST03C-1880	20	131	79	55	50	☆
	5			1536ST05C-1880	20	153	101	77	50	☆
	5		Whistle notch shank	1736ST05C-1880	20	153	101	77	50	☆
19.0	3		Straight shank	1534ST03C-1900	20	131	79	55	50	☆
	5			1536ST05C-1900	20	153	101	77	50	☆
	5		Whistle notch shank	1736ST05C-1900	20	153	101	77	50	☆
19.5	3		Straight shank	1534ST03C-1950	20	131	79	55	50	☆
	5			1536ST05C-1950	20	153	101	77	50	☆
	5		Whistle notch shank	1736ST05C-1950	20	153	101	77	50	☆
19.8	3		Straight shank	1534ST03C-1980	20	131	79	55	50	☆
	5			1536ST05C-1980	20	153	101	77	50	☆
	5		Whistle notch shank	1736ST05C-1980	20	153	101	77	50	☆
20.0	3		Straight shank	1534ST03C-2000	20	131	79	55	50	☆
	5			1536ST05C-2000	20	153	101	77	50	☆
	5		Whistle notch shank	1736ST05C-2000	20	153	101	77	50	☆

☆Recommended grade (produce according to order)



Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303	◎	○				◎					○

Code key C6
Cutting parameters C160
Technical information C165-C171
Non-standard customization tools C172-C176

SH series twist drill

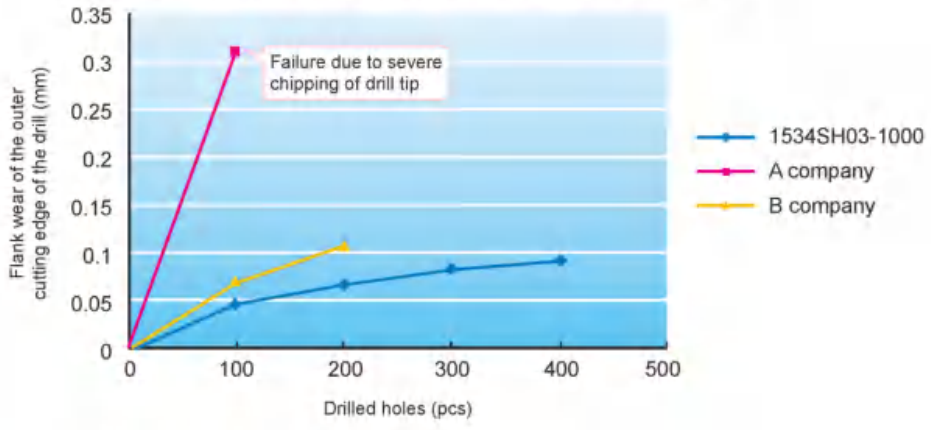
For high hardness steel machining



1. **Small helix angle and large core thickness design dramatically increase tool rigidity.**
2. **Adopting linear cutting edges, achieving superior edge strength.**
3. **The excellent oxidation resistance of substrate and the adoption of high hardness TiAlN coating significantly improve the tool durability.**

Cutting tool: 1534SH03-1000
Workpiece material: S136(HRC53)
Spindle speed: 800r/min
Feed speed: 64mm/min
Cooling method: water-soluble cutting fluid
Tool diameter: Ø10.0mm
Cutting speed: 25m/min
Feedrate: 0.08mm/r
Drilling depth: 20mm(Blind hole)
CNC machine type: MIKRON UCP 1000

Application of SH series drills in the machining of high hardness materials



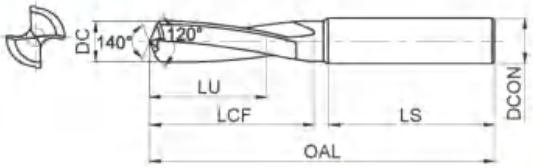
■ **Drill wear condition during the machining:**

Drill	1534SH03-1000	Similar products of A company	Similar products of B company
Drilled holes (pcs)	400	100	200
Wear value	0.08mm	Cutting edge wear value 0.31mm, chipping value 2.59mm	0.108mm
Wear condition			

SH series For high hardness steel machining



External coolant Straight shank



- Suitable for drilling and machining of high hardness steel (HRC 40-60).
- Small helix angle and large core thickness design increase tool rigidity.

Drill diameter DC(mm)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	KDG303
					DCON	OAL	LCF	LU	LS	
3.0	3	External coolant	Straight shank	1534SH03-0300	6	62	20	14	36	☆
3.3	3			1534SH03-0330	6	62	20	14	36	☆
4.0	3			1534SH03-0400	6	66	24	17	36	☆
4.2	3			1534SH03-0420	6	66	24	17	36	☆
5.0	3			1534SH03-0500	6	66	28	20	36	☆
6.0	3			1534SH03-0600	6	66	28	20	36	☆
6.75	3			1534SH03-0675	8	79	34	24	36	☆
7.0	3			1534SH03-0700	8	79	34	24	36	☆
8.0	3			1534SH03-0800	8	79	41	29	36	☆
8.5	3			1534SH03-0850	10	89	47	35	40	☆
9.0	3			1534SH03-0900	10	89	47	35	40	☆
10.0	3			1534SH03-1000	10	89	47	35	40	☆
10.25	3			1534SH03-1025	12	102	55	40	45	☆
10.5	3			1534SH03-1050	12	102	55	40	45	☆
12.0	3			1534SH03-1200	12	102	55	40	45	☆
12.5	3			1534SH03-1250	14	107	60	43	45	☆
14.0	3			1534SH03-1400	14	107	60	43	45	☆
14.5	3			1534SH03-1450	16	115	65	45	48	☆
16.0	3			1534SH03-1600	16	115	65	45	48	☆

☆Recommended grade (produce according to order)

Applicable material table

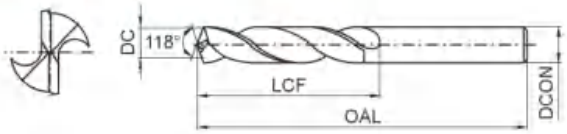
◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK20F				◎	◎						

Code key C6 Cutting parameters C161 Technical information C165-C171 Non-standard customization tools C172-C176

SC series(twist drill) For machining of cast iron, Al alloy


External coolant Straight shank



- For materials with short chips such as cast iron, silicon-aluminum alloy, etc.
- Cutting edge and shank with same diameter.

Drill diameter DC(h8)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)			Recommended grade
					Shank diameter	Overall length	Flute length	YK20F
					DCON	OAL	LCF	
2.0	3	External coolant	Straight shank	1105SC03-0200	2.0	38	12	☆
	5			1101SC05-0200	2.0	49	24	☆
2.5	3			1105SC03-0250	2.5	43	14	☆
	5			1101SC05-0250	2.5	57	30	☆
2.8	3			1105SC03-0280	2.8	46	16	☆
	5			1101SC05-0280	2.8	61	33	☆
3.0	3			1105SC03-0300	3.0	46	16	☆
	5			1101SC05-0300	3.0	61	33	☆
3.1	3			1105SC03-0310	3.1	49	18	☆
3.2	3			1105SC03-0320	3.2	49	18	☆
3.3	3			1105SC03-0330	3.3	49	18	☆
3.4	3			1105SC03-0340	3.4	52	20	☆
3.5	3			1105SC03-0350	3.5	52	20	☆
	5			1101SC05-0350	3.5	70	39	☆
3.6	3			1105SC03-0360	3.6	52	20	☆
3.7	3			1105SC03-0370	3.7	52	20	☆
3.8	3			1105SC03-0380	3.8	55	22	☆
	5			1101SC05-0380	3.8	75	43	☆
3.9	3			1105SC03-0390	3.9	55	22	☆
4.0	3			1105SC03-0400	4.0	55	22	☆
	5			1101SC05-0400	4.0	75	43	☆
4.1	3			1105SC03-0410	4.1	55	22	☆
4.2	3			1105SC03-0420	4.2	55	22	☆
	5			1101SC05-0420	4.2	75	43	☆
4.3	3			1105SC03-0430	4.3	58	24	☆
4.4	3			1105SC03-0440	4.4	58	24	☆
4.5	3			1105SC03-0450	4.5	58	24	☆
	5			1101SC05-0450	4.5	80	47	☆
4.6	3			1105SC03-0460	4.6	58	24	☆
4.7	3			1105SC03-0470	4.7	58	24	☆
4.8	3			1105SC03-0480	4.8	62	26	☆
	5			1101SC05-0480	4.8	86	52	☆

☆Recommended grade (produce according to order)

Drill diameter DC(hs)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)			Recommended grade
					Shank diameter	Overall length	Flute length	YK20F
					DCON	OAL	LCF	
4.9	3	External coolant	Straight shank	1105SC03-0490	4.9	62	26	☆
5.0	3			1105SC03-0500	5.0	62	26	☆
	5			1101SC05-0500	5.0	86	52	☆
5.1	3			1105SC03-0510	5.1	62	26	☆
5.2	3			1105SC03-0520	5.2	62	26	☆
5.3	3			1105SC03-0530	5.3	62	26	☆
5.4	3			1105SC03-0540	5.4	66	28	☆
5.5	3			1105SC03-0550	5.5	66	28	☆
	5			1101SC05-0550	5.5	93	57	☆
5.6	3			1105SC03-0560	5.6	66	28	☆
5.7	3			1105SC03-0570	5.7	66	28	☆
5.8	3			1105SC03-0580	5.8	66	28	☆
	5			1101SC05-0580	5.8	93	57	☆
5.9	3			1105SC03-0590	5.9	66	28	☆
6.0	3			1105SC03-0600	6.0	66	28	☆
	5			1101SC05-0600	6.0	93	57	☆
6.1	3			1105SC03-0610	6.1	70	31	☆
6.2	3			1105SC03-0620	6.2	70	31	☆
6.3	3			1105SC03-0630	6.3	70	31	☆
6.4	3			1105SC03-0640	6.4	70	31	☆
6.5	3			1105SC03-0650	6.5	70	31	☆
	5			1101SC05-0650	6.5	101	63	☆
6.6	3			1105SC03-0660	6.6	70	31	☆
6.7	3			1105SC03-0670	6.7	70	31	☆
6.8	3			1105SC03-0680	6.8	74	34	☆
	5			1101SC05-0680	6.8	109	69	☆
6.9	3			1105SC03-0690	6.9	74	34	☆
7.0	3			1105SC03-0700	7.0	74	34	☆
	5			1101SC05-0700	7.0	109	69	☆
7.1	3			1105SC03-0710	7.1	74	34	☆
7.2	3			1105SC03-0720	7.2	74	34	☆
7.3	3			1105SC03-0730	7.3	74	34	☆
7.4	3			1105SC03-0740	7.4	74	34	☆

☆Recommended grade (produce according to order)

Applicable material table

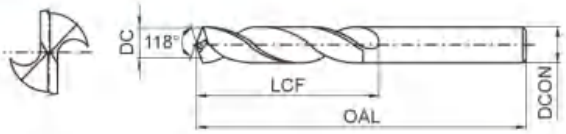
◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK20F							◎	○	◎		

Code key C6
Cutting parameters C161
Technical information C165-C171
Non-standard customization tools C172-C176

SC series(twist drill) For machining of cast iron, Al alloy


External coolant Straight shank



- For materials with short chips such as cast iron, silicon-aluminum alloy, etc.
- Cutting edge and shank with same diameter.

Drill diameter DC(h8)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)			Recommended grade
					Shank diameter	Overall length	Flute length	YK20F
					DCON	OAL	LCF	
7.5	3	External coolant	Straight shank	1105SC03-0750	7.5	74	34	☆
	5			1101SC05-0750	7.5	109	69	☆
7.6	3			1105SC03-0760	7.6	79	37	☆
7.7	3			1105SC03-0770	7.7	79	37	☆
7.8	3			1105SC03-0780	7.8	79	37	☆
	5			1101SC05-0780	7.8	117	75	☆
7.9	3			1105SC03-0790	7.9	79	37	☆
8.0	3			1105SC03-0800	8.0	79	37	☆
	5			1101SC05-0800	8.0	117	75	☆
8.1	3			1105SC03-0810	8.1	79	37	☆
8.2	3			1105SC03-0820	8.2	79	37	☆
8.3	3			1105SC03-0830	8.3	79	37	☆
8.4	3			1105SC03-0840	8.4	79	37	☆
8.5	3			1105SC03-0850	8.5	79	37	☆
	5			1101SC05-0850	8.5	117	75	☆
8.6	3			1105SC03-0860	8.6	84	40	☆
8.7	3			1105SC03-0870	8.7	84	40	☆
8.8	3			1105SC03-0880	8.8	84	40	☆
	5			1101SC05-0880	8.8	125	81	☆
8.9	3			1105SC03-0890	8.9	84	40	☆
9.0	3			1105SC03-0900	9.0	84	40	☆
	5			1101SC05-0900	9.0	125	81	☆
9.1	3			1105SC03-0910	9.1	84	40	☆
9.2	3			1105SC03-0920	9.2	84	40	☆
9.3	3			1105SC03-0930	9.3	84	40	☆
9.4	3			1105SC03-0940	9.4	84	40	☆
9.5	3			1105SC03-0950	9.5	84	40	☆
	5			1101SC05-0950	9.5	125	81	☆
9.6	3			1105SC03-0960	9.6	89	43	☆
9.7	3			1105SC03-0970	9.7	89	43	☆
9.8	3			1105SC03-0980	9.8	89	43	☆
	5			1101SC05-0980	9.8	133	87	☆
9.9	3			1105SC03-0990	9.9	89	43	☆

☆Recommended grade (produce according to order)

Drill diameter DC(hs)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)			Recommended grade
					Shank diameter	Overall length	Flute length	YK20F
					DCON	OAL	LCF	
10.0	3	External coolant	Straight shank	1105SC03-1000	10.0	89	43	☆
	5			1101SC05-1000	10.0	133	87	☆
10.1	3			1105SC03-1010	10.1	89	43	☆
10.2	3			1105SC03-1020	10.2	89	43	☆
10.4	3			1105SC03-1040	10.4	89	43	☆
10.5	3			1105SC03-1050	10.5	89	43	☆
	5			1101SC05-1050	10.5	133	87	☆
10.7	3			1105SC03-1070	10.7	95	47	☆
10.8	3			1105SC03-1080	10.8	95	47	☆
	5			1101SC05-1080	10.8	142	94	☆
11.0	3			1105SC03-1100	11.0	95	47	☆
	5			1101SC05-1100	11.0	142	94	☆
11.5	3			1105SC03-1150	11.5	95	47	☆
	5			1101SC05-1150	11.5	142	94	☆
12.0	3			1105SC03-1200	12.0	102	51	☆
	5			1101SC05-1200	12.0	151	101	☆
12.5	3			1105SC03-1250	12.5	102	51	☆
	5			1101SC05-1250	12.5	151	101	☆
12.8	3			1105SC03-1280	12.8	102	51	☆
13.0	3			1105SC03-1300	13.0	102	51	☆
	5			1101SC05-1300	13.0	151	101	☆
13.1	3			1105SC03-1310	13.1	102	51	☆
13.5	3			1105SC03-1350	13.5	107	54	☆
	5			1101SC05-1350	13.5	160	108	☆
14.0	3			1105SC03-1400	14.0	107	54	☆
	5			1101SC05-1400	14.0	160	108	☆
14.3	3			1105SC03-1430	14.3	111	56	☆
14.5	3			1105SC03-1450	14.5	111	56	☆
	5			1101SC05-1450	14.5	169	114	☆
15.0	3			1105SC03-1500	15.0	111	56	☆
	5			1101SC05-1500	15.0	169	114	☆
15.5	5			1101SC05-1550	15.5	178	120	☆
16.0	3			1105SC03-1600	16.0	115	58	☆
	5			1101SC05-1600	16.0	178	120	☆

☆Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK20F							◎	○	◎		

Code key C6 Cutting parameters C161 Technical information C165-C171 Non-standard customization tools C172-C176

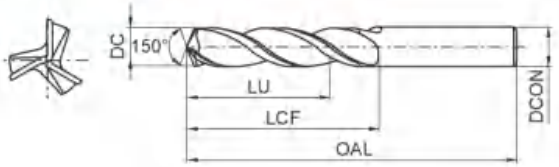
PA series(three flute drill) For maching of cast iron, Al alloy



External coolant



Straight shank



- Suitable for drilling solid workpieces such as cast iron and Al alloy.
- Three-flute construction for high feed rates and excellent centering capability.
- High machining reliability, suitable for harsh working conditions, such as intermittent cutting, etc.

Drill diameter DC(h7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)				Recommended grade	
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	KDG303	YK30F
3.0	3	External coolant	Straight shank	1165PA03-0300	3.0	46	16	12	☆	☆
3.1	3			1165PA03-0310	3.1	49	18	14	☆	☆
3.2	3			1165PA03-0320	3.2	49	18	14	☆	☆
3.3	3			1165PA03-0330	3.3	49	18	14	☆	☆
3.4	3			1165PA03-0340	3.4	52	20	15	☆	☆
3.5	3			1165PA03-0350	3.5	52	20	15	☆	☆
3.6	3			1165PA03-0360	3.6	52	20	15	☆	☆
3.7	3			1165PA03-0370	3.7	52	20	15	☆	☆
3.8	3			1165PA03-0380	3.8	55	22	17	☆	☆
3.9	3			1165PA03-0390	3.9	55	22	17	☆	☆
4.0	3			1165PA03-0400	4.0	55	22	17	☆	☆
4.1	3			1165PA03-0410	4.1	55	22	17	☆	☆
4.2	3			1165PA03-0420	4.2	55	22	17	☆	☆
4.3	3			1165PA03-0430	4.3	58	24	18	☆	☆
4.4	3			1165PA03-0440	4.4	58	24	18	☆	☆
4.5	3			1165PA03-0450	4.5	58	24	18	☆	☆
4.6	3			1165PA03-0460	4.6	58	24	18	☆	☆
4.7	3			1165PA03-0470	4.7	58	24	18	☆	☆
4.8	3			1165PA03-0480	4.8	62	26	20	☆	☆
4.9	3			1165PA03-0490	4.9	62	26	20	☆	☆
5.0	3			1165PA03-0500	5.0	62	26	20	☆	☆
5.1	3			1165PA03-0510	5.1	62	26	20	☆	☆
5.2	3			1165PA03-0520	5.2	62	26	20	☆	☆
5.3	3			1165PA03-0530	5.3	62	26	20	☆	☆
5.4	3			1165PA03-0540	5.4	66	28	21	☆	☆
5.5	3			1165PA03-0550	5.5	66	28	21	☆	☆
5.6	3			1165PA03-0560	5.6	66	28	21	☆	☆
5.7	3			1165PA03-0570	5.7	66	28	21	☆	☆
5.8	3			1165PA03-0580	5.8	66	28	21	☆	☆

☆Recommended grade (produce according to order)

Drill diameter DC(h7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)				Recommended grade	
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	KDG303	YK30F
5.9	3	External coolant	Straight shank	1165PA03-0590	5.9	66	28	21	☆	☆
6.0	3			1165PA03-0600	6.0	66	28	21	☆	☆
6.1	3			1165PA03-0610	6.1	70	31	23	☆	☆
6.2	3			1165PA03-0620	6.2	70	31	23	☆	☆
6.3	3			1165PA03-0630	6.3	70	31	23	☆	☆
6.4	3			1165PA03-0640	6.4	70	31	23	☆	☆
6.5	3			1165PA03-0650	6.5	70	31	23	☆	☆
6.6	3			1165PA03-0660	6.6	70	31	23	☆	☆
6.7	3			1165PA03-0670	6.7	70	31	23	☆	☆
6.8	3			1165PA03-0680	6.8	74	34	25	☆	☆
6.9	3			1165PA03-0690	6.9	74	34	25	☆	☆
7.0	3			1165PA03-0700	7.0	74	34	25	☆	☆
7.1	3			1165PA03-0710	7.1	74	34	25	☆	☆
7.2	3			1165PA03-0720	7.2	74	34	25	☆	☆
7.3	3			1165PA03-0730	7.3	74	34	25	☆	☆
7.4	3			1165PA03-0740	7.4	74	34	25	☆	☆
7.5	3			1165PA03-0750	7.5	74	34	25	☆	☆
7.6	3			1165PA03-0760	7.6	79	37	27	☆	☆
7.7	3			1165PA03-0770	7.7	79	37	27	☆	☆
7.8	3			1165PA03-0780	7.8	79	37	27	☆	☆
7.9	3			1165PA03-0790	7.9	79	37	27	☆	☆
8.0	3			1165PA03-0800	8.0	79	37	27	☆	☆
8.1	3			1165PA03-0810	8.1	79	37	27	☆	☆
8.2	3			1165PA03-0820	8.2	79	37	27	☆	☆
8.3	3			1165PA03-0830	8.3	79	37	27	☆	☆
8.4	3			1165PA03-0840	8.4	79	37	27	☆	☆
8.5	3			1165PA03-0850	8.5	79	37	27	☆	☆
8.6	3			1165PA03-0860	8.6	84	40	29	☆	☆
8.7	3			1165PA03-0870	8.7	84	40	29	☆	☆

☆Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303						○	◎	○	◎		○
YK30F						○	◎	○	◎		○

Code key C6
Cutting parameters C162
Technical information C165-C171
Non-standard customization tools C172-C176

PA series(three flute drill) For maching of cast iron, Al alloy

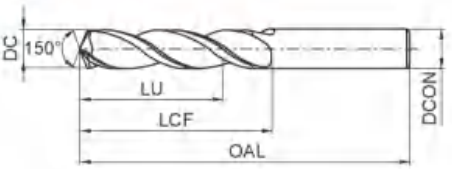


External coolant



Straight shank





- Suitable for drilling solid workpieces such as cast iron and Al alloy.
- Three-flute construction for high feed rates and excellent centering capability.
- High machining reliability, suitable for harsh working conditions, such as intermittent cutting, etc.

Drill diameter DC(h7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)				Recommended grade	
					Shank diameter DCON	Overall length OAL	Flute length LCF	Recommended drilling depth LU	KDG303	YK30F
8.8	3	External coolant	Straight shank	1165PA03-0880	8.8	84	40	29	☆	☆
8.9	3			1165PA03-0890	8.9	84	40	29	☆	☆
9.0	3			1165PA03-0900	9.0	84	40	29	☆	☆
9.1	3			1165PA03-0910	9.1	84	40	29	☆	☆
9.2	3			1165PA03-0920	9.2	84	40	29	☆	☆
9.3	3			1165PA03-0930	9.3	84	40	29	☆	☆
9.4	3			1165PA03-0940	9.4	84	40	29	☆	☆
9.5	3			1165PA03-0950	9.5	84	40	29	☆	☆
9.6	3			1165PA03-0960	9.6	89	43	31	☆	☆
9.7	3			1165PA03-0970	9.7	89	43	31	☆	☆
9.8	3			1165PA03-0980	9.8	89	43	31	☆	☆
9.9	3			1165PA03-0990	9.9	89	43	31	☆	☆
10.0	3			1165PA03-1000	10.0	89	43	31	☆	☆
10.1	3			1165PA03-1010	10.1	89	43	31	☆	☆
10.2	3			1165PA03-1020	10.2	89	43	31	☆	☆
10.3	3			1165PA03-1030	10.3	89	43	31	☆	☆
10.5	3			1165PA03-1050	10.5	89	43	31	☆	☆
11.0	3			1165PA03-1100	11.0	95	47	33	☆	☆
11.2	3			1165PA03-1120	11.2	95	47	33	☆	☆
11.5	3			1165PA03-1150	11.5	95	47	33	☆	☆
11.8	3			1165PA03-1180	11.8	95	47	33	☆	☆
12.0	3			1165PA03-1200	12.0	102	51	35	☆	☆
12.1	3			1165PA03-1210	12.1	102	51	35	☆	☆
12.5	3			1165PA03-1250	12.5	102	51	35	☆	☆
13.0	3			1165PA03-1300	13.0	102	51	35	☆	☆
13.5	3			1165PA03-1350	13.5	107	54	37	☆	☆
14.0	3			1165PA03-1400	14.0	107	54	37	☆	☆
14.5	3			1165PA03-1450	14.5	111	56	38	☆	☆
15.0	3			1165PA03-1500	15.0	111	56	38	☆	☆

☆Recommended grade (produce according to order)

Drill diameter DC(h7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)				Recommended grade	
					Shank diameter	Overall length	Flute length	Recommended drilling depth	KDG303	YK30F
					DCON	OAL	LCF	LU		
15.5	3	External coolant	Straight shank	**1165PA03-1550**	15.5	115	58	38	☆	☆
16.0	3			**1165PA03-1600**	16.0	115	58	38	☆	☆
16.5	3			**1165PA03-1650**	16.5	119	60	39	☆	☆
17.0	3			**1165PA03-1700**	17.0	119	60	39	☆	☆
17.5	3			**1165PA03-1750**	17.5	123	62	40	☆	☆
18.0	3			**1165PA03-1800**	18.0	123	62	40	☆	☆
18.5	3			**1165PA03-1850**	18.5	127	64	41	☆	☆
19.0	3			**1165PA03-1900**	19.0	127	64	41	☆	☆
19.5	3			**1165PA03-1950**	19.5	131	66	42	☆	☆
20.0	3			**1165PA03-2000**	20.0	131	66	42	☆	☆

☆Recommended grade (produce according to order)

Applicable material table

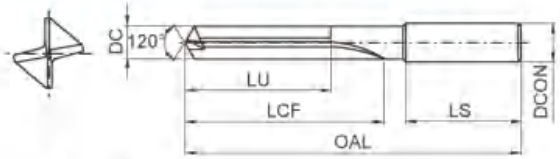
◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KDG303						○	◎	○	◎		○
YK30F						○	◎	○	◎		○

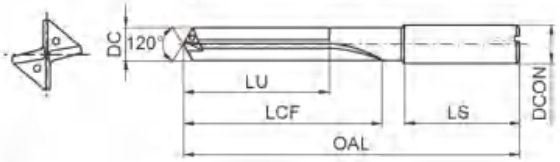
Code key C6
Cutting parameters C162
Technical information C165-C171
Non-standard customization tools C172-C176

PC series(straight flute drill) For machining of cast iron , Al alloy


External coolant Straight shank




Internal coolant Straight shank



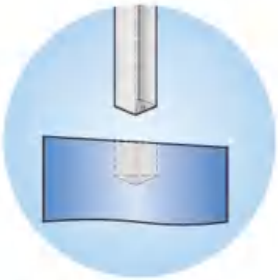
- For materials with short chips such as cast iron, silicon-aluminum alloy, etc.
- Excellent self centering capability, able to machine with high efficiency, the hole precision up to H7.
- High positional accuracy, high linearity and good surface finish can be obtained in the hole drilled.

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	YK20F
					DCON	OAL	LCF	LU	LS	
4.0	5	External coolant	Straight shank	1576PC05-0400	6.0	74	36	29	36	☆
4.2	5	External coolant		1576PC05-0420	6.0	74	36	29	36	☆
5.0	5	External coolant		1576PC05-0500	6.0	82	44	35	36	☆
	15	Internal coolant		1579PC15C-0500	6.0	145	105	96	36	☆
6.0	5	External coolant		1576PC05-0600	6.0	82	44	35	36	☆
	15	Internal coolant		1579PC15C-0600	6.0	145	105	96	36	☆
6.75	5	External coolant		1576PC05-0675	8.0	91	53	43	36	☆
7.0	5	External coolant		1576PC05-0700	8.0	91	53	43	36	☆
8.0	5	External coolant		1576PC05-0800	8.0	91	53	43	36	☆
	15	Internal coolant		1579PC15C-0800	8.0	180	137	127	36	☆
8.5	5	External coolant		1576PC05-0850	10.0	103	61	49	40	☆
9.0	5	External coolant		1576PC05-0900	10.0	103	61	49	40	☆
	15	Internal coolant		1579PC15C-0900	10.0	217	170	158	40	☆
10.0	5	External coolant		1576PC05-1000	10.0	103	61	49	40	☆
	15	Internal coolant		1579PC15C-1000	10.0	217	170	158	40	☆
10.25	5	External coolant		1576PC05-1025	12.0	118	71	56	45	☆
11.0	5	External coolant		1576PC05-1100	12.0	118	71	56	45	☆
	15	Internal coolant		1579PC15C-1100	12.0	258	205	190	45	☆
12.0	5	External coolant		1576PC05-1200	12.0	118	71	56	45	☆
	15	Internal coolant		1579PC15C-1200	12.0	258	205	190	45	☆
13.0	5	External coolant		1576PC05-1300	14.0	124	77	60	45	☆
14.0	5	External coolant		1576PC05-1400	14.0	124	77	60	45	☆
	15	Internal coolant		1579PC15C-1400	14.0	290	236	219	45	☆
15.0	5	External coolant		1576PC05-1500	16.0	133	83	63	48	☆
15.5	5	External coolant		1576PC05-1550	16.0	133	83	63	48	☆

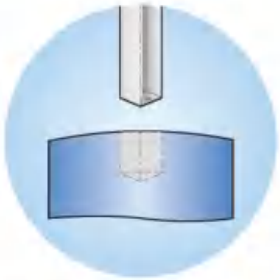
☆Recommended grade (produce according to order)

Drill diameter DC(m7)	Drilling depth (ULDR)	Cooling mode	Shank type	Type	Basic dimension(mm)					Recommended grade
					Shank diameter	Overall length	Flute length	Recommended drilling depth	Shank length	YK20F
					DCON	OAL	LCF	LU	LS	
16.0	5	External coolant	Straight shank	**1576PC05-1600**	16.0	133	83	63	48	☆
17.0	5			**1576PC05-1700**	18.0	143	93	71	48	☆
17.5	5			**1576PC05-1750**	18.0	143	93	71	48	☆
18.0	5			**1576PC05-1800**	18.0	143	93	71	48	☆
19.5	5			**1576PC05-1950**	20.0	153	101	77	50	☆
20.0	5			**1576PC05-2000**	20.0	153	101	77	50	☆

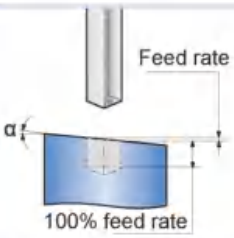
☆Recommended grade (produce according to order)



Inclined face drilling

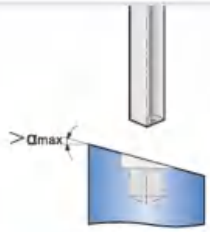


Curved face drilling



When drilling inclined face or curved face, feed rate should be reduced as recommended.

Inclined angle α	Max. feed rate
1°	80%
2°	50%
3°	30%



Surface with a large inclined angle should be pre-treated. Face milling should be conducted before drilling.

Applicable material table

○Very suitable ○Suitable

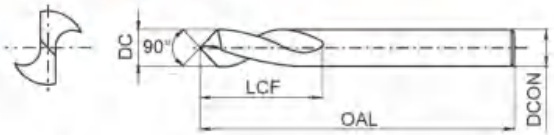
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK20F							○	○	○		

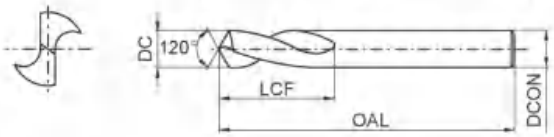
Code key C6 Cutting parameters C163 Technical information C165-C171 Non-standard customization tools C172-C176

SC series(centering drill) For machining of cast iron, Al alloy







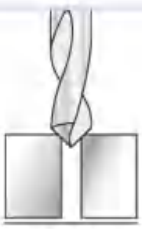


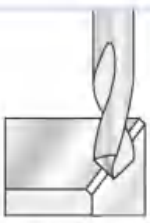
- Suitable for punching center holes and chamfering on CNC machines.
- Compared to conventional center drilling tools, centering drills are more stable and can be easily centered on sloping surfaces.

Drill diameter DC(h8)	Top angle	Cooling mode	Shank type	Type	Basic dimension(mm)			Recommended grade
					Shank diameter	Overall length	Flute length	YK20F
					DCON	OAL	LCF	
5	90°	External coolant	Straight shank	1143SC90-0500	5.00	62	10	☆
	120°			1143SC120-0500	5.00	62	10	☆
6	90°			1143SC90-0600	6.00	66	15	☆
	120°			1143SC120-0600	6.00	66	15	☆
8	90°			1143SC90-0800	8.00	79	17	☆
	120°			1143SC120-0800	8.00	79	17	☆
10	90°			1143SC90-1000	10.00	89	20	☆
	120°			1143SC120-1000	10.00	89	20	☆
12	90°			1143SC90-1200	12.00	102	25	☆
	120°			1143SC120-1200	12.00	102	25	☆
14	90°			1143SC90-1400	14.00	107	30	☆
	120°			1143SC120-1400	14.00	107	30	☆
16	90°			1143SC90-1600	16.00	115	35	☆
	120°			1143SC120-1600	16.00	115	35	☆
20	90°			1143SC90-2000	20.00	131	40	☆
	120°			1143SC120-2000	20.00	131	40	☆

☆Recommended grade (produce according to order)


Centering drilling machining


Hole chamfering machining


Chamfering machining


Hole chamfering machining

Applicable material table

○Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK20F							○	○	○		

Code key C6
Cutting parameters C164
Technical information C165-C171
Non-standard customization tools C172-C176

GD series twist drills(External coolant)

3D 5D

workpiece material	Mild steel HB≤180		Carbon steel, alloy steel ~30HRC		Pre-hardened steel ~40HRC		Stainless steel		Cast iron		Nodular cast iron		Heat resistant alloy	
Cutting speed	60~120m/min		60~120m/min		40~70m/min		25~40m/min		60~120m/min		50~100m/min		15~25m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
2	14000	0.06~0.08	14000	0.06~0.08	9500	0.06~0.08	5500	0.02~0.05	14000	0.06~0.08	11000	0.06~0.08	3200	0.02~0.04
3	9500	0.09~0.12	9500	0.09~0.12	6300	0.09~0.12	3700	0.03~0.07	9500	0.09~0.12	7400	0.09~0.12	2100	0.03~0.06
4	7000	0.10~0.15	7000	0.10~0.15	4700	0.10~0.15	2700	0.04~0.08	7000	0.10~0.15	5600	0.10~0.15	1600	0.04~0.07
5	5700	0.12~0.18	5700	0.12~0.18	3800	0.12~0.18	2200	0.05~0.10	5700	0.12~0.18	4500	0.12~0.18	1250	0.05~0.09
6	4700	0.14~0.20	4700	0.14~0.20	3100	0.14~0.20	1850	0.06~0.12	4700	0.14~0.20	3700	0.14~0.20	1050	0.06~0.11
8	3600	0.16~0.24	3600	0.16~0.24	2400	0.16~0.24	1400	0.08~0.16	3600	0.16~0.24	2800	0.16~0.24	800	0.08~0.14
10	2800	0.18~0.27	2800	0.18~0.27	1900	0.18~0.27	1100	0.10~0.18	2800	0.18~0.27	2200	0.18~0.27	600	0.10~0.16
12	2400	0.20~0.30	2400	0.20~0.30	1600	0.20~0.30	930	0.12~0.20	2400	0.20~0.30	1900	0.20~0.30	500	0.12~0.18
14	2100	0.22~0.35	2100	0.22~0.35	1400	0.22~0.35	800	0.13~0.22	2100	0.22~0.35	1600	0.22~0.35	450	0.13~0.20
16	1800	0.25~0.36	1800	0.25~0.36	1200	0.25~0.36	700	0.14~0.25	1800	0.25~0.36	1400	0.25~0.36	400	0.14~0.23
18	1600	0.28~0.38	1600	0.28~0.38	1100	0.28~0.38	620	0.15~0.28	1600	0.28~0.38	1200	0.28~0.38	350	0.15~0.25
20	1400	0.30~0.40	1400	0.30~0.40	950	0.30~0.40	550	0.16~0.30	1400	0.30~0.40	1100	0.30~0.40	320	0.16~0.28
25	1500	0.32~0.42	1500	0.32~0.42	900	0.32~0.42	700	0.17~0.32	1500	0.32~0.42	1100	0.32~0.42	250	0.17~0.3

1. When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cutting conditions become stable, gradually increase the cutting speed and feed rate.
2. The cutting conditions above are applicable for drilling with emulsion.
3. When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.
4. These conditions above are applicable for cutting depth under 5D.

Recommended cutting parameters

GD series twist drills(Internal coolant) 3D 5D

Workpiece material	Mild steel HB≤180		Carbon steel, alloy steel ~30HRC		Pre-hardened steel ~40HRC		Stainless steel		Cast iron		Nodular cast iron		Heat resistant alloy	
Cutting speed	80~150m/min		80~150m/min		50~80m/min		50~80m/min		80~150m/min		60~120m/min		15~25m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	12700	0.09~0.12	12700	0.09~0.12	7400	0.09~0.12	6300	0.03~0.07	12700	0.09~0.12	9500	0.09~0.12	2100	0.03~0.06
4	9600	0.10~0.15	9600	0.10~0.15	5600	0.10~0.15	4700	0.04~0.08	9600	0.10~0.15	7000	0.10~0.15	1600	0.04~0.07
5	7600	0.12~0.18	7600	0.12~0.18	4500	0.12~0.18	3800	0.05~0.10	7600	0.12~0.18	5700	0.12~0.18	1250	0.05~0.09
6	6400	0.14~0.20	6400	0.14~0.20	3700	0.14~0.20	3200	0.06~0.12	6400	0.14~0.20	4700	0.14~0.20	1050	0.06~0.11
8	4800	0.16~0.24	4800	0.16~0.24	2800	0.16~0.24	2400	0.08~0.16	4800	0.16~0.24	3600	0.16~0.24	800	0.08~0.14
10	3800	0.18~0.27	3800	0.18~0.27	2200	0.18~0.27	1900	0.10~0.18	3800	0.18~0.27	2800	0.18~0.27	600	0.10~0.16
12	3200	0.20~0.30	3200	0.20~0.30	1900	0.20~0.30	1600	0.12~0.20	3200	0.20~0.30	2400	0.20~0.30	500	0.12~0.18
14	2700	0.22~0.35	2700	0.22~0.35	1600	0.22~0.35	1350	0.13~0.22	2700	0.22~0.35	2100	0.22~0.35	450	0.13~0.20
16	2400	0.25~0.36	2400	0.25~0.36	1400	0.25~0.36	1200	0.14~0.25	2400	0.25~0.36	1800	0.25~0.36	400	0.14~0.23
18	2100	0.28~0.38	2100	0.28~0.38	1200	0.28~0.38	1050	0.15~0.28	2100	0.28~0.38	1600	0.28~0.38	350	0.15~0.25
20	1900	0.30~0.40	1900	0.30~0.40	1100	0.30~0.40	950	0.16~0.30	1900	0.30~0.40	1400	0.30~0.40	320	0.16~0.28
25	1500	0.32~0.42	1500	0.32~0.42	900	0.32~0.42	700	0.17~0.32	1500	0.32~0.42	1100	0.32~0.42	250	0.17~0.3

1. When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cutting conditions become stable, gradually increase the cutting speed and feed rate.
2. The cutting conditions above are applicable for drilling with emulsion.
3. When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.
4. These conditions above are applicable for cutting depth under 5D.

GD series twist drills(Internal coolant) 8D

Workpiece material	Mild steel HB≤180		Carbon steel, alloy steel ~30HRC		Pre-hardened steel ~40HRC		Stainless steel		Cast iron		Nodular cast iron		Aluminum alloy		Heat resistant alloy	
Cutting speed	80~150m/min		80~150m/min		50~80m/min		40~60m/min		80~150m/min		60~120m/min		100~180m/min		15~25m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	12700	0.06~0.10	12700	0.06~0.10	7400	0.06~0.10	5300	0.03~0.07	12700	0.06~0.10	9500	0.06~0.10	15000	0.09~0.12	2100	0.03~0.06
4	9600	0.08~0.12	9600	0.08~0.12	5600	0.08~0.12	4000	0.04~0.08	9600	0.08~0.12	7000	0.08~0.12	11100	0.10~0.15	1600	0.04~0.07
5	7600	0.10~0.14	7600	0.10~0.14	4500	0.10~0.14	3200	0.05~0.10	7600	0.10~0.14	5700	0.10~0.14	9000	0.10~0.14	1250	0.05~0.09
6	6400	0.11~0.16	6400	0.11~0.16	3700	0.11~0.16	2700	0.06~0.12	6400	0.11~0.16	4700	0.11~0.16	7400	0.11~0.16	1050	0.06~0.11
8	4800	0.13~0.19	4800	0.13~0.19	2800	0.13~0.19	2000	0.08~0.16	4800	0.13~0.19	3600	0.13~0.19	5600	0.13~0.19	800	0.08~0.14
10	3800	0.14~0.22	3800	0.14~0.22	2200	0.14~0.22	1600	0.10~0.18	3800	0.14~0.22	2800	0.14~0.22	4500	0.14~0.22	600	0.10~0.16
12	3200	0.16~0.24	3200	0.16~0.24	1900	0.16~0.24	1300	0.12~0.20	3200	0.16~0.24	2400	0.16~0.24	3700	0.16~0.24	500	0.12~0.18
14	2700	0.18~0.28	2700	0.18~0.28	1600	0.18~0.28	1100	0.13~0.22	2700	0.18~0.28	2100	0.18~0.28	3200	0.18~0.28	450	0.13~0.20
16	2400	0.20~0.29	2400	0.20~0.29	1400	0.20~0.29	1000	0.14~0.25	2400	0.20~0.29	1800	0.20~0.29	2800	0.20~0.29	400	0.14~0.23
18	2100	0.24~0.32	2100	0.24~0.32	1200	0.24~0.32	880	0.15~0.28	2100	0.24~0.32	1600	0.24~0.32	2500	0.24~0.32	350	0.15~0.25

1. When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cutting conditions become stable, gradually increase the cutting speed and feed rate.
2. The cutting conditions above are applicable for drilling with emulsion.
3. When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.
4. These conditions above are applicable for cutting depth under 8D.

UD series twist drills(External coolant)

3D 5D

Workpiece material	Mild steel HB≤180		Carbon steel, alloy steel ~30HRC		Pre-hardened steel ~40HRC		Stainless steel		Cast iron		Nodular cast iron		Heat resistant alloy	
Cutting speed	60~150m/min		60~150m/min		40~70m/min		25~60m/min		60~150m/min		50~120m/min		15~30m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
2	15000	0.06~0.10	15000	0.06~0.10	9500	0.06~0.10	5500	0.02~0.06	15000	0.06~0.10	11000	0.06~0.10	3200	0.02~0.05
3	10500	0.09~0.15	10500	0.09~0.15	6300	0.09~0.15	4500	0.03~0.09	10500	0.09~0.15	9000	0.09~0.15	2500	0.03~0.07
4	7700	0.10~0.18	7700	0.10~0.18	4700	0.10~0.18	3500	0.04~0.10	7700	0.10~0.18	6800	0.10~0.18	2000	0.04~0.09
5	6800	0.12~0.21	6800	0.12~0.21	3800	0.12~0.21	3000	0.05~0.12	6800	0.12~0.21	5500	0.12~0.21	1500	0.05~0.10
6	6400	0.14~0.24	6400	0.14~0.24	3100	0.14~0.24	2500	0.06~0.15	6400	0.14~0.24	4800	0.14~0.24	1200	0.06~0.12
8	5500	0.16~0.27	5500	0.16~0.27	2400	0.16~0.27	2000	0.08~0.18	5500	0.16~0.27	4000	0.16~0.27	1000	0.08~0.15
10	3500	0.18~0.30	3500	0.18~0.30	1900	0.18~0.30	1500	0.10~0.21	3500	0.18~0.30	3200	0.18~0.30	800	0.10~0.18
12	3000	0.20~0.33	3000	0.20~0.33	1600	0.20~0.33	1200	0.12~0.24	3000	0.20~0.33	2500	0.20~0.33	600	0.12~0.20
14	2800	0.22~0.35	2800	0.22~0.35	1400	0.22~0.35	1100	0.13~0.27	2800	0.22~0.35	2200	0.22~0.35	540	0.13~0.22
16	2500	0.25~0.36	2500	0.25~0.36	1200	0.25~0.36	900	0.14~0.30	2500	0.25~0.36	1800	0.25~0.36	480	0.14~0.24
18	2000	0.28~0.38	2000	0.28~0.38	1100	0.28~0.38	800	0.15~0.30	2000	0.28~0.38	1600	0.28~0.38	420	0.15~0.26
20	1800	0.30~0.40	1800	0.30~0.40	950	0.30~0.40	750	0.16~0.32	1800	0.30~0.40	1400	0.30~0.40	360	0.16~0.28
25	1600	0.32~0.42	1600	0.32~0.42	900	0.32~0.42	700	0.17~0.32	1600	0.32~0.42	1200	0.32~0.42	300	0.17~0.30

1. When the tool is used for first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. Cutting conditions become stable, gradually increase the cutting speed and feed rate.
2. The cutting conditions above are applicable for drilling with emulsion.
3. When clamping drill, please use a collect without any defector dust, and keep the radial run-out of drill under 0.02mm.
4. These conditions above are applicable for cutting depth under 5D.

UD series twist drills(Internal coolant)

3D 5D

Workpiece material	Mild steel HB≤180		Carbon steel, alloy steel ~30HRC		Pre-hardened steel ~40HRC		Stainless steel		Cast iron		Nodular cast iron		Heat resistant alloy	
Cutting speed	60~180m/min		60~180m/min		50~80m/min		50~100m/min		80~180m/min		60~150m/min		15~40m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	13000	0.09~0.15	13000	0.09~0.15	7400	0.09~0.15	8000	0.03~0.08	13000	0.09~0.15	10000	0.09~0.15	3000	0.03~0.08
4	10600	0.10~0.18	10600	0.10~0.18	5600	0.10~0.18	6000	0.04~0.10	10600	0.10~0.18	8000	0.10~0.18	2400	0.04~0.10
5	9000	0.12~0.21	9000	0.12~0.21	4500	0.12~0.21	5000	0.05~0.12	9000	0.12~0.21	6700	0.12~0.21	1800	0.05~0.12
6	8000	0.14~0.24	8000	0.14~0.24	3700	0.14~0.24	4000	0.06~0.15	8000	0.14~0.24	6000	0.14~0.24	1600	0.06~0.14
8	6400	0.16~0.27	6400	0.16~0.27	2800	0.16~0.27	3000	0.08~0.18	6400	0.16~0.27	4800	0.16~0.27	1200	0.08~0.16
10	4800	0.18~0.30	4800	0.18~0.30	2200	0.18~0.30	2500	0.10~0.21	4800	0.18~0.30	3500	0.18~0.30	800	0.10~0.18
12	4000	0.20~0.33	4000	0.20~0.33	1900	0.20~0.33	2000	0.12~0.24	4000	0.20~0.33	3000	0.20~0.33	700	0.12~0.20
14	3500	0.22~0.35	3500	0.22~0.35	1600	0.22~0.35	1500	0.13~0.26	3500	0.22~0.35	2500	0.22~0.35	600	0.13~0.22
16	3000	0.25~0.36	3000	0.25~0.36	1400	0.25~0.36	1200	0.14~0.28	3000	0.25~0.36	2200	0.25~0.36	500	0.14~0.24
18	2500	0.28~0.38	2500	0.28~0.38	1200	0.28~0.38	1050	0.15~0.30	2500	0.28~0.38	2000	0.28~0.38	450	0.15~0.26
20	2200	0.30~0.40	2200	0.30~0.40	1100	0.30~0.40	950	0.16~0.32	2200	0.30~0.40	1600	0.30~0.40	400	0.16~0.28
25	1800	0.32~0.42	1800	0.32~0.42	900	0.32~0.42	700	0.17~0.34	1800	0.32~0.42	1200	0.32~0.42	320	0.17~0.30

1. When the tool is used for first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. Cutting conditions become stable, gradually increase the cutting speed and feed rate.
2. The cutting conditions above are applicable for drilling with emulsion.
3. When clamping drill, please use a collect without any defector dust, and keep the radial run-out of drill under 0.02mm
4. These conditions above are applicable for cutting depth under 5D.

SU series twist drills(External coolant) 3D 5D

Workpiece material	Mild steel HB≤180		Carbon steel, alloy steel ~30HRC		Pre-hardened steel ~40HRC		Stainless steel		Cast iron		Nodular cast iron		Aluminum alloy		Heat resistant alloy	
Cutting speed	60~120m/min		60~120m/min		40~70m/min		25~40m/min		60~120m/min		50~100m/min		60~140m/min		15~25m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
2	14000	0.06~0.08	14000	0.06~0.08	9500	0.06~0.08	5500	0.02~0.05	14000	0.06~0.08	11000	0.06~0.08	16000	0.06~0.08	3200	0.02~0.04
3	9500	0.09~0.12	9500	0.09~0.12	6300	0.09~0.12	3700	0.03~0.07	9500	0.09~0.12	7400	0.09~0.12	10600	0.09~0.12	2100	0.03~0.06
4	7000	0.10~0.15	7000	0.10~0.15	4700	0.10~0.15	2700	0.04~0.08	7000	0.10~0.15	5600	0.10~0.15	8000	0.10~0.15	1600	0.04~0.07
5	5700	0.12~0.18	5700	0.12~0.18	3800	0.12~0.18	2200	0.05~0.10	5700	0.12~0.18	4500	0.12~0.18	6400	0.12~0.18	1250	0.05~0.09
6	4700	0.14~0.20	4700	0.14~0.20	3100	0.14~0.20	1850	0.06~0.12	4700	0.14~0.20	3700	0.14~0.20	5300	0.14~0.20	1050	0.06~0.11
8	3600	0.16~0.24	3600	0.16~0.24	2400	0.16~0.24	1400	0.08~0.16	3600	0.16~0.24	2800	0.16~0.24	4000	0.16~0.24	800	0.08~0.14
10	2800	0.18~0.27	2800	0.18~0.27	1900	0.18~0.27	1100	0.10~0.18	2800	0.18~0.27	2200	0.18~0.27	3200	0.18~0.27	600	0.10~0.16
12	2400	0.20~0.30	2400	0.20~0.30	1600	0.20~0.30	930	0.12~0.20	2400	0.20~0.30	1900	0.20~0.30	2700	0.20~0.30	500	0.12~0.18
14	2100	0.22~0.35	2100	0.22~0.35	1400	0.22~0.35	800	0.13~0.22	2100	0.22~0.35	1600	0.22~0.35	2300	0.22~0.35	450	0.13~0.20
16	1800	0.25~0.36	1800	0.25~0.36	1200	0.25~0.36	700	0.14~0.25	1800	0.25~0.36	1400	0.25~0.36	2000	0.25~0.36	400	0.14~0.23
18	1600	0.28~0.38	1600	0.28~0.38	1100	0.28~0.38	620	0.15~0.28	1600	0.28~0.38	1200	0.28~0.38	1800	0.28~0.38	350	0.15~0.25
20	1400	0.30~0.40	1400	0.30~0.40	950	0.30~0.40	550	0.16~0.30	1400	0.30~0.40	1100	0.30~0.40	1600	0.30~0.40	320	0.16~0.28

1.When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cutting conditions become stable, gradually increase the cutting speed and feed rate.

2.The cutting conditions above are applicable for drilling with emulsion.

3.When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.

4.These conditions above are applicable for cutting depth under 5D.

SU series twist drills(Internal coolant)

3D 5D

Workpiece material	Mild steel HB≤180		Carbon steel, alloy steel ~30HRC		Pre-hardened steel ~40HRC		Stainless steel		Cast iron		Nodular cast iron		Aluminum alloy		Heat resistant alloy	
Cutting speed	80~150m/min		80~150m/min		50~80m/min		50~80m/min		80~150m/min		60~120m/min		100~180m/min		15~25m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	12700	0.09~0.12	12700	0.09~0.12	7400	0.09~0.12	6300	0.03~0.07	12700	0.09~0.12	9500	0.09~0.12	15000	0.09~0.12	2100	0.03~0.06
4	9600	0.10~0.15	9600	0.10~0.15	5600	0.10~0.15	4700	0.04~0.08	9600	0.10~0.15	7000	0.10~0.15	11100	0.10~0.15	1600	0.04~0.07
5	7600	0.12~0.18	7600	0.12~0.18	4500	0.12~0.18	3800	0.05~0.10	7600	0.12~0.18	5700	0.12~0.18	9000	0.12~0.18	1250	0.05~0.09
6	6400	0.14~0.20	6400	0.14~0.20	3700	0.14~0.20	3200	0.06~0.12	6400	0.14~0.20	4700	0.14~0.20	7400	0.14~0.20	1050	0.06~0.11
8	4800	0.16~0.24	4800	0.16~0.24	2800	0.16~0.24	2400	0.08~0.16	4800	0.16~0.24	3600	0.16~0.24	5600	0.16~0.24	800	0.08~0.14
10	3800	0.18~0.27	3800	0.18~0.27	2200	0.18~0.27	1900	0.10~0.18	3800	0.18~0.27	2800	0.18~0.27	4500	0.18~0.27	600	0.10~0.16
12	3200	0.20~0.30	3200	0.20~0.30	1900	0.20~0.30	1600	0.12~0.20	3200	0.20~0.30	2400	0.20~0.30	3700	0.20~0.30	500	0.12~0.18
14	2700	0.22~0.35	2700	0.22~0.35	1600	0.22~0.35	1350	0.13~0.22	2700	0.22~0.35	2100	0.22~0.35	3200	0.22~0.35	450	0.13~0.20
16	2400	0.25~0.36	2400	0.25~0.36	1400	0.25~0.36	1200	0.14~0.25	2400	0.25~0.36	1800	0.25~0.36	2800	0.25~0.36	400	0.14~0.23
18	2100	0.28~0.38	2100	0.28~0.38	1200	0.28~0.38	1050	0.15~0.28	2100	0.28~0.38	1600	0.28~0.38	2500	0.28~0.38	350	0.15~0.25
20	1900	0.30~0.40	1900	0.30~0.40	1100	0.30~0.40	950	0.16~0.30	1900	0.30~0.40	1400	0.30~0.40	2300	0.30~0.40	320	0.16~0.28

1.When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cutting conditions become stable, gradually increase the cutting speed and feed rate.
2.The cutting conditions above are applicable for drilling with emulsion.
3.When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.
4.These conditions above are applicable for cutting depth under 5D.

SU series twist drills(Internal coolant)

8D

Workpiece material	Mild steel HB≤180		Carbon steel, alloy steel ~30HRC		Pre-hardened steel ~40HRC		Stainless steel		Cast iron		Nodular cast iron		Aluminum alloy		Heat resistant alloy	
Cutting speed	80~150m/min		80~150m/min		50~80m/min		40~60m/min		80~150m/min		60~120m/min		100~180m/min		15~25m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	12700	0.06~0.10	12700	0.06~0.10	7400	0.06~0.10	5300	0.03~0.07	12700	0.06~0.10	9500	0.06~0.10	15000	0.09~0.12	2100	0.03~0.06
4	9600	0.08~0.12	9600	0.08~0.12	5600	0.08~0.12	4000	0.04~0.08	9600	0.08~0.12	7000	0.08~0.12	11100	0.10~0.15	1600	0.04~0.07
5	7600	0.10~0.14	7600	0.10~0.14	4500	0.10~0.14	3200	0.05~0.10	7600	0.10~0.14	5700	0.10~0.14	9000	0.10~0.14	1250	0.05~0.09
6	6400	0.11~0.16	6400	0.11~0.16	3700	0.11~0.16	2700	0.06~0.12	6400	0.11~0.16	4700	0.11~0.16	7400	0.11~0.16	1050	0.06~0.11
8	4800	0.13~0.19	4800	0.13~0.19	2800	0.13~0.19	2000	0.08~0.16	4800	0.13~0.19	3600	0.13~0.19	5600	0.13~0.19	800	0.08~0.14
10	3800	0.14~0.22	3800	0.14~0.22	2200	0.14~0.22	1600	0.10~0.18	3800	0.14~0.22	2800	0.14~0.22	4500	0.14~0.22	600	0.10~0.16
12	3200	0.16~0.24	3200	0.16~0.24	1900	0.16~0.24	1300	0.12~0.20	3200	0.16~0.24	2400	0.16~0.24	3700	0.16~0.24	500	0.12~0.18
14	2700	0.18~0.28	2700	0.18~0.28	1600	0.18~0.28	1100	0.13~0.22	2700	0.18~0.28	2100	0.18~0.28	3200	0.18~0.28	450	0.13~0.20
16	2400	0.20~0.29	2400	0.20~0.29	1400	0.20~0.29	1000	0.14~0.25	2400	0.20~0.29	1800	0.20~0.29	2800	0.20~0.29	400	0.14~0.23
18	2100	0.24~0.32	2100	0.24~0.32	1200	0.24~0.32	880	0.15~0.28	2100	0.24~0.32	1600	0.24~0.32	2500	0.24~0.32	350	0.15~0.25

1.When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cutting conditions become stable, gradually increase the cutting speed and feed rate.
2.The cutting conditions above are applicable for drilling with emulsion.
3.When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.
4.These conditions above are applicable for cutting depth under 8D.

SU series step drill(External coolant)

workpiece material	Mild steel HB≤180		Carbon steel, alloy steel ~30HRC		Pre-hardened steel ~40HRC		Stainless steel		Cast iron		Nodular cast iron		Aluminum alloy		Heat resistant alloy	
Cutting speed	50~100m/min		50~100m/min		30~50m/min		25~40m/min		50~100m/min		40~80m/min		60~120m/min		15~25m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3.3	5800	0.09~0.12	5800	0.09~0.12	3850	0.09~0.12	2900	0.03~0.07	5800	0.09~0.12	5000	0.09~0.12	10000	0.09~0.12	1600	0.03~0.06
4.2	4550	0.10~0.15	4550	0.10~0.15	3000	0.10~0.15	2300	0.04~0.08	4550	0.10~0.15	3800	0.10~0.15	7600	0.10~0.15	1250	0.04~0.07
5	3800	0.12~0.18	3800	0.12~0.18	2550	0.12~0.18	1900	0.05~0.10	3800	0.12~0.18	3200	0.12~0.18	6400	0.12~0.18	1050	0.05~0.10
6.75	2850	0.14~0.20	2850	0.14~0.20	1900	0.14~0.20	1400	0.06~0.12	2850	0.14~0.20	2400	0.14~0.20	4800	0.14~0.20	800	0.06~0.11
7	2750	0.15~0.22	2750	0.15~0.22	1800	0.15~0.22	1350	0.07~0.14	2750	0.15~0.22	2300	0.15~0.22	4550	0.15~0.22	730	0.07~0.12
8.5	2250	0.16~0.24	2250	0.16~0.24	1500	0.16~0.24	1100	0.08~0.16	2250	0.16~0.24	1800	0.16~0.24	3600	0.16~0.24	600	0.08~0.14
9	2100	0.17~0.25	2100	0.17~0.25	1400	0.17~0.25	1050	0.09~0.17	2100	0.17~0.25	1750	0.17~0.25	3500	0.17~0.25	560	0.09~0.15
10.25	1850	0.18~0.27	1850	0.18~0.27	1250	0.18~0.27	930	0.10~0.18	1850	0.18~0.27	1550	0.18~0.27	3100	0.18~0.27	500	0.10~0.16
10.5	1800	0.19~0.28	1800	0.19~0.28	1200	0.19~0.28	900	0.11~0.19	1800	0.19~0.28	1500	0.19~0.28	3000	0.19~0.28	480	0.11~0.17
12	1600	0.20~0.30	1600	0.20~0.30	1050	0.20~0.30	800	0.12~0.20	1600	0.20~0.30	1300	0.20~0.30	2600	0.20~0.30	450	0.12~0.18
12.5	1550	0.20~0.30	1550	0.20~0.30	1000	0.20~0.30	760	0.12~0.20	1550	0.20~0.30	1250	0.20~0.30	2550	0.20~0.30	410	0.12~0.18
14	1350	0.22~0.35	1350	0.22~0.35	900	0.22~0.35	700	0.14~0.24	1350	0.22~0.35	1150	0.22~0.35	2300	0.22~0.35	370	0.13~0.20
14.5	1300	0.22~0.35	1300	0.22~0.35	880	0.22~0.35	650	0.14~0.24	1300	0.22~0.35	1050	0.22~0.35	2200	0.22~0.35	350	0.13~0.20

1.When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cutting conditions become stable, gradually increase the cutting speed and feed rate.
2.The cutting conditions above are applicable for drilling with emulsion.
3.When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.

SL series deep twist drills(Internal coolant) 12D

Workpiece material	Mild steel HB≤180		Carbon steel, alloy steel ~30HRC		Pre-hardened steel ~40HRC		Stainless steel		Cast iron		Nodular cast iron		Aluminum alloy		Heat resistant alloy	
Cutting speed	60~120m/min		60~120m/min		50~80m/min		40~60m/min		80~150m/min		60~120m/min		100~180m/min		10~20m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	10600	0.06~0.1	10600	0.06~0.1	7400	0.06~0.1	5300	0.03~0.07	12700	0.06~0.1	9500	0.06~0.1	15000	0.09~0.12	2100	0.03~0.06
4	8000	0.08~0.12	8000	0.08~0.12	5600	0.08~0.12	4000	0.04~0.08	96000	0.08~0.12	7000	0.08~0.12	11000	0.10~0.15	1600	0.04~0.07
5	6400	0.10~0.14	6400	0.10~0.14	4500	0.10~0.14	3200	0.05~0.10	7600	0.10~0.14	5700	0.10~0.14	9000	0.10~0.15	1250	0.05~0.9
6	5300	0.11~0.16	5300	0.11~0.16	3700	0.11~0.16	2700	0.06~0.12	6400	0.11~0.16	4700	0.11~0.16	7400	0.11~0.16	1050	0.06~0.11
8	4000	0.13~0.19	4000	0.13~0.19	2800	0.13~0.19	2000	0.08~0.16	4800	0.13~0.19	3600	0.13~0.19	5600	0.13~0.19	800	0.08~0.14
10	3200	0.14~0.22	3200	0.14~0.22	2200	0.14~0.22	1600	0.10~0.18	3800	0.14~0.22	2600	0.14~0.22	4500	0.14~0.22	600	0.10~0.16
12	2700	0.16~0.24	2700	0.16~0.24	1900	0.16~0.24	1300	0.12~0.20	3200	0.16~0.24	2400	0.16~0.24	3700	0.16~0.24	500	0.12~0.18
14	2300	0.18~0.28	2300	0.18~0.28	1600	0.18~0.28	1100	0.13~0.22	2700	0.18~0.28	2100	0.18~0.28	3200	0.18~0.28	450	0.13~0.20
16	2100	0.20~0.30	2100	0.20~0.30	1400	0.20~0.30	1050	0.14~0.25	2100	0.20~0.30	1800	0.20~0.30	2800	0.25~0.36	400	0.14~0.23
18	1800	0.22~0.32	1800	0.22~0.32	1200	0.22~0.32	950	0.15~0.28	1600	0.22~0.32	1600	0.22~0.32	2500	0.28~0.38	350	0.15~0.25
20	1600	0.25~0.35	1600	0.25~0.35	1100	0.25~0.35	800	0.16~0.30	1600	0.25~0.35	1400	0.25~0.35	2300	0.30~0.40	320	0.16~0.28

SL series deep twist drills(Internal coolant) 20D 30D

Workpiece material	Mild steel HB≤180		Carbon steel, alloy steel ~30HRC		Pre-hardened steel ~40HRC		Stainless steel		Cast iron		Nodular cast iron		Aluminum alloy		Heat resistant alloy	
Cutting speed	70~90m/min		50~80m/min		40~60m/min		40~60m/min		50~80m/min		60~80m/min		100~180m/min		8~15m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	8250	0.06~0.1	7650	0.06~0.1	5200	0.06~0.1	4750	0.03~0.07	7100	0.06~0.1	7600	0.06~0.1	12750	0.09~0.12	1350	0.03~0.06
4	6250	0.08~0.12	5750	0.08~0.12	3900	0.08~0.12	3600	0.04~0.08	5400	0.08~0.12	5600	0.08~0.12	9350	0.10~0.15	1050	0.04~0.07
5	5000	0.10~0.14	4600	0.10~0.14	3150	0.10~0.14	2900	0.05~0.10	4250	0.10~0.14	4550	0.10~0.14	7650	0.10~0.15	800	0.05~0.09
6	4150	0.11~0.16	3800	0.11~0.16	2600	0.11~0.16	2450	0.06~0.12	3600	0.11~0.16	3750	0.11~0.16	6300	0.11~0.16	700	0.06~0.11
8	3100	0.13~0.19	2900	0.13~0.19	1950	0.13~0.19	1800	0.08~0.16	2700	0.13~0.19	2900	0.13~0.19	4750	0.13~0.19	500	0.08~0.14
10	2500	0.14~0.22	2300	0.14~0.22	1550	0.14~0.22	1450	0.10~0.18	2150	0.14~0.22	2250	0.14~0.22	3850	0.14~0.22	400	0.10~0.16
12	2100	0.16~0.24	1950	0.16~0.24	1350	0.16~0.24	1150	0.12~0.20	1800	0.16~0.24	1900	0.16~0.24	3150	0.16~0.24	350	0.12~0.18~
14	1800	0.18~0.28	1650	0.18~0.28	1100	0.18~0.28	1000	0.13~0.22	1500	0.18~0.28	1700	0.18~0.28	2700	0.18~0.28	300	0.13~0.20

1. When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cutting conditions become stable, gradually increase the cutting speed and feed rate.
2. The cutting conditions above are applicable for drilling with emulsion.
3. When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm

Recommended cutting parameters

SP series twist drills(Internal coolant)

3D

Workpiece material	Mild steel HB≤180		Carbon steel, alloy steel ~30HRC		Pre-hardened steel ~40HRC		Stainless steel		Cast iron		Nodular cast iron		Aluminum alloy		Heat resistant alloy	
Cutting speed	80~150m/min		80~150m/min		50~80m/min		50~80m/min		80~150m/min		60~120m/min		100~180m/min		15~25m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	12700	0.09~0.12	12700	0.09~0.12	7400	0.09~0.12	6300	0.03~0.07	12700	0.09~0.12	9500	0.09~0.12	15000	0.09~0.12	2100	0.03~0.06
4	9600	0.10~0.15	9600	0.10~0.15	5600	0.10~0.15	4700	0.04~0.08	9600	0.10~0.15	7000	0.10~0.15	11100	0.10~0.15	1600	0.04~0.07
5	7600	0.12~0.18	7600	0.12~0.18	4500	0.12~0.18	3800	0.05~0.10	7600	0.12~0.18	5700	0.12~0.18	9000	0.12~0.18	1250	0.05~0.09
6	6400	0.14~0.20	6400	0.14~0.20	3700	0.14~0.20	3200	0.06~0.12	6400	0.14~0.20	4700	0.14~0.20	7400	0.14~0.20	1050	0.06~0.11
8	4800	0.16~0.24	4800	0.16~0.24	2800	0.16~0.24	2400	0.08~0.16	4800	0.16~0.24	3600	0.16~0.24	5600	0.16~0.24	800	0.08~0.14
10	3800	0.18~0.27	3800	0.18~0.27	2200	0.18~0.27	1900	0.10~0.18	3800	0.18~0.27	2800	0.18~0.27	4500	0.18~0.27	600	0.10~0.16
12	3200	0.20~0.30	3200	0.20~0.30	1900	0.20~0.30	1600	0.12~0.20	3200	0.20~0.30	2400	0.20~0.30	3700	0.20~0.30	500	0.12~0.18
14	2700	0.22~0.35	2700	0.22~0.35	1600	0.22~0.35	1350	0.13~0.22	2700	0.22~0.35	2100	0.22~0.35	3200	0.22~0.35	450	0.13~0.20

1. When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cuting conditions become stable, gradually increase the cutting speed and feed rate.
2. The cutting conditions above are applicable for drilling with emulsion
3. When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.
4. These conditions above are applicable for cutting depth under 3D.

ST series twist drills(Internal coolant)

3D 5D

Workpiece material	Mild steel HB≤180		Carbon steel alloy steel ~30HRC		Stainless steel					
					Austenite		Martensite		Ferrite	
Cutting speed	80~150m/min		60~150m/min		40~80 m/min		50~100 m/min		60~120 m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	12700	0.09~0.12	12700	0.09~0.12	6300	0.03~0.07	7400	0.03~0.07	9000	0.03~0.07
4	9600	0.10~0.15	9600	0.10~0.15	4700	0.04~0.08	5600	0.04~0.08	6700	0.04~0.08
5	7600	0.12~0.18	7600	0.12~0.18	3800	0.05~0.10	4500	0.05~0.10	5400	0.05~0.10
6	6400	0.14~0.20	6400	0.14~0.20	3200	0.06~0.12	3700	0.06~0.12	4500	0.06~0.12
8	4800	0.16~0.24	4800	0.16~0.24	2400	0.08~0.16	2800	0.08~0.16	3400	0.08~0.16
10	3800	0.18~0.27	3800	0.18~0.27	1900	0.10~0.18	2200	0.10~0.18	2700	0.10~0.18
12	3200	0.20~0.30	3200	0.20~0.30	1600	0.12~0.20	1900	0.12~0.20	2300	0.12~0.20
14	2700	0.22~0.35	2700	0.22~0.35	1350	0.13~0.22	1600	0.13~0.22	1900	0.13~0.22
16	2400	0.25~0.36	2400	0.25~0.36	1200	0.14~0.25	1400	0.14~0.25	1700	0.14~0.25
18	2100	0.28~0.38	2100	0.28~0.38	1050	0.15~0.28	1200	0.15~0.28	1500	0.15~0.28
20	1900	0.30~0.40	1900	0.30~0.40	950	0.16~0.30	1100	0.16~0.30	1350	0.16~0.30

1. When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cutting conditions become stable, gradually increase the cutting speed and feed rate.
2. The cutting conditions above are applicable for drilling with emulsion.
3. When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.
4. These conditions above are applicable for cutting depth under 5D.

SH series twist drills(External coolant)

3D

Workpiece material	Hardened steel					
	40~50HRC		50~55HRC		55~60HRC	
Cutting speed	20~40m/min		15~30m/min		10~20m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	3200	0.02~0.03	2100	0.02~0.03	1060	0.015~0.02
4	2400	0.03~0.04	1600	0.03~0.04	800	0.02~0.025
5	1900	0.04~0.05	1250	0.04~0.05	640	0.025~0.03
6	1600	0.05~0.06	1050	0.05~0.06	530	0.03~0.04
8	1200	0.06~0.08	800	0.06~0.07	400	0.04~0.05
10	950	0.08~0.10	640	0.07~0.08	320	0.05~0.06
12	800	0.10~0.12	530	0.08~0.09	270	0.06~0.07
14	680	0.12~0.14	450	0.09~0.10	230	0.07~0.08
16	600	0.14~0.16	400	0.10~0.12	200	0.08~0.10

1. When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cutting conditions become stable, gradually increase the cutting speed and feed rate.
2. The cutting conditions above are applicable for drilling with emulsion.
3. When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.
4. These conditions above are applicable for cutting depth under 3D.

SC series twist drills(External coolant)

3D 5D

Workpiece material	Cast iron		Nodular cast iron		Silicon aluminium alloy				Aluminum alloy	
					Si≤10%		Si>10%			
Cutting speed	50~80m/min		40~70m/min		100~180m/min		80~140m/min		120~200m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
2	9550	0.06~ 0.08	8000	0.06~ 0.08	20000	0.07~0.16	18000	0.07~0.16	24000	0.07~0.16
3	6400	0.09~ 0.12	5300	0.09~ 0.12	15000	0.09~0.18	12700	0.09~0.18	16000	0.09~0.18
4	4800	0.10~ 0.15	4000	0.10~ 0.15	11000	0.10~0.22	9600	0.10~0.22	12000	0.10~0.22
5	3800	0.12~ 0.18	3200	0.12~ 0.18	9000	0.12~0.25	7600	0.12~0.25	10000	0.12~0.25
6	3100	0.14~ 0.20	2700	0.14~ 0.20	7400	0.14~0.28	6400	0.14~0.28	8500	0.14~0.28
8	2400	0.16~ 0.24	2000	0.16~ 0.24	5600	0.18~0.32	4800	0.18~0.32	6400	0.18~0.32
10	1900	0.18~ 0.27	1600	0.18~ 0.27	4500	0.22~0.36	3800	0.22~0.36	5000	0.22~0.36
12	1600	0.20~ 0.30	1300	0.20~ 0.30	3700	0.25~0.40	3200	0.25~0.40	4200	0.25~0.40
14	1350	0.22~ 0.35	1150	0.22~ 0.35	3200	0.27~0.44	2700	0.27~0.44	3600	0.27~0.44
16	1200	0.25~ 0.36	1000	0.25~ 0.36	2800	0.32~0.48	2400	0.32~0.48	3200	0.32~0.48

1. When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cutting conditions become stable, gradually increase the cutting speed and feed rate.
2. The cutting conditions above are applicable for drilling with emulsion.
3. When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.
4. These conditions above are applicable for cutting depth under 5D.

Recommended cutting parameters

PA series coated 3 flutes drill(External coolant) 3D

Workpiece material	Cast iron		Nodular cast iron		Silicon aluminium alloy Si≤10%		Silicon aluminium alloy Si>10%		Aluminum alloy		Heat resistant alloy	
Cutting speed	60~120m/min		50~100m/min		100~160m/min		80~140m/min		120~200m/min		20~40m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	9500	0.09~0.12	7400	0.09~0.12	14000	0.07~0.16	12700	0.07~0.16	16000	0.07~0.16	3200	0.03~0.06
4	7000	0.10~0.15	5600	0.10~0.15	10000	0.09~0.18	9600	0.09~0.18	12000	0.09~0.18	2400	0.04~0.07
5	5700	0.12~0.18	4500	0.12~0.18	9000	0.10~0.22	7600	0.10~0.22	10000	0.10~0.22	1900	0.05~0.09
6	4700	0.14~0.20	3700	0.14~0.20	7400	0.12~0.25	6400	0.12~0.25	8500	0.12~0.25	1600	0.06~0.11
8	3600	0.16~0.24	2800	0.16~0.24	5600	0.14~0.28	4800	0.14~0.28	6400	0.14~0.28	1200	0.08~0.14
10	2800	0.18~0.27	2200	0.18~0.27	4500	0.18~0.32	3800	0.18~0.32	5000	0.18~0.32	950	0.10~0.16
12	2400	0.20~0.30	1900	0.20~0.30	3700	0.22~0.36	3200	0.22~0.36	4200	0.22~0.36	800	0.12~0.18
14	2100	0.22~0.35	1600	0.22~0.35	3200	0.25~0.40	2700	0.25~0.40	3600	0.25~0.40	700	0.13~0.20
16	1800	0.25~0.36	1400	0.25~0.36	2800	0.27~0.44	2400	0.27~0.44	3200	0.27~0.44	600	0.14~0.23
18	1600	0.28~0.38	1200	0.28~0.38	2500	0.32~0.48	2100	0.32~0.48	2800	0.32~0.48	530	0.15~0.25
20	1400	0.30~0.40	1100	0.30~0.40	2300	0.36~0.54	1900	0.36~0.54	2550	0.36~0.54	480	0.16~0.28

1. When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cuting conditions become stable, gradually increase the cutting speed and feed rate.
2. The cutting conditions above are applicable for drilling with emulsion.
3. When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.
4. These conditions above are applicable for cutting depth under 3D.

PA series non-coated 3 flutes drill(External coolant) 3D

Workpiece material	Cast iron		Nodular cast iron		Silicon aluminium alloy Si≤10%		Silicon aluminium alloy Si>10%		Aluminum alloy		Heat resistant alloy	
Cutting speed	50~100m/min		40~70m/min		80~160m/min		60~120m/min		100~180m/min		15~25m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	7400	0.09~0.12	5300	0.09~0.12	12700	0.07~0.16	10000	0.07~0.16	15000	0.07~0.16	2100	0.03~0.06
4	5600	0.10~0.15	4000	0.10~0.15	9600	0.09~0.18	8000	0.09~0.18	11000	0.09~0.18	1600	0.04~0.07
5	4500	0.12~0.18	3200	0.12~0.18	7600	0.10~0.22	6300	0.10~0.22	9000	0.10~0.22	1250	0.05~0.09
6	3700	0.14~0.20	2700	0.14~0.20	6400	0.12~0.25	5300	0.12~0.25	7400	0.12~0.25	1050	0.06~0.11
8	2800	0.16~0.24	2000	0.16~0.24	4800	0.14~0.28	4000	0.14~0.28	5600	0.14~0.28	800	0.08~0.14
10	2200	0.18~0.27	1600	0.18~0.27	3800	0.18~0.32	3200	0.18~0.32	4500	0.18~0.32	600	0.10~0.16
12	1900	0.20~0.30	1300	0.20~0.30	3200	0.22~0.36	2700	0.22~0.36	3700	0.22~0.36	500	0.12~0.18
14	1600	0.22~0.35	1100	0.22~0.35	2700	0.25~0.40	2300	0.25~0.40	3200	0.25~0.40	450	0.13~0.20
16	1400	0.25~0.36	1000	0.25~0.36	2400	0.27~0.44	2000	0.27~0.44	2800	0.27~0.44	400	0.14~0.23
18	1200	0.28~0.38	880	0.28~0.38	2100	0.32~0.48	1800	0.32~0.48	2500	0.32~0.48	350	0.15~0.25
20	1100	0.30~0.40	800	0.30~0.40	1900	0.36~0.54	1600	0.36~0.54	2300	0.36~0.54	320	0.16~0.28

1. When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cuting conditions become stable, gradually increase the cutting speed and feed rate.
2. The cutting conditions above are applicable for drilling with emulsion.
3. When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.
4. These conditions above are applicable for cutting depth under 3D.

PC series straight flute drill(External coolant) 5D

Workpiece material	Cast iron		Nodular cast iron		Silicon aluminium alloy				Aluminum alloy	
					Si≤10%		Si>10%			
Cutting speed	60~120m/min		50~100m/min		100~200m/min		80~160m/min		120~220m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
4	7000	0.10~ 0.15	5600	0.10~ 0.15	11000	0.12~ 0.20	9600	0.12~ 0.20	12000	0.12~ 0.20
5	5700	0.12~ 0.18	4500	0.12~ 0.18	9000	0.14~ 0.26	7600	0.14~ 0.26	10000	0.14~ 0.26
6	4700	0.14~ 0.20	3700	0.14~ 0.20	7400	0.16~ 0.28	6400	0.16~ 0.28	8500	0.16~ 0.28
8	3600	0.16~ 0.24	2800	0.16~ 0.24	5500	0.18~ 0.30	4800	0.18~ 0.30	6400	0.18~ 0.30
10	2800	0.18~ 0.27	2200	0.18~ 0.27	4500	0.20~ 0.32	3800	0.20~ 0.32	5000	0.20~ 0.32
12	2400	0.20~ 0.30	1900	0.20~ 0.30	3700	0.24~ 0.36	3200	0.24~ 0.36	4200	0.24~ 0.36
14	2100	0.22~ 0.35	1600	0.22~ 0.35	3200	0.28~ 0.44	2700	0.28~ 0.44	3600	0.28~ 0.44
16	1800	0.25~ 0.36	1400	0.25~ 0.36	2800	0.30~ 0.48	2400	0.30~ 0.48	3200	0.30~ 0.48
18	1600	0.28~0.38	1200	0.28~ 0.38	2500	0.34~ 0.52	2100	0.34~ 0.52	3000	0.34~ 0.52
20	1400	0.30~0.40	1100	0.30~ 0.40	2300	0.40~ 0.63	1900	0.40~ 0.63	2500	0.40~ 0.63

1. When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cutting conditions become stable, gradually increase the cutting speed and feed rate.
2. The cutting conditions above are applicable for drilling with emulsion.
3. When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm
4. These conditions above are applicable for cutting depth under 5D.

PC series straight flute drill(Internal coolant) 15D

Workpiece material	Cast iron		Nodular cast iron		Silicon aluminium alloy				Aluminum alloy	
					Si≤10%		Si>10%			
Cutting speed	60~120m/min		50~100m/min		100~200m/min		80~160m/min		120~220m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
5	5700	0.08~ 0.14	4500	0.08~ 0.14	9000	0.09~ 0.18	7600	0.09~ 0.18	10000	0.09~ 0.18
6	4700	0.10~ 0.16	3700	0.10~ 0.16	7400	0.12~ 0.20	6400	0.12~ 0.20	8500	0.12~ 0.20
8	3600	0.12~ 0.20	2800	0.12~ 0.20	5500	0.12~ 0.24	4800	0.12~ 0.24	6400	0.12~ 0.24
10	2800	0.14~ 0.23	2200	0.14~ 0.23	4500	0.16~ 0.28	3800	0.16~ 0.28	5000	0.16~ 0.28
12	2400	0.16~ 0.26	1900	0.16~ 0.26	3700	0.18~ 0.32	3200	0.18~ 0.32	4200	0.18~ 0.32
14	2100	0.18~ 0.32	1600	0.18~ 0.32	3200	0.20~ 0.36	2700	0.20~ 0.36	3600	0.20~ 0.36

1. When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cutting conditions become stable, gradually increase the cutting speed and feed rate.
2. The cutting conditions above are applicable for drilling with emulsion.
3. When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.
4. These conditions above are applicable for cutting depth under 15D.

SC series centering drill(External coolant)

Centering drilling

Workpiece material	Cast iron		Nodular cast iron		Silicon aluminium alloy				Aluminum alloy	
					Si≤10%		Si>10%			
Cutting speed	60~120m/min		50~100m/min		100~180m/min		80~140m/min		120~200m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
5	6400	0.09~0.14	5100	0.09~0.14	9000	0.12~0.25	7600	0.12~0.25	10000	0.12~0.25
6	5300	0.12~0.16	4200	0.12~0.16	7400	0.14~0.28	6400	0.14~0.28	8500	0.14~0.28
8	4000	0.13~0.20	3200	0.13~0.20	5600	0.18~0.32	4800	0.18~0.32	6400	0.18~0.32
10	3200	0.17~0.25	2500	0.17~0.25	4500	0.22~0.36	3800	0.22~0.36	5000	0.22~0.36
12	2700	0.20~0.30	2100	0.20~0.30	3700	0.25~0.40	3200	0.25~0.40	4200	0.25~0.40
14	2400	0.22~0.32	1800	0.22~0.32	3200	0.27~0.44	2700	0.27~0.44	3600	0.27~0.44
16	2000	0.24~0.34	1600	0.24~0.34	2800	0.32~0.48	2400	0.32~0.48	3200	0.32~0.48
20	1600	0.28~0.40	1300	0.28~0.40	2300	0.40~0.60	1900	0.40~0.60	2550	0.40~0.60

1. The cutting datas above are suitable for centering drilling machining.
2. When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cuting conditions become stable, gradually increase the cutting speed and feed rate.
3. The cutting conditions above are applicable for drilling with emulsion.
4. When centering on bevels and toroidal surfaces, please reduce the feed speed.
5. When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.

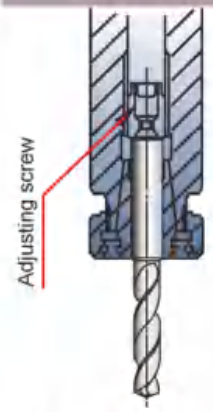
Chamfering

Workpiece material	Cast iron		Nodular cast iron		Silicon aluminium alloy				Aluminum alloy	
					Si≤10%		Si >10%			
Cutting speed	90~180m/min		70~150m/min		150~270m/min		120~210m/min		180~300m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
5	9600	0.08~0.20	7600	0.09~0.20	13500	0.12~0.30	11500	0.12~0.30	15000	0.12~0.30
6	8000	0.12~0.22	6400	0.12~0.22	11100	0.14~0.34	9600	0.14~0.34	12700	0.14~0.34
8	6000	0.13~0.28	4800	0.13~0.28	8400	0.18~0.40	7200	0.18~0.40	9600	0.18~0.40
10	4800	0.17~0.32	3800	0.17~0.32	6800	0.22~0.44	5700	0.22~0.44	7600	0.22~0.44
12	4000	0.20~0.38	3200	0.20~0.38	5600	0.25~0.50	4800	0.25~0.50	6400	0.25~0.50
14	3600	0.22~0.42	2700	0.22~0.42	4800	0.27~0.56	4000	0.27~0.56	5400	0.27~0.56
16	3000	0.24~0.46	2400	0.24~0.46	4200	0.32~0.60	3600	0.32~0.60	4800	0.32~0.60
20	2400	0.28~0.58	1900	0.28~0.58	3500	0.40~0.76	2850	0.40~0.76	3800	0.40~0.76

1. When the tool is used for the first time, please do a test cutting with 90% of the cutting speed or 85% of the feed rate stated above. As cuting conditions become stable, gradually increase the cutting speed and feed rate.
2. The cutting datas above are suitable for chamfering machining.
3. The cutting conditions above are applicable for drilling with emulsion.
4. When clamping drill, please use a collet without any defect or dust, and keep the radial run-out of drill under 0.02mm.

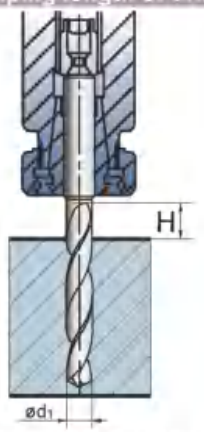
Application guide of drills

Drill clampling



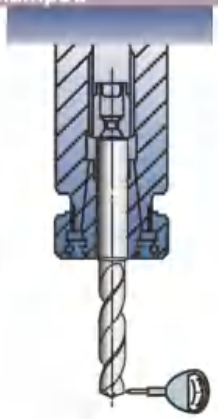
Guarantee tight clamping by using thrust bearing type collet chuck.

How to define the clamping length of drill



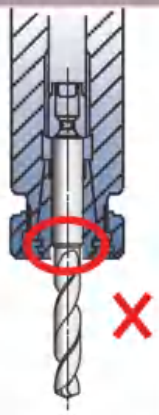
Ensure the size of H is over 1.5d1

Radial run-out of drill clamped



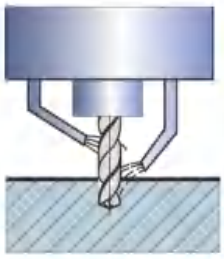
The Radial Run-out should be under 0.02mm.

Wrong drill clamping



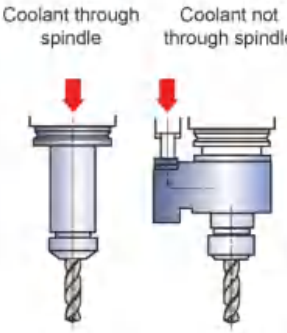
Do not clamp on the drill flutes.

Correct coolant method



The coolant liquid should be injected to the end and the middle of drill as shown in the figure.

Internal cooling: coolant supply method



coolant pressure is about 0.5~1MPa
(coolant pressure is 2~3MPa when the diameter is less than Ø5 mm)
Coolant volume is 1.5~4L/min.

Cautions on coolant use

When using internal coolant

①The little chip particles and dust will cause jamming in the oil hole. A fine mesh filter should be used to prevent such jamming, especially for small-diameter drills.

②Dirt and dust particles will adhere to the oil hole and lead to unsmooth coolant flow. Coolant change as early as possible is recommended.

Cautions on interrupted cutting



Can be drilled

Reduce the feed rate when drilling interrupted part.



Pre-machining prior to drilling

Countersink with end mill prior to drilling.

Correct method for thin workpiece

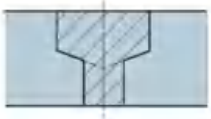


Bending occurs



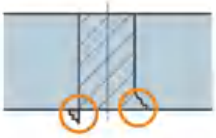
Add a supporter

Drilling method of stepped holes



①Divided to two drilling processes.
②Drill the larger diameter hole firstly.
※Multiple step and chamfer drill can be produced by us.

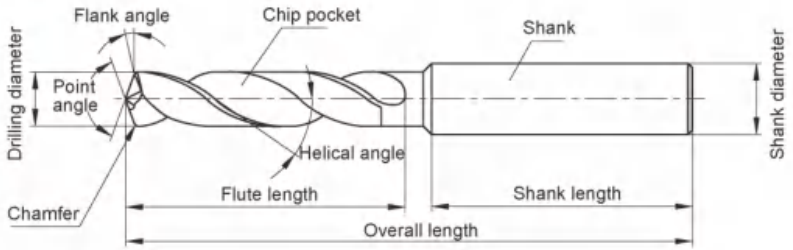
Burrs and workpiece chippings on exit

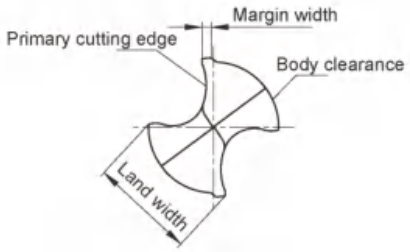


①Reduce the feed rate when approaching the exit.
②Machine chamfers at the point of exit.
③Change the point angle.

Parts terminology of drill

Terminology of drill





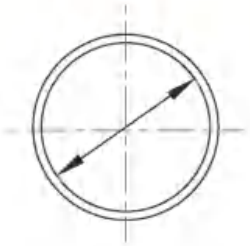
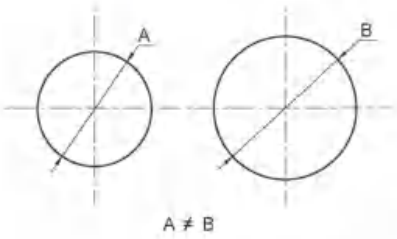
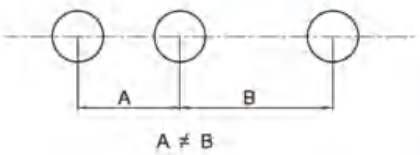
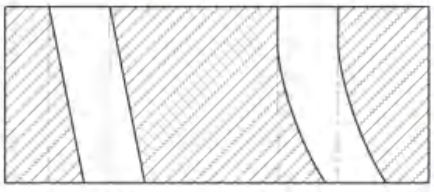
Representative cutting edge shapes

Shape	 (Conical)	 (Dual face)	 (Candler)
Features	● The flank face is conical and the clearance angel increases toward the center of drill. ● Wide applications, commonly used for both soft and hard materials	● Flank face with dual flats to facilitate cutting and initial entering. ● Often used for small-diameter drills.	● Two-stage point angle with perfect centering capability, less burr generated when drilling hole. ● First choice for drilling thin plate.

Structure specification and cutting characteristics

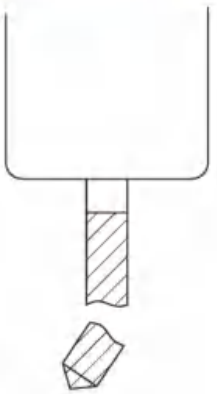
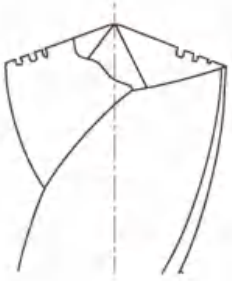
Chip pocket	The function of chip pocket is to remove the chips out of the hole. The larger the cross-sectional area is, the easier for chips to be evacuated.
Helical angle	The helical angle is the inclined angle of flute at the axial direction of a drill. It varies according to the different position of cutting edge. It decreases greatly from the peripheral toward the center. High hardness material Small ⟵ Helical angle ⟶ Large Soft material
Flute length	It is determined by depth of hole, guide bushing length and regrinding allowance. The longer the flute is, the lower the drill rigidity is, which greatly affects tool life. So it is recommended to minimize the flute length as much as possible when other requirements are met. The minimal flute length generally is depth of hole plus 1.5 times of the hole diameter.
Point angle	Generally 118°, set differently as per various applications. Soft easy-to-cut material Small ⟵ Point angle ⟶ Large for hard materials or high-efficiency machining
Core	It is an important factor that influence the rigidity and chip control of a drill. It is set according to applications. Low axial cutting force, Low rigidity, Easy-to-cut materials } Thin ⟵ Core thickness ⟶ Thick { Large axial cutting force, High rigidity, For machining of high hardness materials, cross hole drilling etc.
Margin	As a drill guide during drilling process. The margin width need to take the hole friction into consideration. Low friction with hole wall, poor guiding performance small ⟵ margin width ⟶ large Good guiding performance, high friction with hole wall
Back taper	In order to decrease the friction with inside wall of the drilled hole, there is a slight back taper from tool nose to shank. The degree is usually represented by the quantity decreasing in the diameter per 100 mm flute length.
Body clearance	It is the part formed on the clearance face after margin, mainly to reduce the friction between inside wall of hole and drill peripheral.

Common problems and solutions for drilling

	Problem	Cause	Solution
Hole	Oversize holes 	Poor clamping Large run-out around spindle	Select the holder and chuck with high precision Calibrating spindle Check and adjust after clamping drill
		Non-symmetric point angle Large run-out Chisel edge is off center	Regrind drill Check the precision after regrinding
	Irregular hole size 	Non-symmetric point angle Large run-out Chisel edge is off center Excessive margin abrasion	Select the holder and chuck with high precision Calibrating the spindle Check and adjust when clamping drill
		Poor clamping Large spindle run-out Workpiece is not firmly held	Select the holder and chuck with high precision Calibrating spindle Check and adjust after clamping drill
		Feed rate is too high	Reduce the feed speed
		Coolant provide is not enough	Change the coolant supply method, or increase coolant volume
	Low position accuracy 	Poor re-positioning precision of spindle Poor clamping Large run-out with spindle	Improve the re-positioning precision of machine Select the holder and chuck with high precision Calibrating the spindle Check and adjust after clamping drill
		The feed direction is not vertical to the workpiece surface	Adjust the feed direction vertical to the workpiece
		Top center not align with the spindle center (lathe)	Check and adjust alignment carefully before drilling
	Bad linearity Bad perpendicularity 	Excessive tool abrasion	Regrind
		Poor center hole accuracy	Increase the position accuracy of hole
		Non-symmetric point angle Large run-out Chisel edge is off center	Regrind drill Check the precision after regrinding
		Insufficient drill rigidity	Increase drill rigidity
		Uneven workpiece surface Top center does not align with the spindle center (lathe)	The workpiece must be horizontal or pre-machined to horizontal before drilling Pre-drill a center hole

	Problem	Cause	Solution
Hole	Poor roundness 	Non-symmetric point angle Large drill run-out Chisel edge is off center	Regrind drill Check the precision after regrinding
		Poor clamping Large spindle run-out Workpiece is not firmly held	Select the holder and chuck with high precision Calibrating the spindle Check run-out and adjust after clamping drill
		Clearance angle is too large	Regrind drill
		Insufficient drill rigidity	Increase drill rigidity
	Poor workpiece surface quality	Incorrect regrinding	Regrind calibration
		Insufficient coolant or unsuitable coolant type	Change coolant supply method, increase coolant volume Select the cutting oil with good lubricating property
		Poor clamping Large spindle run-out	Select the holder and chuck with high precision Calibrating the spindle
		Feed rate is too high	Decrease the feed rate
		Excessive abrasion on cutting edge Excessive build-up on margin	Regrind drill Select a coated drill
		Chip jamming	Select a suitable drill (considering flute geometry , helical angle etc) Change the cutting method (adjust feed rate, use step feed etc)
	Poor cylindricity 	Non-symmetric point angle Large drill run-out Chisel edge is off center Excessive margin abrasion	Regrind drill Check the precision after regrinding
		Feed speed is too low	Increase the feed speed

Common problems and solutions for drilling

	Problem	Cause	Solution
Drill	Drill breakage 	Bend ,distortion and slippage of machine and workpiece	Increase the rigidity of drill, machine, workpiece and clamping rigidity
		Clearance angle is too small	Regrind and calibrate
		Feed rate is too high	Decrease the feed rate
		Excessive drill abrasion	Regrind drill
		Chip jamming	Select a suitable drill (considering flute geometry , helical angle etc) Change the cutting method (adjust feed rate, use step feed etc)
		Difficult entering the workpiece	Increase the rigidity of drill and machine Increase rigidity of workpiece and clamping. Select the drill with a sharp point for easy entry Pre-drill a centre hole Adjust the level of workpiece or pre-machined to horizontal before drilling Use guide bushing or bushing plate
	Chipping on the cutting corner 	Unsuitable drill material	Select the suitable drill material
		Hard lump on the workpiece	Analyse the workpiece or select a suitable workpiece Change the cutting parameters(cutting speed , feed rate or machining method)
		Feed rate is too high	Reduce feed rate
		Insufficient coolant	Change coolant supply method, increase coolant volume
	Breakage 	Poor clamping Large spindle run-out	Select the holder and chuck with high precision Calibrating the spindle
		Cutting speed and feed speed are too high	Reduce the cutting speed and feed speed.
		Clearance angle is too large	Regrind and calibrate
		Unsuitable drill material	Select the suitable drill material

	Problem	Cause	Solution
Drill	Abnormal abrasion on cutting corner 	Regrinding delay	Regrind in time
		Drill point does not align with the spindle center (lathe)	Check and adjust alignment carefully before drilling
		Cutting speed is too high	Reduce cutting speed
		Cutting edge shape is inappropriate	Select appropriate cutting edge shape
		Unsuitable drill material	Select suitable drill material
		Incorrect coolant type	Change coolant
	Abrasion and chipping on chisel edge	Feed speed is too high	Reduce feed speed.
		Cutting edge shape is inappropriate	Select appropriate cutting edge shap
		Unsuitable drill material	Select suitable drill material
		Clearance angle is too small	Regrind drill
	Breakage on margin	The size of guide bushing or drill bushing is too large	Select another bush with correct size
	Margin build-up	Excessive abrasion on cutting edge generates high heat	Regrind drill
		Insufficient coolant	Change coolant supply method, increase coolant volume
		Incorrect coolant type	Change coolant
		Workpiece material is too soft	Change drill or machining method
	High vibration	Clearance angle is too large	Regrind drill
		Drill rigidity is not enough	Increase drill rigidity
	Chips roll around the drill	Long chips Chip removal is not fluent	Change the drill and adjust machining method and cutting parameters
	One-side abrasion	Drill point does not align with the spindle center (lathe)	Check and adjust the alignment carefully before drilling
		Poor clamping	Fix drill carefully, control the radial run-out

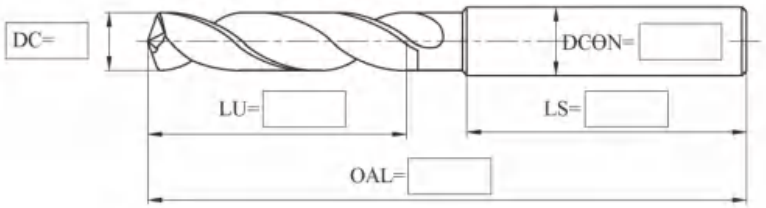
Company name: Fax: Tel: E-MAIL:	ZCC-CT Huanghe Southern Road, Tianyuan Zone, Zhuzhou. Hunan province Fax: 0731-22882721 22885420 22887878 Zip code: 412007 E-mail:zccct@zccct.com

When the diameter specification or length specification on the catalog does not meet your needs, we provide more professional, more precise non-standard customization, you just need to easily choose the series you need.

Diameter Range	External coolant	Ø2.0~Ø20.0mm
	Internal coolant	Ø3.0~Ø20.0mm

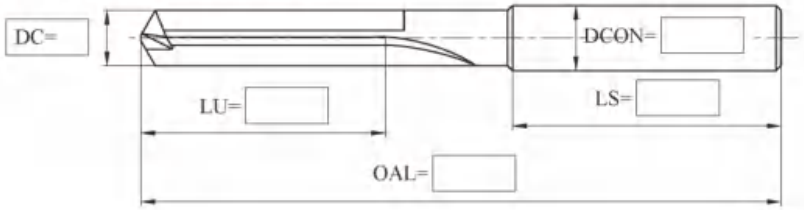
Coolant type
☐ External coolant
☐ Internal coolant

A. Twist drill



Twist drill bit series selection	
☐ GD series	☐ ST series
☐ SL series	☐ SC series

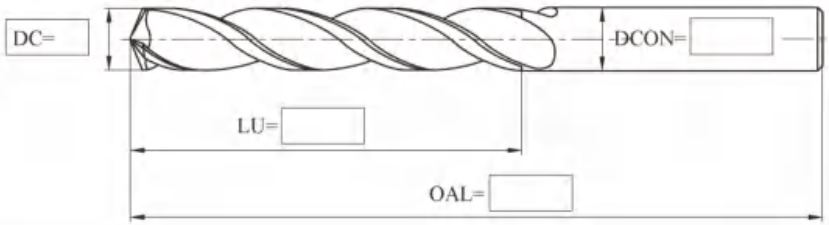
B. Straight groove drill



Straight groove drill bit series selection:

☐ PC series

C. Three flute drill



Three flute drill bit series selection:

☐ PA series

Note:

Order Quantity: PCS	Expected delivery date:
Quotation:	Confirmation:
	Date:

Company name:

Fax:

Tel:

E-MAIL:

ZCC·CT

Huanghe Southern Road, Tianyuan Zone, Zhuzhou. Hunan province

Fax: 0731-22882721 22885420 22887878

Zip code: 412007 E-mail:zccct@zccct.com

Hole information and workpiece material

Size of processed hole= mm

Tolerance of processed hole=

Depth of processed hole= mm

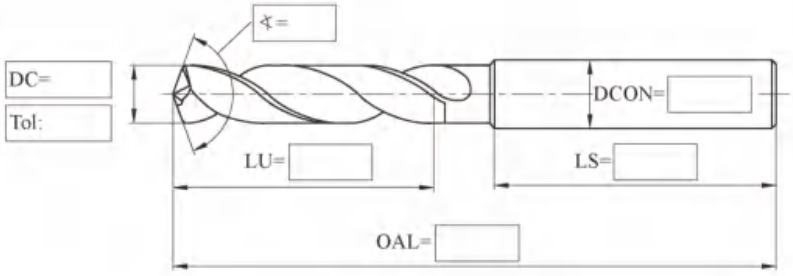
☐ Carbon Steel
☐ Alloy Steel
☐ Pre-hardened steel
☐ Hardened steel
☐ Stainless Steel
☐ Grey cast iron
☐ Ductile Iron
☐ Copper Alloy
☐ Aluminum alloy
☐ Titanium alloy
☐ Heat-resistant alloys

Material grade to be processed:

Tensile strength= N/mm^2

Hardness= Units:(HRC,HB,etc.)

Tool Information



Coolant type	
Internal coolant	
External coolant	

Coating	
Coated	☐
Non-Coated	☐

Shank form	
DIN6535	☐ Form HA
	☐ Form HB
	☐ Form HE
☐ Ordinary straight handle	
☐ With flat tail handle DIN 1809	
☐ Morse Taper Shank MT ☐	
Special shapes	

Note:

Order Quantity: PCS Expected delivery date:

Quotation: Confirmation:

Date:

Special non-standard tool customization(step twist drill)

Company name: Fax: Tel: E-MAIL:	ZCC·CT Huanghe Southern Road, Tianyuan Zone, Zhuzhou. Hunan province Fax: 0731-22882721 22885420 22887878 Zip code: 412007 E-mail:zccct@zccct.com

Hole information and workpiece material

Hole shape to be machined: ☐ ☐

Small hole size= mm

Small hole tolerance=

Large hole size= mm

Large hole tolerance=

Depth of hole to be machined= mm

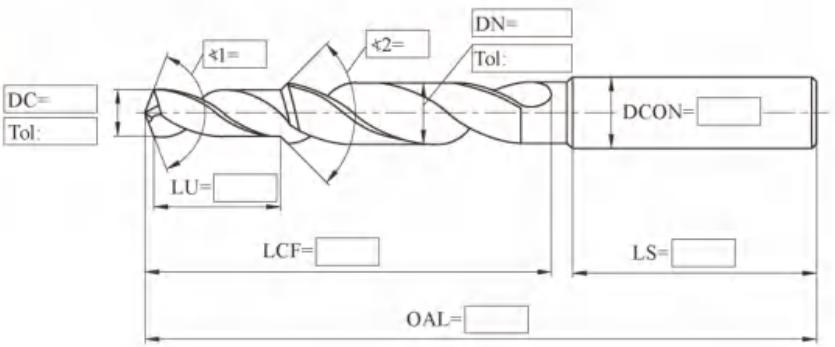
☐ Carbon Steel
☐ Alloy Steel
☐ Pre-hardened steel
☐ Hardened steel
☐ Stainless Steel
☐ Grey cast iron
☐ Ductile Iron
☐ Copper Alloy
☐ Aluminum alloy
☐ Titanium alloy
☐ Heat-resistant alloys

Material grade to be processed:

Tensile strength= N/mm^2

Hardness= Units:(HRC,HB,etc.)

Tool Information



DIN6535 Shank form

☐ Form HA
☐ Form HB
☐ Form HE
☐ Ordinary straight handle
☐ With flat tail handle DIN 1809
☐ Morse Taper Shank MT ☐
Special shapes

Coolant type	
Internal coolant	
External coolant	

Coating	
Coated	☐
Non-Coated	☐

Note:

Order Quantity: PCS	Expected delivery date:
Quotation:	Confirmation:
	Date:

Special non-standard tool customization(stepped straight groove drill)

Company name:	ZCC·CT Huanghe Southern Road, Tianyuan Zone, Zhuzhou. Hunan province
Fax:	Fax: 0731-22882721 22885420 22887878
Tel:	Zip code: 412007 E-mail:zccct@zccct.com
E-MAIL:	

Hole information and workpiece material

Size of processed hole= mm

Tolerance of processed hole=

Depth of processed hole= mm

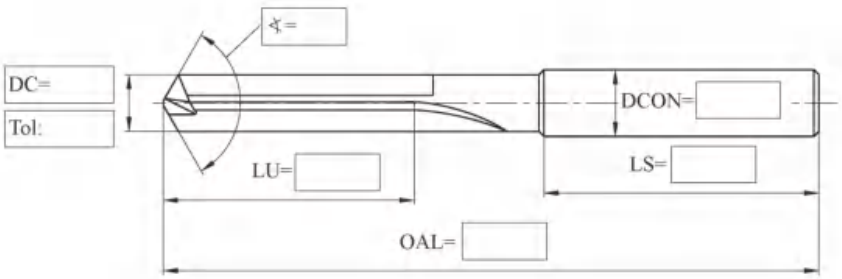
Straight groove drills are widely used for cutting short cutting materials, from cast iron, common aluminum alloys, to high silicon aluminum alloys.

Material grade to be processed:

- ☐ Grey cast iron
- ☐ Ductile Iron
- ☐ Aluminum alloy
- ☐ Silicon Aluminum Alloy Si<10%
- ☐ Silicon Aluminum Alloy Si≥10%

Tensile strength= N/mm^2

Hardness= Units:(HRC,HB,etc.)



DIN6535 Shank form

- ☐ Form HA
- ☐ Form HB
- ☐ Form HE
- ☐ Ordinary straight handle
- ☐ With flat tail handle DIN 1809
- ☐ Morse Taper Shank MT☐
- Special shapes

Coolant type	
Internal coolant	
External coolant	

Coating	
Coated	☐
Non-Coated	☐

Note:

Order Quantity:	PCS	Expected delivery date:
Quotation:		Confirmation:
		Date:

Special non-standard tool customization(stepped straight groove drill)

Company name:	ZCC·CT Huanghe Southern Road, Tianyuan Zone, Zhuzhou. Hunan province
Fax:	Fax: 0731-22882721 22885420 22887878
Tel:	Zip code: 412007 E-mail:zccct@zccct.com
E-MAIL:	

Hole information and workpiece material

Hole shape to be machined: ☐ ☐

Small hole size= mm

Small hole tolerance=

Large hole size= mm

Large hole tolerance=

Depth of hole to be machined= mm

Straight groove drills are widely used for cutting short cutting materials, from cast iron, common aluminum alloys, to high silicon aluminum alloys.

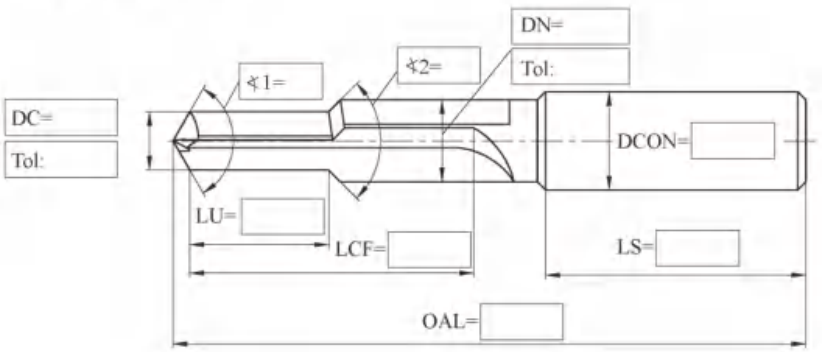
Material grade to be processed:

☐ Grey cast iron
☐ Ductile Iron
☐ Aluminum alloy
☐ Silicon Aluminum Alloy Si<10%
☐ Silicon Aluminum Alloy Si≥10%

Tensile strength= N/mm²

Hardness= Units:(HRC,HB,etc.)

Tool Information



Shank form	
DIN6535	☐ Form HA
	☐ Form HB
	☐ Form HE
☐ Ordinary straight handle	
☐ With flat tail handle DIN 1809	
☐ Morse Taper Shank MT ☐	
Special shapes	

Coolant type	
Internal coolant	
External coolant	

Coating	
Coated	☐
Non-Coated	☐

Note:

Order Quantity:	PCS	Expected delivery date:
Quotation:		Confirmation:
		Date:

How to choose the right Indexable drill

Shape

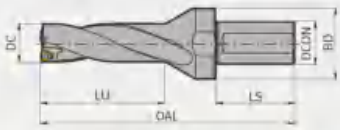
Product category

Cutting tool specification
Includes tool type, basic dimensions, applicable inserts, spare parts

Indexable drill

3D





Type	Stock	Basic dimension(mm)						Applicable inserts	Insert screw	Wrench
		DC	DCON	BD	LS	LU	OAL			
ZD03-400-XP40-WC06-02	△	40	40	47	70	125	218	WCMX06T308	I60M3×9	WT09IP
ZD03-410-XP40-WC06-02	△	41	40	47	70	128	221	WCMX06T308	I60M3×9	WT09IP
ZD03-420-XP40-WC08-02	△	42	40	52	70	131	231	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-430-XP40-WC08-02	△	43	40	52	70	134	234	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-440-XP40-WC08-02	△	44	40	52	70	137	237	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-450-XP40-WC08-02	△	45	40	52	70	140	240	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-460-XP40-WC08-02	△	46	40	52	70	143	243	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-470-XP40-WC08-02	△	47	40	52	70	146	246	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-480-XP40-WC08-02	△	48	40	52	70	149	249	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-490-XP40-WC08-02	△	49	40	52	70	152	252	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-500-XP40-WC08-02	△	50	40	52	70	155	255	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-510-XP40-WC08-02	△	51	40	60	70	158	258	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-520-XP40-WC08-02	△	52	40	60	70	161	261	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-530-XP40-WC08-02	△	53	40	60	70	164	264	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-540-XP40-WC08-02	△	54	40	60	70	167	267	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-550-XP40-WC08-02	△	55	40	60	70	170	270	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-560-XP40-WC08-02	△	56	40	60	70	173	273	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-570-XP40-WC08-02	△	57	40	60	70	176	276	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-580-XP40-WC08-02	△	58	40	60	70	179	279	WCMX080412	I60M3.5×10.4	WT15IP

▲Stock available △Make-to-order

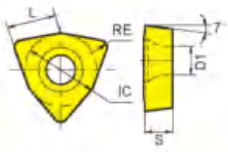
ZD03 applicable inserts

-53



-PG





Type	Basic dimension(mm)					PVD grade
	L	IC	S	D1	RE	YBG202
WCMX030208R-53	3.8	5.56	2.38	2.8	0.8	★
WCMX040208R-53	4.3	6.35	2.38	3.1	0.8	★
WCMX050308R-53	5.4	7.94	3.18	3.2	0.8	★
WCMX06T308R-53	6.5	9.525	3.97	3.7	0.8	★
WCMX080412R-53	8.7	12.7	4.76	4.3	1.2	★
WCMX030208R-PG	3.8	5.56	2.38	2.8	0.8	★
WCMX040208R-PG	4.3	6.35	2.38	3.1	0.8	★
WCMX050308R-PG	5.4	7.94	3.18	3.2	0.8	★
WCMX06T308R-PG	6.5	9.525	3.97	3.7	0.8	★
WCMX080412R-PG	8.7	12.7	4.76	4.3	1.2	★

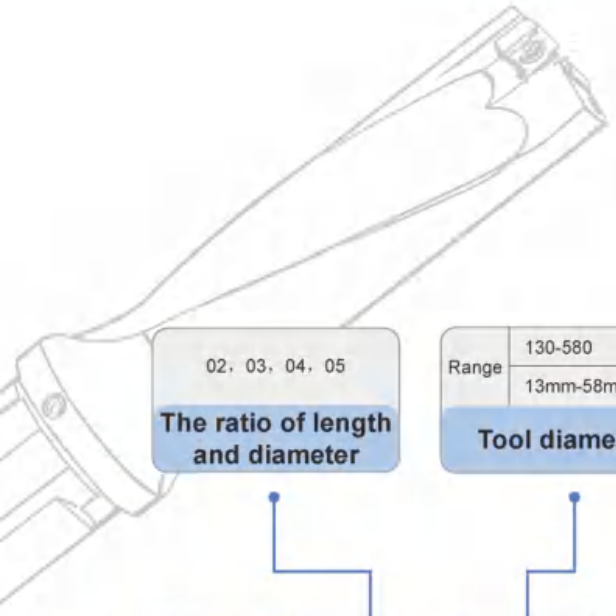
★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

Shape

Product category

Inserts specification
Including type, dimension, grade and stock.

Indexable drill code key



The ratio of length and diameter
02、03、04、05

Tool diameter	
Range	130-580
	13mm-58mm

Insert shape	
W	80°
S	

Insert clearance angle	
C	7°
P	11°

Cutting edge length(mm)		
Code	Edge length	
	W	S
03	3.8	
04	4.3	
05	5.4	5.0
06	6.5	6.0
07		7.94
08	8.7	
09		9.8
11		11.5

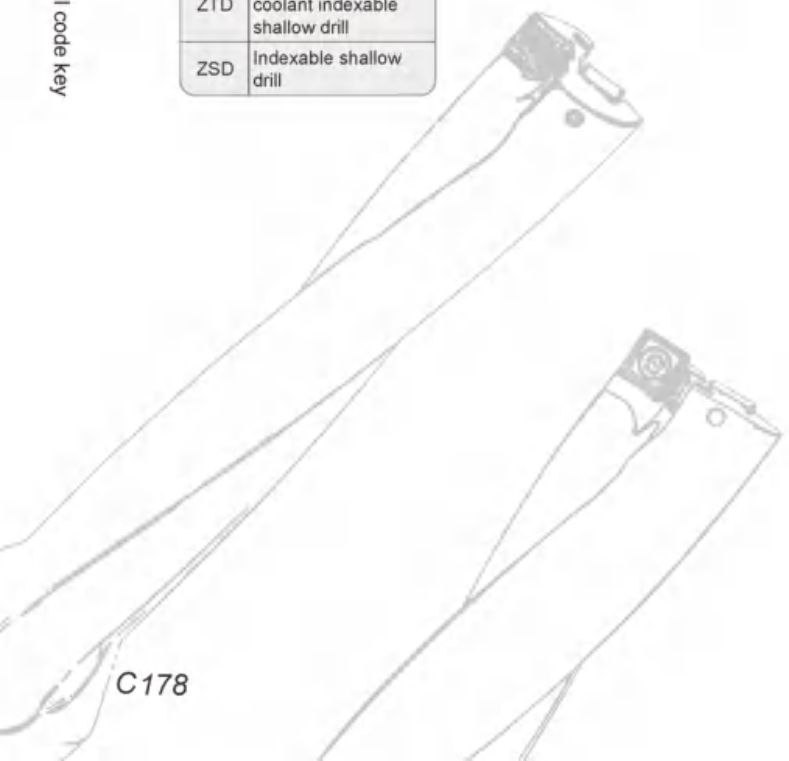
ZD 03 - 300 - XP 32 - W C 05 - 02

Tool type	
Code	Description
ZD	Indexable drill
ZTD	Double helical inner coolant indexable shallow drill
ZSD	Indexable shallow drill

Coupling structure and type	
Code	Description
XP	Weldon shank

Coupling size(mm)
20、25、32、40

Number of tooth





High Efficient Indexable Drill

ZSD series

2 Patents

- Unique waved-edge geometry structure produces steady cutting and smooth chip evacuation;
- Insert designed for double balanced radial run-out control for achieving high accuracy and precision even in long overhang applications;
- Wiper technology produces excellent surface quality and diameter dimension consistency;
- Strong impact-resistance and highly rigid design structure helps achieve high speed, high efficiency, and high stability machining;
- Economical four-edges insert, design suitable for Deep-hole drilling in 2D~5D.



-EM
Geometry for soft steels to prevent chip-wrapping.

-XM
General-purpose geometry for stable machining operations.

-LM
Geometry for Stainless steel and sticky chip materials.

-XR
Machining of hard materials, strengthen cutting edges.

There are four types of geometry, suitable for high efficiency and stability machining in multiple materials.

Case study

Workpiece material: 45°steel (HB170-220)
Tool: ZSD05-160-XP20-SP05-02
Insert: SPMX050204-XM/YB9320
Cutting data: Vc=120m/min, f=0.07mm/r, ap=80mm
Cooling: Internal coolant supply

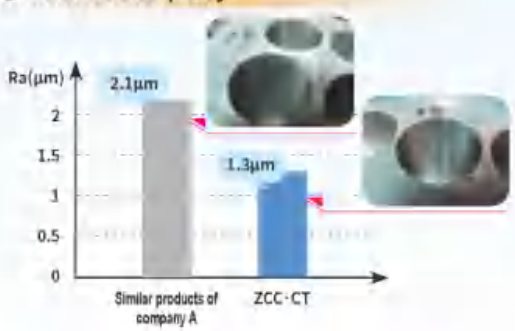
● Aperture cylindricity



ZCC·CT　　Similar products of company A

Cylindricity	0.03mm	0.15mm

● Hole surface quality



Conclusion: under the same working conditions, the machined hole surface quality by ZSD series indexable insert drill contributes to better hole precision than A company's similar products.



CVD Cemented Carbide Coating Grades

YB6338 (Peripheral edge inserts)

- The substrate is made of toughness gradient cemented carbide with enriched surface bonding phase, and adopts nano-dioxide gradient transition layer and nucleus pre-growth coating technology, with high wear resistance and heat resistance.
- Suitable for high speed, high feed, stable working conditions drilling. The first choice for steel and cast iron external edge drilling processing.



PVD Cemented Carbide Coating Grades

YBM215 (Inner/Peripheral edge inserts)

Nano-multilayer PVD coating grades

- Significantly improve the wear resistance and anti-temperature performance of the coating. Gradient transition layer technology effectively improves the coating stress state and interface state, reduces stress concentration, improves the strength between the coating and the substrate,and increases the stability of the tool, suitable for drilling stainless steel materials.

YBS203 (Inner/Peripheral edge inserts)

General grades for S materials

- Through the alloy toughness enhancement technology, the crack extension and high temperature oxidation resistance of the tool is improved while ensuring high wear resistance.
- The use of a new carbide matrix formula significantly improves the tool's high temperature performance, extends tool life, and ensures both the wear resistance and impact resistance.

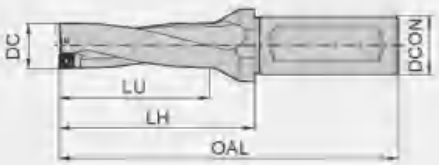
YB9320 (Inner/Peripheral edge inserts)

Suitable for M material milling

- Atomic rearrangement technology, to achieve the long-range orderly arrangement of different coating materials, to achieve the perfect matching of hardness and toughness, effectively solving the problem of high temperature destabilisation of multi-coating interfaces, and improving the high temperature performance of coatings.
- High toughness matrix with TiAlN-based nanomultilayer coating, unique ion etching technology to strengthen the edge and improve the bond strength between the coating and the matrix.
- Advanced surface treatment technology to optimise stress distribution and ensure a better overall performance.

Indexable drill ZSD02 2D



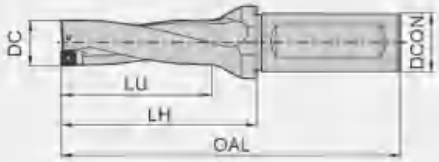


Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LH	OAL			
ZSD02-120-XP20-SP04-02	▲	12.0	20	27	44	94	SPMX040203-XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD02-125-XP20-SP04-02	▲	12.5	20	28	45	95	SPMX040203-XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD02-130-XP20-SP04-02	▲	13.0	20	29	46	96	SPMX040203-XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD02-135-XP20-SP04-02	▲	13.5	20	30	47	97	SPMX040203-XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD02-140-XP20-SP04-02	▲	14.0	20	31	48	98	SPMX040203-XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD02-145-XP20-SP04-02	▲	14.5	20	32	49	99	SPMX040203-XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD02-150-XP20-SP05-02	▲	15.0	20	33	50	100	SPMX050204-XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD02-155-XP20-SP05-02	▲	15.5	20	34	51	101	SPMX050204-XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD02-160-XP20-SP05-02	▲	16.0	20	35	52	102	SPMX050204-XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD02-165-XP20-SP05-02	▲	16.5	20	36	53	103	SPMX050204-XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD02-170-XP20-SP05-02	▲	17.0	20	37	54	104	SPMX050204-XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD02-175-XP20-SP05-02	▲	17.5	20	38	55	105	SPMX050204-XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD02-180-XP25-SP06-02	▲	18.0	25	39	57	113	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD02-185-XP25-SP06-02	▲	18.5	25	40	58	114	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD02-190-XP25-SP06-02	▲	19.0	25	41	59	115	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD02-195-XP25-SP06-02	▲	19.5	25	42	60	116	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD02-200-XP25-SP06-02	▲	20.0	25	43	61	117	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD02-205-XP25-SP06-02	▲	20.5	25	44	62	118	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD02-210-XP25-SP06-02	▲	21.0	25	45	63	119	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD02-215-XP25-SP06-02	▲	21.5	25	46	64	120	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD02-220-XP25-SP06-02	▲	22.0	25	47	65	121	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD02-225-XP25-SP07-02	▲	22.5	25	48	66	122	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD02-230-XP25-SP07-02	▲	23.0	25	49	67	123	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD02-235-XP25-SP07-02	▲	23.5	25	50	68	124	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD02-240-XP25-SP07-02	▲	24.0	25	51	69	125	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD02-245-XP25-SP07-02	▲	24.5	25	52	70	126	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD02-250-XP25-SP07-02	▲	25.0	25	53	71	127	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD02-255-XP25-SP07-02	▲	25.5	25	54	72	128	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD02-260-XP25-SP07-02	▲	26.0	25	55	73	129	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD02-265-XP25-SP07-02	▲	26.5	25	56	74	130	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD02-270-XP25-SP07-02	▲	27.0	25	57	75	131	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP

▲Stock available △Make-to-order

Indexable drill ZSD02 2D





Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LH	OAL			
ZSD02-275-XP25-SP07-02	▲	27.5	25	58	76	132	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD02-280-XP32-SP09-02	▲	28.0	32	59	79	139	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD02-285-XP32-SP09-02	▲	28.5	32	60	80	140	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD02-290-XP32-SP09-02	▲	29.0	32	61	81	141	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD02-295-XP32-SP09-02	▲	29.5	32	62	82	142	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD02-300-XP32-SP09-02	▲	30.0	32	63	83	143	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD02-305-XP32-SP09-02	▲	30.5	32	64	84	144	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD02-310-XP32-SP09-02	▲	31.0	32	65	85	145	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD02-315-XP32-SP09-02	▲	31.5	32	66	86	146	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD02-320-XP32-SP09-02	▲	32.0	32	67	87	147	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD02-325-XP32-SP09-02	▲	32.5	32	68	88	148	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD02-330-XP32-SP09-02	▲	33.0	32	69	89	149	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD02-335-XP32-SP09-02	▲	33.5	32	70	90	150	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD02-340-XP40-SP11-02	▲	34.0	40	71	96	166	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-345-XP40-SP11-02	△	34.5	40	72	97	167	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-350-XP40-SP11-02	▲	35.0	40	73	98	168	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-355-XP40-SP11-02	△	35.5	40	74	99	169	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-360-XP40-SP11-02	▲	36.0	40	75	100	170	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-365-XP40-SP11-02	△	36.5	40	76	101	171	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-370-XP40-SP11-02	▲	37.0	40	77	102	172	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-375-XP40-SP11-02	△	37.5	40	78	103	173	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-380-XP40-SP11-02	▲	38.0	40	79	104	174	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-385-XP40-SP11-02	△	38.5	40	80	105	175	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-390-XP40-SP11-02	▲	39.0	40	81	106	176	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-395-XP40-SP11-02	△	39.5	40	82	107	177	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-400-XP40-SP11-02	▲	40.0	40	83	108	178	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-405-XP40-SP11-02	△	40.5	40	84	109	179	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-410-XP40-SP11-02	▲	41.0	40	85	110	180	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-415-XP40-SP11-02	△	41.5	40	86	111	181	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-420-XP40-SP11-02	▲	42.0	40	87	119	189	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD02-425-XP40-SP14-02	△	42.5	40	88	120	190	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP

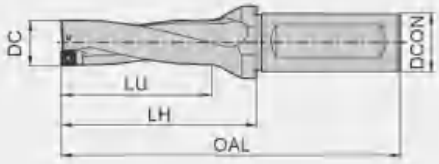
▲Stock available △Make-to-order

Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LH	OAL			
ZSD02-430-XP40-SP14-02	▲	43.0	40	89	121	191	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD02-435-XP40-SP14-02	△	43.5	40	90	122	192	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD02-440-XP40-SP14-02	▲	44.0	40	91	123	193	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD02-445-XP40-SP14-02	△	44.5	40	92	124	194	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD02-450-XP40-SP14-02	▲	45.0	40	93	125	195	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD02-455-XP40-SP14-02	△	45.5	40	94	126	196	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD02-460-XP40-SP14-02	▲	46.0	40	95	127	197	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD02-465-XP40-SP14-02	△	46.5	40	96	128	198	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD02-470-XP40-SP14-02	▲	47.0	40	97	129	199	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD02-475-XP40-SP14-02	△	47.5	40	98	130	200	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD02-480-XP40-SP14-02	▲	48.0	40	99	131	201	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD02-485-XP40-SP14-02	△	48.5	40	100	132	202	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD02-490-XP40-SP14-02	▲	49.0	40	101	133	203	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD02-495-XP40-SP14-02	△	49.5	40	102	134	204	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD02-500-XP40-SP14-02	▲	50.0	40	103	135	205	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP

▲Stock available △Make-to-order

Indexable drill ZSD03 3D





Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LH	OAL			
ZSD03-120-XP20-SP04-02	▲	12.0	20	39	55	105	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD03-125-XP20-SP04-02	▲	12.5	20	41	57	107	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD03-130-XP20-SP04-02	▲	13.0	20	42	58	108	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD03-135-XP20-SP04-02	▲	13.5	20	44	60	110	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD03-140-XP20-SP04-02	▲	14.0	20	45	61	111	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD03-145-XP20-SP04-02	▲	14.5	20	47	63	113	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD03-150-XP20-SP05-02	▲	15.0	20	48	64	114	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD03-155-XP20-SP05-02	▲	15.5	20	50	66	116	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD03-160-XP20-SP05-02	▲	16.0	20	51	67	117	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD03-165-XP20-SP05-02	▲	16.5	20	53	69	119	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD03-170-XP20-SP05-02	▲	17.0	20	54	70	120	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD03-175-XP20-SP05-02	▲	17.5	20	56	72	122	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD03-180-XP25-SP06-02	▲	18.0	25	57	75	131	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD03-185-XP25-SP06-02	▲	18.5	25	59	77	133	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD03-190-XP25-SP06-02	▲	19.0	25	60	78	134	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD03-195-XP25-SP06-02	▲	19.5	25	62	80	136	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD03-200-XP25-SP06-02	▲	20.0	25	63	81	137	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD03-205-XP25-SP06-02	▲	20.5	25	65	83	139	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD03-210-XP25-SP06-02	▲	21.0	25	66	84	140	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD03-215-XP25-SP06-02	▲	21.5	25	68	86	142	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD03-220-XP25-SP06-02	▲	22.0	25	69	87	143	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD03-225-XP25-SP07-02	▲	22.5	25	71	89	145	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD03-230-XP25-SP07-02	▲	23.0	25	72	91	147	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD03-235-XP25-SP07-02	▲	23.5	25	74	93	149	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD03-240-XP25-SP07-02	▲	24.0	25	75	94	150	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD03-245-XP25-SP07-02	▲	24.5	25	77	96	152	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP

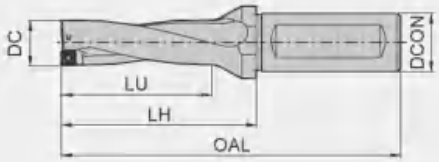
▲Stock available △Make-to-order

Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LH	OAL			
ZSD03-250-XP25-SP07-02	▲	25.0	25	78	97	153	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD03-255-XP25-SP07-02	▲	25.5	25	80	99	155	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD03-260-XP25-SP07-02	▲	26.0	25	81	100	156	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD03-265-XP25-SP07-02	▲	26.5	25	83	102	158	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD03-270-XP25-SP07-02	▲	27.0	25	84	104	160	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD03-275-XP25-SP07-02	▲	27.5	25	86	106	162	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD03-280-XP32-SP09-02	▲	28.0	32	87	109	169	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD03-285-XP32-SP09-02	▲	28.5	32	89	111	171	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD03-290-XP32-SP09-02	▲	29.0	32	90	112	172	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD03-295-XP32-SP09-02	▲	29.5	32	92	114	174	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD03-300-XP32-SP09-02	▲	30.0	32	93	115	175	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD03-305-XP32-SP09-02	▲	30.5	32	95	117	177	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD03-310-XP32-SP09-02	▲	31.0	32	96	118	178	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD03-315-XP32-SP09-02	▲	31.5	32	98	120	180	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD03-320-XP32-SP09-02	▲	32.0	32	99	121	181	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD03-325-XP32-SP09-02	▲	32.5	32	101	123	183	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD03-330-XP32-SP09-02	▲	33.0	32	102	124	184	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD03-335-XP32-SP09-02	▲	33.5	32	104	126	186	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD03-340-XP40-SP11-02	▲	34.0	40	105	130	200	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-345-XP40-SP11-02	△	34.5	40	107	132	202	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-350-XP40-SP11-02	▲	35.0	40	108	133	203	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-355-XP40-SP11-02	△	35.5	40	100	135	205	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-360-XP40-SP11-02	▲	36.0	40	111	136	206	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-365-XP40-SP11-02	△	36.5	40	113	138	208	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-370-XP40-SP11-02	▲	37.0	40	114	139	209	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-375-XP40-SP11-02	△	37.5	40	116	141	211	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-380-XP40-SP11-02	▲	38.0	40	117	142	212	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-385-XP40-SP11-02	△	38.5	40	119	144	214	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-390-XP40-SP11-02	▲	39.0	40	120	145	215	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-395-XP40-SP11-02	△	39.5	40	122	147	217	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-400-XP40-SP11-02	▲	40.0	40	123	148	218	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-405-XP40-SP11-02	△	40.5	40	125	150	220	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-410-XP40-SP11-02	▲	41.0	40	126	151	221	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-415-XP40-SP11-02	△	41.5	40	128	153	223	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD03-420-XP40-SP11-02	▲	42.0	40	129	161	231	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP

▲Stock available △Make-to-order

Indexable drill ZSD03 3D



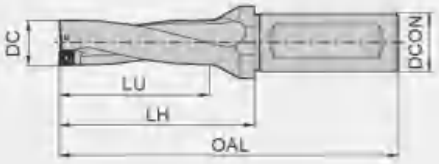


Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LH	OAL			
ZSD03-425-XP40-SP14-02	△	42.5	40	131	163	233	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD03-430-XP40-SP14-02	▲	43.0	40	132	164	234	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD03-435-XP40-SP14-02	△	43.5	40	134	166	236	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD03-440-XP40-SP14-02	▲	44.0	40	135	167	237	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD03-445-XP40-SP14-02	△	44.5	40	137	169	239	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD03-450-XP40-SP14-02	▲	45.0	40	138	170	240	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD03-455-XP40-SP14-02	△	45.5	40	140	172	242	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD03-460-XP40-SP14-02	▲	46.0	40	141	173	243	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD03-465-XP40-SP14-02	△	46.5	40	142	175	245	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD03-470-XP40-SP14-02	▲	47.0	40	144	176	246	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD03-475-XP40-SP14-02	△	47.5	40	146	178	248	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD03-480-XP40-SP14-02	▲	48.0	40	147	179	249	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD03-485-XP40-SP14-02	△	48.5	40	149	181	251	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD03-490-XP40-SP14-02	▲	49.0	40	150	182	252	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD03-495-XP40-SP14-02	△	49.5	40	152	184	254	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD03-500-XP40-SP14-02	▲	50.0	40	153	185	255	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP

▲Stock available △Make-to-order

Indexable drill ZSD04 4D



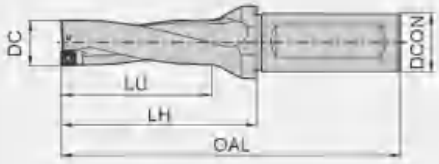


Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LH	OAL			
ZSD04-120-XP20-SP04-02	▲	12.0	20	51	67	117	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD04-125-XP20-SP04-02	▲	12.5	20	53	69	119	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD04-130-XP20-SP04-02	▲	13.0	20	55	71	121	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD04-135-XP20-SP04-02	▲	13.5	20	57	73	123	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD04-140-XP20-SP04-02	▲	14.0	20	59	75	125	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD04-145-XP20-SP04-02	▲	14.5	20	61	77	127	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD04-150-XP20-SP05-02	▲	15.0	20	63	79	129	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD04-155-XP20-SP05-02	▲	15.5	20	65	81	131	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD04-160-XP20-SP05-02	▲	16.0	20	67	83	133	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD04-165-XP20-SP05-02	▲	16.5	20	69	85	135	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD04-170-XP20-SP05-02	▲	17.0	20	71	87	137	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD04-175-XP20-SP05-02	▲	17.5	20	73	89	139	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD04-180-XP25-SP06-02	▲	18.0	25	75	93	149	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD04-185-XP25-SP06-02	▲	18.5	25	77	95	151	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD04-190-XP25-SP06-02	▲	19.0	25	79	97	153	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD04-195-XP25-SP06-02	▲	19.5	25	81	99	155	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD04-200-XP25-SP06-02	▲	20.0	25	83	101	157	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD04-205-XP25-SP06-02	▲	20.5	25	85	103	159	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD04-210-XP25-SP06-02	▲	21.0	25	87	105	161	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD04-215-XP25-SP06-02	▲	21.5	25	89	107	163	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD04-220-XP25-SP06-02	▲	22.0	25	91	109	165	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD04-225-XP25-SP07-02	▲	22.5	25	93	111	167	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-230-XP25-SP07-02	▲	23.0	25	95	114	170	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-235-XP25-SP07-02	▲	23.5	25	97	116	172	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-240-XP25-SP07-02	▲	24.0	25	99	118	174	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-245-XP25-SP07-02	▲	24.5	25	101	120	176	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-250-XP25-SP07-02	▲	25.0	25	103	122	178	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-250-XP32-SP07-02	▲	25.0	32	103	122	182	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-255-XP25-SP07-02	▲	25.5	25	105	125	181	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-255-XP32-SP07-02	▲	25.5	32	105	125	185	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-260-XP25-SP07-02	▲	26.0	25	107	126	182	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP

▲Stock available △Make-to-order

Indexable drill ZSD04 4D





Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LH	OAL			
ZSD04-260-XP32-SP07-02	▲	26.0	32	107	126	186	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-265-XP25-SP07-02	▲	26.5	25	109	128	184	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-265-XP32-SP07-02	▲	26.5	32	109	128	186	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-270-XP25-SP07-02	▲	27.0	25	111	131	187	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-270-XP32-SP07-02	▲	27.0	32	111	131	191	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-275-XP25-SP07-02	▲	27.5	25	113	134	190	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-275-XP32-SP07-02	▲	27.5	32	113	134	194	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD04-280-XP32-SP09-02	▲	28.0	32	115	139	199	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-285-XP32-SP09-02	▲	28.5	32	117	141	201	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-290-XP32-SP09-02	▲	29.0	32	119	143	203	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-295-XP32-SP09-02	▲	29.5	32	121	145	205	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-300-XP32-SP09-02	▲	30.0	32	123	147	207	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-305-XP32-SP09-02	▲	30.5	32	125	149	209	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-310-XP32-SP09-02	▲	31.0	32	127	151	211	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-315-XP32-SP09-02	▲	31.5	32	129	153	213	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-320-XP32-SP09-02	▲	32.0	32	131	155	215	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-320-XP40-SP09-02	▲	32.0	40	131	155	225	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-325-XP32-SP09-02	▲	32.5	32	133	157	217	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-325-XP40-SP09-02	▲	32.5	40	133	157	227	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-330-XP32-SP09-02	▲	33.0	32	135	159	219	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-330-XP40-SP09-02	▲	33.0	40	135	159	229	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-335-XP32-SP09-02	▲	33.5	32	137	161	221	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-335-XP40-SP09-02	▲	33.5	40	137	161	231	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD04-340-XP40-SP11-02	▲	34.0	40	139	164	234	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-345-XP40-SP11-02	△	34.5	40	141	166	236	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-350-XP40-SP11-02	▲	35.0	40	143	168	238	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-355-XP40-SP11-02	△	35.5	40	145	170	240	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-360-XP40-SP11-02	▲	36.0	40	147	172	242	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-365-XP40-SP11-02	△	36.5	40	149	174	244	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-370-XP40-SP11-02	▲	37.0	40	151	176	246	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-375-XP40-SP11-02	△	37.5	40	153	178	248	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP

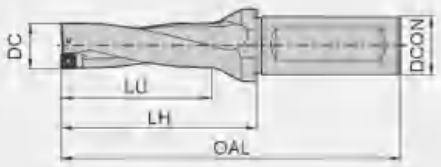
▲Stock available △Make-to-order

Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LH	OAL			
ZSD04-380-XP40-SP11-02	▲	38.0	40	155	180	250	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-385-XP40-SP11-02	△	38.5	40	157	182	252	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-390-XP40-SP11-02	▲	39.0	40	159	184	254	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-395-XP40-SP11-02	△	39.5	40	161	186	256	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-400-XP40-SP11-02	▲	40.0	40	163	188	258	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-405-XP40-SP11-02	△	40.5	40	165	190	260	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-410-XP40-SP11-02	▲	41.0	40	167	192	262	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-415-XP40-SP11-02	△	41.5	40	169	194	264	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-420-XP40-SP11-02	▲	42.0	40	171	203	273	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-420-XP50-SP11-02	△	42.0	50	171	203	283	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD04-425-XP40-SP14-02	△	42.5	40	173	205	275	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-425-XP50-SP14-02	△	42.5	50	173	205	285	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-430-XP40-SP14-02	▲	43.0	40	175	207	277	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-430-XP50-SP14-02	△	43.0	50	175	207	287	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-435-XP40-SP14-02	△	43.5	40	177	209	279	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-435-XP50-SP14-02	△	43.5	50	177	209	289	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-440-XP40-SP14-02	▲	44.0	40	179	211	281	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-440-XP50-SP14-02	△	44.0	50	179	211	291	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-445-XP40-SP14-02	△	44.5	40	181	213	283	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-445-XP50-SP14-02	△	44.5	50	181	213	293	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-450-XP40-SP14-02	▲	45.0	40	183	215	285	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-450-XP50-SP14-02	△	45.0	50	183	225	295	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-455-XP40-SP14-02	△	45.5	40	185	217	287	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-455-XP50-SP14-02	△	45.5	50	185	217	297	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-460-XP40-SP14-02	▲	46.0	40	187	219	289	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-460-XP50-SP14-02	△	46.0	50	187	219	299	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-465-XP40-SP14-02	△	46.5	40	189	221	291	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-465-XP50-SP14-02	△	46.5	50	189	221	301	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-470-XP40-SP14-02	▲	47.0	40	191	223	293	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-470-XP50-SP14-02	△	47.0	50	191	223	303	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-475-XP40-SP14-02	△	47.5	40	193	225	295	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-475-XP50-SP14-02	△	47.5	50	193	225	305	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-480-XP40-SP14-02	▲	48.0	40	195	227	297	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-480-XP50-SP14-02	△	48.0	50	195	227	307	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-485-XP40-SP14-02	△	48.5	40	197	229	299	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-485-XP50-SP14-02	△	48.5	50	197	229	309	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-490-XP40-SP14-02	▲	49.0	40	199	231	301	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-490-XP50-SP14-02	△	49.0	50	199	231	311	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-495-XP40-SP14-02	△	49.5	40	201	233	303	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-495-XP50-SP14-02	△	49.5	50	201	233	313	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-500-XP40-SP14-02	▲	50.0	40	203	235	305	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD04-500-XP50-SP14-02	△	50.0	50	203	235	315	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP

▲Stock available △Make-to-order

Indexable drill ZSD05 5D





Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LH	OAL			
ZSD05-120-XP20-SP04-02	▲	12.0	20	63	79	129	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD05-125-XP20-SP04-02	▲	12.5	20	66	82	132	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD05-130-XP20-SP04-02	▲	13.0	20	68	84	134	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD05-135-XP20-SP04-02	▲	13.5	20	71	87	137	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD05-140-XP20-SP04-02	▲	14.0	20	73	89	139	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD05-145-XP20-SP04-02	▲	14.5	20	76	91	141	SPMX040203- XR/XM/LM/EM	I60M1.8×4.5	WT05IP
ZSD05-150-XP20-SP05-02	▲	15.0	20	78	94	144	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD05-155-XP20-SP05-02	▲	15.5	20	81	97	147	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD05-160-XP20-SP05-02	▲	16.0	20	83	99	149	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD05-165-XP20-SP05-02	▲	16.5	20	86	102	152	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD05-170-XP20-SP05-02	▲	17.0	20	88	104	154	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD05-175-XP20-SP05-02	▲	17.5	20	91	107	157	SPMX050204- XR/XM/LM/EM	I60M2×4.3	WT06P
ZSD05-180-XP25-SP06-02	▲	18.0	25	93	112	167	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD05-185-XP25-SP06-02	▲	18.5	25	96	114	170	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD05-190-XP25-SP06-02	▲	19.0	25	98	116	172	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD05-195-XP25-SP06-02	▲	19.5	25	101	119	175	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD05-200-XP25-SP06-02	▲	20.0	25	103	121	177	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD05-205-XP25-SP06-02	▲	20.5	25	106	124	180	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD05-210-XP25-SP06-02	▲	21.0	25	108	126	182	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD05-215-XP25-SP06-02	▲	21.5	25	111	129	185	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD05-220-XP25-SP06-02	▲	22.0	25	113	131	187	SPMX060204- XR/XM/LM/EM	I60M2.2×5.5	WT07IP
ZSD05-225-XP25-SP07-02	▲	22.5	25	116	134	190	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD05-230-XP25-SP07-02	▲	23.0	25	118	138	194	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD05-235-XP25-SP07-02	▲	23.5	25	121	141	197	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD05-240-XP25-SP07-02	▲	24.0	25	123	143	199	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD05-245-XP25-SP07-02	▲	24.5	25	126	146	202	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD05-250-XP25-SP07-02	▲	25.0	25	128	148	204	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD05-250-XP32-SP07-02	▲	25.0	32	128	148	208	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD05-255-XP25-SP07-02	▲	25.5	25	131	151	207	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD05-255-XP32-SP07-02	▲	25.5	32	131	151	211	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD05-260-XP25-SP07-02	▲	26.0	25	133	153	209	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD05-260-XP32-SP07-02	▲	26.0	32	133	153	213	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP

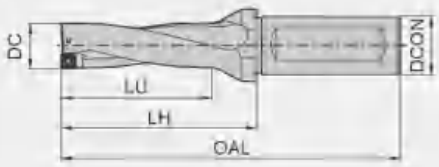
▲Stock available △Make-to-order

Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LH	OAL			
ZSD05-265-XP25-SP07-02	▲	26.5	25	136	156	212	SPMX07T308- XR/XM/LM/EM	I60M2.5*7.4	WT07IP
ZSD05-265-XP32-SP07-02	▲	26.5	32	136	156	216	SPMX07T308- XR/XM/LM/EM	I60M2.5*7.4	WT07IP
ZSD05-270-XP25-SP07-02	▲	27.0	25	136	158	214	SPMX07T308- XR/XM/LM/EM	I60M2.5*7.4	WT07IP
ZSD05-270-XP32-SP07-02	▲	27.0	32	136	158	218	SPMX07T308- XR/XM/LM/EM	I60M2.5*7.4	WT07IP
ZSD05-275-XP25-SP07-02	▲	27.5	25	141	161	217	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD05-275-XP32-SP07-02	▲	27.5	32	141	161	221	SPMX07T308- XR/XM/LM/EM	I60M2.5×7.4	WT07IP
ZSD05-280-XP32-SP09-02	▲	28.0	32	143	163	223	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-285-XP32-SP09-02	▲	28.5	32	146	166	226	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-290-XP32-SP09-02	▲	29.0	32	148	168	228	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-295-XP32-SP09-02	▲	29.5	32	151	171	231	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-300-XP32-SP09-02	▲	30.0	32	153	173	233	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-305-XP32-SP09-02	▲	30.5	32	156	176	236	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-310-XP32-SP09-02	▲	31.0	32	158	178	238	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-315-XP32-SP09-02	▲	31.5	32	161	181	241	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-320-XP32-SP09-02	▲	32.0	32	163	183	243	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-320-XP40-SP09-02	▲	32.0	40	163	183	253	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-325-XP32-SP09-02	▲	32.5	32	166	186	246	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-325-XP40-SP09-02	▲	32.5	40	166	186	256	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-330-XP32-SP09-02	▲	33.0	32	168	189	249	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-330-XP40-SP09-02	▲	33.0	40	168	189	259	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-335-XP32-SP09-02	▲	33.5	32	171	193	253	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-335-XP40-SP09-02	▲	33.5	40	171	193	263	SPMX090408- XR/XM/LM/EM	I60M3.5×8	WT15IP
ZSD05-340-XP40-SP11-02	▲	34.0	40	173	198	268	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-345-XP40-SP11-02	△	34.5	40	176	201	271	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-350-XP40-SP11-02	▲	35.0	40	178	203	273	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-355-XP40-SP11-02	△	35.5	40	181	206	276	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-360-XP40-SP11-02	▲	36.0	40	183	208	278	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-365-XP40-SP11-02	△	36.5	40	186	211	281	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-370-XP40-SP11-02	▲	37.0	40	188	213	283	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-375-XP40-SP11-02	△	37.5	40	191	216	286	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-380-XP40-SP11-02	▲	38.0	40	193	218	288	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-385-XP40-SP11-02	△	38.5	40	196	221	291	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-390-XP40-SP11-02	▲	39.0	40	198	223	293	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-395-XP40-SP11-02	△	39.5	40	201	226	296	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-400-XP40-SP11-02	▲	40.0	40	203	228	298	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-405-XP40-SP11-02	△	40.5	40	206	231	301	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-410-XP40-SP11-02	▲	41.0	40	208	233	303	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-415-XP40-SP11-02	△	41.5	40	211	236	306	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-420-XP40-SP11-02	▲	42.0	40	213	245	315	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-420-XP50-SP11-02	△	42.0	50	213	245	325	SPMX110408- XR/XM/LM/EM	I60M4×10	WT15IP
ZSD05-425-XP40-SP14-02	△	42.5	40	216	248	318	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP

▲Stock available △Make-to-order

Indexable drill ZSD05 5D





Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LH	OAL			
ZSD05-425-XP50-SP14-02	△	42.5	50	216	248	328	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-430-XP40-SP14-02	▲	43.0	40	218	250	320	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-430-XP50-SP14-02	△	43.0	50	218	250	330	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-435-XP40-SP14-02	△	43.5	40	221	253	323	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-435-XP50-SP14-02	△	43.5	50	221	253	333	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-440-XP40-SP14-02	▲	44.0	40	223	255	325	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-440-XP50-SP14-02	△	44.0	50	223	255	335	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-445-XP40-SP14-02	△	44.5	40	226	258	328	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-445-XP50-SP14-02	△	45.5	50	226	258	338	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-450-XP40-SP14-02	▲	45.0	40	228	260	330	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-450-XP50-SP14-02	△	45.0	50	228	260	340	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-455-XP40-SP14-02	△	45.5	40	231	263	333	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-455-XP50-SP14-02	△	45.5	50	231	263	343	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-460-XP40-SP14-02	▲	46.0	40	233	265	335	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-460-XP50-SP14-02	△	46.0	50	233	265	345	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-465-XP40-SP14-02	△	46.5	40	236	268	338	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-465-XP50-SP14-02	△	46.5	50	236	268	348	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-470-XP40-SP14-02	▲	47.0	40	238	270	340	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-470-XP50-SP14-02	△	47.0	50	238	270	350	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-475-XP40-SP14-02	△	47.5	40	241	273	343	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-475-XP50-SP14-02	△	47.5	50	241	273	353	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-480-XP40-SP14-02	▲	48.0	40	243	275	345	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-480-XP50-SP14-02	△	48.0	50	246	275	355	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-485-XP40-SP14-02	△	48.5	40	246	278	348	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-485-XP50-SP14-02	△	48.5	50	246	278	358	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-490-XP40-SP14-02	▲	49.0	40	248	280	350	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-490-XP50-SP14-02	△	49.0	50	248	280	360	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-495-XP40-SP14-02	△	49.5	40	251	283	353	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-495-XP50-SP14-02	△	49.5	50	251	283	363	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-500-XP40-SP14-02	▲	50.0	40	253	285	355	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP
ZSD05-500-XP50-SP14-02	△	50.0	50	253	285	365	SPMX140512- XR/XM/LM/EM	I60M5×13	WT20IP

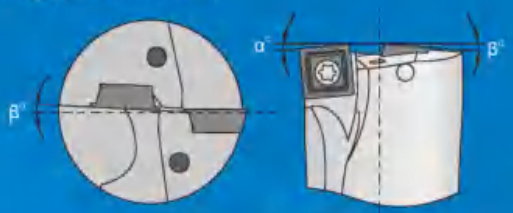
▲Stock available △Make-to-order

Silver fox -New indexable drills for shallow holes

1. Internal coolant hose connecter, which is used in lathe.

2. New tool body material with greatly improved tool rigidity.

3. Tool body with specially treated coating for superior lubricating performance.



Innovative technology fully upgrading

Optimized flutes and double spiraled internal coolant holes for high efficient drilling.

4. Optimized structure for better chip breaking, lower vibration during cutting, higher machining precision.



5. Extremely large chip pocket, innovative liquid angle, for smoother chip evacuation.

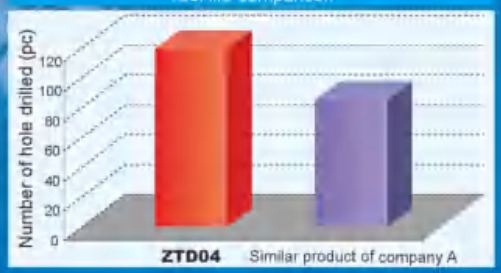
Case study

Tool applied: ZTD04-260-XP25-SP07-02
Insert applied: SPGT07T308-PM /YBG205(Peripheral edge)
SPGT07T308-PM /YBG212(Inner edge)
Workpiece material: 50Mn(HB240)
Cooling system: Double helical internal cooling
Cutting parameters: Vc=130m/min; f=210mm/min; ap=90mm

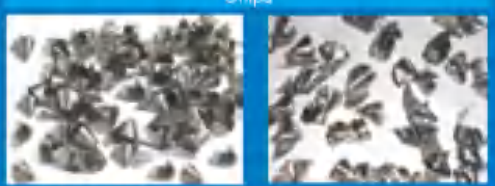


Machining situation

Tool life comparison



Chips



ZTD04-260-XP25-SP07-02 Similar product of company A

- Optimized cutting edge design ensures more stable cutting and better chip breaking.
- Meeting the requirements of central edge and peripheral edge with economy and efficiency.
- Perfect combination of grade and chipbreaker solves all your difficulties in machining.



YBG212



Inner edge insert



- Special coating technology makes insert surface smooth, reducing friction and ensuring unobstructed chip flow.
- Unique nano coating, stronger combination of substrate and highly wear-resistant TiAlN coating, higher toughness and hardness.
- Good thermal stability and chemical stability of coating provide more effective protection for the cutting edge.
- Ultra-fine solid carbide substrate with high toughness ensures high strength of cutting edge.

YBG205



Peripheral edge insert



- Ultra-fine TiAlN base nano coating added with wear-resistant and heat-resistant rare elements greatly improves over-all properties.
- Special coating technology ensures stronger combination of substrate and coating.
- Thin PVD coating, sharp cutting edge.
- Fine grain WC base solid carbide with high hardness and high toughness.
- Special surface treatment after coating improves surface finish while eliminating harmful stress.

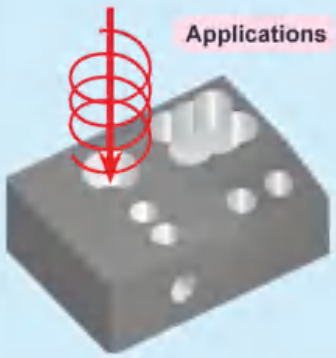
Because of the low speed of inner edge and the poor working condition, there is high requirement for insert toughness. Therefore, YBG212 with good over-all properties is recommended for inner edge and YBG205 with high wear resistance for peripheral edge.

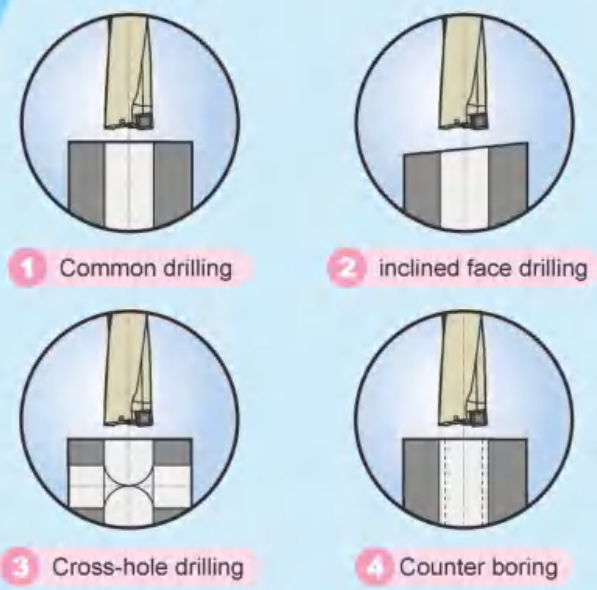
Case study

Workpiece		Cooling system	Double helical internal cooling	
		Insert applied	SPGT07T308-PM/YBG205	Similar product of company A
Workpiece material	42CrMo（HRC25）	Comparison of insert abrasion (after 15 minutes of machining)		
Cutting parameters	V_c=150m/min f_r=0.12mm/r a_p=80mm			



If stationary drilling method is used, the small ejected discs may lead to accidents when workpiece is drilled through, so please see to it that the machine has adequate safety measurements.



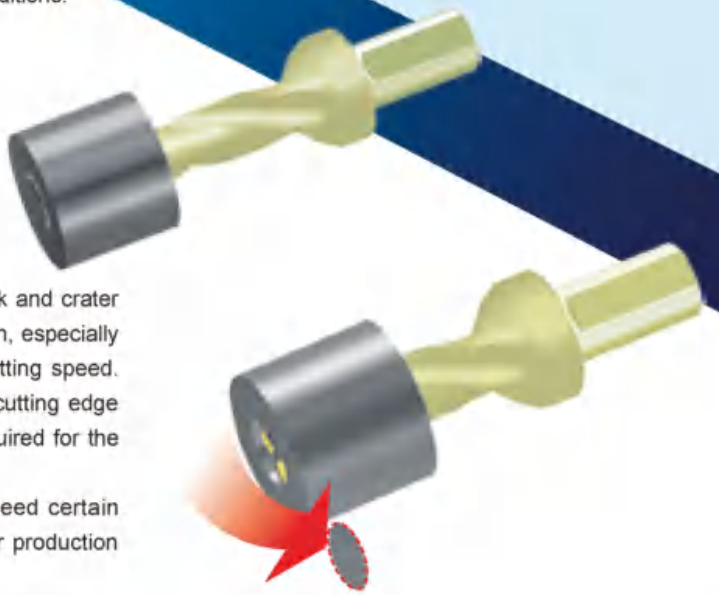


Safety information

■ Breakage

Chipping on cutting edges can be caused by various conditions:

- •Off-center drill.
- •Tool overhang or feed rate is too large.
- •Incorrect inserts seating, tip seat was damaged.
- •Poor insert stability.
- •Insufficient coolant supply.
- •Incorrect insert chipbreaker or grade.



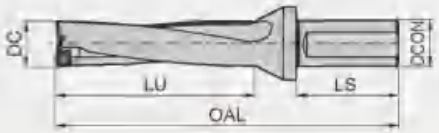
■ Insert abrasion

The two most common types of insert abrasion are flank and crater abrasion. The flank abrasion is generally natural abrasion, especially on the peripheral insert which is applied with higher cutting speed. However, this abrasion will finally result that the insert cutting edge cannot achieve the tolerance and/or surface quality required for the machining.

In drilling operations, if flank and crater abrasion exceed certain values, the inserts should be changed without delay for production security.

Indexable drill ZTD02 2D



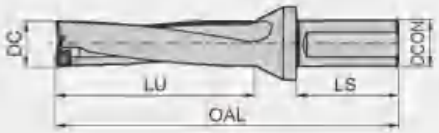


Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LS	OAL			
ZTD02-130-XP20-SP04-02	▲	13	20	31	50	98	SPGT04T102-PM/EM	I60M1.8×4.0	WT05IP
ZTD02-140-XP20-SP04-02	▲	14	20	33	50	100	SPGT04T102-PM/EM	I60M1.8×4.0	WT05IP
ZTD02-150-XP20-SP05-02	▲	15	20	35	50	102	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD02-160-XP20-SP05-02	▲	16	20	37	50	104	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD02-170-XP25-SP05-02	▲	17	25	39	56	117	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD02-180-XP25-SP06-02	▲	18	25	41	56	119	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD02-190-XP25-SP06-02	▲	19	25	43	56	121	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD02-200-XP25-SP06-02	▲	20	25	45	56	123	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD02-210-XP25-SP06-02	▲	21	25	47	56	125	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD02-220-XP25-SP07-02	▲	22	25	49	56	127	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD02-230-XP25-SP07-02	▲	23	25	51	56	129	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD02-240-XP25-SP07-02	▲	24	25	53	56	131	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD02-250-XP25-SP07-02	▲	25	25	55	56	133	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD02-260-XP25-SP07-02	▲	26	25	57	56	135	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD02-270-XP25-SP07-02	▲	27	25	59	56	137	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD02-280-XP32-SP09-02	▲	28	32	61	60	146	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD02-290-XP32-SP09-02	▲	29	32	63	60	148	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD02-300-XP32-SP09-02	▲	30	32	65	60	150	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD02-310-XP32-SP09-02	▲	31	32	67	60	152	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD02-320-XP32-SP09-02	▲	32	32	69	60	154	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD02-330-XP32-SP09-02	▲	33	32	71	60	156	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD02-340-XP40-SP11-02	▲	34	40	73	70	173	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-350-XP40-SP11-02	▲	35	40	75	70	175	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-360-XP40-SP11-02	▲	36	40	77	70	177	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-370-XP40-SP11-02	▲	37	40	79	70	179	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-380-XP40-SP11-02	▲	38	40	81	70	181	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-390-XP40-SP11-02	▲	39	40	83	70	183	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-400-XP40-SP11-02	▲	40	40	85	70	185	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-410-XP40-SP11-02	▲	41	40	87	70	187	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-420-XP40-SP14-02	△	42	40	89	70	199	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-430-XP40-SP14-02	△	43	40	91	70	201	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-440-XP40-SP14-02	△	44	40	93	70	203	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-450-XP40-SP14-02	△	45	40	95	70	205	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-460-XP40-SP14-02	△	46	40	97	70	207	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-470-XP40-SP14-02	△	47	40	99	70	209	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-480-XP40-SP14-02	△	48	40	101	70	211	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-490-XP40-SP14-02	△	49	40	103	70	213	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-500-XP40-SP14-02	△	50	40	105	70	215	SPGT140512-PM/EM	I60M5×13	WT20IP

▲Stock available △Make-to-order

Indexable drill ZTD03 3D



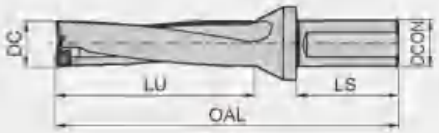


Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LS	OAL			
ZTD03-130-XP20-SP04-02	▲	13	20	44	50	111	SPGT04T102-PM/EM	I60M1.8×4.0	WT05IP
ZTD03-140-XP20-SP04-02	▲	14	20	47	50	114	SPGT04T102-PM/EM	I60M1.8×4.0	WT05IP
ZTD03-150-XP20-SP05-02	▲	15	20	50	50	117	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD03-160-XP20-SP05-02	▲	16	20	53	50	120	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD03-170-XP25-SP05-02	▲	17	25	56	56	134	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD03-180-XP25-SP06-02	▲	18	25	59	56	137	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD03-190-XP25-SP06-02	▲	19	25	62	56	140	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD03-200-XP25-SP06-02	▲	20	25	65	56	143	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD03-210-XP25-SP06-02	▲	21	25	68	56	146	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD03-220-XP25-SP07-02	▲	22	25	71	56	149	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD03-230-XP25-SP07-02	▲	23	25	74	56	152	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD03-240-XP25-SP07-02	▲	24	25	77	56	155	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD03-250-XP25-SP07-02	▲	25	25	80	56	158	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD03-260-XP25-SP07-02	▲	26	25	83	56	161	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD03-270-XP25-SP07-02	▲	27	25	86	56	164	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD03-280-XP32-SP09-02	▲	28	32	89	60	174	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD03-290-XP32-SP09-02	▲	29	32	92	60	177	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD03-300-XP32-SP09-02	▲	30	32	95	60	180	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD03-310-XP32-SP09-02	▲	31	32	98	60	183	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD03-320-XP32-SP09-02	▲	32	32	101	60	186	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD03-330-XP32-SP09-02	▲	33	32	104	60	189	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD03-340-XP40-SP11-02	▲	34	40	107	70	207	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-350-XP40-SP11-02	▲	35	40	110	70	210	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-360-XP40-SP11-02	▲	36	40	113	70	213	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-370-XP40-SP11-02	▲	37	40	116	70	216	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-380-XP40-SP11-02	▲	38	40	119	70	219	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-390-XP40-SP11-02	▲	39	40	122	70	222	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-400-XP40-SP11-02	▲	40	40	125	70	225	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-410-XP40-SP11-02	▲	41	40	128	70	228	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-420-XP40-SP14-02	△	42	40	131	70	241	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-430-XP40-SP14-02	△	43	40	134	70	244	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-440-XP40-SP14-02	△	44	40	137	70	247	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-450-XP40-SP14-02	△	45	40	140	70	250	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-460-XP40-SP14-02	△	46	40	143	70	253	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-470-XP40-SP14-02	△	47	40	146	70	256	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-480-XP40-SP14-02	△	48	40	149	70	259	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-490-XP40-SP14-02	△	49	40	152	70	262	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-500-XP40-SP14-02	△	50	40	155	70	265	SPGT140512-PM/EM	I60M5×13	WT20IP

▲Stock available △Make-to-order

Indexable drill ZTD04 4D



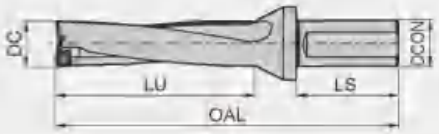


Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LS	OAL			
ZTD04-130-XP20-SP04-02	▲	13	20	57	50	124	SPGT04T102-PM/EM	I60M1.8×4.0	WT05IP
ZTD04-140-XP20-SP04-02	▲	14	20	61	50	128	SPGT04T102-PM/EM	I60M1.8×4.0	WT05IP
ZTD04-150-XP20-SP05-02	▲	15	20	65	50	132	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD04-160-XP20-SP05-02	▲	16	20	69	50	136	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD04-170-XP25-SP05-02	▲	17	25	73	56	151	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD04-180-XP25-SP06-02	▲	18	25	77	56	155	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD04-190-XP25-SP06-02	▲	19	25	81	56	159	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD04-200-XP25-SP06-02	▲	20	25	85	56	163	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD04-210-XP25-SP06-02	▲	21	25	89	56	167	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD04-220-XP25-SP07-02	▲	22	25	93	56	171	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD04-230-XP25-SP07-02	▲	23	25	97	56	175	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD04-240-XP25-SP07-02	▲	24	25	101	56	179	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD04-250-XP25-SP07-02	▲	25	25	105	56	183	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD04-260-XP25-SP07-02	▲	26	25	109	56	187	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD04-270-XP25-SP07-02	▲	27	25	113	56	191	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD04-280-XP32-SP09-02	▲	28	32	117	60	202	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD04-290-XP32-SP09-02	▲	29	32	121	60	206	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD04-300-XP32-SP09-02	▲	30	32	125	60	210	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD04-310-XP32-SP09-02	▲	31	32	129	60	214	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD04-320-XP32-SP09-02	▲	32	32	133	60	218	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD04-330-XP32-SP09-02	▲	33	32	137	60	222	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD04-340-XP40-SP11-02	▲	34	40	141	70	241	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-350-XP40-SP11-02	▲	35	40	145	70	245	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-360-XP40-SP11-02	▲	36	40	149	70	249	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-370-XP40-SP11-02	▲	37	40	153	70	253	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-380-XP40-SP11-02	▲	38	40	157	70	257	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-390-XP40-SP11-02	▲	39	40	161	70	261	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-400-XP40-SP11-02	▲	40	40	165	70	265	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-410-XP40-SP11-02	▲	41	40	169	70	269	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-420-XP40-SP14-02	△	42	40	173	70	283	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-430-XP40-SP14-02	△	43	40	177	70	287	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-440-XP40-SP14-02	△	44	40	181	70	291	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-450-XP40-SP14-02	△	45	40	185	70	295	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-460-XP40-SP14-02	△	46	40	189	70	299	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-470-XP40-SP14-02	△	47	40	193	70	303	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-480-XP40-SP14-02	△	48	40	197	70	307	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-490-XP40-SP14-02	△	49	40	201	70	311	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-500-XP40-SP14-02	△	50	40	205	70	315	SPGT140512-PM/EM	I60M5×13	WT20IP

▲Stock available △Make-to-order

Indexable drill ZTD05 5D





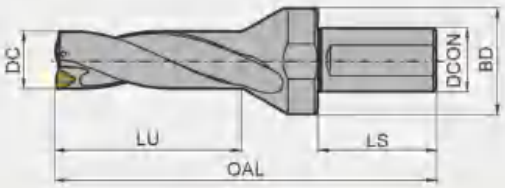
Type	Stock	Basic dimension(mm)					Applicable inserts	Insert screw	Wrench
		DC	DCON	LU	LS	OAL			
ZTD05-130-XP20-SP04-02	▲	13	20	70	50	137	SPGT04T102-PM/EM	I60M1.8×4	WT05IP
ZTD05-140-XP20-SP04-02	▲	14	20	75	50	142	SPGT04T102-PM/EM	I60M1.8×4	WT05IP
ZTD05-150-XP20-SP04-02	▲	15	20	80	50	147	SPGT0050204-PM/EM	I60M2.0×4.3	WT06P
ZTD05-160-XP20-SP04-02	▲	16	20	85	50	152	SPGT0050204-PM/EM	I60M2.0×4.3	WT06P
ZTD05-170-XP25-SP05-02	▲	17	25	90	56	168	SPGT050204-PM/EM	I60M2.2×5.5	WT06P
ZTD05-180-XP25-SP06-02	▲	18	25	95	56	173	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD05-190-XP25-SP06-02	▲	19	25	100	56	178	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD05-200-XP25-SP06-02	▲	20	25	105	56	183	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD05-210-XP25-SP06-02	▲	21	25	110	56	188	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD05-220-XP25-SP07-02	▲	22	25	115	56	193	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD05-230-XP25-SP07-02	▲	23	25	120	56	198	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD05-240-XP25-SP07-02	▲	24	25	125	56	203	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD05-250-XP25-SP07-02	▲	25	25	130	56	208	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD05-260-XP25-SP07-02	▲	26	25	135	56	213	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD05-270-XP25-SP07-02	▲	27	25	140	56	218	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD05-280-XP32-SP09-02	▲	28	32	145	60	230	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD05-290-XP32-SP09-02	▲	29	32	150	60	235	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD05-300-XP32-SP09-02	▲	30	32	155	60	240	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD05-310-XP32-SP09-02	▲	31	32	160	60	245	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD05-320-XP32-SP09-02	▲	32	32	165	60	250	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD05-330-XP32-SP09-02	▲	33	32	170	60	255	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD05-340-XP40-SP11-02	▲	34	40	175	70	275	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-350-XP40-SP11-02	▲	35	40	180	70	280	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-360-XP40-SP11-02	▲	36	40	185	70	285	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-370-XP40-SP11-02	▲	37	40	190	70	290	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-380-XP40-SP11-02	▲	38	40	195	70	295	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-390-XP40-SP11-02	▲	39	40	200	70	300	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-400-XP40-SP11-02	▲	40	40	205	70	305	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-410-XP40-SP11-02	▲	41	40	210	70	310	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-420-XP40-SP14-02	△	42	40	215	70	325	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-430-XP40-SP14-02	△	43	40	220	70	330	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-440-XP40-SP14-02	△	44	40	225	70	335	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-450-XP40-SP14-02	△	45	40	230	70	340	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-460-XP40-SP14-02	△	46	40	235	70	345	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-470-XP40-SP14-02	△	47	40	240	70	350	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-480-XP40-SP14-02	△	48	40	245	70	355	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-490-XP40-SP14-02	△	49	40	250	70	360	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-500-XP40-SP14-02	△	50	40	255	70	365	SPGT140512-PM/EM	I60M5×13	WT20IP

▲Stock available △Make-to-order

Indexable drill

2D





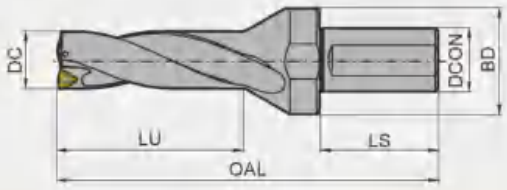
Type	Stock	Basic dimension(mm)						Applicable inserts	Insert screw	Wrench
		DC	DCON	BD	LS	LU	OAL			
ZD02-160-XP20-WC03-02	△	16	20	25	50	35	102	WCMX030208	I60M2.5×6.5	WT07IP
ZD02-170-XP25-WC03-02	△	17	25	32	56	37	111	WCMX030208	I60M2.5×6.5	WT07IP
ZD02-180-XP25-WC03-02	△	18	25	32	56	39	113	WCMX030208	I60M2.5×6.5	WT07IP
ZD02-190-XP25-WC03-02	△	19	25	32	56	41	115	WCMX030208	I60M2.5×6.5	WT07IP
ZD02-200-XP25-WC03-02	△	20	25	32	56	43	117	WCMX030208	I60M2.5×6.5	WT07IP
ZD02-210-XP25-WC04-02	△	21	25	32	56	45	119	WCMX040208	I60M2.5×6.5T	WT08IP
ZD02-220-XP25-WC04-02	△	22	25	32	56	47	121	WCMX040208	I60M2.5×6.5T	WT08IP
ZD02-230-XP25-WC04-02	△	23	25	32	56	49	123	WCMX040208	I60M2.5×6.5T	WT08IP
ZD02-240-XP25-WC04-02	△	24	25	32	56	51	125	WCMX040208	I60M2.5×6.5T	WT08IP
ZD02-250-XP25-WC04-02	△	25	25	32	56	53	127	WCMX040208	I60M2.5×6.5T	WT08IP
ZD02-260-XP25-WC05-02	△	26	25	32	60	55	137	WCMX050308	I60M3×9	WT09IP
ZD02-270-XP32-WC05-02	△	27	32	37	60	57	139	WCMX050308	I60M3×9	WT09IP
ZD02-280-XP32-WC05-02	△	28	32	37	60	59	141	WCMX050308	I60M3×9	WT09IP
ZD02-290-XP32-WC05-02	△	29	32	37	60	61	143	WCMX050308	I60M3×9	WT09IP
ZD02-300-XP32-WC05-02	△	30	32	37	60	63	145	WCMX050308	I60M3×9	WT09IP
ZD02-310-XP32-WC06-02	△	31	32	37	60	65	147	WCMX06T308	I60M3×9	WT09IP
ZD02-320-XP32-WC06-02	△	32	32	37	60	67	149	WCMX06T308	I60M3×9	WT09IP
ZD02-330-XP32-WC06-02	△	33	32	37	60	69	151	WCMX06T308	I60M3×9	WT09IP
ZD02-340-XP40-WC06-02	△	34	40	47	70	71	166	WCMX06T308	I60M3×9	WT09IP
ZD02-350-XP40-WC06-02	△	35	40	47	70	73	168	WCMX06T308	I60M3×9	WT09IP
ZD02-360-XP40-WC06-02	△	36	40	47	70	75	170	WCMX06T308	I60M3×9	WT09IP
ZD02-370-XP40-WC06-02	△	37	40	47	70	77	172	WCMX06T308	I60M3×9	WT09IP
ZD02-380-XP40-WC06-02	△	38	40	47	70	79	174	WCMX06T308	I60M3×9	WT09IP
ZD02-390-XP40-WC06-02	△	39	40	47	70	81	176	WCMX06T308	I60M3×9	WT09IP

▲Stock available △Make-to-order

Indexable drill

2D





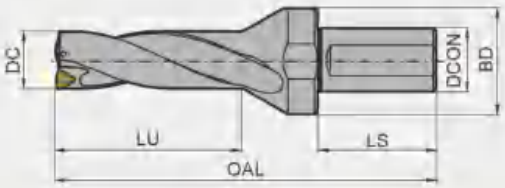
Type	Stock	Basic dimension(mm)						Applicable inserts	Insert screw	Wrench
		DC	DCON	BD	LS	LU	OAL			
ZD02-400-XP40-WC06-02	△	40	40	47	70	83	178	WCMX06T308	I60M3×9	WT09IP
ZD02-410-XP40-WC06-02	△	41	40	47	70	85	180	WCMX06T308	I60M3×9	WT09IP
ZD02-420-XP40-WC08-02	△	42	40	52	70	87	189	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-430-XP40-WC08-02	△	43	40	52	70	89	191	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-440-XP40-WC08-02	△	44	40	52	70	91	193	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-450-XP40-WC08-02	△	45	40	52	70	93	195	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-460-XP40-WC08-02	△	46	40	52	70	95	197	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-470-XP40-WC08-02	△	47	40	52	70	97	199	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-480-XP40-WC08-02	△	48	40	52	70	99	201	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-490-XP40-WC08-02	△	49	40	52	70	101	203	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-500-XP40-WC08-02	△	50	40	52	70	103	205	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-510-XP40-WC08-02	△	51	40	60	70	105	207	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-520-XP40-WC08-02	△	52	40	60	70	107	209	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-530-XP40-WC08-02	△	53	40	60	70	109	211	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-540-XP40-WC08-02	△	54	40	60	70	111	213	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-550-XP40-WC08-02	△	55	40	60	70	113	215	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-560-XP40-WC08-02	△	56	40	60	70	115	217	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-570-XP40-WC08-02	△	57	40	60	70	117	219	WCMX080412	I60M3.5×10.4	WT15IP
ZD02-580-XP40-WC08-02	△	58	40	60	70	119	221	WCMX080412	I60M3.5×10.4	WT15IP

▲Stock available △Make-to-order

Indexable drill

3D





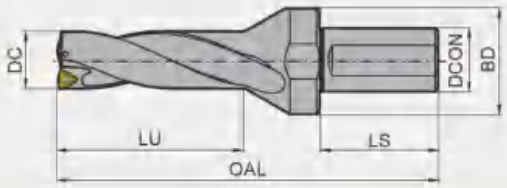
Type	Stock	Basic dimension(mm)						Applicable inserts	Insert screw	Wrench
		DC	DCON	BD	LS	LU	OAL			
ZD03-160-XP20-WC03-02	△	16	20	25	50	52	119	WCMX030208	I60M2.5×6.5	WT07IP
ZD03-170-XP25-WC03-02	△	17	25	32	56	55	128	WCMX030208	I60M2.5×6.5	WT07IP
ZD03-180-XP25-WC03-02	△	18	25	32	56	58	131	WCMX030208	I60M2.5×6.5	WT07IP
ZD03-190-XP25-WC03-02	△	19	25	32	56	61	134	WCMX030208	I60M2.5×6.5	WT07IP
ZD03-200-XP25-WC03-02	△	20	25	32	56	64	137	WCMX030208	I60M2.5×6.5	WT07IP
ZD03-210-XP25-WC04-02	△	21	25	32	56	67	140	WCMX040208	I60M2.5×6.5T	WT08IP
ZD03-220-XP25-WC04-02	△	22	25	32	56	70	143	WCMX040208	I60M2.5×6.5T	WT08IP
ZD03-230-XP25-WC04-02	△	23	25	32	56	73	146	WCMX040208	I60M2.5×6.5T	WT08IP
ZD03-240-XP25-WC04-02	△	24	25	32	56	76	149	WCMX040208	I60M2.5×6.5T	WT08IP
ZD03-250-XP25-WC04-02	△	25	25	32	56	79	152	WCMX040208	I60M2.5×6.5T	WT08IP
ZD03-260-XP25-WC05-02	△	26	25	32	60	83	163	WCMX050308	I60M3×9	WT09IP
ZD03-270-XP32-WC05-02	△	27	32	37	60	86	166	WCMX050308	I60M3×9	WT09IP
ZD03-280-XP32-WC05-02	△	28	32	37	60	89	169	WCMX050308	I60M3×9	WT09IP
ZD03-290-XP32-WC05-02	△	29	32	37	60	92	172	WCMX050308	I60M3×9	WT09IP
ZD03-300-XP32-WC05-02	△	30	32	37	60	95	175	WCMX050308	I60M3×9	WT09IP
ZD03-310-XP32-WC06-02	△	31	32	37	60	98	178	WCMX06T308	I60M3×9	WT09IP
ZD03-320-XP32-WC06-02	△	32	32	37	60	101	181	WCMX06T308	I60M3×9	WT09IP
ZD03-330-XP32-WC06-02	△	33	32	37	60	104	184	WCMX06T308	I60M3×9	WT09IP
ZD03-340-XP40-WC06-02	△	34	40	47	70	107	200	WCMX06T308	I60M3×9	WT09IP
ZD03-350-XP40-WC06-02	△	35	40	47	70	110	203	WCMX06T308	I60M3×9	WT09IP
ZD03-360-XP40-WC06-02	△	36	40	47	70	113	206	WCMX06T308	I60M3×9	WT09IP
ZD03-370-XP40-WC06-02	△	37	40	47	70	116	209	WCMX06T308	I60M3×9	WT09IP
ZD03-380-XP40-WC06-02	△	38	40	47	70	119	212	WCMX06T308	I60M3×9	WT09IP
ZD03-390-XP40-WC06-02	△	39	40	47	70	122	215	WCMX06T308	I60M3×9	WT09IP

▲Stock available △Make-to-order

Indexable drill

3D





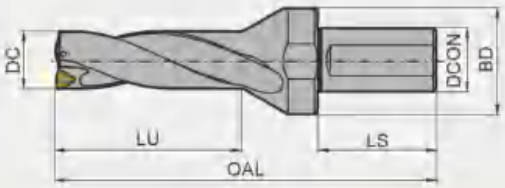
Type	Stock	Basic dimension(mm)						Applicable inserts	Insert screw	Wrench
		DC	DCON	BD	LS	LU	OAL			
ZD03-400-XP40-WC06-02	△	40	40	47	70	125	218	WCMX06T308	I60M3×9	WT09IP
ZD03-410-XP40-WC06-02	△	41	40	47	70	128	221	WCMX06T308	I60M3×9	WT09IP
ZD03-420-XP40-WC08-02	△	42	40	52	70	131	231	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-430-XP40-WC08-02	△	43	40	52	70	134	234	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-440-XP40-WC08-02	△	44	40	52	70	137	237	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-450-XP40-WC08-02	△	45	40	52	70	140	240	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-460-XP40-WC08-02	△	46	40	52	70	143	243	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-470-XP40-WC08-02	△	47	40	52	70	146	246	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-480-XP40-WC08-02	△	48	40	52	70	149	249	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-490-XP40-WC08-02	△	49	40	52	70	152	252	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-500-XP40-WC08-02	△	50	40	52	70	155	255	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-510-XP40-WC08-02	△	51	40	60	70	158	258	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-520-XP40-WC08-02	△	52	40	60	70	161	261	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-530-XP40-WC08-02	△	53	40	60	70	164	264	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-540-XP40-WC08-02	△	54	40	60	70	167	267	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-550-XP40-WC08-02	△	55	40	60	70	170	270	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-560-XP40-WC08-02	△	56	40	60	70	173	273	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-570-XP40-WC08-02	△	57	40	60	70	176	276	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-580-XP40-WC08-02	△	58	40	60	70	179	279	WCMX080412	I60M3.5×10.4	WT15IP

▲Stock available △Make-to-order

Indexable drill

4D





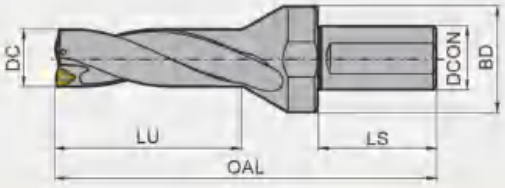
Type	Stock	Basic dimension(mm)						Applicable inserts	Insert screw	Wrench
		DC	DCON	BD	LS	LU	OAL			
ZD04-160-XP20-WC03-02	△	16	20	25	50	67	134	WCMX030208	I60M2.5×6.5	WT07IP
ZD04-170-XP25-WC03-02	△	17	25	32	56	71	145	WCMX030208	I60M2.5×6.5	WT07IP
ZD04-180-XP25-WC03-02	△	18	25	32	56	75	149	WCMX030208	I60M2.5×6.5	WT07IP
ZD04-190-XP25-WC03-02	△	19	25	32	56	79	153	WCMX030208	I60M2.5×6.5	WT07IP
ZD04-200-XP25-WC03-02	△	20	25	32	56	83	157	WCMX030208	I60M2.5×6.5	WT07IP
ZD04-210-XP25-WC04-02	△	21	25	32	56	87	161	WCMX040208	I60M2.5×6.5T	WT08IP
ZD04-220-XP25-WC04-02	△	22	25	32	56	91	165	WCMX040208	I60M2.5×6.5T	WT08IP
ZD04-230-XP25-WC04-02	△	23	25	32	56	95	169	WCMX040208	I60M2.5×6.5T	WT08IP
ZD04-240-XP25-WC04-02	△	24	25	32	56	99	173	WCMX040208	I60M2.5×6.5T	WT08IP
ZD04-250-XP25-WC04-02	△	25	25	32	56	103	177	WCMX040208	I60M2.5×6.5T	WT08IP
ZD04-260-XP25-WC05-02	△	26	25	32	60	107	189	WCMX050308	I60M3×9	WT09IP
ZD04-270-XP32-WC05-02	△	27	32	37	60	111	193	WCMX050308	I60M3×9	WT09IP
ZD04-280-XP32-WC05-02	△	28	32	37	60	115	197	WCMX050308	I60M3×9	WT09IP
ZD04-290-XP32-WC05-02	△	29	32	37	60	119	201	WCMX050308	I60M3×9	WT09IP
ZD04-300-XP32-WC05-02	△	30	32	37	60	123	205	WCMX050308	I60M3×9	WT09IP
ZD04-310-XP32-WC06-02	△	31	32	37	60	127	209	WCMX06T308	I60M3×9	WT09IP
ZD04-320-XP32-WC06-02	△	32	32	37	60	131	213	WCMX06T308	I60M3×9	WT09IP
ZD04-330-XP32-WC06-02	△	33	32	37	60	135	217	WCMX06T308	I60M3×9	WT09IP
ZD04-340-XP40-WC06-02	△	34	40	47	70	139	234	WCMX06T308	I60M3×9	WT09IP
ZD04-350-XP40-WC06-02	△	35	40	47	70	143	238	WCMX06T308	I60M3×9	WT09IP
ZD04-360-XP40-WC06-02	△	36	40	47	70	147	242	WCMX06T308	I60M3×9	WT09IP
ZD04-370-XP40-WC06-02	△	37	40	47	70	151	246	WCMX06T308	I60M3×9	WT09IP
ZD04-380-XP40-WC06-02	△	38	40	47	70	155	250	WCMX06T308	I60M3×9	WT09IP
ZD04-390-XP40-WC06-02	△	39	40	47	70	159	254	WCMX06T308	I60M3×9	WT09IP

▲Stock available △Make-to-order

Indexable drill

4D





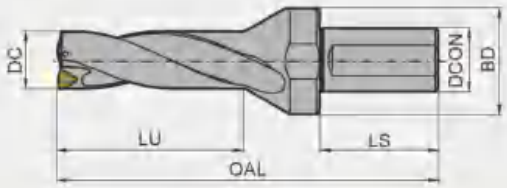
Type	Stock	Basic dimension(mm)						Applicable inserts	Insert screw	Wrench
		DC	DCON	BD	LS	LU	OAL			
ZD04-400-XP40-WC06-02	△	40	40	47	70	163	258	WCMX06T308	I60M3×9	WT09IP
ZD04-410-XP40-WC06-02	△	41	40	47	70	167	262	WCMX06T308	I60M3×9	WT09IP
ZD04-420-XP40-WC08-02	△	42	40	52	70	171	273	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-430-XP40-WC08-02	△	43	40	52	70	175	277	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-440-XP40-WC08-02	△	44	40	52	70	179	281	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-450-XP40-WC08-02	△	45	40	52	70	183	285	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-460-XP40-WC08-02	△	46	40	52	70	187	289	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-470-XP40-WC08-02	△	47	40	52	70	191	293	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-480-XP40-WC08-02	△	48	40	52	70	195	297	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-490-XP40-WC08-02	△	49	40	52	70	199	301	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-500-XP40-WC08-02	△	50	40	52	70	203	305	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-510-XP40-WC08-02	△	51	40	60	70	207	309	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-520-XP40-WC08-02	△	52	40	60	70	211	313	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-530-XP40-WC08-02	△	53	40	60	70	215	317	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-540-XP40-WC08-02	△	54	40	60	70	219	321	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-550-XP40-WC08-02	△	55	40	60	70	223	325	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-560-XP40-WC08-02	△	56	40	60	70	227	329	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-570-XP40-WC08-02	△	57	40	60	70	231	333	WCMX080412	I60M3.5×10.4	WT15IP
ZD04-580-XP40-WC08-02	△	58	40	60	70	235	337	WCMX080412	I60M3.5×10.4	WT15IP

▲Stock available △Make-to-order

Indexable drill

5D





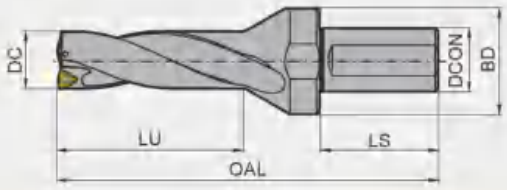
Type	Stock	Basic dimension(mm)						Applicable inserts	Insert screw	Wrench
		DC	DCON	BD	LS	LU	OAL			
ZD05-160-XP20-WC03-02	△	16	20	25	50	83	151	WCMX030208	I60M2.5×6.5	WT07IP
ZD05-170-XP25-WC03-02	△	17	25	32	56	88	162	WCMX030208	I60M2.5×6.5	WT07IP
ZD05-180-XP25-WC03-02	△	18	25	32	56	93	167	WCMX030208	I60M2.5×6.5	WT07IP
ZD05-190-XP25-WC03-02	△	19	25	32	56	98	172	WCMX030208	I60M2.5×6.5	WT07IP
ZD05-200-XP25-WC03-02	△	20	25	32	56	103	177	WCMX030208	I60M2.5×6.5	WT07IP
ZD05-210-XP25-WC04-02	△	21	25	32	56	108	182	WCMX040208	I60M2.5×6.5T	WT08IP
ZD05-220-XP25-WC04-02	△	22	25	32	56	113	187	WCMX040208	I60M2.5×6.5T	WT08IP
ZD05-230-XP25-WC04-02	△	23	25	32	56	118	192	WCMX040208	I60M2.5×6.5T	WT08IP
ZD05-240-XP25-WC04-02	△	24	25	32	56	123	197	WCMX040208	I60M2.5×6.5T	WT08IP
ZD05-250-XP25-WC04-02	△	25	25	32	56	128	202	WCMX040208	I60M2.5×6.5T	WT08IP
ZD05-260-XP25-WC05-02	△	26	25	32	56	133	211	WCMX050308	I60M3×9	WT09IP
ZD05-270-XP32-WC05-02	△	27	32	37	60	138	220	WCMX050308	I60M3×9	WT09IP
ZD05-280-XP32-WC05-02	△	28	32	37	60	143	225	WCMX050308	I60M3×9	WT09IP
ZD05-290-XP32-WC05-02	△	29	32	37	60	148	230	WCMX050308	I60M3×9	WT09IP
ZD05-300-XP32-WC05-02	△	30	32	37	60	153	235	WCMX050308	I60M3×9	WT09IP
ZD05-310-XP32-WC06-02	△	31	32	37	60	158	240	WCMX06T308	I60M3×9	WT09IP
ZD05-320-XP32-WC06-02	△	32	32	37	60	163	245	WCMX06T308	I60M3×9	WT09IP
ZD05-330-XP32-WC06-02	△	33	32	37	60	168	250	WCMX06T308	I60M3×9	WT09IP
ZD05-340-XP40-WC06-02	△	34	40	47	70	173	268	WCMX06T308	I60M3×9	WT09IP
ZD05-350-XP40-WC06-02	△	35	40	47	70	178	273	WCMX06T308	I60M3×9	WT09IP
ZD05-360-XP40-WC06-02	△	36	40	47	70	183	278	WCMX06T308	I60M3×9	WT09IP
ZD05-370-XP40-WC06-02	△	37	40	47	70	188	283	WCMX06T308	I60M3×9	WT09IP
ZD05-380-XP40-WC06-02	△	38	40	47	70	193	288	WCMX06T308	I60M3×9	WT09IP
ZD05-390-XP40-WC06-02	△	39	40	47	70	198	293	WCMX06T308	I60M3×9	WT09IP

▲Stock available △Make-to-order

Indexable drill

5D





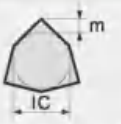
Type	Stock	Basic dimension(mm)						Applicable inserts	Insert screw	Wrench
		DC	DCON	BD	LS	LU	OAL			
ZD05-400-XP40-WC06-02	△	40	40	47	70	203	298	WCMX06T308	I60M3×9	WT09IP
ZD05-410-XP40-WC06-02	△	41	40	47	70	208	303	WCMX06T308	I60M3×9	WT09IP
ZD05-420-XP40-WC08-02	△	42	40	52	70	213	315	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-430-XP40-WC08-02	△	43	40	52	70	218	320	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-440-XP40-WC08-02	△	44	40	52	70	223	325	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-450-XP40-WC08-02	△	45	40	52	70	228	330	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-460-XP40-WC08-02	△	46	40	52	70	233	335	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-470-XP40-WC08-02	△	47	40	52	70	238	340	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-480-XP40-WC08-02	△	48	40	52	70	243	345	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-490-XP40-WC08-02	△	49	40	52	70	248	350	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-500-XP40-WC08-02	△	50	40	52	70	253	355	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-510-XP40-WC08-02	△	51	40	60	70	258	360	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-520-XP40-WC08-02	△	52	40	60	70	263	365	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-530-XP40-WC08-02	△	53	40	60	70	268	370	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-540-XP40-WC08-02	△	54	40	60	70	273	375	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-550-XP40-WC08-02	△	55	40	60	70	278	380	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-560-XP40-WC08-02	△	56	40	60	70	283	385	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-570-XP40-WC08-02	△	57	40	60	70	288	390	WCMX080412	I60M3.5×10.4	WT15IP
ZD05-580-XP40-WC08-02	△	58	40	60	70	293	395	WCMX080412	I60M3.5×10.4	WT15IP

▲Stock available △Make-to-order

Naming rules for insert of indexable drill

Code	Insert shape
S	
W	

Insert shape / code

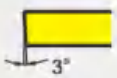
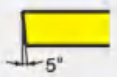
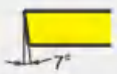
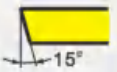
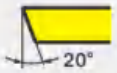
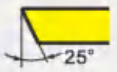
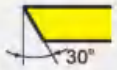
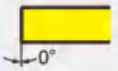
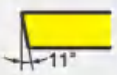


Code	Nose Height m Tolerance(mm)	Inscribed Circle IC Tolerance(mm)	Thickness S Tolerance(mm)	Code	Nose Height m Tolerance(mm)	Inscribed Circle IC Tolerance(mm)	Thickness S Tolerance(mm)
A	±0.005	±0.025	±0.025	J	±0.005	±0.05-±0.13	±0.025
F	±0.005	±0.013	±0.025	K	±0.013	±0.05-±0.13	±0.025
C	±0.013	±0.025	±0.025	L	±0.025	±0.05-±0.13	±0.025
H	±0.013	±0.013	±0.025	M	±0.08-±0.18	±0.05-±0.13	±0.13
E	±0.025	±0.025	±0.025	N	±0.08-±0.18	±0.05-±0.13	±0.025
G	±0.025	±0.025	±0.13	U	±0.13-±0.38	±0.08-±0.25	±0.13

Tolerance

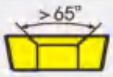
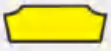
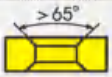
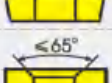
W C M X

Clearance angle of main cutting edge

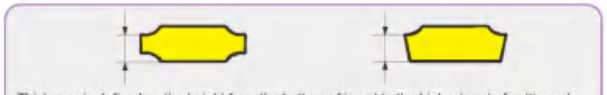
Code	Clearance angle	Code	Clearance angle
A	 3°	B	 5°
C	 7°	D	 15°
E	 20°	F	 25°
G	 30°	N	 0°
P	 11°	O	Other clearance angle

Chipbreaker and clamping system

Metric

Code	With/Without hole	With/Without chipbreaker	Section plane of Insert	Code	With/Without hole	With/Without chipbreaker	Section plane of Insert
B	With	Without	 >65°	N	Without	Without	
H	With	Single-side	 >65°	R	Without	Single-side	
C	With	Without	 >65°	F	Without	Double-side	
J	With	Double-side	 >65°	A	With	Without	
W	With	Without	 ≤65°	M	With	Single-side	
T	With	Single-side	 ≤65°	G	With	Double-side	
Q	With	Without	 ≤65°	X	---	---	Special
U	With	Double-side	 ≤65°				

Naming rules for insert of indexable drill



Thickness is defined as the height from the bottom of insert to the highest part of cutting edge.

Code	Insert thickness (mm)	Code	Insert thickness (mm)
00	0.79	**05**	5.96
T0	0.99	**T5**	5.95
01	1.59	**06**	6.35
T1	1.98	**T6**	6.75
02	2.38	**07**	7.94
T2	2.58	**09**	9.52
03	3.18	**T9**	9.72
T3	3.97	**11**	11.11
04	4.76	**12**	12.70
T4	4.96		

Insert thickness

Code	Length	
	W	S
03	3.8	
04	4.3	
05	5.4	
06	6.5	6.35
08	8.7	8.0
09		9.525
12		12.7

Length of cutting edge (mm)

08 04 12 R - PG

Nose radius

Code	Description
04	0.4mm
08	0.8mm
12	1.2mm

Cutting direction

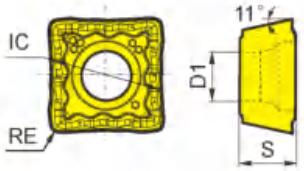
Code	Description
R	Right hand
L	Left hand
N	Neutral

Chipbreaker code

ZSD applicable inserts

-EM



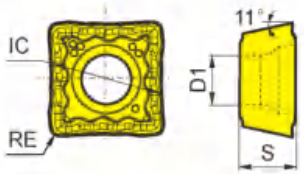


Type	Basic dimension(mm)				CVD grade	PVD grade		
	IC	S	D1	RE	YB6338 (Peripheral edge)	YBM215 (Inner/peripheral edge)	YBS203 (Inner/peripheral edge)	YB9320 (Inner/peripheral edge)
SPMX040204-EM	4.2	2.38	2.0	0.3	★	●	●	★
SPMX050204-EM	5.0	2.38	2.2	0.4	★	●	●	★
SPMX060204-EM	6.15	2.38	2.5	0.4	★	●	●	★
SPMX07T308-EM	7.94	3.97	2.8	0.8	★	●	●	★
SPMX090408-EM	9.8	4.3	4.1	0.8	★	●	●	★
SPMX110408-EM	11.8	4.76	4.4	0.8	★	●	●	★
SPMX140512-EM	14.8	5.2	5.5	1.2	★	●	●	★

★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

-LM





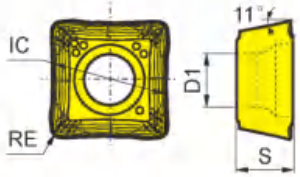
Type	Basic dimension(mm)				CVD grade	PVD grade		
	IC	S	D1	RE	YB6338 (Peripheral edge)	YBM215 (Inner/peripheral edge)	YBS203 (Inner/peripheral edge)	YB9320 (Inner/peripheral edge)
SPMX040204-LM	4.2	2.38	2.0	0.3	★	●	●	★
SPMX050204-LM	5.0	2.38	2.2	0.4	★	●	●	★
SPMX060204-LM	6.15	2.38	2.5	0.4	★	●	●	★
SPMX07T308-LM	7.94	3.97	2.8	0.8	★	●	●	★
SPMX090408-LM	9.8	4.3	4.1	0.8	★	●	●	★
SPMX110408-LM	11.8	4.76	4.4	0.8	★	●	●	★
SPMX140512-LM	14.8	5.2	5.5	1.2	★	●	●	★

★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

ZSD applicable inserts

-XM



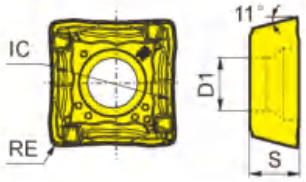


Type	Basic dimension(mm)				CVD grade	PVD grade		
	IC	S	D1	RE	YB6338 (Peripheral edge)	YBM215 (Inner/peripheral edge)	YBS203 (Inner/peripheral edge)	YB9320 (Inner/peripheral edge)
SPMX040203-XM	4.2	2.38	2.0	0.3	★	●	●	★
SPMX050204-XM	5.0	2.38	2.2	0.4	★	●	●	★
SPMX060204-XM	6.15	2.38	2.5	0.4	★	●	●	★
SPMX07T308-XM	7.94	3.97	2.8	0.8	★	●	●	★
SPMX090408-XM	9.8	4.3	4.1	0.8	★	●	●	★
SPMX110408-XM	11.8	4.76	4.4	0.8	★	●	●	★
SPMX140512-XM	14.3	5.2	5.5	1.2	★	●	●	★

★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

-XR



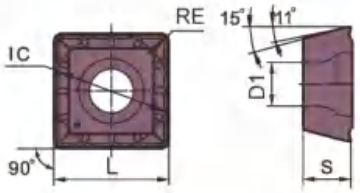


Type	Basic dimension(mm)				CVD grade	PVD grade		
	IC	S	D1	RE	YB6338 (Peripheral edge)	YBM215 (Inner/peripheral edge)	YBS203 (Inner/peripheral edge)	YB9320 (Inner/peripheral edge)
SPMX050204-XR	5.0	2.38	2.2	0.4	★	●	●	★
SPMX060204-XR	6.15	2.38	2.5	0.4	★	●	●	★
SPMX07T308-XR	7.94	3.97	2.8	0.8	★	●	●	★
SPMX090408-XR	9.8	4.30	4.1	0.8	★	●	●	★
SPMX110408-XR	11.8	4.76	4.4	0.8	★	●	●	★
SPMX140512-XR	14.8	5.20	5.5	1.2	★	●	●	★

★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

ZTD applicable inserts

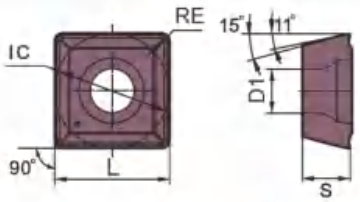




Type	Basic dimension(mm)					PVD grade	
	L	IC	S	D1	RE	YBG205 (Peripheral edge)	YBG212 (Inner edge)
SPGT050204-PM	5	5	2.38	2.2	0.4	★	★
SPGT060204-PM	6	6	2.38	2.6	0.4	★	★
SPGT07T308-PM	7.94	7.94	3.97	2.8	0.8	★	★
SPGT090408-PM	9.8	9.8	4.3	4.2	0.8	★	★
SPGT110408-PM	11.5	11.5	4.76	4.4	0.8	★	★
SPGT140512-PM	14.3	14.3	5.2	5.75	1.2	★	★

★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order





Type	Basic dimension(mm)					PVD grade	
	L	IC	S	D1	RE	YBG205 (Peripheral edge)	YBG212 (Inner edge)
SPGT050204-EM	5	5	2.38	2.2	0.4	★	★
SPGT060204-EM	6	6	2.38	2.6	0.4	★	★
SPGT07T308-EM	7.94	7.94	3.97	2.8	0.8	★	★
SPGT090408-EM	9.8	9.8	4.3	4.2	0.8	★	★
SPGT110408-EM	11.5	11.5	4.76	4.4	0.8	★	★
SPGT140512-EM	14.3	14.3	5.2	5.75	1.2	★	★

★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order



-EM chipbreaker characteristics

Recommended chipbreaker for M materials drilling.With G-class accuracy, sharp cutting edges, and high strength, better performance of resisting impacts. Inserts meet the required of machining adhesive material, It is also properly suited for machining Austenite Stainless steel etc adhesive materials.

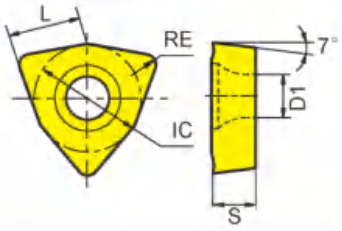
ZD03 applicable inserts

-53



-PG





Type	Basic dimension(mm)					PVD grade
	L	IC	S	D1	RE	YBG202
WCMX030208R-53	3.8	5.56	2.38	2.8	0.8	★
WCMX040208R-53	4.3	6.35	2.38	3.1	0.8	★
WCMX050308R-53	5.4	7.94	3.18	3.2	0.8	★
WCMX06T308R-53	6.5	9.525	3.97	3.7	0.8	★
WCMX080412R-53	8.7	12.7	4.76	4.3	1.2	★
WCMX030208R-PG	3.8	5.56	2.38	2.8	0.8	★
WCMX040208R-PG	4.3	6.35	2.38	3.1	0.8	★
WCMX050308R-PG	5.4	7.94	3.18	3.2	0.8	★
WCMX06T308R-PG	6.5	9.525	3.97	3.7	0.8	★
WCMX080412R-PG	8.7	12.7	4.76	4.3	1.2	★

★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order



-PG chipbreaker characteristics

Unique design of corrugated edge ensures high edge strength and good chip breaking performance, for machining of carbon steel and alloy steel.



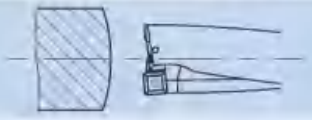
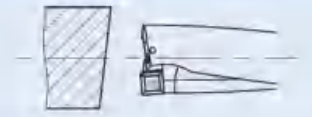
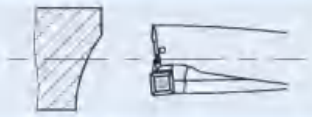
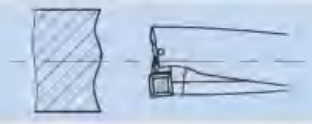
-53 chipbreaker characteristics

Sharp cutting edge beneficial to gaining low roughness surface, mainly applicable for low load cutting of aluminum alloy, mild steel and cast iron.

Technical information for indexable drill

Initial drill penetration

Initial drill penetration is an important factor for successful drilling. One way of ensuring good hole quality is to make sure the penetration surface of the workpiece is vertical to the drill centre axis. In addition, an indexable drill can carry out initial penetration of convex, concave, inclined and irregular surfaces by adjusting feed rates.

Workpiece surface	Countermeasures
	For a convex surface, the conditions are relatively good and the centre of the drill ideally makes contact with the workpiece first, thus normal feed can be adopted.
	When penetrating an inclined surface, the cutting edges will be unevenly loaded, which may result in the premature drill abrasion. If the angle of the inclined surface is larger than 2°, the feed should be reduced to 1/3 of the value recommended for the drill.
	When drilling into concave surface, drill center axis normally tends to go off-center, the feed should be reduced to 1/3 of the value recommended for the drill.
	When drilling into non-symmetric curved surfaces, the drill tends to deviate from the centre because it is penetrating an inclined surface. The feed should be reduced to lower than the value recommended for the initial penetration of concave surfaces.
	When drilling into irregular surface, the insert faces the risk of chipping, which may also occur when drilling through the workpiece. Therefore, the feed rate should be reduced.

Calculations for shallow drilling

Cutting speed(Vc)

$$Vc = \frac{Dc \times \pi \times n}{1000}$$

Vc (m/min): Cutting speed
Dc(mm): Drill diameter
n (rev/min): Rotating speed

◆ Example

Spindle speed is1600 rev/min, drill diameter is 20mm, thus cutting speed is:

$$Vc = \frac{Dc \times \pi \times n}{1000} = \frac{20 \times 3.14 \times 1600}{1000} = 100\ (m/min)$$

Feed speed

$$Vf = fr \times n\ (mm/min)$$

Vf (mm/min): Feed speed
fr (mm/rev): Feed rate per revolution
n (rev/min): Spindle speed

◆ Example

Spindle speed is1500 rev/min, feed rate per revolution is 0.1mm/rev, thus feed speed is:

$$Vf = fr \times n = 0.1 \times 1500 = 150\ (mm/min)$$

Machining time

$$Tc = \frac{ld \times i}{n \times f}$$

Tc (min): Machining time
fr (mm/rev): Feed rate per revolution
i: Number of holes ld (mm): Drilling depth
n (rev/min): Spindle speed

◆ Example

Drilling a hole with a diameter of 20mm and a depth of 40mm, cutting speed is 100m/min and feed rate per revolution is 0.1mm/rev. Calculate the drilling time.

$$n = \frac{Vc \times 1000}{Dc \times \pi} = \frac{100 \times 1000}{20 \times 3.14} = 1600\ (rev/min)$$

$$Tc = \frac{ld \times i}{n \times fr} = \frac{40 \times 1}{1600 \times 0.1} = 0.25\ (min)$$

Metal removal rate

$$Q = \frac{Vf \times \pi \times Dc^2}{4 \times 1000}$$

Q (cm^3/min): Metal removal rate
Dc(mm): Drill diameter
Vf (mm/min): Feed speed

◆ Example

Drill diameter is 20mm, feed speed is 160mm/rev, thus metal removal rate is:

$$Q = \frac{Vf \times \pi \times Dc^2}{4 \times 1000} = \frac{160 \times 3.14 \times 20^2}{4 \times 1000} = 50.24\ (cm^3/min)$$

Recommended cutting parameters for ZSD

ISO	Materials	Hardness HB	Diameter Dc (mm)	Feed rate f (mm/r)	Cutting speed Vc (m/min)
P	Carbon steel	80-200	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.09 0.05-0.09 0.06-0.10 0.07-0.11	200(170-240)
	Low alloy steel	150-260	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.09 0.05-0.12 0.06-0.14 0.08-0.16	170(140-220)
	Hign alloy steel	150-320	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.09 0.05-0.12 0.06-0.16 0.08-0.18	150(120-180)
	Cast steel	180-250	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.08 0.05-0.08 0.06-0.10 0.07-0.11	140(120-170)
M	Stainless steel Ferrite Martensite	150-270	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.09 0.05-0.12 0.06-0.16 0.08-0.18	160(110-230)
	Austenite	150-275	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.09 0.05-0.11 0.06-0.13 0.08-0.14	140(110-220)
K	Malleable cast iron	150-230	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.10 0.05-0.14 0.08-0.16 0.10-0.20	160(120-220)
	Gray cast iron	150-220	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.10 0.05-0.14 0.08-0.16 0.10-0.20	200(170-240)
	Nodular cast iron	160-250	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.09 0.05-0.12 0.06-0.14 0.08-0.16	160(130-200)
N	Aluminum alloy	60-110	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.10 0.05-0.14 0.08-0.16 0.10-0.20	300(250-350)

Recommended cutting parameters for ZTD/ZD

ISO	Materials	Hardness HB	Diameter Dc (mm)	Feed rate f (mm/r)	Cutting speed Vc (m/min)
P	Carbon steel	80-200	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.09 0.05-0.09 0.06-0.10 0.07-0.11 0.08-0.12	200(170-240)
	Low alloy steel	150-260	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.09 0.05-0.12 0.06-0.14 0.08-0.16 0.10-0.20	170(140-220)
	High alloy steel	150-320	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.09 0.05-0.12 0.06-0.16 0.08-0.18 0.10-0.22	150(120-180)
	Cast steel	180-250	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.08 0.05-0.08 0.06-0.10 0.07-0.11 0.07-0.12	140(120-170)
M	Stainless steel Ferrite Martensite	150-270	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.09 0.05-0.12 0.06-0.16 0.08-0.18 0.10-0.22	160(110-230)
	Austenite	150-275	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.09 0.05-0.11 0.06-0.13 0.08-0.14 0.10-0.16	140(110-220)
K	Malleable cast iron	150-230	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.10 0.05-0.14 0.08-0.16 0.10-0.20 0.12-0.24	160(120-220)
	Gray cast iron	150-220	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.10 0.05-0.14 0.08-0.16 0.10-0.20 0.12-0.24	200(170-240)
	Nodular cast iron	160-250	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.09 0.05-0.12 0.06-0.14 0.08-0.16 0.10-0.20	160(130-200)
N	Aluminum alloy	60-110	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.10 0.05-0.14 0.08-0.16 0.10-0.20 0.12-0.24	300(250-350)

ZTK series

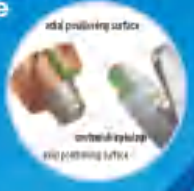
Interchangeable head drill

3 Patents

High-performance Interchangeable head drill with unique structure design, can reduce machining cost and improve production efficiency, Achieve high precision and high efficiency cutting.

Double helical internal coolant holes, provide accurate cooling supply and good chip control during machining;

Double clamping
Both axial, radial positioning surface and thread interface coordinately clamping to ensure stable and reliable tool head assembly;



Unique cutting edge design, with good versatility can ensure smooth cutting, achieve low resistance and efficient machining.





General-purpose machining-GD
The combination of curve and straight cutting edge generates good universality



For Cast Iron-KD
Enhanced cutting edge prolong tool life



For AL-LD
Low resistance design, achieve high efficiency cutting

Three types of drill-head, able to meet requirements for various materials, prolong tool life, achieve machining stability.

Case study

Excellent machining accuracy

Tool holder specification
ZTK03-ED125-G16C
Tool head specification :
EDC1260-060-GD
Workpiece material: 42CrMo (HRC30)
Cutting data: Vc=100m/min,
f=0.20mm/r, ap=30mm
Cooling type: internal coolant supply



ZTK Similar products of company A

Excellent chip-breaking performance

Tool holder specification: ZTK03-ED160-G20C
Tool head specification:
EDC1630-080-GD
Workpiece material: 50Mn (HB240)
Cutting data: Vc=120m/min,
f=0.30mm/r,
ap=30mm
Cooling type: internal coolant supply

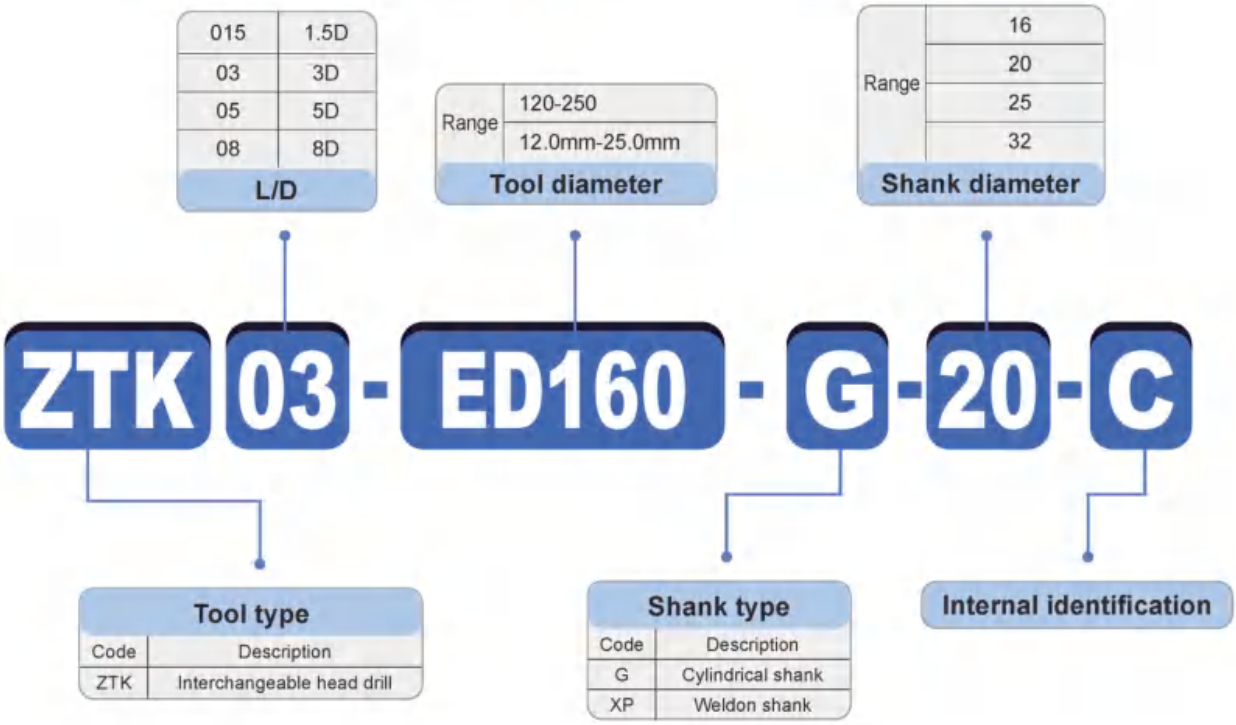


ZTK Similar products of company A

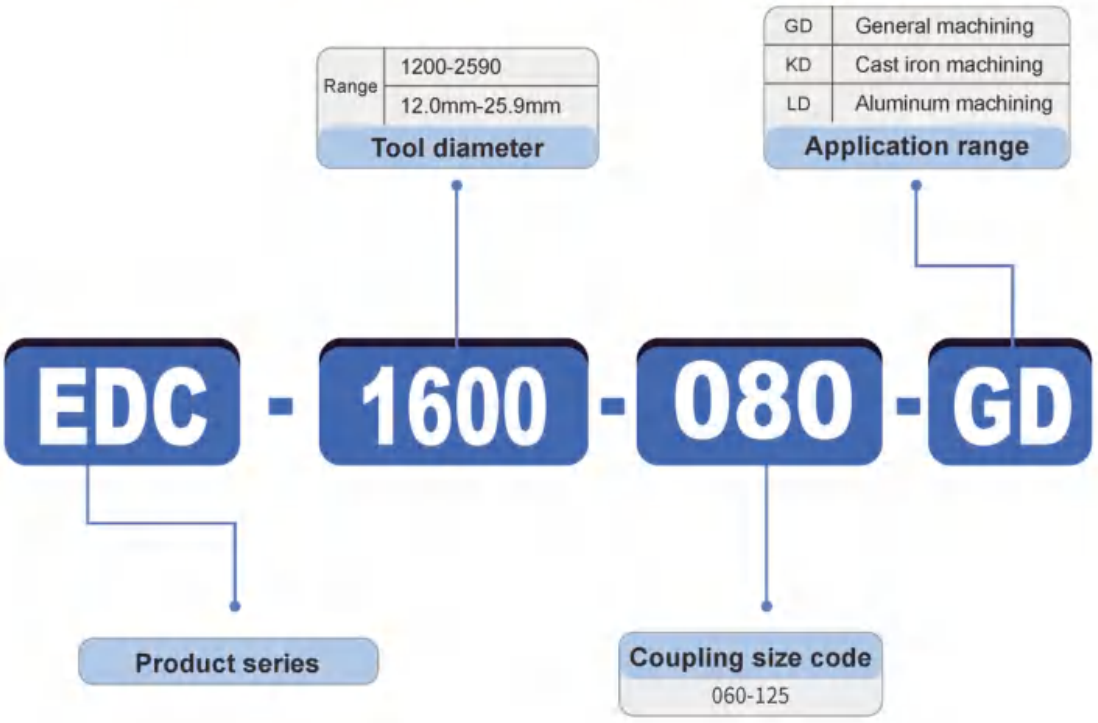
Conclusion: Under the same working conditions, the surface accuracy, verticality and chip breaking performance of our ZTK series interchangeable drill holes are better than similar products of Company A.

Interchangeable head drills code key

Code key of Interchangeable head drill tool holder



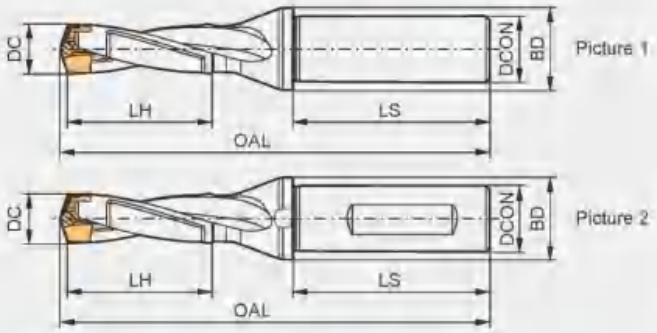
Code key of Interchangeable head drill head



Interchangeable head drill ZTK015 1.5D

Used for shanks with 12.0mm – 25.9mm diameter drill head





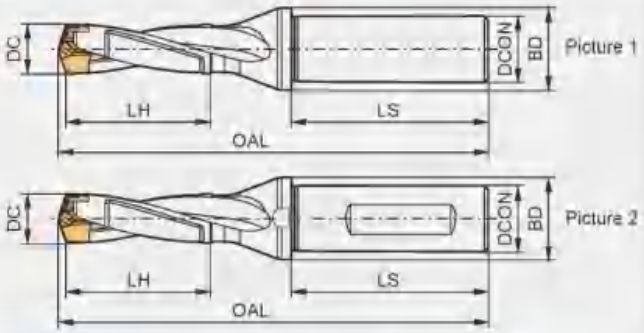
Type		Stock	Basic dimension(mm)						Coupling	Shank form	Wrench
			DC	LH	DCON	BD	LS	OAL			
ZTK015 Cylindrical shank	**-ED120-G16C**	▲	12-12.9	18.0	16	20	48	83.0	060	Picture 1	ZTK12-15.9
	-ED130-G16C	▲	13-13.9	19.5	16	20	48	85.5	065	Picture 1	ZTK12-15.9
	-ED140-G16C	▲	14-14.9	21.0	16	20	48	89.0	070	Picture 1	ZTK12-15.9
	-ED150-G20C	▲	15-15.9	22.5	20	25	50	96.5	075	Picture 1	ZTK12-15.9
	-ED160-G20C	▲	16-16.9	24.0	20	25	50	100.0	080	Picture 1	ZTK16-20.9
	-ED170-G20C	▲	17-17.9	25.5	20	25	50	102.5	085	Picture 1	ZTK16-20.9
	-ED180-G25C	▲	18-18.9	27.0	25	32	56	112.0	090	Picture 1	ZTK16-20.9
	-ED190-G25C	▲	19-19.9	28.5	25	32	56	114.5	095	Picture 1	ZTK16-20.9
	-ED200-G25C	▲	20-20.9	30.0	25	32	56	116.0	100	Picture 1	ZTK16-20.9
	-ED210-G25C	▲	21-21.9	31.5	25	32	56	125.5	105	Picture 1	ZTK21-25.9
	-ED220-G25C	▲	22-22.9	33.0	25	32	56	128.0	110	Picture 1	ZTK21-25.9
	-ED230-G32C	▲	23-23.9	34.5	32	42	60	131.5	115	Picture 1	ZTK21-25.9
	-ED240-G32C	▲	24-24.9	36.0	32	42	60	134.0	120	Picture 1	ZTK21-25.9
	-ED250-G32C	▲	25-25.9	37.5	32	42	60	137.5	125	Picture 1	ZTK21-25.9
Weldon shank	**-ED120-XP16C**	▲	12-12.9	18.0	16	20	48	83.0	060	Picture 2	ZTK12-15.9
	-ED130-XP16C	▲	13-13.9	19.5	16	20	48	85.5	065	Picture 2	ZTK12-15.9
	-ED140-XP16C	▲	14-14.9	21.0	16	20	48	89.0	070	Picture 2	ZTK12-15.9
	-ED150-XP20C	▲	15-15.9	22.5	20	25	50	96.5	075	Picture 2	ZTK12-15.9
	-ED160-XP20C	▲	16-16.9	24.0	20	25	50	100.0	080	Picture 2	ZTK16-20.9
	-ED170-XP20C	▲	17-17.9	25.5	20	25	50	102.5	085	Picture 2	ZTK16-20.9
	-ED180-XP25C	▲	18-18.9	27.0	25	32	56	112.0	090	Picture 2	ZTK16-20.9
	-ED190-XP25C	▲	19-19.9	28.5	25	32	56	114.5	095	Picture 2	ZTK16-20.9
	-ED200-XP25C	▲	20-20.9	30.0	25	32	56	116.0	100	Picture 2	ZTK16-20.9
	-ED210-XP25C	▲	21-21.9	31.5	25	32	56	125.5	105	Picture 2	ZTK21-25.9
	-ED220-XP25C	▲	22-22.9	33.0	25	32	56	128.0	110	Picture 2	ZTK21-25.9
	-ED230-XP32C	▲	23-23.9	34.5	32	42	60	131.5	115	Picture 2	ZTK21-25.9
	-ED240-XP32C	▲	24-24.9	36.0	32	42	60	134.0	120	Picture 2	ZTK21-25.9
	-ED250-XP32C	▲	25-25.9	37.5	32	42	60	137.5	125	Picture 2	ZTK21-25.9

▲Regular Stock △Made-to-order

Interchangeable head drill ZTK03 3D

Used for shanks with 12.0mm – 25.9mm diameter drill head





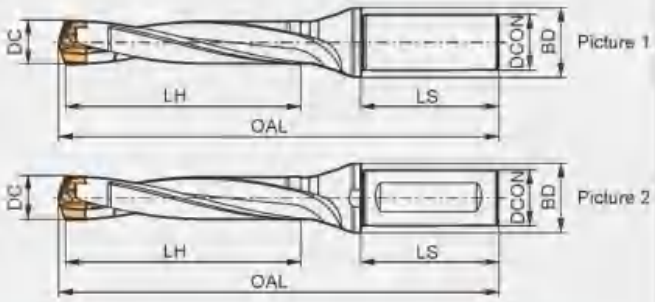
Type		Stock	Basic dimension(mm)						Coupling	Shank form	Wrench
			DC	LH	DCON	BD	LS	OAL			
ZTK03 Cylindrical shank	-ED120-G16C	▲	12-12.4	36.0	16	20	48	101.0	060	Picture 1	ZTK12-15.9
	-ED125-G16C	▲	12.5-12.9	37.0	16	20	48	103.0	060	Picture 1	ZTK12-15.9
	-ED130-G16C	▲	13-13.4	39.0	16	20	48	105.0	065	Picture 1	ZTK12-15.9
	-ED135-G16C	▲	13.5-13.9	41.0	16	20	48	107.0	065	Picture 1	ZTK12-15.9
	-ED140-G16C	▲	14-14.4	42.0	16	20	48	110.0	070	Picture 1	ZTK12-15.9
	-ED145-G16C	▲	14.5-14.9	44.0	16	20	48	112.0	070	Picture 1	ZTK12-15.9
	-ED150-G20C	▲	15-15.9	45.0	20	25	50	119.0	075	Picture 1	ZTK12-15.9
	-ED160-G20C	▲	16-16.9	48.0	20	25	50	124.0	080	Picture 1	ZTK16-20.9
	-ED170-G20C	▲	17-17.9	51.0	20	25	50	128.0	085	Picture 1	ZTK16-20.9
	-ED180-G25C	▲	18-18.9	54.0	25	32	56	139.0	090	Picture 1	ZTK16-20.9
	-ED190-G25C	▲	19-19.9	57.0	25	32	56	143.0	095	Picture 1	ZTK16-20.9
	-ED200-G25C	▲	20-20.9	60.0	25	32	56	146.0	100	Picture 1	ZTK16-20.9
	-ED210-G25C	▲	21-21.9	63.0	25	32	56	157.0	105	Picture 1	ZTK21-25.9
	-ED220-G25C	▲	22-22.9	66.0	25	32	56	161.0	110	Picture 1	ZTK21-25.9
	-ED230-G32C	▲	23-23.9	69.0	32	42	60	166.0	115	Picture 1	ZTK21-25.9
	-ED240-G32C	▲	24-24.9	72.0	32	42	60	170.0	120	Picture 1	ZTK21-25.9
	-ED250-G32C	▲	25-25.9	75.0	32	42	60	175.0	125	Picture 1	ZTK21-25.9
Weldon shank	-ED120-XP16C	▲	12-12.4	36.0	16	20	48	101.0	060	Picture 2	ZTK12-15.9
	-ED125-XP16C	▲	12.5-12.9	37.0	16	20	48	103.0	060	Picture 2	ZTK12-15.9
	-ED130-XP16C	▲	13-13.4	39.0	16	20	48	105.0	065	Picture 2	ZTK12-15.9
	-ED135-XP16C	▲	13.5-13.9	41.0	16	20	48	107.0	065	Picture 2	ZTK12-15.9
	-ED140-XP16C	▲	14-14.4	42.0	16	20	48	110.0	070	Picture 2	ZTK12-15.9
	-ED145-XP16C	▲	14.5-14.9	44.0	16	20	48	112.0	070	Picture 2	ZTK12-15.9
	-ED150-XP20C	▲	15-15.9	45.0	20	25	50	119.0	075	Picture 2	ZTK12-15.9
	-ED160-XP20C	▲	16-16.9	48.0	20	25	50	124.0	080	Picture 2	ZTK16-20.9
	-ED170-XP20C	▲	17-17.9	51.0	20	25	50	128.0	085	Picture 2	ZTK16-20.9
	-ED180-XP25C	▲	18-18.9	54.0	25	32	56	139.0	090	Picture 2	ZTK16-20.9
	-ED190-XP25C	▲	19-19.9	57.0	25	32	56	143.0	095	Picture 2	ZTK16-20.9
	-ED200-XP25C	▲	20-20.9	60.0	25	32	56	146.0	100	Picture 2	ZTK16-20.9
	-ED210-XP25C	▲	21-21.9	63.0	25	32	56	157.0	105	Picture 2	ZTK21-25.9
	-ED220-XP25C	▲	22-22.9	66.0	25	32	56	161.0	110	Picture 2	ZTK21-25.9
	-ED230-XP32C	▲	23-23.9	69.0	32	42	60	166.0	115	Picture 2	ZTK21-25.9
	-ED240-XP32C	▲	24-24.9	72.0	32	42	60	170.0	120	Picture 2	ZTK21-25.9
	-ED250-XP32C	▲	25-25.9	75.0	32	42	60	175.0	125	Picture 2	ZTK21-25.9

▲Regular Stock △Made-to-order

Interchangeable head drill ZTK04 4D

Used for shanks with 12.0mm – 25.9mm diameter drill head





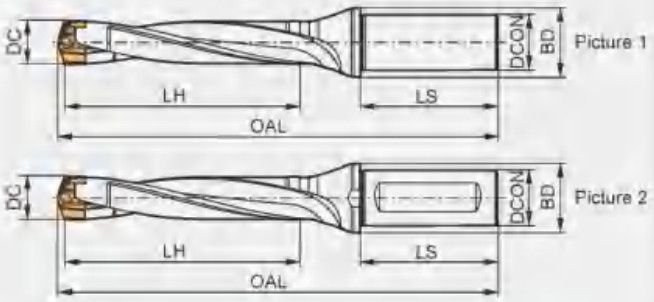
Type		Stock	Basic dimension(mm)						Coupling	Shank form	Wrench
			DC	LH	DCON	BD	LS	OAL			
ZTK04 Cylindrical shank	**ED120-G16C**	▲	12-12.4	48	16	20	48	115.0	060	Picture 1	ZTK12-15.9
	ED125-G16C	▲	12.5-12.9	50	16	20	48	117.0	060	Picture 1	ZTK12-15.9
	ED130-G16C	▲	13-13.4	52	16	20	48	119.0	065	Picture 1	ZTK12-15.9
	ED135-G16C	▲	13.5-13.9	54	16	20	48	121.0	065	Picture 1	ZTK12-15.9
	ED140-G20C	▲	14-14.4	56	16	20	48	123.5	070	Picture 1	ZTK12-15.9
	ED145-G20C	▲	14.5-14.9	58	16	20	48	125.5	070	Picture 1	ZTK12-15.9
	ED150-G20C	▲	15-15.9	60	20	25	50	132.5	075	Picture 1	ZTK12-15.9
	ED160-G20C	▲	16-16.9	64	20	25	50	136.5	080	Picture 1	ZTK16-20.9
	ED170-G20C	▲	17-17.9	68	20	25	50	141.0	085	Picture 1	ZTK16-20.9
	ED180-G25C	▲	18-18.9	72	25	32	56	151.0	090	Picture 1	ZTK16-20.9
	ED190-G25C	▲	19-19.9	76	25	32	56	155.0	095	Picture 1	ZTK16-20.9
	ED200-G25C	▲	20-20.9	80	25	32	56	159.5	100	Picture 1	ZTK16-20.9
	ED210-G25C	▲	21-21.9	84	25	32	56	163.5	105	Picture 1	ZTK21-25.9
	ED220-G25C	▲	22-22.9	88	25	32	56	168.0	110	Picture 1	ZTK21-25.9
	ED230-G32C	▲	23-23.9	92	32	42	60	186.0	115	Picture 1	ZTK21-25.9
	ED240-G32C	▲	24-24.9	96	32	42	60	190.0	120	Picture 1	ZTK21-25.9
	ED250-G32C	▲	25-25.9	100	32	42	60	194.5	125	Picture 1	ZTK21-25.9
Weldon shank	**ED120-XP16C**	▲	12-12.4	48	16	20	48	115.0	060	Picture 2	ZTK12-15.9
	ED125-XP16C	▲	12.5-12.9	50	16	20	48	117.0	060	Picture 2	ZTK12-15.9
	ED130-XP16C	▲	13-13.4	52	16	20	48	119.0	065	Picture 2	ZTK12-15.9
	ED135-XP16C	▲	13.5-13.9	54	16	20	48	121.0	065	Picture 2	ZTK12-15.9
	ED140-XP20C	▲	14-14.4	56	16	20	48	123.5	070	Picture 2	ZTK12-15.9
	ED145-XP20C	▲	14.5-14.9	58	16	20	48	125.5	070	Picture 2	ZTK12-15.9
	ED150-XP20C	▲	15-15.9	60	20	25	50	132.5	075	Picture 2	ZTK12-15.9
	ED160-XP20C	▲	16-16.9	64	20	25	50	136.5	080	Picture 2	ZTK16-20.9
	ED170-XP20C	▲	17-17.9	68	20	25	50	141.0	085	Picture 2	ZTK16-20.9
	ED180-XP25C	▲	18-18.9	72	25	32	56	151.0	090	Picture 2	ZTK16-20.9
	ED190-XP25C	▲	19-19.9	76	25	32	56	155.0	095	Picture 2	ZTK16-20.9
	ED200-XP25C	▲	20-20.9	80	25	32	56	159.5	100	Picture 2	ZTK16-20.9
	ED210-XP25C	▲	21-21.9	84	25	32	56	163.5	105	Picture 2	ZTK21-25.9
	ED220-XP25C	▲	22-22.9	88	25	32	56	168.0	110	Picture 2	ZTK21-25.9
	ED230-XP32C	▲	23-23.9	92	32	42	60	186.0	115	Picture 2	ZTK21-25.9
	ED240-XP32C	▲	24-24.9	96	32	42	60	190.0	120	Picture 2	ZTK21-25.9
	ED250-XP32C	▲	25-25.9	100	32	42	60	194.5	125	Picture 2	ZTK21-25.9

▲Regular Stock △Made-to-order

Interchangeable head drill ZTK05 5D

Used for shanks with 12.0mm – 25.9mm diameter drill head





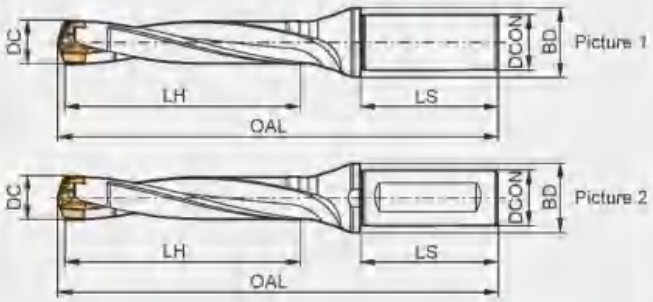
Type		Stock	Basic dimension(mm)						Coupling	Shank form	Wrench
			DC	LH	DCON	BD	LS	OAL			
ZTK05 Cylindrical shank	-ED120-G16C	▲	12-12.4	60.0	16	20	48	125.0	060	Picture 1	ZTK12-15.9
	-ED125-G16C	▲	12.5-12.9	62.0	16	20	48	128.0	060	Picture 1	ZTK12-15.9
	-ED130-G16C	▲	13-13.4	65.0	16	20	48	131.0	065	Picture 1	ZTK12-15.9
	-ED135-G16C	▲	13.5-13.9	68.0	16	20	48	134.0	065	Picture 1	ZTK12-15.9
	-ED140-G16C	▲	14-14.4	70.0	16	20	48	139.0	070	Picture 1	ZTK12-15.9
	-ED145-G16C	▲	14.5-14.9	73.0	16	20	48	141.0	070	Picture 1	ZTK12-15.9
	-ED150-G20C	▲	15-15.9	75.0	20	25	50	149.0	075	Picture 1	ZTK12-15.9
	-ED160-G20C	▲	16-16.9	80.0	20	25	50	156.0	080	Picture 1	ZTK16-20.9
	-ED170-G20C	▲	17-17.9	85.0	20	25	50	162.0	085	Picture 1	ZTK16-20.9
	-ED180-G25C	▲	18-18.9	90.0	25	32	56	175.0	090	Picture 1	ZTK16-20.9
	-ED190-G25C	▲	19-19.9	95.0	25	32	56	181.0	095	Picture 1	ZTK16-20.9
	-ED200-G25C	▲	20-20.9	100.0	25	32	56	188.0	100	Picture 1	ZTK16-20.9
	-ED210-G25C	▲	21-21.9	105.0	25	32	56	199.0	105	Picture 1	ZTK21-25.9
	-ED220-G25C	▲	22-22.9	110.0	25	32	56	205.0	110	Picture 1	ZTK21-25.9
	-ED230-G32C	▲	23-23.9	115.0	32	42	60	212.0	115	Picture 1	ZTK21-25.9
	-ED240-G32C	▲	24-24.9	120.0	32	42	60	218.0	120	Picture 1	ZTK21-25.9
	-ED250-G32C	▲	25-25.9	125.0	32	42	60	225.0	125	Picture 1	ZTK21-25.9
Weldon shank	-ED120-XP16C	▲	12-12.4	60.0	16	20	48	125.0	060	Picture 2	ZTK12-15.9
	-ED125-XP16C	▲	12.5-12.9	62.0	16	20	48	128.0	060	Picture 2	ZTK12-15.9
	-ED130-XP16C	▲	13-13.4	65.0	16	20	48	131.0	065	Picture 2	ZTK12-15.9
	-ED135-XP16C	▲	13.5-13.9	68.0	16	20	48	134.0	065	Picture 2	ZTK12-15.9
	-ED140-XP16C	▲	14-14.4	70.0	16	20	48	139.0	070	Picture 2	ZTK12-15.9
	-ED145-XP16C	▲	14.5-14.9	73.0	16	20	48	141.0	070	Picture 2	ZTK12-15.9
	-ED150-XP20C	▲	15-15.9	75.0	20	25	50	149.0	075	Picture 2	ZTK12-15.9
	-ED160-XP20C	▲	16-16.9	80.0	20	25	50	156.0	080	Picture 2	ZTK16-20.9
	-ED170-XP20C	▲	17-17.9	85.0	20	25	50	162.0	085	Picture 2	ZTK16-20.9
	-ED180-XP25C	▲	18-18.9	90.0	25	32	56	175.0	090	Picture 2	ZTK16-20.9
	-ED190-XP25C	▲	19-19.9	95.0	25	32	56	181.0	095	Picture 2	ZTK16-20.9
	-ED200-XP25C	▲	20-20.9	100.0	25	32	56	188.0	100	Picture 2	ZTK16-20.9
	-ED210-XP25C	▲	21-21.9	105.0	25	32	56	199.0	105	Picture 2	ZTK21-25.9
	-ED220-XP25C	▲	22-22.9	110.0	25	32	56	205.0	110	Picture 2	ZTK21-25.9
	-ED230-XP32C	▲	23-23.9	115.0	32	42	60	212.0	115	Picture 2	ZTK21-25.9
	-ED240-XP32C	▲	24-24.9	120.0	32	42	60	218.0	120	Picture 2	ZTK21-25.9
	-ED250-XP32C	▲	25-25.9	125.0	32	42	60	225.0	125	Picture 2	ZTK21-25.9

▲Regular Stock △Made-to-order

Interchangeable head drill ZTK08 8D

Used for shanks with 12.0mm – 25.9mm diameter drill head





Type		Stock	Basic dimension(mm)						Coupling	Shank form	Wrench
			DC	LH	DCON	BD	LS	OAL			
ZTK08 Cylindrical shank	**-ED120-G16C**	▲	12-12.4	96.0	16	20	48	161.0	060	Picture 1	ZTK12-15.9
	-ED125-G16C	▲	12.5-12.9	99.5	16	20	48	165.5	060	Picture 1	ZTK12-15.9
	-ED130-G16C	▲	13-13.4	104.0	16	20	48	170.0	065	Picture 1	ZTK12-15.9
	-ED135-G16C	▲	13.5-13.9	108.5	16	20	48	174.5	065	Picture 1	ZTK12-15.9
	-ED140-G16C	▲	14-14.4	112.0	16	20	48	181.0	070	Picture 1	ZTK12-15.9
	-ED145-G16C	▲	14.5-14.9	116.5	16	20	48	184.5	070	Picture 1	ZTK12-15.9
	-ED150-G20C	▲	15-15.9	120.0	20	25	50	194.0	075	Picture 1	ZTK12-15.9
	-ED160-G20C	▲	16-16.9	128.0	20	25	50	204.0	080	Picture 1	ZTK16-20.9
	-ED170-G20C	▲	17-17.9	136.0	20	25	50	213.0	085	Picture 1	ZTK16-20.9
	-ED180-G25C	▲	18-18.9	144.0	25	32	56	229.0	090	Picture 1	ZTK16-20.9
	-ED190-G25C	▲	19-19.9	152.0	25	32	56	238.0	095	Picture 1	ZTK16-20.9
	-ED200-G25C	▲	20-20.9	160.0	25	32	56	248.0	100	Picture 1	ZTK16-20.9
	-ED210-G25C	▲	21-21.9	168.0	25	32	56	262.0	105	Picture 1	ZTK21-25.9
	-ED220-G25C	▲	22-22.9	176.0	25	32	56	271.0	110	Picture 1	ZTK21-25.9
	-ED230-G32C	▲	23-23.9	184.0	32	42	60	281.0	115	Picture 1	ZTK21-25.9
	-ED240-G32C	▲	24-24.9	192.0	32	42	60	290.0	120	Picture 1	ZTK21-25.9
	-ED250-G32C	▲	25-25.9	200.0	32	42	60	300.0	125	Picture 1	ZTK21-25.9
Weldon shank	**-ED120-XP16C**	▲	12-12.4	96.0	16	20	48	161.0	060	Picture 2	ZTK12-15.9
	-ED125-XP16C	▲	12.5-12.9	99.5	16	20	48	165.5	060	Picture 2	ZTK12-15.9
	-ED130-XP16C	▲	13-13.4	104.0	16	20	48	170.0	065	Picture 2	ZTK12-15.9
	-ED135-XP16C	▲	13.5-13.9	108.5	16	20	48	174.5	065	Picture 2	ZTK12-15.9
	-ED140-XP16C	▲	14-14.4	112.0	16	20	48	181.0	070	Picture 2	ZTK12-15.9
	-ED145-XP16C	▲	14.5-14.9	116.5	16	20	48	184.5	070	Picture 2	ZTK12-15.9
	-ED150-XP20C	▲	15-15.9	120.0	20	25	50	194.0	075	Picture 2	ZTK12-15.9
	-ED160-XP20C	▲	16-16.9	128.0	20	25	50	204.0	080	Picture 2	ZTK16-20.9
	-ED170-XP20C	▲	17-17.9	136.0	20	25	50	213.0	085	Picture 2	ZTK16-20.9
	-ED180-XP25C	▲	18-18.9	144.0	25	32	56	229.0	090	Picture 2	ZTK16-20.9
	-ED190-XP25C	▲	19-19.9	152.0	25	32	56	238.0	095	Picture 2	ZTK16-20.9
	-ED200-XP25C	▲	20-20.9	160.0	25	32	56	248.0	100	Picture 2	ZTK16-20.9
	-ED210-XP25C	▲	21-21.9	168.0	25	32	56	262.0	105	Picture 2	ZTK21-25.9
	-ED220-XP25C	▲	22-22.9	176.0	25	32	56	271.0	110	Picture 2	ZTK21-25.9
	-ED230-XP32C	▲	23-23.9	184.0	32	42	60	281.0	115	Picture 2	ZTK21-25.9
	-ED240-XP32C	▲	24-24.9	192.0	32	42	60	290.0	120	Picture 2	ZTK21-25.9
	-ED250-XP32C	▲	25-25.9	200.0	32	42	60	300.0	125	Picture 2	ZTK21-25.9

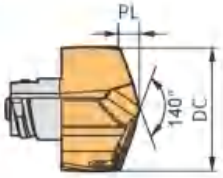
▲Regular Stock △Made-to-order

EDC Interchangeable head drill

Diameter 12.0mm – 25.9mm

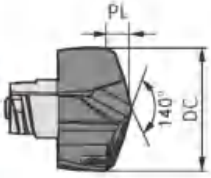
-GD





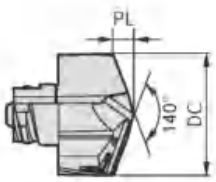
-KD





-LD





Type	Grade	Basic dimension(mm)		Compatible tool holder	Coupling	Wrench
	KDG3013	DC	PL			
EDC1200-060-GD/KD/LD	▲	12.0	2.18	ZTK015-ED120-□□ ZTK03-ED120-□□ ZTK04-ED120-□□ ZTK05-ED120-□□ ZTK08-ED120-□□	060	ZTK12-15.9
EDC1210-060-GD/KD/LD	△	12.1	2.20			
EDC1220-060-GD/KD/LD	△	12.2	2.22			
EDC1230-060-GD/KD/LD	△	12.3	2.24			
EDC1240-060-GD/KD/LD	△	12.4	2.26			
EDC1250-060-GD/KD/LD	▲	12.5	2.27	ZTK015-ED120-□□ ZTK03-ED125-□□ ZTK04-ED125-□□ ZTK05-ED125-□□ ZTK08-ED125-□□		
EDC1260-060-GD/KD/LD	△	12.6	2.29			
EDC1270-060-GD/KD/LD	△	12.7	2.31			
EDC1280-060-GD/KD/LD	△	12.8	2.33			
EDC1290-060-GD/KD/LD	△	12.9	2.35			
EDC1300-065-GD/KD/LD	▲	13.0	2.36	ZTK015-ED130-□□ ZTK03-ED130-□□ ZTK04-ED130-□□ ZTK05-ED130-□□ ZTK08-ED130-□□	065	
EDC1310-065-GD/KD/LD	△	13.1	2.38			
EDC1320-065-GD/KD/LD	△	13.2	2.40			
EDC1330-065-GD/KD/LD	△	13.3	2.42			
EDC1340-065-GD/KD/LD	△	13.4	2.44			
EDC1350-065-GD/KD/LD	▲	13.5	2.46	ZTK015-ED130-□□ ZTK03-ED135-□□ ZTK04-ED135-□□ ZTK05-ED135-□□ ZTK08-ED135-□□		
EDC1360-065-GD/KD/LD	△	13.6	2.47			
EDC1370-065-GD/KD/LD	△	13.7	2.49			
EDC1380-065-GD/KD/LD	△	13.8	2.51			
EDC1390-065-GD/KD/LD	△	13.9	2.53			
EDC1400-070-GD/KD/LD	▲	14.0	2.55	ZTK015-ED140-□□ ZTK03-ED140-□□ ZTK04-ED140-□□ ZTK05-ED140-□□ ZTK08-ED140-□□	070	
EDC1410-070-GD/KD/LD	△	14.1	2.56			
EDC1420-070-GD/KD/LD	△	14.2	2.58			
EDC1430-070-GD/KD/LD	△	14.3	2.60			
EDC1440-070-GD/KD/LD	△	14.4	2.62			
EDC1450-070-GD/KD/LD	▲	14.5	2.64	ZTK015-ED140-□□ ZTK03-ED145-□□ ZTK04-ED145-□□ ZTK05-ED145-□□ ZTK08-ED145-□□		
EDC1460-070-GD/KD/LD	△	14.6	2.66			
EDC1470-070-GD/KD/LD	△	14.7	2.67			
EDC1480-070-GD/KD/LD	△	14.8	2.69			
EDC1490-070-GD/KD/LD	△	14.9	2.71			
EDC1500-075-GD/KD/LD	▲	15.0	2.73	ZTK015-ED150-□□ ZTK03-ED150-□□ ZTK04-ED150-□□ ZTK05-ED150-□□ ZTK08-ED150-□□	075	
EDC1510-075-GD/KD/LD	△	15.1	2.75			
EDC1520-075-GD/KD/LD	△	15.2	2.76			
EDC1530-075-GD/KD/LD	△	15.3	2.78			
EDC1540-075-GD/KD/LD	△	15.4	2.80			

▲Regular Stock △Made-to-order

Type	Grade	Basic dimension(mm)		Compatible tool holder	Coupling	Wrench
	KDG3013	DC	PL			
EDC1550-075-GD/KD/LD	▲	15.5	2.82	ZTK015-ED150-□□ ZTK03-ED150-□□ ZTK04-ED150-□□ ZTK05-ED150-□□ ZTK08-ED150-□□	075	ZTK12-15.9
EDC1560-075-GD/KD/LD	△	15.6	2.84			
EDC1570-075-GD/KD/LD	△	15.7	2.86			
EDC1580-075-GD/KD/LD	△	15.8	2.87			
EDC1590-075-GD/KD/LD	△	15.9	2.89			
EDC1600-080-GD/KD/LD	▲	16.0	2.91	ZTK015-ED160-□□ ZTK03-ED160-□□ ZTK04-ED160-□□ ZTK05-ED160-□□ ZTK08-ED160-□□	080	ZTK16-20.9
EDC1610-080-GD/KD/LD	△	16.1	2.93			
EDC1620-080-GD/KD/LD	△	16.2	2.95			
EDC1630-080-GD/KD/LD	△	16.3	2.96			
EDC1640-080-GD/KD/LD	△	16.4	2.98			
EDC1650-080-GD/KD/LD	▲	16.5	3.00			
EDC1660-080-GD/KD/LD	△	16.6	3.02			
EDC1670-080-GD/KD/LD	△	16.7	3.04			
EDC1680-080-GD/KD/LD	△	16.8	3.06			
EDC1690-080-GD/KD/LD	△	16.9	3.07			
EDC1700-085-GD/KD/LD	▲	17.0	3.09	ZTK015-ED170-□□ ZTK03-ED170-□□ ZTK04-ED170-□□ ZTK05-ED170-□□ ZTK08-ED170-□□	085	
EDC1710-085-GD/KD/LD	△	17.1	3.11			
EDC1720-085-GD/KD/LD	△	17.2	3.13			
EDC1730-085-GD/KD/LD	△	17.3	3.15			
EDC1740-085-GD/KD/LD	△	17.4	3.16			
EDC1750-085-GD/KD/LD	▲	17.5	3.18			
EDC1760-085-GD/KD/LD	△	17.6	3.20			
EDC1770-085-GD/KD/LD	△	17.7	3.22			
EDC1780-085-GD/KD/LD	△	17.8	3.24			
EDC1790-085-GD/KD/LD	△	17.9	3.26			
EDC1800-090-GD/KD/LD	▲	18.0	3.27	ZTK015-ED180-□□ ZTK03-ED180-□□ ZTK04-ED180-□□ ZTK05-ED180-□□ ZTK08-ED180-□□	090	
EDC1810-090-GD/KD/LD	△	18.1	3.29			
EDC1820-090-GD/KD/LD	△	18.2	3.31			
EDC1830-090-GD/KD/LD	△	18.3	3.33			
EDC1840-090-GD/KD/LD	△	18.4	3.35			

▲Regular Stock △Made-to-order

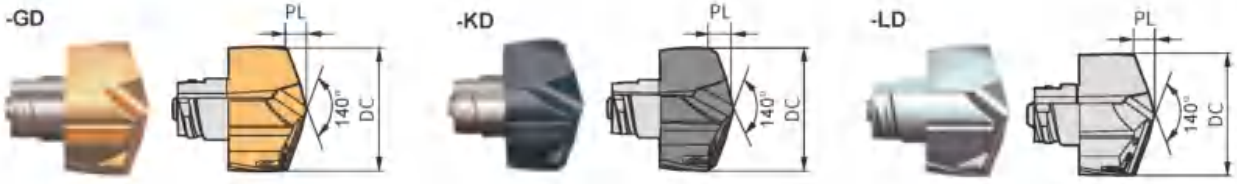
Applicable material table

◎Very suitable ○Suitable

Workpiece material										
Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC						
○	◎	◎			○	◎	◎			

EDC Interchangeable head drill

Diameter 12.0mm – 25.9mm



Type	Grade	Basic dimension(mm)		Compatible tool holder	Coupling	Wrench
	KDG3013	DC	PL			
EDC1850-090-GD/KD/LD	▲	18.5	3.36	ZTK015-ED180-□□ ZTK03-ED180-□□ ZTK04-ED180-□□ ZTK05-ED180-□□ ZTK08-ED180-□□	090	ZTK16-20.9
EDC1860-090-GD/KD/LD	△	18.6	3.38			
EDC1870-090-GD/KD/LD	△	18.7	3.40			
EDC1880-090-GD/KD/LD	△	18.8	3.42			
EDC1890-090-GD/KD/LD	△	18.9	3.44			
EDC1900-095-GD/KD/LD	▲	19.0	3.46	ZTK015-ED190-□□ ZTK03-ED190-□□ ZTK04-ED190-□□ ZTK05-ED190-□□ ZTK08-ED190-□□	095	
EDC1910-095-GD/KD/LD	△	19.1	3.47			
EDC1920-095-GD/KD/LD	△	19.2	3.49			
EDC1930-095-GD/KD/LD	△	19.3	3.51			
EDC1940-095-GD/KD/LD	△	19.4	3.53			
EDC1950-095-GD/KD/LD	▲	19.5	3.55			
EDC1960-095-GD/KD/LD	△	19.6	3.56			
EDC1970-095-GD/KD/LD	△	19.7	3.58			
EDC1980-095-GD/KD/LD	△	19.8	3.60			
EDC1990-095-GD/KD/LD	△	19.9	3.62			
EDC2000-100-GD/KD/LD	▲	20.0	3.64	ZTK015-ED200-□□ ZTK03-ED200-□□ ZTK04-ED200-□□ ZTK05-ED200-□□ ZTK08-ED200-□□	100	
EDC2010-100-GD/KD/LD	△	20.1	3.66			
EDC2020-100-GD/KD/LD	△	20.2	3.67			
EDC2030-100-GD/KD/LD	△	20.3	3.69			
EDC2040-100-GD/KD/LD	△	20.4	3.71			
EDC2050-100-GD/KD/LD	▲	20.5	3.73			
EDC2060-100-GD/KD/LD	△	20.6	3.75			
EDC2070-100-GD/KD/LD	△	20.7	3.77			
EDC2080-100-GD/KD/LD	△	20.8	3.78			
EDC2090-100-GD/KD/LD	△	20.9	3.80			
EDC2100-105-GD/KD/LD	▲	21.0	3.82	ZTK015-ED210-□□ ZTK03-ED210-□□ ZTK04-ED210-□□ ZTK05-ED210-□□ ZTK08-ED210-□□	105	ZTK21-25.9
EDC2110-105-GD/KD/LD	△	21.1	3.84			
EDC2120-105-GD/KD/LD	△	21.2	3.86			
EDC2130-105-GD/KD/LD	△	21.3	3.88			
EDC2140-105-GD/KD/LD	△	21.4	3.89			

▲Regular Stock △Made-to-order

Type	Grade	Basic dimension(mm)		Compatible tool holder	Coupling	Wrench
	KDG3013	DC	PL			
EDC2150-105-GD/KD/LD	▲	21.5	3.91	ZTK015-ED210-□□ ZTK03-ED210-□□ ZTK04-ED210-□□ ZTK05-ED210-□□ ZTK08-ED210-□□	105	ZTK21-25.9
EDC2160-105-GD/KD/LD	△	21.6	3.93			
EDC2170-105-GD/KD/LD	△	21.7	3.95			
EDC2180-105-GD/KD/LD	△	21.8	3.97			
EDC2190-105-GD/KD/LD	△	21.9	3.98			
EDC2200-110-GD/KD/LD	▲	22.0	4.00	ZTK015-ED220-□□ ZTK03-ED220-□□ ZTK04-ED220-□□ ZTK05-ED220-□□ ZTK08-ED220-□□	110	
EDC2210-110-GD/KD/LD	△	22.1	4.02			
EDC2220-110-GD/KD/LD	△	22.2	4.04			
EDC2230-110-GD/KD/LD	△	22.3	4.06			
EDC2240-110-GD/KD/LD	△	22.4	4.08			
EDC2250-110-GD/KD/LD	▲	22.5	4.09			
EDC2260-110-GD/KD/LD	△	22.6	4.11			
EDC2270-110-GD/KD/LD	△	22.7	4.13			
EDC2280-110-GD/KD/LD	△	22.8	4.15			
EDC2290-110-GD/KD/LD	△	22.9	4.17			
EDC2300-115-GD/KD/LD	▲	23.0	4.18	ZTK015-ED230-□□ ZTK03-ED230-□□ ZTK04-ED230-□□ ZTK05-ED230-□□ ZTK08-ED230-□□	115	
EDC2310-115-GD/KD/LD	△	23.1	4.20			
EDC2320-115-GD/KD/LD	△	23.2	4.22			
EDC2330-115-GD/KD/LD	△	23.3	4.24			
EDC2340-115-GD/KD/LD	△	23.4	4.26			
EDC2350-115-GD/KD/LD	▲	3.5	4.27			
EDC2360-115-GD/KD/LD	△	23.6	4.29			
EDC2370-115-GD/KD/LD	△	23.7	4.31			
EDC2380-115-GD/KD/LD	△	23.8	4.33			
EDC2390-115-GD/KD/LD	△	23.9	4.35			

▲Regular Stock △Made-to-order

Applicable material table

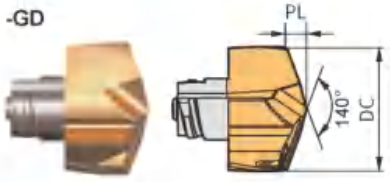
◎Very suitable ○Suitable

Workpiece material										
Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC						
○	◎	◎			○	◎	◎			

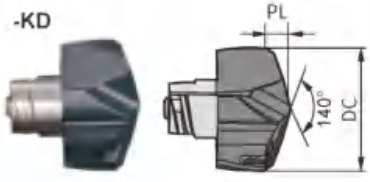
EDC Interchangeable head drill

Diameter 12.0mm – 25.9mm

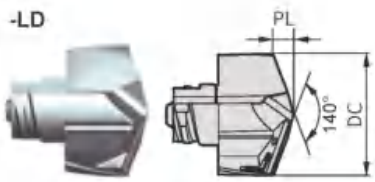
-GD



-KD



-LD



Type	Grade	Basic dimension(mm)		Compatible tool holder	Coupling	Wrench
	KDG3013	DC	PL			
EDC2400-120-GD/KD/LD	▲	24.0	4.37	ZTK015-ED240-□□ ZTK03-ED240-□□ ZTK04-ED240-□□ ZTK05-ED240-□□ ZTK08-ED240-□□	120	ZTK21-25.9
EDC2410-120-GD/KD/LD	△	24.1	4.38			
EDC2420-120-GD/KD/LD	△	24.2	4.40			
EDC2430-120-GD/KD/LD	△	24.3	4.42			
EDC2440-120-GD/KD/LD	△	24.4	4.44			
EDC2450-120-GD/KD/LD	▲	24.5	4.46			
EDC2460-120-GD/KD/LD	△	24.6	4.48			
EDC2470-120-GD/KD/LD	△	24.7	4.49			
EDC2480-120-GD/KD/LD	△	24.8	4.51			
EDC2490-120-GD/KD/LD	△	24.9	4.53			
EDC2500-125-GD/KD/LD	▲	25.0	4.55	ZTK015-ED250-□□ ZTK03-ED250-□□ ZTK04-ED250-□□ ZTK05-ED250-□□ ZTK08-ED250-□□	125	
EDC2510-125-GD/KD/LD	△	25.1	4.57			
EDC2520-125-GD/KD/LD	△	25.2	4.58			
EDC2530-125-GD/KD/LD	△	25.3	4.60			
EDC2540-125-GD/KD/LD	△	25.4	4.62			
EDC2550-125-GD/KD/LD	▲	25.5	4.64			
EDC2560-125-GD/KD/LD	△	25.6	4.66			
EDC2570-125-GD/KD/LD	△	25.7	4.68			
EDC2580-125-GD/KD/LD	△	25.8	4.69			
EDC2590-125-GD/KD/LD	△	25.9	4.70			

▲Regular Stock △Made-to-order

Applicable material table

◎Very suitable ○Suitable

Workpiece material									
Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC						
○	◎	◎			○	◎	◎			

Geometry selection and hole tolerance

Geometry	-GD				-KD				-LD			
Workpeice materials application ranges	P M K				K				P M			
L/D	1.5D、3D、5D		8D		1.5D、3D、5D		8D		1.5D、3D、5D		8D	
	12-18mm	18-26mm	12-18mm	18-26mm	12-18mm	18-26mm	12-18mm	18-26mm	12-18mm	18-26mm	12-18mm	18-26mm
Tolerance of hole	0/+0.043	0/+0.052	0/+0.070	0/+0.084	0/+0.043	0/+0.052	0/+0.070	0/+0.084	0/+0.043	0/+0.052	0/+0.070	0/+0.084

Cooling requirements

Internal coolant supply	External coolant supply (Drilling depth < 2D)	No dry cutting
○	○	×
		

User guide for drills with 8D shanks



1 Pre-drill a hole whose depth is 0.5D to 1.5D with a standard 1.5xD drill;



2 The 8xD drill is fed slowly to the place 2~5mm away from the bottom of the pre-drilled hole, then the internal cooling is provided, and suspending for 2~3 seconds;



3 Strat drilling with normal parameters.

Assembly instructions:





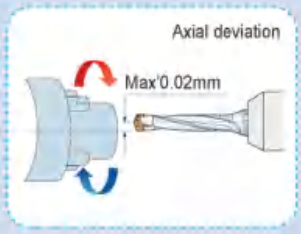


There will be a gap on radial direction after tightening with wrench L=0.05~0.1mm(the gap will be eliminated in cutting automatically).

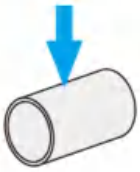
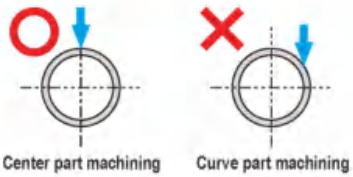
After inserting the tip into the shanks, tighten it with a wrench. When removing, turn the wrench in the opposite direction.

Maximum deviation in assembly:

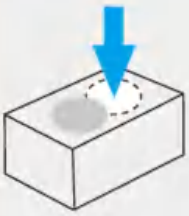
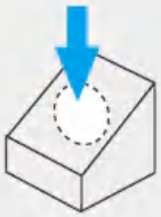
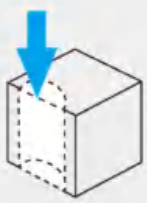
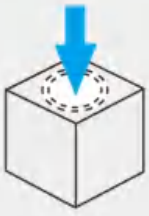




Suitable workpiece shape

Processing content	Workpiece	Points for attention during processing
Plane surface		1、For Stainless steel machining, suggest set up feed rate below 0.15mm/rev from entrance to 0.5D depth position; 2、In order to removal chip, suggest internal cooling, Recommend internal coolant for better chip control, combine internal and external coolant when machining stainless steel materials.
Overlapping plate		1、In order to prevent dislocation, when processing the overlapping plate, The workpieces needed to be fixed.
Concave hole		1、There could be interrupted cuts, suggest to set feed rate under half of the recommended cutting parameters before peripheral edges fully entering the hole; 2、Fine adjustment are recommened when long chips apearing at entrence.
Cylindrical surface hole		1、It can be used for hole machining on the central axis of the shaft. 2、The curve part not recommend.  Center part machining　Curve part machining

Workpiece shape not recommend

Processing content	Overlapped hole	Slope	Half-section	Reaming
Workpiece shape				

Recommended cutting parameters of Interchangeable drills

Workpiece materials		Cutting speed (m/min)	Diameter(mm)					
			12-13.9	14-15.9	16-17.9	18-19.9	20-22.9	23-25.9
			Feed rate mm/r	Feed rate mm/r	Feed rate mm/r	Feed rate mm/r	Feed rate mm/r	Feed rate mm/r
P	Soft steel HB ≤ 180	80 115 150	0.12 0.18 0.25	0.14 0.21 0.28	0.16 0.23 0.31	0.18 0.26 0.34	0.20 0.29 0.37	0.22 0.32 0.40
P	Carbon steel Alloy steel ~ 30HRC	70 105 140	0.11 0.17 0.23	0.13 0.20 0.26	0.15 0.22 0.29	0.17 0.24 0.32	0.19 0.26 0.34	0.21 0.28 0.36
P	Pre-hardened steel ~ 40HRC	50 65 80	0.10 0.15 0.20	0.12 0.17 0.23	0.14 0.20 0.26	0.16 0.22 0.29	0.18 0.24 0.32	0.20 0.26 0.34
M	Stainless steel	30 50 70	0.10 0.12 0.15	0.11 0.14 0.28	0.12 0.16 0.20	0.13 0.18 0.23	0.14 0.20 0.26	0.15 0.21 0.28
K	Cast iron	80 115 150	0.11 0.17 0.23	0.13 0.20 0.26	0.15 0.22 0.29	0.17 0.24 0.32	0.19 0.26 0.34	0.21 0.28 0.36
K	Nodular cast iron	60 90 120	0.11 0.17 0.23	0.13 0.20 0.26	0.15 0.22 0.29	0.17 0.24 0.32	0.19 0.26 0.34	0.21 0.28 0.36
N	Aluminum alloy	90 140 180	0.16 0.20 0.24	0.18 0.23 0.28	0.20 0.25 0.29	0.24 0.28 0.32	0.27 0.31 0.35	0.30 0.35 0.40
S	Heat resistant alloy	15 20 25	0.06 0.08 0.11	0.08 0.10 0.13	0.10 0.12 0.15	0.10 0.14 0.18	0.12 0.16 0.20	0.12 0.17 0.22

Note: please set feed rate below to the recommendation parameter referring to the drill head diameters increasing(1.5D→3D→5D→8D).
Criteria: for 1.5D, 3D, 5D=80% or below, 8D=60% or below.
Cooling: adopt internal cooling or external cooling drilling no more than 2D, dry cutting is prohibited!

How to choose the right solid carbide reamers

Shape

Product type

Product name

Product category

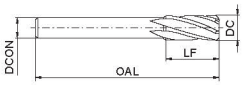
Reamers

Size

Solid carbide reamer with straight shank and right helical flute

3101H7





H7

Type	Basic dimension(mm)				Number of tooth	Recommended grade
	DC	DCON(h_7)	OAL	LF		YK10F
3101H7-0400	4.0	3.55	56	20	4	☆
3101H7-0450	4.5	4.00	63	22	6	☆
3101H7-0500	5.0	4.00	63	22	6	☆
3101H7-0550	5.5	5.00	63	22	6	☆
3101H7-0600	6.0	5.00	63	22	6	☆
3101H7-0650	6.5	5.00	63	22	6	☆
3101H7-0700	7.0	6.30	71	25	6	☆
3101H7-0750	7.5	6.30	71	25	6	☆
3101H7-0800	8.0	6.30	71	25	6	☆
3101H7-0850	8.5	8.00	71	25	6	☆
3101H7-0900	9.0	8.00	71	25	6	☆
3101H7-0950	9.5	8.00	71	25	6	☆
3101H7-1000	10.0	8.00	71	25	6	☆
3101H7-1050	10.5	8.00	71	25	6	☆
3101H7-1100	11.0	10.00	80	28	6	☆
3101H7-1150	11.5	10.00	80	28	6	☆
3101H7-1200	12.0	10.00	80	28	6	☆
3101H7-1250	12.5	10.00	80	28	6	☆
3101H7-1300	13.0	10.00	80	28	6	☆
3101H7-1350	13.5	12.5	90	32	6	☆
3101H7-1400	14.0	12.5	90	32	6	☆
3101H7-1450	14.5	12.5	90	32	6	☆
3101H7-1500	15.0	12.5	90	32	6	☆
3101H7-1550	15.5	12.5	90	32	6	☆
3101H7-1600	16.0	12.5	90	32	6	☆
3101H7-1700	17.0	12.5	90	32	6	☆
3101H7-1800	18.0	16.00	100	36	6	☆
3101H7-1900	19.0	16.00	100	36	6	☆
3101H7-2000	20.0	16.00	100	36	6	☆

☆ Recommended grade (produce according to order)

Applicable material table ◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK10F							◎	◎	◎	◎	

Code key C235 Cutting parameters C239 Technical information C240-C242 Non-standard customization tools C243

Applicable workpiece material range

Hole precision class and shank type

Specification
Type, basic dimensions ,number of tooth and grade.

Code key, cutting parameter, technical information, non-standard customization



HOLEMAKING TOOLS

C

Reamers

Solid carbide reamers overview C234

Icons information C234

Solid carbide reamer code key C235

Detail information of solid carbide reamers C236-C238

Recommended cutting parameters for solid carbide reamers C239

Technical information for solid carbide reamers C240-C242

Non-standard customized solid carbide reamers C243







Solid carbide reamers overview

Name	Type	Shape	Diameter range	Workpiece material								Page	
				P		M	K	N		S	H		
				Mild steel	Common steel	Stainless steel	Cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy	High hardness steel	Specification	Cutting parameters
Right helical flute reamer	**3101H7**		Ø4-Ø20				◎	◎	◎			C236	C239
Straight flute reamer	**3102H7**		Ø4-Ø20				◎	◎	◎			C237	C239
Left helical flute reamer	**3103H7**		Ø4-Ø20				◎	◎	◎			C238	C239

◎ Very suitable ○ Suitable

Solid carbide reamers icons information

Precision class of reamed hole

H7 — The precision class of reamed hole reaches H7 specified in GB/T1800-1804

Shank type

 Straight shank

Solid carbide reamer code key

Code	Description
3	Reamer

Tool type

Code	Description
1	Right chip flute
2	Straight flute
3	Left chip flute

Type of flute

Code	Description
H7	The precision class of reamed hole reaches H7 specified in GB/T1800-1804

Precision class of reamed hole

3 1 0 1 H7 -0850

Shank type

Code	Description
1	Straight shank
2	Square straight shank as per DIN10
5	Straight shank as per DIN6535HA
9	Tapered shank

Mode of cooling

Code	Description
0	External coolant
1	Internal coolant

Specification

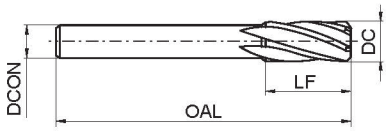
Code	Description
0850	Diameter is 8.5mm



Solid carbide reamer with straight shank and right helical flute

3101H7





H7

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3101H7-1400	14.0	12.5	90	32	6	☆
3101H7-1450	14.5	12.5	90	32	6	☆
3101H7-1500	15.0	12.5	90	32	6	☆
3101H7-1550	15.5	12.5	90	32	6	☆
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3101H7-1800	18.0	16.00	100	36	6	☆
3101H7-1900	19.0	16.00	100	36	6	☆
3101H7-2000	20.0	16.00	100	36	6	☆

☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

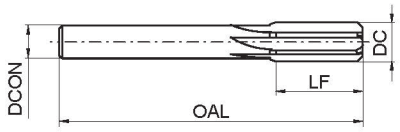
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK10F							◎	◎	◎	◎	

Code key C235
Cutting parameters C239
Technical information C240-C242
Non-standard customization tools C243

Solid carbide reamer with straight shank and straight flute

3102H7





H7

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3102H7-1200	12.0	10.00	80	28	6	☆
3102H7-1250	12.5	10.00	80	28	6	☆
3102H7-1300	13.0	10.00	80	28	6	☆
3102H7-1350	13.5	12.5	90	32	6	☆
3102H7-1400	14.0	12.5	90	32	6	☆
3102H7-1450	14.5	12.5	90	32	6	☆
3102H7-1500	15.0	12.5	90	32	6	☆
3102H7-1550	15.5	12.5	90	32	6	☆
3102H7-1600	16.0	12.5	90	32	6	☆
3102H7-1700	17.0	12.5	90	32	6	☆
3102H7-1800	18.0	16.00	100	36	6	☆
3102H7-1900	19.0	16.00	100	36	6	☆
3102H7-2000	20.0	16.00	100	36	6	☆

☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK10F							◎	◎	◎	◎	

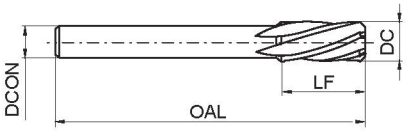
Code key C235 Cutting parameters C239 Technical information C240-C242 Non-standard customization tools C243

Solid carbide reamer with straight shank and left helical flute

3103H7



H7



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☆ Recommended grade (produce according to order)

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK10F							◎	◎	◎	◎	

Code key C235
Cutting parameters C239
Technical information C240-C242
Non-standard customization tools C243

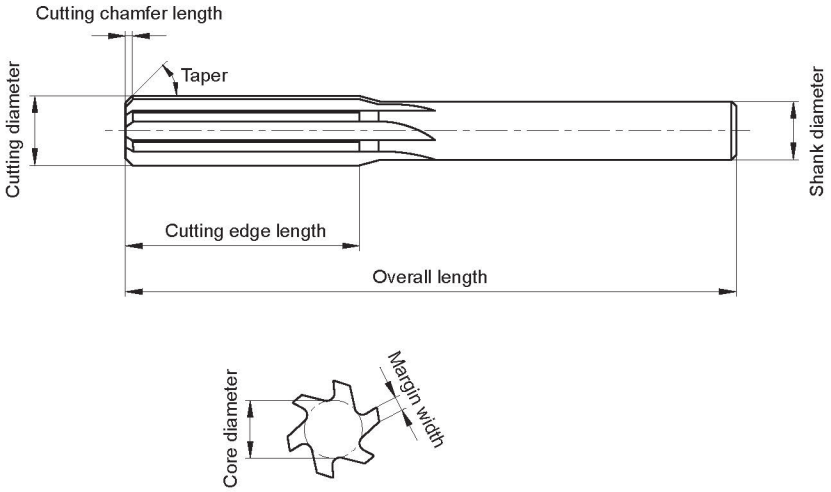
3101H7★3102H7★3103H7

Workpiece material	Cast iron Nodular cast iron			Copper alloy			Casting aluminium alloy		
Cutting speed	8~16m/min			10~25m/min			15~30 m/min		
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Allowance (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Allowance (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Allowance (mm)
4	950	0.04~0.06	0.1~0.2	1600	0.04~0.06	0.1~0.2	2000	0.04~0.06	0.1~0.2
5	760	0.05~0.09	0.1~0.2	1300	0.05~0.09	0.1~0.2	1600	0.05~0.09	0.1~0.2
6	640	0.06~0.12	0.1~0.2	1050	0.06~0.12	0.1~0.2	1300	0.06~0.12	0.1~0.2
7	550	0.07~0.14	0.1~0.2	910	0.07~0.14	0.1~0.2	1150	0.07~0.14	0.1~0.2
8	480	0.08~0.16	0.1~0.2	800	0.08~0.16	0.1~0.2	1000	0.08~0.16	0.1~0.2
9	430	0.09~0.18	0.1~0.2	710	0.09~0.18	0.1~0.2	890	0.09~0.18	0.1~0.2
10	380	0.10~0.20	0.1~0.2	640	0.10~0.20	0.1~0.2	800	0.10~0.20	0.1~0.2
11	350	0.11~0.22	0.1~0.2	580	0.11~0.22	0.1~0.2	720	0.11~0.22	0.1~0.2
12	320	0.12~0.24	0.1~0.2	530	0.12~0.24	0.1~0.2	660	0.12~0.24	0.1~0.2
13	290	0.13~0.26	0.1~0.2	490	0.13~0.26	0.1~0.2	610	0.13~0.26	0.1~0.2
14	270	0.14~0.28	0.1~0.2	460	0.14~0.28	0.1~0.2	570	0.14~0.28	0.1~0.2
15	250	0.15~0.30	0.1~0.2	430	0.15~0.30	0.1~0.2	530	0.15~0.30	0.1~0.2
16	240	0.16~0.32	0.1~0.2	400	0.16~0.32	0.1~0.2	500	0.16~0.32	0.1~0.2
17	225	0.18~0.34	0.1~0.2	380	0.18~0.34	0.1~0.2	470	0.18~0.34	0.1~0.2
18	210	0.20~0.36	0.1~0.2	350	0.20~0.36	0.1~0.2	440	0.20~0.36	0.1~0.2
19	200	0.22~0.38	0.1~0.2	340	0.22~0.38	0.1~0.2	420	0.22~0.38	0.1~0.2
20	190	0.24~0.40	0.1~0.2	320	0.24~0.40	0.1~0.2	400	0.24~0.40	0.1~0.2

1.Please select the holder with high rigidity and high precision.
2.Make sure coolant supply is sufficient.
3.Please adjust cutting parameters according workpiece and machine rigidity.



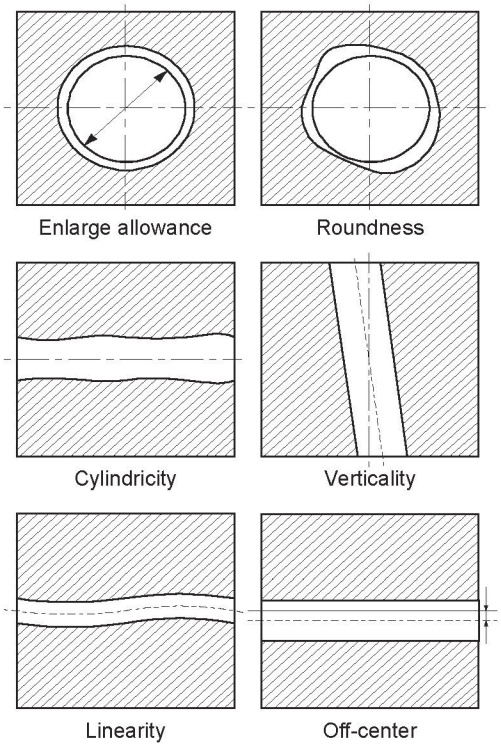
Terminology of reamer



Reaming is the semi-finishing and finishing of an existing hole to achieve precise size, high surface quality, perfect roundness and cylindricity, etc.

In order to gain precise hole in reaming process, the reamer diameter must be defined correctly. Therefore, it is necessary to consider the allowance which is determined by workpiece material and machining conditions. It is also necessary to select the cutting conditions correctly in addition to using high precision reamer to achieve good surface quality.

The reaming precision is mainly determined by diameter and radial run-out. With respect to cutting condition, it is better to select low speed cutting to improve machining precision, but the upper limit should be considered carefully for higher machining efficiency.



Common problems and solutions for reaming

Common problems	Solutions
Oversized holes	1.Reduce diameter of reamer. 2.The center of reamer is not in alignment with hole center. Adjust the concentricity of hole and reamer. 3.Radial run-out of reamer is too large. Good radial run-out is a key to successful reaming. 4.Scratches on reamer shank. 5.When using bushing and bushing, ensure shank is clean. 6.Select a suitable coolant. 7.Adjust cutting parameters.
Undersized holes	1.Increase diameter of reamer. 2.Reduce rotating speed. 3.Reduce the margin width. 4.Excessive tool abrasion, please conduct cutting after regrinding. 5.Thermal expansion coefficient of workpiece is too large. Please keep it cooled enough.
Poor hole roundness and linearity	1.Ensure better roundness of reamer chamfer. 2.Reamer rigidity is low. Make the overhang as short as possible in conditions of non-inference. 3.Check radial run-out after clamping reamer. 4.Adjust the concentricity of hole and reamer. 5.Ensure reaming allowance equality.
Poor hole surface quality	1.The hole surface roughness of entering part is bad. 2.Reduce rotating speed. 3.Ensure correct reaming allowance. The allowance being too large or too small would result in bad surface roughness. 4.Select the reamer with large chip pocket to avoid chip jamming. 5.Increase clearance angle of reamer entering part. 6.Check whether there is built-up on chamfer and margin land. 7.Increase the rigidity of machine, holder and reamer. 8.Check out whether the type of reamer head is suitable for the workpiece. 9.Increase the margin width and land width appropriately.
Hole precision is low	1.In return pass, the reamer should be pulled out of hole rotating at the same direction as before. Opposite rotation must be prohibited. 2.Reduce rotating speed. 3.Select the reamer with more lips. 4.Increase the margin width appropriately to enhance the guiding performance and extrusion effect. 5.Improve reamer lubricating property by surface treatment. 6.Select a suitable coolant.

Common problems and solutions for reaming

Common problems	Solutions
Reamer breakage, thermal damage	1.The guide hole is defective before reaming, for example, linearity is not good. 2.Adjust machining allowance to avoid tool breakage caused by too large allowance. 3.If the chip removal is obstructed, select a reamer with larger chip pocket. 4.Ensure sufficient coolant supply. 5.Adjust rotating speed and feed speed appropriately. 6.Increase the rigidity of machine, holder and reamer. 7.Improve the sharpness of reamer to make cutting easy and fast. 8.Excessive abrasion occurs on cutting edge, which means tool life has expired. It is recommended to change or regrind tool.
Damage on reamer shank	1.Check whether the shank hardness is enough. Too low hardness would cause deformation, and too high hardness may cause breakage. 2.Check the conjunction of holder and bushing. Do not use a defective holder.
Short tool life	1.Enhance the hardness of reamer cutting edge. 2.Select the reamer made by advanced material. 3.Check the coolant. 4.Use surface treatment for reamer such as nitride process. 5.Change the straight flute to helical flute. 6.Check all factors affecting machining precision.
Scratches on hole surface	1.Make sure no built-up is on the reamer surface. 2.Improve workpiece holding.
Trumpet-shaped entry hole	1.Improve workpiece holding. 2.Check radial run-out after clamping reamer. 3.The center of reamer is not in alignment with the hole center. Adjust the concentricity of hole and reamer.
Oversized holes	1.The center of reamer is not in alignment with hole center. Adjust the concentricity of hole and reamer. 2.Improve workpiece holding.

Company name:

Fax:

Tel:

E-MAIL:

ZCC-CT

Huanghe Southern Road, Tianyuan Zone, Zhuzhou. Hunan province

Fax: 0731-22882721 22885420 22887878

Zip code: 412007 E-mail:zccct@zccct.com

Hole information and workpiece material

Hole shape to be machined: ☐ Through hole ☐ Blind hole

Size of processed hole= mm

Tolerance of processed hole=

Depth of processed hole= mm

☐ Grey cast iron
☐ Ductile Iron
☐ Aluminum alloy
☐ Silicon Aluminum Alloy Si < 10%
☐ Silicon Aluminum Alloy Si ⩾ 10%

Material grade to be processed:

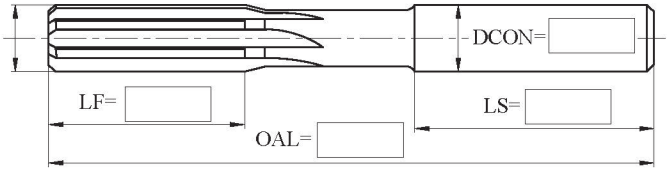
Tensile strength= N/mm^2

Hardness= Units:(HRC,HB,etc.)

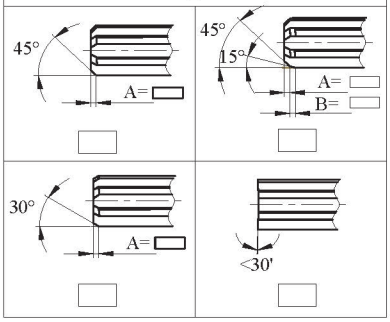
Direction of cutting tools' rotation

Right-handed rotation	☐
Straight flute	☐
Left-handed rotation	☐

DC=
Tol:



Lead angle forms



Coolant type	
Internal coolant	
External coolant	

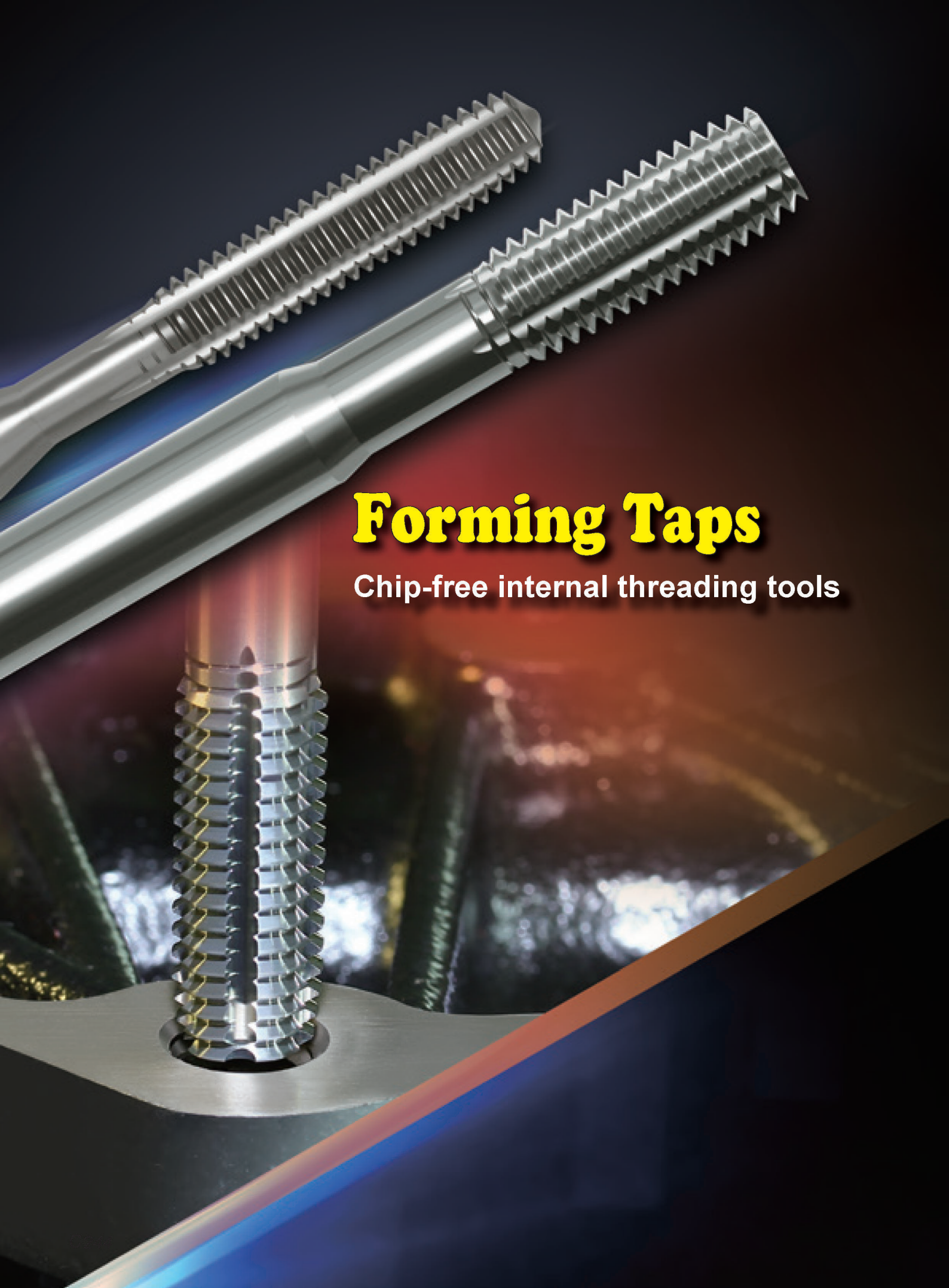
Coating	
Coated	☐
Non-Coated	☐

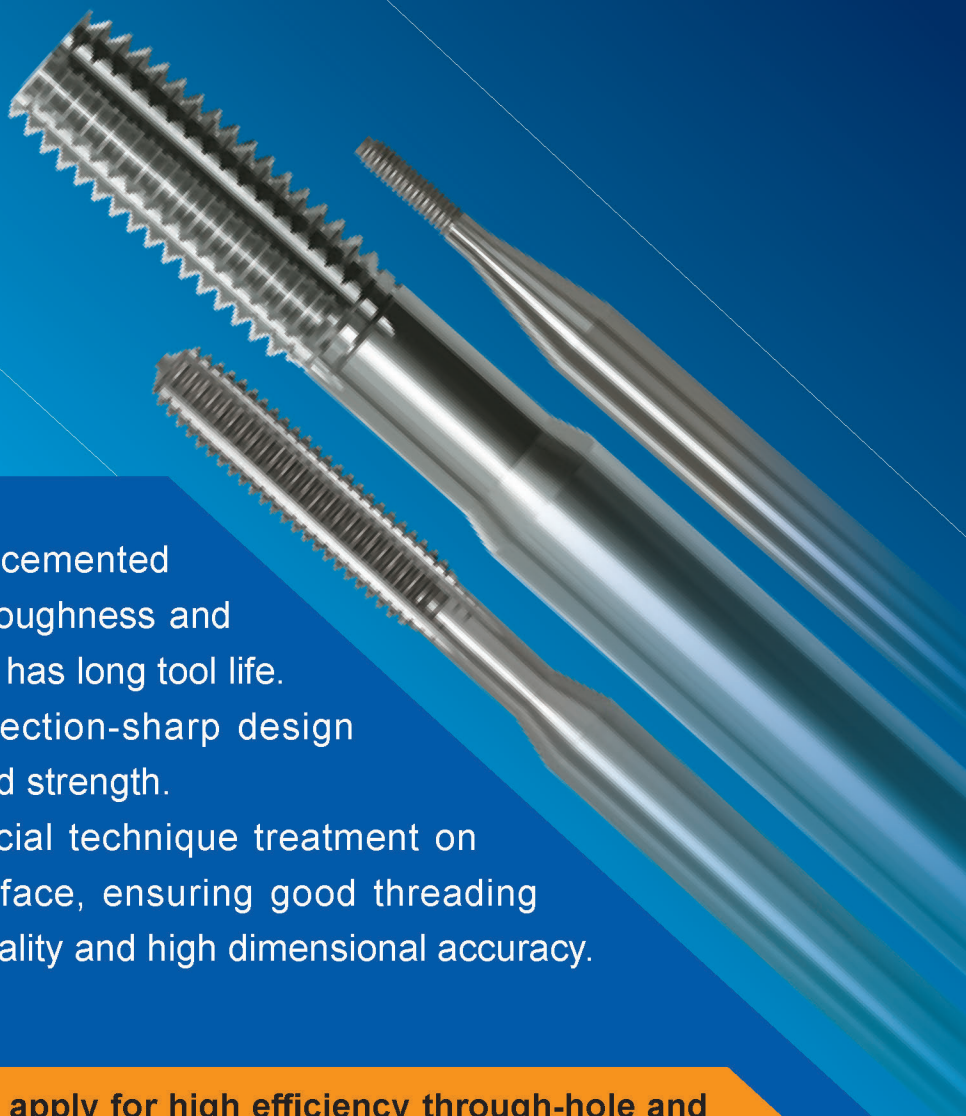
DIN6535 Shank form

☐ Form HA
☐ Form HB
☐ Form HE
☐ Ordinary straight handle
☐ With flat tail handle DIN 1809
☐ Morse Taper Shank MT ☐
Special shapes

Note:

Order Quantity:	PCS	Expected delivery date:
Quotation:		Confirmation:
		Date:


Forming Taps
Chip-free internal threading tools



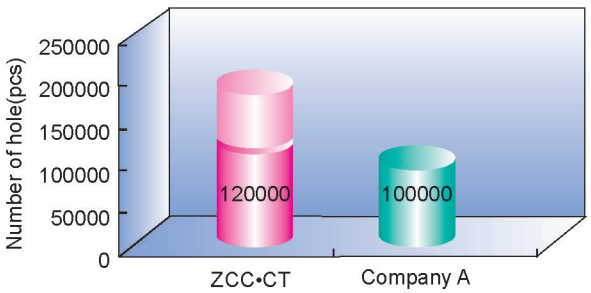
- Super micro grain cemented carbide with good toughness and abrasion resistance has long tool life.
- With particularly section-sharp design has good rigidity and strength.
- Thanks to the special technique treatment on cutting edge surface, ensuring good threading machining quality and high dimensional accuracy.

It is apply for high efficiency through-hole and blind-hole machining of high tensility material such as mild steel, stainless steel, Al alloys and cast Al alloy, etc.

Application case

Workpiece: Auto engine shell
Workpiece material: Al alloy (HB90~120)
Tool type: 4222ACS-M10×1.25-6H
Cutting parameters: n=1300r/min
F=1625mm/min
h=29mm, through hole or blind hole machining
Machining tool: Horizontal machining center
Cooling style: Emulsified liquid cooling

Comparison of hole number



ZCC•CT: 120000 holes (still usable)
Company A: 100000 holes (failure)

How to choose the right solid carbide threading tools

Shape

Product name

Product category

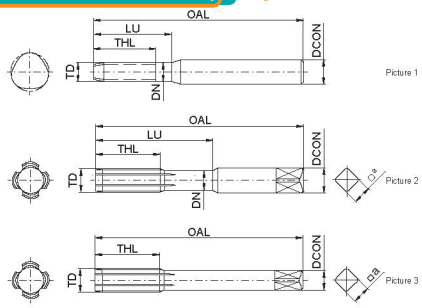
Solid carbide threading cutter

Application

Size

Forming taps - Stainless steel machining





ISO 2 (6H)

Type	Cooling mode	Basic dimension(mm)											Grade		Pre-hole diameter
		TCP	TD	P	DCON	DN	OAL	THL	LU	a*a	Thread profile	Geometry	Number of teeth	KTG402	YK40F	d
4122M-M1*0.25-6H	External coolant	3P	M1	0.25	3		40	5			60°	Picture 1	4	●	○	0.9
4122MS-M1*0.25-6H		2P	M1	0.25	3		40	5			60°	Picture 1	4	●	○	0.9
4122M-M1.2*0.25-6H		3P	M1.2	0.25	3		40	5			60°	Picture 1	4	●	○	1.1
4122MS-M1.2*0.25-6H		2P	M1.2	0.25	3		40	5			60°	Picture 1	4	●	○	1.1
4122M-M1.6*0.35-6H		3P	M1.6	0.35	3	1.1	40	5	11		60°	Picture 1	4	●	○	1.47
4122MS-M1.6*0.35-6H		2P	M1.6	0.35	3	1.1	40	5	11		60°	Picture 1	4	●	○	1.47
4122M-M2*0.4-6H		3P	M2	0.4	3	1.5	45	6	12		60°	Picture 1	4	●	○	1.85
4122MS-M2*0.4-6H		2P	M2	0.4	3	1.5	45	6	12		60°	Picture 1	4	●	○	1.85
4122M-M2.5*0.45-6H		3P	M2.5	0.45	3	1.9	50	6	14		60°	Picture 1	4	●	○	2.33
4122MS-M2.5*0.45-6H		2P	M2.5	0.45	3	1.9	50	6	14		60°	Picture 1	4	●	○	2.33
4222M-M3*0.5-6H		3P	M3	0.5	3.5	2.3	56	6	18	2.7	60°	Picture 2	4	●	○	2.8
4222MS-M3*0.5-6H		2P														
4222M-M4*0.5-6H		3P	M4	0.5	4.5	3.1	63	8	21	3.4	60°	Picture 2	4	●	○	3.8
4222MS-M4*0.5-6H		2P														
4222M-M4*0.7-6H		3P	M4	0.7	4.5	3.1	63	8	21	3.4	60°	Picture 2	4	●	○	3.7
4222MS-M4*0.7-6H		2P														
4222M-M5*0.5-6H		3P	M5	0.5	6	4.3	70	10	25	4.9	60°	Picture 2	4	●	○	4.8
4222MS-M5*0.5-6H		2P														

● Stock available ○ Make-to-order

Applicable material table ◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KTG402	◎					◎					
YK40F	○					○			○		

Code key C249 Cutting parameters C264 Technical information C265-C270 Non-standard customization C271

Applicable workpiece material range

Thread profile angle, shank type, precision class

Specification
Type, basic dimensions, number of tooth and grade.

Code key, cutting parameter, technical information, Non-standard customization



HOLEMAKING TOOLS

C

Threading tools

Solid carbide threading tools overview C248

Icons information of solid carbide threading tools C248

Code key of solid carbide threading tools C249

Detail information of solid carbide threading tools C250-C263

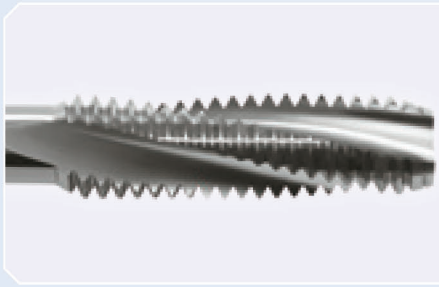
Solid carbide threading taps C250-C261

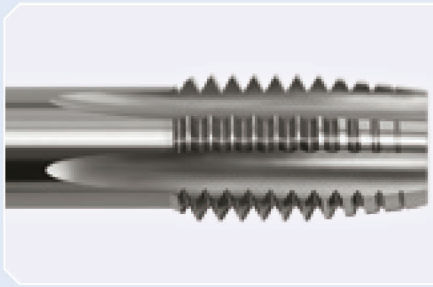
Solid carbide threading end mills C262-C263

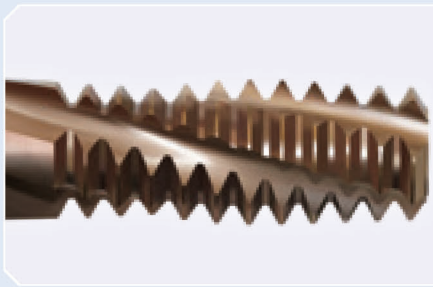
Recommended cutting parameters of solid carbide threading tools C264

Technical information of solid carbide threading tools C265-C270

Non-standard customization for threading tools C271-C272







Threading tools overview

Name	Type	Shape	Diameter range	Workpiece material							Page	
				P		M	K	N	S	H		
				Mild steel	Common steel	Stainless steel	Cast iron	Aluminum alloy	Heat resistant alloy	High hardness steel	Specification	Cutting parameters
Forming taps	4122A		M1~M2.5					◎			C250	C264
	4222A		M3~M16					◎			C250-C251	C186
	4122M		M1~M2.5	◎		◎		○			C252	C186
	4222M		M3~M16	◎		◎		○			C252-C253	C186
Helical-flute cutting taps	4201C		M3~M16				◎				C254-C255	C186
	4201A							◎			C258-C259	C186
Straight-flute cutting taps	4202C		M3~M16				◎				C256-C257	C186
	4202A							◎			C260-C261	C186
Threading end mills	4111		M3~M20	○	◎		○	○			C263	C186

◎ Very suitable ○ Suitable

Icons information

Shank type


Straight shank


Square straight shank as per din10

Thread profile angle of tap



60° shown

Precision class of screw thread

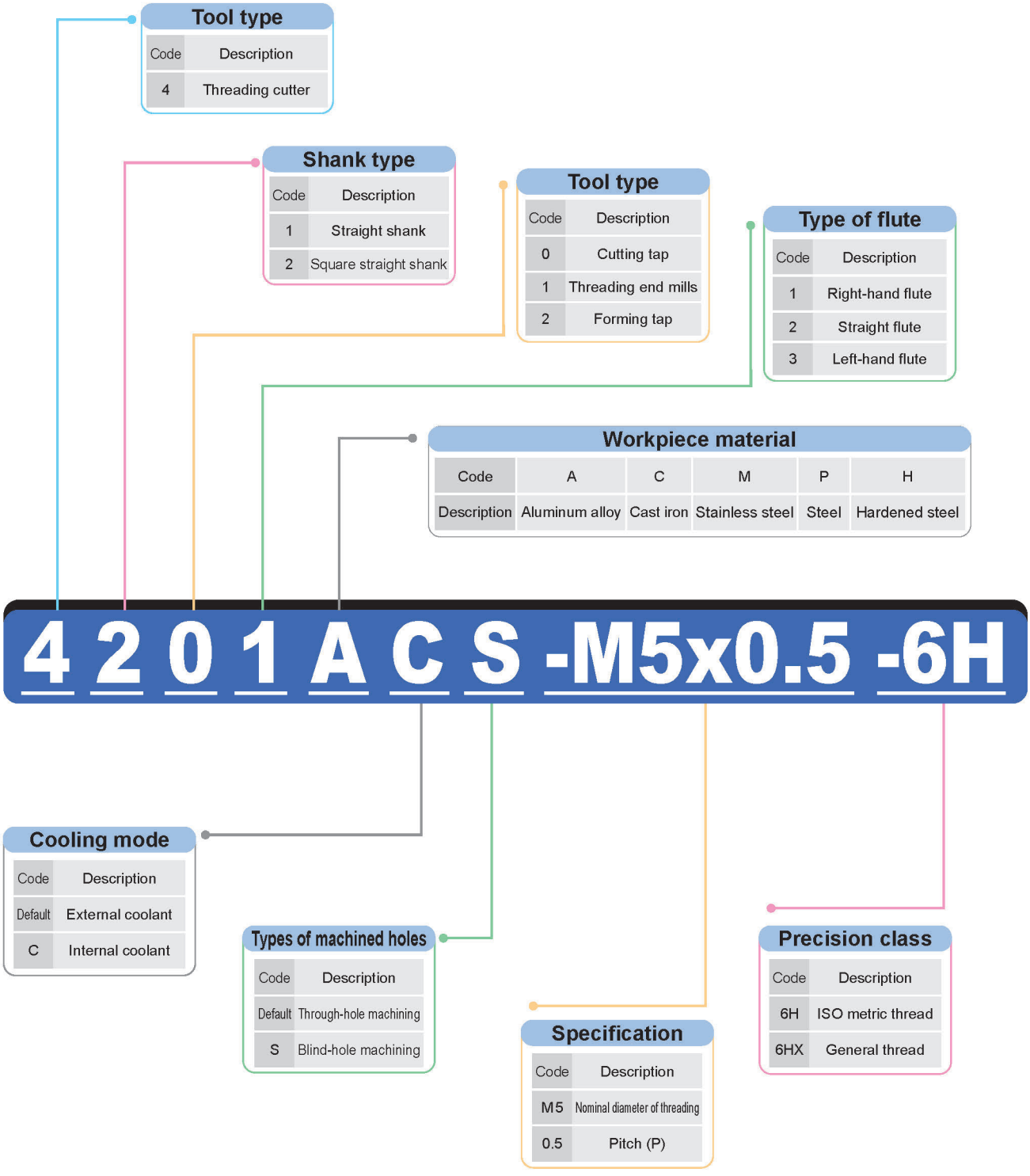


Precision class of screw thread



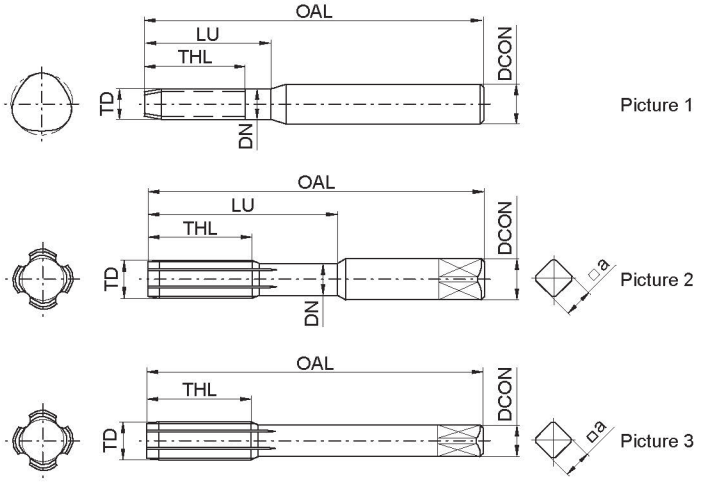
Precision class of screw thread

Threading tools code key



Forming taps - Al alloys machining







Type	Cooling mode	Basic dimension(mm)												Recommended grade	Pre-hole diameter
		TCP	TD	P	DCON	DN	OAL	THL	LU	a*a	Thread profile	Geometry	Number of teeth	YK40F	d
4122A-M1*0.25-6H	External coolant	3P	M1	0.25	3		40	5			60°	Picture 1	3	●	0.9
4122AS-M1*0.25-6H		1.5P	M1	0.25	3		40	5			60°	Picture 1	3	●	0.9
4122A-M1.2*0.25-6H		3P	M1.2	0.25	3		40	5			60°	Picture 1	3	●	1.1
4122AS-M1.2*0.25-6H		1.5P	M1.2	0.25	3		40	5			60°	Picture 1	3	●	1.1
4122A-M1.6*0.35-6H		3P	M1.6	0.35	3	1.1	40	5	11		60°	Picture 1	3	●	1.47
4122AS-M1.6*0.35-6H		1.5P	M1.6	0.35	3	1.1	40	5	11		60°	Picture 1	3	●	1.47
4122A-M2*0.4-6H		3P	M2	0.4	3	1.5	45	6	12		60°	Picture 1	3	●	1.85
4122AS-M2*0.4-6H		1.5P	M2	0.4	3	1.5	45	6	12		60°	Picture 1	3	●	1.85
4122A-M2.5*0.45-6H		3P	M2.5	0.45	3	1.9	50	6	14		60°	Picture 1	3	●	2.33
4122AS-M2.5*0.45-6H		1.5P	M2.5	0.45	3	1.9	50	6	14		60°	Picture 1	3	●	2.33
4222A-M3*0.5-6H		3P	M3	0.5	3.5	2.3	56	6	18	2.7	60°	Picture 2	4	●	2.8
4222AS-M3*0.5-6H		1.5P													
4222A-M4*0.5-6H		3P	M4	0.5	4.5	3.1	63	8	21	3.4	60°	Picture 2	4	●	3.8
4222AS-M4*0.5-6H		1.5P													
4222A-M4*0.7-6H		3P	M4	0.7	4.5	3.1	63	8	21	3.4	60°	Picture 2	4	●	3.7
4222AS-M4*0.7-6H		1.5P													
4222A-M5*0.5-6H		3P	M5	0.5	6	4.3	70	10	25	4.9	60°	Picture 2	4	●	4.8
4222AS-M5*0.5-6H		1.5P													
4222A-M5*0.8-6H		3P	M5	0.8	6	4	70	10	25	4.9	60°	Picture 2	4	●	4.65
4222AS-M5*0.8-6H		1.5P													
4222A-M6*0.75-6H		3P	M6	0.75	6	5	80	12	30	4.9	60°	Picture 2	4	●	5.7
4222AS-M6*0.75-6H		1.5P													
4222A-M6*1-6H		3P	M6	1	6	4.7	80	12	30	4.9	60°	Picture 2	4	●	5.6
4222AS-M6*1-6H		1.5P													
4222A-M7*1-6H		3P	M7	1	7	5.7	80	14	30	5.5	60°	Picture 2	4	●	6.6
4222AS-M7*1-6H		1.5P													

● Stock available ○ Make-to-order

Type	Cooling mode	Basic dimension(mm)											Recommended grade	Pre-hole diameter
		TCP	TD	P	DCON	DN	OAL	THL	LU	a*a	Thread profile	Geometry	Number of teeth	YK40F	d
4222A-M8*1-6H	External coolant	3P	M8	1	8	6.7	90	16	35	6.2	60°	Picture 2	4	●	7.6
4222AS-M8*1-6H		1.5P													
4222A-M8*1.25-6H		3P	M8	1.25	8	6.4	90	16	35	6.2	60°	Picture 2	4	●	7.45
4222AS-M8*1.25-6H		1.5P													
4222A-M10*1-6H		3P	M10	1	10	8.7	100	20	39	8	60°	Picture 2	5	●	9.6
4222AS-M10*1-6H		1.5P													
4222A-M10*1.25-6H		3P	M10	1.25	10	8.4	100	20	39	8	60°	Picture 2	5	●	9.45
4222AS-M10*1.25-6H		1.5P													
4222A-M10*1.5-6H		3P	M10	1.5	10	8.1	100	20	39	8	60°	Picture 2	5	●	9.35
4222AS-M10*1.5-6H		1.5P													
4222AC-M10*1.5-6H		3P													
4222ACS-M10*1.5-6H		1.5P													
4222A-M12*1.25-6H		3P	M12	1.25	9		110	24		7	60°	Picture 3	5	●	11.45
4222AS-M12*1.25-6H		1.5P													
4222A-M12*1.5-6H		3P	M12	1.5	9		110	24		7	60°	Picture 3	5	●	11.35
4222AS-M12*1.5-6H		1.5P													
4222A-M12*1.75-6H		3P	M12	1.75	9		110	24		7	60°	Picture 3	5	●	11.25
4222AS-M12*1.75-6H		1.5P													
4222AC-M12*1.75-6H		3P													
4222ACS-M12*1.75-6H		1.5P													
4222A-M14*1.5-6H		3P	M14	1.5	11		110	26		9	60°	Picture 3	6	●	13.35
4222AS-M14*1.5-6H		1.5P													
4222A-M14*2-6H		3P	M14	2	11		110	26		9	60°	Picture 3	6	●	13.1
4222AS-M14*2-6H		1.5P													
4222A-M16*1.5-6H		3P	M16	1.5	12		110	27		9	60°	Picture 3	6	●	15.35
4222AS-M16*1.5-6H		1.5P													
4222A-M16*2-6H		3P	M16	2	12		110	27		9	60°	Picture 3	6	●	15.1
4222AS-M16*2-6H		1.5P													
4222AC-M16*2-6H		3P													
4222ACS-M16*2-6H		1.5P													

● Stock available ○ Make-to-order

Applicable material table

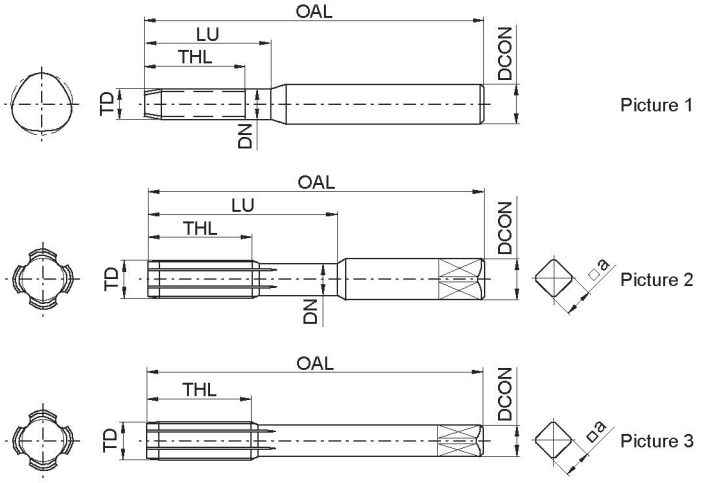
◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK40F									◎		

Code key C249 Cutting parameters C264 Technical information C265-C270 Non-standard customization C271

Forming taps - Stainless steel machining







Type	Cooling mode	Basic dimension(mm)											Recommended grade		Pre-hole diameter
		TCP	TD	P	DCON	DN	OAL	THL	LU	a*a	Thread profile	Geometry	Number of teeth	KTG402	YK40F	d
4122M-M1*0.25-6H	External coolant	3P	M1	0.25	3		40	5			60°	Picture 1	4	●	○	0.9
4122MS-M1*0.25-6H		2P	M1	0.25	3		40	5			60°	Picture 1	4	●	○	0.9
4122M-M1.2*0.25-6H		3P	M1.2	0.25	3		40	5			60°	Picture 1	4	●	○	1.1
4122MS-M1.2*0.25-6H		2P	M1.2	0.25	3		40	5			60°	Picture 1	4	●	○	1.1
4122M-M1.6*0.35-6H		3P	M1.6	0.35	3	1.1	40	5	11		60°	Picture 1	4	●	○	1.47
4122MS-M1.6*0.35-6H		2P	M1.6	0.35	3	1.1	40	5	11		60°	Picture 1	4	●	○	1.47
4122M-M2*0.4-6H		3P	M2	0.4	3	1.5	45	6	12		60°	Picture 1	4	●	○	1.85
4122MS-M2*0.4-6H		2P	M2	0.4	3	1.5	45	6	12		60°	Picture 1	4	●	○	1.85
4122M-M2.5*0.45-6H		3P	M2.5	0.45	3	1.9	50	6	14		60°	Picture 1	4	●	○	2.33
4122MS-M2.5*0.45-6H		2P	M2.5	0.45	3	1.9	50	6	14		60°	Picture 1	4	●	○	2.33
4222M-M3*0.5-6H		3P	M3	0.5	3.5	2.3	56	6	18	2.7	60°	Picture 2	4	●	○	2.8
4222MS-M3*0.5-6H		2P														
4222M-M4*0.5-6H		3P	M4	0.5	4.5	3.1	63	8	21	3.4	60°	Picture 2	4	●	○	3.8
4222MS-M4*0.5-6H		2P														
4222M-M4*0.7-6H		3P	M4	0.7	4.5	3.1	63	8	21	3.4	60°	Picture 2	4	●	○	3.7
4222MS-M4*0.7-6H		2P														
4222M-M5*0.5-6H		3P	M5	0.5	6	4.3	70	10	25	4.9	60°	Picture 2	4	●	○	4.8
4222MS-M5*0.5-6H		2P														
4222M-M5*0.8-6H		3P	M5	0.8	6	4	70	10	25	4.9	60°	Picture 2	4	●	○	4.65
4222MS-M5*0.8-6H		2P														
4222M-M6*0.75-6H		3P	M6	0.75	6	5	80	12	30	4.9	60°	Picture 2	4	●	○	5.7
4222MS-M6*0.75-6H		2P														
4222M-M6*1-6H		3P	M6	1	6	4.7	80	12	30	4.9	60°	Picture 2	4	●	○	5.6
4222MS-M6*1-6H		2P														
4222M-M7*1-6H		3P	M7	1	7	5.7	80	14	30	5.5	60°	Picture 2	4	●	○	6.6
4222MS-M7*1-6H		2P														

● Stock available ○ Make-to-order

Forming taps - Stainless steel machining

Type	Cooling mode	Basic dimension(mm)											Recommended grade		Pre-hole diameter
		TCP	TD	P	DCON	DN	OAL	THL	LU	a*a	Thread profile	Geometry	Number of teeth	KTG402	YK40F	d
4222M-M8*1-6H	External coolant	3P	M8	1	8	6.7	90	16	35	6.2	60°	Picture 2	4	●	○	7.6
4222MS-M8*1-6H		2P														
4222M-M8*1.25-6H		3P	M8	1.25	8	6.4	90	16	35	6.2	60°	Picture 2	4	●	○	7.45
4222MS-M8*1.25-6H		2P														
4222M-M10*1-6H		3P	M10	1	10	8.7	100	20	39	8	60°	Picture 2	5	●	○	9.6
4222MS-M10*1-6H		2P														
4222M-M10*1.25-6H		3P	M10	1.25	10	8.4	100	20	39	8	60°	Picture 2	5	●	○	9.45
4222MS-M10*1.25-6H		2P														
4222M-M10*1.5-6H		3P	M10	1.5	10	8.1	100	20	39	8	60°	Picture 2	5	●	○	9.35
4222MS-M10*1.5-6H		2P														
4222MC-M10*1.5-6H	Internal coolant	3P														
4222MCS-M10*1.5-6H		2P														
4222M-M12*1.25-6H	External coolant	3P	M12	1.25	9		110	24		7	60°	Picture 3	5	●	○	11.45
4222MS-M12*1.25-6H		2P														
4222M-M12*1.5-6H		3P	M12	1.5	9		110	24		7	60°	Picture 3	5	●	○	11.35
4222MS-M12*1.5-6H		2P														
4222M-M12*1.75-6H		3P	M12	1.75	9		110	24		7	60°	Picture 3	5	●	○	11.25
4222MS-M12*1.75-6H		2P														
4222MC-M12*1.75-6H	Internal coolant	3P														
4222MCS-M12*1.75-6H		2P														
4222M-M14*1.5-6H	External coolant	3P	M14	1.5	11		110	26		9	60°	Picture 3	6	●	○	13.35
4222MS-M14*1.5-6H		2P														
4222M-M14*2-6H		3P	M14	2	11		110	26		9	60°	Picture 3	6	●	○	13.1
4222MS-M14*2-6H		2P														
4222M-M16*1.5-6H		3P	M16	1.5	12		110	27		9	60°	Picture 3	6	●	○	15.35
4222MS-M16*1.5-6H		2P														
4222M-M16*2-6H		3P	M16	2	12		110	27		9	60°	Picture 3	6	●	○	15.1
4222MS-M16*2-6H		2P														
4222MC-M16*2-6H	Internal coolant	3P														
4222MCS-M16*2-6H		2P														

● Stock available ○ Make-to-order

Applicable material table

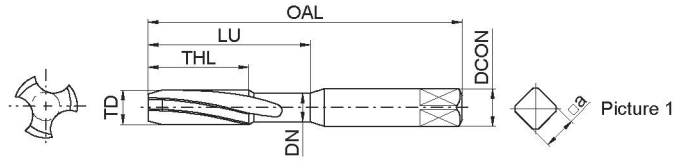
◎Very suitable ○Suitable

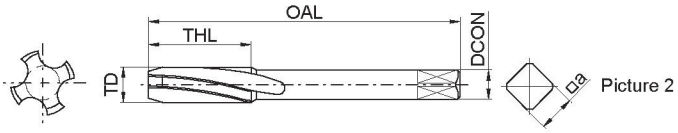
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KTG402	◎					◎					
YK40F	○					○			○		

Code key C249 Cutting parameters C264 Technical information C265-C270 Non-standard customization C271

Helical-flute cutting taps - Cast iron machining









Type	Basic dimension(mm)											Recommended grade	Pre-hole diameter
	TCP	TD	P	DCON	DN	OAL	THL	LU	a*a	Thread profile	Geometry	Number of teeth	YK40F	d
4201C-M3*0.5-6H	3P	M3	0.5	3.5	2.3	56	11	18	2.7	60°	Picture 1	3	●	2.5
4201C-M3*0.5-6HX	3P													
4201CS-M3*0.5-6H	1.5P													
4201CS-M3*0.5-6HX	1.5P													
4201C-M4*0.7-6H	3P	M4	0.7	4.5	3.1	63	13	21	3.4	60°	Picture 1	3	●	3.3
4201C-M4*0.7-6HX	3P													
4201CS-M4*0.7-6H	1.5P													
4201CS-M4*0.7-6HX	1.5P													
4201C-M5*0.8-6H	3P	M5	0.8	6	4	70	16	25	4.9	60°	Picture 1	3	●	4.2
4201C-M5*0.8-6HX	3P													
4201CS-M5*0.8-6H	1.5P													
4201CS-M5*0.8-6HX	1.5P													
4201C-M6*0.75-6H	3P	M6	0.75	6	5	80	19	30	4.9	60°	Picture 1	3	●	5.25
4201C-M6*0.75-6HX	3P													
4201CS-M6*0.75-6H	1.5P													
4201CS-M6*0.75-6HX	1.5P													
4201C-M6*1-6H	3P	M6	1	6	4.7	80	19	30	4.9	60°	Picture 1	3	●	5
4201CC-M6*1-6H	3P													
4201C-M6*1-6HX	3P													
4201CS-M6*1-6H	1.5P													
4201CCS-M6*1-6H	1.5P													
4201CS-M6*1-6HX	1.5P													
4201C-M7*1-6H	3P	M7	1	7	5.7	80	19	30	5.5	60°	Picture 1	3	●	6
4201CS-M7*1-6H	1.5P													
4201C-M8*1-6H	3P	M8	1	8	6.7	90	20	35	6.2	60°	Picture 1	3	●	7
4201CS-M8*1-6H	1.5P													
4201C-M8*1.25-6H	3P	M8	1.25	8	6.4	90	22	35	6.2	60°	Picture 1	3	●	6.75
4201CC-M8*1.25-6H	3P													
4201C-M8*1.25-6HX	3P													
4201CS-M8*1.25-6H	1.5P													
4201CCS-M8*1.25-6H	1.5P													
4201CS-M8*1.25-6HX	1.5P													

● Stock available ○ Make-to-order

Helical-flute cutting taps - Cast iron machining

Type	Basic dimension(mm)											Recommended grade	Pre-hole diameter
	TCP	TD	P	DCON	DN	OAL	THL	LU	a*a	Thread profile	Geometry	Number of teeth	YK40F	d
4201C-M10*1-6H	3P	M10	1	10	8.7	100	20	39	8	60°	Picture 1	4	●	9
4201CS-M10*1-6H	1.5P													
4201C-M10*1.25-6H	3P	M10	1.25	10	8.4	100	24	39	8	60°	Picture 1	4	●	8.75
4201CS-M10*1.25-6H	1.5P													
4201C-M10*1.5-6H	3P	M10	1.5	10	8.1	100	24	39	8	60°	Picture 1	4	●	8.5
4201CC-M10*1.5-6H	3P													
4201C-M10*1.5-6HX	3P													
4201CS-M10*1.5-6H	1.5P													
4201CCS-M10*1.5-6H	1.5P													
4201CS-M10*1.5-6HX	1.5P													
4201C-M12*1.25-6H	3P	M12	1.25	9		110	29		7	60°	Picture 2	4	●	10.75
4201CS-M12*1.25-6H	1.5P													
4201C-M12*1.5-6H	3P	M12	1.5	9		110	29		7	60°	Picture 2	4	●	10.5
4201CS-M12*1.5-6H	1.5P													
4201C-M12*1.75-6H	3P	M12	1.75	9		110	29		7	60°	Picture 2	4	●	10.25
4201CC-M12*1.75-6H	3P													
4201C-M12*1.75-6HX	3P													
4201CS-M12*1.75-6H	1.5P													
4201CCS-M12*1.75-6H	1.5P													
4201CS-M12*1.75-6HX	1.5P													
4201C-M14*1.5-6H	3P	M14	1.5	11		110	30		9	60°	Picture 2	4	●	12.5
4201CS-M14*1.5-6H	1.5P													
4201C-M14*2-6H	3P	M14	2	11		110	30		9	60°	Picture 2	4	●	12
4201CS-M14*2-6H	1.5P													
4201C-M16*1.5-6H	3P	M16	1.5	12		110	32		9	60°	Picture 2	4	●	14.5
4201CS-M16*1.5-6H	1.5P													
4201C-M16*2-6H	3P	M16	2	12		110	32		9	60°	Picture 2	4	●	14
4201C-M16*2-6HX	3P													
4201CS-M16*2-6H	1.5P													
4201CS-M16*2-6HX	1.5P													

● Stock available ○ Make-to-order

Applicable material table

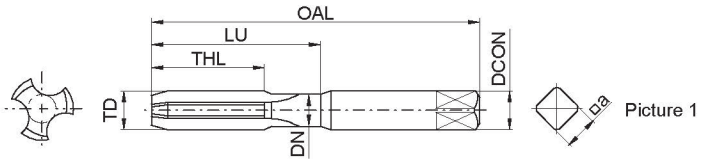
◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK40F							◎	◎			

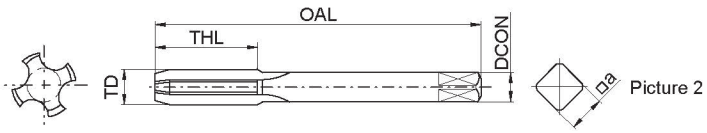
Code key C249 Cutting parameters C264 Technical information C265-C270 Non-standard customization C271

Straight-flute cutting taps - Cast iron machining





Picture 1



Picture 2

60° ISO 2 (6H) (6HX)

Type	Basic dimension(mm)											Recommended grade	Pre-hole diameter
	TCP	TD	P	DCON	DN	OAL	THL	LU	a*a	Thread profile	Geometry	Number of teeth	YK40F	d
4202C-M3*0.5-6H	3P	M3	0.5	3.5	2.3	56	11	18	2.7	60°	Picture 1	3	●	2.5
4202C-M3*0.5-6HX	3P													
4202CS-M3*0.5-6H	1.5P													
4202CS-M3*0.5-6HX	1.5P													
4202C-M4*0.7-6H	3P	M4	0.7	4.5	3.1	63	13	21	3.4	60°	Picture 1	3	●	3.3
4202C-M4*0.7-6HX	3P													
4202CS-M4*0.7-6H	1.5P													
4202CS-M4*0.7-6HX	1.5P													
4202C-M5*0.8-6H	3P	M5	0.8	6	4	70	16	25	4.9	60°	Picture 1	3	●	4.2
4202C-M5*0.8-6HX	3P													
4202CS-M5*0.8-6H	1.5P													
4202CS-M5*0.8-6HX	1.5P													
4202C-M6*0.75-6H	3P	M6	0.75	6	5	80	19	30	4.9	60°	Picture 1	3	●	5.25
4202C-M6*0.75-6HX	3P													
4202CS-M6*0.75-6H	1.5P													
4202CS-M6*0.75-6HX	1.5P													
4202C-M6*1-6H	3P	M6	1	6	4.7	80	19	30	4.9	60°	Picture 1	3	●	5
4202CC-M6*1-6H	3P													
4202C-M6*1-6HX	3P													
4202CS-M6*1-6H	1.5P													
4202CCS-M6*1-6H	1.5P													
4202CS-M6*1-6HX	1.5P													
4202C-M7*1-6H	3P	M7	1	7	5.7	80	19	30	5.5	60°	Picture 1	3	●	6
4202CS-M7*1-6H	1.5P													
4202C-M8*1-6H	3P	M8	1	8	6.7	90	20	35	6.2	60°	Picture 1	3	●	7
4202CS-M8*1-6H	1.5P													
4202C-M8*1.25-6H	3P	M8	1.25	8	6.4	90	22	35	6.2	60°	Picture 1	3	●	6.75
4202CC-M8*1.25-6H	3P													
4202C-M8*1.25-6HX	3P													
4202CS-M8*1.25-6H	1.5P													
4202CCS-M8*1.25-6H	1.5P													
4202CS-M8*1.25-6HX	1.5P													

● Stock available ○ Make-to-order

Straight-flute cutting taps - Cast iron machining

Type	Basic dimension(mm)											Recommended grade	Pre-hole diameter
	TCP	TD	P	DCON	DN	OAL	THL	LU	a*a	Thread profile	Geometry	Number of teeth	YK40F	d
4202C-M10*1-6H	3P	M10	1	10	8.7	100	20	39	8	60°	Picture 1	4	●	9
4202CS-M10*1-6H	1.5P													
4202C-M10*1.25-6H	3P	M10	1.25	10	8.4	100	24	39	8	60°	Picture 1	4	●	8.75
4202CS-M10*1.25-6H	1.5P													
4202C-M10*1.5-6H	3P	M10	1.5	10	8.1	100	24	39	8	60°	Picture 1	4	●	8.5
4202CC-M10*1.5-6H	3P													
4202C-M10*1.5-6HX	3P													
4202CS-M10*1.5-6H	1.5P													
4202CCS-M10*1.5-6H	1.5P													
4202CS-M10*1.5-6HX	1.5P													
4202C-M12*1.25-6H	3P	M12	1.25	9		110	29		7	60°	Picture 2	4	●	10.75
4202CS-M12*1.25-6H	1.5P													
4202C-M12*1.5-6H	3P	M12	1.5	9		110	29		7	60°	Picture 2	4	●	10.5
4202CS-M12*1.5-6H	1.5P													
4202C-M12*1.75-6H	3P	M12	1.75	9		110	29		7	60°	Picture 2	4	●	10.25
4202CC-M12*1.75-6H	3P													
4202C-M12*1.75-6HX	3P													
4202CS-M12*1.75-6H	1.5P													
4202CCS-M12*1.75-6H	1.5P													
4202CS-M12*1.75-6HX	1.5P													
4202C-M14*1.5-6H	3P	M14	1.5	11		110	30		9	60°	Picture 2	4	●	12.5
4202CS-M14*1.5-6H	1.5P													
4202C-M14*2-6H	3P	M14	2	11		110	30		9	60°	Picture 2	4	●	12
4202CS-M14*2-6H	1.5P													
4202C-M16*1.5-6H	3P	M16	1.5	12		110	32		9	60°	Picture 2	4	●	14.5
4202CS-M16*1.5-6H	1.5P													
4202C-M16*2-6H	3P	M16	2	12		110	32		9	60°	Picture 2	4	●	14
4202C-M16*2-6HX	3P													
4202CS-M16*2-6H	1.5P													
4202CS-M16*2-6HX	1.5P													

● Stock available ○ Make-to-order

Applicable material table

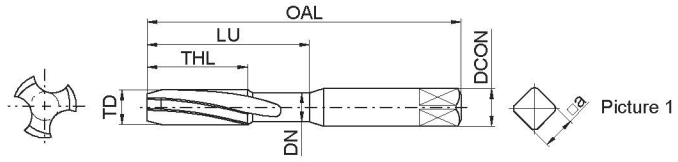
◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK40F							◎	◎			

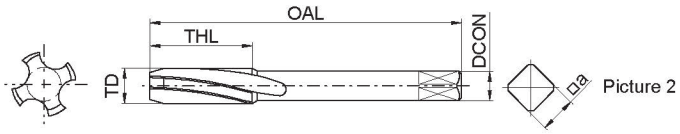
Code key C249 Cutting parameters C264 Technical information C265-C270 Non-standard customization C271

Helical-flute cutting taps - Al alloys machining





Picture 1



Picture 2



Type	Basic dimension(mm)											Recommended grade	Pre-hole diameter
	TCP	TD	P	DCON	DN	OAL	THL	LU	a*a	Thread profile	Geometry	Number of teeth	YK40F	d
4201A-M3*0.5-6H	3P	M3	0.5	3.5	2.3	56	11	18	2.7	60°	Picture 1	3	●	2.5
4201A-M3*0.5-6HX	3P													
4201AS-M3*0.5-6H	1.5P													
4201AS-M3*0.5-6HX	1.5P													
4201A-M4*0.7-6H	3P	M4	0.7	4.5	3.1	63	13	21	3.4	60°	Picture 1	3	●	3.3
4201A-M4*0.7-6HX	3P													
4201AS-M4*0.7-6H	1.5P													
4201AS-M4*0.7-6HX	1.5P													
4201A-M5*0.8-6H	3P	M5	0.8	6	4	70	16	25	4.9	60°	Picture 1	3	●	4.2
4201A-M5*0.8-6HX	3P													
4201AS-M5*0.8-6H	1.5P													
4201AS-M5*0.8-6HX	1.5P													
4201A-M6*0.75-6H	3P	M6	0.75	6	5	80	19	30	4.9	60°	Picture 1	3	●	5.25
4201A-M6*0.75-6HX	3P													
4201AS-M6*0.75-6H	1.5P													
4201AS-M6*0.75-6HX	1.5P													
4201A-M6*1-6H	3P	M6	1	6	4.7	80	19	30	4.9	60°	Picture 1	3	●	5
4201AC-M6*1-6H	3P													
4201A-M6*1-6HX	3P													
4201AS-M6*1-6H	1.5P													
4201ACS-M6*1-6H	1.5P													
4201AS-M6*1-6HX	1.5P													
4201A-M7*1-6H	3P	M7	1	7	5.7	80	19	30	5.5	60°	Picture 1	3	●	6
4201AS-M7*1-6H	1.5P													
4201A-M8*1-6H	3P	M8	1	8	6.7	90	20	35	6.2	60°	Picture 1	3	●	7
4201AS-M8*1-6H	1.5P													

● Stock available ○ Make-to-order

Helical-flute cutting taps - Al alloys machining

Type	Basic dimension(mm)											Recommended grade	Pre-hole diameter
	TCP	TD	P	DCON	DN	OAL	THL	LU	a*a	Thread profile	Geometry	Number of teeth	YK40F	d
4201A-M8*1.25-6H	3P	M8	1.25	8	6.4	90	22	35	6.2	60°	Picture 1	3	●	6.75
4201AC-M8*1.25-6H	3P													
4201A-M8*1.25-6HX	3P													
4201AS-M8*1.25-6H	1.5P													
4201ACS-M8*1.25-6H	1.5P													
4201AS-M8*1.25-6HX	1.5P													
4201A-M10*1-6H	3P	M10	1	10	8.7	100	20	39	8	60°	Picture 1	4	●	9
4201AS-M10*1-6H	1.5P													
4201A-M10*1.25-6H	3P	M10	1.25	10	8.4	100	24	39	8	60°	Picture 1	4	●	8.75
4201AS-M10*1.25-6H	1.5P													
4201A-M10*1.5-6H	3P	M10	1.5	10	8.1	100	24	39	8	60°	Picture 1	4	●	8.5
4201AC-M10*1.5-6H	3P													
4201A-M10*1.5-6HX	3P													
4201AS-M10*1.5-6H	1.5P													
4201ACS-M10*1.5-6H	1.5P													
4201AS-M10*1.5-6HX	1.5P													
4201A-M12*1.25-6H	3P	M12	1.25	9		110	29		7	60°	Picture 2	4	●	10.75
4201AS-M12*1.25-6H	1.5P													
4201A-M12*1.5-6H	3P	M12	1.5	9		110	29		7	60°	Picture 2	4	●	10.5
4201AS-M12*1.5-6H	1.5P													
4201A-M12*1.75-6H	3P	M12	1.75	9		110	29		7	60°	Picture 2	4	●	10.25
4201AC-M12*1.75-6H	3P													
4201A-M12*1.75-6HX	3P													
4201AS-M12*1.75-6H	1.5P													
4201ACS-M12*1.75-6H	1.5P													
4201AS-M12*1.75-6HX	1.5P													
4201A-M14*1.5-6H	3P	M14	1.5	11		110	30		9	60°	Picture 2	4	●	12.5
4201AS-M14*1.5-6H	1.5P													
4201A-M14*2-6H	3P	M14	2	11		110	30		9	60°	Picture 2	4	●	12
4201AS-M14*2-6H	1.5P													
4201A-M16*1.5-6H	3P	M16	1.5	12		110	32		9	60°	Picture 2	4	●	14.5
4201AS-M16*1.5-6H	1.5P													
4201A-M16*2-6H	3P	M16	2	12		110	32		9	60°	Picture 2	4	●	14
4201A-M16*2-6HX	3P													
4201AS-M16*2-6H	1.5P													
4201AS-M16*2-6HX	1.5P													

● Stock available ○ Make-to-order

Applicable material table

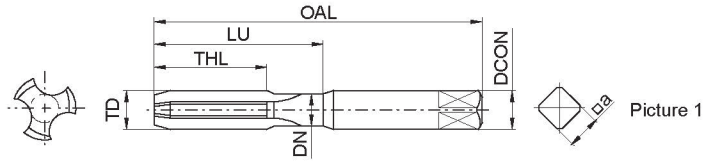
◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK40F									◎		

Code key C249 Cutting parameters C264 Technical information C265-C270 Non-standard customization C271

Straight-flute cutting taps - Al alloys machining





Picture 1



Picture 2

60° ISO 2 (6H) (6HX)

Type	Basic dimension(mm)											Recommended grade	Pre-hole diameter
	TCP	TD	P	DCON	DN	OAL	THL	LU	a*a	Thread profile	Geometry	Number of teeth	YK40F	d
4202A-M3*0.5-6H	3P	M3	0.5	3.5	2.3	56	11	18	2.7	60°	Picture 1	3	●	2.5
4202A-M3*0.5-6HX	3P													
4202AS-M3*0.5-6H	1.5P													
4202AS-M3*0.5-6HX	1.5P													
4202A-M4*0.7-6H	3P	M4	0.7	4.5	3.1	63	13	21	3.4	60°	Picture 1	3	●	3.3
4202A-M4*0.7-6HX	3P													
4202AS-M4*0.7-6H	1.5P													
4202AS-M4*0.7-6HX	1.5P													
4202A-M5*0.8-6H	3P	M5	0.8	6	4	70	16	25	4.9	60°	Picture 1	3	●	4.2
4202A-M5*0.8-6HX	3P													
4202AS-M5*0.8-6H	1.5P													
4202AS-M5*0.8-6HX	1.5P													
4202A-M6*0.75-6H	3P	M6	0.75	6	5	80	19	30	4.9	60°	Picture 1	3	●	5.25
4202A-M6*0.75-6HX	3P													
4202AS-M6*0.75-6H	1.5P													
4202AS-M6*0.75-6HX	1.5P													
4202A-M6*1-6H	3P	M6	1	6	4.7	80	19	30	4.9	60°	Picture 1	3	●	5
4202AC-M6*1-6H	3P													
4202A-M6*1-6HX	3P													
4202AS-M6*1-6H	1.5P													
4202ACS-M6*1-6H	1.5P													
4202AS-M6*1-6HX	1.5P													
4202A-M7*1-6H	3P	M7	1	7	5.7	80	19	30	5.5	60°	Picture 1	3	●	6
4202AS-M7*1-6H	1.5P													
4202A-M8*1-6H	3P	M8	1	8	6.7	90	20	35	6.2	60°	Picture 1	3	●	7
4202AS-M8*1-6H	1.5P													

● Stock available ○ Make-to-order

Straight-flute cutting taps - Al alloys machining

Type	Basic dimension(mm)											Recommended grade	Pre-hole diameter
	TCP	TD	P	DCON	DN	OAL	THL	LU	a*a	Thread profile	Geometry	Number of teeth	YK40F	d
4202A-M8*1.25-6H	3P	M8	1.25	8	6.4	90	22	35	6.2	60°	Picture 1	3	●	6.75
4202AC-M8*1.25-6H	3P													
4202A-M8*1.25-6HX	3P													
4202AS-M8*1.25-6H	1.5P													
4202ACS-M8*1.25-6H	1.5P													
4202AS-M8*1.25-6HX	1.5P													
4202A-M10*1-6H	3P	M10	1	10	8.7	100	20	39	8	60°	Picture 1	4	●	9
4202AS-M10*1-6H	1.5P													
4202A-M10*1.25-6H	3P	M10	1.25	10	8.4	100	24	39	8	60°	Picture 1	4	●	8.75
4202AS-M10*1.25-6H	1.5P													
4202A-M10*1.5-6H	3P	M10	1.5	10	8.1	100	24	39	8	60°	Picture 1	4	●	8.5
4202AC-M10*1.5-6H	3P													
4202A-M10*1.5-6HX	3P													
4202AS-M10*1.5-6H	1.5P													
4202ACS-M10*1.5-6H	1.5P													
4202AS-M10*1.5-6HX	1.5P													
4202A-M12*1.25-6H	3P	M12	1.25	9		110	29		7	60°	Picture 2	4	●	10.75
4202AS-M12*1.25-6H	1.5P													
4202A-M12*1.5-6H	3P	M12	1.5	9		110	29		7	60°	Picture 2	4	●	10.5
4202AS-M12*1.5-6H	1.5P													
4202A-M12*1.75-6H	3P	M12	1.75	9		110	29		7	60°	Picture 2	4	●	10.25
4202AC-M12*1.75-6H	3P													
4202A-M12*1.75-6HX	3P													
4202AS-M12*1.75-6H	1.5P													
4202ACS-M12*1.75-6H	1.5P													
4202AS-M12*1.75-6HX	1.5P													
4202A-M14*1.5-6H	3P	M14	1.5	11		110	30		9	60°	Picture 2	4	●	12.5
4202AS-M14*1.5-6H	1.5P													
4202A-M14*2-6H	3P	M14	2	11		110	30		9	60°	Picture 2	4	●	12
4202AS-M14*2-6H	1.5P													
4202A-M16*1.5-6H	3P	M16	1.5	12		110	32		9	60°	Picture 2	4	●	14.5
4202AS-M16*1.5-6H	1.5P													
4202A-M16*2-6H	3P	M16	2	12		110	32		9	60°	Picture 2	4	●	14
4202A-M16*2-6HX	3P													
4202AS-M16*2-6H	1.5P													
4202AS-M16*2-6HX	1.5P													

● Stock available ○ Make-to-order

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK40F									◎		

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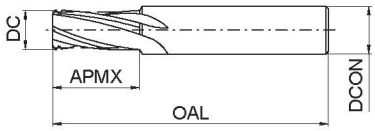
Solid carbide
Thread mills

Thread mills







Type	Basic dimension(mm)							Recommended grade		Pre-hole diameter
	D	DC	P	DCON	OAL	APMX	Number of teeth	KTG4015	YK40F	d
4111-M3*0.5	M3	2.35	0.5	4	50	6	3	●	○	2.5
4111-M4*0.7	M4	3.15	0.7	4	50	8	3	●	○	3.3
4111-M5*0.5	M5	4.3	0.5	6	50	10	3	●	○	4.5
4111-M5*0.8	M5	4	0.8	6	50	10	3	●	○	4.2
4111-M6*0.75	M6	5	0.75	6	60	12	4	●	○	5.25
4111-M6*1	M6	4.75	1	6	60	12	4	●	○	5
4111-M8*1	M8	6.65	1	8	60	16	4	●	○	7
4111-M8*1.25	M8	6.45	1.25	8	60	16	4	●	○	6.75
4111-M10*1	M10	8.55	1	10	75	20	4	●	○	9
4111-M10*1.5	M10	8.1	1.5	10	75	20	4	●	○	8.5
4111-M12*1.25	M12	10.25	1.25	12	75	24	4	●	○	10.75
4111-M12*1.75	M12	9.75	1.75	12	75	24	4	●	○	10.25
4111-M14*1	M14	12.35	1	14	75	20	4	●	○	13
4111-M14*1.5	M14	11.9	1.5	14	75	28	4	●	○	12.5
4111-M14*2	M14	11.4	2	14	75	28	4	●	○	12
4111-M16*2	M16	13.3	2	16	90	32	6	●	○	14
4111-M18*1	M18	16.15	1	18	90	20	6	●	○	17
4111-M18*2.5	M18	14.75	2.5	18	90	36	6	●	○	15.5
4111-M20*2	M20	17.1	2	18	100	40	6	●	○	18
4111-M20*2.5	M20	16.65	2.5	18	100	40	6	●	○	17.5

● Stock available ○ Make-to-order

Applicable material table

◎Very suitable ○Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KTG4015	○	◎	○				○	○			
YK40F							○		○	○	

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Forming tap

Workpiece material	Cutting speed (m/min)
Stainless steel / Mild steel	5~20
Aluminium alloy	20~50
Cast aluminium alloy(Si＜10%)	15~40

Cutting tap

Workpiece material	Cutting speed (m/min)
Grey cast iron	15~30
Nodular cast iron	10~20
Aluminium alloy	20~50
Cast aluminium alloy (Si < 10%)	20~45
Cast aluminium alloy (Si ≥ 10%)	15~40

Thread mills

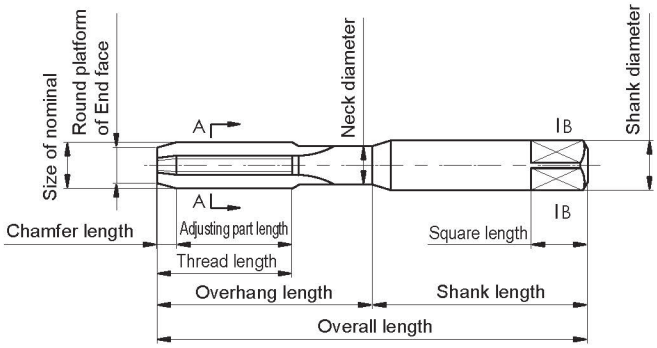
Workpiece material	Cutting speed (m/min)		Feed rate (mm/z)	
	Uncoated	Coated	D≤8	D>8
Alloy steel、Common steel	20~60	40~120	0.02~0.05	0.04~0.12
Aluminium alloy	100~250	---	0.05~0.2	

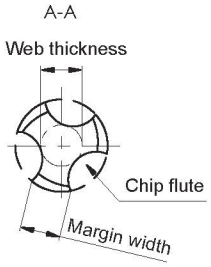
Note:

The tool entering feed is less than 70% of threading feed. It is in direct proportion to the diameter of the tap. The above cut parameters are suitable for thread cutters with helical flute. Please reduce feed rate and cutting speed by 20% ~ 40% if it is straight-flute tools.

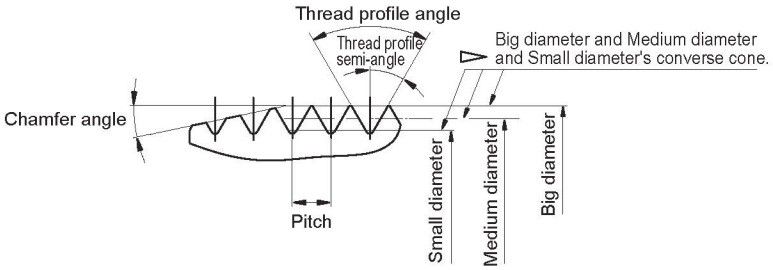
Tap

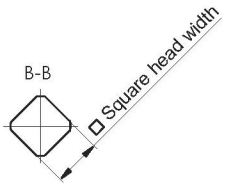
Parts terminology of cutting taps



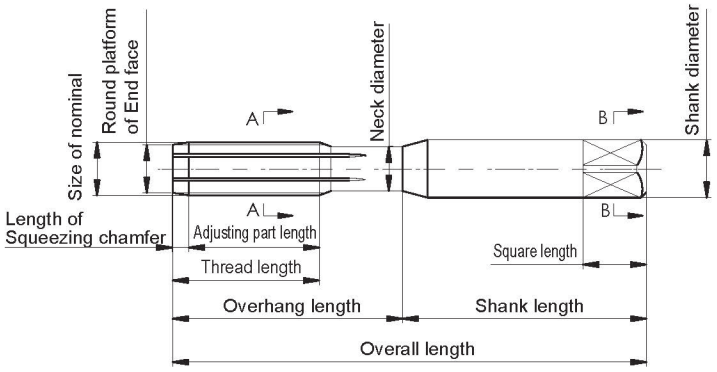


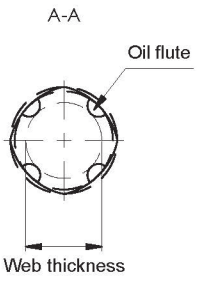
Magnifying fig of chamfer and thread profile



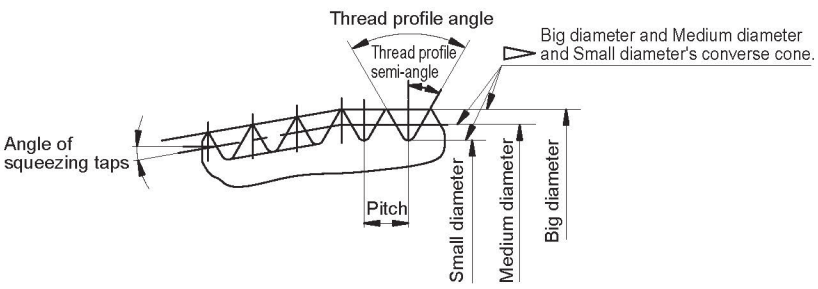


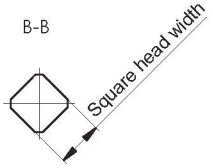
Parts terminology of forming taps



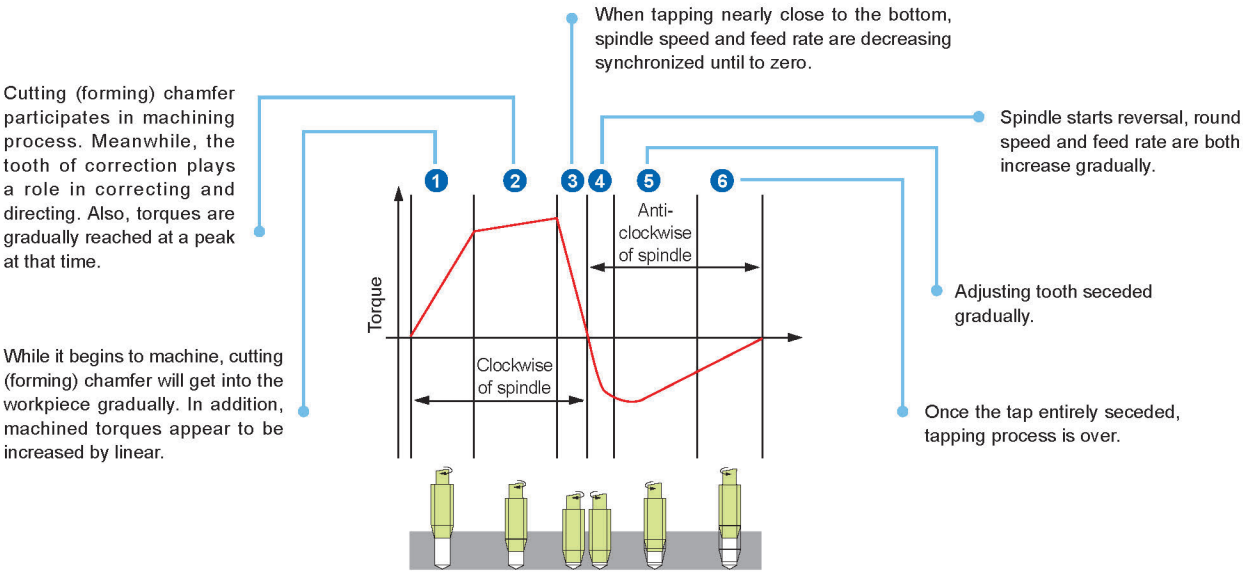


Magnifying fig of squeezing chamfer and guided threads

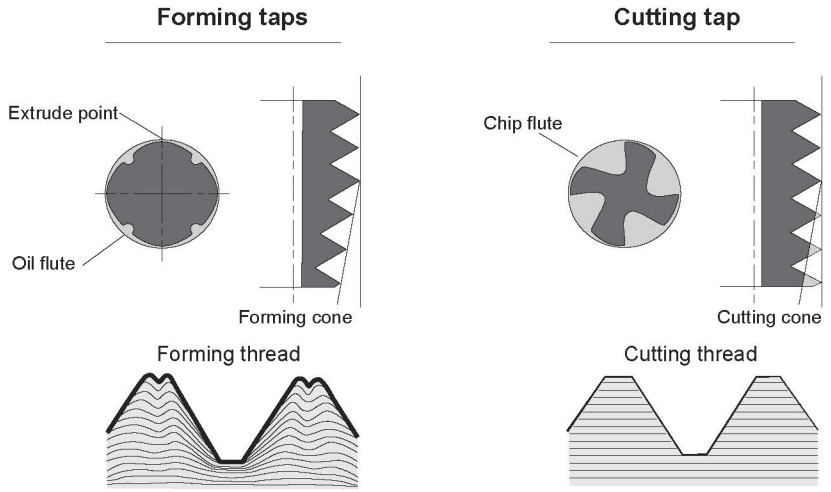




Process of tapping and tapping torques



Comparison of forming taps and cutting taps



Tapping types of cutting taps

Due to different machines, tapping types of cutting taps can be broadly divided into flexible tapping and rigid tapping. Due to different pre-hole, it can also be divided into through-hole tapping and blind-hole tapping.

Rigid tapping: Machine tool has good precision , the spindle feed rate is consistent with the tap pitch. Used general chunks.

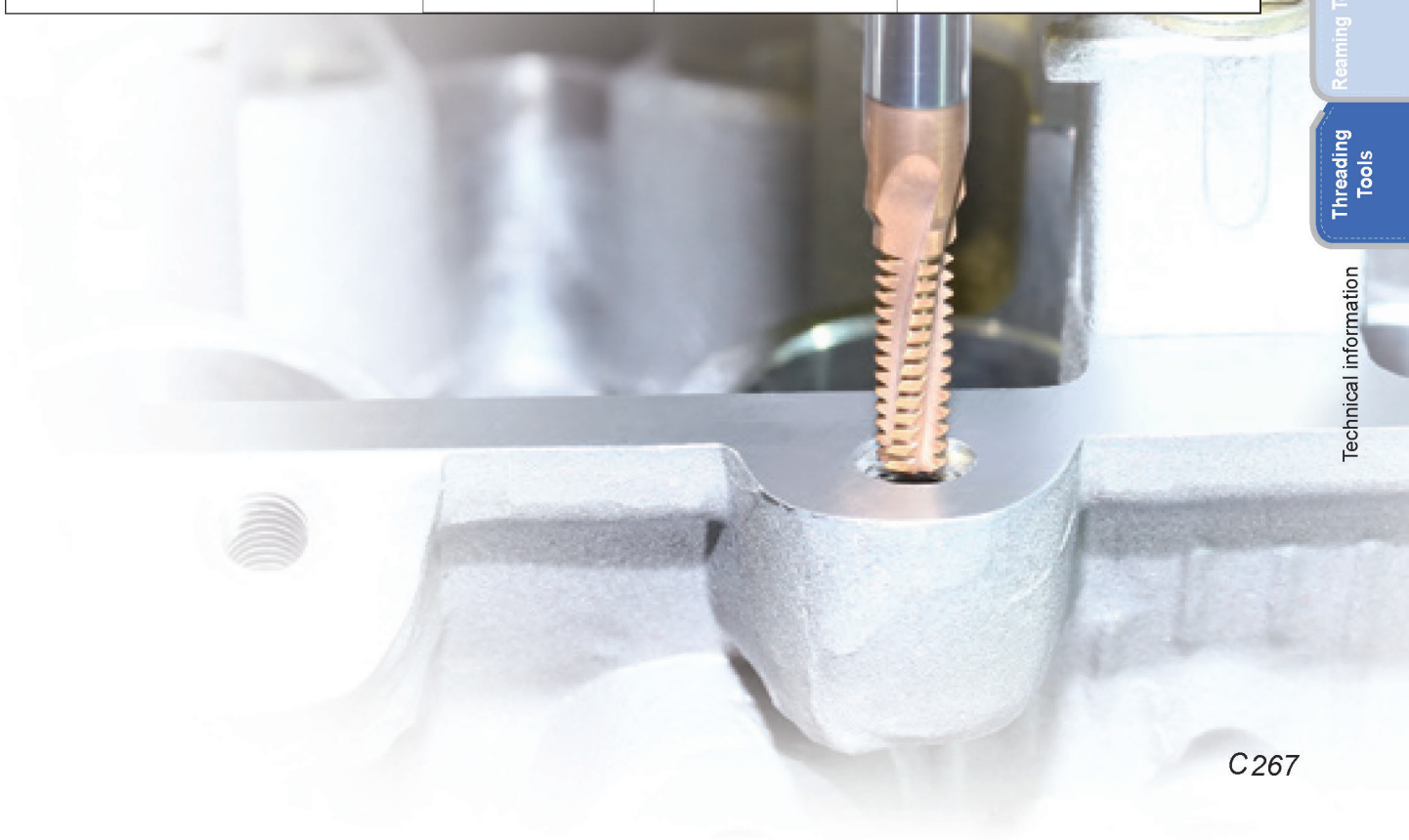
Flexible tapping: Machine tool has poor precision, the spindle feed rate cannot be strictly in accordance with the pitch. Compensating floating chucks should be used to compensate the error between the tapping feed and the tap pitch, so that the tap can feed in accordance with the pitch.

Through-hole tapping: chip removal along the direction of tapping feed, so that the chip clogging and scratching and squeezing on the machined surface caused by chips can be reduced and the accuracy of thread processing can be improved.

Bind-hole tapping: chips removal along the direction of tap shank. Increase of cutting force, which is caused by chips blocked in the groove, can be prevented.

Features and applications of tap flute

Classification	Advantages	Disadvantages	Recommend applications
Straight-flute taps 	• general performance is good • high cutting edge strength • easy to regrind	• large cutting torque by machining • bad chip-breaking and chip removal ability • cannot tapping to the bottom of blind holes	• for machining of high hardness material • material generating powdered chips • material easy to cause abrasion • tap shot through and blind hole
Helical-flute taps 	• small cutting torque by machining • better chip-breaking and chip removal ability • available for tapping to the bottom of blind holes • penetrate to pre-hole easily	• bad cutting edge strength • easily fall in tooth when seceding	• tap long through and blind hole • material generating long curling chips • the hole with axial slot on inner wall
Forming taps 	• no chips • high precision of internal thread • high tool strength • available for tapping to the bottom of blind holes	• only for machining of specific material • high requirement of pre-hole • high requirement of lubrication liquid	• for soft materials with good toughness and ductility • tap through and blind hole

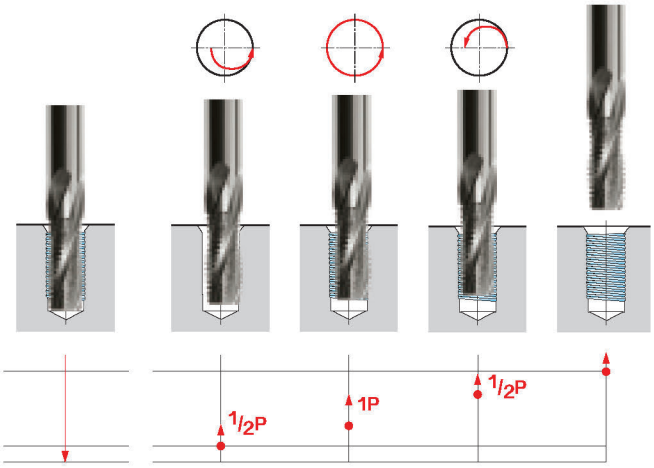


The common problems in tapping

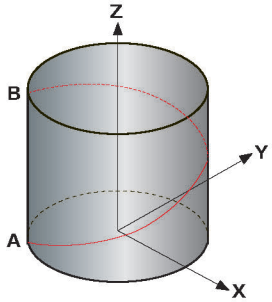
Common problems	Reasons	Solutions
Too large Internal thread	Wrong tap type selection	Selecting right tap according to work materials and requirement
	Pre-hole is too large	Select appropriate prehole drills
	Pre-hole is off center	Improve prehole quality
		Change to floated tapping method
	Axial feed not equable	Mechanical feed
		Use flexible tapping
	Build-up edge	Regrinding in time or change taps
		Adopt coated taps
		Fully lubricated
	Extremely high cutting speed	Lower cutting speed
	Insufficient lubrication or cooling	Check lubricating oil density
		Increase cooling liquid pressure and volume
	Wrong selection of tap tolerance level	Select taps with right tolerance
Too small internal thread	Wrong selection of tap tolerance level	Select taps with right tolerance
	Wrong tapping	Avoid taps bear higher axial stress in the process of tapping
	The rigidity of machine tool spindle is too well	Adopt axial floated chuck
Thread disorderly buckle	When starts tapping, force too much press on right helical taps	Decrease pressure when starts tapping
	When starts tapping, force too small press on left helical taps	increase pressure when starts tapping
	Unmatched of machine tool feed and thread pitch	Change to floated tapping
Unsmooth on internal thread surface	Wrong selection of taps	Selecting right tap according to work materials and requirement
	Too high Cutting speed	Lower cutting speed
	Insufficient cooling	Use right cooling liquid and enough volume or select taps with inner coolant
	Obstructed chip removal	Select helical flute taps
	Too small pre-hole diameter	Adjust pre-hole drill
	Build-up edge	Adopt coated taps
		Fully lubricated
Tap breakage	Too small pre-hole	Adjust pre-hole drill
	Torque is too large when tapping	Increase length of cutting chamfer
		Increase cutting edge
	Tap touch hole bottom	Check the depth of pre-hole
		Adopt floated tapping
	Pre-hole chamfer is too small, pre-hole location or angle error	Check pre-hole
		adopt floated tapping
	Cutting speed is too high	Lower cutting speed
		Select helical flute taps

Thread mills

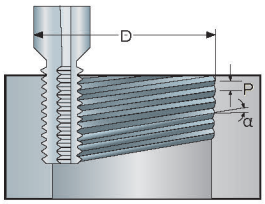
Thread mills (graphic demonstration)



Thread milling is composed of tool rotation and helical interpolate mill of machine tool. In a circle interpolation process, required threads are machined by using the geometry shape of tool and moving axially with a pitch.



Picture A

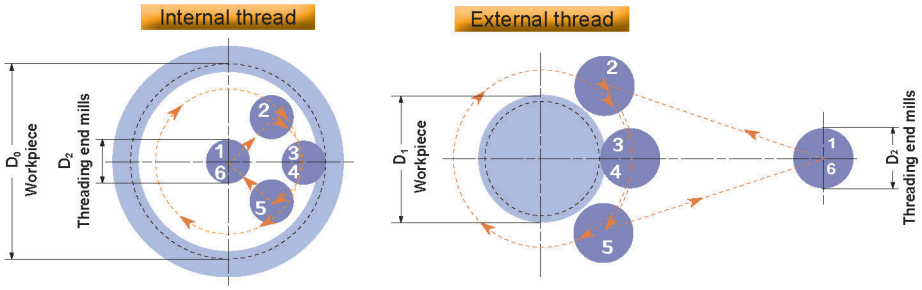


α: Helical angle
D: Large-diameter
p: Pitch

Picture B

Arc entering method

Thread milling can use arc entering method and radial entering method.
Arc entering: placidly entering and out leads to almost no cutting traces or vibration, so that it is particularly suitable for materials difficult to be machined and precise threading.



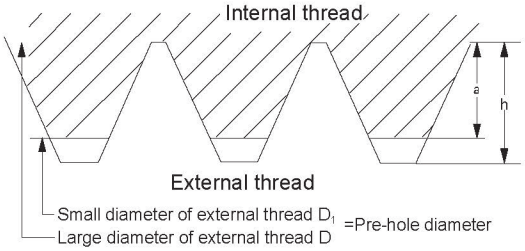
1-2 rapid positioning
2-3 entering by arc feed and interpolating along the Z axis at the same time
3-4 360 °full circle cutting interpolation and axial moving of one pitch
4-5 cutting-out by arc feed and interpolating along the Z axis at the same time
5-6 quick return

Thread overlap ratio

The thread overlap ratio is the ratio of effective chimeric height of external thread and internal thread and the height of standard tooth. It must be considered before machining of internal thread pre-hole.

$$\text{Thread overlap ratio} = \frac{\text{Reference dimension of large diameter of external thread} - \text{pre-hole diameter}}{2*(\text{height of standard tooth type})} \times 100\%$$

While external thread appears to be standardized tooth



Small diameter of external thread D_1 =Pre-hole diameter
Large diameter of external thread D

a=1/2×(D-D_1)
h=height of standard tooth of external thread
chimerism ratio=a/h×100%

The solutions of common problems in thread milling

	Common problems	Reasons	Solutions
Thread milling cutter	Roughness on internal thread milling cutter surface	Too long overhang	Decrease the length of overhang
		Select wrong type	Select appropriate tool(e.g. tool with helix flute)
		Poor chip removal	Select helix flute tap
			Adopt inner cooling
		Too large cutting force	Decrease cutting force
		Unreasonable cutting parameter	Adjust cutting parameter
	Severe tool wear	Unreasonable cutting parameter	Lower cutting speed
			Increase the feed rate per tooth
		Unreasonable machining mode	Adopt down milling
			Adopt Arc cut-in milling.
		Uncoated tools/inappropriate coated	Adopt Coated tool/ instead coat
		Too large overhang	Decrease length of overhang
	Falling on cutting edge	Unreasonable cutting parameter	Decrease the feed rate per tooth
		Unreasonable machining mode	Adopt down milling
			Adopt Arc cut-in milling
		Uncoated tools/inappropriate coated	Adopt Coated tool/instead coat
		Too large overhang	Decrease length of overhang
	Thread is taper	Unreasonable cutting parameter	Decrease the feed rate per tooth
		Unreasonable machining mode	Adopt up milling
		Too large overhang	Decrease length of overhang
		Too large cutting force	Decrease cutting force

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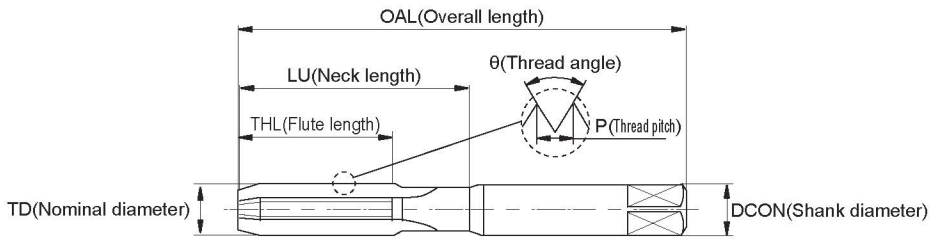
Workpiece materials			Hole Form			
Grey cast iron			Through hole		Blind hole	
Ductile Iron						
Aluminum alloy						
Silicon Aluminum Alloy(Si≤10%)						
Silicon Aluminum Alloy(Si>10%)			Bottom hole diameter			
Stainless Stee			Bottom hole depth			
Soft steel			Thread form			
Hardened steel (HRC48~63)			Threading precision			
Other materials	Workpiece material grade		Tapping depth			
			Threading rotation speed			
	Hardness		Tapping form			
			Rigid tapping		Flexible tapping	
Tool Information (attachment)						
Shank form			Chip pocket form			
Square shank			Straight flute			
Round shank			Right handed flute		Left handed flute	
Coolant form			Coating			
External coolant			Coated			
Internal coolant			Non-Coated			

Unit: mm ; Check mark for copy to fill the form: ✓



Applying tools: Cutting tap _____ Thread forming tap _____

Nominal diameter TD=_____ Shank diameter DCON=_____ Thread pitch P=_____ Thread angle θ=_____

Overall length OAL=_____ Flute length THL=_____ Neck length LU=_____

Note:

Order Quantity: PCS Expected delivery date:

Quotation: Confirmation:

Date:

Company name:

Fax:

Tel:

E-MAIL:

ZCC·CT

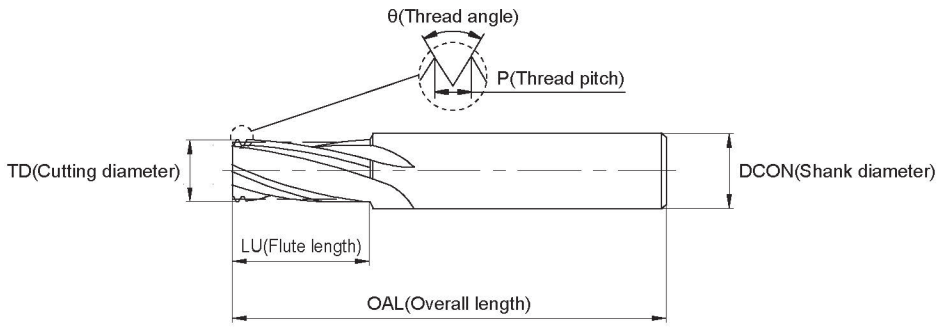
Huanghe Southern Road, Tianyuan Zone, Zhuzhou. Hunan province

Fax: 0731-22882721 22885420 22887878

Zip code: 412007 E-mail:zccct@zccct.com

Workpiece materials			Hole Form			
Grey cast iron			Through hole		Blind hole	
Ductile Iron						
Aluminum alloy						
Silicon Aluminum Alloy(Si≤10%)						
Silicon Aluminum Alloy(Si>10%)			Bottom hole diameter			
Stainless Stee			Bottom hole depth			
Soft steel			Thread form			
Ordinary steel			Threading precision			
Other materials	Workpiece material grade		Tapping depth			
			Threading rotation speed			
	Hardness		Thread form			
			External threading		Internal threading	
Tool Information (attachment)						
Chip pocket	Right handed flute		Left handed flute		Straight flute	
Coating	Coated		Non-Coated			
Coolant type	External coolant		Internal coolant			

Unit: mm ; Check mark for copy to fill the form: ✓



Thread specification=_____ Cutting diameter TD=_____ Shank diameter DCON=_____ Thread angle θ=_____

Overall length OAL=_____ Flute length LU=_____ Thread pitch P=_____

Note:

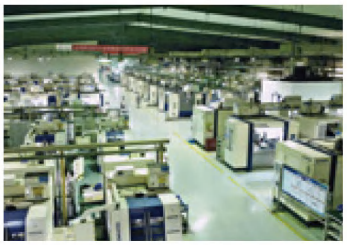
Order Quantity: PCS Expected delivery date:

Quotation: Confirmation:

Date:

General Technical Information

D





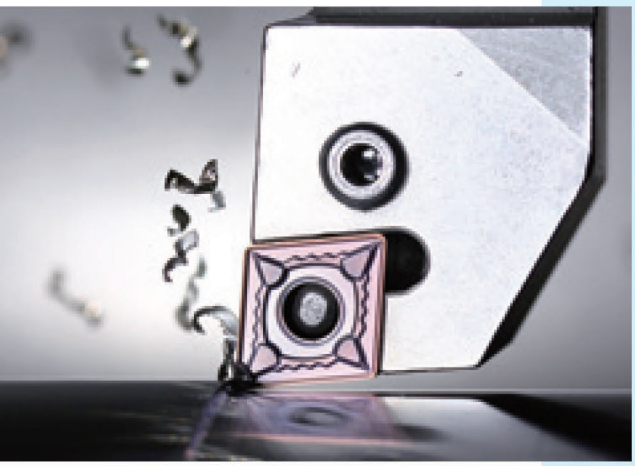


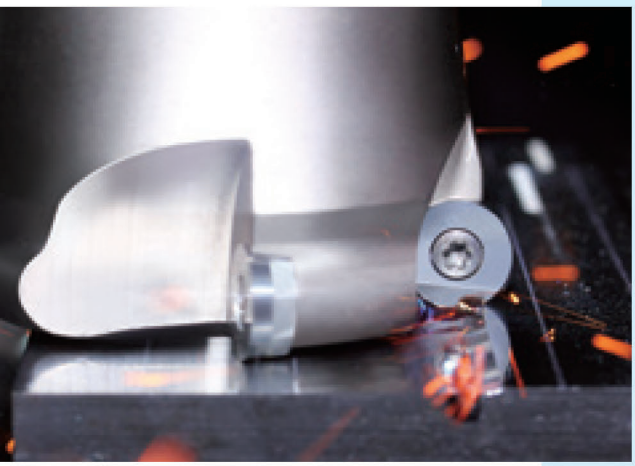






Cemented Carbide products safety standard







1、Safety responsibilities

Before using ZCCCT products, please provide necessary safety training for operators, and carefully read the 'NOTE' and 'CAUTION' contents on the product package. We are not liable for any responsibility caused by not complying with the request for operation.

2、Features of cemented carbide materials

Cemented carbide cutting tools are mainly composed of W, C, Co, N, Ti, Si, Al, O, etc elements and their chemical compound, and come into shape after sintering and a series of subsequent machining. Cemented carbide tool has good chemical stability and high strength. It is the ideal tool to cut most metals and high-strength nonmetals.

3、Cautions for safely using cemented carbide tools

1) Cemented carbide is hard and frangible material, liable to brittle rupture and breakage due to larger force or partial stress, which causes sharp edge.

2) Most cemented carbide is mainly composed of W and Co with high density. In the process of transport and storage, it should be treated as great heavy object and be handled with care.

3) Cemented carbide and steel have different thermal expansion coefficients. To avoid breakage caused by concentrated stress, welding should be conducted under suitable temperature.

4) Cemented carbide tools should be stored in dry environment, away from corrosive atmosphere.

5) In the cutting process, it is unavoidable to generate chips and brittle discs, etc. Please make sure necessary labor protection articles are prepared before machining.

6) If coolant is needed in the cutting process, please select correct coolant to prolong machine and tool life.

7) If cracks are generated in the machining process, please stop using the tool.

8) Long use of cemented carbide tool will lead to cutting edge passivation and lower strength. Please make sure it is regrinded by professionals

9) Please collect the broken tools and chips properly to avoid injury to other people.

Cautions for safely using cutting tools

Danger	Protective measure
Direct contact with the sharp cutting edges may cause injuries.	Please use labor protection articles such as gloves when assembling or disassembling cutting tools on machine.
Improper use of tools may cause tool breakage and expulsion from machine, causing injuries.	Please read catalogue and safety standard before operating.
	Please wear safeguard glasses and protective clothes.
Rapid increase of cutting resistance due to excessive abrasion and severe impact may lead to breakage of tool and spatter of chips, thus cause injuries to operator.	Change the tool with excessive abrasion without delay.
	Please wear safeguard glasses and protective clothes.
In the cutting process, hot chips may cause scald and scratch on operator.	Please use tools such as pliers to clear away the chips in time.
	Please wear safeguard glasses and protective clothes.
In cutting process, sparks and hot chips may cause fire and explosion hazard.	Clear away the Inflammable and explosive materials in the cutting area.
	Please make sure the fire extinguishers are ready for use.
At high speed, the machine will vibrate severely because of poor balance of holder, causing tool breakage.	Check whether the machine is loose or has any abnormal noise before cutting.
	Please wear safeguard glasses and protective clothes.
Burrs on workpiece are very sharp and likely to cause injuries.	Do not touch the burrs on the workpiece with bare hand.
	Please wear protective gloves and clothes.
Machining workpiece held infirmly will cause tool breakage and spatter of workpiece.	Make sure the workpiece is clamped firmly.
	Please wear safeguard glasses and protective clothes.
If inserts or spare parts are not clamped properly, they may become loose and fly off, causing risk of injuries.	Make sure the inserts and spare parts are clamped firmly before machining.
If Inserts and tool are clamped too tightly with screw and clamp, they face the risk of breakage and spatter.	Please do not clamp tools too tightly with bushing.
Inserts or spare parts may fly off due to inertial centrifugal force at high cutting speed.	Use the tools within recommended cutting conditions.
	Please wear safeguard glasses and protective clothes.
Milling cutters have sharp cutting edges and direct contact with them may cause injuries.	For your safety, please wear protective gloves if you need to touch inserts.
During rotary cutting, clothes, gloves, etc. are easily to get wringed in the machine at high speed, thus cause casualties.	The operator should not wear gloves during rotary cutting.
	Please pay attention that the clothes should not contact the operational parts of machine.
Off-center or poor balance of tools in rotating machining will cause vibration, breakage and splash of tool, thus will cause injuries.	Please use the tools within the range of recommended rotating speed.
	Check and adjust machine balance periodically.
During cutting at high speed, the chips flying off rapidly may cause injuries.	Safeguard articles such as protective cover, screen, etc. should be used.
	Please wear safeguard glasses, protective clothes and gloves.
Using the extremely small drill is likely to cause tool breakage and spatter, and it would be hard to take out the broken part.	Reduce tool vibration and conduct machining at suitable speed.
	Please wear safeguard glasses, protective clothes and gloves.
Machine and tools may be damaged if they are used beside the range of specified purposes, thus may cause other risks.	Please use them strictly according to instructions and specified purposes.

Note: We are not responsible for any accidents caused by private modified tools without our permission.

Threading pre-hole diameter

Metric common thread

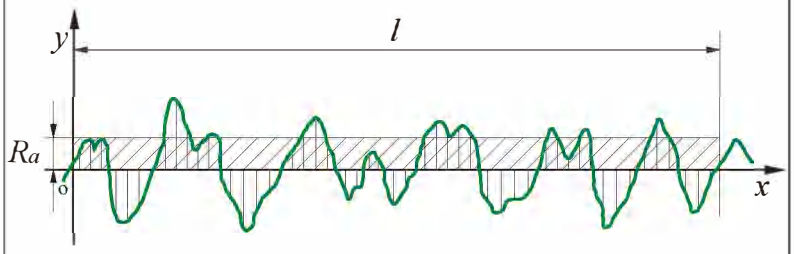
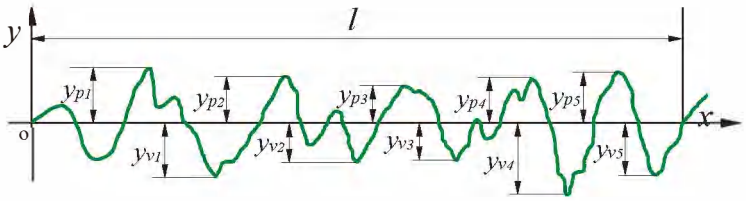
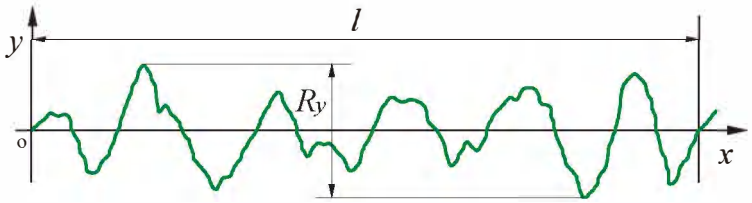
Thread code	Recommended hole diameter (mm)
M3×0.5	2.5
M3.5×0.6	2.9
M4×0.7	3.3
M5×0.8	4.2
M6×1.0	5.0
M7×1.0	6.0
M8×1.25	6.75
M9×1.25	7.75
M10×1.5	8.5
M11×1.5	9.5
M12×1.75	10.25
M14×2.0	12.0
M16×2.0	14.0
M18×2.5	15.5
M20×2.5	17.5
M24×3.0	21.0
M27×3.0	24.0
M30×3.5	26.5

Metric fine thread

Thread code	Recommended hole diameter (mm)	Thread code	Recommended hole diameter (mm)
M3×0.35	2.65	M14×1.5	12.5
M3.5×0.35	3.15	M14×1.0	13.0
M4×0.5	3.5	M15×1.5	13.5
M4.5×0.5	4.0	M15×1.0	14.0
M5×0.5	4.5	M16×1.5	14.5
M5.5×0.5	5.0	M16×1.0	15.0
M6×0.75	5.25	M17×1.5	15.5
M7×0.75	6.25	M17×1.0	16.0
M8×1.0	7.0	M18×2.0	16.0
M8×0.75	7.25	M18×1.5	16.5
M9×1.0	8.0	M18×1.0	17.0
M9×0.75	8.25	M20×2.0	18.0
M10×1.25	8.75	M20×1.5	18.5
M10×1.0	9.0	M20×1.0	19.0
M10×0.75	9.25	M22×2.0	20.0
M11×1.0	10.0	M22×1.5	20.5
M11×0.75	10.25	M22×1.0	21.0
M12×1.5	10.5	M24×2.0	22.0
M12×1.25	10.75	M24×1.5	22.5
M12×1.0	11.0	M24×1.0	23.0

Surface roughness

The surface roughness refers to the small space and unevenness from peak to valley on workpiece surface.
Surface roughness has close relationship with the matching property of machine elements, wear resistance, machining precision and corrosion resistance. It influences the reliability and life of machine and instrument.

Type	Code	Calculation method	Calculation example (figure)
Arithmetic average deviation of profile	Ra	Within sampling length l, the arithmetic average absolute value of profile deviation is $Ra=\frac{1}{l}\int_0^l \lvert y(x)\rvert dx$ In the formula, the profile deviation y is the distance between profile points and reference line in the measuring direction. Reference line is the profile least-square average line O. This line divides the profile and makes the sum of squares of profile deviation to be the minimum within the sampling length.	
Irregularity Ten-point height	Rz	Within sampling length l, the sum of the average value of heights of five highest profile peak and the depths of five deepest profile valleys $Rz=\frac{\sum_{i=1}^{5} y_{pi}+\sum_{i=1}^{5} y_{vi}}{5}$ In the formula, y_{pi} means the height of the 'i'th highest profile peak. In the formula, y_{vi} means the depth of the 'i'th deepest profile valley. Maximum height of profile Ry: the distance between the top profile peak line and the bottom profile valley line in the longitudinal direction within the sampling length l.	
Maximum height of profile	Ry	The distance between the inner profile peak line and the bottom profile valley line in the longitudinal direction within the sampling length l. Top profile peak line is the line that parallels to the reference line and passes through the highest point of profile peak. Bottom profile line is the line that parallels to the reference line and passes through the lowest point of profile valley.	

The value of sampling length l and evaluated length ln

Ra / μm	*Rz / μm*	*l/mm*	*ln=5l /mm*
⩾0.008~0.02	⩾0.025~0.10	0.08	0.4
>0.02~0.1	>0.1~0.50	0.25	1.25
>0.1~0.2	>0.50~10.0	0.8	4.0
>0.2~10.0	>10.0~50.0	2.5	12.5
>10.0~80.0	>50~320	8.0	40.0

Material cross comparison table

ISO	Country and Standard										
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	Japan
	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS
P	**Structural steel**										
	15	1015	1.0401	C15	080M15	-	1350	CC12	C15C16	F.111	-
	20	1020	1.0402	C22	050A20	2C	1450	CC20	C20C21	F.112	-
	35	1035	1.0501	C35	060A35	-	1550	CC35	C35	F.113	-
	45	1045	1.0503	C45	080M40	-	1650	CC45	C45	F.114	-
	55	1055	1.0535	C55	070M55	-	1655	-	C55	-	-
	60	1060	1.0601	C60	080A62	43D	-	CC55	C60	-	-
	Y15	1213	1.7015	9SMn28	230M07	-	1912	S250	CF9SMn28	11SMn28	SUM22
	-	12L13	1.0718	9SMnPb28	-	-	1914	S250Pb	CF9MnPb28	11SMnPb28	SUM22L
	-	-	1.0722	10SPb20	-	-	-	10PbF2	CF10Pb20	10SPb20	-
	-	1140	1.0726	35S20	212M36	8M	1957	35MF4	-	F210G	-
	Y13	1215	1.0736	9SMn36	240M07	1B	-	S300	CF9SMn36	12SMn35	-
	-	12L14	1.0737	9SMnPb36	-	-	1926	S300Pb	CF9SMnPb36	12SMnP35	-
	55Si2Mn	9255	1.0904	55Si9	250A53	45	2085	55S7	55Si8	56Si7	-
	-	9262	1.0961	60SiCr7	-	-	-	60SC7	60SiCr8	60SiCr8	-
	15	1015	1.1141	Ck15	080M15	32C	1370	XC12	C16	C15K	S15C
	40Mn	1039	1.1157	40Mn4	150M36	15	-	35M5	-	-	-
	25	1025	1.1158	Ck25	-	-	-	-	-	-	S25C
	35Mn2	1335	1.1167	36Mn5	-	-	2120	40Mn5	-	36Mn5	SMn438(H)
	30Mn	1330	1.1170	28Mn6	150M28	14A	-	20M5	C28Mn	-	SCMn1
	35Mn	1035	1.1183	Cf35	060A35	-	1572	XS38TS	C36	-	S35C
	Ck45	1045	1.1191	45	080M46	-	1672	XC42	C45	C45K	S45C
	55	1055	1.1203	Ck55	070M55	-	-	XC45	C50	C55K	S55C
	50	1050	1.1213	Cf53	060A52	-	1674	XC48TS	C53	-	S50C
	60Mn	1060	1.1221	Ck60	080A62	43D	1678	XC60	C60	-	S58C
	-	1095	1.1274	Ck101	060A96	-	1870	-	-	-	SUP4
	-	-	1.3401	X120Mn12	Z120M12	-	-	X120M12	XG120Mn12	X120Mn12	SCMnH/1
	Gr15;45Gr	52100	1.3505	100Cr6	534A99	31	2258	100C6	100Cr6	F.131	SUJ2
	-	ASTM A204Gr.A	1.5415	15Mo3	1501-240	-	2912	15D3	16Mo3KW	16Mo3	-
	-	4520	1.5426	16Mo5	1503-245-420	-	-	-	16Mo5	16Mo5	-
	-	ASTM A350LF5	1.5622	14Ni6	-	-	-	16N6	14Ni6	15Ni6	-
	-	ASTM A353	1.5662	X8Ni9	1501-509;510	-	-	-	X10Ni9	XBNi09	-

Material cross comparison table

ISO	Country and Standard										
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	Japan
	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS
P	**Structural steel**										
	-	2515	1.5680	12Ni19	-	-	-	Z18N5	-	-	-
	-	3135	1.5710	36NiCr6	640A35	111A	-	35NC6	-	-	SNC236
	-	3415	1.5732	14NiCr10	-	-	-	14NC11	16NiCr11	15NiCr11	SNC415(H)
	-	3415 3310	1.5752	14NiCr14	655M13 655A12	36A	-	12NC15	-	-	SNC815(H)
	-	9840	1.6511	36CrNiMo4	816M40	110	-	40NCD3	38CrNiMo4(KB)	35CrNiMo4	-
	-	8620	1.6523	21NiCrMo2	850M20	362	2503	20NCD2	20NiCrMo2	20NiCrMo2	SNCCM220(H)
	-	8740	1.6546	40NiCrMo2	311-Type7	-	-	-	40NiCrMo2(KB)	40NiCrMo2	SNC240
	40CrNiMoA	4340	1.6582	34CrNiMo6	817M40	24	2541	35NCD6	35CrNiMo6(KB)	-	-
	-	-	1.6587	17CrNiMo6	820A16	-	-	18NCD6	-	14CrNiMo13	-
	15Cr	5015	1.7015	15Cr3	523M15	-	-	12C3	-	-	SCr415(H)
	35Cr	5132	1.7033	34Cr4	530A32	18B	-	32C4	34Cr4(KB)	35Cr4	SCr430(H)
	40Cr	5140	1.7035	41Cr4	530M40	18	-	42C4	41Cr4	42Cr4	SCr440(H)
	40Cr	5140	1.7045	42Cr4	-	-	2245	-	-	42Cr4	SCr440
	18CrMn	5115	1.7131	16MnCr15	(527M20)	-	2511	16MC5	16MnCr15	16MnCr15	-
	20CrMn	5155	1.7176	55Cr3	527A60	48	-	55C3	-	-	SUP9(A)
	30CrMn	4130	1.7218	25CrMo4	1717CDS110	-	2225	25CD4	25CrMo4(KB)	55Cr3	SCM420; SCM430
	35CrMo	4137;4135	1.7220	34CrMo4	708A37	19B	2234	35CD4	35CrMo4	34CrMo4	SCM432; SCRRM3
	40CrMoA	4140;4142	1.7223	41CrMo4	708M40	19A	2244	42CD4TS	41CrMo4	41CrMo4	SCM440
	42CrMo 42CrMnMo	4140	1.7225	42CrMo4	708M40	19A	2244	42CD4	42CrMo4	42CrMo4	SCM440(H)
	-	-	1.7262	15CrMo5	-	-	2216	12CD4	-	12CrMo4	SCM415(H)
	-	ASTM A182 F11;F12	1.7335	13CrMo44	1501- 620Gr.27	-	-	15CD3.5; 15CD4.5	14CrMo44	14CrMo45	-
	-	-	1.7361	32CrMo12	722M24	40B	2240	30CD12	32CrMo12	F.124.A	-
	-	ASTM A182 F.22	1.7380	10CrMo910	1501- 622Gr.31;45	-	2218	12CD9;10	12CrMo9,10	TU.H	-
	-	-	1.7715	14MoV63	1503-660-440	-	-	-	-	13MoCrV6	-
	50CrVA	6150	1.8159	50CrV4	735A50	47	2230	50CV4	50CrV4	51CrV4	SUP10
	-	-	1.8509	41CrAlMo7	905M39	41B	2940	40CAD6,12	41CrAlMo7	41CrAlMo7	-
	-	-	1.8523	39CrMoV139	897M39	40C	-	-	36CrMoV12	-	-

Material cross comparison table

ISO	Country and Standard										
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	
	GB	AISI/ SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	
P	**Tool steel**										
	T10	W.110	1.1545	C105W1	-	-	1880	$Y_1$105	C98KU C100KU	F.515 F.516	
	T12A	W.112	1.1663	C125W	-	-	-	$Y_2$120	C120KU	(C120)	SK2
	CrV;9SiCr	L3	1.2067	100Cr6	BL3	-	-	Y100C6	-	100Cr6	-
	Cr12	D3	1.2080	X210Cr12	BD3	-	-	Z200Cr12	X210Cr13KU X250Cr12KU	X210Cr12	SKD1
	4Cr5MoVSi	H13	1.2344	X40CrMoV5 1	BH13	-	2242	Z40CDV5	X35CrMoV05KU X40CrMoV51KU	X40CrMoV5	SKD61
	Cr6WV	A2	1.2363	X100CrMoV5 1	BA2	-	2260	Z100CDV5	X100CrMoV51KU	X100CrMoV5	SKD12
	CrWMo	-	1.2419	105WCr6	-	-	2140	105WC13	10WCr6 107WCr5KU	105WCr5	SKS31 SKS2 SKS3
	Cr12W	-	1.2436	X210CrW12	-	-	2312	-	X215CrW12 1KU	X210CrW12	SKD2
	5CrNiMo	S1	1.2542	45WCrV7	BS1	-	2710	-	45WCrV8KU	45WCrSi8	-
	3Cr2W8V	H21	1.2581	X30WCrV9 3 X30WCrV93KU	BH21	-	-	Z30WCV9	X28W09KU X30WCrV9 3KU	X30WCrV9	SKD5
	Cr12MoV	-	1.2601	X165CrMoV 12	-	-	2310	-	X165CrMoW12KU	X160CrMoV12	SKD11
	5CrNiMo	L6	1.2713	55NiCrMoV6	-	-	-	55NCDV7	-	F.250.S	SKT4
	V	W210	1.2833	100V1	BW2	-	-	$Y_1$105V	-	-	SKS43
	W6Mo5Cr4V2Co5	-	1.3243	S6-5-2-5	-	-	2723	Z85WDKCV	HS6-5-2-5	HS6-5-2-5	SKH55
	W18Cr4VCo5	T4	1.3255	S18-1-2-5	BT4	-	-	Z80WKCV 10-05-04-01	X78WCo1805KU	HS18-1-1-5	SKH3
	W6Mo5Cr4V2	M2	1.3343	S6-5-2	BM2	-	2722	Z85WDCV 06-05-04-02	X82WMo0605KU	HS6-5-2	SKH9
	-	M7	1.3348	S2-9-2	-	-Z-	2782	Z100WCWV 09-02-04-02	HS2-9-2	HS2-9-2	-
	W18Cr4V	T1	1.3355	S18-0-1	BT1	-	-	Z80WCV 18-04-01	X75W18KU	HS18-0-1	SKH2
	W6Mo5Cr4V3	M3	-	S6-5-3	-	-	-	-	-	-	SKH52
	-	M42	-	-	BM42	-	-	-	-	-	SKH59

Material cross comparison table

ISO	Country and Standard					Main application
	China	USA	Germany	Japan	Daido Steel Co., Ltd (Japan)	
	GB	AISI/SAE	DIN	JIS	DAIDO	
P	**Plastic die steel**					
	-	P20 mod.		-	PX5N	For mass production of large mirror dies. Automobile rear light, front fender of car, video camera, household electrical appliances etc
	-	-		-	NAK55	For high-precision mirror die. Video camera, music disc, cosmetic containers, transparent covers, transparent films etc
	-	-		-	NAK80	For high-precision mirror dies. Video camera, music disc, cosmetic containers, transparent covers, transparent films etc
	3Cr13	420 mod.		SUS420J2 mod.	S-STAR	For ultra-mirror corrosion resistant precise dies. Accessories of camera, CD, lens, watch case
	Cold-working die steel					
	-	02	-	SKS93	YK30	Stamping die, gauge calipers, paper cutter, auxiliary tools
	9CrWMn	01 mod.	-	SKS3 mod.	GOA	Blanking die, gauge calipers, drawing die, taps, Perforated punch
	Cr12MoV	D2	X165CrMoV12	SKD11	DC11	Blanking die, cold forming die, cold drawing die, forming roller, punch
	-	D2 mod.	-	SKD11 mod.	DC53	Blanking die, cold forming die, cold drawing die, forming roll, punch
	Hot-working die steel					
	4Cr5MoSiV1	H13	X40CrMoV51	SKD61	DHA1	Aluminum compression die, connecting parts of compression die, hot stamping die, hot extrusion die, thermal shear cutting blade
	-	-	-	-	DH21	Long life aluminum compression die
	-	-	-	-	DH31-S	Large compression die
	-	-	-	-	DH2F	Compression die, plastic die

Material cross comparison table

ISO	Country and Standard										
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	Japan
	GB	AISI/ SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS
M	**Stainless steel**										
	0Cr13; 1Cr12	403	1.4000	X6Cr13	403S17	-	2301	Z6C13	X6Cr13	F.3110	SUS403
	-	-	1.4001	X7Cr14	-	-	-	-	-	F.8401	-
	1Cr13	410	1.4006	X10Cr13	410S21	56A	2302	Z10C14	X12Cr13	F.3401	SUS410
	1Cr17	430	1.4016	X6Cr17	430S15	60	220	Z8C17	X8Cr17	F.3113	SUS430
	2Cr13	410	1.4021	X20Cr13	S62	56B; 56C	-	Z20C13	X20C13	F.3401	SUS410
	-	-	1.4027	G-X20Cr14	420C29	56B	-	Z20C13M	-	-	SCS2
	4Cr13	-	1.4034	X46Cr13	420S45	56D	2304	Z40CM Z38C13M	X40Cr14	F.3405	SUS420J2
	1Cr17Ni2	431	1.4057	X20CrNi172	431S29	57	2321	Z15CNi6.02	X16CNi16	F.3427	SUS431
	Y1Cr17	430F	1.4104	X12CrMoS17	-	-	2383	Z10CF17	X10CrS17	F.3117	SUS430F
	1Cr17Mo	434	1.4113	X6CrMo171	434S17	-	2325	Z8CD17.01	X8CrMo17	-	SUS434
	-	-	1.4313	X5CrNi134	425C11	-	-	Z4CND13.4M	-	-	SCS5
	-	-	1.4408	G-X6CrNiMo1810	316C16	-	-	-	-	F.8414	SCS14
	4Cr9Si2	HW3	1.4718	X45CrSi93	401S45	52	-	Z45CS9	X45CrSi8	F.322	SUH1
	0Cr13Al	405	1.4724	X10CrAl13	403S17	-	-	Z10C13	X10CrAl12	F.311	SUS405
	Cr17	430	1.4742	X10CrAl18	430S15	60	-	Z10CAS18	X8Cr17	F.3113	SUS430
	8Cr20Si2Ni	HNV6	1.4757	X80CrNiSi20	443S65	59	-	Z80CSN20.02	X80CrSiNi20	F.320V	SUH4
	2Cr25N	446	1.4762	X10CrAl24	-	-	2322	Z10CAS24	X16Cr26	-	SUH446
	Austenitic stainless steel										
	0Cr18Ni9	304	1.4301	X5CrNi1810	304S15	58E	2332	Z6CN18.09	X5CrNi1810	F.3551; F.3541; F.3504	SUS304
	1Cr18Ni9MoZr	303	1.4305	X10CrNiS189	303S21	58M	2346	Z10CNF18.09	X10CrNiS18.09	F.3508	SUS303
	0Cr19Ni10	304L	1.4306	X2CrNi1911	304S12	-	2352	Z2CN18.10	X2CrNi18.11	F.3503	SCS19
	-	-	1.4308	G-X6CrNi189	304C15	-	-	Z6CN18.10M	-	-	SCS13
	Cr17Ni7	301	1.4310	X12CrNi177	-	-	2331	Z12CN17.07	X12CrNi1707	F.3517	SUS301
	-	304LN	1.4311	X2CrNiN1810	304S62	-	2371	Z2CN18.10	-	-	SUS304LN
	0Cr19Ni9	304	1.4350	X5CrNi189	304S31	58E	-	Z6CN18.09	X5CrNi1810	-	SUS304
	0Cr17Ni11Mo2	316	1.4401	X5CrNiMo1712	316S16	Z6CND17.11	2347	1.4401	X5CrNiMo1712	F.3543	SUS316
	00Cr17Ni13Mo2	316LN	1.4429	X2CrNiMoN17133	-	-	2375	Z2CND17.13	-	-	SUS316LN
	0Cr27Ni12Mo3	316L	1.4435	X2CrNiMo18143	316S12	-	2353	Z2CDN17.13	X2CrNiMo1713	-	SCS16,
	00Cr19Ni13Mo3	317L	1.4438	X2CrNiMo17133	317S12	-	2367	Z2CND19.15	X2CrNiMo18.16	-	SUS317L
	-	329L	1.4460	X8CrNiMo275	-	-	2324	-	-	-	SUS329L; SCH11; SCS11
	1Cr18Ni9Ti	321	1.4541	X6CrNiTi1810	2337	321S12	58B	Z6CNT18.10	X6CrNiTi1811	F.3553	SUS321
	1Cr18Ni11Nb	347	1.4550	X6CrNiNb1810	347S17	58F	2338	Z6CNNb18.1	X6CrNiTi1811	F.3552	SUS347
	Cr18Ni12Mo2Ti	316Ti	1.4571	X6CrNiMoTi17122	320S17	58J	2350	Z6NDT17.12	X6CrNiMoTi17	F.3535	-

Material cross comparison table

ISO	Country and Standard										
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	Japan
	GB	AISI/ SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS
M	**Austenitic stainless steel**										
	-	-	1.4581	G-X5CrNiMoNb1810	318C7	-	-	Z4CNDNb1812M	XG8CrNiMo18	-	SCS22
	Cr17Ni12Mo3Nb	318	1.4583	X10CrNiMoNb1812	-	-	-	Z6CNDNb1713B	X6CrNiMoTiNb17	-	-
	1Cr23Ni13	309	1.4828	X15CrNiSi2012	309S24	-	-	Z15CNS20.1	-	-	SUH309
	0Cr25Ni20	310S	1.4845	X12CrNi2521	310S24	-	2361	Z12CN2520	X6CrNi2520	F.331	SUH310
	Cr15Ni36W3Ti	330	1.4864	X12NiCrSi3616	-	-	-	Z12CNS35.1	-	-	SUH330
	-	-	1.4865	G-X40NiCrSi3818	330C11	-	-	-	XG50NiCr3919	-	SCH15
	5Cr2Mn9Ni4N	EV8	1.4871	X53CrMnNiN219	349S54; 321S12	- 58B	-	Z52CMN21.0	X53CrMnNiN219	-	SUH35
	1Cr18Ni9Ti	321	1.4878	X12CrNiTi189	321S320	58C	-	Z6CNT18.12	X6CrNiTi1811	F.3523	SU321

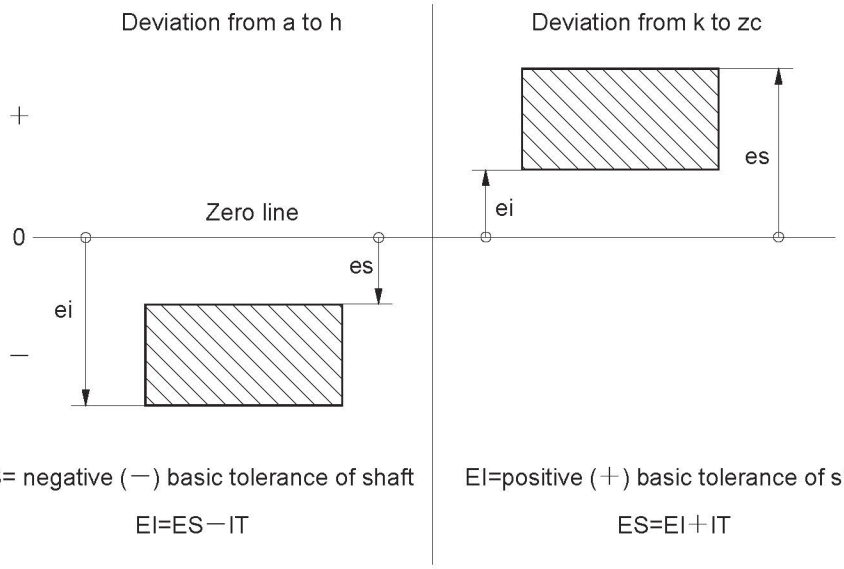
ISO	Country and Standard								
	China	USA	Germany	Great Britain	Sweden	France	Italy	Spain	Japan
K	**Nodular cast iron**								
	QT400-18	60-40-18	GGG40	400/17	0717-02	FGS370-17	GS370-17	FGE38-17	FCD400
	QT450-10	65-45-12	--	420/12	--	FGS400-12	GS400-12	FGE42-12	FCD450
	QT500-7	70-50-05	GGG50	500/7	0727-02	FGS500-7	GS500-7	FGE50-7	FCD500
	QT600-3	80-60-03	GGG60	600/7	0732-03	FGS600-2	GS600-2	FGE60-2	FCD600
	QT700-2	100-70-03	GGG70	700/2	0737-01	FGS700-2	GS700-2	FGE70-2	FCD700
	QT800-2	120-90-02	GGG80	800/2	0864-03	FGS800-2	GS800-2	FGE80-2	FCD800
	QT900-2	--	--	900/2	--	--	--	--	--
	Grey cast iron								
	--	NO.60	GG40	--	0140	FGL400	--	--	--
	HT350	NO.50	GG35	350	0135	FGL350	G35	FG35	FC350
	HT300	NO.45	GG30	300	0130	FGL300	G30	FG30	FC300
	HT250	NO.35	GG25	250	0125	FGL250	G25	FG25	FC250
	HT200	NO.30	GG20	200	0120	FGL200	G20	FG20	FC200
	HT150	NO.20	GG15	150	0115	FGL150	G15	FG15	FC150
	HT100	--	--	100	0110	--	G10	--	FC100

Tolerance of fitting dimensions

Basic dimensions mm		Standard tolerance class																
		IT1	IT2	IT3	IT4	IT5	IT6	IT7	IT8	IT9	IT10	IT11	IT12	IT13	IT14	IT15	IT16	IT17	IT18
Min(>)	Max(≤)	μm											mm						
---	3	0.8	1.2	2	3	4	6	10	14	25	40	60	0.1	0.14	0.25	0.4	0.6	1	1.4
3	6	1	1.5	2.5	4	5	8	12	18	30	48	75	0.12	0.18	0.3	0.48	0.75	1.2	1.8
6	10	1	1.5	2.5	4	6	9	15	22	36	58	90	0.15	0.22	0.36	0.58	0.9	1.5	2.2
10	18	1.2	2	3	5	8	11	18	27	43	70	110	0.18	0.27	0.43	0.7	1.1	1.8	2.7
18	30	1.5	2.5	4	6	9	13	21	33	52	84	130	0.21	0.33	0.52	0.84	1.3	2.1	3.3
30	50	1.5	2.5	4	7	11	16	25	39	62	100	160	0.25	0.39	0.62	1	1.6	2.5	3.9
50	80	2	3	5	8	13	19	30	46	74	120	190	0.3	0.46	0.74	1.2	1.9	3.	4.6
80	120	2.5	4	6	10	15	22	35	54	87	140	220	0.35	0.54	0.87	1.4	2.2	3.5	5.4
120	180	3.5	5	8	12	18	25	40	63	100	160	250	0.4	0.63	1	1.6	2.5	4	6.3
180	250	4.5	7	10	14	20	29	46	72	115	185	290	0.46	0.72	1.15	1.85	2.9	4.6	7.2
250	315	6	8	12	16	23	32	52	81	130	210	320	0.52	0.81	1.3	2.1	3.2	5.2	8.1
315	400	7	9	13	18	25	36	57	89	140	230	360	0.57	0.89	1.4	2.3	3.6	5.7	8.9
400	500	8	10	15	20	27	40	63	97	155	250	400	0.63	0.97	1.55	2.5	4	6.3	9.7
500	630	9	11	16	22	32	44	70	110	175	280	440	0.7	1.1	1.75	2.8	4.4	7	11
630	800	10	13	18	25	36	50	80	125	200	320	500	0.8	1.25	2	3.2	5	8	12.5
800	1000	11	15	21	28	40	56	90	140	230	360	560	0.9	1.4	2.3	3.6	5.6	9	14
1000	1250	13	18	24	33	47	66	105	165	260	420	660	1.05	1.65	2.6	4.2	6.6	10.5	16.5
1250	1600	15	21	29	39	55	78	125	195	310	500	780	1.25	1.95	3.1	5	7.8	12.5	19.5
1600	2000	18	25	35	46	65	92	150	230	370	600	920	1.5	2.3	3.7	6	9.2	15	23
2000	2500	22	30	41	55	78	110	175	280	440	700	1100	1.75	2.8	4.4	7	11	17.5	28
2500	3150	26	36	50	68	96	135	210	330	540	860	1350	2.1	3.3	5.4	8.6	13.5	21	33

Note:
1. From IT1 to IT5, the standard tolerance with basic dimension more than 500 mm is on trial.
2. When the basic dimension ≦1 mm, the tolerances from IT4 to IT8 are invalid.

The shaft lower deviation(ei) and upper deviation (es) can be obtained by basic tolerance and standard tolerance (IT) of shaft.



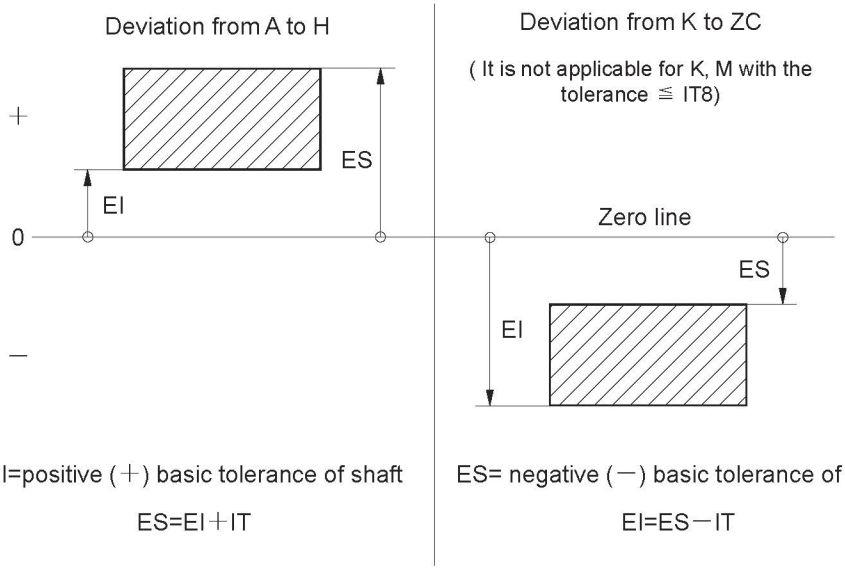
ES= negative (−) basic tolerance of shaft

EI=ES−IT

EI=positive (+) basic tolerance of shaft

ES=EI+IT

The hole lower deviation(EI) and upper deviation (ES) can be obtained by basic tolerance and standard tolerance (IT) of hole.



EI=positive (+) basic tolerance of shaft

ES=EI+IT

ES= negative (−) basic tolerance of shaft

EI=ES−IT

For example: for a hole with diameter 3 mm and tolerance H7, we can find that the lower deviation EI=0 in relation to H7 from the basic tolerance table, and the standard tolerance IT=10μm corresponding to H7, thus the upper deviation ES=EI+IT=10μm. Therefore the hole fitting dimension is $\varnothing 3^{+0.01}_{0}$ mm.

Tolerance of fitting dimensions

● Basic deviations value of shaft

Dimensions (mm)		Basic deviation value											
		Upper deviation es											
		Standard tolerance class											
Min(>)	Max(≤)	a	b	c	cd	d	e	ef	f	fg	g	h	js
---	3	-270	-140	-60	-34	-20	-14	-10	-6	-4	-2	0	In the formula Deviation $=\pm\frac{IT_n}{2}$, ITn is the IT value corresponding to 'n'.
3	6	-270	-140	-70	-46	-30	-20	-14	-10	-6	-4	0	
6	10	-280	-150	-80	-56	-40	-25	-18	-13	-8	-5	0	
10	14	-290	-150	-95		-50	-32		-16		-6	0	
14	18												
18	24	-300	-160	-110		-65	-40		-20		-7	0	
24	30												
30	40	-310	-170	-120		-80	-50		-25		-9	0	
40	50	-320	-180	-130									
50	65	-340	-190	-140		-100	-60		-30		-10	0	
65	80	-360	-200	-150									
80	100	-380	-220	-170		-120	-72		-36		-12	0	
100	120	-410	-240	-180									
120	140	-460	-260	-200		-145	-85		-43		-14	0	
140	160	-520	-280	-210									
160	180	-580	-310	-230									
180	200	-660	-340	-240		-170	-100		-50		-15	0	
200	225	-740	-380	-260									
225	250	-820	-420	-280									
250	280	-920	-480	-300		-190	-110		-56		-17	0	
280	315	-1050	-540	-330									
315	355	-1200	-600	-360		-210	-125		-62		-18	0	
355	400	-1350	-680	-400									
400	450	-1500	-760	-440		-230	-135		-68		-20	0	
450	500	-1650	-840	-480									
500	560					-260	-145		-76		-22	0	
560	630												
630	710					-290	-160		-80		-24	0	
710	800												
800	900					-320	-170		-86		-26	0	
900	1000												
1000	1120					-350	-195		-98		-28	0	
1120	1250												
1250	1400					-390	-220		-110		-30	0	
1400	1600												
1600	1800					-430	-240		-120		-32	0	
1800	2000												
2000	2240					-480	-260		-130		-34	0	
2240	2500												
2500	2800					-520	-290		-145		-38	0	
2800	3150												

Note: 1. If basic dimension ≤1mm, the basic deviation a and b are not adopted.

2. Within the range from js7 to js11, if the value of ITn is odd number, then the final deviation=$\pm\frac{IT_n-1}{2}$.

Tolerance of fitting dimensions

μm

Basic deviation value																		
Lower deviationei																		
IT5 IT6	IT7	IT8	IT4 IT7	≤IT3 >IT7	Standard tolerance class													
j			k		m	n	p	r	s	t	u	v	x	y	z	zn	zb	zc
-2	-4	-6	0	0	+2	+4	+6	+10	+14		+18		+20		+26	+32	+40	+60
-2	-4		+1	0	+4	+8	+12	+15	+19		+23		+28		+35	+42	+50	+80
-2	-5		+1	0	+6	+10	+15	+19	+23		+28		+34		+42	+52	+67	+97
-3	-6		+1	0	+7	+12	+18	+23	+28		+33		+40		+50	+64	+90	+130
												+39	+45		+60	+77	+108	+150
-4	-8		+2	0	+8	+15	+22	+28	+35		+41	+47	+54	+63	+73	+98	+136	+188
										+41	+48	+55	+64	+75	+88	+118	+160	+218
-5	-10		+2	0	+9	+17	+26	+34	+43	+48	+60	+68	+80	+94	+112	+148	+200	+274
										+54	+70	+81	+97	+114	+136	+180	+242	+325
-7	-12		+2	0	+11	+20	+32	+41	+53	+66	+87	+102	+122	+144	+172	+226	+300	+405
								+43	+59	+75	+102	+120	+146	+174	+210	+274	+360	+480
-9	-15		+3	0	+13	+23	+37	+51	+71	+91	+124	+146	+178	+214	+258	+335	+445	+585
								+54	+79	+104	+144	+172	+210	+254	+310	+400	+525	+690
-11	-18		+3	0	+15	+27	+43	+63	+92	+122	+170	+202	+248	+300	+365	+470	+620	+800
								+65	+100	+134	+190	+228	+280	+340	+415	+535	+700	+900
								+68	+108	+146	+210	+252	+310	+380	+465	+600	+780	+1000
-13	-21		+4	0	+17	+31	+50	+77	+122	+166	+236	+284	+350	+425	+520	+670	+880	+1150
								+80	+130	+180	+258	+310	+385	+470	+575	+740	+960	+1250
								+84	+140	+196	+284	+340	+425	+520	+640	+820	+1050	+1350
-16	-26		+4	0	+20	+34	+56	+94	+158	+218	+315	+385	+475	+580	+710	+920	+1200	+1550
								+98	+170	+240	+350	+425	+525	+650	+790	+1000	+1300	+1700
-18	-28		+4	0	+21	+37	+62	+108	+190	+268	+390	+475	+590	+730	+900	+1150	+1500	+1900
								+114	+208	+294	+435	+530	+660	+820	+1000	+1300	+1650	+2100
-20	-32		+5	0	+23	+40	+68	+126	+232	+330	+490	+595	+740	+920	+1100	+1450	+1850	+2400
								+132	+252	+360	+540	+660	+820	+1000	+1250	+1600	+2100	+2600
			0	0	+26	+44	+78	+150	+280	+400	+600							
								+155	+310	+450	+660							
			0	0	+30	+50	+88	+175	+340	+500	+740							
								+185	+380	+560	+840							
			0	0	+34	+56	+100	+210	+430	+620	+940							
								+220	+470	+680	+1050							
			0	0	+40	+66	+120	+250	+520	+780	+1150							
								+260	+580	+840	+1300							
			0	0	+48	+78	+140	+300	+640	+960	+1450							
								+330	+720	+1050	+1600							
			0	0	+58	+92	+170	+370	+820	+1200	+1850							
								+400	+920	+1350	+2000							
			0	0	+68	+110	+195	+440	+1000	+1500	+2300							
								+460	+1100	+1650	+2500							
			0	0	+76	+135	+240	+550	+1250	+1900	+2900							
								+580	+1400	+2100	+3200							

Tolerance of fitting dimensions

● Basic deviations value of hole

Dimensions (mm)		Basic deviation value																				
		Lower deviation EI											Upper deviation ES									
		Standard tolerance class											IT6	IT7	IT8	≤IT8	>IT8	≤IT8	>IT8	≤IT8	>IT8	≤IT7
Min(>)	Max(≤)	A	B	C	CD	D	E	EF	F	FG	G	H	JS	J			K		M		N		P to ZC
---	3	+270	+140	+60	+34	+20	+14	+10	+6	+4	+2	0	In the formula Deviation $=\pm\frac{IT_n}{2}$, ITn is the IT value corresponding to 'n'.	+2	+4	+6	0	0	-2	-2	-4	-4	If IT ≥IT7, add a Δ value to the relevant value
3	6	+270	+140	+70	+46	+30	+20	+14	+10	+6	+4	0		+5	+6	+10	-1+Δ		-4+Δ	-4	-8+Δ	0	
6	10	+280	+150	+80	+56	+40	+25	+18	+13	+8	+5	0		+5	+8	+12	-1+Δ		-6+Δ	-6	-10+Δ	0	
10	14	+290	+150	+95		+50	+32		+16		+6	0		+6	+10	+15	-1+Δ		-7+Δ	-7	-12+Δ	0	
14	18																						
18	24	+300	+160	+110		+65	+40		+20		+7	0		+8	+12	+20	-2+Δ		-8+Δ	-8	-15+Δ	0	
24	30																						
30	40	+310	+170	+120		+80	+50		+25		+9	0		+10	+14	+24	-2+Δ		-9+Δ	-9	-17+Δ	0	
40	50	+320	+180	+130																			
50	65	+340	+190	+140		+100	+60		+30		+10	0		+13	+18	+28	-2+Δ		-11+Δ	-11	-20+Δ	0	
65	80	+360	+200	+150																			
80	100	+380	+220	+170		+120	+72		+36		+12	0		+16	+22	+34	-3+Δ		-13+Δ	-13	-23+Δ	0	
100	120	+410	+240	+180																			
120	140	+460	+260	+200		+145	+85		+43		+14	0		+18	+26	+41	-3+Δ		-15+Δ	-15	-27+Δ	0	
140	160	+520	+280	+210																			
160	180	+580	+310	+230																			
180	200	+660	+340	+240		+170	+100		+50		+15	0		+22	+30	+47	-4+Δ		-17+Δ	-17	-31+Δ	0	
200	225	+740	+380	+260																			
225	260	+820	+420	+280																			
260	280	+920	+480	+300		+190	+110		+56		+17	0		+25	+36	+55	-4+Δ		-20+Δ	-20	-34+Δ	0	
280	315	+1050	+540	+330																			
315	355	+1200	+600	+360		+210	+125		+62		+18	0		+29	+39	+60	-4+Δ		-21+Δ	-21	-37+Δ	0	
355	400	+1350	+680	+400																			
400	450	+1500	+760	+440		+230	+135		+68		+20	0		+33	+43	+66	-5+Δ		-23+Δ	-23	-40+Δ	0	
450	500	+1650	+840	+480																			
500	560					+260	+145		+76		+22	0					0		-26		-44		
560	630																						
630	710					+290	+160		+80		+24	0					0		-30		-50		
710	800																						
800	900					+320	+170		+86		+26	0					0		-34		-56		
900	1000																						
1000	1120					+350	+195		+98		+28	0					0		-40		-66		
1120	1250																						
1250	1400					+390	+220		+110		+30	0					0		-48		-78		
1400	1600																						
1600	1800					+430	+240		+120		+32	0					0		-58		-92		
1800	2000																						
2000	2240					+480	+260		+130		+34	0					0		-68		-110		
2240	2500																						
2500	2800					+520	+290		+145		+38	0					0		-76		-135		
2800	3150																						

Note: 1. If basic dimension ≤1mm, the basic deviation A and B are not adopted, so is the N when IT≥IT8.

2. Within the range from JS7 to JS11, if the value of ITn is odd number, then the final deviation=$\pm\frac{IT_n-1}{2}$.

3.Regarding to the K,M, N with IT≤IT8 or the P to ZC with IT≤IT7, the Δ value can be selected from the right-side sheet.

For example,: within the range 8~30mm of K7, Δ=8μm, therefore ES=-2+8=+6μm within the range 18~30mm of S6:Δ=4μm, therefore ES=-35+4=-31μm.

4. Special cases: within the range 250~315mm of M5, ES=-9μm (instead -11μm).

Tolerance of fitting dimensions

μm

Basic deviation value												Δ					
Upper deviationES																	
Standard tolerance class >IT7												Standard tolerance class					
P	R	S	T	U	V	X	Y	Z	ZA	ZB	ZC	IT3	IT4	IT5	IT6	IT7	IT8
-6	-10	-14		-18		-20		-26	-32	-40	-60	0	0	0	0	0	0
-12	-15	-19		-23		-28		-35	-42	-50	-80	1	1.5	1	3	4	6
-15	-19	-23		-28		-34		-42	-52	-67	-97	1	1.5	2	3	6	7
-18	-23	-28		-33		-40		-50	-64	-90	-130	1	2	3	3	7	9
					-39	-45		-60	-77	-108	-150						
-22	-28	-35		-41	-47	-54	-63	-73	-98	-136	-188	1.5	2	3	4	8	12
			-41	-48	-55	-64	-75	-88	-118	-160	-218						
-26	-34	-43	-48	-60	-68	-80	-94	-112	-148	-200	-274	1.5	3	4	5	9	14
			-54	-70	-81	-97	-114	-136	-180	-242	-325						
-32	-41	-53	-66	-87	-102	-122	-144	-172	-226	-300	-405	2	3	5	6	11	16
	-43	-59	-75	-102	-120	-146	-174	-210	-274	-360	-480						
-37	-51	-71	-91	-124	-146	-178	-214	-258	-335	-445	-585	2	4	5	7	13	19
	-54	-79	-104	-144	-172	-210	-254	-310	-400	-525	-690						
-43	-63	-92	-122	-170	-202	-248	-300	-365	-470	-620	-800	3	4	6	7	15	23
	-65	-100	-134	-190	-228	-280	-340	-415	-535	-700	-900						
	-68	-108	-146	-210	-252	-310	-380	-465	-600	-780	-1000						
-50	-77	-122	-166	-236	-284	-350	-425	-520	-670	-880	-1150	3	4	6	9	17	26
	-80	-130	-180	-258	-310	-385	-470	-575	-740	-960	-1250						
	-84	-140	-196	-284	-340	-425	-520	-640	-820	-1050	-1350						
-56	-94	-158	-218	-315	-385	-475	-580	-710	-920	-1200	-1550	4	4	7	9	20	29
	-98	-170	-240	-350	-425	-525	-650	-790	-1000	-1300	-1700						
-62	-108	-190	-268	-390	-475	-590	-730	-900	-1150	-1500	-1900	4	5	7	11	21	32
	-114	-208	-294	-435	-530	-660	-820	-1000	-1300	-1650	-2100						
-68	-126	-232	-330	-490	-595	-740	-920	-1100	-1450	-1850	-2400	5	5	7	13	23	34
	-132	-252	-360	-540	-660	-820	-1000	-1250	-1600	-2100	-2600						
-78	-150	-280	-400	-600													
	-155	-310	-450	-660													
-88	-175	-340	-500	-740													
	-185	-380	-560	-840													
100	-210 -220	-430 -470	-620 -680	-940 -1050													
-120	-250 -260	-520 -580	-780 -840	-1150 -1300													
-140	-300 -330	-640 -720	-960 -1050	-1450 -1600													
-170	-370	-820	-1200	-1850													
	-400	-920	-1350	-2000													
-195	-440 -460	-1000 -1100	-1500 -1650	-2300 -2500													
-240	-550 -580	-1250 -1400	-1900 -2100	-2900 -3200													

Hardness reference table(conversion of hardness and strength for ferrous metal)

Hardness				Tensile strength N/mm²
Rockwell hardness		Vickers hardness	Brinell hardness	
HRC	HRA	HV	HB	
70.0	86.6	1037	—	—
69.5	86.3	1017	—	—
69.0	86.1	997	—	—
68.5	85.8	978	—	—
68.0	85.5	959	—	—
67.5	85.2	941	—	—
67.0	85.0	923	—	—
66.5	84.7	906	—	—
66.0	84.4	889	—	—
65.5	84.1	872	—	—
65.0	83.9	856	—	—
64.5	83.6	840	—	—
64.0	83.3	825	—	—
63.5	83.1	810	—	—
63.0	82.8	795	—	—
62.5	82.5	780	—	—
62.0	82.2	766	—	—
61.5	82.0	752	—	—
61.0	81.7	739	—	—
60.5	81.4	726	—	—
60.0	81.2	713	—	2555
59.5	80.9	700	—	2500
59.0	80.6	688	—	2450
58.5	80.3	676	—	2395
58.0	80.1	664	—	2345
57.5	79.8	653	—	2295
57.0	79.5	642	—	2250
56.5	79.3	631	—	2205
56.0	79.0	620	—	2160
55.5	78.7	609	—	2115
55.0	78.5	599	—	2075
54.5	78.2	589	—	2035
54.0	77.9	579	—	1995
53.5	77.7	570	—	1955
53.0	77.4	561	—	1920
52.5	77.1	551	—	1885
52.0	76.9	543	—	1850
51.5	76.6	534	—	1815

Hardness				Tensile strength N/mm²
Rockwell hardness		Vickers hardness	Brinell hardness	
HRC	HRA	HV	HB	
51.0	76.3	525	501	1780
50.5	76.1	517	494	1750
50.0	75.8	509	488	1720
49.5	75.5	501	481	1690
49.0	75.3	493	474	1660
48.5	75.0	485	468	1630
48.0	74.7	478	461	1605
47.5	74.5	470	455	1575
47.0	74.2	463	449	1550
46.5	73.9	456	442	1525
46.0	73.7	449	436	1500
45.5	73.4	443	430	1475
45.0	73.2	436	424	1450
44.5	72.9	429	418	1430
44.0	72.6	423	413	1405
43.5	72.4	417	407	1385
43.0	72.1	411	401	1360
42.5	71.8	405	396	1340
42.0	71.6	399	391	1320
41.5	71.3	393	385	1300
41.0	71.1	388	380	1280
40.0	70.8	382	375	1260
40.0	70.5	377	370	1245
39.5	70.3	372	365	1225
39.0	70.0	367	360	1210
38.5	—	362	355	1190
38.0	—	357	350	1175
37.5	—	352	345	1160
37.0	—	347	341	1140
36.5	—	342	336	1125
36.0	—	338	332	1110
35.5	—	333	327	1095
35.0	—	329	323	1080
34.5	—	324	318	1065
34.0	—	320	314	1050
33.5	—	316	310	1035
33.0	—	312	306	1020
32.5	—	308	302	1010

Hardness reference table

Hardness				Tensile strength N/mm²	Hardness				Tensile strength N/mm²
Rockwell hardness		Vickers hardness	Brinell hardness		Rockwell hardness		Vickers hardness	Brinell hardness	
HRC	HRA	HV	HB		HRC	HRA	HV	HB	
32.0	—	304	298	995	24.0	—	249	245	820
31.5	—	300	294	980	23.5	—	246	242	810
31.0	—	296	291	970	23.0	—	243	240	800
30.5	—	292	287	960	22.5	—	240	237	790
30.0	—	289	283	950	22.0	—	237	234	785
29.5	—	285	280	935	21.5	—	234	232	775
29.0	—	281	276	920	21.0	—	231	229	765
28.5	—	278	273	910	20.5	—	229	227	760
28.0	—	274	269	900	20.0	—	226	225	750
27.5	—	271	266	890	19.5	—	223	222	745
27.0	—	268	263	880	19.0	—	221	220	735
26.5	—	264	260	870	18.5	—	218	218	730
26.0	—	261	257	860	18.0	—	216	216	725
25.5	—	258	254	850	17.5	—	214	214	715
25.0	—	255	251	835	17.0	—	211	211	710
24.5	—	252	248	830					

Note: The conversion values for steel in the table are commonly applicable for the steels with low and high carbon content.
The tensile strength in the table are applicable for the steels without high conversion precision requirement 1N/mm2=1Mpa.
This table is selected from GB1172-74.

CVD coating grades

Application	ISO Code		ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	MiTSUBiSHi	SUMITOMO	TUNGALOY	KYOCERA	DIJET	HITACHI	KENNAMETAL	SECO	ISCAR
Turning	P	P01		GC4305 GC4205		TT8115	WPP01 WPP05 WPP05S	UE6105	AC810P AC700G	T9105	CA510 CA5505	JC110V	HG8010	KCP05B KCP05 KC9105	TP0501 TP0500 TP1501 TP1500	IC9150 IC8150 IC428
		P10	YBC103 YBC152 YBC151	GC4315 GC4215 GC4325	NC310 NC3015	TT8115	WPP05 WPP10 WAK20 WPP05S WPP10S	UE6105 MC6015 UE6110 MY5015	AC8015P AC810P AC700G AC820P AC2000	T9105 T9115	CA510 CA5505 CA515 CA5515 CA025P	JC110V JC215V	HG8010 HG8025 GM8020	KCP10B KCP10 KCP25 KC9110	TP1501 TP1500 TP2501 TP2500	IC9150 IC8150 IC8250
		P20	YBC203 YBC251 YBC252	GC4315 GC4215 GC4325 GC4225	NC3020	TT8125 TT5100	WPP20 WPP20S	MC6015 UE6110 MC6025 UE6020 MY5015	AC820P AC2000 AC8025P AC830P	T9115 T9125	CA515 CA5515 CA525 CA5525 CR9025 CA025P	JC110V JC215V	HG8025 GM8020 GM25	KCP25B KCP30B KCP25 KC9125	TP2501 TP2500	IC8250 IC9250 IC8350
		P30	YBC252 YBC351 YBC352	GC4335 GC4325 GC4225 GC4025 GC4235	NC330	TT8125 TT5100 TT8135	WPP30 WAK30 WPP30S	MC6025 UE6020 MC6035 UE6035 UH6400	AC8035P AC830P AC630M	T9125 T9135 T6130	CA525 CA5525 CA530 CA5535 CR9025	JC325V JC215V	GM25 GM8035	KCP30B KCP30	TP3501 TP3500 TP3000	IC8350 IC9250 IC9350
		P40	YBC351 YBC352	GC4335 GC4235		TT7100 TT8135	WPP30 WAK30 WPP30S	MC6035 UE6035 UH6400	AC8035P AC630M	T9135 T6130	CA530 CA5535	JC325V	GM8035 GX30	KCP40B KCP40 KC9140 KC9240	TP3501 TP3500 TP3000	IC9350
	M	M10		GC2015 GC2220		TT9215		MC7015 US7020	AC610M AC6020M	T9115	CA6515	JX605X JC110V		KCM15B KCM15	TM2000	IC6015 IC8250
		M20	YBM151 YBM153	GC2220 GC2015	NC9020	TT9215 TT9225		MC7015 US7020 MC7025	AC6020M AC610M AC6030M AC630M	T6120 T9125	CA6515 CA6525	JC110V	HG8025 GM25	KCM15 KC9225 KCM25B	TM2000	IC6015
		M30	YBM151 YBM251	GC2025	NC330	TT9225 TT9235		MC7025 US735	AC6030M AC630M	T6130	CA6525	JX525X	GM8035 GX30	KCM25 KC9230 KCM35B	TM4000	IC6025
		M40	YBM253	GC2025		TT9235		US735	AC6030M AC630M			JX525X	GX30	KCM35B KCM35 KC9240 KC9245	TM4000	IC6025
	K	K01	YBD052	GC3205 GC3210			WAK10 WPP01	MC5005 UC5015	AC405K AC410K	T5105	CA4505 CA4010 CA310	JC050W JC105V	HX3505	KCK05B KCK05	TK0501 TH1500	IC5005
		K10	YBD102	GC3205 GC3210	N305K	TT7005	WPP10 WAK10 WKK10S	MC5015 UC5115 MY5015	AC405K AC410K AC415K AC420K AC700G	T5105 T515 T5115	CA315 CA4515 CA4010 CA4115	JC108W JC050W JC105V JC110V	HX3515 HG8010	KCK15B KCK15 KCK20 KC9315 KCK20B	TK0501 TH1501	IC5005 IC5010 IC428
		K20	YBD152 YBD252	GC3225 GC3215	N315K	TT7310	WPP20 WAK20 WKK20S	MC5015 UC5115 UE6110 MY5015	AC415K AC420K AC700G AC820P	T515 T5115 T5125	CA320 CA4515 CA4115 CA4120	JC108W JC110V JC215V	HG8025 GM8020	KCK20B KCK20 KC9325 KCPK05	TK1501	IC5010 IC8150
		K30		GC3225			WAK30 WKP30S	UE6110	AC820P	T9115 T5125		JC215	HG8025 GM8020	KCPK05		
	S	S01		S05F				US905			CA6515 CA6525 CA6535		HS9105 HS9115			

CVD coating grades

Application	ISO Code		ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	MiTSUBiSHi	SUMITOMO	TUNGALOY	KYOCERA	DIJET	HITACHI	KENNAMETAL	SECO	ISCAR
Milling	P	P10					WKP25					JC730U			MP1500	IC9080 IC4100 IC9015
		P20	YBC301 YBM251	GC4220		TT7800	WKP25 WKP35 WKP35S	F7030 MC7020	ACP100	T3225		JC730U	GX2140		MP1500 MP2500	IC5500 IC5100 IC520M
		P30	YBM351	GC4230	NCM335	TT7800	WKP25 WKP35 WKP35S	F7030 MC7020	ACP100	T3130 T3225			GX2140 GX2160	KCPK30 KC930M	MP2500	IC5500 IC4050
		P40	YBC302	GC4240		TT7800	WKP35 WKP35S						GX2030 GX30 GX2160	KC935M KC530M		
	M	M10														IC9250
		M20	YBM251 YBM253			TT7800		F7030 MC7020	ACP100 ACM200	T3225	CA6535	JC730U	AX2040 GX2140	KC925M	MP2500 MM4500	IC520M IC9350
		M30	YBC302	GC2040	NCM335	TT7800		F7030 MC7020	ACP100	T3130 T3225	CA6535		AX2040 GX2140 GX2160 GX30	KC930M	MP2500 MM4500	IC9350 IC4050
		M40	YBM351										GX2030 GX2160 GX30	KC930M KC935M		IC635
	K	K01					WKP15					JC600				
		K10	YBD152		NCM310	TT6800	WKP15 WKP25	MC5020	ACK100	T1215 T1115	CA420M	JC600				
		K20	YBD203 YBD252	GC3220 GC3330 K20W	NCM320	TT6800	WKP15 WKP25 WKP35 WKP35S	MC5020	ACK200	T1215		JC610		KC915M	MK1500 MK2000	IC5100 IC9150
		K30	YBD252	GC3330 GC3040			WKP25 WKP35 WKP35S					JC610	GX30	KC920M KC925M KCPK30 KC930M KC935M	MK2000 MK3000	IC4100 IC4050 IC520M

PVD coating grades

Application	ISO Code		ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	MiTSUBiSHi	SUMITOMO	TUNGALOY	KYOCERA	DIJET	HITACHI	KENNAMETAL	SECO	ISCAR
Turning	P	P01					WXN10				PR1005					
		P10	YBG102	GC1125			WSM10 WSM21	VP10MF MS6015		AH710	PR1005 PR930 PR1025 PR115 PR1225 PR1425			KCU10 KC5010 KC5510 KU10T	CP200 TS2000	IC250 IC507 IC570 IC807 IC907 IC908
		P20	YBG202	GC1125 GC15	PC230	TT9030	WSM21 WSM20	VP10RT VP20RT VP15TF VP20MF MS6015	AC520U	AH120 AH730 AH725 SH725 SH730 J740	PR930 PR1025 PR1115 PR1225 PR1425 PR1535		IP2000	KCU10 KC5025 KC5525 KU25T	TS2500	IC1007 IC250 IC308 IC507 IC807 IC808 IC907 IC908 IC1008 IC1028 IC3028
		P30	YBG202	GC1125		TT9030 TT8020	WSM30	VP10RT VP20RT VP15TF VP20MF	AC1030U AC530U	AH725 AH120 AH730 SH730 GH330 GH730 J740 SH725	PR1025 PR1225 PR1425 PR1535 PR1625		IP3000	KCU25 KC5525 KU25T	CP500	IC228 IC250 IC328 IC330 IC354 IC528 IC1008 IC1028 IC3028
		P40			PC240	TT8020				AH120 AH725 AH645	PR1535				CP500 CP600	IC228 IC328 IC528 IC928 IC1008 IC1028 IC3028
	M	M10	YBG202 YBG205	GC1115 GC15 GC1105			WSM10 WSM10S	VP10MF MS6015		AH630	PR1025 PR1225 PR1425	JC5003 JC8015	IP050S	KCU10 KC5010 KC5510	CP200 TS2000	IC354 IC507 IC520 IC807 IC907 IC1007 IC5080T
		M20	YBG202 YBG205	GC1115 GC15 GC1125	PC9030	TT9030 TT8010	WSM20 WSM21 WSM20S	VP10RT VP20RT VP15TF VP20MF	AC520U	AH725 AH120 SH730 AH630 SH725	PR1025 PR1125 PR1225 PR1425 PR915 PR930 PR1535	JC5003 JC5015 JC8015 JC5118	IP100S	KCU10 KC5010 KC5510	TS2500 CP500	IC354 IC808 IC908 IC1008 IC1028 IC3028 IC5080T
		M30		GC1125 GC2035	PC9030	TT8020	WSM30 WSM30S	VP10RT VP20RT VP15TF VP20MF MP7035	AC520U AC530U AC1030U AC6040U	AH725 AH120 SH730 J740 AH645 SH725	PR1125 PR1425 PR1535	JC5015 JC8015 JC5118		KCU25 KC5525 KU25T	CP500 CP600	IC228 IC250 IC328 IC330 IC1008 IC1028 IC9080T
		M40		GC2035				MP7035	AC530U AC6040U	AH645	PR1535	JC5118				IC328 IC928 IC1008 IC1028 IC3028 IC9080T

PVD coating grades

Application	ISO Code		ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	MiTSUBiSHi	SUMITOMO	TUNGALOY	KYOCERA	DIJET	HITACHI	KENNAMETAL	SECO	ISCAR
Turning	K	K01								AH110						
		K10		GC15	PC205K	TT9030			AC510U	GH110 AH110				KCU10 KC5010 KC5510	CP200 TS2000	IC350 IC910 IC1008
		K20			PC215K	TT9030		VP10RT VP20RT VP15TF		AH120				KCU15 KCU25	CP200 TS2000 TS2500	IC228 IC350 IC808 IC830 IC908 IC1007 IC1008
		K30				TT9030		VP10RT VP20RT VP15TF		AH120 GH130				KCU25 KC5525 KU25T	CP500	IC228 IC350 IC808 IC830 IC908 IC1007 IC1008
	S	S01					WSM10	MP9005 VP05RT		AH8005	PR005S PR1305	JC5003 JC8015	JP9105		TH1000	IC507 IC807 IC903 IC806 IC5080T
		S10	YBG102 YBG105 YBG202	GC1105 GC15		TT8010	WSM10 WSM10S	MP9005 MP9015 VP10RT	AC510U	AH8005 AH8015	PR005S PR1310 PR015S	JC5003 JC5015 JC8015	JP9115	KCU10 KC5010 KC5410 KC5510	CP200 CP250 TS2000 TS2050 TS2500 TH1000	IC228 IC300 IC328 IC808 IC908 IC928 IC3028 IC806 IC9080T
		S20	YBG212	GC1125		TT8020	WSM20 WSM20S WSM21	MP9005 MT9015	AC510U AC520U	AH8015	PR015S PR1125 PR1325	JC5015 JC8015 JC5118		KCU10 KCU25 KC5025 KC5525	TS2500 CP500	IC928 IC830
		S30		GC1125			WSM30 WSM30S	VP15TF MP9025 VP20RT	AC1030U	AH630 AH7025	PR1125 PR1535	JC5118		KC5525	CP600	

PVD coating grades

Application	ISO Code		ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	MiTSUBiSHi	SUMITOMO	TUNGALOY	KYOCERA	DIJET	HITACHI	KENNAMETAL	SECO	ISCAR
Milling	P	P01	YBH053			TT2510 TT5505				AH110 AH710		JC8003	ATH80D ATH08M TH308 PN208 JP4105 PN15M			IC903
		P10	YBG252	GC1010 GC1130		TT2510 TT5505 TT5515 TT7080	WXH15 WXM15		ACP200	AH120 AH725	PR830 PR1225	JC8003 JC8015 JC5015 JC5118	PN15M PN215 PCA12M JP4115	KC505M KC715M KC510M KC515M		IC250 IC350 IC808 IC810 IC900 IC903 IC908 IC910 IC950
		P20	YBG205 YBG202 YBG9320 YBG252	GC1010 GC1030 GC1130 GC2030	PC230	TT2510 TT5505 TT5525 TT7080 TT9030 TT9080	WHH15 WXM15	MP6120 VP15TF	ACP200	AH725 AH120 AH3135 AH9030	PR830 PR1225 PR1230 PR1525	JC5015 JC5040 JC6235 JC8015 JC5118 JC6235 JC7560P JC8118P	CY9020 JP4120 CY150	KC522M KC525M KC527M KC610M KC620M KC635M KC715M KC720M KC730M KTPK20	F25M MP3000	IC250 IC300 IC328 IC330 IC350 IC808 IC810 IC830 IC900 IC908 IC910 IC928 IC950 IC1008
		P30	YBG302	GC1010 GC1030 GC1130 GC2030	PC3530 PC130	TT5525 TT7080 TT8020 TT8080 TT9030 TT9080	WSP45 WSP46	MP6120 VP15TF MP6130 VP30RT	ACP200 ACP300	AH725 AH120 AH130 AH3135 AH6030	PR1230 PR1525	JC6235 JC7560 JC8050 JC7560P JC5015 JC8118 JC5040 JC8118P JC8015 JC5118	JS4045 CY250 CY250V CY25 HC844	KC735M KC725M KC530M KC537M KCPM40	F25M MP3000 F30M	IC250 IC300 IC328 IC330 IC350 IC830 IC845 IC900 IC928 IC950 IC1008
		P40	YBG302	GC1030 GC1130 GC2030		TT8020	WSP45 WSP46	VP30RT	ACP300	AH140	PR1525	JC6235 JC7560 JC8050 JC7560P JC5040 JC8118 JC5118 JC8118P JC5118	JS4060 PTH30E PTH40H JX1060 JS4060	KC735M KC537M KCPM40	F40M T60M	IC300 IC328 IC330 IC830 IC928 IC1008

PVD coating grades

Application	ISO Code		ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	MiTSUBiSHi	SUMITOMO	TUNGALOY	KYOCERA	DIJET	HITACHI	KENNAMETAL	SECO	ISCAR
Milling	M	M01											PN08M PN208			IC907
		M10	YBG252	GC1025 GC1130 GC1030 GC1010		TT5525 TT9030 TT9080	WXM15		ACM100	AH725	PR1225		PN15M PN215	KC735M KC515M		IC903
		M20	YBG205 YBG202 YBG9320 YBG252	GC1025 GC1030 GC1040 GC2030 S30T		TT8020 TT8080	WXM15 WSM35 WSM36	VP15TF MP7130 MP7030 VP20RT	ACP200	AH725 AH130 AH6030 AH3135	PR1025 PR1225	JC5015 JC5118 JC8015	JP4120	KC610M KC5635M KC730M KC720M KC522M KC525M KCPM40 KCPK20	F25M MP3000	IC250 IC300 IC808 IC830 IC900 IC908 IC928 IC1008
		M30	YBG302	S30T GC1040 GC2030	PC9530	TT8020 TT8080	WSM35 WSM36 WSP45 WSP46	VP15TF MP7130 MP7030 VP20RT MP7140 VP30RT	ACP200 ACP300 ACM300	AH130 AH3135	PR830 PR1225 PR1525 PR1535	JC5015 JC7560 JC8015 JC7560P JC8050 JC8118 JC5118 JC8118P	JS4045 CY250 HC844	KC537M KC725M KC735M KCPM40 KC530M	F30M F40M MP3000	IC250 IC300 IC328 IC330 IC830 IC928 IC1008 IC380 IC882
		M40	YBG302			TT8020	WSM35 WSM36 WSP45 WSP46	MP7140 VP30RT	ACP300 ACM300	AH140	PR1525 PR1535	JC5015 JC7560 JC5118 JC7560P JC8050 JC8118 JC8118P	PTH30E PTH40H JM4160		F40M	IC250 IC300 IC328I C330 IC1008 IC882

PVD coating grades

Application	ISO Code		ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	MiTSUBiSHi	SUMITOMO	TUNGALOY	KYOCERA	DIJET	HITACHI	KENNAMETAL	SECO	ISCAR
Milling	K	K01				TT6080		MP8010		AH110		JC8003	ATH80D ATH08M TH308			
		K10	YBG102 YBG252	GC1010	PC205K	TT6080	WHH15 WXM15 WKK25	MP8010		AH110 AH120	PR1210 PR1510	JC8015	ATH10E TH315 CY100H	KC514M KC515M KC527M KC635M	MK2050	IC350 IC810 IC830 IC900 IC910 IC928 IC950 IC380 IC1008
		K20	YBG152	GC1010 GC1020	PC215K		WHH15 WXM15 WKK25	VP15TF VP20RT	ACK300	AH120 AH9030	PR1210 PR1510	JC5015 JC8015 JC6235	CY150 JP4120 CY9020 PTH13S	KTPK20 KC514M KC610M KC520M KC620M KC524M	MK2000 MK2050	IC350 IC808 IC810 IC830 IC900 IC908 IC910 IC928 IC950 IC1008
		K30		GC1020			WKK25	VP15TF VP20RT	ACK300	AH120		JC6235 JC5015 JC8015 JC8118 JC8118P	CY250 JS4045	KC522M KC725M KC524M KC735M KC537M	MK2050	IC350 IC808 IC830 IC908 IC928 IC950 IC1008
	S	S01								AH110 AH710	PR1210	JC8003 JC8015 JC5118	PN08M PN208			IC907 IC908 IC808 IC903
		S10	YBG202	GC1130 GC1010 GC1030 GC2030		TT9030 TT9080 TT8080		MP9120 VP15TF	EH520Z EH20Z ACM100	AH120 AH725	PR1210	JC8003 JC8015 JC5118 JC5015	JS1025 JP4120	KC510M	MS2050	IC903 IC907 IC908 IC840 IC910 IC808
		S20		S30T GC2030 GC1030 GC1130		TT8020 TT8080	WSM35 WSM36	MP9120 VP15TF MP9130 MP9030	EH520Z EH20Z ACK300 ACP300	AH725 AH130 AH6030	PR1535	JC8050 JC8015 JC5118 JC5015	PTH30H	KC522M KC525M KCSM30 KCPM40	MS2050	IC300 IC908 IC808 IC900 IC830 IC928 IC328 IC330 IC840 IC882 IC380
		S30		GC2030 GC1040		TT8020	WSM35 WSM36 WSP45 WSP46		ACM300 ACP300	AH130	PR1535	JC8050 JC7560 JC5118	JM4160	KC725M KCPM40	MS2050 F40M KCSM40	IC830 IC882 IC928
	H	H01				TT2510 TT5505		MP8010 VP05HT		AH110		JC8003 DH103 JC8008 DH102				IC903
		H10		GC1130 GC1010 GC1030		TT5515 TT6080	WHH15	VP15TF VP10H		AH120		JC8003 JC8008 JC8015 JC5118 JC8118P	JP4105 TH308 TH303 PTH08M ATH08M ATH80D	KC505M KC510M	MH1000 F15M	IC900 IC808 IC907 IC905
		H20		GC1030 GC1130		TT5515 TT6080	WHH15	VP15TF		AH120 AH725 AH9030		JC8015 JC5118 JC8118P	JP4115 TH315		F15M	IC900 IC808 IC908 IC380 IC1008
		H30											JP4120		MP3000 F30M	IC380 IC900 IC1008

Cermet grades

Application	ISO Code		ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	MiTSUBiSHi	SUMITOMO	TUNGALOY	KYOCERA	DIJET	HITACHI	KENNAMETAL	SECO	ISCAR
Turning	P	P01			CC105 CN100	PV3010 CT3000		AP25N* VP25N*	T110A T1000A	NS520	TN30 TN610 PV710* PV30* TN6010 PV7010*	LN10 CX50				IC20N IC520N*
		P10	YNG151 YNG151C	CT5015 GC1525*	CC15 CN200 CT10	PV3010 CT3000	WCE10	NX2525 AP25N* VP25N*	T1200A T2000Z* T1500A T1500Z*	GT9530* J9530	TN60TN610 PV710* PV60* TN6010 PV7010*	CX50 CX75 PX75*	CZ25*	KT315 KT125	TP1020 TP1030* CM CMP*	IC20N IC520N* IC530N*
		P20		GC1525*		PV3010 CT3000	WCE10	NX2525 AP25N* VP25N* NX3035 MP3025*	T1200A T2500A T2000Z* T3000Z* T1500A T1500Z*	GT9530* NS9530 J9530	TN60 PV60* TN620 PV720* TN6020 PV7020* PV7025*	CX75 PX75* PX90*	CH550	KT325 KT1120 KT5020*	TP1020 TP1030*	IC20N IC520N* IC30N IC530N* IC75T
		P30						MP3025* VP45N*	T3000Z*	NS9530	PV7025* PV90*	PX90*				IC75T
	M	M10	YNG151 YNG151C	GC1525*		PV3010 CT3000		NX2525 AP25N VP25N	T110A T1000A T2000Z T1500Z	NS520	TN60 PV60* TN620 PV720* TN6020 PV7020*	LN10 CX50		KT125	TP1020 TP1030* CM CMP*	
		M20				PV3010 CT3000		NX2525 AP25N* VP25N*	T1200A T2000Z T1500A T1500Z	GT9530 NS9530 J9530	TN90 TN6020 TN620 PV720* PV90* PV7020* PV7025*	CX50 CX75 PX75	CH550			
		M30								NS9530						
		M40														
	K	K01			CC105 CN100	PV3010 CT3000		NX2525 AP25N*	T110A T1000A T2000Z* T1500Z*	NS520	TN30 PV30* PV7005* TN610 PV710* TN6010 PV7010*	LN10				
		K10	YNG151 YNG151C	CT5015	CC115	CT3000		NX2525 AP25N*	T1200A T2000Z* T1500A T1500Z*	GT9530 NS9530 J9530	TN60 PV60* TN6020 TN620 PV720* PV7020* PV7025*	LN10		KT325 KT125		
		K20						NX2525 AP25N*	T3000Z*	NS9530		CX75				
		K30														

Cermet grades

Application	ISO Code		ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	MiTSUBiSHi	SUMITOMO	TUNGALOY	KYOCERA	DIJET	HITACHI	KENNAMETAL	SECO	ISCAR
Milling	P	P01				CT3000										
		P10	YNG151 YNG151C		CN100	CT3000 CT7000		NX2525		NS740	TN60	CX75	MZ1000*		C15M	IC30N
		P20		CT530	CN20	CT3000 CT7000		NX2525 MX3020	T250A	NS740	TN100M TN60	CX75 CX90	CH550 CH7030 MZ1000* MZ2000*	KT530M HT7 KT605M	C15M MP1020	IC30N
		P30			CN30	CT7000		MX3030 NX4545	T250A T4500A			CX90 CX99	MZ3000* CH7035			IC30N
	M	M01														
		M10	YNG151 YNG151C			CT3000 CT7000		NX2525		NS740	TN60					IC30N
		M20		CT530		CT7000		NX2525 MX3020		NS740	TN100M	CX75	CH550 CH7030 MZ1000* MZ2000*	KT530M HT7 KT605M	C15M	IC30N
		M30						MX3030 NX4545	T250A			CX90 CX99	MZ3000* CH7035			
		M40														
	K	K01														
		K10	YNG151 YNG151C			CT7000		NX2525		NS740	TN60					
		K20						NX2525				CX75		KT530M HT7		
		K30														

PCBN grades

Application	ISO Code		ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	MiTSUBiSHi	SUMITOMO	TUNGALOY	KYOCERA	DIJET	SECO	Element Six
Turning	H	H01					WCB30	BC8105 BC8110 MBC010 MB810	BNC100 BNX10 BN1000	BXM10 BX310	KBN050M KBN10M KBN510		CBN060K	
		H10	YCB012	CB7015	KB320 KB330 KB420	KB50 TB650	WCB30 WCB50	BC8110 MBC020 BC8120 BC8020 MB825 MB8025	BNC160 BNX20 BN2000	BXM10 BX330 BX530	KBN25M KBN525	JBN300	CBN010	DBC50
		H20		CB7025 CB20		TB650	WCB50 WCB80	MBC020 BC8120 BC8020 MB8025	BNC200 BNX25 BN250	BXA20 BXM20 BX360	KBN30M	JBN245	CBN150 CBN160C	DBN45
		H30		CB7525				BC8130 MB835	BNC300 BN350	BXC50 BX380	KBN35M		CBN150 CBN160C	
	S	S01				KB90		MB730	BN700 BN7000	M714B			CBN170	
	K	K01				KB90	WCB90	MB710 MB5015	BN500 BNC500	BX930 BX910 BX870				
		K10	YCB011 YZB221	CB7525	KB350 KB360	KB90A	WCB50 WCB80	MB730 MB4020	BN700 BN7500	BX470 BX480 BX950	KBN60M	JBN795		DBA80
		K20	YZB221				WCB80	MB730 MB4020	BN700 BN7000	BXC90 BX90S	KBN60M	JBN500	CBN200	
		K30		CB7925				BC5030 MBS140	BNS800	BX90S BXC90	KBN900		CBN300 CBN400C CBN500	

PCD grades

Application	ISO Code		ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	MiTSUBiSHi	SUMITOMO	TUNGALOY	KYOCERA	DIJET	SECO	Element Six
Turning	N	N01		CD05			WCD10	MD205	DA90	DX180 DX160	KPD001	JDA30 JDA735	PCD05	CTH025
		N10	YCD011	CD10	DP90 DP150 DP200	KP500	WCD10	MD220	DA150	DX140	KPD010		PCD10	CTB010
		N20				KP300	WCD10	MD220	DA2200	DX120		JDA715	PCD20	CTB002
		N30				KP100		MD230	DA1000	DX110	KPD230	JDA10	PCD30 PCD30M	

Uncoating grades

Application	ISO Code		ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	MiTSUBiSHi	SUMITOMO	TUNGALOY	KYOCERA	DIJET	HITACHI	KENNAMETAL	SECO	ISCAR
Turning	P	P01			ST05											
		P10	YC10		ST10	P10			ST10P	TH10		SRT				IC70
		P20		SMA	ST20	P20		UTI20T	ST20E	KS20		SRT DX30	EX35			IC70 IC50M
		P30		SM30	ST30A	P30		UTI20T	A30	KS15F UX30	PW30	SR30 DX30	EX35			IC50M IC54
		P40	YC40			P40			ST40E	TX40		SR30	EX45			IC54
	M	M10		H10A	U10	M10			EH510 U10E	TH10		UMN	WA10B	KU10 K313 K68	890	IC07
		M20		H13A	U20	M20		UTI20T	EH520 U2	KS20		DX25 UMS	EX35	KU10 K313 K68	HX	IC07 IC08 IC20
		M30		H10F SM30	ST30A			UTI20T	A30	UX30		DX25 UMS	EX45		883	IC08 IC20 IC28
		M40			U40	M40				TU40		UM40	EX45			IC28
	K	K01	YD051		H02	UF1		HTI05T	H1 H2	KS05F		KG03	WH05	KU10 K313 K68		
		K10	YD201	H10 HM	H01	K10		HTi10	EH10 EH510	TH10	KW10 GW15	KG10 KT9	WH10	KU10 K313 K68	890	IC20
		K20	YD201	H13A	G10	K20		UTI20T	G10E EH20 EH520	KS15F KS20	GW25	CR1 KG20		KU10 K313 K68	HX	IC20
		K30			G3	K30		UTI20T	G10E			KG30			883	
	N	N01		H10 H13A					H1 H2	KS05F	KW10					
		N10	YD101		H01	K10	WK1 WK10	HTI10	EH10 EH510	TH10	KW10 GW15	KT9	WH10	KU10 K313 K68	H15	IC08 IC20
		N20				K20	WK1 WK10		G10E EH20 EH520	KS15F		CR1	WH20	KU10 K313 K68	HX	IC08 IC20
		N30					WK40 WMG40					KG30			H25	
	S	S01						RT9005			SW05	KG03				
		S10	YD101	H10 H10A H10F H13A	H01	K10	WK1	RT9005 RT9010 MT9015	EH10 EH510	KS05F TH10	SW10	FZ05 KG10	WH135	KU10 K313 K68	HX	IC07 IC08
		S20				K20	WK1 WMG40	RT9010 TF15	EH20 EH520	KS15F KS20	SW25	FZ15 KG20		KU10 K313 K68	H25	IC07 IC08
		S30					WMG40	TF15				KG30				

Uncoating grades

Application	ISO Code		ZCC.CT	SANDVIK	KORLOY	TaeguTec	WALTER	MiTSUBiSHi	SUMITOMO	TUNGALOY	KYOCERA	DIJET	HITACHI	KENNAMETAL	SECO	ISCAR
Milling	P	P10		S1P								SRT				
		P20			ST20	P30		UTI20T	A30N			SRT DX30	EX35	K125M		IC50M IC28
		P30			ST30A	P30		UTI20T	A30N	UX30	PW30	SR30 DX30	EX35	GX		IC50M IC28
		P40	YC30S		ST40						PW30	SR30	EX45			IC28
	M	M10			U10	M10										
		M20			U20	M20						UMN				
		M30	YC30S					UTI20T	A30N			DX25 UMS	EX35			IC08 IC20
		M40		SM30	U40	M40		UTI20T	A30N			DX25 UMS	EX35			IC08 IC28
	K	K01	YD051		H01	K10		HTI05T				KG03		K115M K313		
		K10	YD051		H05 H10	K10	WK10	HTI10	G10E	TH10	KW10 GW25	KG10	WH10	K115M K313		IC20
		K20	YD201	H13A	G10			UTI20T	G10E		GW25	KT9 CR1 KG20			HX	IC20
		K30						UTI20T				KG30				

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RT□□W-□□BSPT A316
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Safety & environmental protection

Cemented carbide products are hard and fragile, which are easily damaged due to improper carrying or clamping, so please be careful with them.

Spattering of chips may occur and a lot of cooling liquid is used during the machining process, so protective measures should be used, such as ventilating equipment, machine protective shield, safeguard glasses, protective clothes, and so on. Please take care to protect hand when clamping inserts with sharp edge.

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We have been awarded GB/T19001-ISO9001 Quality System Certificate.
All our products are inspected strictly.


QUALITY MANAGEMENT SYSTEM CERTIFICATE


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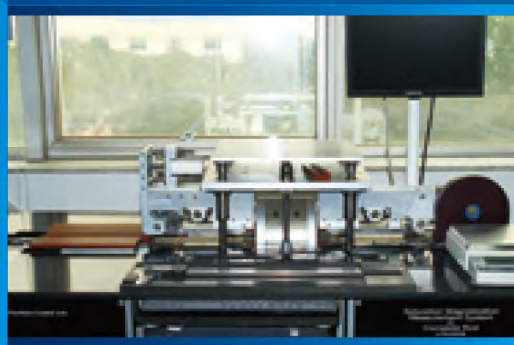



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Zhuzhou Cemented Carbide Cutting Tool Co.Ltd(ZCCCT) is the research, production and sales base of CNC cutting tools with large production scale, advanced equipments and leading technology strength in China.

——Starting from the very beginning of material selection, we strictly control each procedure and implement refined management to guarantee the stable quality of products.

——Our research and application experts constantly pay close attention to the latest development of materials and cutting technology to provide high-quality and high-efficiency cutting tools and complete solutions to our customers.

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