ISCAR HARD PART MACHINING

CERAMIC • CBN • PCD

METRIC CATALOG

MACHINING INTELLIGENTLY

TURNING | GROOVING | MILLING | GRADES

Member IMC Group

ISCAR

www.iscar.com

Quality Standard

ISCAR has been certified by the prestigious Standards Institution, as being in full compliance to ensure delivery of the finest quality goods. Quality control facilities include the metallurgical laboratory, raw metal testing, an online testing procedure and a machining center for tool performance testing and final product inspection. Only the finest products are packaged for entry into ISCAR's inventory.

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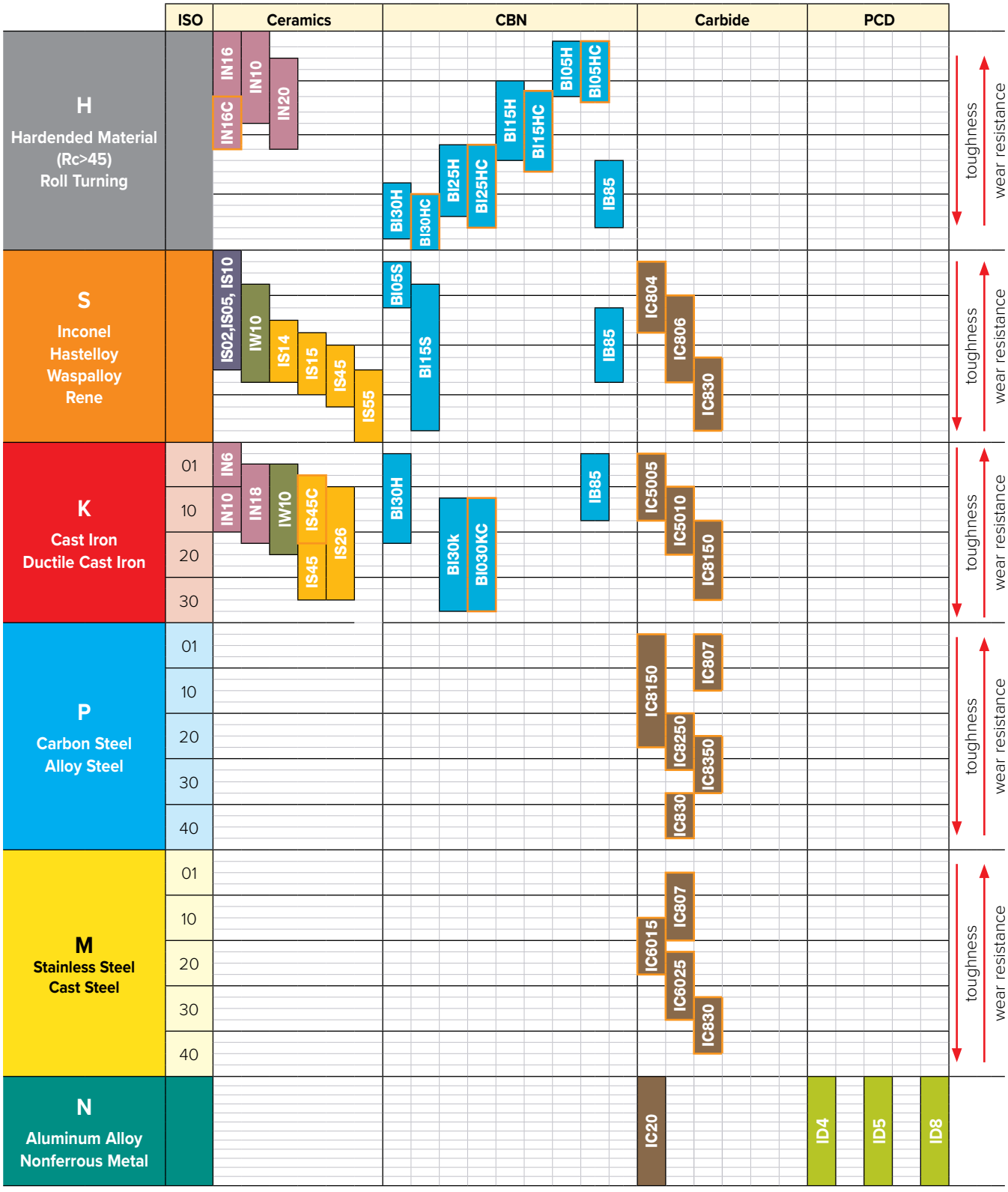
INTRODUCTION

Grade Recommendation Based on the Type of Workpiece Material

Insert Grade



CBN

Coated

PCD

Carbide

Bidemics-based Ceramics

Whisker-based Ceramics

Silicon Nitride-based Ceramics

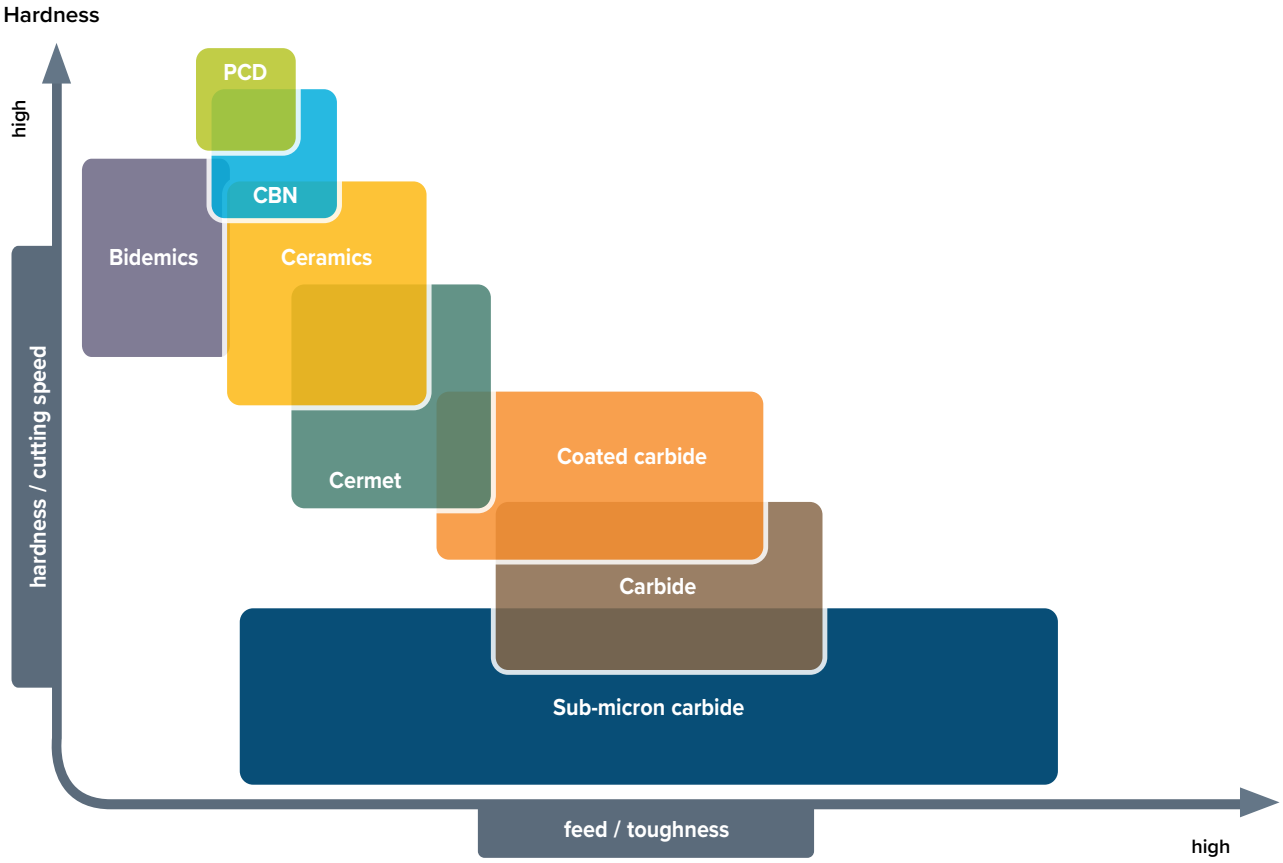
Alumina-based Ceramics

Tool Materials / Selection Guide

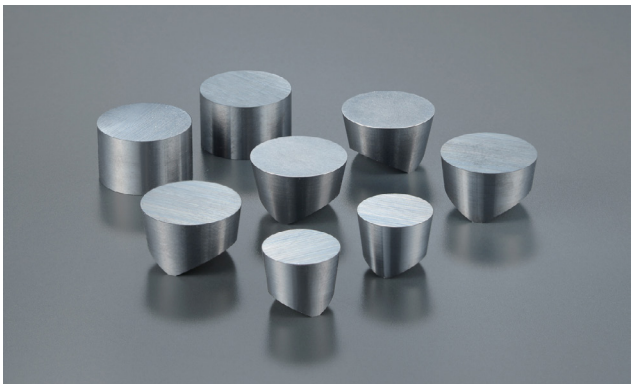
ISCAR cutting tools provide a diverse selection of tool materials, such as PCD, CBN, bidemics, ceramics, Cermet and carbide (coated & uncoated).

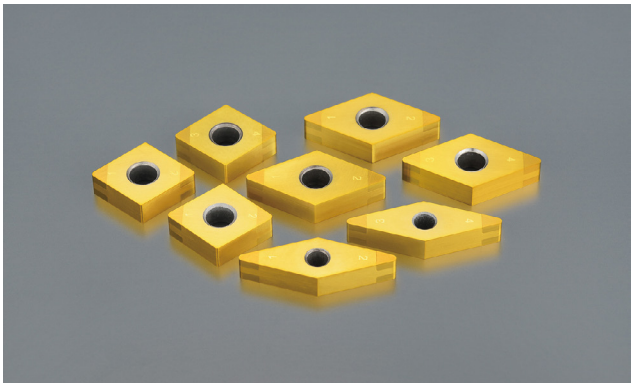
These materials suit different cutting conditions and requirements.

This catalog emphasizes the materials PCD, CBN, and Ceramics.



Bidemics



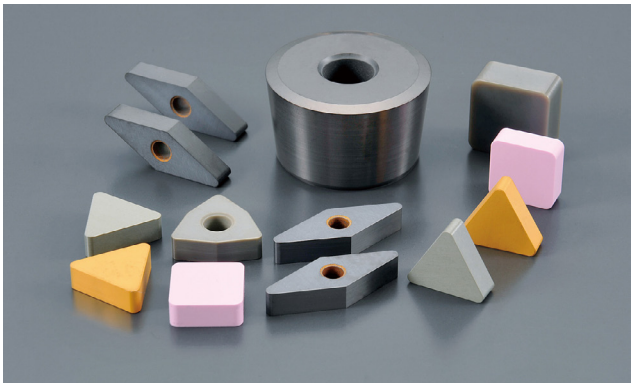


Highly Efficient Machining for Heat-Resistant Super Alloys (HRSA)

ISCAR's bidemics is the most recent breakthrough insert grade to impact the HRSA machining industry since the introduction of whisker-based ceramics .

Bidemics is a patented material with exceptional physical properties that surpass the current whisker-based ceramics grades commonly used in HRSA applications.

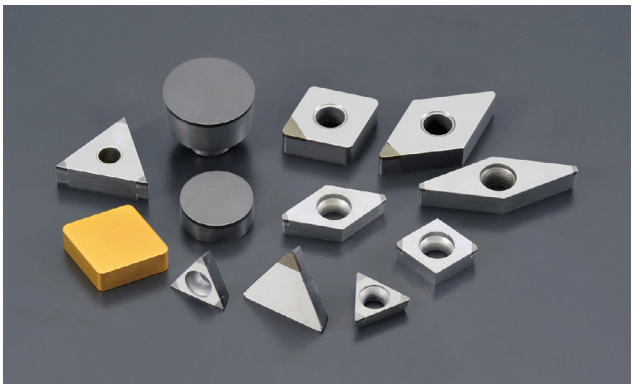
Ceramics



For High-Efficiency Cutting of Hardened Materials and Cast Irons

Ceramic tools are renowned for their exceptional heat resistance and chemical stability, which enable high cutting speeds and efficient machining. With a wide range of tools available in various shapes and made from materials like silicon nitride, alumina, and whisker series, ceramics tools often outperform carbide tools in numerous applications, ultimately leading to productivity.

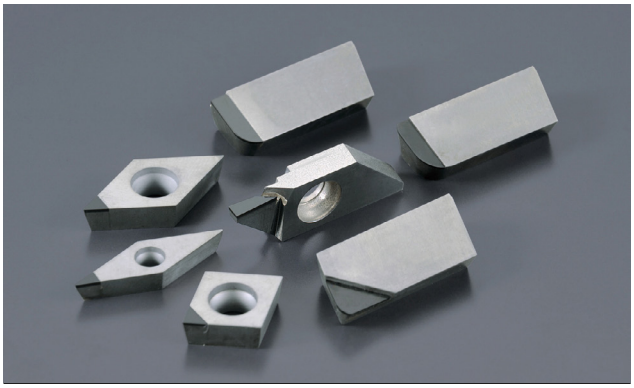
CBN



For High-Speed Cutting of Hard Materials and Cast Iron

This material is created by combining cubic boron nitride (CBN) with a unique ceramic or metal binder. It possesses remarkable hardness at both normal and elevated temperatures. One of its key advantages is its low chemical reactivity with workpiece materials. It is primarily used for machining high-hardness materials and for high-speed cutting of cast iron, proving efficient in these applications.

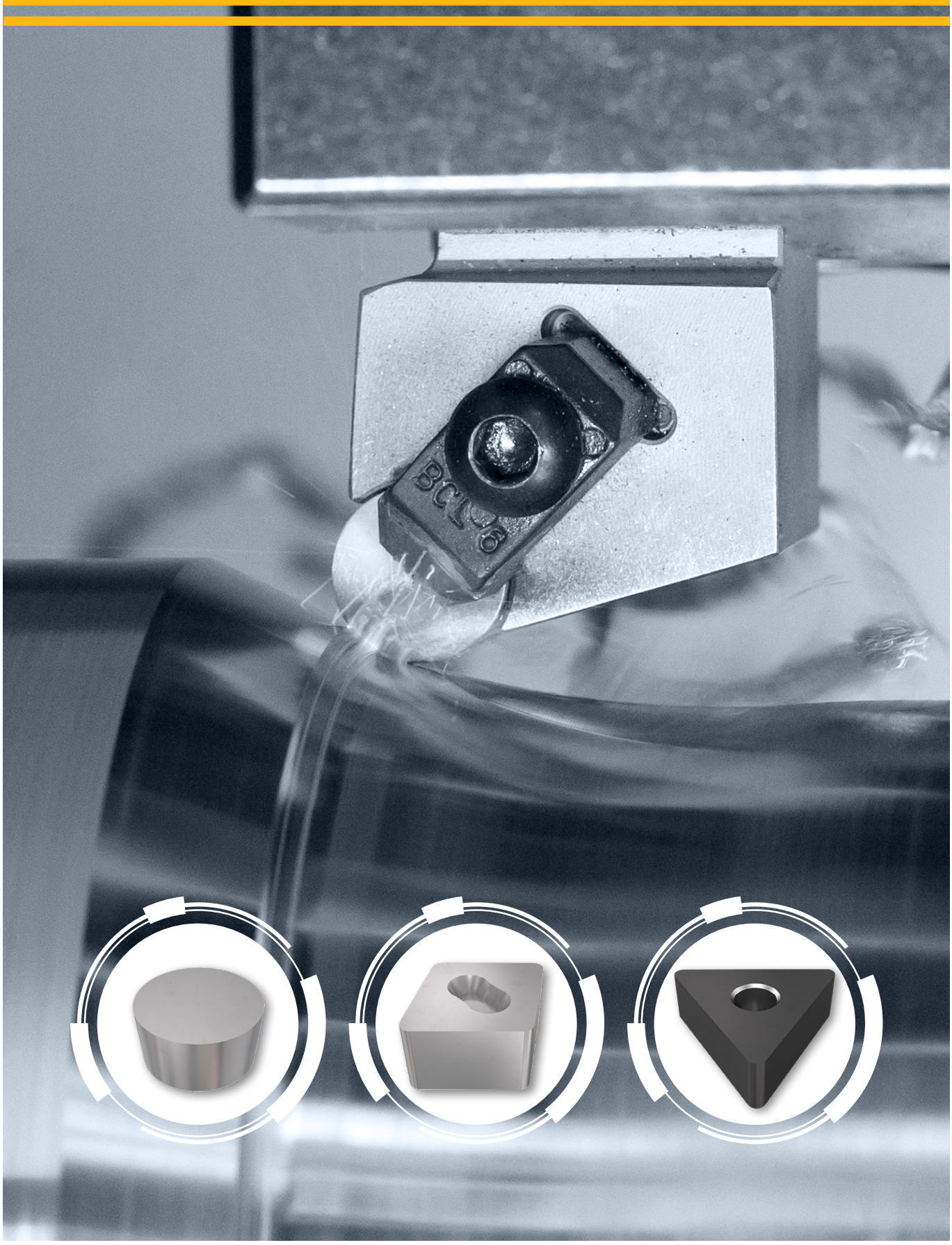
PCD



For High-Speed Cutting of Non-Ferrous Metals

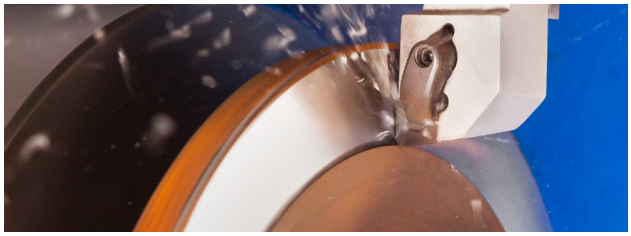
Diamond, renowned for its exceptional hardness and limited affinity with nonferrous metals, possesses remarkable resistance to deposition and wear. Nevertheless, its application as a tool is impeded by its low toughness and vulnerability to chipping. PCD (polycrystalline diamond) presents a solution to these challenges, achieved through theintering of micro-grain diamonds into a polycrystalline structure while retaining the distinctive properties of diamond. This material enables high-speed cutting of nonferrous, surpassing the capabilities of carbide cutting tools

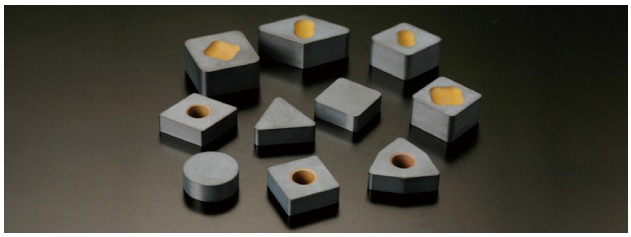
CERAMIC INSERTS PRELUDE



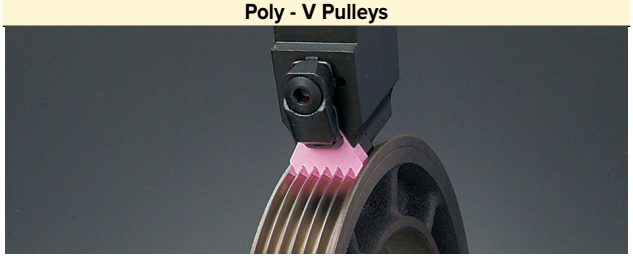
Ceramics Typical Uses

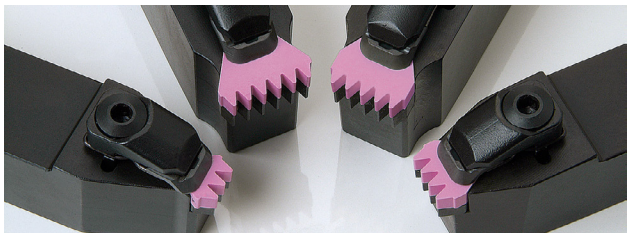
Disc and Drum Brakes



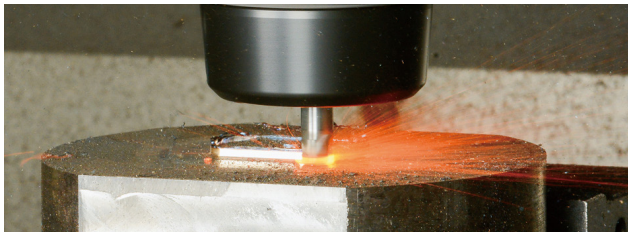


Poly - V Pulleys

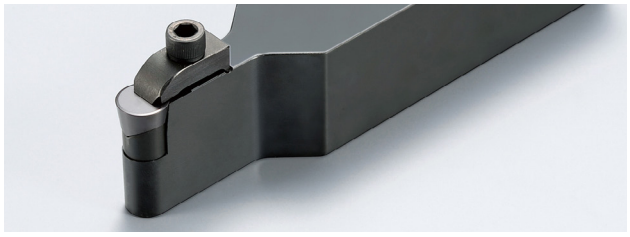




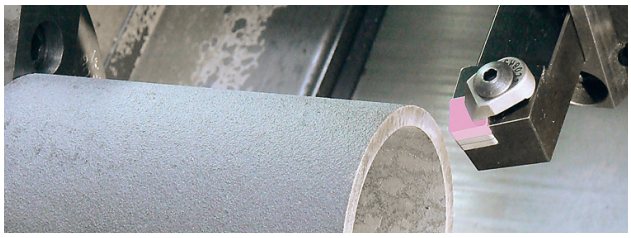
Machining HRSA by Ceramic Endmill

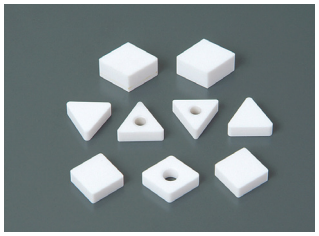


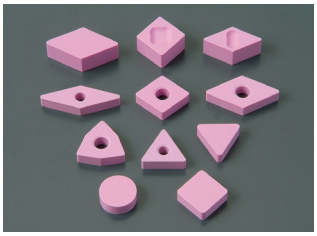
Mill Rolls



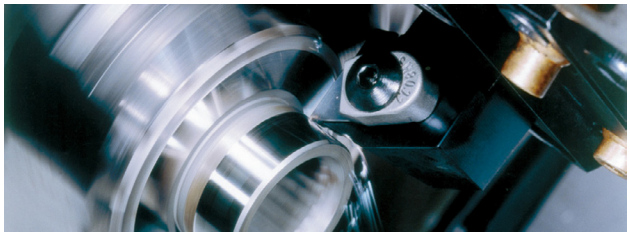
Cylinder Liners



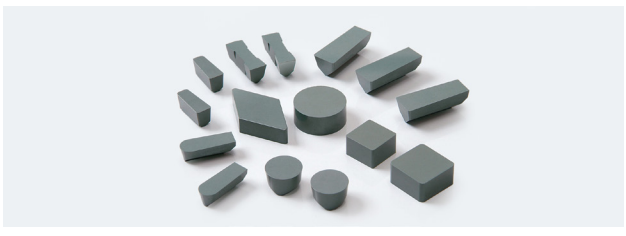




Hardened Materials

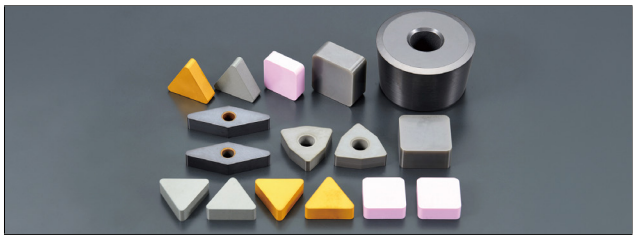


Aerospace Components

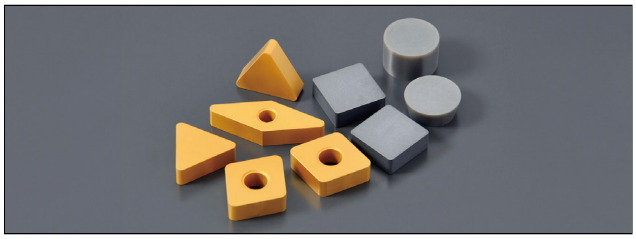


Types of Ceramics

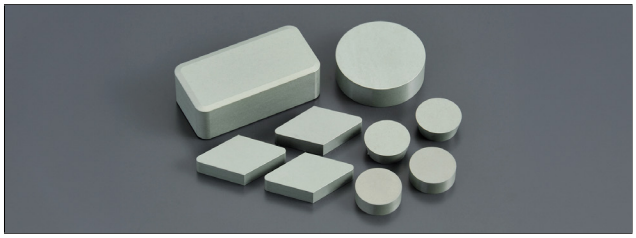
ISCAR ceramic tools deliver exceptional machining efficiency due to their outstanding high-temperature hardness, heat resistance, and chemical stability. To cater to specific application needs and achieve higher efficiency at increased cutting speeds, **ISCAR** provides a range of ceramic tool materials such as silicon-nitride-base, alumina-base, and whisker-reinforced, available in diverse shapes..



Silicon Nitride-Based Ceramics
These types of ceramics are particularly well-suited for high-speed roughing of normal cast iron. With these ceramics, it is possible to achieve machining speeds of up to 1000 m/min.

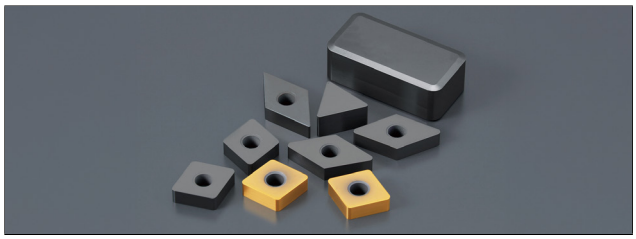


Whisker-Reinforced Ceramics
By incorporating SiC whisker, the wear resistance and fracture resistance of the material are substantially improved. This makes it the preferred option for machining heat-resistant super alloys and rolls that are composed of cemented materials. These ceramics tools excel in their ability to withstand wear and fractures, making them highly suitable for demanding machining operations involving such materials.



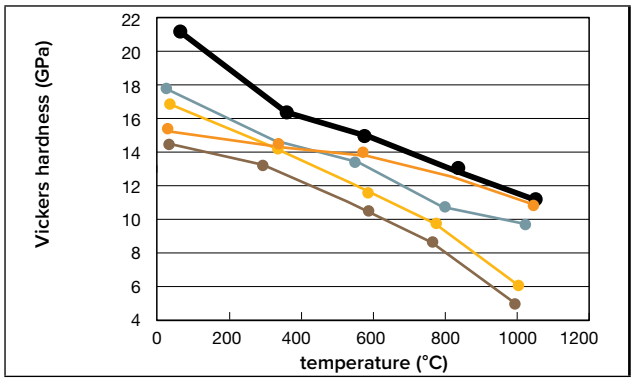
Alumina-Based Ceramics (White Ceramics)
Due to its exceptional wear resistance, this material is highly suitable for achieving efficient high-speed finishing on regular cast iron surfaces.

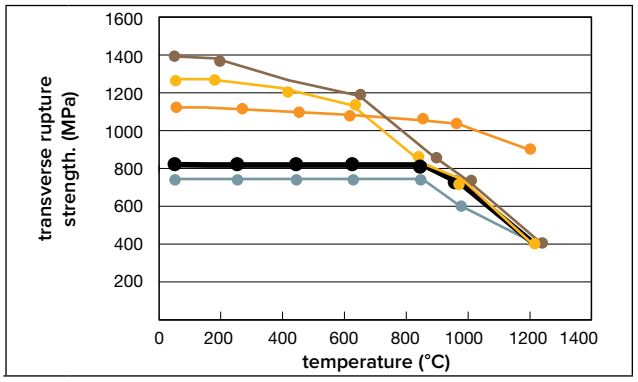
Alumina+TIC-Based Ceramics (Black Ceramics)
By incorporating TiC (titanium carbide), the toughness of this material is enhanced. As a result, it can be effectively utilized for semi-finishing to finishing operations on both regular cast iron and hardened materials.



Advantages of Ceramics Cutting Tools
The material retains high hardness even at elevated temperatures. Excellent wear resistance at high cutting speed.

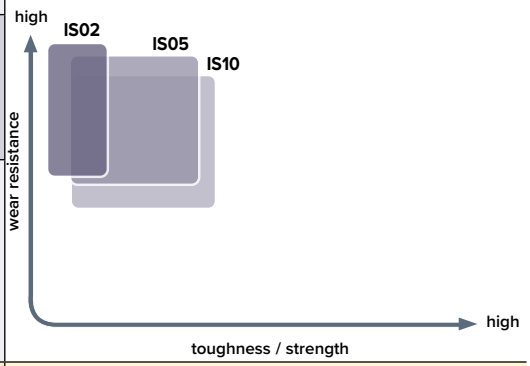
High temperature conditions do not significantly impact the breaking strength of the material. As a result, stable machining can be achieved in the high-speed range.

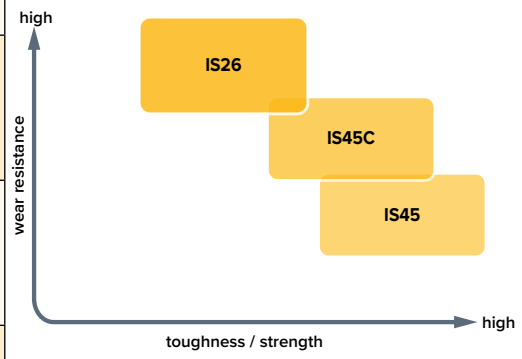




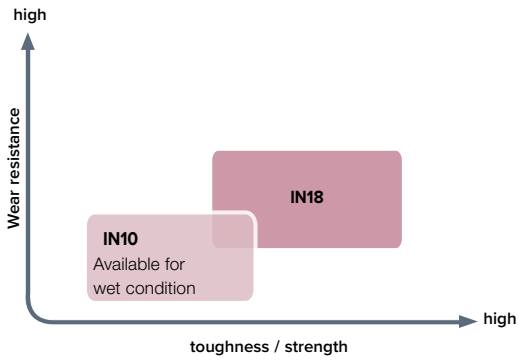
Silicon Nitride-based ceramics
Carbide
Black Ceramics
Cermet
White Ceramics

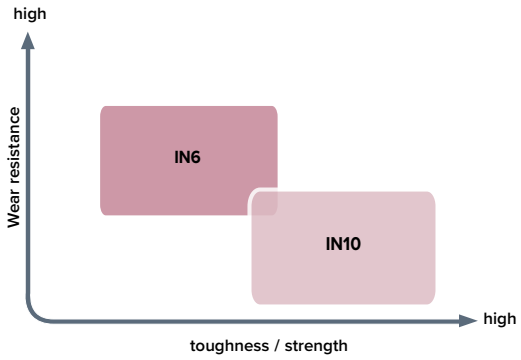
Category	Grades	Applications / Features	Physical Properties: Density g/cm³	Hardness HRA	Transverse Intensity MPa	Young's Modulus GPa	Thermal Expansion Coefficient X10⁻⁶/K	Thermal Conductivity W/m•K	Applications and Ceramics Property Map
Bidemics	**IS02** Bidemics	• heat resistant alloy finishing	9.3	95.5	1,800	500	6.2	40	Heat-Resistant Alloy / Finishing
	IS05 Bidemics	• heat resistant alloy • semi-finishing with non-scale turning grooving / profiling • rough to semi-finishing	9.3	95.5	1,800	500	6.2	40	
	IS10 Bidemics	• heat resistant alloy • turning / grooving / profiling • rough to semi-finishing with non-scale	9.0	95.0	2,100	460	6.7	30	
Silicon Nitride - Based Ceramics	**IS15** SiAlON	• roughing to semi-finishing • best balance of toughness and hardness	3.3	93.0	1,100	290	3.4	12	Gray Cast Iron / Roughing
	IS26 Si_3N_4	• gray cast iron turning • gray cast iron milling • resistance to insert flank wear	3.2	93.5	1,200	320	3.0	50	
	IS14 SiAlON	• heat resistant alloy turning • heat resistant alloy milling • high wear resistance	3.3	93.0	900	290	3.4	11	
	IS45 SiAlON	• heat resistant alloy turning • rough turning of normal cast iron • high fracture resistance	3.3	93.5	1,200	330	3.0	15	
	IS45C Si_3N_4 TiN + Al_2O_3 coated	• heat resistant alloy turning • rough turning of normal cast iron • special edge treatment for lower cutting forces + high precision cutting with coated inserts	3.3	93.5	1200	330	3.0	15	
Whisker - Based Ceramics	**IW10** Al_2O_3 + SiC	• heat resistant alloy turning • high-efficiency cutting of normal cast iron	3.7	94.5	1,200	400	7.0	35	Heat-Resistant Alloy / Roughing

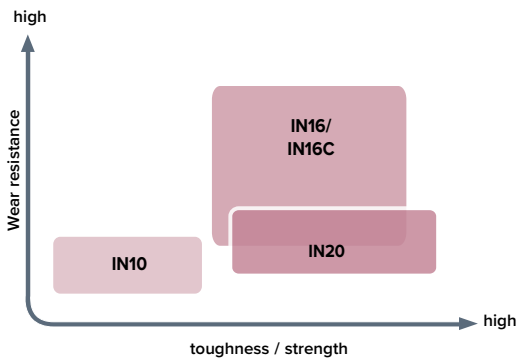




Category	Grades	Applications / Features	Physical Properties						Applications and Ceramics Property Map
			Density g/cm³	Hardness HRA	Transverse Intensity MPa	Young's Modulus GPa	Thermal Expansion Coefficient X10⁻⁶/K	Thermal Conductivity W/m•K	
White Ceramics Alumina - Based Ceramics	**IN18** Al_2O_3	• semi-finishing to finishing of cast iron • cylinder liner machining • excellent fracture resistance	4.1	94.0	750	390	7.8	19	**Normal Cast Iron, Finishing**
Black Ceramics Alumina + TiC - Based Ceramics	**IN10** Al_2O_3 + TiC	• semi-finishing to finishing of cast iron	4.3	94.5	800	420	7.9	21	**Ductile Cast Iron Finish**
	IN6 TiC + Al_2O_3	• semi-finishing to finishing of ductile cast iron • semi-finishing to finishing of cast iron with coolant	4.7	94.0	800	450	7.6	29	
	IN16 Al_2O_3 + TiC	• cutting of hardened materials (removal of carburized layer)	4.6	95.0	1,100	420	7.9	23	**Cutting of Hardened Materials**
	IN16C Al_2O_3 + TiC TiN coated	• recommended for cutting of hardened materials (removal of carburized layer)	4.6	95.0	1,100	420	7.9	23	



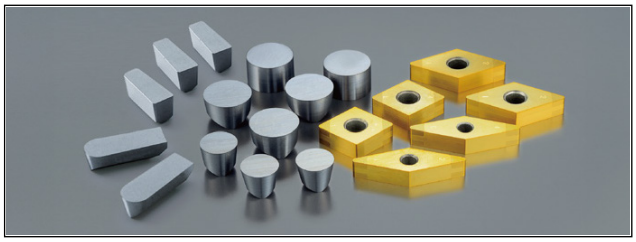




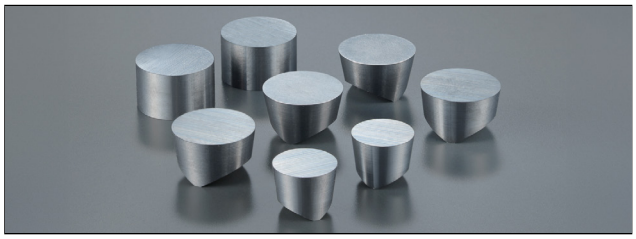
Bidemics

A Revolution in HRSA (Heat-Resistance Super Alloys)

ISCAR Bidemics is the most recent cutting-edge insert material to revolutionize the HRSA material machining industry, marking a significant advancement since the introduction of whisker ceramics. This groundbreaking material offers unprecedented capabilities and performance in HRSA applications.
Bidemics is a patented material with exceptional physical properties that surpass the current whisker grades commonly used in HRSA material applications. The industry and global community are recognizing the remarkable results achieved through the utilization of bidemics, leading to its growing popularity and reputation.

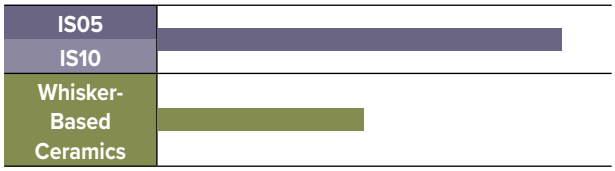


IS05 and IS10 Semi-finishing and Finishing / Rough no Scale



- The speed capability can reach up to 480 m/min.
- The tool life is significantly extended in the speed range of whisker-based ceramics.
- It exhibits better wear resistance and notching resistance than whisker-based ceramics.
- It delivers a superior surface finish compared to whisker-based ceramics.
- The bidemics family has been enhanced with the addition of IS10, providing improved toughness.

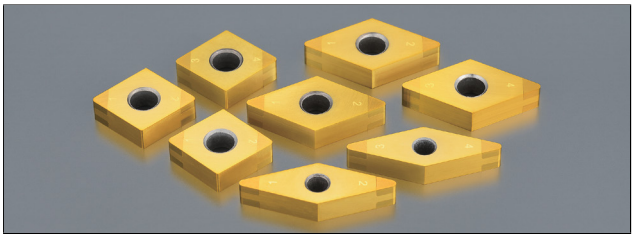
Increase Productivity vs. Whisker-Based Ceramics Significantly Extend Tool Life At Same Speed Double Speed Capability



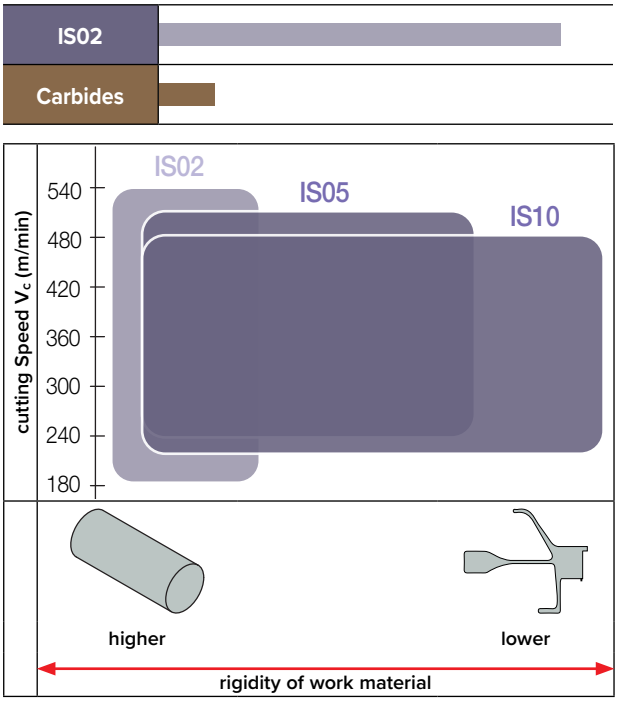
IS05
- Higher speed, more productivity than ceramics.
- Suitable for hard turning conditions (external/ end face turning). Turning using more toughness with RNCN type insert.
- Offering excellent notch wear resistance.

IS10
- Turning at the corner part, grooving.
- Chipping occured when using IS05 grade.
- Turning under low rigidity.

IS02 Finishing
- It exhibits a speed capability that is 10 to 15 times higher compared to carbide materials.
- The surface finish it achieves is superior to carbide and materials.
- It utilizes advanced brazing technology for exceptional strength and performance.



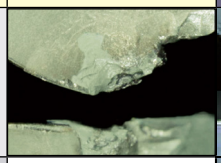
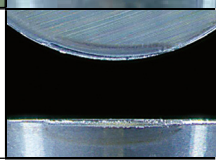
Increase Productivity vs. Carbides Shows 10 to 15 Times Higher Speed Capability



Grade	Work Material	Tooling	Applications	Cutting Speed (m/min)	Feed (mm/rev)	D.O.C (mm)	Dry	Wet
IS05 / IS10	heat resistant alloy	turning	rough no scale	180-**480**	0.15-0.30	1.00-2.50		•
			semi-finish	180-**480**	0.10-0.25	0.50-2.00		•
IS02	heat resistant alloy	turning	finish	180-**520**	0.10-0.25	0.20-1.00		•

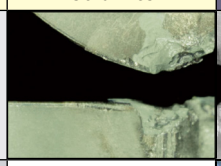
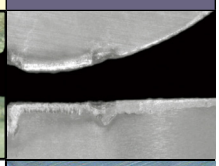
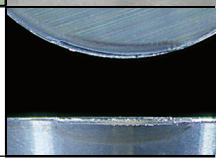
1 Higher Speeds, More Productivity

The superior physical properties of IS05/IS10 compared to whisker-based ceramics allow for increased speeds, potentially reaching up to twice the speeds of whisker-based ceramics. This increase in speed can enhance productivity and potentially eliminate the need for additional equipment to meet growing demands. Unlike HRSA materials, which produce continuous chips that can easily break at higher cutting speeds, IS05/IS10 enables more efficient chip removal.

480 m/min	Competitor's Whisker-Based Ceramics	IS05
1st pass after 0.50 min		
2nd pass after 1 min	impossible	

2 Longer Tool Life

The combination of high hardness, superior thermal conductivity, and improved strength in IS05/IS10 compared to whisker-based ceramics leads to significantly longer tool life when used at typical whisker-based ceramics speeds, feeds, and depth of cut.

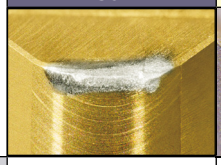
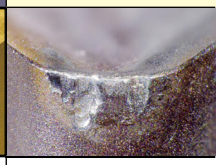
330 m/min	Competitor's Whisker-Based Ceramics	IS05
1st pass after 0.75 min		
2nd pass after 1.50 min	impossible	

3 Works Well on a Wide Range of High Temperature Alloys

Bidemics shows successful results.

- Inconel 718
- Inconel 625
- Inconel 718 plus
- Rene 41
- Rene 88
- Rene 104
- Waspaloy

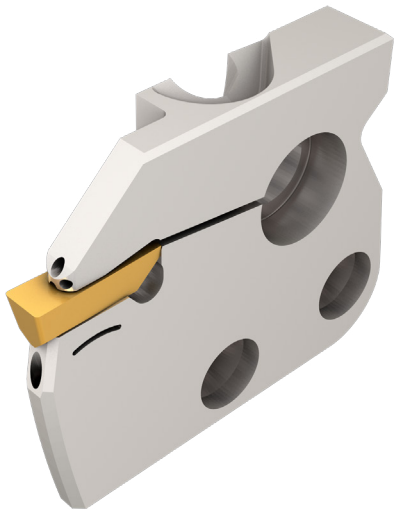
4 Superior Surface Finish

		IS02	Carbide
			
Roughness	Ra	0.64 µm	2.75 µm
	Rz	3.36 µm	9.64 µm
Cutting Speed		240 m/min	35 m/min
Feed		0.15 mm/rev	-
Cycle Time		3.3 min	14.7 min
Removed Chip		48 cc	-

IS02 exhibits remarkable wear resistance and notching resistance, leading to consistently superior workpiece surface finishes when compared carbide material.

5 Speed Up Grooving Operations

GCP grooving inserts are now available.



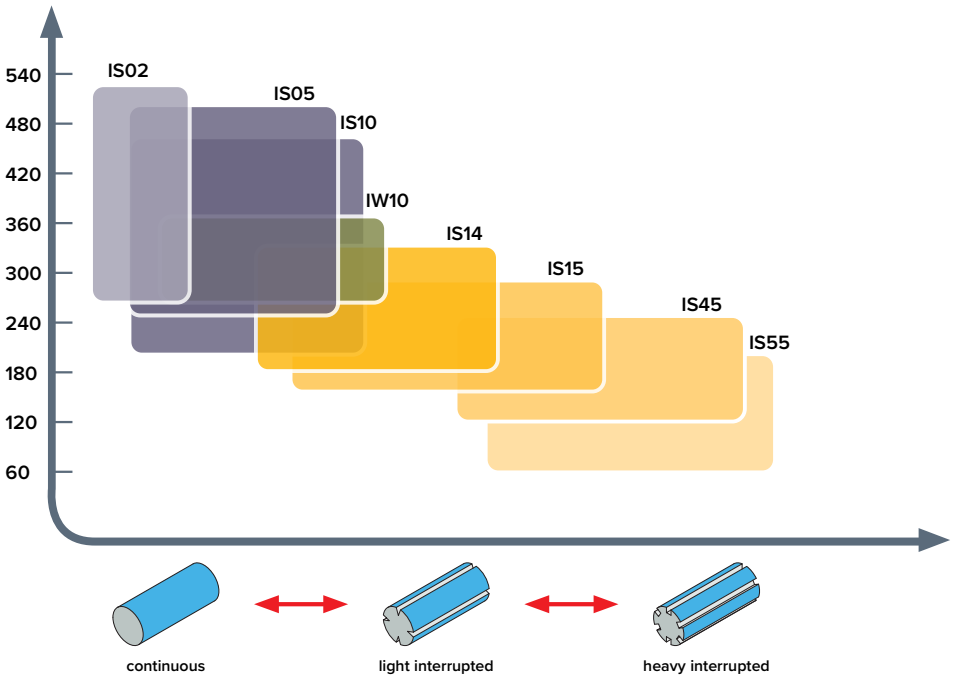
Guideline for Machining Heat Resistant Super Alloys (HRSA)

Insert Grades

Category	Grade	Attributes	Applications						
			Scale	No Scale	Profiling	Finishing	Grooving	Milling	Endmills
SiAlON	IS14	versatile grade for turning and milling	●	●	●		○	○	
SiAlON	IS15	best balance of toughness and hardness	●	○	○		○	○	
SiAlON	IS45	best grade for scale of inco718	○	●	●			●	○
SiAlON	IS55	best grade for waspaloy with scale	○				●		
Bidemics	IS02	special grade for finish turning				○			
Bidemics	IS05	special grade with higher speed and longer tool life potential		○	○	●	○		
Bidemics	IS10	added toughness in bidemics		○	○	●	○		
Whisker	IW10	general versatile grade for turning		●	●		●		

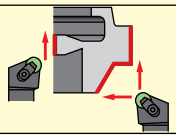
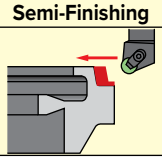
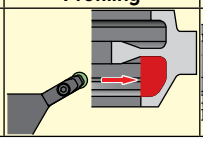
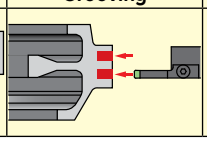
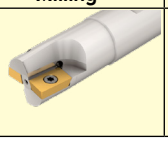
○ First choice

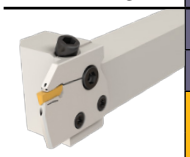
● Second choice



	Grade	Roughing with Scale	Roughing	Semi-Finishing	Finishing
SiAlON	IS14				
SiAlON	IS15				
SiAlON	IS45				
SiAlON	IS55				
Bidemics	IS02				
Bidemics	IS05				
Bidemics	IS10				
Whisker	IW10				

Applications

Application	Grade	Workpiece Material	Cutting Speed (m/min) 180 240 300 360 420 480	Feed (mm/rev) 0.1 0.2 0.3 0.4 0.5	Depth of Cut (mm) 0.5 1.0 1.5 2.0 2.5	Coolant
Roughing with Scale	IS15	waspaloy	**200** (180-240)	**0.3** (0.2-0.35)	**2.0** (1.5-5.0)	wet
	IS45	inco718	**200** (180-240)	**0.3** (0.2-0.35)	**2.0** (1.5-5.0)	
	IS15	universal	**240** (180-270)	**0.2** (0.1-0.22)	**2.0** (1.0-5.0)	
Roughing No Scale	IS05 IS10	universal	**210-390** (180-480)	**0.2** (0.13-0.28)	**1.7** (1.0-2.5)	wet
	IS45 IS15 IS14	universal	**210** (180-270)	**0.2** (0.15-0.3)	**2.0** (1.0-2.5)	
	IW10	universal	**240** (180-300)	**0.2** (0.12-0.25)	**1.7** (1.0-2.5)	
Profiling and Semi-Finish	IS05 IS10	universal	**210-450** (180-480)	**0.2** (0.1-0.25)	**1.5** (1.0-2.0)	wet
	IS45 IS14	universal	**240** (180-270)	**0.2** (0.12-0.25)	**1.5** (1.0-2.0)	
	IW10	universal	**240** (180-330)	**0.2** (0.1-0.25)	**1.5** (1.0-2.0)	
Finishing	IS02	universal	**210-480** (180-510)	**0.1** (0.05-0.18)	**0.25** (0.13-0.76)	wet
 Grooving	IS05 IS10	universal	**360** (180-480)	**0.07** (0.05-0.1)		wet
	IS55	waspaloy	**210** (180-240)	**0.15** (0.07-0.17)		
	IS15 IS14	universal	**230** (180-270)	**1.1** (0.07-0.15)		
	IW10	universal	**240** (180-330)	**0.07** (0.05-0.1)		

Application	Grade	Workpiece Material	Cutting Speed (m/min) 300 450 600 750 900 1000 1200	Feed (mm/rev) 0.05 0.07 0.10 0.12 0.15	Depth of Cut (mm) 0.5 1.0 1.5 2.0 2.5	Coolant
Milling	IS15 IS14	universal	**810** (600-1200)	**0.1** (0.07-0.12)	**1.7** (1.0-2.5)	dry
	IS45	universal	**750** (450-1000)	**0.12** (0.1-0.15)	**2.0** (1.0-2.5)	
Endmills	IS45	universal	**600** (300-1000)	0.02-0.03		dry

first choice

Heat-Resistant Super Alloy Machining

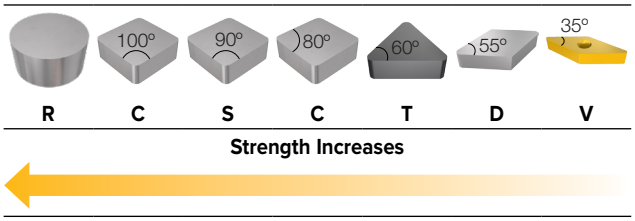
Key Points in Machining

The Key to Successful Heat-Resistant Alloy Machining the Use of "Bidemics" and "Ceramics".

- Bidemics and ceramics materials improve productivity in machining heat-resistant super alloys.
- Bidemics have excellent abrasive wear resistance and SiAlON. Ceramics have excellent wear resistance on the infeed side
- Bidemics provides high-speed machining and superior surface finishes not possible with conventional ceramic materials.
- Optimizing cutting conditions and tool grade enables stable machining.

Selection of Insert Shape with Toughness

Select inserts with higher strength cutting edges if possible.

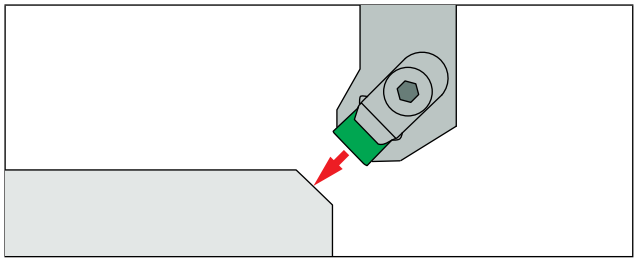


Selection of Corner R with Superior Strength

The larger the insert's corner radius, the stronger the insert's cutting edge and the longer its life. However, note that the larger the corner radius, the higher the cutting resistance. In general, RNGN1207 inserts are used for rough machining and CNGN1204 inserts are used for finish machining of heat resistant alloys.

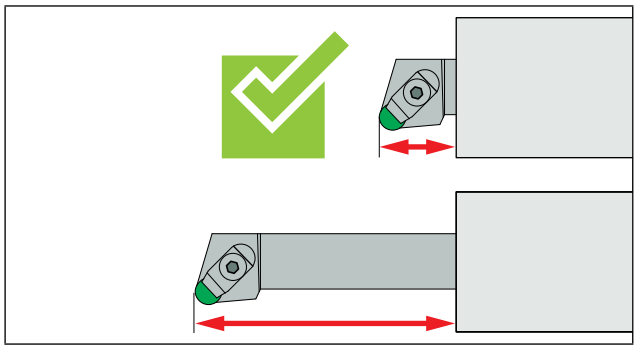
Minimize Overhang

If the overhang is too long, chattering or chip loss will occur



Insert Chipping Protection

Before machining, be sure to chamfer the corners of the workpiece. Machining sharp corners of workpieces without chamfering will result in chipping or defects of the inserts.



No Dwell Allowed

Please note that if the insert is in contact with the workpiece at zero feed, wear will progress significantly.

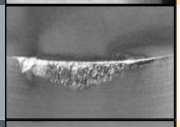
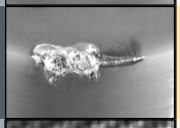
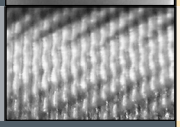
Coolant

Wet machining is recommended when using bidemics, SiAlON-based ceramics, or whisker-based ceramics in turning. However, dry machining may be more effective in the case of strong interrupted machining. When using SiAlON ceramics (IS15, IS14, IS45) in milling, be sure to use dry machining.

Cutting Edge Treatment

Sharp edge preparation is required when machining heat-resistant super alloys, but in the case of ceramic inserts, minute angle chamfering or round honing is better for wear resistance, especially border wear resistance.

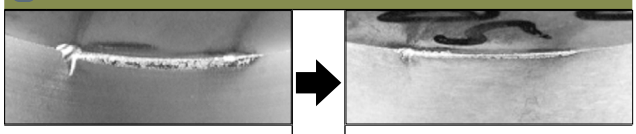
Troubleshooting

Adjustment of Cutting Conditions							
	Cutting Speed (m/min)		Feed Rate (mm/rev)		Grade Attribute		
	SiAlon	Bidemics	SiAlon	Bidemics	Bidemics	SiAlon	Whisker
Notch Wear		1 ↗	2 ↗		●	●	
Flank Wear 	3 ↘		4 ↗		●	○ *	●
Breakage 			↘	↘	○	●	
Chatter 	↗	↗	↘	↘			
Heat	↘	↘	↘	↘			

● First Choice ○ Second Choice
* IS14 or IS15

Result

1 IW10 - Increase Cuting Speed

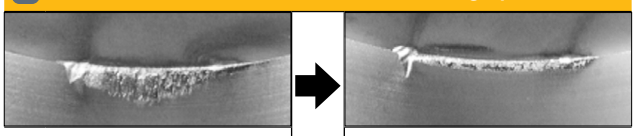


150 m/min | 550 m/min

2 IS14 ● IS15 ● IS45 ● IS55 - Increase Cuting Speed

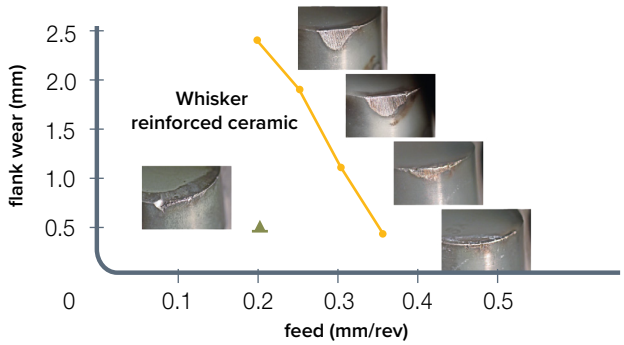
0.2 mm/rev | 0.4 mm/rev

3 IS14 ● IS15 ● IS45 ● IS55 - Decrease Cuting Speed



400 m/min | 150 m/min

4 IS14, IS15, IS45, IS55 Increase Feed Rate



feed rate increased wear amount of SiAlON

IS14, IS15, IS45, IS55

Whisker-Based Ceramics

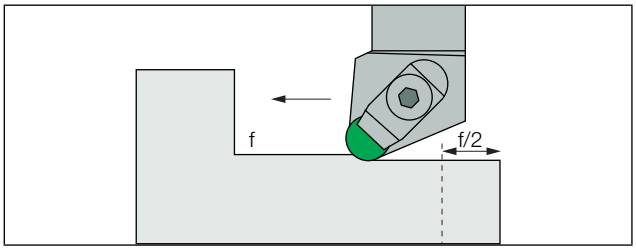
Cutting Conditions
Work Material: inco718
Insert Shape: RNGN120700
Cutting Speed: 250 m/min
Depth of Cut: 2.0 mm
Wet

When using the IS14 and IS15 and IS45 and IS55, increased feed is necessary to increase the wear resistance of the tool. By increasing the feed rate and taking advantage of the high tool material strength specifically IS14 and IS15 and IS45 and IS55, the number of times the tool and workpiece material rub against each other can be reduced, thereby reducing wear. In addition, higher feed rates shorten cycle time, increase productivity and profitability.

Note: When machining corner R, reduce feed rate by 25% to prevent insert defects.

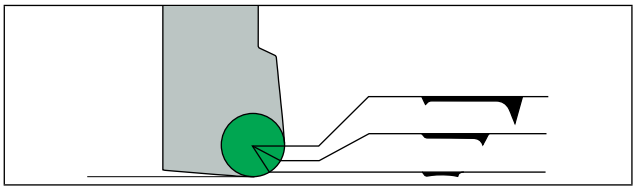
Machining with Scale

If Inserts Break in the Early Stages of Scale Machining, High Cutting Speeds and Feed Rates May Be the Cause.
Understanding the hardness of the work material is the key to a successful cutting process. Many machining operators do not know the hardness of their work material. This causes them to spend a lot of time finding the optimum cutting conditions for test machining. The higher the hardness of the work material, the lower the cutting speed should be. Where there is scale on the workpiece surface, the cutting speed and feed rate must be reduced by 25%. By changing the machining program excessive tool damage can be reduced.



Depth of Cut

As shown in the figure on the right, as the depth of cut increases, the amount of wear, especially border wear, increases. In order to reduce border wear and extend tool life, it is necessary to control the depth of cut. The table below shows the maximum depth of cut for RN inserts and the maximum depth of cut by corner R size. Please refer to these values to determine the depth of cut.



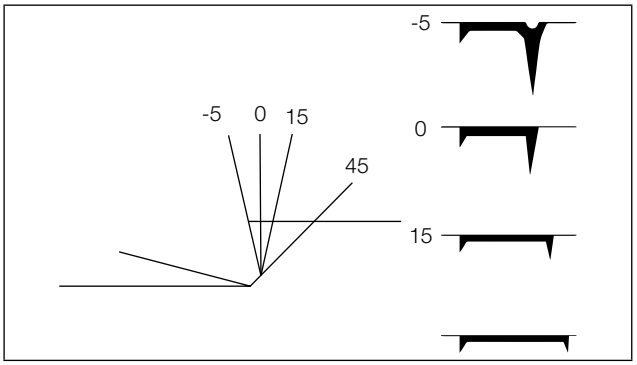
Recommended Depth of Cut

IC Size of RN Insert	Max. Depth of Cut	*Corner R Size	Max. Depth of Cut
Ø6.35 mm	~1.5 mm	0.8	0.2 mm
Ø9.525 mm	~2.3 mm	1.2	0.3 mm
Ø12.7 mm	~3.2 mm	1.6	0.4 mm
Ø25.4 mm	~6.4 mm	2.4	0.6 mm

The optimum depth of cut is 5-15% of the insert diameter.
*In case of lead angle: 0°

Lead Angle

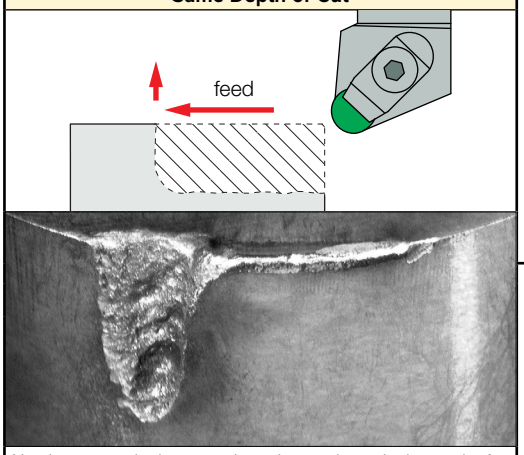
When machining heat-resistant super alloys, the larger the lead angle, the less wear is likely to occur. Also, the larger the lead angle, the more cutting resistance is distributed over a wider area of the insert, which reduces border wear and at the same time improves tool life and workpiece surface roughness. In addition, the larger the lead angle, the better the chip control. In the case of the IS45 inserts, which have excellent chip resistance, higher feed rates reduce wear and machining time.



Effect of lead angle on wear pattern

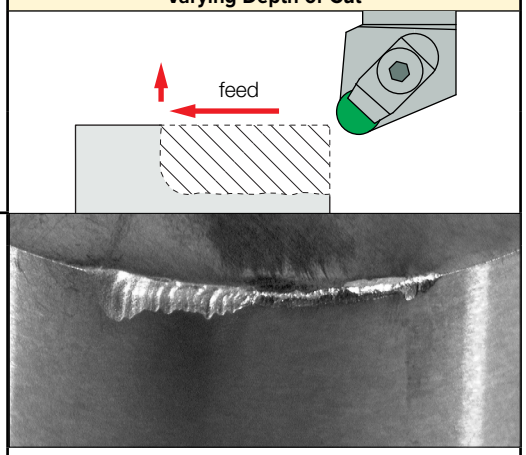
Troubleshooting Rough Turning

Same Depth of Cut



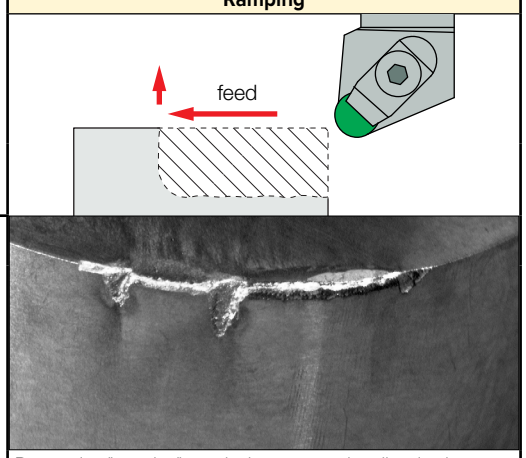
Notch wear on the insert cutting edge as shown in the result of multiple passes being taken at the same depth of cut.
The following programming examples will help to minimize this mode of failure.

Varying Depth of Cut



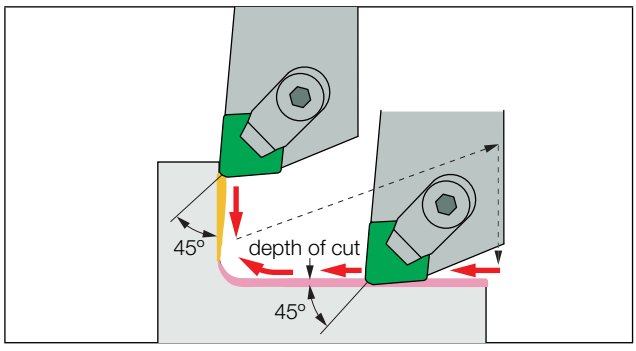
Roughing while varying the depth of cut reduces notch wear because the point at which notch wear occurs changes time.

Ramping



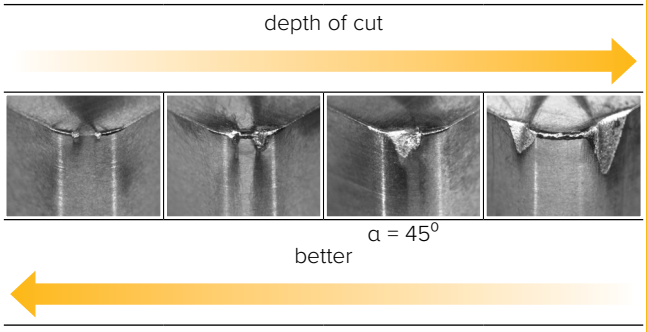
Programing "ramping" cuts in the same cutting direction is one of the best procedures to minimize notching.
By varying the DOC, wear is distributed over the entire cutting edge not on one point.

Troubleshooting Finish Turning

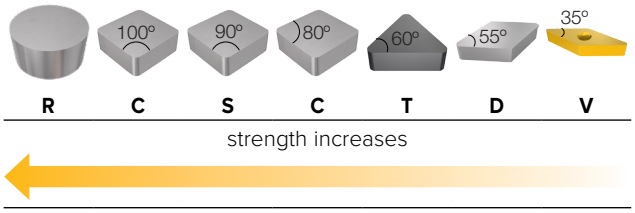


Insert Corner Radius mm	DOC mm
0.4	0.12
0.8	0.23
1.2	0.35
1.6	0.47
2.4	0.70
3.2	094

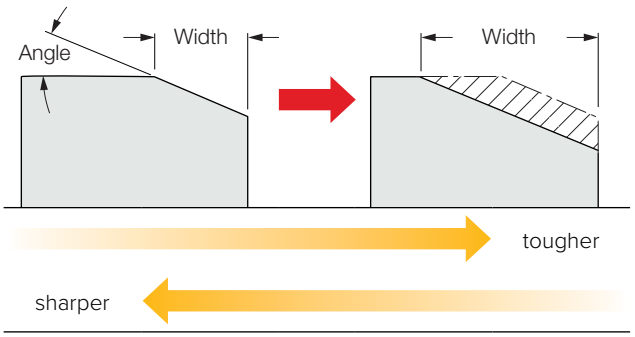
The correct procedure is to remove more material during the previous roughing application. Then remove the amount suitable for the nose radius of the insert by staying below the 45° mark of the corner radius. This will minimize notching and allow a cut from both directions.



Insert Shape



Edge Treatment



slightly larger T-land on the edge preparation may eliminate flaking.

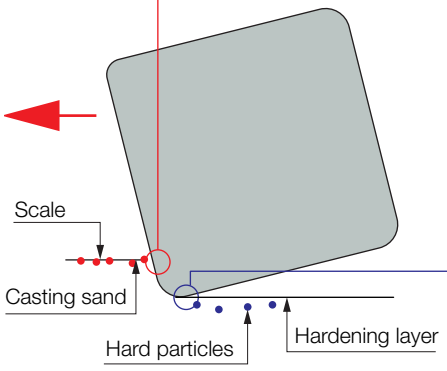
Prevention of Chattering

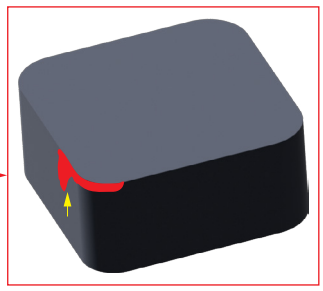
When machining nickel-based heat-resistant super alloys, chattering often occurs due to increased cutting resistance. Chatter is likely to occur when using a holder with a large overhang for copying or grooving, when machining thin-walled workpieces, or when using a machine with low rigidity, resulting in abnormal insert wear or sudden loss of inserts. Generally, increasing the cutting speed and decreasing the feed rate will reduce or eliminate chattering. In addition, the following methods are also effective.

- Increase cutting speed and reduce feed rate.
- Change to an insert grade with higher hardness.
- Change to an insert with a smaller inscribed circle or smaller corner radius.
- Change the cutting edge treatment to the sharpest possible shape.
- Change to a positive insert.
- Reduce the lead angle.
- Minimum overhang.
- Change the holder material to anti-vibration material.

Guideline for Machining Cast Iron / Ductile Cast Iron Machining

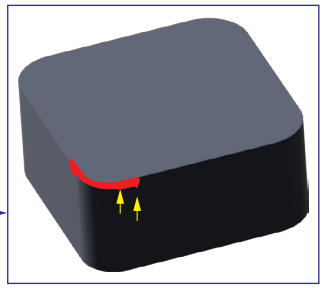
Choosing the Right Grade Based on Insert Wear





Recommended when wear on the infeed side wear has progressed due to scale or casting sand, resulting in chipping of the cutting edge.

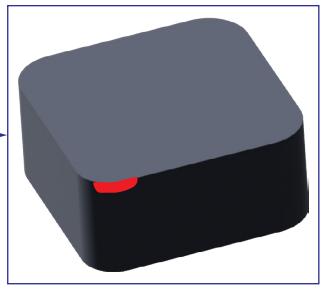
Roughing
IS26



Recommended when VB wear has progressed due to the surface machining layer and hard particles, and the machined surface has deteriorated.

Roughing
IS45C
*DRY machining

Finishing
IN6
IN10
*IN6 WET machining recommended

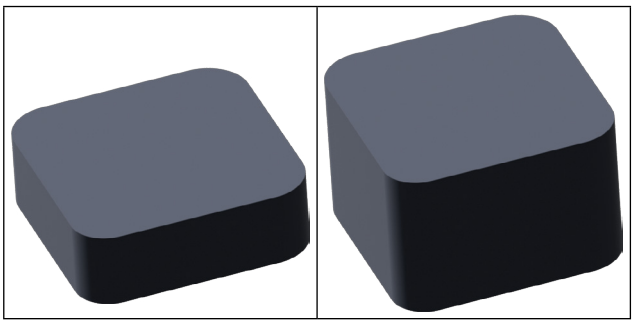


Recommended when the heat generated during DRY machining causes progressive wear, resulting in worsening of the machined surface and deterioration of dimensional accuracy.

Finishing
IN18
*DRY machining

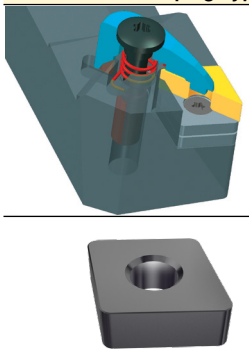
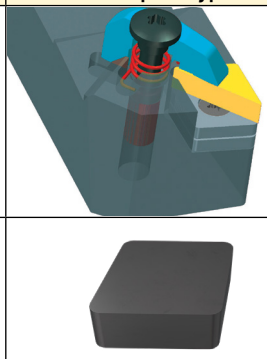
Effect of Insert Thickness

For roughing operations using a thicker insert is recommended, it reduces wear such as chipping, allowing to achieve better tool life.

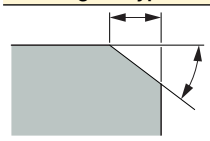
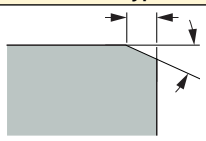
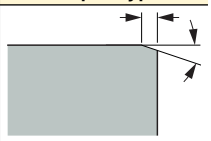


Recommended Clamping Type when for Ceramic Inserts

Using the right clamping allows to maximize the performance of ceramic inserts.

Double Clamping Type	Clamp on Type
	
Capable of clamping inserts tightly. Supports cutting loads from any direction.	Best suited for ceramic inserts. Not suitable where cutting loads are applied from each direction.

Effect of Edge Treatment

Tougher Type	Balance Type	Shaper Type
		
width: bigger angle: bigger ex. width 0.3 × angle 35°	width: medium angle: medium ex. width 0.2 × angle 20°	width: smaller angle: smaller ex. width 0.1 × angle 15°

Case1.
Excessive notch wear or chipping in the early stages of machining.

➜ Choose a tougher edge preparation.

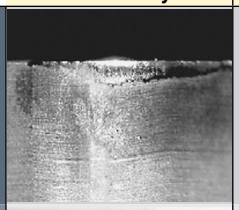
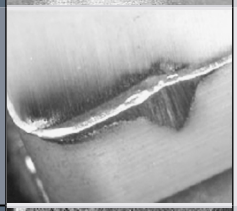
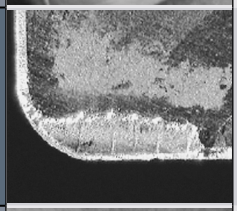
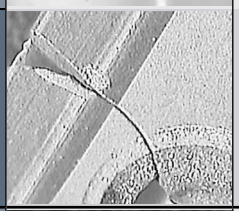
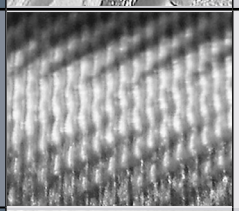
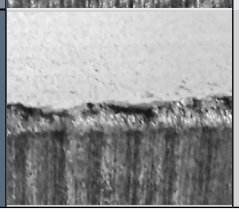
Case2.
Unstable machining dimensions and excessive VB wear

➜ Choose a sharper edge preparation .

Case3.
Micro chipping occured.

➜ Add round honing on the cutting edge is recommended.

Troubleshooting

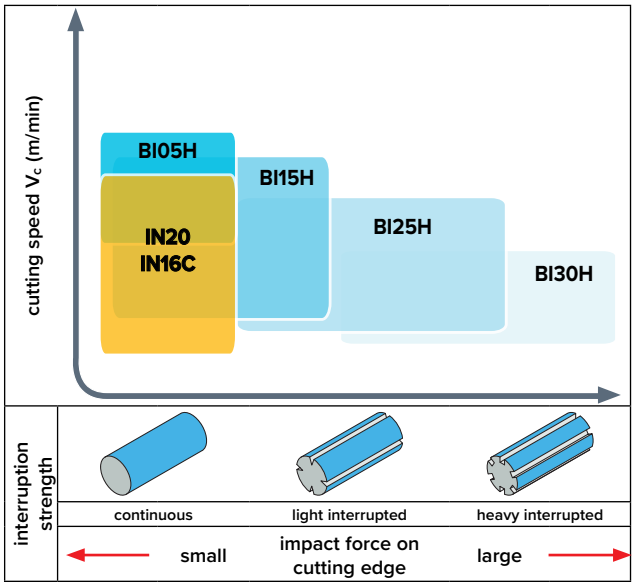
		Case Study	Cause	Measure
Insert	Insert		• cutting speed too high • feed rate too low • insert shape incorrect • incorrect insert grade	• reduce cutting speed • increase feed rate • increase corner radius • change to a grade with superior wear resistance
	Notch Wear		• incorrect insert grade • cutter geometry incorrect • insert shape incorrect	• change to a grade with better wear resistance • increase the lead angle • change the geometry of inserts
	Thermal Crack		• cutting conditions incorrect • incorrect insert grade	• reduce cutting speed • change from wet to dry machining • change to a grade with superior thermal shock resistance
	Fracture		• cutting condition incorrect • edge treatment incorrect • use coolant	• lower feed • increase cutting edge treatment • apply honing • change from wet to dry machining
	Cracked		• insert clamped with incorrect seating	• clean the mounting area and install according to the correct procedure • tighten to the correct torque
Work Material	Chatter		• low cutting resistance • workpiece/tool less rigidity • low cutting speed	• lower feed • smaller cutting edge treatment • increase the clearance angle of the insert • shorten tool overhang • increase cutting speed
	Edge Chipped		• high feed rate • small cutting edge corner radius • insert wear	• lower feed • increase the corner radius of insert • use wiper inserts • reduce cutting speed

Guideline for Machining Hardened Materials

Features

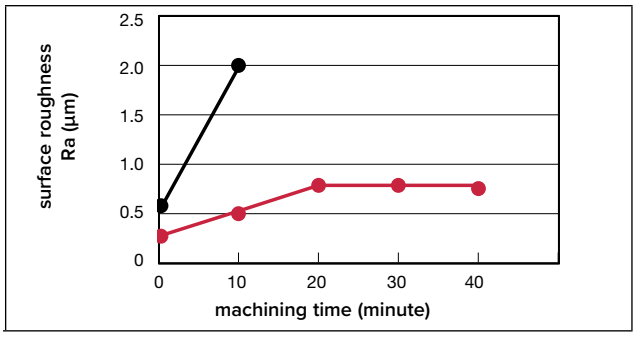
- IN16C and IN20 ceramic materials have high wear resistance in machining of hardened materials.
- IN16C is suitable for a wide range of machining applications from carburized hardened steel to induction hardened steel.
- IN20 offers high cutting performance in workpiece hardness in the HRc 55-70 range.
- Wiper inserts and inserts with breakers (AG) improve machining efficiency

Recommended Insert Grades and Cutting Speed



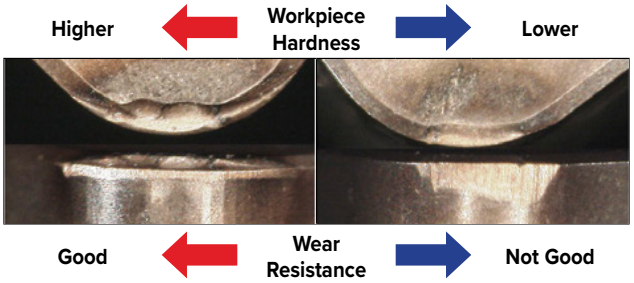
Ceramic
CBN

Advantages of Wiper Inserts

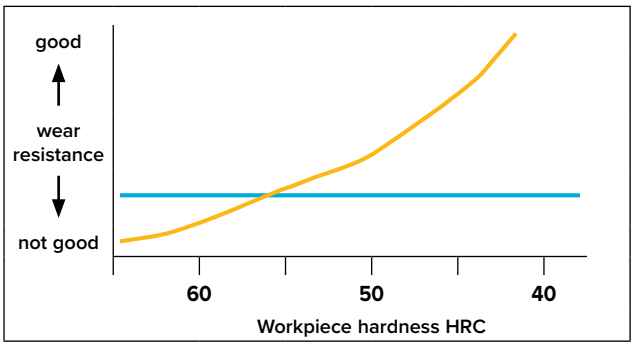


WL wiper
no wiper

Advantages of Ceramic Inserts



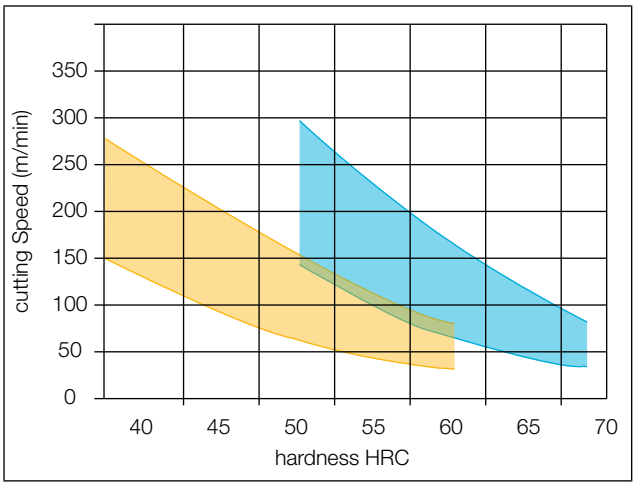
Lower workpiece hardness causes CBN tools wear out easier.



Ceramic
CBN

Ceramic has superior wear resistance to CBN in machining workpieces with hardnesses of HRC55 or less.

Recommended Cutting Speed by Hardness



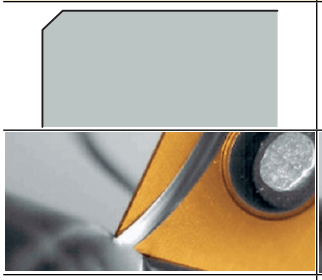
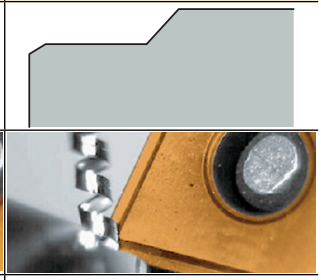
Ceramic
CBN

Recommended Depth of Cut and Feed

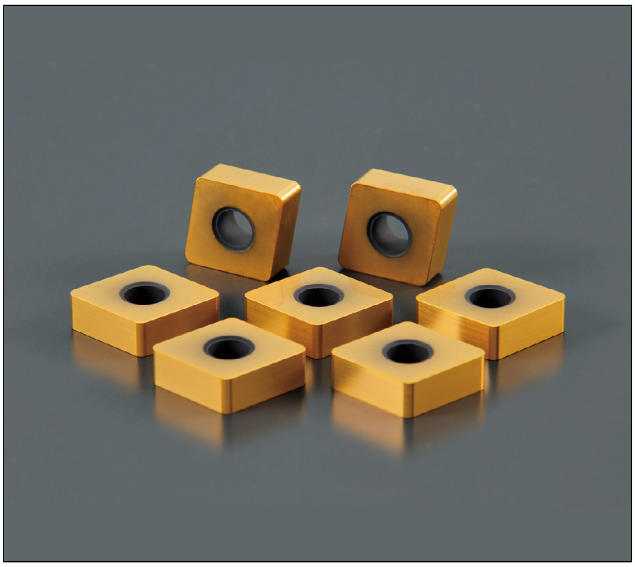
Corner R	Depth of Cut (mm)	Feed (mm /rev)
R0.4	0.15	0.05-0.08
R0.8	0.3	0.08-0.10
R1.2	0.4	0.10-0.13
R1.6	0.5	0.13-0.16
R6.35	2.0	0.16-0.25

Key Points for Using Different Edge Treatments

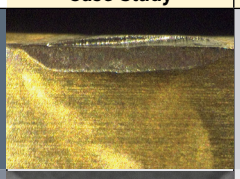
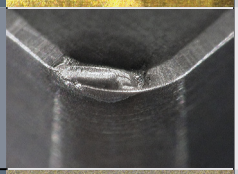
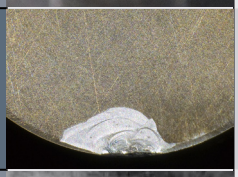
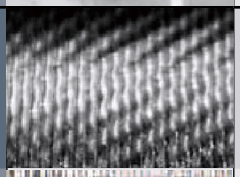
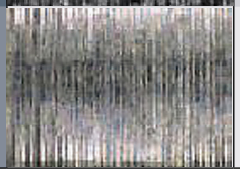
IN16C
Ceramic insert for hardened materials
AG chipbreaker

No Chipbreaker	AG Chipbreaker
	

Prevents chip tangling that tends to occur when machining layers with low workpiece hardness.



Troubleshooting

		Case Study	Cause	Measure
Insert	VB wear		• Cutting speed too high • Feed too low • Insert geometry unsuitable	• Reduce cutting speed • Increase feed • Increase the corner R
	Crater Wear		• Unsuitable cutting conditions • Insert geometry unsuitable	• Reduce cutting speed • Smaller cutting edge treatment angle
	Flaking		• Insert geometry unsuitable	• Smaller cutting edge treatment angle • Eliminate honing • Lower feed • Increase cutting speed
	Fracture		• Insert geometry unsuitable • Unsuitable edge treatment • Using coolant	• Lower feed • Larger cutting edge treatment • Add honing • Change from WET to DRY machining
Work Material	Chatter		• Higher cutting resistance • Not rigid enough for workpiece and tool • Low cutting speed	• Lower feed • Smaller cutting edge treatment angle • Larger insert relief angle • Shorten tool overhang • Increase cutting speed
	Surface		• Higher feed rate • Smaller insert corner R • Insert wear	• Lower feed • Larger insert corner R • Using wiper inserts • Reduce cutting speed

Mill Roll Machining

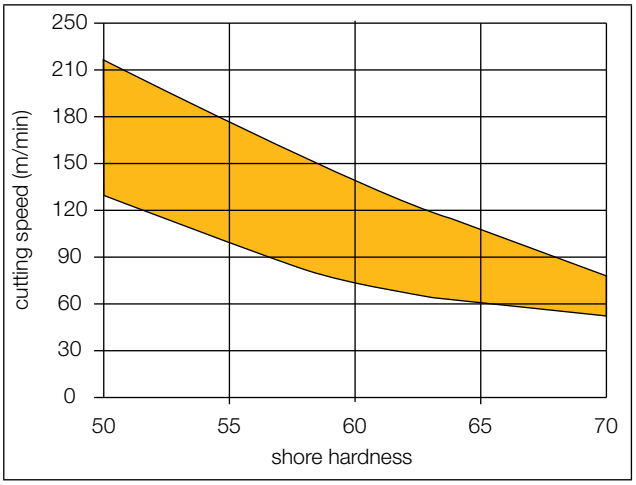
- In addition to the "IN10" ceramics material, which can be used for various types of mill roll machining, **ISCAR** offers the "IN16" ceramics material, which improve machining efficiency even further.
- "IW10" has excellent wear resistance and is best suited for rough machining of carbide and high-hardness mill rolls.
- "IN16C" is applicable for a wide range of applications including carburized and induction hardened steels.
- "IN20C" has the best performance in hardened mill roll machining in the shore hardness range of 74 to 97.

Recommended Cutting Conditions

Mill Roll Material	Insert Material	Grade	Cutting Speed, m/min	Cutting Speed (m/min) Mill Roll Hardness, HS (Shore) 55-65	65-72	More Than 72	Feed (mm/rev)	Depth of Cut (mm)	Dry	Wet
Steel	ceramics	IN16	130-180	100%	80%	60%	0.1-0.3	0.5-2.0	●	
	ceramics	IN10	100-130	100%	80%	60%	0.1-0.3	0.5-2.0	●	
Chilled Cast Iron	ceramics	IN16	130-180	100%	80%	60%	0.1-0.3	0.5-2.0	●	
	ceramics	IN10	100-130	100%	80%	60%	0.1-0.3	0.5-2.0	●	
Ductile Cast Iron	ceramics	IN16	90-180	100%	80%	60%	0.1-0.3	0.5-2.0	●	
	ceramics	IN10	70-130				0.1-0.3	0.5-2.0	●	
Carbide	whisker-based ceramics	IW10	40-150				0.1-0.3	0.25-2.0	●	
CPM	ceramics	IN20C*	120-150				0.1-0.3	0.6-2.0	●	
	ceramics	IN16	120-150				0.1-0.3	0.6-2.0	●	
Hardness Hs46-86 (Continuous Machining)	ceramics	IN16C	40-200	finish	finish	finish	0.07-0.2	0.1-0.7	●	●
Hardness Hs74-97 (Continuous Machining)	ceramics	IN20C*	40-200	finish	finish	finish	0.07-0.2	0.1-0.7	●	●

* IN20C = Make to order

Recommended Cutting Speed



Recommended Feed

Insert Corner Radius	Depth of Cut (mm)	Feed (mm/rev) for Required Roughness Ra 0.8 µm	Ra 1.6 µm
0.4	0.18	0.05-0.07	0.07-0.1
0.8	0.4	0.07-0.1	0.1-0.13
1.2	0.5	0.1-0.13	0.13-0.16
1.6	0.8	0.1-0.14	0.15-0.2
6.35	2.0	0.17-0.25	0.25-0.35

Key Points of Mill Roll Machining

- Mill roll hardness is an important factor. The higher the hardness, the lower the cutting speed should be.
- RCGX type inserts are effective for high rigidity and tool cost reduction.
- When machining multiple passes in a single corner, the wear position can be distributed and notch wear can be reduced by varying the depth of cut.
- If chattering occurs, increase the feed rate. Chattering may be suppressed by adjusting the cutting speed.
- If chattering is severe, the machining point and tool cutting edge may not be centered.
- Chilled cast iron mill rolls and ductile cast iron mill rolls are generally low hardness, high strength materials. Even after use in rolling mills, the hardness of roll material rarely exceeds HS 67.
- HSS and CPM rolls typically have a hardness of HS 100 or higher. They are considered strong materials with high chromium and cobalt content. Considering the type and hardness of the roll material, machining at low speeds is required.

Types, Applications, and Features of Mill Rolls

Mill Rolls	Applications	Features
Forged Rolls • Cr-Mo-based • high-speed-steel-based • carbide-based	bloom-milling at heavy rolling load. work rolls for rough cold rolling, and rolls for reinforcement.	strong and relatively high in heat resistance.
Cast Iron Rolls • carbide-based	semi-rolling or finishing that requires a very heavy load.	more wear-resistant and high heat-resistant than steel in between ordinary steel and cast- iron-based steel.
Cast Steel Rolls • adamite roll for deep profile chilled roll for boards and wire steel process • grain roll for steel finishing process boards (resistant to thermal crack) • ductile roll for boards, profile steel, and bar wire steel process (rolls for roughing and finishing use) • special cast iron roll	wide range of applications from bloom-milling and semi-rolling to finishing.	suitable for the applications that require heat resistance and strength. suitable for the applications that require wear resistance.
Carbide Rolls	• pinch mills • wire rod • wire flattering or forming • erw tube mills • turks heads • hot and cold rolls • work reducing rolls	preferred in abrasive operations. high wear capabilities.

Ceramic Grades

H Hardened Materials

Ceramic Grades Guide Hardened Steel – Coated and Uncoated

IN10

- The standard tool material for machining cast iron and hardened materials.
- Excellent performance in machining of cast iron and hardened materials thanks to its high hardness and low plastic deformation in high temperature ranges.

IN16/IN16C

- Alumina TiC ceramics is designed for continuous processing of hard materials.
- Reduced tool cost by replacing CBN
- Covers a wide range of hardened materials (HRC 30-62).
- For machining of hardened parts with varying levels of hardness.
- Inserts are offered with wiper and chipbreakers options, enhancing machining efficiency even further.
- IN16C, TiN coated , provided as standard stocked product.
- IN16C excellent for machining carburized or induction hardened steels.

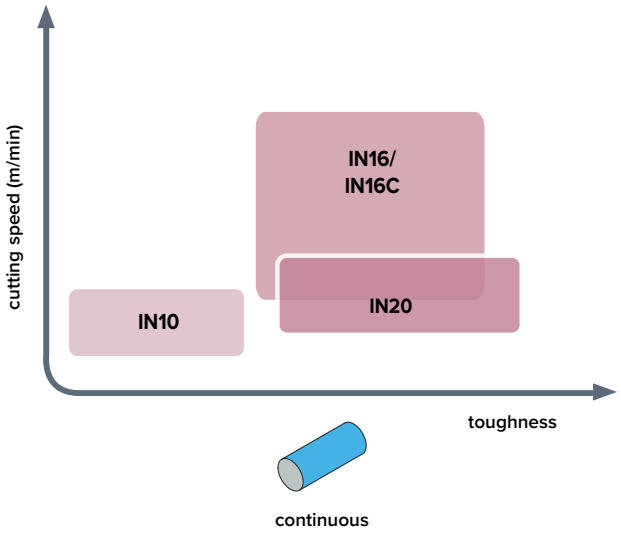
IN20

- Alumina TiC ceramics is designed for continuous processing of hard materials.
- Optimal for use in continuous machining conditions with hard materials of 55-70 HRC.

General Features

- Machines a wide range of hardened materials.
- High hot hardness and low plasticity at high temperature ranges make them ideal for finishing hardened materials.

Grade and Speed Recommendation Chart

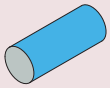
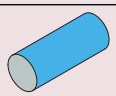
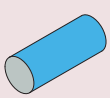
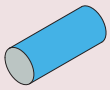


Recommended Depth of Cut and Feed Rate

Insert Corner Radius (mm)	DOC (mm)	Feed (mm/rev)
0.4	0.15	0.05 ~ 0.08
0.8	0.30	0.08 ~ 0.10
1.2	0.40	0.10 ~ 0.13
1.6	0.5	0.13 ~ 0.16
round insert	2.0	0.16 ~ 0.25

Recommended Cutting Conditions for Uncoated and Coated Ceramics Grades

Application Range

Workpiece Material	Grade	Cutting Mode	Application	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Dry	Wet
hardened steel	IN10	the standard tool material for machining cast iron and hardened materials		35-250	0.05-0.20	0.1-0.6	O	●
	IN16	designed for continuous processing of hard materails		35-250	0.05-0.20	0.1-0.6	O	●
	IN16C	for maching of hardened parts with varying levels of hardeness standard tool material for machining cast iron and hardened materials		35-250	0.05-0.20	0.1-0.6	O	●
	IN20	the standard tool material for machining cast iron and hardened materials		35-250	0.05-0.20	0.1-0.6	O	●

IN10

This versatile grade is suitable for machining both gray cast iron and hardened materials.

It exhibits a well-balanced composition, providing excellent resistance to wear and chipping. This is an ideal choice for a wide range of machining tasks involving these specific materials.

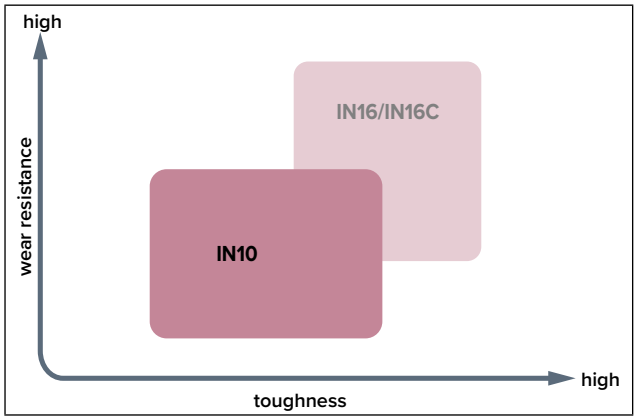
For continuous machining of gray cast iron and hardened materials Alumina TiC-based ceramics.

Performance

Excellent insert hardness, low plastic deformation at high temperatures, and excellent performance in turning gray cast iron and hardened materials

Application

- Gray cast iron / semi to finishing with continuous machining
- Hardened materials / finishing
- Hardened and cast iron mill rolls / semi to finishing

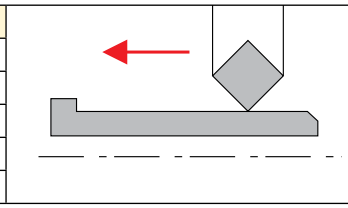


Case Study Cylinder Liner Machining

IN10 achieves 1.3 times higher machining efficiency and nearly three times longer tool life than other Competitor's' carbide.

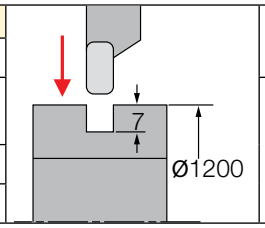
Processing Practical Example Liner Processing

Compared to Competitor's carbide products, IN10 has a machining efficiency of more than 1.35 times and a lifespan nearly three times longer.

Work Material	Cast Iron			
cutting speed	600 m/min (IN10)		IN10	110 Pieces/Corner
	400 m/min (Competitor's carbide)		Competitor's carbide	40 Pieces/Corner
feed	0.5 mm/rev			
depth of cut	0.7 mm			
coolant	dry			

Machining of roller bearing

Work Material : SNCM (HRC58)

Work Material	SNCM (HRC58)			
ISCAR cutting speed	112 m/min (IN10)		IN10	6 Grooves
competitor cutting speed	23 m/min (carbide)		Competitor's carbide	4 Grooves
depth of cut	0.06 mm/rev			
coolant	dry			

IN16/IN16C

This grade is ideal for a variety of work materials with varying hardness levels.

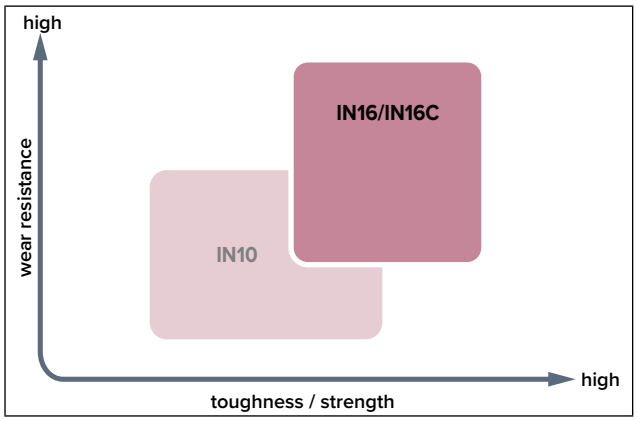
It is specifically designed to effectively machine hardened materials with a hardness range of HRC30-62.

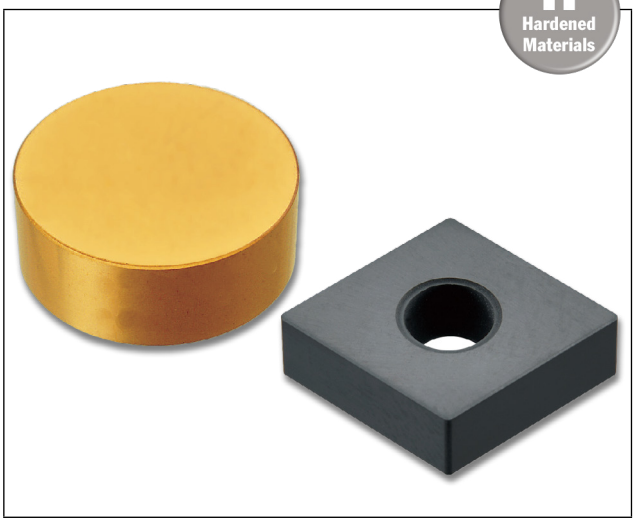
Performance

- Ideal for finishing of hardened materials due to the insert's high temperature hardness and low plastic deformation at high temperatures.
- Inserts with a wiper and chipbreaker types are also available.

Application

Continuous machining of hardened materials HRC 30-62



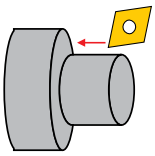


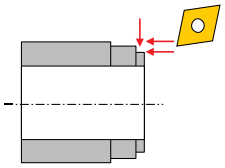
For continuous machining of hardened materials. Alumina TiC-based ceramics.

Case Study Tool Parts Machining

IN16C can machine the same number of pieces as CBN and has a stable tool life. Significant cost reductions are now achieved.

Examples of Tool Parts Machining

Work Material	Steel JIS SCr42H		IN16	Stable Processing for 50 Minutes
cutting speed	120 m/min		Competitor's CBN	50 Minutes of Instability
feed	0.15 mm/rev			
depth of cut	0.4 mm			
coolant	wet			

Work Material	Case Carburizing Steel		IN16C	6 Grooves
cutting speed	200 m/min		Competitor's CBN	4 Grooves
feed	0.2 mm/rev			
depth of cut	0.7 mm			
coolant	dry			

IN16C showed significant cost reduction, through longer tool life as compared with the competitor's CBN product.

IN20

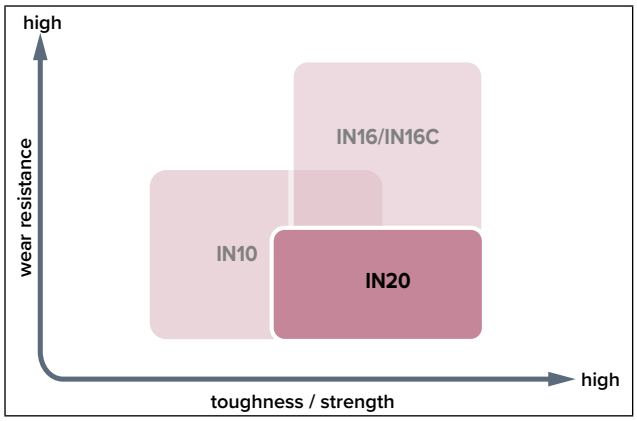
Ceramics grade best for hardened materials.
Excellent performance by increasing the hardness and strength of the insert base material.
Suitable for hardened materials in the range of HRC 55-70.

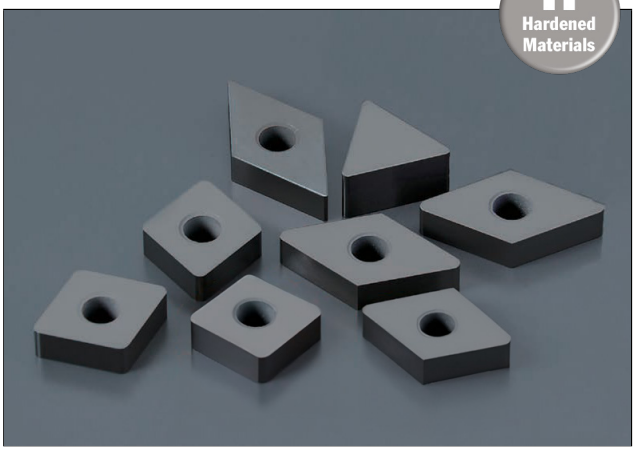
Performance

- Excellent chipping resistance and wear resistance due to a combination of high toughness material and CVD coating
- Significant tool cost reductions are achieved by replacing CBN
- Inserts with a wiper flat or a chipbreaker are available to further improve machining efficiency

Application

Continuous machining of hardened materials HRC 55-70





For continuous machining of hardened materials.
Alumina TiC-based Ceramics.

Case Study Cylinder Linear Machining

IN20 has superior wear resistance and twice the tool life extension compared to Competitor's' tool.

Work Material	Carburized and Hardened Steel (HRC 63)		IN20	60 Pieces/Corner
cutting speed	121 m/min			
feed	0.03-0.04 mm/rev		Competitor's black ceramic	4 Grooves
depth of cut	0.15 mm			
coolant	dry			

Ceramic Grades Guide

IN6

- Specifically designed for ductile cast iron machining.
- The first-ever TiC-based ceramics has been effectively applied in practical scenarios.
- It is exceptionally well-suited for semi-finishing and finishing operations on ductile cast iron, spanning a broad range of low to high-speed requirements.
- Notably, it demonstrates outstanding dimensional stability when used for machining cast iron under wet cutting conditions.

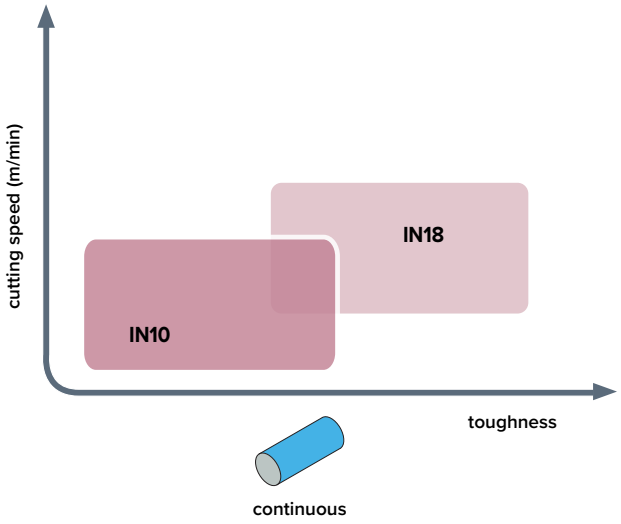
IN10

- The standard tool material for machining cast iron and hardened materials !
- Excellent performance in machining of cast iron and hardened materials thanks to its high hardness and low plastic deformation in high temperature ranges.

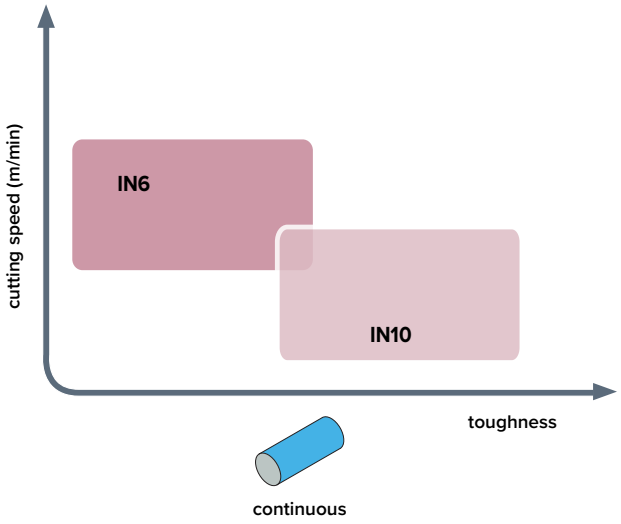
IN18

- This alumina-based ceramics tool exhibits exceptional toughness.
- First recommendation for finishing gray cast iron
- By introducing zirconium to high purity alumina, this material demonstrates exceptional strength and toughness.
- It is well-suited for semi-interrupted finishing tasks involving normal cast iron.
- It excels in both roughing and finishing operations on special cast iron materials, including lining materials.

Grade and Speed Recommendation Chart
Gray Cast Iron - Finish Turning

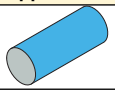
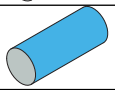


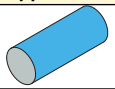
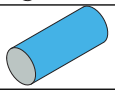
Grade and Speed Recommendation Chart
Ductile Cast Iron - Finish Turning



Recommended Cutting Conditions

Application Range

Workpiece Material	Grade	Cutting Mode	Application	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Dry	Wet
cast iron - finish	IN18	highly tough alumina-based ceramics tool		200-500	0.2-0.4	0.5-3.5	●	O
	IN10	the standard tool material for machiningcast iron and hardened materials		200-500	0.2-0.4	0.5-3.5	●	O

Workpiece Material	Grade	Cutting Mode	Application	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Dry	Wet
ductile cast iron - finish	IN6	for machining of ductile cast iron		200-500	0.1-0.38	0.5-1	●	●
	IN10	the standard tool material for machining cast iron and hardened materials		100-500	0.2-0.4	0.5-3.5	●	●

IN6

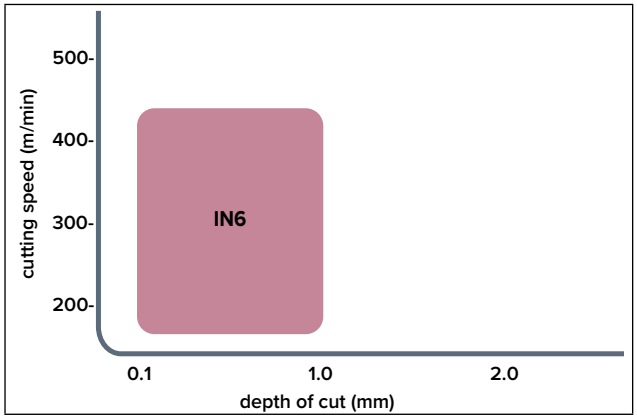
Ceramics grade specifically designed for ductile iron machining.
Ideal for high-speed finishing at V_c =400 m/min.

Performance

- Specially developed ceramic grade for ductile cast iron machining
- The world's first TiC-based ceramic material put into practical use
- Longer tool life and stable machining even under high-speed machining

Application

- Ductile cast iron
- Finish turning

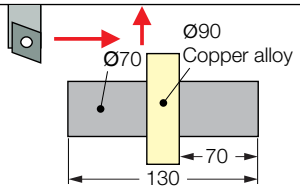


TiC-based ceramics + alumina for ductile cast iron finishing

Case Study Differential Case Machining

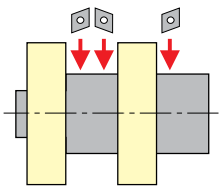
IN6 has achieved twice the tool life improvement compared to competitor's CVD coated carbide.

Gear Cutting

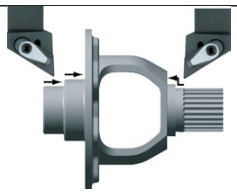
Work Material	FCD450		IN6	50 Pieces/Corner
cutting speed	300 m/min		Competitor's CVD coated carbide	20 Pieces/Corner
feed	0.05 mm/rev			
depth of cut	0.5 mm			
coolant	wet			

IN6 produced remarkably long life, less dimensional variations and better wear resistance compared with the competitor's product.

Camshaft

Work Material	Ductile Cast Iron		IN6	650 Pieces/Corner
cutting speed	450 m/min		Competitor's CVD coated carbide	150 Pieces/Corner
feed	0.01 mm/rev			
depth of cut	0.2 mm			
coolant	wet			

Differential case

Work Material	Ductile Cast Iron		IN6	60 Pieces/Corner
cutting speed	450 m/min		Competitor's CVD coated carbide	30 Pieces/Corner
feed	0.01 mm/rev			
depth of cut	0.2 mm			
coolant	wet			

IN18

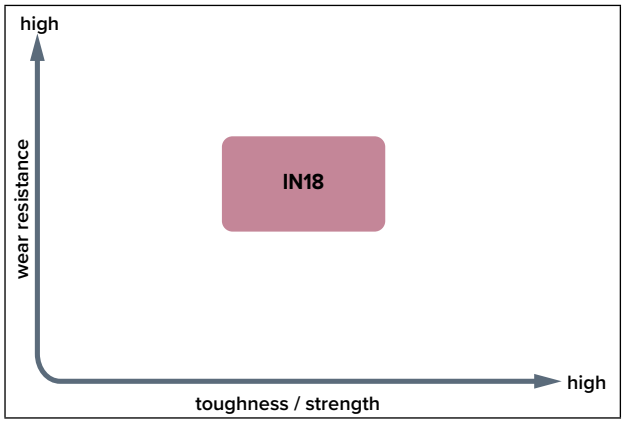
Stable high-speed finish machining is achieved by alumina particles with excellent high-temperature hardness and strength.
High-speed machining at V_c =700 m/min.

Performance

- High-speed finishing material
- High-strength and high-toughness

Application

- Gray cast iron
- Finishing light interrupted to continuous turning

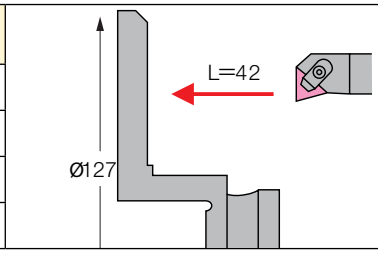


Alumina ceramics for Gray cast iron continuous finishing.

Case Study Cylinder Liner Machining

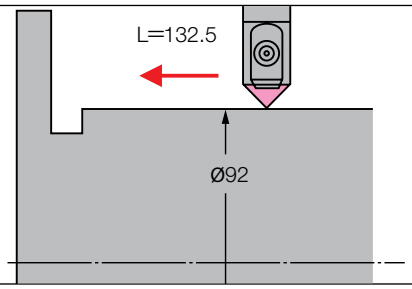
IN18 has twice the amount of tool life than the competitor's grade, as well as a higher quality machined surface.

Brake Disc

Work Material	Special Cast Iron		IN18	130 Pieces/Corner
cutting speed	630 m/min			
feed	0.3 mm/rev		Competitor's black ceramics	60 Pieces/Corner
depth of cut	0.5 mm			
coolant	dry			

IN18 achieved twice the tool life of the competitor's product, due to its superior strength.

Cylinder Liner

Work Material	Special Cast Iron		IN18	70 Pieces/Corner
cutting speed	600 m/min			
feed	0.32 mm/rev		Competitor's black ceramics	30 Pieces/Corner
depth of cut	3 mm			
coolant	dry			

K Cast Iron

Ceramic Grades Guide

Cast Iron, Gray and Ductile - Finish

IS26

- Premium silicon nitride grade.
- First recommendation for roughing gray cast iron
- Excellent wear resistance in applications where notch wear appears.
- Provides stable tool life in applications that demand thermal shock resistance, such as wet machining or milling.
- Long tool life and high productivity at high cutting speed

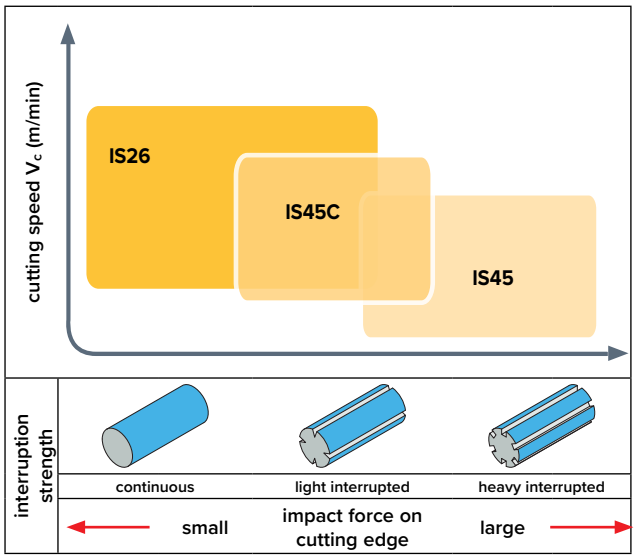
IS45C

- Excellent wear-resistance and chipping resistance with CVD coated high- strength silicon nitride-based ceramics
- Roughing to finishing of ductile cast iron and gray cast iron
- Also usable for finishing.
- High speed machining with low cutting forces.

IS45

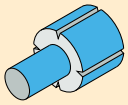
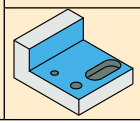
- Excellent notch wear resistance.
- Better flank wear resistance compared to competitor's silicon nitride ceramics
- Superior toughness compared to whisker-reinforced ceramics
- Best thermal shock resistance.
- Suitable grade for gray cast iron with scale.
- Considered the optimal grade for roughing inco 718 with scale.

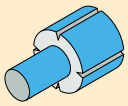
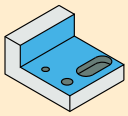
Grade and Speed Recommendation
Rough and Finish

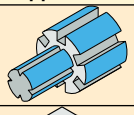
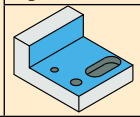


Recommended Cutting Conditions

Application Range

Workpiece Material	Grade	Operation Type	Machining	Application	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Dry	Wet
gray cast iron	IS26	turning	roughing with scale / rough to semi-finish		450-1000	0.3-0.5	0.5-3.5	●	O
		milling			450-1200	0.07-0.2			

Workpiece Material	Grade	Operation Type	Machining	Application	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Dry	Wet
gray cast iron	IS45C	turning	roughing / finishing		350-800	0.3-0.6	0.5-3.5	●	
ductile cast iron					250-550	0.15-0.4	0.5-3.0		
gray cast iron		milling	roughing / semi-finishing		350-700	0.07-0.25	0.5-6.0		
ductile cast iron					400-800				

Workpiece Material	Grade	Operation Type	Machining	Application	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Dry	Wet
gray cast iron	IS45	turning	roughing with scale / rough to semi-finish		450-1000	0.3-0.5	0.5-3.5	●	O
		milling			450-1200	0.07-0.2			

IS26

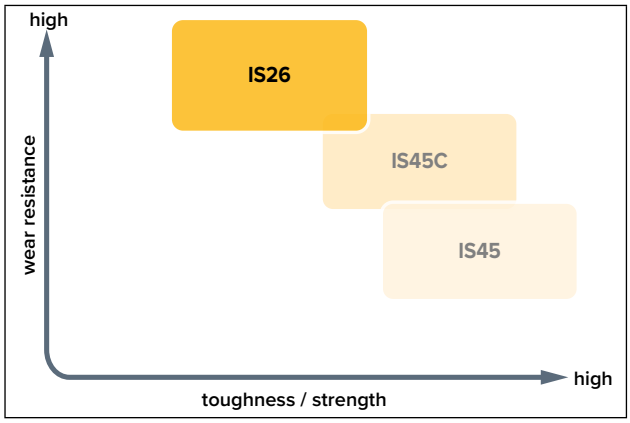
Machining gray cast iron at V_c =1,200 m/min.
Outstanding notch wear resistance and thermal shock.
First choice for roughing gray cast iron

Performance

- Significantly reduces the progress of notch wear, achieving high-speed and longer tool life machining.
- Excellent thermal shock resistance, and can be used for wet machining.

Application

- Gray cast iron with scale
- Turning / milling



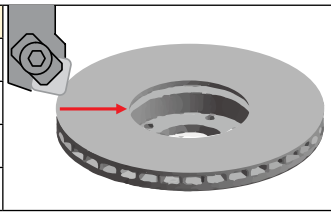
Machining cast iron at V_c = ~1,200 m/min

Silicon nitride ceramics offer excellent wear resistance for machining gray cast iron with scale.

Case Study Brake Disc

IS26 has a 1.5 times longer tool life than other Competitor's silicon nitride.

Brake Rotor

Work Material	Gray Cast Iron		IN26	75 Pieces/Corner
cutting speed	1100 m/min		Competitor's black ceramics	50 Pieces/Corner
feed	0.5 mm/rev			
depth of cut	2.5 mm			
coolant	wet			

IS45C

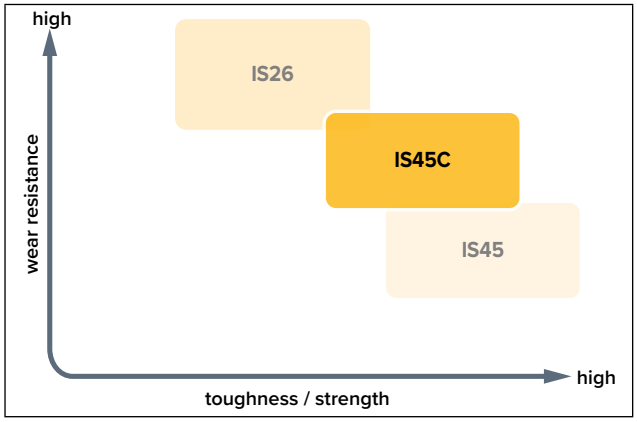
Excellent chipping resistance and wear resistance due to the combination of high toughness material and CVD coating.
CVD coating enables longer tool life even in the low-speed range at V_c = 300 m/min.

Performance

- Combination of high-toughness material and CVD coating provides both excellent chipping resistance and wear resistance
- Minimum cutting edge treatment reduces cutting resistance
- Finishing is also available

Application

- Ductile cast iron / gray cast iron
- Turning / milling roughing with scale to finishing

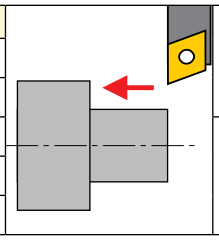


Coated silicon nitride ceramics for roughing ductile cast iron and finishing gray cast iron with scale

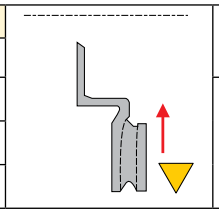
Case Study Differential Case Machining

IS45C offers faster machining than competitor's CVD coated carbide that allows to reduce the cutting time (C/T).

Differential case

Work Material	Ductile Cast Iron with Scale			
cutting speed	450 m/min (IS45C)		IS45C	C/T 30 Seconds/pc
	200 m/min (CVD coated carbide)			
feed	0.35 mm/rev		competitor's CVD coated carbide	C/T 60 Seconds/pc
depth of cut	1.5 mm			
coolant	dry			

Brake Rotor

Work Material	Gray Cast Iron			
cutting speed	550 m/min		IS45C	120 Pieces/Corner
feed	0.4 mm/rev		Competitor's whisker based ceramic	80 Pieces/Corner
depth of cut	2.5 mm			
coolant	dry			

S Super Alloys

Ceramic Grades Guide
Super Alloys - Uncoated

IS02
- Ideal for ultra-high-speed finishing of heat-resistant alloy machining.
- Achieve cutting speeds up to V_c=520 m/min.
- Longer tool life and improved surface finish when compared to carbide tools.

IS05
- A unique hybrid grade of ceramics and carbide, designed for increased speed and extended tool life .
- Revolutionary material for machining heat-resistant alloys.
- Capable of achieving speeds up to 480 m/min.
- Exhibits superior wear resistance and resistance to notching compared to whisker-based ceramics.
- Delivers exceptional surface finish in comparison to whisker-based ceramics.

IS10
- Offers the same speed capability as IS05.
- Provides increased toughness as a valuable addition to the bidemics family.

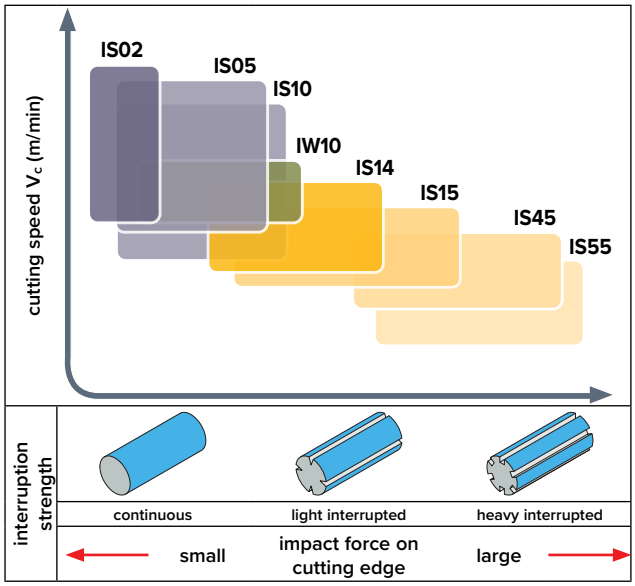
IS14
- Offers superior notching resistance compared to whisker-based ceramics, eliminating the need for ramping in programming.
- Exhibits superior flank wear resistance compared to other SiAlON ceramics.
- Outperforms whisker-based ceramics under similar conditions, resulting in even higher productivity, especially at higher feed rates.
- Demonstrates excellent thermal shock resistance, enabling high-speed milling operations at speeds of 914.4 m/min or higher.

IS15
- First recommendation for heat-resistant alloys machining
- Demonstrates exceptional wear resistance and toughness.
- Suitable for a wide range of HRSA machining applications, including rough turning with scale and semi-finish turning.
- Capable of machining the latest generation of HRSA work materials, such as rene, as well as commonly used HRSA like inconel 718.
- Enables efficient milling operations with high productivity.

IS45
- Excellent notch wear resistance.
- Better flank wear resistance compared to competitor's silicon nitride ceramics
- Superior toughness compared to whisker-reinforced ceramics
- Best thermal shock resistance
- Considered the optimal grade for roughing nickel-based HRSA (like inconel 718) with scale.

IS55
- Known for its exceptional toughness among ceramics grades.
- Grade suitable for processing heat-resistant alloy scale, specifically SiAlON ceramics.
- Ideal grade for machining waspaloy with scale.
- Recommended grade for machining high-cobalt alloys.
- Primary recommendation for processing scale and interrupted materials.

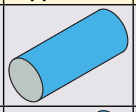
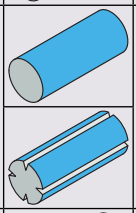
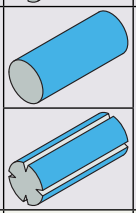
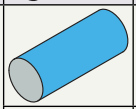
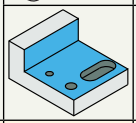
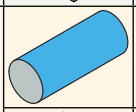
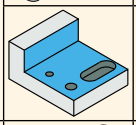
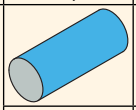
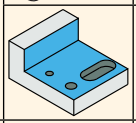
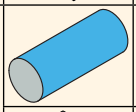
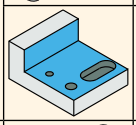
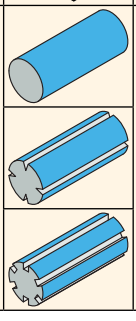
Grade and Speed Recommendation Gray Cast Iron -Finish



Recommended Cutting Conditions

S Super Alloys

Application Range

Workpiece Material	Grade		Operation Type	Cutting Mode	Application	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Dry	Wet
Heat Resistant Alloy	Bidemics	IS02	turning	superior surface finish		180-520	0.10-0.25	0.20-1.00	O	●
		IS05	turning	special grade with higher speed and longer tool life potential		180-480	0.15-0.30	1.00-2.50	O	●
		IS10	turning	added toughness in bidemics		180-480	0.10-0.25	0.50-2.00	O	●
	Whisker	IW10	turning	general versatile grade for turning		200-350	0.15-0.45	0.50-4.00	O	●
			milling			600-1000			●	O
	SIALON	IS14	turning	versatile grade for turning and milling		100-350	0.15-0.45	0.50-4.00	O	●
			milling			800-1200			●	O
		IS15	turning	best balance of toughness and hardness		100-350	0.15-0.45	0.50-4.00	O	●
			milling			800-1200			●	O
		IS45	turning	best grade for scale of inco718		100-350	0.15-0.45	0.50-4.00	O	●
			milling			800-1200			●	
		IS55	turning	toughest sialon ceramics on the market		100-350	0.15-0.45	0.50-4.00	O	●

● First choice

O Second choice

Ceramic Grades Guide

Super Alloys

Bidemics

IS02

- Speed capability is 10 to 15 times more when compared to cemented carbide
- Better wear resistance and notching resistance than CBN
- Superior surface finish to cemented carbide or CBN
- Strong brazing technology

IS05

- A unique hybrid grade of ceramics and carbide, designed for increased speed and extended tool life .
- Revolutionary material for machining heat-resistant alloys.
- Capable of achieving speeds up to 480 m/min.
- Exhibits superior wear resistance and resistance to notching compared to whisker-based ceramics.
- Delivers exceptional surface finish in comparison to whisker-based ceramics.

IS10

- Offers the same speed capability as IS05.
- Provides increased toughness as a valuable addition to the bidemics family.

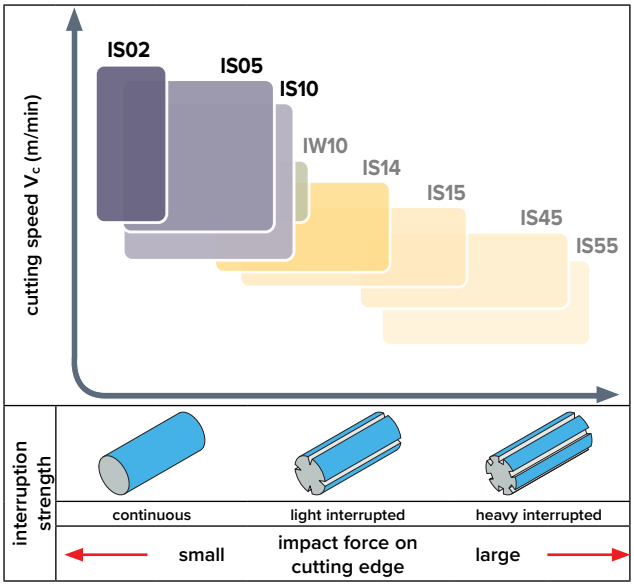
Application Range

	Grade	Roughing with Scale	Roughing	Semi-Finishing	Finishing
Bidemics	IS02				
	IS05				
	IS10				

General Features

ISCAR's bidemics has recently made waves in the HRSA material machining industry, marking a significant advancement since the introduction of whisker-based ceramics. This patented insert material showcases unparalleled physical properties that surpass the existing whisker grades commonly employed for HRSA material applications. The remarkable outcomes achieved with bidemics have garnered attention and recognition not only within the HRSA industry but also on a global scale, as word spreads about its exceptional performance

Grade and Speed Recommendation



Ceramic Grades Guide

Super Alloys - Uncoated

Whisker

IW10

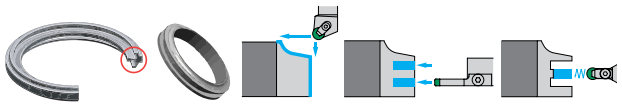
- Reduce costs and eliminate grinding.
- Excellent wear resistance with high toughness excellent crack resistance
- Whisker-reinforcing technology for heat-resistant super alloys high-hardened mill rolls.
- IW10 is a whisker-reinforced composite ceramics material with silicon carbide whisker added to alumina, the main component.

Application Range

Whisker	Grade	Roughing with Scale	Roughing	Semi-Finishing	Finishing
	IW10				

Whisker-Based Ceramics

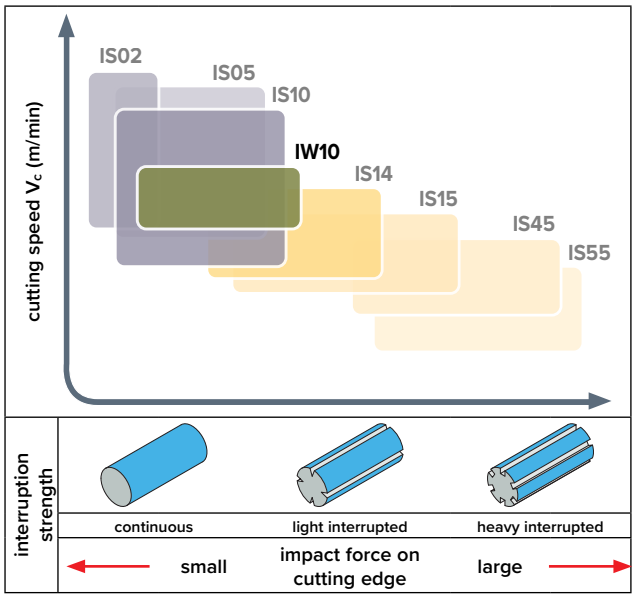
Turbine Disc
Inconel 718



	External Turning	Grooving	Ramping
	IW10	IW10	IW10
cutting speed (m/min)	300	300	300
feed (mm/rev)	0.15	0.1	0.06
D.O.C (mm)	3-4 mm	-	2-3 mm
coolant	wet	wet	wet
tool life (min)	20	20	20

Whisker-based ceramics iW10 achieved stable machining.

Grade and Speed Recommendation



S Super Alloys

Ceramic Grades Guide

Super Alloys - Uncoated

SiAlON

IS14

- Offers superior notching resistance compared to whisker-based ceramics, eliminating the need for ramping in programming.
- Exhibits superior flank wear resistance compared to other SiAlON ceramics.
- Out performs whisker-based ceramics under similar conditions, resulting in even higher productivity, especially at higher feed rates.
- Demonstrates excellent thermal shock resistance, enabling high-speed milling operations at speeds of 3000SFM or higher.

IS15

- First recommendation for heat-resistant alloys machining
- Demonstrates exceptional wear resistance and toughness.
- Suitable for a wide range of HRSA machining applications, including rough turning with scale and semi-finish turning.
- Capable of machining the latest generation of HRSA work materials, such as rene, as well as commonly used HRSA like inconel 718.
- Enables efficient milling operations with high productivity.

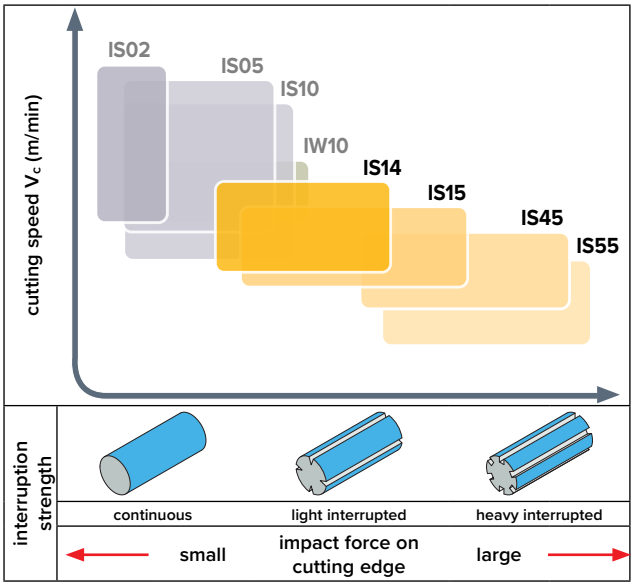
IS45

- Excellent notch wear resistance.
- Better flank wear resistance compared to competitor's silicon nitride ceramics
- Superior toughness compared to whisker-reinforced ceramics
- Best thermal shock resistance
- Considered the optimal grade for roughing inco 718 with scale.

IS55

- Known for its exceptional toughness among ceramics grades.
- Grade suitable for processing heat-resistant alloy scale, specifically SiAlON ceramics.
- Ideal grade for machining waspaloy with scale.
- Recommended grade for machining high-cobalt alloys.
- Primary recommendation for processing scale and interrupted materials.

Grade and Speed Recommendation



Application Range

	Grade	Roughing with Scale	Roughing	Semi-Finishing	Finishing
SiAlON	IS14		■	■	
	IS15		■	■	
	IS45	■	■	■	
	IS55	■	■	■	

IS02

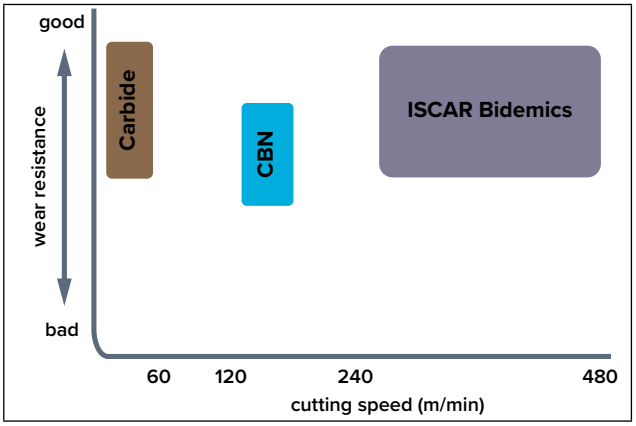
For high-speed finishing and ultra-high-speed finishing of heat-resistant alloy machining.
15 times faster than carbide and 3 times faster than CBN.
Made-to-order.

Performance

- Improves the wear-resistant performance of bidemics and good for part's straightness performance of workpiece in finishing operations.
- Finish machining of heat-resistant super alloys at a cutting speed of 500 m/min is achieved.

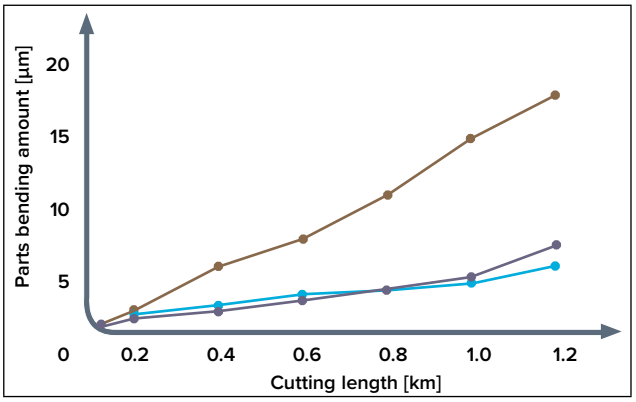
Application

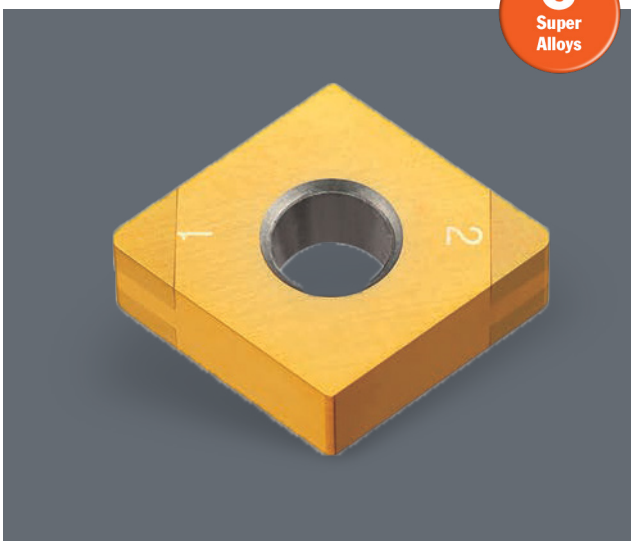
- Heat-resistant alloys
- Finishing



Part's Straightness Performance

[cutting conditions] material: inconel 718
v_c=320 m/min (carbide v_c=50 m/min)
f=0.2 mm/rev a_p=0.1 mm wet

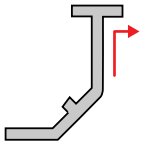




Bidemics for finishing of heat-resistant super alloys.

Case Study

Practical Machining Example Turbine Disk (Finishing)

Workpiece Material	Inconel 718		IS02	525 cm³/min
cutting speed	240 m/min			
feed	0.08 mm/rev		Competitor's whisker-based ceramics	45 cm³/min
depth of cut	0.25 mm			
coolant	wet			

IS05 / IS10

Ultra-high speed machining of heat-resistant super alloys at Vc = 480 m/min.
Longer life and higher quality machined surface compared to Whisker-Based Ceramics.
Applicable machining for aircraft parts.

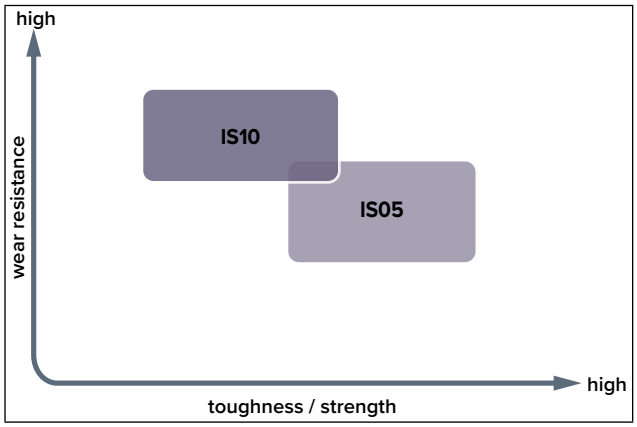
Performance

- Significantly longer life than whisker ceramics
- Twice the cutting speed is possible
- Good machined surfaces are achieved
- Suitable for machining HRSA made by powder metallurgy technology

Application

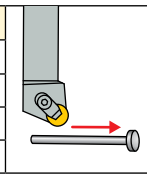
- Heat-resistant super alloys
- Turning / grooving / profiling
- Rough to semi-finishing with non-scale

Bidemics for rough to semi-finishing of heat-resistant super alloys.

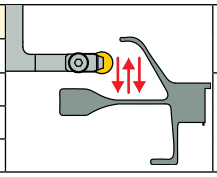


Case Study

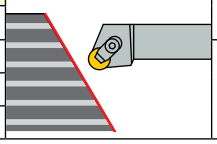
Processing Practical Example – Turbine Shaft

Workpiece Material	Inconel 718- No Scale		IS10	10 min
cutting speed	240 m/min		Competitor's whisker-based ceramics	3 min
feed	0.2 mm/rev			
depth of cut	2.0 mm			
coolant	wet			

Processing Practical Example – Turbine Disc

Workpiece Material	Inconel 718		IS10	82 cm^3/min
cutting speed	350 m/min		Competitor's whisker-based ceramics	48 cm^3/min
feed	0.15 mm/rev			
depth of cut	1.5 mm			
coolant	wet			

Processing Practical Example – Turbine Disc

Workpiece Material	Inconel 718 Plus		IS10	3 Pass
cutting speed	240 m/min		Competitor's whisker-based ceramics	1 Pass
feed	0.25 mm/rev			
depth of cut	0.5 mm			
coolant	wet			

IW10

High speed and efficient machining of heat resistant alloys.
SiC fibers in the material provide strength, flank wear resistance and thermal shock resistance.

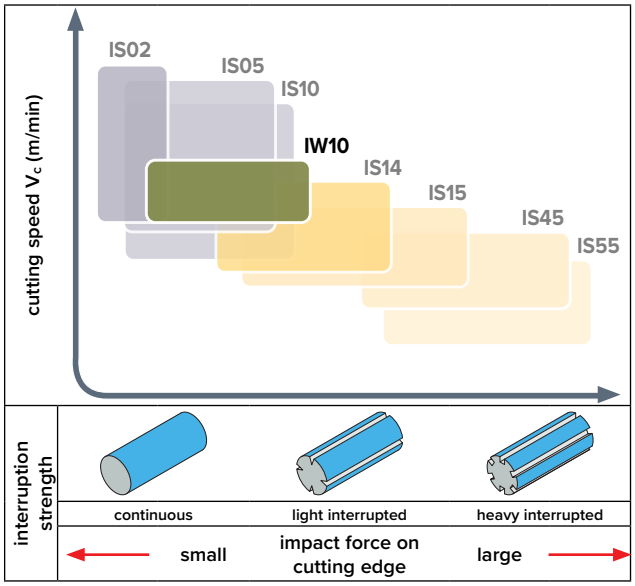
Whisker ceramics (whisker-based ceramics) for roughing (no scale) to semi-finishing of heat resistant super alloys.

Performance

- Alumina ceramics material with enhanced toughness due to the addition of SiC whiskers
- High-speed machining is possible due to flank and notch wear resistance and toughness

Application

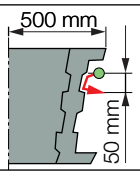
- Roughing (no scale) to semi-finishing heat resistant super alloys
- Turning / grooving / milling



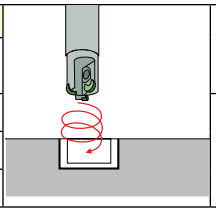
Case Study Gas Turbine Case

IW10 significantly reduced cycle time compared to the competitor's carbide endmill.

Gas Turbine Case

Workpiece Material	Inconel 718		IW10	1 Pass=2min
cutting speed	200 m/min		Competitor's whisker-based ceramics	1 Pass=60min
feed	0.1 mm/rev			
depth of cut	0.3 mm			
coolant	wet			

Jet Engine Part

Workpiece Material	Inconel 718		IW10	80 mm/ Corner (consistent performance)
cutting speed	800 m/min		Competitor's solid carbide end mill	80 mm / Corner (streaks visible on part surface)
feed	0.1 mm/rev			
depth of cut	2.0 mm			
coolant	dry			

IS14

Better notch resistance than Whisker-Based Ceramics. Improved boundary wear resistance to prevent cutting edge wear and breakage.

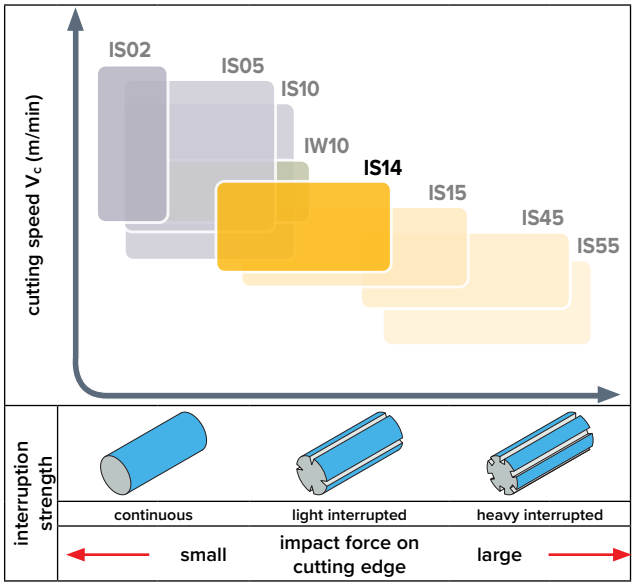
SiAlON ceramics. for roughing (no scale) to semi-finishing of heat resistant super alloys .

Performance

- Better notch resistance compared to whisker-based ceramics
- No need to program ramping to shift wear on insert
- Better flank wear resistance compared to other SiAlONs.
- Ideal for semi-finishing inconel and waspaloy

Application

- Roughing with no scale to semi-finishing heat resistant super alloys
- Turning/grooving/ milling



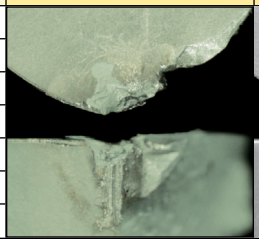
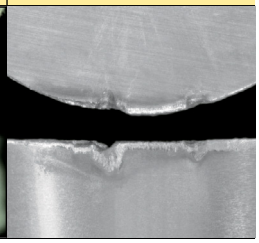
Case Study Turbine Case (Semi-Finishing)

IS14 insert achieved more stable machining due to its excellent notch resistance compared to the competitor's whisker insert.

Turbine Case Semi-Finishing

Workpiece Material	Waspaloy		IS14	7.2 min
cutting speed	240 m/min			
feed	0.3 mm/rev		Competitor's whisker-based ceramics	broken after 5.3 min
Insert	RPGX 120700	ϕ39"		
coolant	wet			

Jet Engine Part

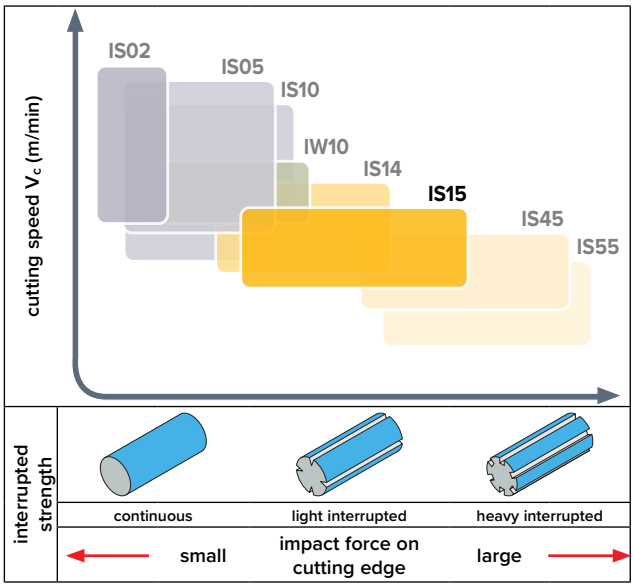
Turning (semi-finishing): Turbine Disc		Inconel 718	Competitor's Whisker-Based Ceramics	IS14
	Current Tool	ISCAR		
grade	whisker-based ceramics	IS14		
insert shape	RPGX 120700	RPGX 120700		
cutting speed (m/min)	240	240		
feed (mm/rev)	0.15	0.15		
d.o.c (mm)	1.5	1.5		
coolant	wet	wet		
tool life (min)	7	7		

IS15
Covers a wide range of machining:
Roughing with scale to semi-finishing.
Ceramics grade combining toughness and wear resistance.
High speed and stable machining in turning and milling.

SiAlON ceramics. for roughing (with scale) to semi-finishing of heat resistant super alloys .

Performance
- Excellent wear and chipping resistance
- Versatile ceramics grade
- Covers a wide range of heat-resistant alloy machining from scale to semi-finishing
- High-efficiency machining in milling and turning

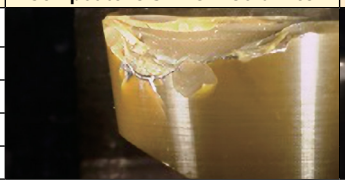
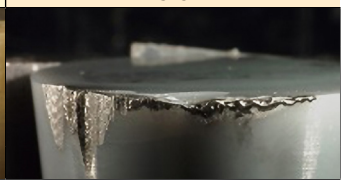
Application
- Heat-resistant super alloys
- Turning / profiling / milling
- Roughing with scale to semi-finishing



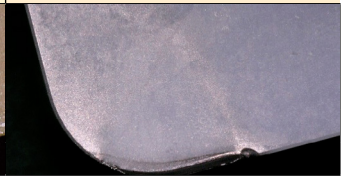
Case Study: Rene 130

IS15 provides better wear resistance compared to competitor's SiALON Ceramics showing extensive wear.

Semi-Finishing

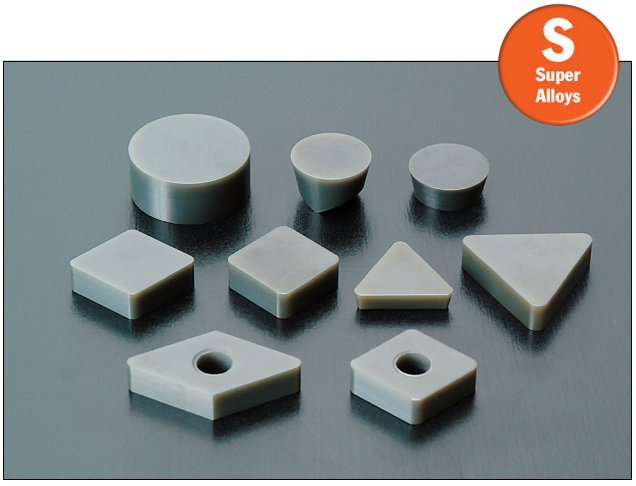
Workpiece Material	Rene 130	Competitor's SiALON Ceramics	IS15
cutting speed	100 m/min		
feed	0.25 mm/rev		
Insert	RCGX 120700		
coolant	wet		
tool life	10 min		

Rough Turning With Scale

Workpiece Material	Rene 130	Competitor's SiALON Ceramics	IS15
cutting speed	115 m/min		
feed	0.15 mm/rev		
Insert	SNGN 190724		
coolant	wet		
tool life	10 min		

IS45

SiAlON Ceramics grade material with improved chipping resistance.
Best grade for roughing heat resistant alloys like Inconel 718 with scale.



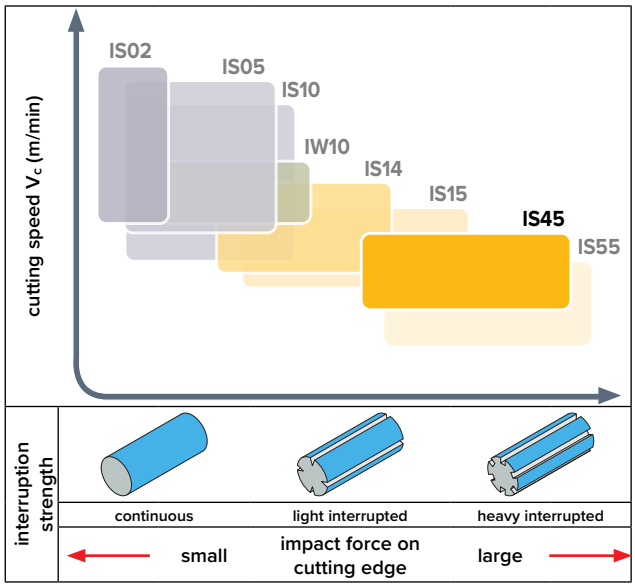
SiAlON ceramics for roughing heat resistant super alloys with scale.

Performance

- SiAlON with excellent notch and flank wear resistance
- Superior toughness compared to whisker-based ceramics
- Best thermal shock resistance, perfect for milling applications
- Best grade for roughing inconel with scale

Application

- Heat resistant alloys
- Turning / milling / end milling: roughing operations



Case Study Aircraft Part (with Scale)

IS45 is a significant cost advantage and double the tool life compared to competitor's whisker insert.

Aircraft Parts (Scale Processing)

Work Material	Inconel 718		IS45	2 Pieces/Corner
cutting speed	180 m/min			
feed	0.2 mm/rev		Competitor's whisker-based ceramics	1 piece/Corner
depth of cut	0.6 mm			
coolant	wet			

Rough Turning

Work Material	Inconel 718 with Scale		IS45	10 passes
cutting speed	200 m/min			
feed	0.1 mm/rev		Competitor's whisker-based ceramics	5 Passes
depth of cut	2.5 mm			
coolant	dry			

Housing Rotor

Work Material	Inconel 718 with Scale		IS45	Feed = 0.2 mm/rev
cutting speed	180 m/min			
Insert	RCGX 120700	Ø101	Competitor's SiAlON based ceramics	Feed = 0.13 mm/rev
depth of cut	2.5 mm			
coolant	wet	147		

IS55

First recommendation for machining tough scale.
Excellent notch wear resistance ideal for machining scale.
Made-to-order.

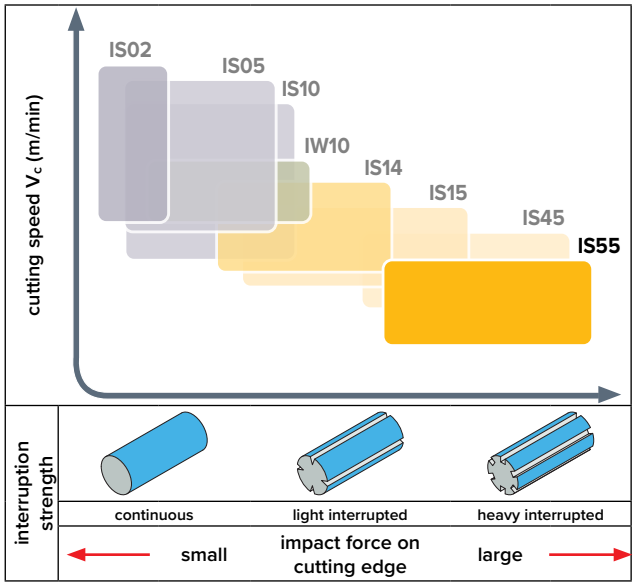
Performance

- Ceramics with the highest fracture resistance
- Best for machining where scale or interruptions exist
- Best grade for roughing waspaloy with scale

Application

- Heat resistant alloys
- Turning / grooving through scale

SiAlON ceramics for roughing heat resistant super alloys with scale.



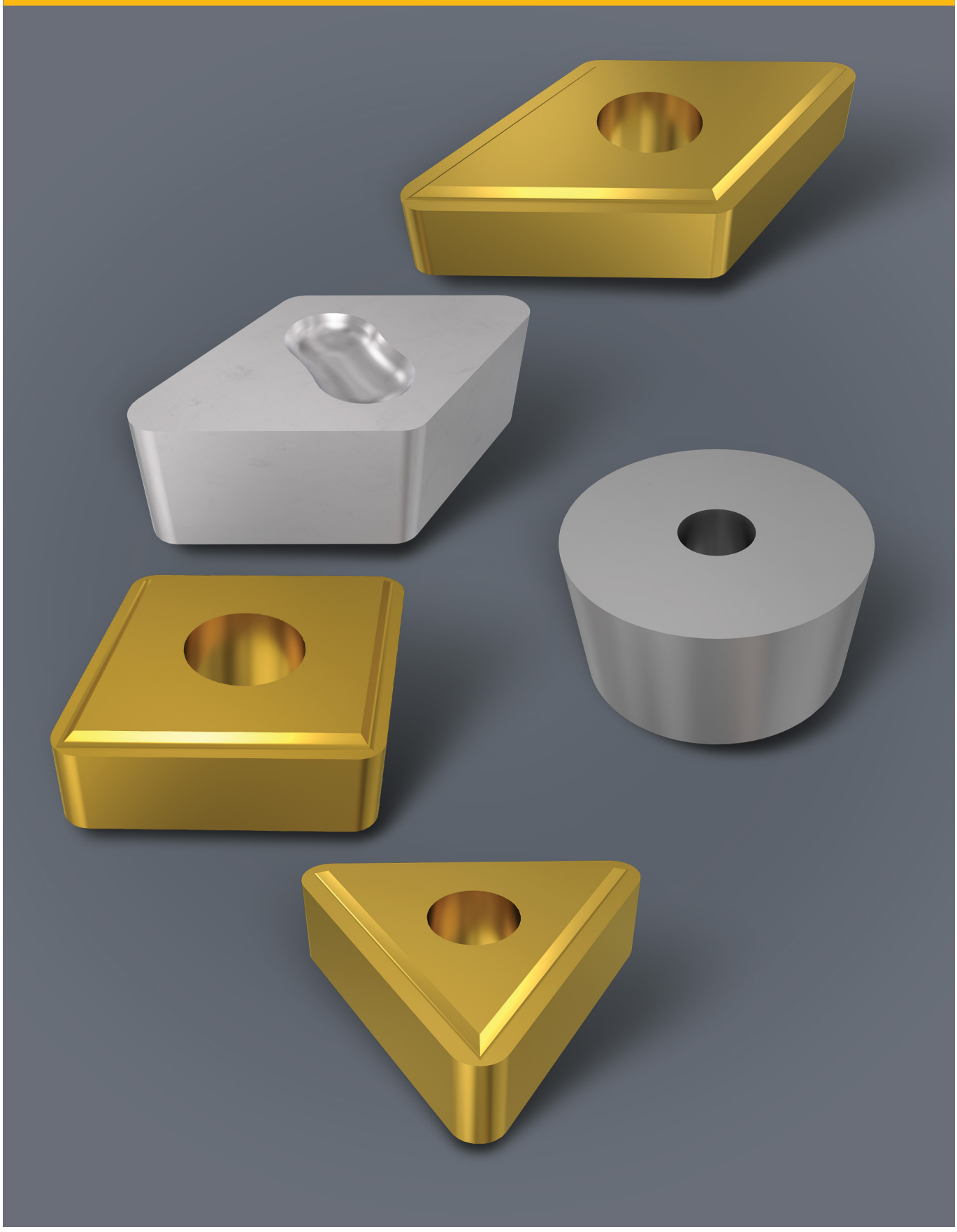
Case Study Aircraft Part (Roughing with Scale)

IS55 provided a more stable process without insert chipping

Processing Example Aircraft Parts (Scale Processing)

Work Material	Inconel 718		IS55	1 Pass
cutting speed	200 m/min			
feed	0.2 mm/rev		Competitor's SiAlON ceramics	Chipping after 1 pass
depth of cut	2.5 mm			
coolant	wet			

CERAMIC TURNING INSERTS

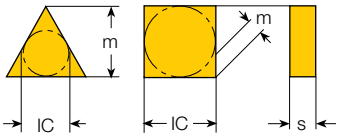


ISO Insert Nomenclature / Identification Key Codes for Ceramics Indexable Inserts

1. Shape

	R	75°	E	80°	W
90°	S	55°	D		L
60°	T	35°	V	55°	K
80°/100	C	25°	Y	80°	Q

3. Tolerance



	m		S	IC	
E		±0.025	±0.025		±0.025
G		±0.025	±0.13		±0.025
M	from	±0.08	±0.13	from	±0.05
	to	±0.18(1)		to	±0.13(1)
U	from	±0.13	±0.13	from	±0.08
	to	±0.38(1)		to	±0.25(1)

(1) Exact tolerance depends on insert size

IC	Tolerance (mm)			
	m		IC	
	Class M	Class U	Class M	Class U
6.35	±0.08	±0.13	±0.05	±0.08
9.52	±0.08	±0.13	±0.05	±0.08
12.70	±0.13	±0.20	±0.08	±0.13
15.87	±0.15	±0.27	±0.10	±0.18
19.05	±0.15	±0.27	±0.10	±0.18
25.40	±0.18	±0.38	±0.13	±0.25

1	2	3	4
C	N	G	A

2. Clearance Angle

Symbol	Relief Angle
B	5°
C	7°
N	0°
P	11°
O	other

4. Type

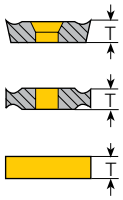
Symbol	Hole	Shape of Hole	Chipbreaker	Shape
N	without	—	without	
R			single- sided	
F			double- sided	
A	with	cylindrical hole	without	
M			single- sided	
G			double- sided	
W		partly cylindrical hole, single-side 40° ~ 60° countersink	without	
T			single- sided	
Q		partly cylindrical hole, double-side 40° ~ 60° countersink	without	
U			double- sided	
B		partly cylindrical hole, single-side 70° ~ 90° countersink	without	
H			single- sided	
C		partly cylindrical hole, double-side 70° ~ 90° countersink	without	
J			double- sided	
X	special			

5. Codes for Cutting Edge Length or for Inscribed Circle Diameters

Diameter of Inscribed Circle d (mm)	Metric System – Shapes H	O	P	S	T	C	D	E	F	M	V	W	R
3.97					06			T3			07		
4.76					08			04			08		
5.56				05	09	05	06	05	07	05	09	03	
6.35	03	02	04	06	11	06	07	06	08	06	11	04	06
7.94	04	03	05	07	13	08	09	08	10	07	13	05	07
9.525	05	04	07	09	16	09	11	09	12	09	16	06	09
12.7	07	05	09	12	22	12	15	13	16	12	22	08	12
15.875	09	06	11	15	27	16	19	16	20	15	27	10	15
19.05	11	07	13	19	33	19	23	19	24	19	33	13	19
25.4	14	10	18	25	44	25	31	26	33	25	44	17	25
31.75	18	13	23	31	54	32	38	32	41	31	54	21	31

6. Codes for Thickness

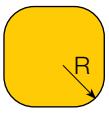
Thickness S (mm)	Metric System
1.59	01
1.98	T1
2.38	02
3.18	03
3.97	T3
4.76	04
5.56	05
6.35	06
7.94	07
9.52	09
12.7	12



7. Codes for Corner Radii

For Corner R – Corner Nominal Value (mm)	Metric System
Sharp corner 0	00
0.1	01
0.2	02
0.3	03
0.4	04
0.6	06
0.8	08
1	10
1.2	12
1.5	15
1.6	16
2	20
2.4	24
3.2	32
Other radii	X
For round inserts	M0*
	00*

Notes :"00"(double zero) is used for insert circle diameter indicated in inches. " M0" is used for insert circle diameter indicated in millimeters.



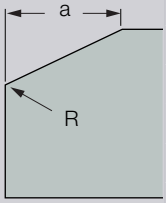
5	6	7	8	9		10	11
12	04	08	S	010	-	20	W

8. Cutting Edge Treatment

	Code	Shape
Sharp Edge	F	
Round Honing	E	R R
T-Land/Chamfer (Angular Grinding)	T	
Chamfer + Honed (Angular Grinding + Round Honing)	Z S	R0.02 R0.04
Double Chamfer + Honed (2-Step Chamfering + Round Honing)	P	R

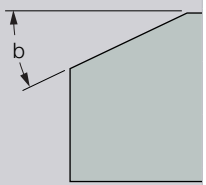
9. Chamfer Width and Honing

Symbol	Product Number Display	A (mm)	R (mm)
E	002	-	0.02
	004	-	0.04
T	005	0.05	-
	008	0.08	-
	010	0.10	-
	012	0.12	-
	015	0.15	-
	020	0.2	-
Z	010	0.1	0.02
	020	0.2	0.02
S	010	0.1	0.04
	020	0.2	0.04
P	070	0.7	0.04
	200	2.0	0.04



10. Chamfer Angle

Product Number Display	B-Chamfer Angle (°)
10	10°
15	15°
20	20°
25	25°
30	30°



11. Chipbreaker and Wiper

Symbol	Description
W	wiper
AG	chipbreaker

Part no. Designation Code for Inserts ➔ Refer to Previous Page

							1	2	3
C	N	G	A	12	04	12	T	010	20

1 Codes for Major Cutting Edges

	Code	Shape
Sharp Edge	F	
Round Honing	E	R
Angular Grinding	T	
Angular Grinding + Round Honing	Z	R0 .0 2
	S	R0.0 4
2 - Step Chamfering + Round Honing	P	R

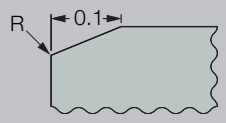
Cutting Performance

Strength of Cutting Edge

Cutting edge treatment : Chamfering or honing of the cutting edge in order to strengthen the edge or to adjust the cutting performance

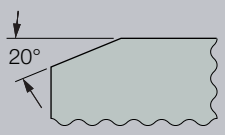
2 Edge Preparation

Width and Hone



3 Edge Preparation

Chamfer Angle



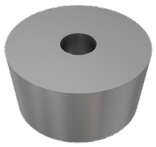
Codes for Cutting Edges and the Shapes

Code	Shape of the Cutting Edge
E002	round honing with R = 0.02 mm
E004	round honing with R = 0.04 mm
E007	round honing with R = 0.07 mm
EX0004	round honing with R = 0.02 mm
S01015	chamfering 0.10 mm x 15 deg. + round honing with R = 0.04 mm
S01020	chamfering 0.10 mm x 20 deg. + round honing with R = 0.04 mm
S01325	chamfering 0.13 mm x 25 deg. + round honing with R = 0.04 mm
S01535	chamfering 0.15 mm x 35 deg. + round honing with R = 0.04 mm
S02025	chamfering 0.20 mm x 25 deg. + round honing with R = 0.04 mm
T00320	chamfering 0.03 mm x 20 deg.
T00520	chamfering 0.05 mm x 20 deg.
T00525	chamfering 0.05 mm x 25 deg.
T00820	chamfering 0.08 mm x 20 deg.
T01015	chamfering 0.10 mm x 15 deg.
T01020	chamfering 0.10 mm x 20 deg.
T01025	chamfering 0.10 mm x 25 deg.
T01515	chamfering 0.15 mm x 15 deg.
T01520	chamfering 0.15 mm x 20 deg.
T01525	chamfering 0.15 mm x 25 deg.
T02020	chamfering 0.20 mm x 20 deg.
T02025	chamfering 0.20 mm x 25 deg.
Z01015	chamfering 0.10 mm x 15 deg. + round honing with R = 0.02 mm
Z01025	chamfering 0.10 mm x 25 deg. + round honing with R = 0.02 mm
Z01030	chamfering 0.10 mm x 30 deg. + round honing with R = 0.02 mm
Z01520	chamfering 0.15 mm x 20 deg. + round honing with R = 0.02 mm
Z02025	chamfering 0.20 mm x 25 deg. + round honing with R = 0.02 mm

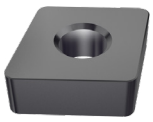
Note: for "P" type land primary land width is shown

Ceramic Turning Inserts - Index

CDH (CER) 54



CNGA (CER) 54

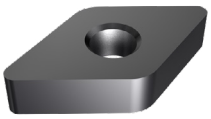


CNGG (CER) 55

CNGN (CER) 55

CNGX-DIMPLE (CER) 56

DNGA (CER) 56



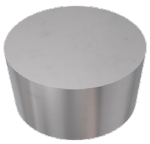
DNGG (CER) 57

DNGN (CER) 57

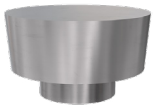
DNGX-DIMPLE (CER) 58

LNMN (CER) 58

RBGN (CER) 58

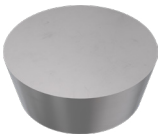


RBGX (CER) 59

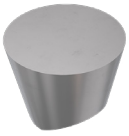


RCGX (CER) 59

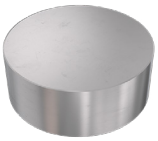
RPGN (CER) 60



RPGX (CER) 60

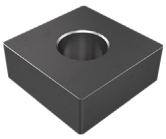


RNGN (CER) 61

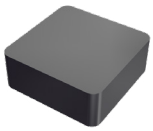


SPGN (CER) 61

SNGA (CER) 62

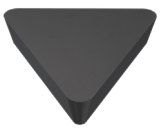


SNGN (CER) 62



SNGX-DIMPLE (CER) 63

TPGN (CER) 63



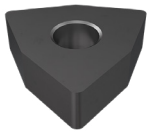
TNGA (CER) 64

TNGG (CER) 64

TNGN (CER) 65

VNGA (CER) 65

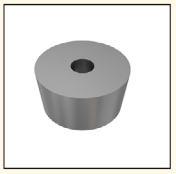
WNGA (CER) 66

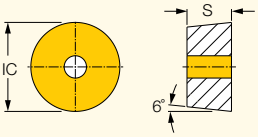


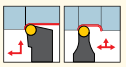
ISCAR CER-LINE

CDH (CER)

Ceramic Inserts for Machining Mill Rolls and Heat-Resistant Alloys







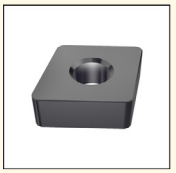
Designation	Dimensions IC	S	Alumina IN10	IN16	Recommended Machining Data a_p (mm)	f (mm/rev)
CDH 1909 P15010	19.05	9.52	●	●	2.00-8.00	0.05-0.30
CDH 2512 P20015	25.40	12.70	●	●	3.00-10.00	0.05-0.30
CDH 3209 P20015	31.75	9.52	●	●	3.00-3.00	0.05-0.30
CDH 3219 P20015	31.75	19.05	●	●	3.00-3.00	0.05-0.30

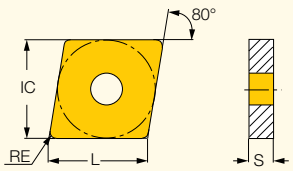
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

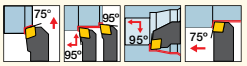
ISCAR CER-LINE

CNGA (CER)

Negative 80° Rhombic Double-Sided Inserts for Machining Cast Iron, Hardened Steel, and Heat-Resistant Alloys







Designation	Dimensions L	IC	S	RE	Whisker IW10	Silicon Nitride IS45C	IS45	IS26	Alumina IN10	IN16C	IN18	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGA 120404 S02025	12.90	12.70	4.76	0.40						●		0.05-2.00	0.05-0.20
CNGA 120404 T00520	12.90	12.70	4.76	0.40	●							0.05-2.00	0.05-0.20
CNGA 120404 T01025	12.90	12.70	4.76	0.40						●		0.05-2.00	0.05-0.20
CNGA 120404WLS02025	12.90	12.70	4.76	0.40						●		0.05-2.00	0.05-0.20
CNGA 120408 S02025	12.90	12.70	4.76	0.80						●		0.05-3.00	0.05-0.30
CNGA 120408 T00520	12.90	12.70	4.76	0.80	●							0.05-3.00	0.05-0.30
CNGA 120408 T01020	12.90	12.70	4.76	0.80	●	●	●		●		●	0.05-3.00	0.05-0.30
CNGA 120408 T01025	12.90	12.70	4.76	0.80						●		0.05-3.00	0.05-0.30
CNGA 120408 T02020	12.90	12.70	4.76	0.80				●				0.05-3.00	0.05-0.30
CNGA 120408WLS02025	12.90	12.70	4.76	0.80						●		0.05-3.00	0.05-0.30
CNGA 120408 Z02020	12.90	12.70	4.76	0.80	●							0.05-3.00	0.05-0.30
CNGA 120412 S02025	12.90	12.70	4.76	1.20						●		0.05-4.00	0.05-0.50
CNGA 120412 T00520	12.90	12.70	4.76	1.20	●							0.05-4.00	0.05-0.50
CNGA 120412 T01020	12.90	12.70	4.76	1.20	●	●	●		●		●	0.05-4.00	0.05-0.50
CNGA 120412 T01025	12.90	12.70	4.76	1.20						●		0.05-4.00	0.05-0.50
CNGA 120412 T02020	12.90	12.70	4.76	1.20				●				0.05-4.00	0.05-0.50
CNGA 120412WLS02025	12.90	12.70	4.76	1.20						●		0.05-4.00	0.05-0.50
CNGA 120412 Z02020	12.90	12.70	4.76	1.20	●							0.05-4.00	0.05-0.50
CNGA 120416 T00520	12.90	12.70	4.76	1.60	●							0.50-5.00	0.05-0.50
CNGA 120416 T01020	12.90	12.70	4.76	1.60	●	●	●		●		●	0.50-5.00	0.05-0.50
CNGA 120416 T02020	12.90	12.70	4.76	1.60				●				0.50-5.00	0.05-0.50
CNGA 120416 T02025	12.90	12.70	4.76	1.60	●							0.50-5.00	0.05-0.50
CNGA 160612 T00520	16.12	15.88	6.35	1.20	●							0.05-4.00	0.05-0.50
CNGA 160612 Z02025	16.12	15.88	6.35	1.20	●							0.05-4.00	0.05-0.50
CNGA 160616 T00520	16.12	15.88	6.35	1.60	●							0.50-5.00	0.05-0.50
CNGA 190612 T00520	19.30	19.05	6.35	1.20	●							0.05-4.00	0.05-0.50
CNGA 190612 T01020	19.30	19.05	6.35	1.20	●							0.05-4.00	0.05-0.50
CNGA 190612 Z01520	19.30	19.05	6.35	1.20	●							0.05-4.00	0.05-0.50
CNGA 190616 T00520	19.30	19.05	6.35	1.60	●							0.50-5.00	0.05-0.50

• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

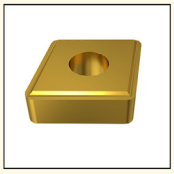
For tools, see pages: A/S-PCLNR/L (282) • A/S-PCLNR/L-X/G (283) • C#-MULNR/L-MW (268) • C#-PCLNR/L-12-JHP (241) • C#-PCLNR/L-X (241) • C#-PCLNR/L-X-JHP (242) • DCLNR/L (234) • DCLNR/L-JHP-MC (235) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PCLNR/L (237) • PCLNR/L-12-JHP (237) • PCLNR/L-X (238) • PCLNR/L-X-JHP (239) • PCLNR/L-X-JHP-MC (240) • S-DCLNR/L (282) • S-MULNR-MW (297)

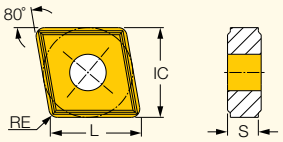
Material		H				K							S						
		Hard Materials				Cast Iron							Heat-Resistant Super Alloys						
Grade		IN10	IN16	IN16C	IN20	IN6	IN10	IN18	IW10	IS26	IS45C	IS45	IS05	IS10	IW10	IS14	IS15	IS45	IS55
	Heavy interrupted																		
	Light interrupted																		
	Continuous																		

ISCAR CER-LINE

CNGG (CER)

Negative 80° Rhombic Ground Ceramic Inserts with a Chipbreaker for Machining Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	Alumina IN16C	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGG 120404Z01030AG	12.90	12.70	4.76	0.40	•	0.05-2.00	0.05-0.20
CNGG 120408Z01030AG	12.90	12.70	4.76	0.80	•	0.05-0.25	0.05-0.20
CNGG 120412Z01030AG	12.90	12.70	4.76	1.20	•	0.05-0.25	0.05-0.25

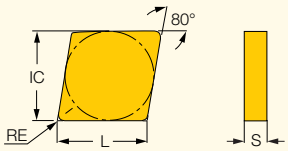
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

For tools, see pages: A/S-PCLNR/L (282) • A/S-PCLNR/L-X/G (283) • C#-MULNR/L-MW (268) • C#-PCLNR/L-12-JHP (241) • C#-PCLNR/L-X (241) • C#-PCLNR/L-X-JHP (242) • DCLNR/L (234) • DCLNR/L-JHP-MC (235) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PCLNR/L (237) • PCLNR/L-12-JHP (237) • PCLNR/L-X (238) • PCLNR/L-X-JHP (239) • PCLNR/L-X-JHP-MC (240) • S-DCLNR/L (282) • S-MULNR-MW (297)

ISCAR CER-LINE

CNGN (CER)

Negative 80° Rhombic Double-Sided Ceramic Inserts for Machining Cast Iron, Hardened Steel and Heat-Resistant Alloys



Designation	Dimensions L	IC	S	RE	Bidemics IS05	IS10	Whisker IW10	Silicon Nitride IS15	IS45C	IS45	IS26	Alumina IN6	IN10	IN16C	IN18	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGN 090308 T01020	9.67	9.53	3.18	0.80			•									0.05-3.00	0.05-0.30
CNGN 090312 T02025	9.67	9.53	3.18	1.20			•									0.05-4.00	0.05-0.50
CNGN 120408 EM04X	12.90	12.70	4.76	0.80				•		•						0.05-3.00	0.05-0.30
CNGN 120408 E004	12.90	12.70	4.76	0.80	•	•										0.05-3.00	0.05-0.30
CNGN 120408 T01020	12.90	12.70	4.76	0.80	•	•	•	•	•	•		•	•		•	0.05-3.00	0.05-0.30
CNGN 120408 T02020	12.90	12.70	4.76	0.80							•					0.05-3.00	0.05-0.30
CNGN 120412 EM04X	12.90	12.70	4.76	1.20				•		•						0.05-4.00	0.05-0.50
CNGN 120412 E004	12.90	12.70	4.76	1.20	•	•										0.05-4.00	0.05-0.50
CNGN 120412 T01020	12.90	12.70	4.76	1.20	•		•	•	•	•		•	•		•	1.00-4.00	0.10-0.50
CNGN 120412 T02020	12.90	12.70	4.76	1.20							•					0.05-4.00	0.05-0.50
CNGN 120416 EM04X	12.90	12.70	4.76	1.60				•		•						0.10-5.00	0.05-0.50
CNGN 120416 E004	12.90	12.70	4.76	1.60	•	•										0.10-5.00	0.05-0.50
CNGN 120416 T01020	12.90	12.70	4.76	1.60	•	•		•	•	•		•	•		•	0.10-5.00	0.05-0.50
CNGN 120416 T02020	12.90	12.70	4.76	1.60							•					0.10-5.00	0.05-0.50
CNGN 120404 S02025	12.90	12.70	4.76	0.40										•		0.05-2.00	0.05-0.20
CNGN 120408 S02025	12.90	12.70	4.76	0.80										•		0.05-3.00	0.05-0.30
CNGN 120408 T00520	12.90	12.70	4.76	0.80			•									0.05-3.00	0.05-0.30
CNGN 120408 T02025	12.90	12.70	4.76	0.80			•									0.05-3.00	0.05-0.30
CNGN 120412 S01025	12.90	12.70	4.76	1.20			•									0.05-4.00	0.05-0.50
CNGN 120412 S02025	12.90	12.70	4.76	1.20			•							•		0.05-4.00	0.05-0.50
CNGN 120412 T00520	12.90	12.70	4.76	1.20			•									0.05-4.00	0.05-0.50
CNGN 120412 T01025	12.90	12.70	4.76	1.20			•									0.05-4.00	0.05-0.50
CNGN 120412 T02025	12.90	12.70	4.76	1.20			•									0.05-4.00	0.05-0.50
CNGN 120416 T00520	12.90	12.70	4.76	1.60			•									0.50-5.00	0.05-0.50
CNGN 120708 T00520	12.90	12.70	7.94	0.80			•									0.05-3.00	0.05-0.30
CNGN 120708 T00820	12.90	12.70	7.94	0.80			•									0.05-3.00	0.05-0.30
CNGN 120712 T00520	12.90	12.70	7.94	1.20			•									0.05-4.00	0.05-0.50
CNGN 120712 T01020	12.90	12.70	7.94	1.20			•									0.05-4.00	0.05-0.50
CNGN 120716 T00520	12.90	12.70	7.94	1.60			•									0.50-5.00	0.05-0.50
CNGN 120716 T01020	12.90	12.70	7.94	1.60			•									0.50-5.00	0.05-0.50
CNGN 120720 T05030	12.90	12.70	7.94	2.00			•									0.50-5.50	0.05-0.55
CNGN 160712 T01020	16.12	15.88	7.94	1.20			•									0.05-4.00	0.05-0.50
CNGN 160716 T00520	16.12	15.88	7.94	1.60			•									0.50-5.00	0.05-0.50
CNGN 160716 T02025	16.12	15.88	7.94	1.60			•									0.50-5.00	0.05-0.50
CNGN 190624 T00520	19.30	19.05	6.35	2.40			•									0.05-6.00	0.05-0.60

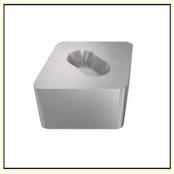
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

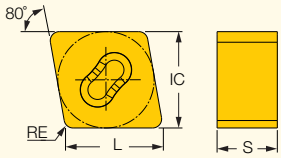
For tools, see pages: • CCBNR/L-F/X (71) • CCKNR/L-F/X (71) • CCLNR/L-F/X (72) • S-CCLNR/L-F/X (78)

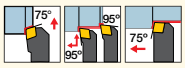
ISCAR CER-LINE

CNGX-DIMPLE (CER)

Negative 80° Rhombic Ground Ceramic Dimple Inserts for Cast Iron Roughing







Designation	Dimensions L	IC	S	RE	Silicon Nitride IS45C	IS45	IS26	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGX 120712 T01020	12.90	12.70	7.94	1.20	•	•		0.50-4.00	0.05-0.45
CNGX 120712 T02020	12.90	12.70	7.94	1.20			•	0.50-4.00	0.05-0.45
CNGX 120716 T01020	12.90	12.70	7.94	1.60	•	•		0.50-5.00	0.05-0.50
CNGX 120716 T02020	12.90	12.70	7.94	1.60			•	0.50-5.00	0.05-0.50

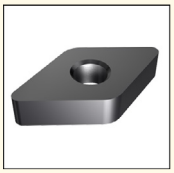
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

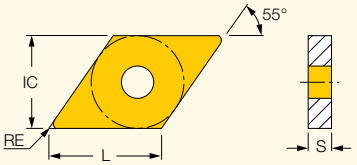
For tools, see pages: CCBNR/L-F/X (71) • CCKNR/L-F/X (71) • CCLNR/L-F/X (72) • S-CCLNR/L-F/X (78)

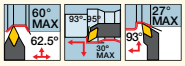
ISCAR CER-LINE

DNGA (CER)

Negative 55° Rhombic Double-Sided Ceramic Inserts for Machining Cast Iron and Hardened Steel







Designation	Dimensions L	IC	S	RE	Whisker IW10	Silicon Nitride IS45C	IS45	IS26	Alumina IN6	IN10	IN16C	IN18	IN20	Recommended Machining Data a_p (mm)	f (mm/rev)
DNGA 150404 S02025	15.50	12.70	4.76	0.40							•			0.05-2.00	0.05-0.20
DNGA 150404 T00520	15.50	12.70	4.76	0.40	•									0.05-2.00	0.05-0.20
DNGA 150404 T01025	15.50	12.70	4.76	0.40							•			0.05-2.00	0.05-0.20
DNGA 150408 S02025	15.50	12.70	4.76	0.80							•			0.05-3.00	0.05-0.30
DNGA 150408 T00520	15.50	12.70	4.76	0.80	•									0.05-3.00	0.05-0.30
DNGA 150408 T01020	15.50	12.70	4.76	0.80	•	•	•		•	•		•		0.05-3.00	0.05-0.30
DNGA 150408 T01025	15.50	12.70	4.76	0.80							•			0.05-3.00	0.05-0.30
DNGA 150408 T02020	15.50	12.70	4.76	0.80				•						0.05-3.00	0.05-0.30
DNGA 150408 Z02020	15.50	12.70	4.76	0.80	•									0.05-3.00	0.05-0.30
DNGA 150408 Z02025	15.50	12.70	4.76	0.80									•	0.05-3.00	0.05-0.30
DNGA 150412 S02025	15.50	12.70	4.76	1.20							•			0.05-4.00	0.05-0.50
DNGA 150412 T00520	15.50	12.70	4.76	1.20	•									0.05-4.00	0.05-0.50
DNGA 150412 T01020	15.50	12.70	4.76	1.20	•	•	•		•	•		•		0.05-4.00	0.05-0.50
DNGA 150412 T01025	15.50	12.70	4.76	1.20							•			0.05-4.00	0.05-0.50
DNGA 150412 T02020	15.50	12.70	4.76	1.20				•						0.05-4.00	0.05-0.50
DNGA 150416 T00520	15.50	12.70	4.76	1.60	•									0.50-5.00	0.05-0.50
DNGA 150416 T01020	15.50	12.70	4.76	1.60	•									0.50-5.00	0.05-0.50
DNGA 150424 T01020	15.50	12.70	4.76	2.40	•									0.05-6.00	0.05-0.60

• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

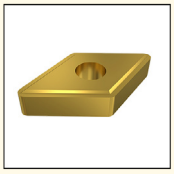
For tools, see pages: A/S-PDUNR/L (291) • AVC-DDUNR/L-VH (291) • C#-DDJNR/L (246) • C#-PDJNR/L-JHP (249) • DDJNR/L (245) • HSK A63WH-DDJNR/L (246) • HSK A63WH-DDNNN (246) • PDJNR/L (248) • PDJNR/L-JHP (249) • S-DDUNR/L (290) • AVC-DDUNR/L (290) • DDJNR/L-JHP-MC (245)

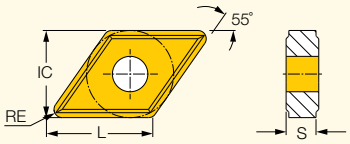
Material		H				K							S						
		Hard Materials				Cast Iron							Heat-Resistant Super Alloys						
Grade		IN10	IN16	IN16C	IN20	IN6	IN10	IN18	IW10	IS26	IS45C	IS45	IS05	IS10	IW10	IS14	IS15	IS45	IS55
	Heavy interrupted																		
	Light interrupted																		
	Continuous																		

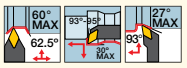
ISCAR CER-LINE

DNGG (CER)

Negative 55° Rhombic Double-Sided Ceramic Inserts with a Chipbreaker for Machining Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	Alumina IN16C	Recommended Machining Data a_p (mm)	f (mm/rev)
DNGG 150404Z01030AG	15.50	12.70	4.76	0.40	●	0.05-2.00	0.05-0.20
DNGG 150408Z01030AG	15.50	12.70	4.76	0.80	●	0.05-0.25	0.05-0.20
DNGG 150412Z01030AG	15.50	12.70	4.76	1.20	●	0.05-0.25	0.05-0.25

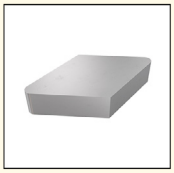
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

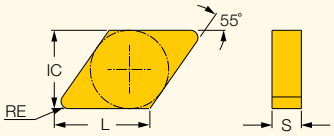
For tools, see pages: A/S-PDUNR/L (291) • C#-DDJNR/L (246) • C#-PDJNR/L-JHP (249) • HSK A63WH-DDJNR/L (246) • HSK A63WH-DDNNN (246) • PDJNR/L (248) • PDJNR/L-JHP (249) • S-DDUNR/L (290) • DDJNR/L-JHP-MC (245)

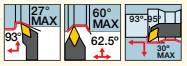
ISCAR CER-LINE

DNGN (CER)

Negative 55° Rhombic Double-Sided Ceramic Inserts for Machining Cast Iron and Hardened Steel







Designation	Dimensions L	IC	S	RE	Whisker IW10	Silicon Nitride IS45C	IS45	IS26	Alumina IN6	IN10	IN18	Recommended Machining Data a_p (mm)	f (mm/rev)
DNGN 110316 T00520	11.63	9.53	3.18	1.60	●							0.50-5.00	0.05-0.50
DNGN 150408 T01020	15.50	12.70	4.76	0.80	●	●	●		●	●	●	0.50-3.00	0.05-0.30
DNGN 150408 T02020	15.50	12.70	4.76	0.80				●				0.50-3.00	0.05-0.30
DNGN 150412 T01020	15.50	12.70	4.76	1.20	●	●			●	●	●	0.50-4.00	0.05-0.50
DNGN 150412 T02020	15.50	12.70	4.76	1.20				●				0.50-4.00	0.05-0.50
DNGN 150408 T00520	15.50	12.70	4.76	0.80	●							0.05-3.00	0.05-0.30
DNGN 150412 T00520	15.50	12.70	4.76	1.20	●							0.05-4.00	0.05-0.50
DNGN 150412 T02025	15.50	12.70	4.76	1.20	●							0.05-4.00	0.05-0.50
DNGN 150416 T00520	15.50	12.70	4.76	1.60	●							0.50-5.00	0.05-0.50
DNGN 150416 T01020	15.50	12.70	4.76	1.60	●							0.50-5.00	0.05-0.50
DNGN 150420 T02025	15.50	12.70	4.76	2.00	●							0.50-5.50	0.05-0.55
DNGN 150708 T01020	15.50	12.70	7.94	0.80	●							0.05-3.00	0.05-0.30
DNGN 150708 T02020	15.50	12.70	7.94	0.80	●							0.05-3.00	0.05-0.30
DNGN 150712 T00820	15.50	12.70	7.94	1.20	●							0.05-4.00	0.05-0.50
DNGN 150712 T02025	15.50	12.70	7.94	1.20	●							0.05-4.00	0.05-0.50
DNGN 150716 P10015	15.50	12.70	7.94	1.60	●							0.50-5.00	0.05-0.50
DNGN 150716 T01020	15.50	12.70	7.94	1.60	●							0.50-5.00	0.05-0.50

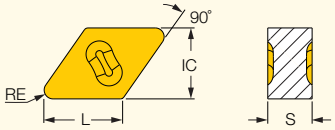
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

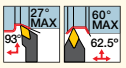
For tools, see pages: DDJNR/L-F (73)

ISCAR CER LINE

DNGX-DIMPLE (CER)

Negative 55° Rhombic
Double-Sided Ceramic Dimple
Inserts for Machining Cast Iron





Designation	Dimensions L	IC	S	RE	Silicon Nitride IS45C	IS45	IS26	Recommended Machining Data a_p (mm)	f (mm/rev)
DNGX 150712 T01020	15.50	12.70	7.94	1.20	•	•		0.50-4.00	0.05-0.50
DNGX 150712 T02020	15.50	12.70	7.94	1.20			•	0.50-4.00	0.05-0.50
DNGX 150716 T01020	15.50	12.70	7.94	1.60	•	•		0.50-5.00	0.05-0.50
DNGX 150716 T02020	15.50	12.70	7.94	1.60			•	0.50-5.00	0.05-0.50

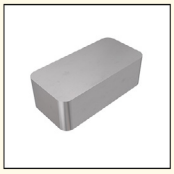
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

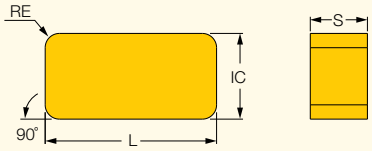
For tools, see pages: CDJNR/L-X (72) • S-CDQNR/L-X (79) • S-CDUNR/L-X (79)

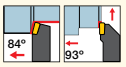
ISCAR CER LINE

LNMN (CER)

Negative Rectangular Ceramic
Inserts for Roll Turning







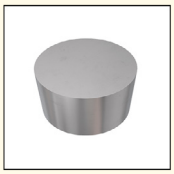
Designation	Dimensions L	IC	S	RE	Alumina IN10	IN16	IN20	Recommended Machining Data a_p (mm)	f (mm/rev)
LNMN 6688 SNX6	38.10	19.50	12.70	3.20	•	•	•	5.00-20.00	0.05-0.30

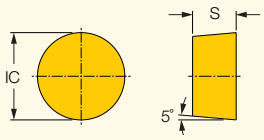
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

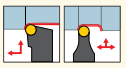
ISCAR CER LINE

RBGN (CER)

Positive Round Ceramic
Inserts for Machining Cast
Iron and Hardened Steel







Designation	Dimensions IC	S	Alumina IN10	IN16	IN20	Recommended Machining Data a_p (mm)	f (mm/rev)
RBGN 090400 P07020	9.53	4.76	•	•	•	0.50-3.00	0.05-0.30
RBGN 120600 P07020	12.70	6.35	•	•	•	1.00-5.00	0.05-0.30

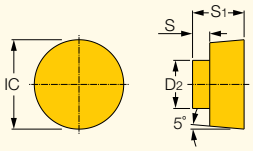
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

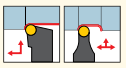
Material		H				K							S						
		Hard Materials				Cast Iron							Heat-Resistant Super Alloys						
Grade		IN10	IN16	IN16C	IN20	IN6	IN10	IN18	IW10	IS26	IS45C	IS45	IS05	IS10	IW10	IS14	IS15	IS45	IS55
	Heavy interrupted																		
	Light interrupted																		
	Continuous																		

ISCAR CER-LINE

RBGX (CER)

Positive Round Ceramic Inserts for Machining Cast Iron and Hardened Steel





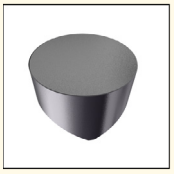
Designation	Dimensions IC	S	S1	D2	Alumina IN10	IN16	IN20	Recommended Machining Data a_p (mm)	f (mm/rev)
RBGX 20 P20015	20.00	5.00	15.00	10.00	●	●	●	2.00-8.00	0.05-0.30
RBGX 26 P20015	26.00	5.00	15.00	14.00	●	●	●	3.00-10.00	0.05-0.30
RBGX 32 P20015	32.00	6.00	21.00	16.00	●			3.00-13.00	0.05-0.30

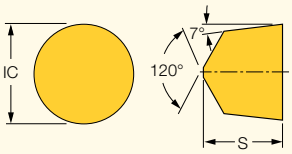
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

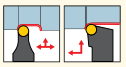
ISCAR CER-LINE

RCGX (CER)

Positive Round Ceramic Inserts for Machining Cast Iron, Hardened Steel, and Heat-Resistant Alloys







Designation	Dimensions IC	S	Bidemics IS05	IS10	Whisker IW10	Silicon Nitride IS14	IS15	IS45	Alumina IN10	IN16	IN20	Recommended Machining Data a_p (mm)	f (mm/rev)
RCGX 060400 E004	6.35	4.76	●	●	●	●	●	●				0.50-2.00	0.05-0.30
RCGX 060400 T01020	6.35	4.76	●	●	●	●	●	●				0.50-2.00	0.05-0.30
RCGX 060400 P07015	6.35	4.76							●	●	●	0.50-2.00	0.05-0.30
RCGX 060400 T01025	6.35	4.76							●	●	●	0.50-2.00	0.05-0.30
RCGX 060600 E004	6.35	6.35	●	●	●	●	●	●				0.50-2.00	0.05-0.30
RCGX 060600 T01020	6.35	6.35	●	●	●	●	●	●				0.50-2.00	0.05-0.30
RCGX 060600 P07015	6.35	6.35							●	●	●	0.50-2.00	0.05-0.30
RCGX 060600 T01025	6.35	6.35							●	●	●	0.50-2.00	0.05-0.30
RCGX 090700 P07015	9.53	7.94							●	●	●	0.50-3.00	0.05-0.30
RCGX 090700 E004	9.53	7.94	●	●	●	●	●	●				0.50-3.00	0.05-0.30
RCGX 090700 T01020	9.53	7.94	●	●	●	●						0.50-3.00	0.05-0.30
RCGX 090700 T01025	9.53	7.94							●	●	●	0.50-3.00	0.05-0.30
RCGX 120700 E004	12.70	7.94	●	●	●	●	●	●				0.50-3.00	0.05-0.30
RCGX 120700 T01020	12.70	7.94	●	●	●	●						0.50-3.00	0.05-0.30
RCGX 120700 P07015	12.70	7.94							●	●	●	0.50-3.00	0.05-0.30
RCGX 120700 T01025	12.70	7.94							●	●	●	0.50-3.00	0.05-0.30

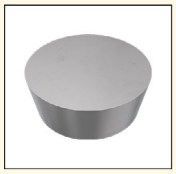
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

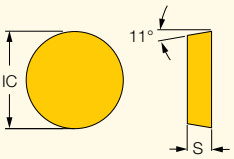
For tools, see pages: CRDCN-F (73) • RCGAD #R/L-T# (91)

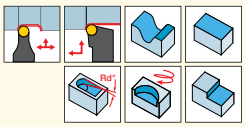
ISCAR CER-LINE

RPGN (CER)

Positive Round Ceramic Inserts for Machining Cast Iron and Heat-Resistant Alloys







Designation	Dimensions IC	Dimensions S	Silicon IS14	Silicon IS15	Silicon IS45	Recommended Machining Data a_p (mm)	Recommended Machining Data f (mm/rev)	Recommended Machining Data f_z (mm/rev)(1)
RPGN 060200 E004	6.35	2.38	•	•	•	1.00-1.50	0.08-0.15	0.10-0.30
RPGN 060200 T00520	6.35	2.38			•	1.00-1.50	0.08-0.15	0.10-0.30
RPGN 060200 T01020	6.35	2.38	•	•	•	1.00-1.50	0.08-0.15	0.10-0.30
RPGN 090300 E004	9.53	3.18	•	•	•	1.00-2.00	0.08-0.15	0.10-0.30
RPGN 090300 T01020	9.53	3.18	•	•	•	1.00-2.00	0.08-0.15	0.10-0.30
RPGN 120400 E004	12.70	4.76	•	•	•	1.00-3.00	0.08-0.15	0.10-0.30
RPGN 120400 T01020	12.70	4.76	•	•	•	1.00-3.00	0.08-0.15	0.10-0.30

• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

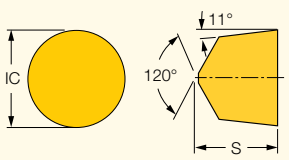
(1) For milling applications

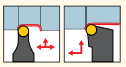
For tools, see pages: ERP (110)

ISCAR CER-LINE

RPGX (CER)

Positive Round Ceramic Inserts for Machining Cast Iron, Hardened Steel and Heat-Resistant Alloys





Designation	Dimensions IC	Dimensions S	Bidemics IS05	Bidemics IS10	Whisker IW10	Silicon Nitride IS14	Silicon Nitride IS15	Silicon Nitride IS45	Recommended Machining Data a_p (mm)	Recommended Machining Data f (mm/rev)
RPGX 060400 E004	6.35	4.76	•	•	•	•	•	•	0.50-1.50	0.10-0.30
RPGX 060400 T01020	6.35	4.76	•	•	•	•		•	0.50-1.50	0.10-0.30
RPGX 060600 E004	6.35	6.35	•	•	•	•	•	•	0.50-1.50	0.10-0.30
RPGX 060600 T01020	6.35	6.35	•	•	•	•	•	•	0.50-1.50	0.10-0.30
RPGX 090700 E004	6.35	6.35	•	•	•	•	•	•	0.50-2.00	0.10-0.30
RPGX 090700 T01020	9.53	7.94	•	•	•	•	•		0.50-2.00	0.10-0.30
RPGX 120700 E004	12.70	7.94	•	•	•	•	•	•	0.50-3.00	0.10-0.30
RPGX 120700 T01020	12.70	7.94	•	•	•	•	•	•	0.50-4.50	0.10-0.45

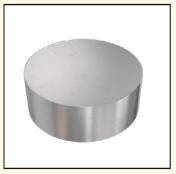
• Tools can be supplied on request. • For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

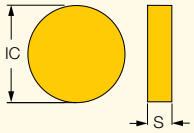
Material		H				K							S						
		Hard Materials				Cast Iron							Heat-Resistant Super Alloys						
Grade		IN10	IN16	IN16C	IN20	IN6	IN10	IN18	IW10	IS26	IS45C	IS45	IS05	IS10	IW10	IS14	IS15	IS45	IS55
	Heavy interrupted																		
	Light interrupted																		
	Continuous																		

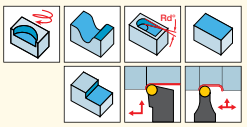
ISCAR CER-LINE

RNGN (CER)

Negative Round Double-Sided Ceramic Inserts for Machining Cast Iron, Hardened Steel, and Heat-Resistant Alloys







Designation	Dimensions IC	S	Bidemics IS05	Bidemics IS10	Whisker IW10	Silicon Nitride IS14	Silicon Nitride IS15	Silicon Nitride IS45C	Silicon Nitride IS45	Silicon Nitride IS55	Silicon Nitride IS26	Alumina IN10	Alumina IN16	Alumina IN16C	Alumina IN20	Recommended Machining Data a_p (mm)	f (mm/rev)
RNGN 120400 E004	12.70	4.76	●	●	●	●	●		●	●						0.05-3.00	0.05-0.50
RNGN 120400 T01020	12.70	4.76	●	●	●	●	●	●	●	●						0.05-3.00	0.05-0.50
RNGN 120400 T02020	12.70	4.76									●					0.05-3.00	0.05-0.50
RNGN 120400 S02025	12.70	4.76												●		0.05-3.00	0.05-0.50
RNGN 120400 T01025	12.70	4.76												●		0.05-3.00	0.05-0.50
RNGN 120700 E004	12.70	7.94	●	●	●	●	●		●	●						0.05-3.00	0.05-0.50
RNGN 120700 T01020	12.70	7.94	●	●	●	●	●	●		●	●					0.10-4.50	0.07-0.50
RNGN 120700 T00520	12.70	7.94			●				●							0.05-3.00	0.05-0.50
RNGN 120700 P20015	12.70	7.94										●	●		●	0.05-3.00	0.05-0.50
RNGN 120700 S02025	12.70	7.94												●		0.05-3.00	0.05-0.50
RNGN 120700 T02025	12.70	7.94												●		0.05-3.00	0.05-0.50
RNGN 190700 E004	19.05	7.94					●		●	●						1.00-5.00	0.10-0.30
RNGN 190700 T01020	19.05	7.94							●	●						0.10-3.00	0.07-0.20
RNGN 250700 E004	25.40	7.94					●		●	●						1.00-6.50	0.10-0.30
RNGN 250700 T01020	25.40	7.94					●		●	●						1.00-6.50	0.10-0.30

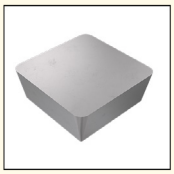
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

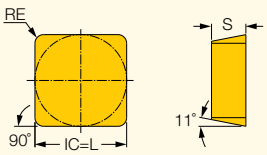
For tools, see pages: • CRDNN-F (74) • CRGNR/L (254) • FRN (110)

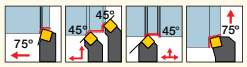
ISCAR CER-LINE

SPGN (CER)

Positive Square Ceramic Inserts for Machining Cast Iron and Hardened Steel







Designation	Dimensions IC	S	RE	Silicon Nitride IS26	Alumina IN10	Alumina IN18	Recommended Machining Data a_p (mm)	f (mm/rev)
SPGN 090308 T01020	9.53	3.18	0.80		●	●	0.50-2.00	0.50-0.20
SPGN 120308 T01020	12.70	3.18	0.80		●	●	0.50-3.00	0.50-0.20
SPGN 120312 T01020	12.70	3.18	1.20		●	●	0.50-4.00	0.50-0.20
SPGN 120316 T01020	12.70	3.18	1.60		●	●	0.50-5.00	0.50-0.20
SPGN 120412 T01020	12.70	4.76	1.20	●			0.50-4.00	0.50-0.20
SPGN 120416 T01020	12.70	4.76	1.60	●			0.50-5.00	0.50-0.20

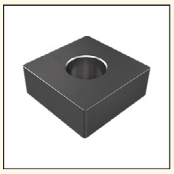
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

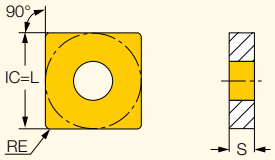
For tools, see pages: CSSPR/L (246) • S-CSKPR (284)

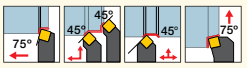
ISCAR CER-LINE

SNGA (CER)

Negative Square Double-Sided Ceramic Inserts for Machining Cast Iron and Hardened Steel







Designation	Dimensions IC	S	RE	Silicon Nitride IS45C	IS45	IS26	Alumina IN6	IN10	IN16C	IN18	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGA 120404 S02025	12.70	4.76	0.40						●		0.05-2.00	0.05-0.20
SNGA 120404 T01025	12.70	4.76	0.40						●		0.05-2.00	0.05-0.20
SNGA 120408 S02025	12.70	4.76	0.80						●		0.05-3.00	0.05-0.30
SNGA 120408 T01020	12.70	4.76	0.80	●	●		●	●		●	0.05-3.00	0.05-0.30
SNGA 120408 T01025	12.70	4.76	0.80						●		0.05-3.00	0.05-0.30
SNGA 120408 T02020	12.70	4.76	0.80			●					0.05-3.00	0.05-0.30
SNGA 120412 S02025	12.70	4.76	1.20						●		0.05-4.00	0.05-0.45
SNGA 120412 T01020	12.70	4.76	1.20	●	●		●	●		●	0.05-4.00	0.05-0.45
SNGA 120412 T01025	12.70	4.76	1.20						●		0.05-4.00	0.05-0.45
SNGA 120412 T02020	12.70	4.76	1.20			●					0.05-4.00	0.05-0.45
SNGA 120416 T01020	12.70	4.76	1.60	●	●		●			●	0.50-5.00	0.05-0.50
SNGA 120416 T02020	12.70	4.76	1.60			●					0.15-5.00	0.05-0.50

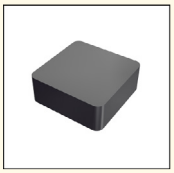
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

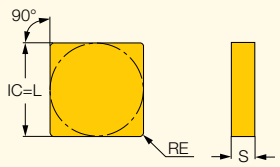
For tools, see pages: C#-MULNR/L-MW (268) • DSBNR/L (256) • DSDNN (257) • DSKNR/L (257) • DSSNR/L (257) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PSBNR/L (258) • PSDNN (258) • PSDNN-JHP (259) • PSKNR/L (259) • PSSNR/L (260) • PSSNR/L-JHP (260)

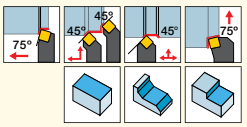
ISCAR CER-LINE

SNGN (CER)

Negative Square Double-Sided Ceramic Inserts for Machining Cast Iron, Hardened Steel and Heat-Resistant Alloys







Designation	Dimensions IC	S	RE	Silicon Nitride IS15	IS45C	IS45	IS55	IS26	Alumina IN6	IN10	IN16C	IN18	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGN 120404 S02025	12.70	4.76	0.40								●		0.05-2.00	0.05-0.20
SNGN 120408 S02025	12.70	4.76	0.80								●		0.05-3.00	0.05-0.30
SNGN 120408 T01020	12.70	4.76	0.80		●	●		●	●	●		●	0.05-3.00	0.05-0.30
SNGN 120408 T02020	12.70	4.76	0.80					●					0.05-3.00	0.05-0.30
SNGN 120412 S02025	12.70	4.76	1.20								●		0.05-4.00	0.05-0.45
SNGN 120412 T01020	12.70	4.76	1.20		●	●		●	●	●		●	0.05-4.00	0.05-0.45
SNGN 120416 T01020	12.70	4.76	1.60		●	●		●	●	●		●	0.50-5.00	0.05-0.50
SNGN 120416 T02020	12.70	4.76	1.60					●					0.50-5.00	0.05-0.50
SNGN 150716 EM04X	15.88	7.94	1.60	●		●	●						1.00-4.00	0.10-0.30
SNGN 150716 T01020	15.88	7.94	1.60	●		●	●						1.00-4.00	0.10-0.30
SNGN 190716 EM04X	19.05	7.94	1.60	●		●	●						1.00-4.00	0.10-0.30
SNGN 190716 T01020	19.05	7.94	1.60	●		●	●						1.00-4.00	0.10-0.30
SNGN 250924 EM04X	25.40	9.52	2.40	●		●	●						1.00-6.00	0.10-0.30
SNGN 250924 T01020	25.40	9.52	2.40	●		●	●						1.00-6.00	0.10-0.30

• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

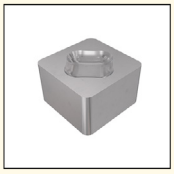
For tools, see pages: CSDNN-CE/CEA (255) • CSDNN-F/X (74) • CSKNR/L-F/X (75) • CSRNR/L-F/X (75) • CSSNR/L-F/X (76) • CSXNR/L-F/X (76) • CSYNR/L-F/X (77) • F45SN (111) • F75SN (111) • F88SN (112) • F90SN (112) • S-CSSNR/L-X (80)

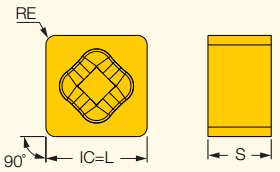
Material		H				K							S						
		Hard Materials				Cast Iron							Heat-Resistant Super Alloys						
Grade		IN10	IN16	IN16C	IN20	IN6	IN10	IN18	IW10	IS26	IS45C	IS45	IS05	IS10	IW10	IS14	IS15	IS45	IS55
	Heavy interrupted										▲	▲							
	Light interrupted								▲	▲					▲	▲	▲	▲	▲
	Continuous	▲	▲	▲	▲	▲	▲	▲					▲	▲					

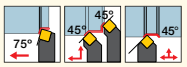
ISCAR CER-LINE

SNGX-DIMPLE (CER)

Negative Square
Double-Sided Ceramic Dimple
Inserts for Machining Cast Iron







Designation	Dimensions IC	S	RE	Silicon Nitride IS45C	IS45	IS26	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGX 120712 T01020	12.70	7.94	1.20	•	•		0.50-4.00	0.05-0.45
SNGX 120712 T02020	12.70	7.94	1.20			•	0.50-4.00	0.05-0.45
SNGX 120716 T01020	12.70	7.94	1.60		•		0.50-5.00	0.05-0.50
SNGX 120716 T02020	12.70	7.94	1.60			•	0.50-5.00	0.05-0.50
SNGX 150716 T02020	15.88	7.94	1.60	•	•	•	0.50-5.00	0.05-0.50

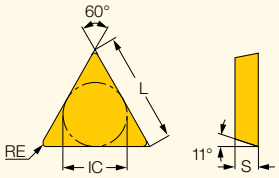
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

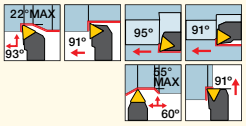
For tools, see pages: CSDNN-F/X (74) • CSKNR/L-F/X (75) • CSRNR/L-F/X (75) • CSSNR/L-F/X (76) • CSXNR/L-F/X (76) • CSYNR/L-F/X (77) • S-CSKNR/L-X (79) • S-CSSNR/L-X (80) • S-CSYNR/L-X (80)

ISCAR CER-LINE

TPGN (CER)

Positive 60° Triangular Ceramic
Inserts for Machining Cast
Iron and Hardened Steel





Designation	Dimensions L	IC	S	RE	Alumina IN10	IN18	Recommended Machining Data a_p (mm)	f (mm/rev)
TPGN 110304 T01020	11.00	6.35	3.18	0.40	•	•	0.50-2.00	0.05-0.20
TPGN 160304 T01020	16.50	9.53	3.18	0.40	•	•	0.50-2.00	0.05-0.20
TPGN 160308 T01020	16.50	9.53	3.18	0.80	•	•	0.50-3.00	0.05-0.30
TPGN 160312 T01020	16.50	9.53	3.18	1.20	•	•	0.50-3.00	0.05-0.30

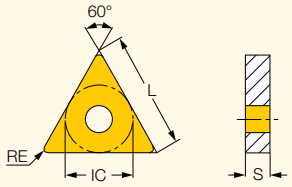
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

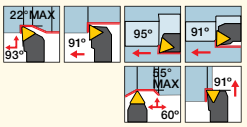
For tools, see pages: CTFPR/L (261) • CTGPR/L (262) • S-CTFPR/L (294)

ISCAR CER-LINE

TNGA (CER)

Negative 60° Triangular Double-Sided Ceramic Inserts for Machining Cast Iron, Hardened Steel, and Heat-Resistant Alloys





Designation	Dimensions L	IC	S	RE	Silicon Nitride IS45C	IS45	IS26	Alumina IN6	IN10	IN16C	IN18	Recommended Machining Data a_p (mm)	f (mm/rev)
TNGA 160404 S02025	16.50	9.53	4.76	0.40						●		0.05-2.00	0.05-0.20
TNGA 160404 T01025	16.50	9.53	4.76	0.40						●		0.05-2.00	0.05-0.20
TNGA 160408 S02025	16.50	9.53	4.76	0.80						●		0.05-3.00	0.05-0.30
TNGA 160408 T01020	16.50	9.53	4.76	0.80	●	●		●	●		●	0.05-3.00	0.05-0.30
TNGA 160408 T01025	16.50	9.53	4.76	0.80						●		0.05-3.00	0.05-0.30
TNGA 160408 T02020	16.50	9.53	4.76	0.80			●					0.05-3.00	0.05-0.30
TNGA 160412 S02025	16.50	9.53	4.76	1.20						●		0.05-4.00	0.05-0.50
TNGA 160412 T01020	16.50	9.53	4.76	1.20	●	●		●	●		●	0.05-4.00	0.05-0.50
TNGA 160412 T01025	16.50	9.53	4.76	1.20						●		0.05-4.00	0.05-0.50
TNGA 160412 T02020	16.50	9.53	4.76	1.20			●					0.05-4.00	0.05-0.50
TNGA 160416 T01020	16.50	9.53	4.76	1.60	●	●		●	●		●	0.50-5.00	0.05-0.50
TNGA 160416 T02020	16.50	9.53	4.76	1.60			●					0.50-5.00	0.05-0.50

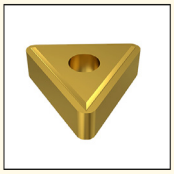
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

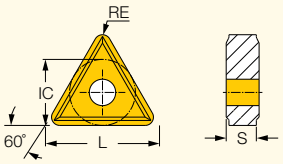
For tools, see pages: A-PTFNR/L-X/G (295) • C#-DTGNR/L (262) • DTGNR/L (262) • MTENN-W (263) • MTJNR/L-W (263) • PTFNR/L (264) • PTGNR/L (264) • PTGNR/L-X (265) • PTGNR/L-X-JHP (265) • PTGNR/L-X-JHP-MC (266) • S-MTLNR/L-W (295) • S-PTFNR/L (296)

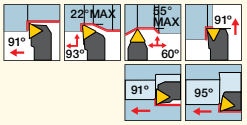
ISCAR CER-LINE

TNGG (CER)

Negative 60° Triangular Ceramic Inserts with a Chipbreaker for Machining Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	Alumina IN16C	Recommended Machining Data a_p (mm)	f (mm/rev)
TNGG 160404Z01030AG	16.50	9.53	4.76	0.40	●	0.05-2.00	0.05-0.20
TNGG 160408Z01030AG	16.50	9.53	4.76	0.80	●	0.05-0.25	0.05-0.20
TNGG 160412Z01030AG	16.50	9.53	4.76	1.20	●	0.05-0.25	0.05-0.25
TNGG 160416Z01030AG	16.50	9.53	4.76	1.60	●	0.05-0.30	0.05-0.30

• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

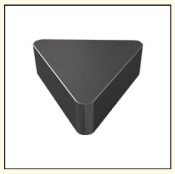
For tools, see pages: A-PTFNR/L-X/G (295)

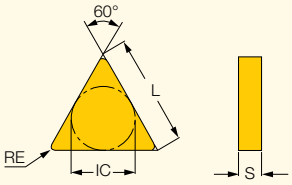
Material		H				K							S						
		Hard Materials				Cast Iron							Heat-Resistant Super Alloys						
Grade		IN10	IN16	IN16C	IN20	IN6	IN10	IN18	IW10	IS26	IS45C	IS45	IS05	IS10	IW10	IS14	IS15	IS45	IS55
	Heavy interrupted																		
	Light interrupted																		
	Continuous																		

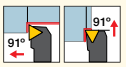
ISCAR CER-LINE

TNGN (CER)

Negative 60° Triangular Double-Sided Ceramic Inserts for Machining Hardened Steel, Cast Iron and Heat Resistant Alloys







Designation	Dimensions L	IC	S	RE	Silicon Nitride IS45C	IS26	Alumina IN6	IN10	IN16C	IN18	Recommended Machining Data a_p (mm)	f (mm/rev)
TNGN 160408 T01020	16.50	9.53	4.76	0.80	●		●	●		●	0.05-3.00	0.05-0.30
TNGN 160408 T02020	16.50	9.53	4.76	0.80		●					0.05-3.00	0.05-0.30
TNGN 160412 T01020	16.50	9.53	4.76	1.20	●		●	●		●	0.05-4.00	0.05-0.50
TNGN 160412 T02020	16.50	9.53	4.76	1.20		●					0.05-4.00	0.05-0.50
TNGN 160416 T01020	16.50	9.53	4.76	1.60	●		●	●		●	0.50-5.00	0.05-0.50
TNGN 160416 T02020	16.50	9.53	4.76	1.60		●					0.50-5.00	0.05-0.50
TNGN 160404 S02025	16.50	9.53	4.76	0.40					●		0.05-2.00	0.05-0.20
TNGN 160408 S02025	16.50	9.53	4.76	0.80					●		0.05-3.00	0.05-0.30
TNGN 160412 S02025	16.50	9.53	4.76	1.20					●		0.05-4.00	0.05-0.50

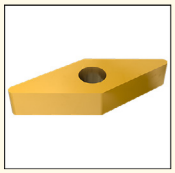
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

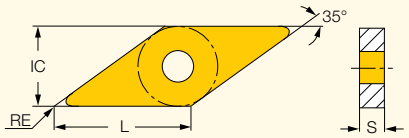
For tools, see pages: CTFNR/L-F (77) • CTGNR/L-F (78) • F90TN (113)

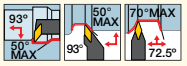
ISCAR CER-LINE

VNGA (CER)

Negative 35° Rhombic Double-Sided Ceramic Inserts for Machining Cast Iron, Cast Iron and Heat Resistant Alloys.







Designation	Dimensions L	IC	S	RE	Silicon Nitride IS45C	IS45	IS26	Alumina IN6	IN10	IN16C	IN18	Recommended Machining Data a_p (mm)	f (mm/rev)
VNGA 160404 S02025	16.60	9.53	4.76	0.40						●		0.05-2.00	0.05-0.20
VNGA 160404 T01020	16.60	9.53	4.76	0.40				●	●		●	0.05-2.00	0.05-0.20
VNGA 160404 T01025	16.60	9.53	4.76	0.40						●		0.05-2.00	0.05-0.20
VNGA 160408 S02025	16.60	9.53	4.76	0.80						●		0.05-3.00	0.05-0.30
VNGA 160408 T01020	16.60	9.53	4.76	0.80	●	●		●	●		●	0.05-3.00	0.05-0.30
VNGA 160408 T01025	16.60	9.53	4.76	0.80						●		0.05-3.00	0.05-0.30
VNGA 160408 T02020	16.60	9.53	4.76	0.80			●					0.05-3.00	0.05-0.30
VNGA 160412 S02025	16.60	9.53	4.76	1.20						●		0.05-4.00	0.05-0.50
VNGA 160412 T01020	16.60	9.53	4.76	1.20	●	●		●	●		●	0.05-4.00	0.05-0.50
VNGA 160412 T01025	16.60	9.53	4.76	1.20						●		0.05-4.00	0.05-0.50
VNGA 160412 T02020	16.60	9.53	4.76	1.20			●					0.05-4.00	0.05-0.50

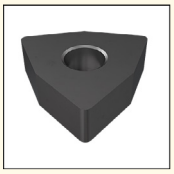
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

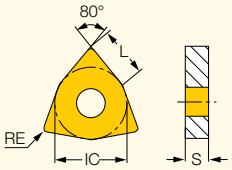
For tools, see pages: MVJNR/L (270) • MVVNN (270)

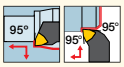
ISCAR CER LINE

WNGA (CER)

Negative 80° Trigon
Double-Sided Ceramic Inserts for Machining Cast Iron, Hardened Steel and Heat-Resistant Alloys







Designation	Dimensions L	IC	S	RE	Whisker IW10	Silicon Nitride IS45C	IS45	IS26	Alumina IN16C	Recommended Machining Data a_p (mm)	f (mm/rev)
WNGA 080404 S02025	8.70	12.70	4.76	0.40					●	0.05-2.00	0.05-0.20
WNGA 080408 S02025	8.70	12.70	4.76	0.80					●	0.05-3.00	0.05-0.30
WNGA 080408 T00520	8.70	12.70	4.76	0.80	●					0.05-3.00	0.05-0.30
WNGA 080408 T01020	8.70	12.70	4.76	0.80		●	●			0.05-3.00	0.05-0.30
WNGA 080408 T02020	8.70	12.70	4.76	0.80				●		0.05-3.00	0.05-0.30
WNGA 080412 S02025	8.70	12.70	4.76	1.20					●	0.05-3.00	0.05-0.45
WNGA 080412 T01020	8.70	12.70	4.76	1.20		●	●			0.05-3.00	0.05-0.45
WNGA 080412 T02020	8.70	12.70	4.76	1.20				●		0.05-3.00	0.05-0.45
WNGA 080416 T01020	8.70	12.70	4.76	1.60		●	●			0.50-3.00	0.05-0.50
WNGA 080416 T02020	8.70	12.70	4.76	1.60				●		0.50-3.00	0.05-0.50

• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

For tools, see pages: A/S-MWLNR/L-W (301) • A/S-PWLNR/L (302) • C#-MULNR/L-MW (268) • C#-PWLNR/L-08-JHP (281) • DWLNR/L (277) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • MWLNR/L-W (278) • PWLNR/L (278) • PWLNR/L-08-JHP (279) • PWLNR/L-X (279) • PWLNR/L-X-JHP (280) • PWLNR/L-X-JHP-MC (281) • S-DWLNR/L (301) • S-MULNR-MW (297) • DWLNR/L-JHP-MC (277)

Material		H				K							S						
		Hard Materials				Cast Iron							Heat-Resistant Super Alloys						
Grade		IN10	IN16	IN16C	IN20	IN6	IN10	IN18	IW10	IS26	IS45C	IS45	IS05	IS10	IW10	IS14	IS15	IS45	IS55
	Heavy interrupted										▲	▲							
	Light interrupted								▲	▲					▲	▲	▲	▲	▲
	Continuous	▲	▲	▲	▲	▲	▲	▲					▲	▲					

CERAMIC TURNING TOOLS

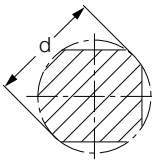
Toolholder Identification System

Toolholder				M	W	L	N	R	25	25	M	-	08	W	X
				4	5	6	7	8	9	10	3		11	12	13
Boring Bar	S	25	S	M	W	L	N	R				-	08	04	X
	1	2	3	4	5	6	7	8					11	12	13

1 Boring Bar

S	steel shank
A	coolant through steel shank
C	solid carbide shank
E	coolant through carbide shank

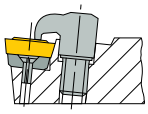
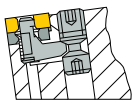
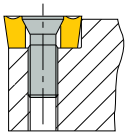
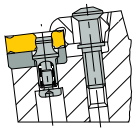
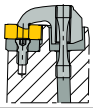
2 Bar Diameter



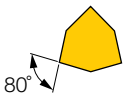
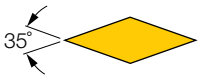
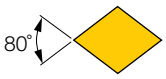
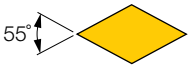
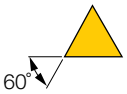
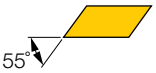
3 Tool Length

A = 32	H = 100	Q = 180
B = 40	J = 110	R = 200
C = 50	K = 125	S = 250
D = 60	L = 140	T = 300
E = 70	M = 150	U = 350
F = 80	N = 160	V = 400
G = 90	P = 170	W = 450
		Y = 500
		X = Special

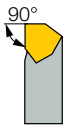
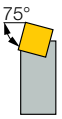
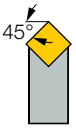
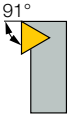
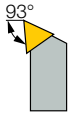
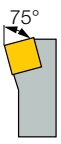
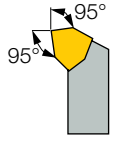
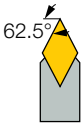
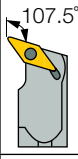
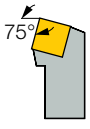
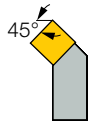
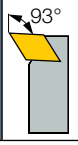
4 Clamping System

C	 top clamp iscadex	P	 lever lock
S	 SC-screw clamping	M...W	 top wedge lock
D	 rigid clamp		

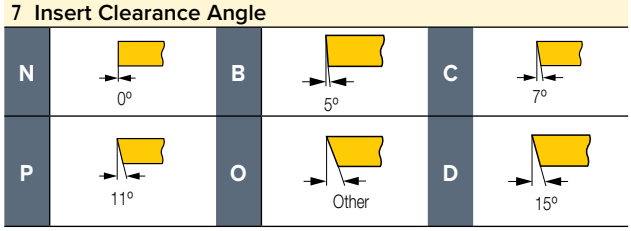
5 Insert Shape

W		V	
C		D	
T		S	
R		K	
L		Q	

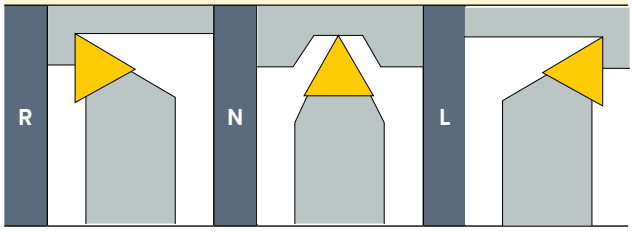
6 Approach Angle

A		B		D		E	
F		G		J		K	
L		N		Q		R	
S		U		V		X	

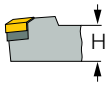
7 Insert Clearance Angle



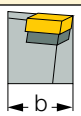
8 Hand of Tool



9 Shank Height

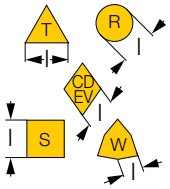


10 Shank Width



11 Insert Size

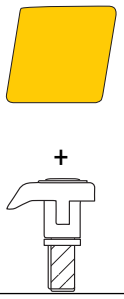
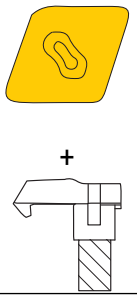
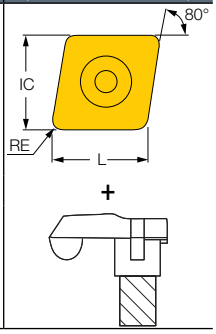
cutting edge length



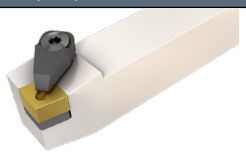
12 Thickness of Insert

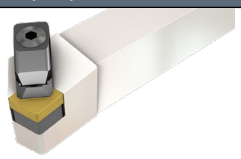
Index	S (mm)
03	3.18
04	4.76
06	6.35
07	7.94
09	9.52

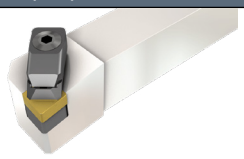
13 Clamping System

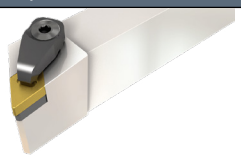
F - Flat (CNGN)	X - Special Dimple (CNGX)	R - Round Dimple (CNGX - ROUND)
		

Ceramic Turning Tools

CCBNR/L-F/X 71


CCKNR/L-F/X 71


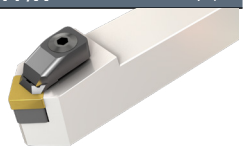
CCLNR/L-F/X 72


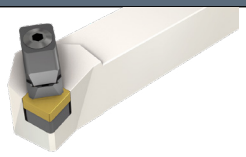
CDJNR/L-X 72


DDJNR/L-F 73

CRDCN-F 73

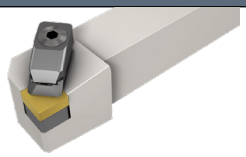
CRDNN-F 74

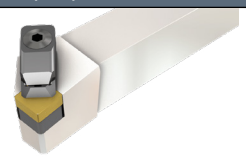
CSDNN-F/X 74


CSKNR/L-F/X 75


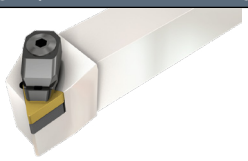
CSRNR/L-F/X 75

CSSNR/L-F/X 76

CSXNR/L-F/X 76


CSYNR/L-F/X 77


CTFNR/L-F 77

CTGNR/L-F 78


S-CCLNR/L-F/X 78

S-CDQNR/L-X 79

S-CDUNR/L-X 79

S-CSKNR/L-X 79

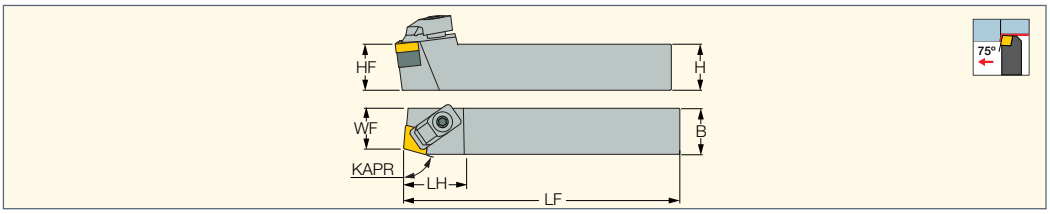
S-CSSNR/L-X 80

S-CSYNR/L-X 80

ISCAR CER-LINE

CCBNR/L-F/X

75° Lead Angle Clamp Lock Tools Carrying Negative 80° Rhombic Ceramic Inserts



Designation	H	HF	B	LF	LH	WF	KAPR(1)	MIID(2)
CCBNR/L 2525M-1204F	25.0	25.0	25.0	150.00	34.0	22.00	75.0	CNGN 1204
CCBNR/L 2525M-1207F	25.0	25.0	25.0	150.00	34.0	22.00	75.0	CNGN 1207
CCBNR/L 3225P-1204F	32.0	32.0	25.0	170.00	34.0	22.00	75.0	CNGN 1204
CCBNR/L 3225P-1207F	32.0	32.0	25.0	170.00	34.0	22.00	75.0	CNGN 1207
CCBNR/L 2525M-1607F	25.0	25.0	25.0	150.00	34.0	27.00	75.0	CNGN 1607
CCBNR/L 3225P-1607F	32.0	32.0	25.0	170.00	34.0	27.00	75.0	CNGN 1607
CCBNR/L 2525M-1207X	25.0	25.0	25.0	150.00	34.0	22.00	75.0	CNGX 1207
CCBNR/L 3225P-1207X	32.0	32.0	25.0	170.00	34.0	22.00	75.0	CNGX 1207

(1) Tool cutting edge angle

(2) Master insert identification

For inserts, see pages: CNGN (CER) (55) • CNGN S (CBN) (147) • CNGX-DIMPLE (CER) (56)

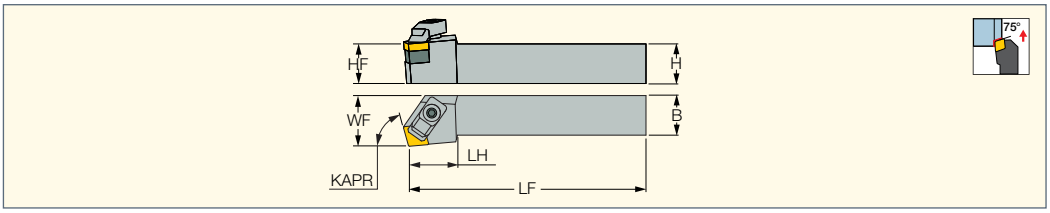
Spare Parts

Designation					
CCBNR/L 2525M-1204F	SR M6X1-L13.5 T20	HW 4.0	ICSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CCBNR/L 2525M-1207F	SR M6X1-L13.5 T20	HW 4.0	ICSN 434A	CB-CDRS	TCL CDSV-N-09-16F
CCBNR/L 3225P-1204F	SR M6X1-L13.5 T20	HW 4.0	ICSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CCBNR/L 3225P-1207F	SR M6X1-L13.5 T20	HW 4.0	ICSN 434A	CB-CDRS	TCL CDSV-N-09-16F
CCBNR/L 2525M-1607F	SR M8X1-L13.5-D11 T25	HW 4.0	ICSN 533A	CB-CDRS	TCL CDSV-N-09-16F
CCBNR/L 3225P-1607F	SR M8X1-L13.5-D11 T25	HW 4.0	ICSN 533A	CB-CDRS	TCL CDSV-N-09-16F
CCBNR/L 2525M-1207X	SR M6X1-L13.5 T20	HW 4.0	ICSN 434A		TCL C-N-12-X
CCBNR/L 3225P-1207X	SR M6X1-L13.5 T20	HW 4.0	ICSN 434A		TCL C-N-12-X

ISCAR CER-LINE

CCKNR/L-F/X

75° Lead Angle Clamp Lock Tools Carrying Negative 80° Rhombic Ceramic Inserts for Facing



Designation	H	HF	B	LF	LH	WF	KAPR(1)	MIID(2)
CCKNR/L 2525M-1204F	25.0	25.0	25.0	150.00	29.0	32.00	75.0	CNGN 1204
CCKNR/L 2525M-1207F	25.0	25.0	25.0	150.00	29.0	32.00	75.0	CNGN 1207
CCKNR/L 3225P-1204F	32.0	32.0	25.0	170.00	29.0	32.00	75.0	CNGN 1204
CCKNR/L 3225P-1207F	32.0	32.0	25.0	170.00	29.0	32.00	75.0	CNGN 1207
CCKNR/L 2525M-1207X	25.0	25.0	25.0	150.00	29.0	32.00	75.0	CNGX 1207
CCKNR/L 3225P-1207X	32.0	32.0	25.0	170.00	29.0	32.00	75.0	CNGX 1207

(1) Tool cutting edge angle

(2) Master insert identification

For inserts, see pages: CNGN (CER) (55) • CNGN S (CBN) (147) • CNGX-DIMPLE (CER) (56)

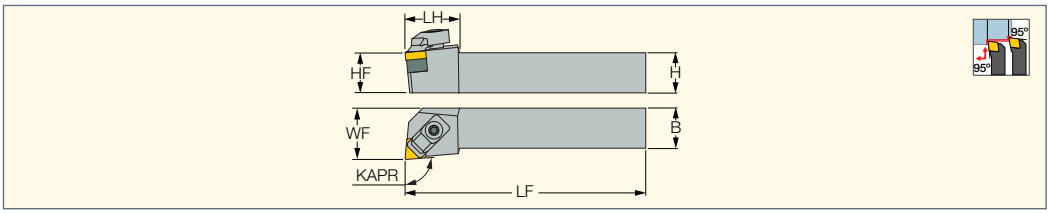
Spare Parts

Designation					
CCKNR/L 2525M-1204F	SR M6X1-L13.5 T20	HW 4.0	ICSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CCKNR/L 2525M-1207F	SR M6X1-L13.5 T20	HW 4.0	ICSN 434A	CB-CDRS	TCL CDSV-N-09-16F
CCKNR/L 3225P-1204F	SR M6X1-L13.5 T20	HW 4.0	ICSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CCKNR/L 3225P-1207F	SR M6X1-L13.5 T20	HW 4.0	ICSN 434A	CB-CDRS	TCL CDSV-N-09-16F
CCKNR/L 2525M-1207X	SR M6X1-L13.5 T20	HW 4.0	ICSN 434A		TCL C-N-12-X
CCKNR/L 3225P-1207X	SR M6X1-L13.5 T20	HW 4.0	ICSN 434A		TCL C-N-12-X

ISCAR CER-LINE

CCLNR/L-F/X

Clamp Lock Tools Carrying Negative 80° Rhombic Ceramic Inserts



Designation	H	HF	B	LF	LH	WF	KAPR[1]	MIID[2]
CCLNR/L 2525M-1204F	25.0	25.0	25.0	150.00	34.0	32.00	95.0	CNGN 1204
CCLNR/L 2525M-1207F	25.0	25.0	25.0	150.00	34.0	32.00	95.0	CNGN 1207
CCLNR/L 3225P-1204F	32.0	32.0	25.0	170.00	34.0	32.00	95.0	CNGN 1204
CCLNR/L 3225P-1207F	32.0	32.0	25.0	170.00	34.0	32.00	95.0	CNGN 1207
CCLNR/L 2525M-1607F	25.0	25.0	25.0	150.00	34.0	32.00	95.0	CNGN 1607
CCLNR/L 3225P-1607F	32.0	32.0	25.0	170.00	38.0	32.00	95.0	CNGN 1607
CCLNR/L 2525M-1207X	25.0	25.0	25.0	150.00	34.0	32.00	95.0	CNGX 1207
CCLNR/L 3225P-1207X	32.0	32.0	25.0	170.00	34.0	32.00	95.0	CNGX 1207

[1] Tool cutting edge angle

[2] Master insert identification

For inserts, see pages: CNGN (CER) (55) • CNGN S (CBN) (147) • CNGX-DIMPLE (CER) (56)

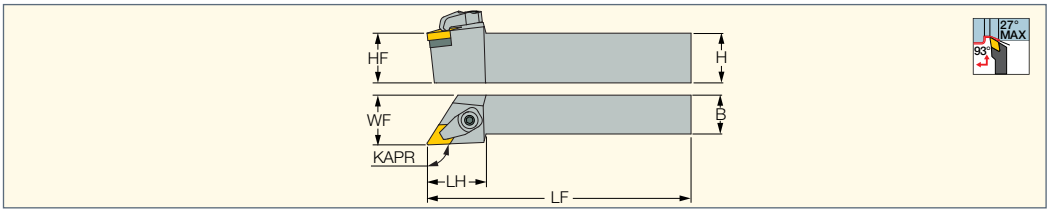
Spare Parts

Designation					
CCLNR/L 2525M-1204F	SR M6X1-L13.5 T20	HW 4.0	ICSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CCLNR/L 2525M-1207F	SR M6X1-L13.5 T20	HW 4.0	ICSN 434A	CB-CDRS	TCL CDSV-N-09-16F
CCLNR/L 3225P-1204F	SR M6X1-L13.5 T20	HW 4.0	ICSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CCLNR/L 3225P-1207F	SR M6X1-L13.5 T20	HW 4.0	ICSN 434A	CB-CDRS	TCL CDSV-N-09-16F
CCLNR/L 2525M-1607F	SR M8X1-L13.5-D11 T25	HW 4.0	ICSN 533A	CB-CDRS	TCL CDSV-N-09-16F
CCLNR/L 3225P-1607F	SR M8X1-L13.5-D11 T25	HW 4.0	ICSN 533A	CB-CDRS	TCL CDSV-N-09-16F
CCLNR/L 2525M-1207X	SR M6X1-L13.5 T20	HW 4.0	ICSN 434A		TCL CDS-N12-16X
CCLNR/L 3225P-1207X	SR M6X1-L13.5 T20	HW 4.0	ICSN 434A		TCL CDS-N12-16X

ISCAR CER-LINE

CDJNR/L-X

Clamp Lock Tools Carrying 55° Negative Rhombic Inserts



Designation	H	HF	B	LF	LH	WF	KAPR[1]	MIID[2]
CDJNR/L 2525M-1507X	25.0	25.0	25.0	150.00	38.0	32.00	93.0	DNGX 1507
CDJNR/L 3225P-1507X	32.0	32.0	25.0	170.00	38.0	32.00	93.0	DNGX 1507

[1] Tool cutting edge angle

[2] Master insert identification

For inserts, see pages: DNGX-DIMPLE (CER) (58)

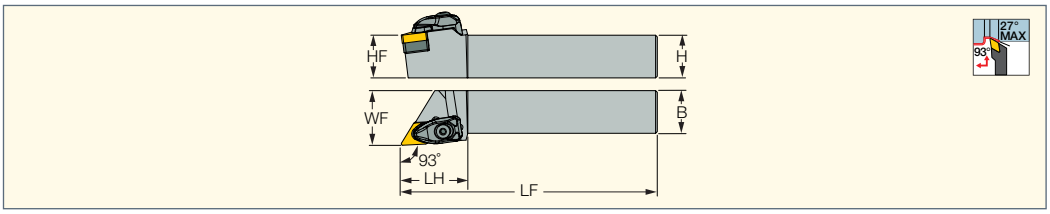
Spare Parts

Designation				
CDJNR/L-X	SR M6X1-L13.5 T20	HW 4.0	IDSN 434A	TCL CD-N-12-16X

ISCAR CER-LINE

DDJNR/L-F

Clamp Lock Holder with 93° Approach Angle for Negative 55° Rhombic ISO Type Ceramic Inserts without Hole



Designation	H	HF	B	LF	LH	WF	MIID[1]
DDJNR 2525M-1504F	25.0	25.0	25.0	150.00	39.0	32.00	DNGN 1504
DDJNR 2525M-1507F	25.0	25.0	25.0	150.00	39.0	32.00	DNGN 1507
DDJNR/L 3232P-1507F	32.0	32.0	32.0	170.00	39.0	40.00	DNGN 1507

(1) Master insert identification

For inserts, see pages: DNGN (CER) (57)

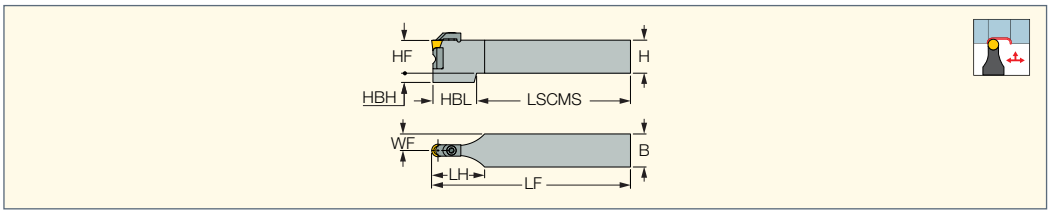
Spare Parts

Designation						
DDJNR 2525M-1504F	IDSN 44	DLS 4	T-15/5	DSP 4	HW 3.0	DCL S-4F
DDJNR 2525M-1507F	IDSN 42	DLS 4	T-15/5	DSP 4	HW 3.0	DCL S-4F
DDJNR/L 3232P-1507F	IDSN 42	DLS 4	T-15/5	DSP 4	HW 3.0	DCL S-4F

ISCAR CER-LINE

CRDCN-F

Clamp Lock Tools Carrying RCGX Positive Ceramic Inserts



Designation	H	HF	B	LF	LH	WF	LSCMS	HBH	HBL	MIID[1]
CRDCN 2525M-0604F	25.0	25.0	25.0	150.00	28.0	12.50	122.00	7.0	28.0	RCGX 0604
CRDCN 2525M-0606F	25.0	25.0	25.0	150.00	28.0	12.50	122.00	7.0	28.0	RCGX 0606
CRDCN 2525M-0607F	25.0	25.0	25.0	150.00	28.0	12.50	122.00	7.0	28.0	RCGX 0607
CRDCN 2525M-0907F	25.0	25.0	25.0	150.00	20.0	12.50	116.00	7.0	33.0	RCGX 0907
CRDCN 2525M-1207F	25.0	25.0	25.0	150.00	25.0	12.50	125.00	7.0	29.0	RCGX 1207
CRDCN 3225P-0907F	32.0	32.0	25.0	170.00	20.0	12.50	-	-	-	RCGX 0907
CRDCN 3225P-1207F	32.0	32.0	25.0	170.00	25.0	12.50	-	-	-	RCGX 1207

(1) Master insert identification

For inserts, see pages: RCGX (CER) (59)

Spare Parts

Designation							
CRDCN 2525M-0604F	SR M3.5X0.6-L15 T15	T-15/5	SR M2.5-L12.5 A2	TCL R-C-06-F	IRSC 23C		
CRDCN 2525M-0606F	SR M3.5X0.6-L15 T15	T-15/5	SR M2.5-L12.5 A2	TCL R-C-06-F	IRSC 24C		
CRDCN 2525M-0607F	SR M3.5X0.6-L15 T15	T-15/5	SR M2.5-L12.5 A2	TCL R-C-06-F	IRSC 25C	IRSC 24C[a]*	IRSC 23C[b]*
CRDCN 2525M-0907F	SR M3.5X0.6-L15 T15	T-20/5	SR M5X0.8-L12 T20	TCL R-C-09-F	IRSC 35C		
CRDCN 2525M-1207F	SR M3.5X0.6-L15 T15	K40	SR M5X0.8-L12 T20	TCL R-C-09-F	IRSC 45C		
CRDCN 3225P-0907F	SR M6X1-L16 T25	T-20/5	SR M5X0.8-L22 T20	TCL R-C-09-F	IRSC 35C		
CRDCN 3225P-1207F	SR M6X1-L16 T25	K40	SR M5X0.8-L22 T20	TCL R-C-12-F	IRSC 45C		

* Optional, to be ordered separately

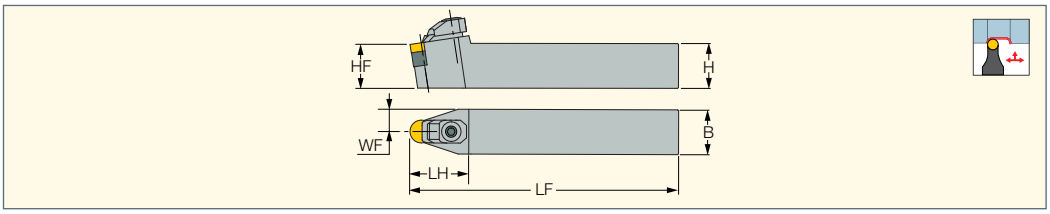
(a) For RCGX 0606 insert

(b) For RCGX 0604 insert

ISCAR CER LINE

CRDNN-F

Clamp Lock Neutral Tools Carrying Round Negative Ceramic Inserts



Designation	H	HF	B	LF	LH	WF	MIID[1]
CRDNN 2525M-1204F	25.0	25.0	25.0	150.00	34.0	12.50	RNGN 1204
CRDNN 2525M-1207F	25.0	25.0	25.0	150.00	34.0	12.50	RNGN 1207
CRDNN 3225P-1204F	32.0	32.0	25.0	170.00	34.0	12.50	RNGN 1204
CRDNN 3225P-1207F	32.0	32.0	25.0	170.00	34.0	12.50	RNGN 1207
CRDNN 2525M-1507F	25.0	25.0	25.0	150.00	34.0	12.50	RNGN 1507
CRDNN 3225P-1507F	32.0	32.0	25.0	170.00	42.0	12.50	RNGN 1507
CRDNN 3225P-1907F	32.0	32.0	25.0	170.00	42.0	12.50	RNGN 1907
CRDNN 3232P-2507F	32.0	32.0	32.0	170.00	42.0	16.00	RNGN 2507

(1) Master insert identification

For inserts, see pages: RNGN (CER) (104) • RNGN HS (PCD) (205) • RNGN S (CBN) (156)

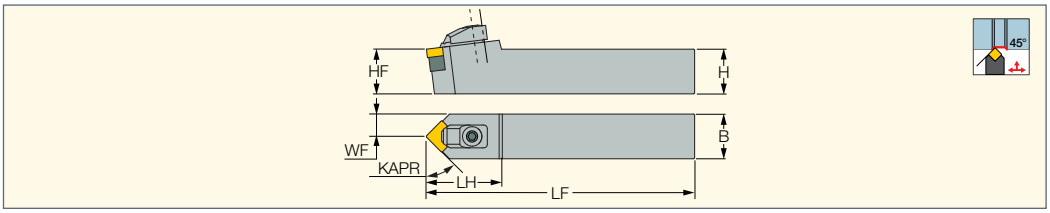
Spare Parts

Designation					
CRDNN 2525M-1204F	SR M6X1-L13.5 T20	HW 4.0	IRSN 45A	CB-CDRS	TCL DRT-N09-12F
CRDNN 2525M-1207F	SR M6X1-L13.5 T20	HW 4.0	IRSN 43A	CB-CDRS	TCL DRT-N09-12F
CRDNN 3225P-1204F	SR M6X1-L13.5 T20	HW 4.0	IRSN 45A	CB-CDRS	TCL DRT-N09-12F
CRDNN 3225P-1207F	SR M6X1-L13.5 T20	HW 4.0	IRSN 43A	CB-CDRS	TCL DRT-N09-12F
CRDNN 2525M-1507F	SR M8X1-L13.5-D11 T25	HW 4.0	IRSN 53A	CB-CDRS	TCL CDSV-N-09-16F
CRDNN 3225P-1507F	SR M8X1-L13.5-D11 T25	HW 4.0	IRSN 53A	CB-CDRS	TCL CDSV-N-09-16F
CRDNN 3225P-1907F	SR M8X1-L13.5-D10.5 T25	HW 4.0	IRSN 65B	CB-CDRS	TCL CDSV-N-09-16F
CRDNN 3232P-2507F	SR M8X1.25-L20 C.S. 70°	HW 4.0	IRSN 85B	CB-CDRS	TCL CDSV-N-09-16F

ISCAR CER LINE

CSDNN-F/X

Clamp Lock 75° Lead Angle Tools Carrying Square Ceramic Inserts



Designation	H	HF	B	LF	LH	WF	KAPR[1]	MIID[2]
CSDNN 2525M-1204F	25.0	25.0	25.0	150.00	42.0	12.50	45.0	SNGN 1204
CSDNN 2525M-1207F	25.0	25.0	25.0	150.00	42.0	12.50	45.0	SNGN 1207
CSDNN 3225P-1204F	32.0	32.0	25.0	170.00	42.0	12.50	45.0	SNGN 1204
CSDNN 3225P-1207F	32.0	32.0	25.0	170.00	42.0	12.50	45.0	SNGN 1207
CSDNN 2525M-1507F	25.0	25.0	25.0	150.00	42.0	12.50	45.0	SNGN 1507
CSDNN 3225P-1507F	32.0	32.0	25.0	170.00	42.0	12.50	45.0	SNGN 1507
CSDNN 2525M-1207X	25.0	25.0	25.0	150.00	42.0	12.50	45.0	SNGX 1207
CSDNN 3225P-1207X	32.0	32.0	25.0	170.00	42.0	12.50	45.0	SNGX 1207
CSDNN 2525M-1507X	25.0	25.0	25.0	150.00	42.0	12.50	45.0	SNGX 1507
CSDNN 3225P-1507X	32.0	32.0	25.0	170.00	42.0	12.50	45.0	SNGX 1507

(1) Tool cutting edge angle

(2) Master insert identification

For inserts, see pages: SNGN (CBN) (161) • SNGN (CER) (105) • SNGN (PCD) (209) • SNGN 4MT (CBN) (162) • SNGN HS (CBN) (163) • SNGN HS (PCD) (210) • SNGN MT (CBN) (161) • SNGN MT (PCD) (209) • SNGN S (CBN) (162) • SNGX-DIMPLE (CER) (63)

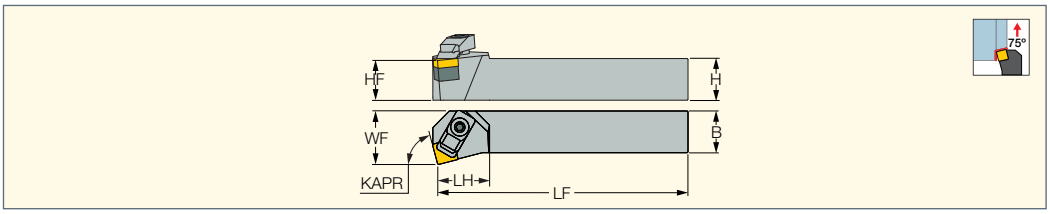
Spare Parts

Designation					
CSDNN 2525M-1204F	SR M6X1-L13.5 T20	HW 4.0	ISSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CSDNN 2525M-1207F	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A	CB-CDRS	TCL CDSV-N-09-16F
CSDNN 3225P-1204F	SR M6X1-L13.5 T20	HW 4.0	ISSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CSDNN 3225P-1207F	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A	CB-CDRS	TCL CDSV-N-09-16F
CSDNN 2525M-1507F	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A	CB-CDRS	TCL CDSV-N-09-16F
CSDNN 3225P-1507F	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A	CB-CDRS	TCL CDSV-N-09-16F
CSDNN 2525M-1207X	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A		TCL CDS-N12-16X
CSDNN 3225P-1207X	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A		TCL CDS-N12-16X
CSDNN 2525M-1507X	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A		TCL CDS-N12-16X
CSDNN 3225P-1507X	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A		TCL CDS-N12-16X

ISCAR CERLINE

CSKNR/L-F/X

Clamp Lock 75° Lead Angle Tools Carrying Square Ceramic Inserts for Face Turning



Designation	H	HF	B	LF	LH	WF	KAPR[1]	MIID[2]
CSKNR/L 2525M-1204F	25.0	25.0	25.0	150.00	34.0	32.00	75.0	SNGN 1204
CSKNR/L 2525M-1207F	25.0	25.0	25.0	150.00	34.0	32.00	75.0	SNGN 1207
CSKNR/L 3225P-1204F	32.0	32.0	25.0	170.00	34.0	32.00	75.0	SNGN 1204
CSKNR/L 3225P-1207F	32.0	32.0	25.0	170.00	34.0	32.00	75.0	SNGN 1207
CSKNR/L 2525M-1507F	25.0	25.0	25.0	150.00	34.0	32.00	75.0	SNGN 1507
CSKNR/L 3225P-1507F	32.0	32.0	25.0	170.00	34.0	32.00	75.0	SNGN 1507
CSKNR/L 2525M-1207X	25.0	25.0	25.0	150.00	34.0	32.00	75.0	SNGX 1207
CSKNR/L 3225P-1207X	32.0	32.0	25.0	170.00	34.0	32.00	75.0	SNGX 1207
CSKNR/L 2525M-1507X	25.0	25.0	25.0	150.00	34.0	32.00	75.0	SNGX 1507
CSKNR/L 3225P-1507X	32.0	32.0	25.0	170.00	34.0	32.00	75.0	SNGX 1507

(1) Tool cutting edge angle

(2) Master insert identification

For inserts, see pages: SNGN (CBN) (161) • SNGN (CER) (105) • SNGN (PCD) (209) • SNGN 4MT (CBN) (162) • SNGN HS (CBN) (163) • SNGN HS (PCD) (210) • SNGN MT (CBN) (161) • SNGN MT (PCD) (209) • SNGN S (CBN) (162) • SNGX-DIMPLE (CER) (63)

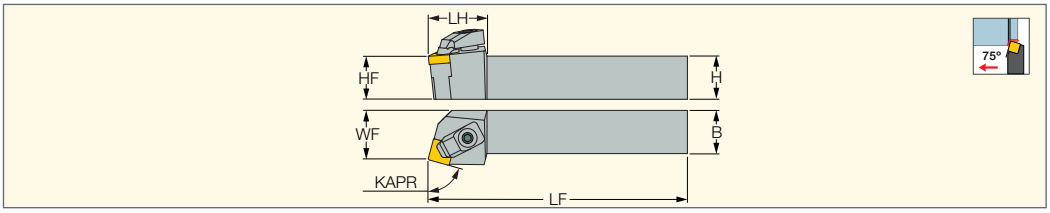
Spare Parts

Designation					
CSKNR/L 2525M-1204F	SR M6X1-L13.5 T20	HW 4.0	ISSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CSKNR/L 2525M-1207F	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A	CB-CDRS	TCL CDSV-N-09-16F
CSKNR/L 3225P-1204F	SR M6X1-L13.5 T20	HW 4.0	ISSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CSKNR/L 3225P-1207F	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A	CB-CDRS	TCL CDSV-N-09-16F
CSKNR/L 2525M-1507F	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A	CB-CDRS	TCL CDSV-N-09-16F
CSKNR/L 3225P-1507F	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A	CB-CDRS	TCL CDSV-N-09-16F
CSKNR/L 2525M-1207X	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A		TCL CDS-N12-16X
CSKNR/L 3225P-1207X	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A		TCL CDS-N12-16X
CSKNR/L 2525M-1507X	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A		TCL CDS-N12-16X
CSKNR/L 3225P-1507X	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A		TCL CDS-N12-16X

ISCAR CERLINE

CSRNR/L-F/X

Clamp Lock 75° Lead Angle Tools Carrying Square Ceramic Inserts



Designation	H	HF	B	LF	LH	WF	KAPR[1]	MIID[2]
CSRNR/L 2525M-1204F	25.0	25.0	25.0	150.00	34.0	27.00	75.0	SNGN 1204
CSRNR/L 3225P-1204F	32.0	32.0	25.0	170.00	34.0	27.00	75.0	SNGN 1204
CSRNR/L 2525M-1507F	25.0	25.0	25.0	150.00	34.0	27.00	75.0	SNGN 1507
CSRNR/L 3225P-1507F	32.0	32.0	25.0	170.00	38.0	27.00	75.0	SNGN 1507
CSRNR/L 3232P-1907F	32.0	32.0	32.0	170.00	42.0	35.00	75.0	SNGN 1907
CSRNR/L 2525M-1207X	25.0	25.0	25.0	150.00	34.0	27.00	75.0	SNGX 1207
CSRNR/L 3225P-1207X	32.0	32.0	25.0	170.00	34.0	27.00	75.0	SNGX 1207
CSRNR/L 2525M-1507X	25.0	25.0	25.0	150.00	34.0	27.00	75.0	SNGX 1507
CSRNR/L 3225P-1507X	32.0	32.0	25.0	170.00	38.0	27.00	75.0	SNGX 1507

(1) Tool cutting edge angle

(2) Master insert identification

For inserts, see pages: SNGN (CBN) (161) • SNGN (CER) (105) • SNGN (PCD) (209) • SNGN 4MT (CBN) (162) • SNGN HS (CBN) (163) • SNGN HS (PCD) (210) • SNGN MT (CBN) (161) • SNGN MT (PCD) (209) • SNGN S (CBN) (162) • SNGX-DIMPLE (CER) (63)

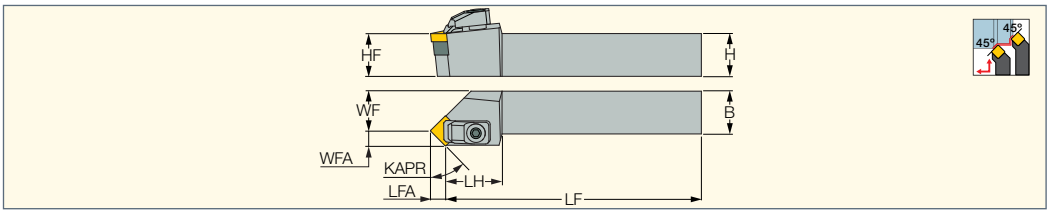
Spare Parts

Designation					
CSRNR/L 2525M-1204F	SR M6X1-L13.5 T20	HW 4.0	ISSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CSRNR/L 3225P-1204F	SR M6X1-L13.5 T20	HW 4.0	ISSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CSRNR/L 2525M-1507F	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A	CB-CDRS	TCL CDSV-N-09-16F
CSRNR/L 3225P-1507F	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A	CB-CDRS	TCL CDSV-N-09-16F
CSRNR/L 3232P-1907F	SR M8X1-L13.5-D10.5 T25	HW 4.0	ISSN 654B	CB-CDRS	TCL CDSV-N-09-16F
CSRNR/L 2525M-1207X	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A		TCL CDS-N12-16X
CSRNR/L 3225P-1207X	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A		TCL CDS-N12-16X
CSRNR/L 2525M-1507X	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A		TCL CDS-N12-16X
CSRNR/L 3225P-1507X	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A		TCL CDS-N12-16X

ISCAR CER-LINE

CSSNR/L-F/X

Clamp Lock 45° Lead Angle Tools Carrying Square Ceramic Inserts for Longitudinal and Face Turning



Designation	H	HF	B	LF	LFA	LH	WF	WFA	KAPR[1]	MIID[2]
CSSNR/L 2525M-1204F	25.0	25.0	25.0	150.00	8.32	35.0	23.68	8.32	45.0	SNGN 1204
CSSNR/L 3225P-1204F	32.0	32.0	25.0	170.00	8.32	35.0	23.68	8.32	45.0	SNGN 1204
CSSNR/L 2525M-1507F	25.0	25.0	25.0	150.00	10.23	37.0	21.77	10.23	45.0	SNGN 1507
CSSNR/L 3225P-1507F	32.0	32.0	25.0	170.00	10.23	37.0	29.77	10.23	45.0	SNGN 1507
CSSNR/L 3232P-1907F	32.0	32.0	32.0	170.00	12.50	37.0	37.50	12.50	45.0	SNGN 1907
CSSNR/L 2525M-1207X	25.0	25.0	25.0	150.00	8.32	35.0	23.68	8.32	45.0	SNGX 1207
CSSNR/L 3225P-1207X	32.0	32.0	25.0	170.00	8.32	35.0	23.68	8.32	45.0	SNGX 1207
CSSNR/L 2525M-1507X	25.0	25.0	25.0	150.00	10.23	37.0	21.77	10.23	45.0	SNGX 1507
CSSNR/L 3225P-1507X	32.0	32.0	25.0	170.00	10.23	37.0	21.77	10.23	45.0	SNGX 1507

[1] Tool cutting edge angle

[2] Master insert identification

For inserts, see pages: SNGN (CBN) (161) • SNGN (CER) (105) • SNGN (PCD) (209) • SNGN 4MT (CBN) (162) • SNGN HS (CBN) (163) • SNGN HS (PCD) (210) • SNGN MT (CBN) (161) • SNGN MT (PCD) (209) • SNGN S (CBN) (162) • SNGX-DIMPLE (CER) (63)

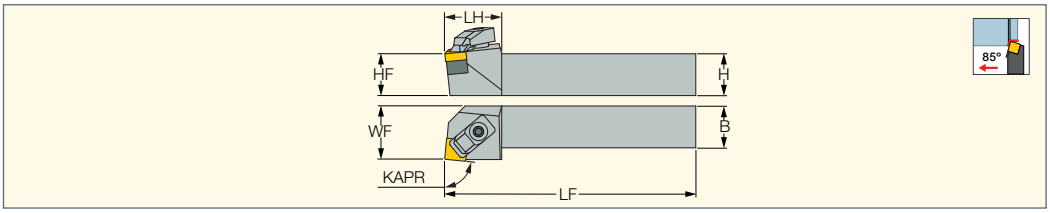
Spare Parts

Designation					
CSSNR/L 2525M-1204F	SR M6X1-L13.5 T20	HW 4.0	ISSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CSSNR/L 3225P-1204F	SR M6X1-L13.5 T20	HW 4.0	ISSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CSSNR/L 2525M-1507F	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A	CB-CDRS	TCL CDSV-N-09-16F
CSSNR/L 3225P-1507F	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A	CB-CDRS	TCL CDSV-N-09-16F
CSSNR/L 3232P-1907F	SR M8X1-L13.5-D10.5 T25	HW 4.0	ISSN 654B	CB-CDRS	TCL CDSV-N-09-16F
CSSNR/L 2525M-1207X	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A		TCL CDS-N12-16X
CSSNR/L 3225P-1207X	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A		TCL CDS-N12-16X
CSSNR/L 2525M-1507X	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A		TCL CDS-N12-16X
CSSNR/L 3225P-1507X	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A		TCL CDS-N12-16X

ISCAR CER-LINE

CSXNR/L-F/X

Clamp Lock 85° Lead Angle Tools Carrying Square Ceramic Inserts



Designation	H	HF	B	LF	LH	WF	KAPR[1]	MIID[2]
CSXNR/L 2525M-1204F	25.0	25.0	25.0	150.00	30.0	32.00	85.0	SNGN 1204
CSXNR/L 3225P-1204F	32.0	32.0	25.0	170.00	30.0	32.00	85.0	SNGN 1204
CSXNR/L 2525M-1507F	25.0	25.0	25.0	150.00	33.0	32.00	85.0	SNGN 1507
CSXNR/L 3225P-1507F	32.0	32.0	25.0	170.00	33.0	32.00	85.0	SNGN 1507
CSXNR/L 2525M-1207X	25.0	25.0	25.0	150.00	30.0	32.00	85.0	SNGX 1207
CSXNR/L 3225P-1207X	32.0	32.0	25.0	170.00	30.0	32.00	85.0	SNGX 1207
CSXNR/L 2525M-1507X	25.0	25.0	25.0	150.00	33.0	32.00	85.0	SNGX 1507
CSXNR/L 3225P-1507X	32.0	32.0	25.0	170.00	33.0	32.00	85.0	SNGX 1507

[1] Tool cutting edge angle

[2] Master insert identification

For inserts, see pages: SNGN (CBN) (161) • SNGN (CER) (105) • SNGN (PCD) (209) • SNGN 4MT (CBN) (162) • SNGN HS (CBN) (163) • SNGN HS (PCD) (210) • SNGN MT (CBN) (161) • SNGN MT (PCD) (209) • SNGN S (CBN) (162) • SNGX-DIMPLE (CER) (63)

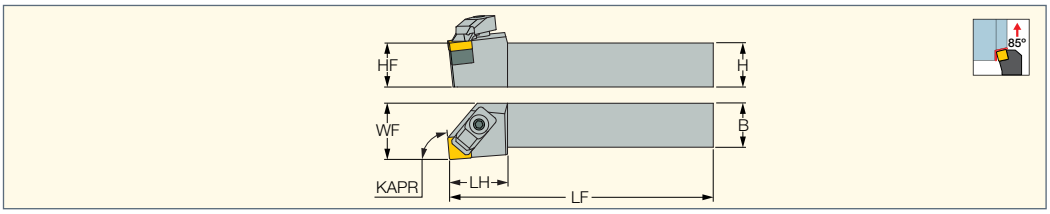
Spare Parts

Designation					
CSXNR/L 2525M-1204F	SR M6X1-L13.5 T20	HW 4.0	ISSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CSXNR/L 3225P-1204F	SR M6X1-L13.5 T20	HW 4.0	ISSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CSXNR/L 2525M-1507F	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A	CB-CDRS	TCL CDSV-N-09-16F
CSXNR/L 3225P-1507F	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A	CB-CDRS	TCL CDSV-N-09-16F
CSXNR/L 2525M-1207X	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A		TCL CDS-N12-16X
CSXNR/L 3225P-1207X	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A		TCL CDS-N12-16X
CSXNR/L 2525M-1507X	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A		TCL CDS-N12-16X
CSXNR/L 3225P-1507X	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A		TCL CDS-N12-16X

ISCAR CERLINE

CSYNR/L-F/X

Clamp Lock 85° Lead Angle Tools Carrying Square Ceramic Inserts



Designation	H	HF	B	LF	LH	WF	KAPR[1]	MIID[2]
CSYNR/L 2525M-1204F	25.0	25.0	25.0	150.00	27.0	32.00	85.0	SNGN 1204
CSYNR/L 3225P-1204F	32.0	32.0	25.0	170.00	27.0	32.00	85.0	SNGN 1204
CSYNR/L 2525M-1507F	25.0	25.0	25.0	150.00	27.0	32.00	85.0	SNGN 1507
CSYNR/L 3225P-1507F	32.0	32.0	25.0	170.00	27.0	32.00	85.0	SNGN 1507
CSYNR/L 2525M-1207X	25.0	25.0	25.0	150.00	27.0	32.00	85.0	SNGX 1207
CSYNR/L 3225P-1207X	32.0	32.0	25.0	170.00	27.0	32.00	85.0	SNGX 1207
CSYNR/L 2525M-1507X	25.0	25.0	25.0	150.00	27.0	32.00	85.0	SNGX 1507
CSYNR/L 3225P-1507X	32.0	32.0	25.0	170.00	27.0	32.00	85.0	SNGX 1507

(1) Tool cutting edge angle

(2) Master insert identification

For inserts, see pages: SNGN (CBN) (161) • SNGN (CER) (105) • SNGN (PCD) (209) • SNGN 4MT (CBN) (162) • SNGN HS (CBN) (163) • SNGN HS (PCD) (210) • SNGN MT (CBN) (161) • SNGN MT (PCD) (209) • SNGN S (CBN) (162) • SNGX-DIMPLE (CER) (63)

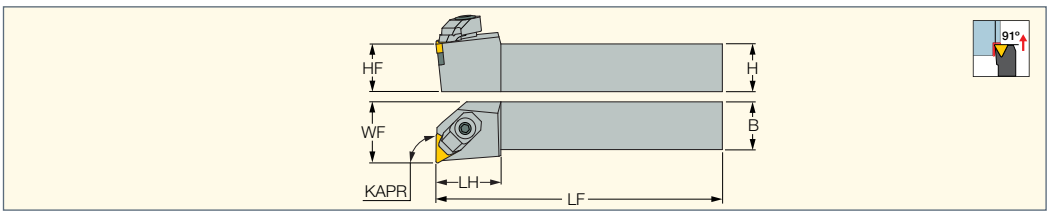
Spare Parts

Designation					
CSYNR/L 2525M-1204F	SR M6X1-L13.5 T20	HW 4.0	ISSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CSYNR/L 3225P-1204F	SR M6X1-L13.5 T20	HW 4.0	ISSN 454A	CB-CDRS	TCL CDSV-N-09-16F
CSYNR/L 2525M-1507F	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A	CB-CDRS	TCL CDSV-N-09-16F
CSYNR/L 3225P-1507F	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A	CB-CDRS	TCL CDSV-N-09-16F
CSYNR/L 2525M-1207X	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A		TCL CDS-N12-16X
CSYNR/L 3225P-1207X	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A		TCL CDS-N12-16X
CSYNR/L 2525M-1507X	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A		TCL CDS-N12-16X
CSYNR/L 3225P-1507X	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A		TCL CDS-N12-16X

ISCAR CERLINE

CTFNR/L-F

Clamp Lock 90° Lead Angle Tools Carrying Square Ceramic Inserts for Face Turning



Designation	H	HF	B	LF	LH	WF	KAPR[1]	MIID[2]
CTFNR/L 2525M-1604F	25.0	25.0	25.0	150.00	29.0	32.00	90.0	TNGN 1604
CTFNR/L 3225P-1604F	32.0	32.0	25.0	170.00	29.0	32.00	90.0	TNGN 1604

(1) Tool cutting edge angle

(2) Master insert identification

For inserts, see pages: TNGN (CER) (65)

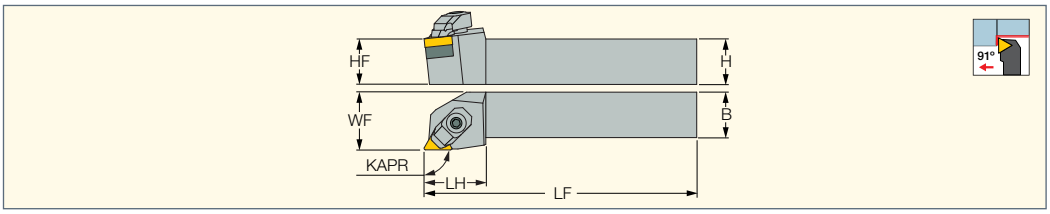
Spare Parts

Designation					
CTFNR/L-F	SR M5X0.8-L13.5 T9	HW 4.0	ITSN 342A	CB-DTV	TCL DRT-N09-12F

ISCAR CERLINE

CTGNR/L-F

Clamp Lock 90° Lead Angle Tools Carrying Triangular Ceramic Inserts



Designation	H	HF	B	LF	LH	WF	KAPR(1)	MIID(2)
CTGNR/L 2525M-1604F	25.0	25.0	25.0	150.00	20.0	32.00	90.0	TNGN 1604
CTGNR/L 3225P-1604F	32.0	32.0	25.0	170.00	20.0	32.00	90.0	TNGN 1604

(1) Tool cutting edge angle

(2) Master insert identification

For inserts, see pages: TNGN (CER) (65)

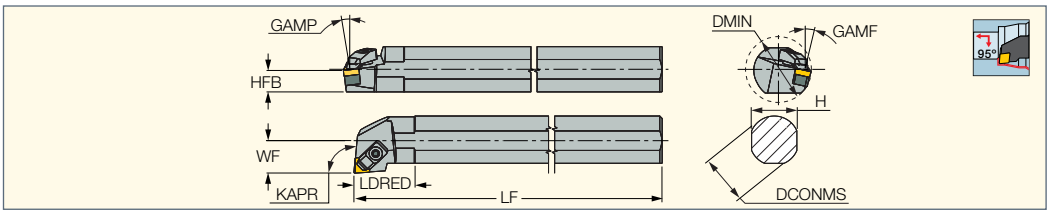
Spare Parts

Designation					
CTGNR/L-F	SR M5X0.8-L13.5 T9	HW 4.0	ITSN 342A	CB-DTV	TCL DRT-N09-12F

ISCAR CERLINE

S-CCLNR/L-F/X

Clamp Lock Boring Bars Carrying Negative 80° Rhombic Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	DMIN	GAMP	GAMF	KAPR(1)	MIID(2)
S32S CCLNR/L-1207F	32.00	250.00	40.0	30.0	15.0	22.00	40.00	-5.0	-14.0	95.0	CNGN 1207
S40T CCLNR/L-1204F	40.00	300.00	35.0	37.0	18.5	27.00	70.00	-6.0	-12.0	95.0	CNGN 1204
S40T CCLNR/L-1207F	40.00	300.00	35.0	37.0	18.5	27.00	70.00	-6.0	-12.0	95.0	CNGN 1207
S50U CCLNR/L-1204F	50.00	350.00	38.0	47.0	23.5	32.00	70.00	-5.0	-11.5	95.0	CNGN 1204
S50U CCLNR/L-1207F	50.00	350.00	38.0	47.0	23.5	32.00	70.00	-5.0	-11.5	95.0	CNGN 1207
S32S CCLNR/L-1207X	32.00	250.00	40.0	30.0	15.0	22.00	40.00	-5.0	-14.0	95.0	CNGX 1207
S40T CCLNR/L-1207X	40.00	300.00	35.0	37.0	18.5	27.00	70.00	-6.0	-12.0	95.0	CNGX 1207
S50U CCLNR/L-1207X	50.00	350.00	38.0	47.0	23.5	32.00	70.00	-5.0	-11.5	95.0	CNGX 1207

(1) Tool cutting edge angle

(2) Master insert identification

For inserts, see pages: CNGN (CER) (55) • CNGN S (CBN) (147) • CNGX-DIMPLE (CER) (56)

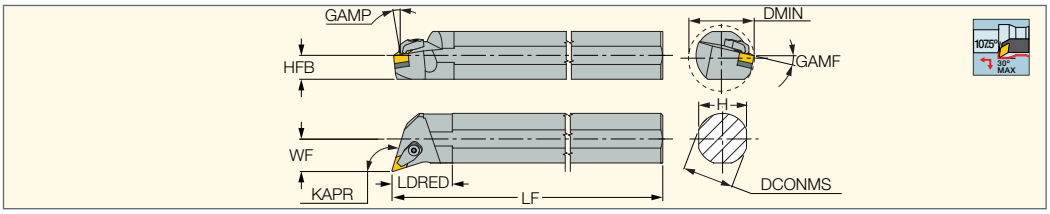
Spare Parts

Designation					
S32S CCLNR/L-1207F		HW 4.0		CB-CDRS	TCL CDSV-N-09-16F
S40T CCLNR/L-1204F	SR M6X1-L10.5 T20	HW 4.0	ICSN 454A	CB-CDRS	TCL CDSV-N-09-16F
S40T CCLNR/L-1207F	SR M6X1-L10.5 T20	HW 4.0	ICSN 434A	CB-CDRS	TCL CDSV-N-09-16F
S50U CCLNR/L-1204F	SR M6X1-L13.5 T20	HW 4.0	ICSN 454A	CB-CDRS	TCL CDSV-N-09-16F
S50U CCLNR/L-1207F	SR M6X1-L13.5 T20	HW 4.0	ICSN 434A	CB-CDRS	TCL CDSV-N-09-16F
S32S CCLNR/L-1207X		HW 4.0			TCL CDS-N12-16X
S40T CCLNR/L-1207X	SR M6X1-L10.5 T20	HW 4.0	ICSN 434A		TCL CDS-N12-16X
S50U CCLNR/L-1207X	SR M6X1-L13.5 T20	HW 4.0	ICSN 434A		TCL CDS-N12-16X

ISCAR CERLINE

S-CDQNR/L-X

Clamp Lock Boring Bars
Carrying 55° Negative
Ceramic Rhombic Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	DMIN	KAPR(1)	GAMP	GAMF	MIID(2)
S50U CDQNR/L-1507X	50.00	350.00	38.0	47.0	23.5	32.00	70.00	107.5	6.0	11.0	DNGX 1507

(1) Tool cutting edge angle
(2) Master insert identification

For inserts, see pages: DNGX-DIMPLE (CER) (58)

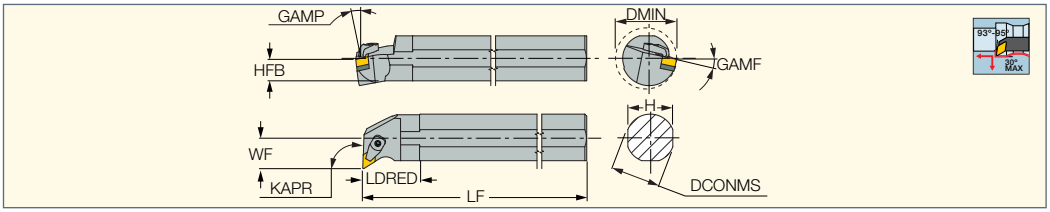
Spare Parts

Designation				
S-CDQNR/L-X	SR M6X1-L13.5 T20	HW 4.0	IDSN 432A	TCL CD-N-12-16X

ISCAR CERLINE

S-CDUNR/L-X

Clamp Lock Boring Bars
Carrying 55° Negative
Ceramic Rhombic Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	GAMP	GAMF	KAPR(1)	DMIN	MIID(2)
S50U CDUNR/L-1507X	50.00	350.00	50.0	47.0	23.5	32.00	-5.5	-11.3	93.0	70.00	DNGX 1507

(1) Tool cutting edge angle
(2) Master insert identification

For inserts, see pages: DNGX-DIMPLE (CER) (58)

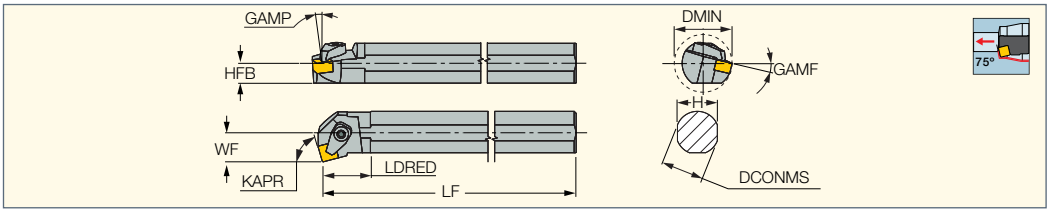
Spare Parts

Designation				
S-CDUNR/L-X	SR M6X1-L13.5 T20	HW 4.0	IDSN 432A	TCL CD-N-12-16X

ISCAR CERLINE

S-CSKNR/L-X

75° Clamp Lock Boring Bars
Carrying Square Ceramic Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	DMIN	KAPR(1)	GAMP	GAMF	MIID(2)
S32S CSKNR/L-1207X	32.00	250.00	40.0	30.0	15.0	22.00	40.00	75.0	-3.3	-14.0	SNGX 1207
S40T CSKNR/L-1207X	40.00	300.00	67.0	37.0	18.5	27.00	70.00	75.0	-3.3	-11.0	SNGX 1207
S50U CSKNR/L-1207X	50.00	350.00	67.0	47.0	23.5	35.00	70.00	75.0	-3.8	-9.3	SNGX 1207

(1) Tool cutting edge angle
(2) Master insert identification

For inserts, see pages: SNGX-DIMPLE (CER) (63)

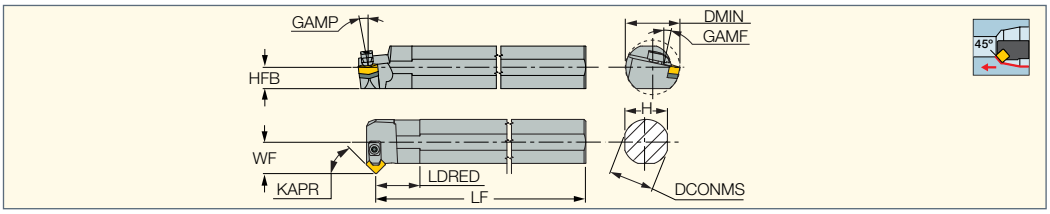
Spare Parts

Designation				
S32S CSKNR/L-1207X		HW 4.0		TCL CDS-N12-16X
S40T CSKNR/L-1207X	SR M6X1-L10.5 T20	HW 4.0	ISSN 434A	TCL CDS-N12-16X
S50U CSKNR/L-1207X	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A	TCL CDS-N12-16X

ISCAR CER-LINE

S-CSSNR/L-X

45° Clamp Lock Boring Bars
Carrying Square Ceramic Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	DMIN	GAMP	GAMF	KAPR[1]	MIID[2]
S32S CSSNR/L-1207X	32.00	250.00	40.0	30.0	15.0	22.00	40.00	-6.0	-14.0	45.0	SNGX 1207
S40T CSSNR/L-1207X	40.00	300.00	50.0	37.0	18.5	27.00	70.00	-6.0	-12.0	45.0	SNGX 1207
S50U CSSNR/L-1507F	50.00	350.00	50.0	47.0	23.5	32.00	70.00	-6.0	-12.0	45.0	SNGN 1507
S50U CSSNR/L-1507X	50.00	350.00	50.0	47.0	23.5	32.00	70.00	-6.0	-12.0	45.0	SNGX 1507

[1] Tool cutting edge angle
[2] Master insert identification

For inserts, see pages: SNGN (CER) (105) • SNGX-DIMPLE (CER) (63)

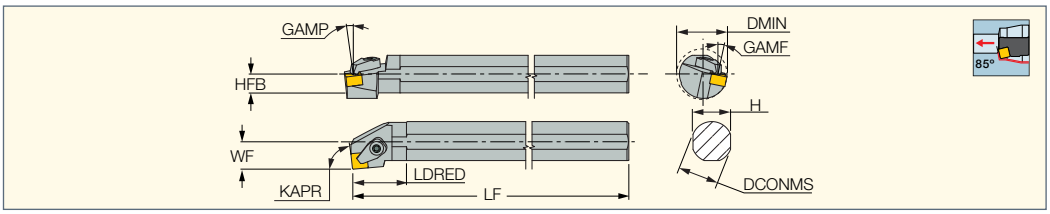
Spare Parts

Designation					
S32S CSSNR/L-1207X		HW 4.0			TCL CDS-N12-16X
S40T CSSNR/L-1207X	SR M6X1-L10.5 T20	HW 4.0	ISSN 434A		TCL CDS-N12-16X
S50U CSSNR/L-1507F	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A	CB-CDRS	TCL CDSV-N-09-16F
S50U CSSNR/L-1507X	SR M8X1-L13.5-D11 T25	HW 4.0	ISSN 534A		TCL CDS-N12-16X

ISCAR CER-LINE

S-CSYNR/L-X

85° Clamp Lock Boring Bars
Carrying Square Ceramic Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	DMIN	GAMP	GAMF	KAPR[1]	MIID[2]
S32S CSYNR/L-1207X	32.00	250.00	40.0	30.0	15.0	22.00	40.00	-6.0	-14.0	85.0	SNGX 1207
S40T CSYNR/L-1207X	40.00	300.00	67.0	37.0	18.5	27.00	70.00	-6.0	-12.0	85.0	SNGX 1207
S50U CSYNR/L-1207X	50.00	350.00	67.0	47.0	23.5	35.00	70.00	-5.3	-11.0	85.0	SNGX 1207

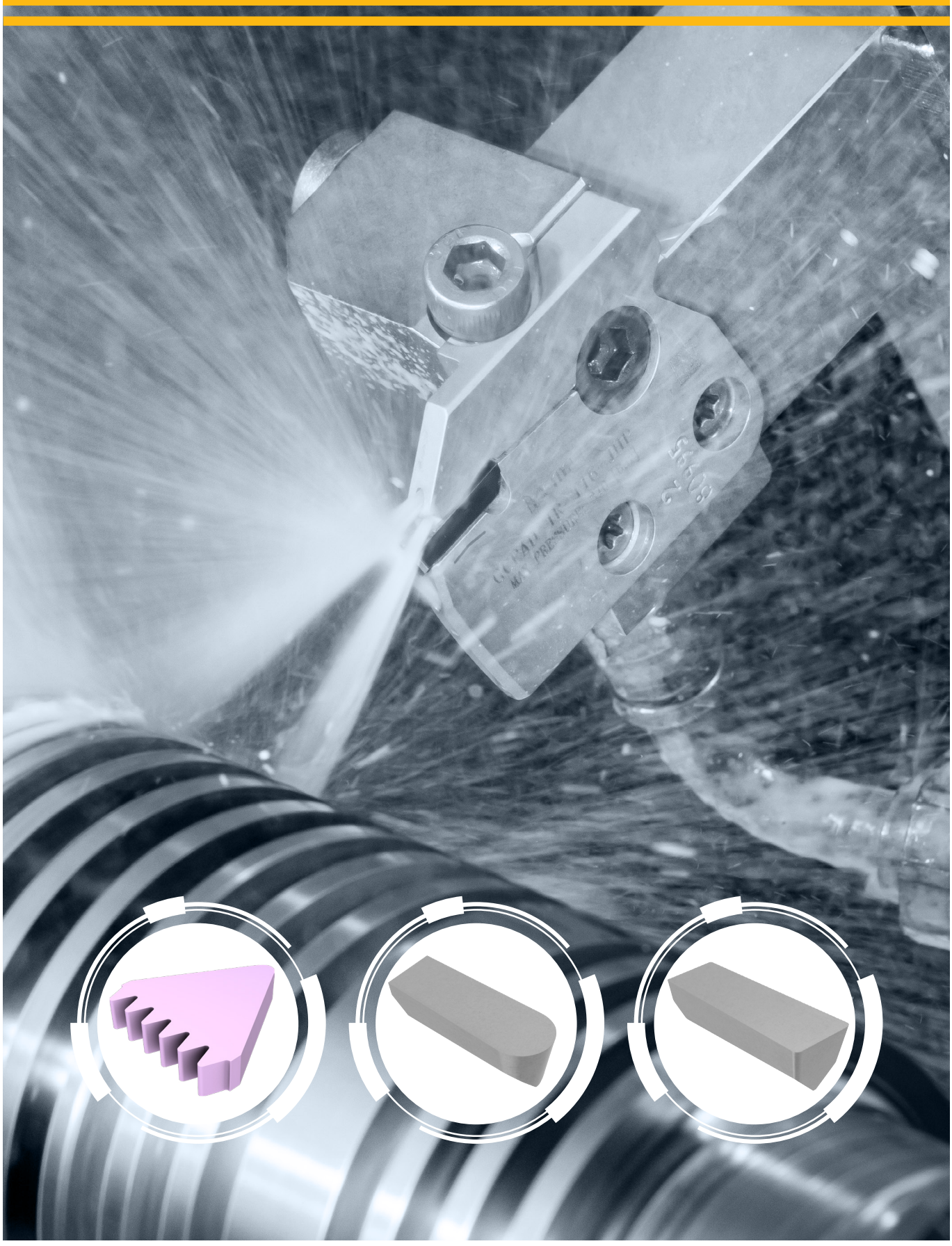
[1] Tool cutting edge angle
[2] Master insert identification

For inserts, see pages: SNGX-DIMPLE (CER) (63)

Spare Parts

Designation				
S32S CSYNR/L-1207X		HW 4.0		TCL CDS-N12-16X
S40T CSYNR/L-1207X	SR M6X1-L10.5 T20	HW 4.0	ISSN 434A	TCL CDS-N12-16X
S50U CSYNR/L-1207X	SR M6X1-L13.5 T20	HW 4.0	ISSN 434A	TCL CDS-N12-16X

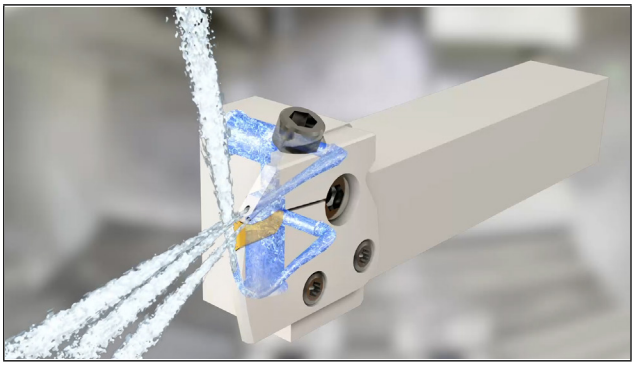
CERAMICS GROOVING PRELUDE



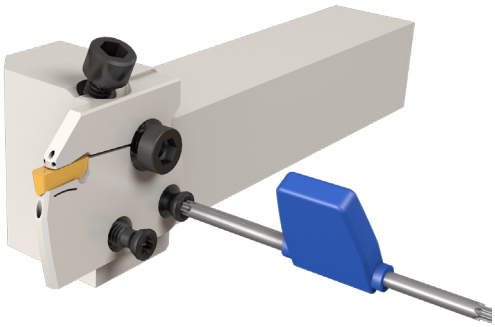
GCPAD – Modular - Ceramic GRIP Adapters

Ceramic Specialist's Design:

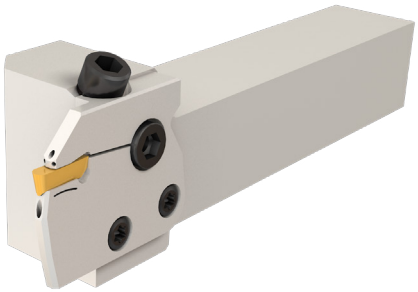
GCP	GCP-R



JETCUT
- 4 coolant inlets - three cooling outlets located on the upper jaw and one on the lower jaw
- Coolant directly on the cutting edge
- Increased cutting speed
- Increased tool life

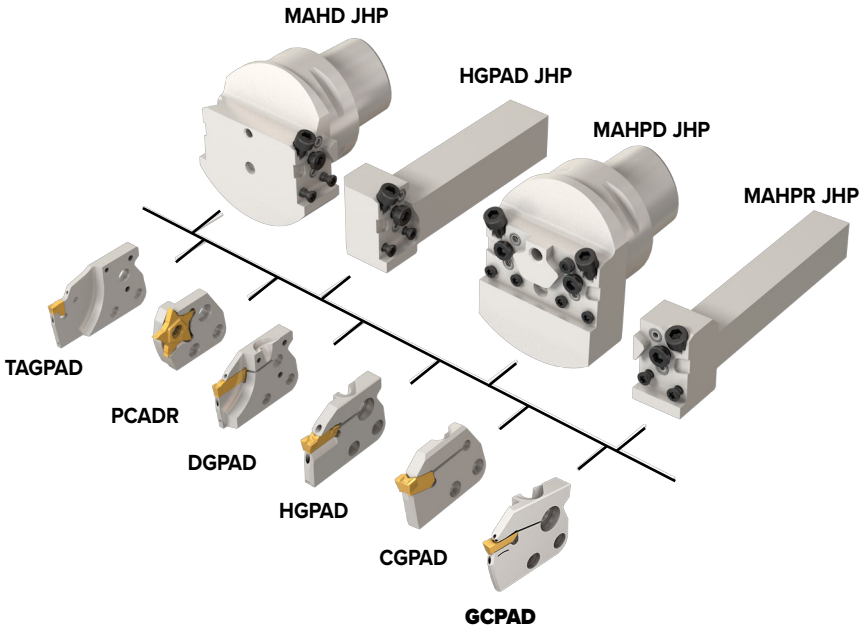


High Rigidity
- 4 clamping



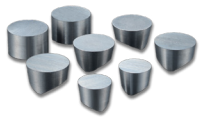
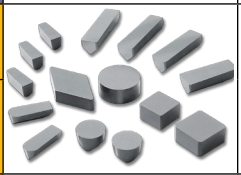
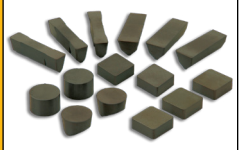
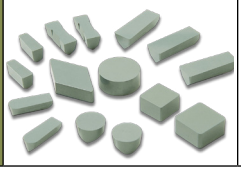
GCP/GCP-R
- Adaptors with high pressure coolant channels carrying GCP/GCP-R grooving ceramic inserts

GCPAD
- Adaptors specifically designed for modular-grip holders
- Combination of modular-Ceramic grip adapters and JHP
- Unique and attractive solution
- Economical solution for implementation of JHP on **CAMFIX** shanks



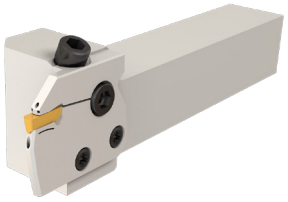
Guideline for Grooving HRSA

- Bidemics for grooving inserts provide high speed capability to your process.
- Whisker-based ceramic is the most versatile option in this category.
- **ISCAR** also offers SiAlON grades for more productivity and stability.

			Speed	Feed	Versatility	Toughness	
Bidemics	IS05 / IS10		●		●		can run at up to 480 m/min double the speed of whisker
SiALON	IS14 / IS15		●	●	●	●	double the feed of whisker
	IS45		●	●		●	best for scale and interruption
Whisker	IW10		●		●		versatile grade

● 1st choice

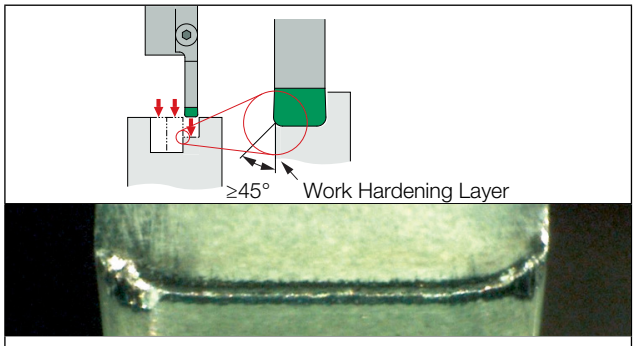
● 2nd choice

Application	Grooving
	

Grade		IS05-IS10	IS14-IS15	IS45	IW10
Cutting Speed (m/min)	180				
	240				
	300				
	360				
	420				
	480				
		360 (180-480)	230 (180-270)	210 (180-240)	240 (180-330)
Feed (mm/rev)	0.05				
	0.1				
	0.15				
	0.20				
	0.25				
		0.07 (0.05-0.1)	0.11 (0.07-0.15)	0.15 (0.07-0.17)	0.07 (0.05-0.1)
Coolant					

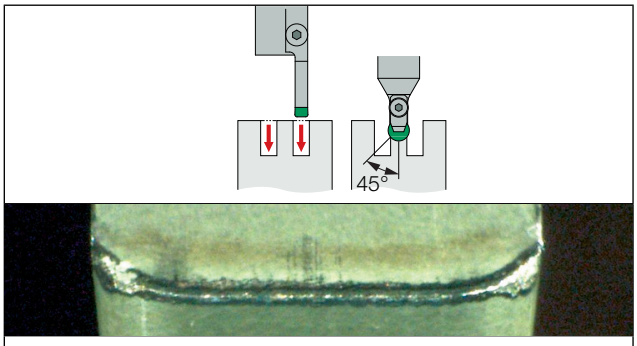
When using IS05/IS10, it is advisable to increase the speed to over 300 m/min. For IS15/IS45, it is recommended to increase the feed rates by 100% compared to Whisker-Based Ceramic.

Application Information



When machining a grooved area with multiple passes, it is possible for the insert radius to encounter a work-hardened area during the final plunge.
This programming procedure increases the risk of chipping or notching on the corner radius

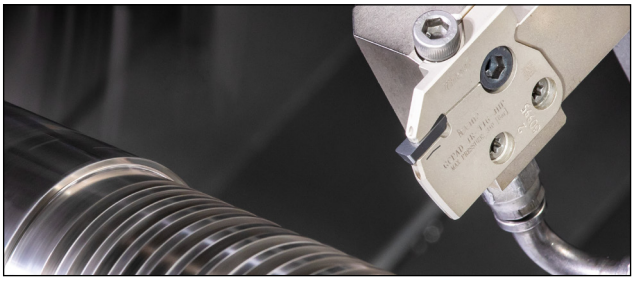
Change to



By plunging the grooving insert down both outside walls, a high-quality finish is maintained. To remove the remaining material, it is recommended to use a stronger insert shape, such as the RCGX style.

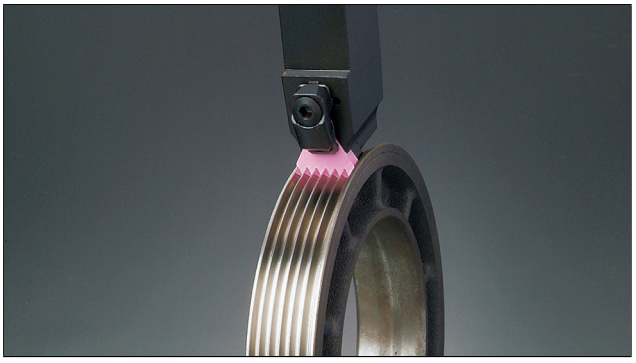
Test Teport

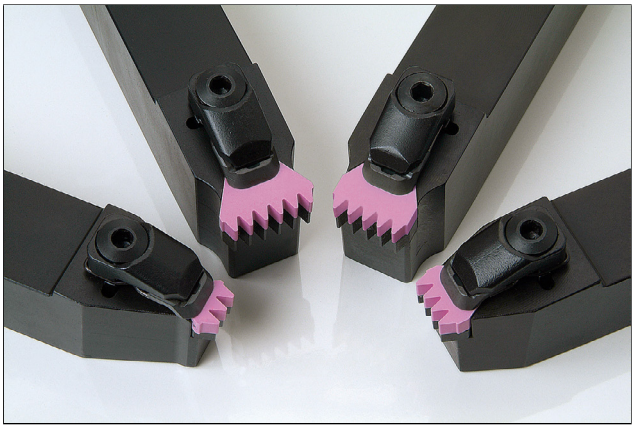
work material	inconel 718
operation	grooving
cutting speed	320 m/min
feed	0.1 mm/rev
coolant	wet
GCPAD 4R-T16-JHP	**Stable machining for 50 minutes**
competitor	50 minutes of Unstable machining

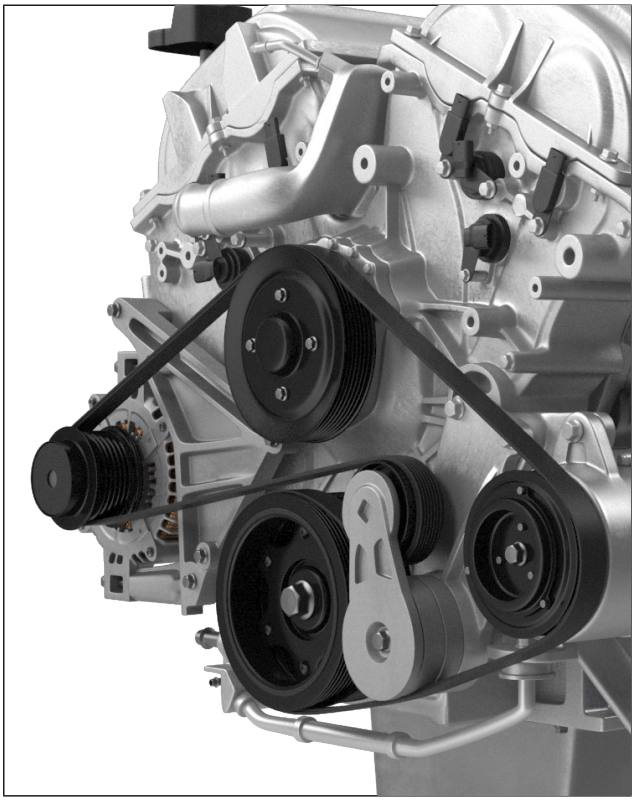


Machining Poly-V Pulley Profiles

Grooving with Ceramic





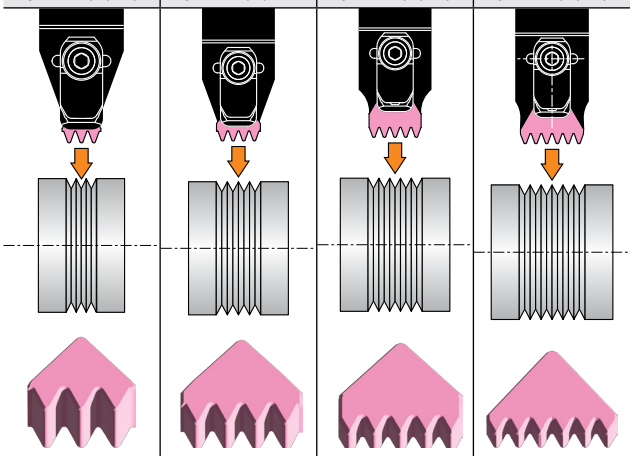


Recommended Cutting Conditions

Material	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Dry	Wet
gray cast iron	IN18	300–600	0.05–0.15	•	

	3V	4V	5V	6V
Required Cutting Power	15 kw	21 kw	26 kw	26 kw

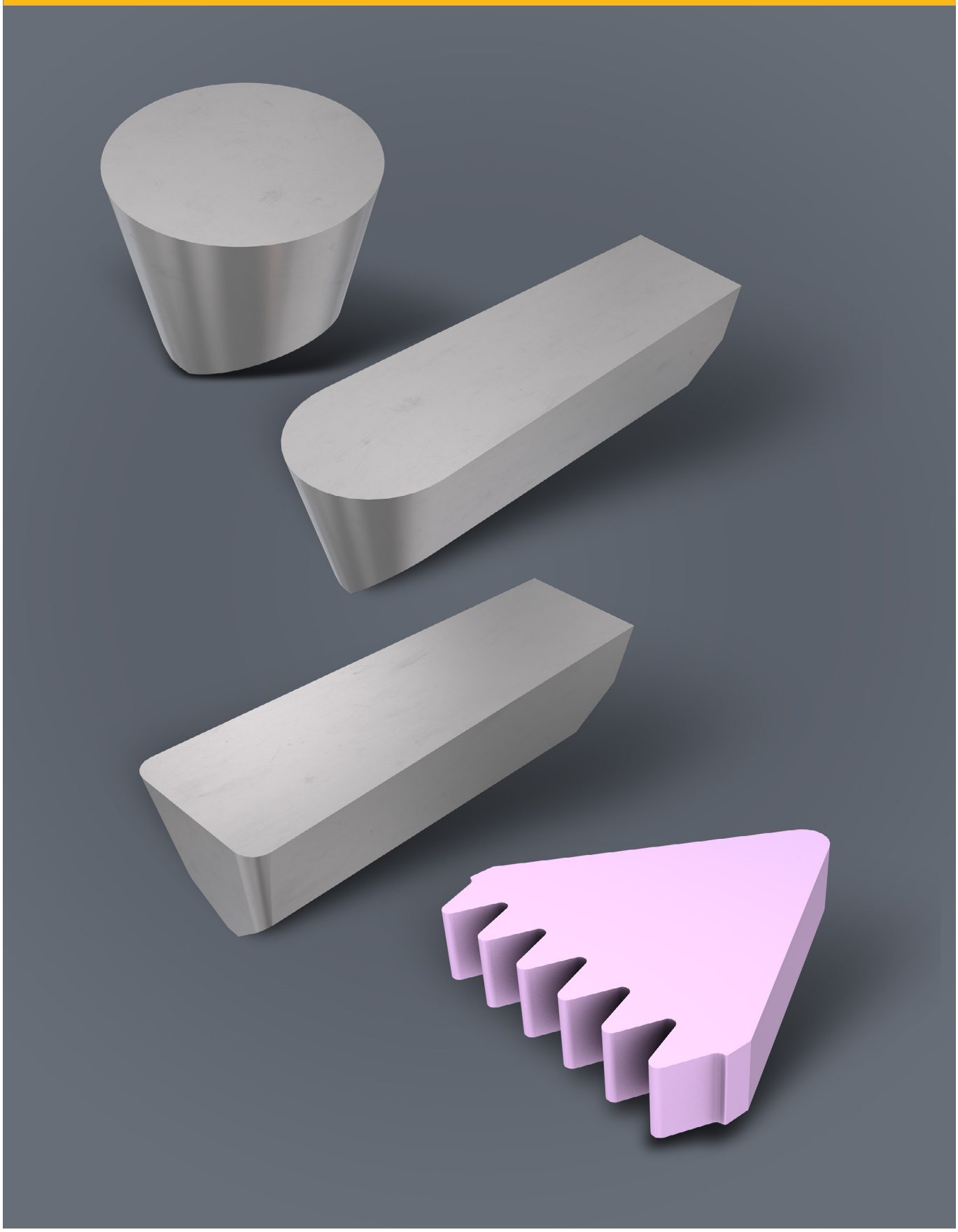
ISCAR's Ceramic inserts ensure higher productivity and stable tool life for damper-pulley machining.

3V	4V	5V	6V
Tool: CHNPV 2525M-3	Tool: CHNPV 2525M-4	Tool: CHNPV 2525M-5	Tool: CHNPV 2525M-6
			
15 kw needed	21 kw needed	26 kw needed	26 kw needed
insert: CPV 11-3.56-0503-3 IN18	insert: CPV 14-3.56-0503-4 IN18	insert: CPV 18-3.56-0503-5 IN18	insert: CPV 21-3.56-0503-6 IN18

Features

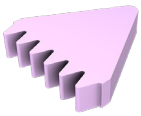
- High speed machining for poly-V pulleys
- Up to 6-V Grooving with single pass
- Precision inserts for plunging profiles

CERAMIC GROOVING INSERTS

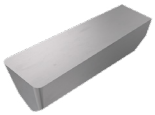


Grooving Inserts - Index

CPV (CER) 87



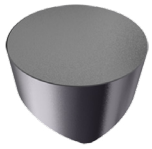
GCP (CER) 88



GCP-R (CER) 88

RCGX (CER) 89

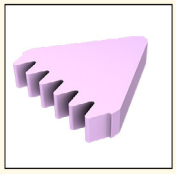
RPGX (CER) 89

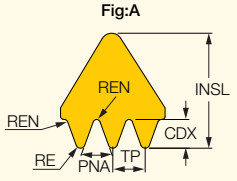


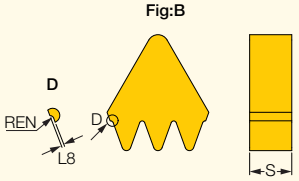
ISCAR CER-LINE

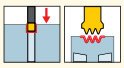
CPV (CER)

Ceramic Precision Inserts for Grooving Multi V-Ribbed Pulleys









Designation	Dimensions										Alumina	Recommended Machining Data
	TP[1]	CDX	INSL	RE	PNA	REN	L8	NT[2]	S	Fig.	IN18	f groove (mm/rev)
CPV 11-3.56-0504-3A	3.560	3.16	13.10	0.50	40.0	0.30	-	3	4.76	A	●	0.05-0.15
CPV 11-3.56-0504-3B	3.560	3.16	13.10	0.50	40.0	0.30	0.20	3	4.76	B	●	0.05-0.15
CPV 14-3.56-0504-4A	3.560	3.16	17.35	0.50	40.0	0.40	-	4	4.76	A	●	0.05-0.15
CPV 14-3.56-0504-4B	3.560	3.16	17.35	0.50	40.0	0.40	0.20	4	4.76	B	●	0.05-0.15
CPV 18-3.56-0504-5A	3.560	3.16	22.52	0.50	40.0	0.30	-	5	4.76	A	●	0.05-0.15
CPV 18-3.56-0504-5B	3.560	3.16	22.52	0.50	40.0	0.30	0.20	5	4.76	B	●	0.05-0.15
CPV 21-3.56-0504-6A	3.560	3.16	22.11	0.50	40.0	0.40	-	6	4.76	A	●	0.05-0.15
CPV 21-3.56-0504-6B	3.560	3.16	22.11	0.50	40.0	0.40	0.20	6	4.76	B	●	0.05-0.15
CPV 11-3.56-0503-3A	3.560	3.35	13.10	0.50	40.0	0.30	-	3	4.76	A	●	0.05-0.15
CPV 11-3.56-0503-3B	3.560	3.35	13.10	0.50	40.0	0.30	0.20	3	4.76	B	●	0.05-0.15
CPV 14-3.56-0503-4A	3.560	3.35	17.35	0.50	40.0	0.40	-	4	4.76	A	●	0.05-0.15
CPV 14-3.56-0503-4B	3.560	3.35	17.35	0.50	40.0	0.40	0.20	4	4.76	B	●	0.05-0.15
CPV 18-3.56-0503-5A	3.560	3.35	22.52	0.50	40.0	0.30	-	5	4.76	A	●	0.05-0.15
CPV 18-3.56-0503-5B	3.560	3.35	22.52	0.50	40.0	0.30	0.20	5	4.76	B	●	0.05-0.15
CPV 21-3.56-0503-6A	3.560	3.35	22.11	0.50	40.0	0.40	-	6	4.76	A	●	0.05-0.15
CPV 21-3.56-0503-6B	3.560	3.35	22.11	0.50	40.0	0.40	0.20	6	4.76	B	●	0.05-0.15

• For cutting speed recommendations and user guide, see pages 4,12-48,50-52, 82-84,323-324,335-336

(1) Thread pitch

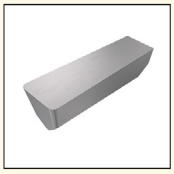
(2) tooth count

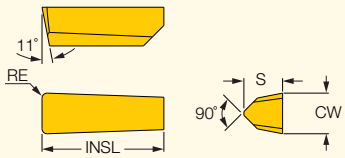
For tools, see pages: CHNPV (92)

ISCAR CER-LINE

GCP (CER)

Flat Grooving Ceramic Inserts for Machining Heat-Resistant Alloys





Designation	Dimensions						Bidemics		Whisker	Silicon Nitride		Recommended Machining Data
	CW	CWTOL(1)	INSL	S	RE	RETOL(2)	IS05	IS10	IW10	IS15	IS45	f groove (mm/rev)
GCP 3.18-0.4 E004	3.18	0.025	12.70	4.51	0.40	0.100	•	•	•	•	•	0.02-0.07
GCP 3.18-0.8 E004	3.18	0.025	12.70	4.51	0.80	0.100	•	•	•	•	•	0.02-0.07
GCP 3.96-0.4 E004	3.96	0.025	12.70	4.51	0.40	0.100	•	•	•	•	•	0.02-0.08
GCP 3.96-0.8 E004	3.96	0.025	12.70	4.51	0.80	0.100	•	•	•	•	•	0.02-0.08
GCP 4.75-0.4 E004	4.75	0.025	12.70	4.51	0.40	0.100	•	•	•	•	•	0.02-0.09
GCP 4.75-0.8 E004	4.75	0.025	12.70	4.51	0.80	0.100	•	•	•	•	•	0.02-0.09
GCP 6.35-0.4 E004	6.35	0.025	19.05	6.05	0.40	0.100	•	•	•	•	•	0.03-0.10
GCP 6.35-0.8 E004	6.35	0.025	19.05	6.05	0.80	0.100	•	•	•	•	•	0.03-0.10
GCP 9.52-0.8 E004	9.52	0.025	25.40	8.31	0.80	0.100	•	•	•	•	•	0.05-0.14

• For cutting speed recommendations and user guide, see pages 4,12-48,50-52, 82-84,323-324,335-336

(1) Cutting width tolerance (+/-)

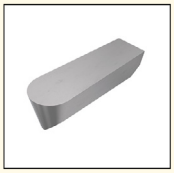
(2) Corner radius tolerance (+/-)

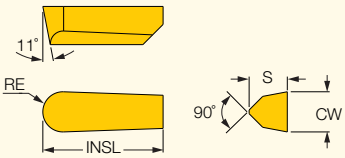
For tools, see pages: GCPAD #R/L-T#-JHP (91)

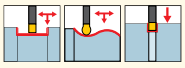
ISCAR CER-LINE

GCP-R (CER)

Full Nose Grooving Ceramic Inserts for Machining Heat-Resistant Alloys







Designation	Dimensions						Bidemics		Whisker	Silicon Nitride		Recommended Machining Data		
	CW	CWTOL(1)	INSL	S	RE	RETOL(2)	IS05	IS10	IW10	IS15	IS45	a_p (mm)	f turn (mm/rev)	f groove (mm/rev)
GCP 3.18-1.59 E004	3.18	0.025	12.70	4.51	1.59	0.100	•	•	•	•	•	0.10-1.00	0.03-0.15	0.02-0.07
GCP 3.96-1.98 E004	3.96	0.025	12.70	4.51	1.98	0.100	•	•	•	•	•	0.10-1.30	0.04-0.18	0.02-0.08
GCP 4.75-2.38 E004	4.75	0.025	12.70	4.51	2.38	0.100	•	•	•	•	•	0.10-1.50	0.05-0.22	0.02-0.09
GCP 6.35-3.18 E004	6.35	0.025	19.05	6.05	3.18	0.100	•	•	•	•	•	0.10-2.00	0.05-0.25	0.03-0.10
GCP 9.52-4.76 E004	9.52	0.025	25.40	8.31	4.76	0.100	•	•	•	•	•	0.10-3.00	0.05-0.30	0.05-0.14

• For cutting speed recommendations and user guide, see pages 4,12-48,50-52, 82-84,323-324,335-336

(1) Cutting width tolerance (+/-)

(2) Corner radius tolerance (+/-)

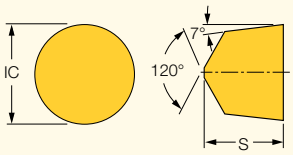
For tools, see pages: GCPAD #R/L-T#-JHP (91)

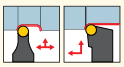
Material		H				K							S						
		Hard Materials				Cast Iron							Heat-Resistant Super Alloys						
Grade		IN10	IN16	IN16C	IN20	IN6	IN10	IN18	IW10	IS26	IS45C	IS45	IS05	IS10	IW10	IS14	IS15	IS45	IS55
	Heavy interrupted																		
	Light interrupted																		
	Continuous																		

ISCAR CER-LINE

RCGX (CER)

Positive Round Ceramic Inserts for Machining Cast Iron, Hardened Steel, and Heat-Resistant Alloys





Designation	Dimensions IC	S	Bidemics IS05	IS10	Whisker IW10	Silicon Nitride IS14	IS15	IS45	Alumina IN10	IN16	IN20	Recommended Machining Data a_p (mm)	f (mm/rev)
RCGX 060400 E004	6.35	4.76	●	●	●	●	●	●				0.50-2.00	0.05-0.30
RCGX 060400 T01020	6.35	4.76	●	●	●	●	●	●				0.50-2.00	0.05-0.30
RCGX 060400 P07015	6.35	4.76							●	●	●	0.50-2.00	0.05-0.30
RCGX 060400 T01025	6.35	4.76							●	●	●	0.50-2.00	0.05-0.30
RCGX 060600 E004	6.35	6.35	●	●	●	●	●	●				0.50-2.00	0.05-0.30
RCGX 060600 T01020	6.35	6.35	●	●	●	●	●	●				0.50-2.00	0.05-0.30
RCGX 060600 P07015	6.35	6.35							●	●	●	0.50-2.00	0.05-0.30
RCGX 060600 T01025	6.35	6.35							●	●	●	0.50-2.00	0.05-0.30
RCGX 090700 P07015	9.53	7.94							●	●	●	0.50-3.00	0.05-0.30
RCGX 090700 E004	9.53	7.94	●	●	●	●	●	●				0.50-3.00	0.05-0.30
RCGX 090700 T01020	9.53	7.94	●	●	●	●		●				0.50-3.00	0.05-0.30
RCGX 090700 T01025	9.53	7.94							●	●	●	0.50-3.00	0.05-0.30
RCGX 120700 E004	12.70	7.94	●	●	●	●	●	●				0.50-3.00	0.05-0.30
RCGX 120700 T01020	12.70	7.94	●	●	●	●	●	●				0.50-3.00	0.05-0.30
RCGX 120700 P07015	12.70	7.94							●	●	●	0.50-3.00	0.05-0.30
RCGX 120700 T01025	12.70	7.94							●	●	●	0.50-3.00	0.05-0.30

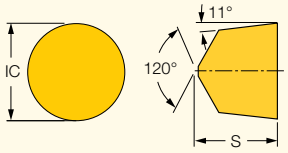
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 82-84,323-324,335-336

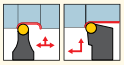
For tools, see pages: CRDCN-F (73) • RCGAD #R/L-T# (91)

ISCAR CER-LINE

RPGX (CER)

Positive Round Ceramic Inserts for Machining Cast Iron, Hardened Steel and Heat-Resistant Alloys

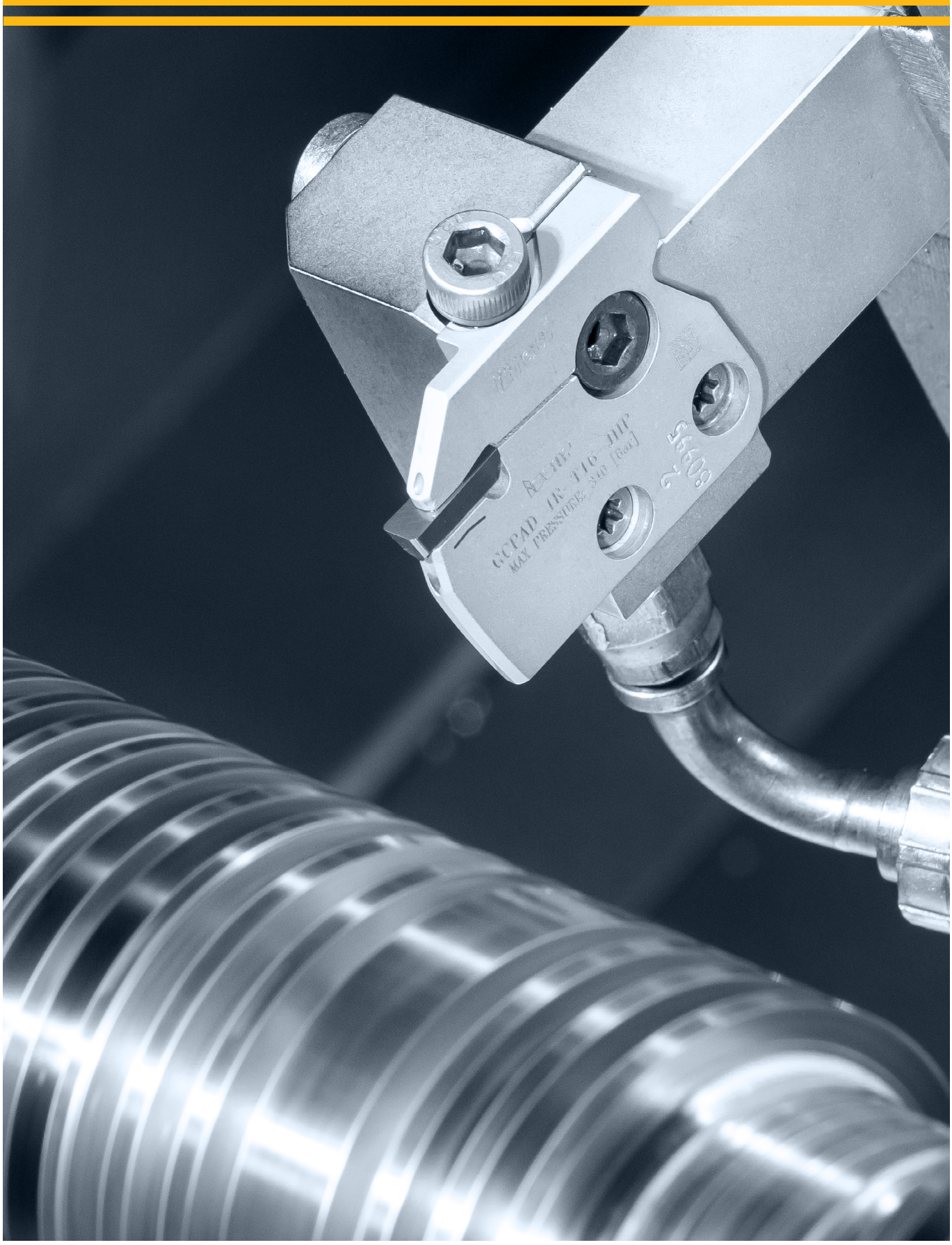




Designation	Dimensions IC	S	Bidemics IS05	IS10	Whisker IW10	Silicon Nitride IS14	IS15	IS45	Recommended Machining Data a_p (mm)	f (mm/rev)
RPGX 060400 E004	6.35	6.35	●	●	●	●	●	●	0.50-1.50	0.10-0.30
RPGX 060400 T01020	6.35	6.35	●	●	●	●		●	0.50-1.50	0.10-0.30
RPGX 060600 E004	6.35	6.35	●	●	●	●	●	●	0.50-1.50	0.10-0.30
RPGX 060600 T01020	6.35	6.35	●	●	●	●	●	●	0.50-1.50	0.10-0.30
RPGX 090700 E004	6.35	6.35	●	●	●	●	●	●	0.50-2.00	0.10-0.30
RPGX 090700 T01020	9.53	7.94	●	●	●	●	●		0.50-2.00	0.10-0.30
RPGX 120700 E004	12.70	7.94	●	●	●	●	●	●	0.50-3.00	0.10-0.30
RPGX 120700 T01020	12.70	7.94	●	●	●	●	●	●	0.50-4.50	0.10-0.45

• Tools can be supplied on request. • For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 82-84,323-324,335-336

CERAMIC GROOVING TOOLS

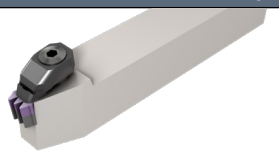


Grooving Tools - Index

GCPAD #R/L-T#-JHP 91

RCGAD #R/L-T# 91

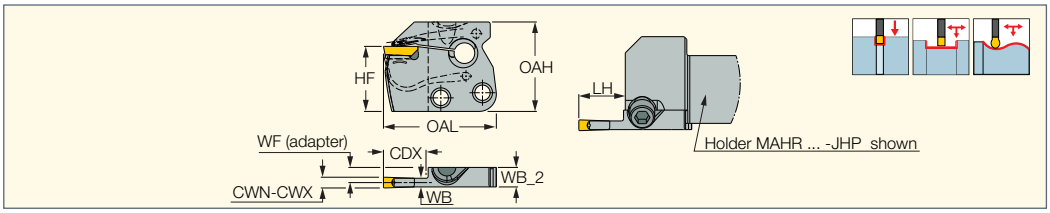
CHNPV 92



ISCAR CER-LINE

GCPAD #R/L-T#-JHP

Adapters with High-Pressure Coolant Channels Carrying GCP & CGP-R Ceramic Inserts



Designation	CWN(1)	CWX(2)	CDX(3)	LH	WF	WB	WB_2	OAL	OAH	HF
GCPAD 3R/L-T10-JHP	3.18	3.96	10.00	11.0	5.95	2.50	7.2	36.00	33.0	24.0
GCPAD 4R/L-T16-JHP	3.96	4.75	16.00	17.0	5.60	3.20	7.2	42.00	33.0	24.0
GCPAD 6R/L-T16-JHP	6.35	7.13	16.00	17.0	4.60	5.20	7.2	42.00	33.0	24.0
GCPAD 6R/L-T20-JHP	6.35	7.13	20.00	21.0	4.60	5.20	7.2	46.00	33.0	24.0
GCPAD 8R/L-T25-JHP	8.74	9.52	30.00	31.0	4.15	8.30	8.3	56.00	33.0	24.0

- For user guide, see pages 82-83

(1) Minimum cutting width

(2) Maximum cutting width

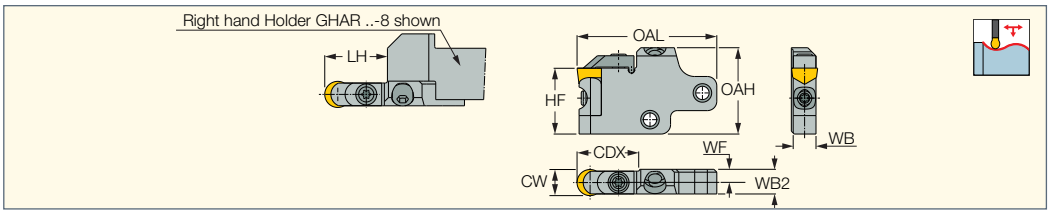
(3) Cutting depth maximum

For inserts, see pages: GCP (CER) (88) • GCP-R (CER) (88)

ISCAR CER-LINE

RCGAD #R/L-T#

Adapters Carrying RCGX and RPGX Positive Ceramic Inserts



Designation	CW	CDX(1)	LH	WB	HF	OAH	OAL	WB_2	WF
RCGAD 6R/L-T23	6.35	20.00	21.0	5.00	32.0	42.0	58.00	12.0	9.50
RCGAD 9R/L-T28	9.53	25.00	26.0	7.70	32.0	42.0	63.00	12.0	8.15
RCGAD 12R/L-T30	12.70	30.00	31.0	11.10	32.0	42.0	68.00	12.0	6.45

- For user guide and accessories see pages 82-83

(1) Cutting depth maximum

For inserts, see pages: RCGX (CER) (59) • RPGX (CER) (60)

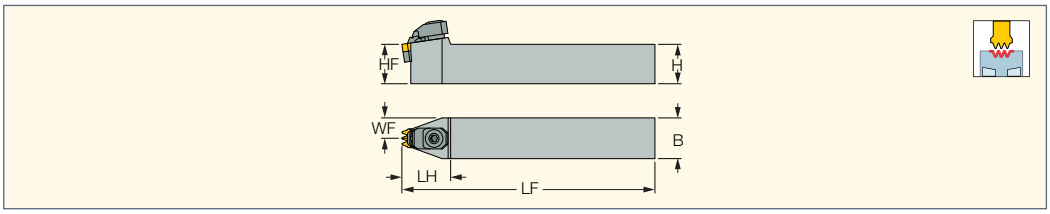
Spare Parts

Designation						
RCGAD 6R/L-T23	TCL R-C-06-F	IRSC 23C	SR M2.5-L12.5 A2	SR M3.5X0.6-L15 T15	T-15/5	HW 2.0
RCGAD 9R/L-T28	TCL R-C-09-F	IRSC 35C	SR M3.5X0.6-L15 T15	SR M5X0.8-L22 T20	T-20/5	T-15/5
RCGAD 12R/L-T30	TCL R-C-12-F	IRSC 45C	SR M6X1-L16 T25	SR M5X0.8-L22 T20	T-20/5	K40

ISCAR CER-LINE

CHNPV

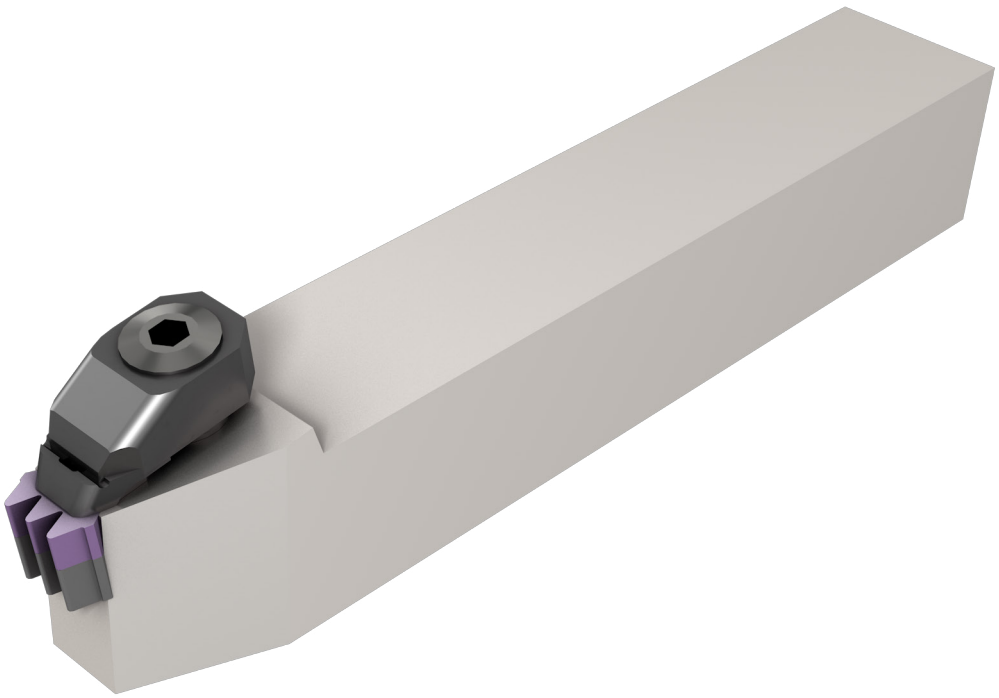
External Tool for Ceramic Poly-V Grooving Inserts



Designation	H	HF	B	LF	LH	WF	MIID[1]				
CHNPV 2525M-3	25.0	25.0	25.0	150.00	30.0	12.50	CPV 11-3.56-0504-3A	SR M3X0.5-L9 T8	SHIM IPVN-3T	CHIP BREAKER CB-PV	TOP CLAMP TCL PV-N3T-6T-F
CHNPV 2525M-4	25.0	25.0	25.0	150.00	34.0	12.50	CPV 14-3.56-0504-4A	SR M3X0.5-L9 T8	SHIM IPVN-4T	CHIP BREAKER CB-PV	TOP CLAMP TCL PV-N3T-6T-F
CHNPV 3225P-3	32.0	32.0	32.0	170.00	30.0	16.00	CPV 11-3.56-0504-3A	SR M3X0.5-L9 T8	SHIM IPVN-3T	CHIP BREAKER CB-PV	TOP CLAMP TCL PV-N3T-6T-F
CHNPV 3225P-4	32.0	32.0	25.0	170.00	34.0	12.50	CPV 14-3.56-0504-4A	SR M3X0.5-L9 T8	SHIM IPVN-4T	CHIP BREAKER CB-PV	TOP CLAMP TCL PV-N3T-6T-F
CHNPV 3225P-5	32.0	32.0	25.0	170.00	35.5	12.50	CPV 18-3.56-0504-5A	SR M3X0.5-L9 T8	SHIM IPVN-5T	CHIP BREAKER CB-PV	TOP CLAMP TCL PV-N3T-6T-F
CHNPV 3225P-6	32.0	32.0	25.0	170.00	35.5	12.50	CPV 21-3.56-0504-6A	SR M3X0.5-L9 T8	SHIM IPVN-6T	CHIP BREAKER CB-PV	TOP CLAMP TCL PV-N3T-6T-F

[1] Master insert identification

For inserts, see pages: CPV (CER) (87)



CERAMICS MILLING PRELUDE

Heat-Resistant Super Alloys (HRSA) and Hardened Materials Overview

FRN

- A high-performance milling cutter line designed to handle machining operations on aerospace components, cast iron, and hardened steels.
- Utilizes round-shaped inserts, providing excellent performance and versatility across different materials.
- Introducing IS15, a new SiAlON grade, which delivers exceptional performance specifically for high-speed machining high-temperature alloys.

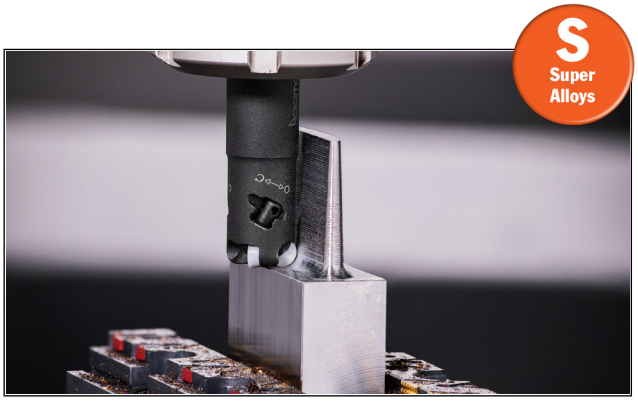
Recommend Cutting Conditions

	Workpiece Material		Grade	Dry	Wet	Cutting Speed (m/min) 50 200 350 500 650 800 950 1100	Feed (mm/t) 0.05 0.08 0.1 0.12 0.15	Depth of Cut (mm)
S	heat-resistant super alloys		IS14	•				~ 4.0
			IS15	•				~ 4.0
			IS45	•				~ 4.0
H	hardned steel	45-55 HRC	IW10	•	o			~ 4.0
			IN16C	•	o			~ 4.0
		55-65 HRC	IW10	•	o			~ 4.0
			IN15C	•	o			~ 4.0

For inserts see pages 104,205
For tools see page 110

ERP

- A high-performance milling cutter line designed for milling faces, cavities, pockets, complex-shaped surfaces, close-to-shoulder milling, and ramping down including helical and circular interpolation



Recommend Cutting Conditions

	Workpiece Material	Grade	Dry	Wet	Cutting Speed (m/min) 350 500 650 800 950 1100 1200	Feed (mm/t) 0.05 0.08 0.1 0.12 0.15	Depth of Cut (mm)
S	gray cast iron ductile cast iron	IS14	•				~ 3.00
		IS15	•				~ 3.00
		IS45	•				~ 3.00

For inserts see page 103
For tools see page 110

Guidelines for Success

- Minimize overhang and have ridged set-ups
- Keep cutter engagement to 1/2 to 5/8 of the cutter diameter
- Reduce feed upon entrance and exit of the cut by 25%
- Use air blast without coolant
- Use helical interpolation to ramp down into a cavity
- Increase feed rates in corners to compensate for heat loss
- Use climb milling
- Use shrink fit holders whenever possible
- Safety first-do not exceed Cutting Speed
- As DOC gets smaller speed should accelerate to compensate for heat loss
- Adjust speed to maximize plastic deformation

Target Industries

- mold shops
- tool & die
- food processing
- forging
- mining

Application Materials

- tool steels
- mold steels
- chilled irons
- powered metal
- stellite
- weld overlays

Gray / Ductile Cast Iron Overview

K Cast Iron

ERP

- A high-performance milling cutter line designed for milling faces, cavities, pockets, complex-shaped surfaces, close-to-shoulder milling, and ramping down including helical and circular interpolation

Recommend Cutting Conditions

K	Workpiece Material	Grade	Dry	Wet	Cutting Speed (m/min) 450	500	650	800	950	1100	1200	Feed (mm/t) 0.07	0.1	0.15	0.2	0.25	0.3	Depth of Cut (mm)
	gray cast iron	IS45	•				○						○					~ 3.00

For inserts see page 103
For tools see page 110

T488 FLN

- Enhanced productivity with the ability to achieve a large depth of cut (DOC) due to the fine pitch of the inserts.
- T488 LNHU insert incorporates a chipbreaker design to effectively reduce tool pressure, improving performance.
- Newly introduced left-handed cutters for added versatility and convenience.

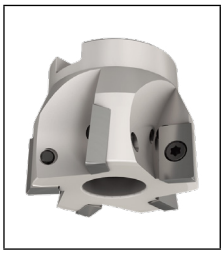
Recommended Cutting Conditions

K	Workpiece Material	Grade	Dry	Wet	Cutting Speed (m/min) 350	500	650	800	950	1100	1250	Feed (mm/t) 0.05	0.1	0.15	0.2	0.25	0.3	Depth of Cut (mm)
	gray cast iron	IS26	•	•			○							○				~ 8.0
		IS45	•	o		○								○				~ 8.0
	ductile cast iron	IS45C	•	o			○							○				~ 8.0

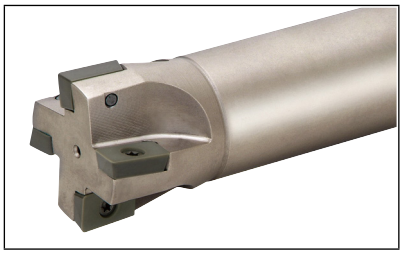
For inserts see page 106
For tools see page 113

F90-AP16/E90-AP016

- Enables precise 90-degree shoulder milling operations.
- Offers a wide range of cutter diameters, including small options as small as φ20 mm, providing flexibility for various milling needs.



E90-AP016



F90-AP16

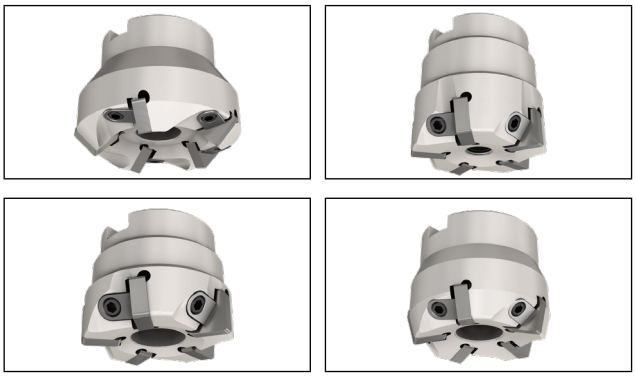
Recommended Cutting Conditions

K	Workpiece Material	Grade	Dry	Wet	Cutting Speed (m/min) 350	500	650	800	950	1100	1250	Feed (mm/t) 0.05	0.1	0.15	0.2	0.25	0.3	Depth of Cut (mm)
	gray cast iron	IS26	•	o			○							○				~ 8.0
		IS45	•	•		○								○				~ 8.0
	ductile cast iron	IS45C	•	o			○							○				~ 8.0

For inserts see page 103
For tools see page 109

F45SN/F75SN/F88SN/F90SN

- Highly cost-effective 8-corner inserts that offer excellent value for money.
- Versatile usage with 45, 75, 88, and 90. degree angle milling cutters.
- Ceramics inserts with chipformer and wiper options are also offered, providing additional versatility and efficiency.



Recommended Cutting Conditions

	Workpiece Material	Grade	Dry	Wet	Cutting Speed (m/min) 350	500	650	800	950	1100	1250	Feed (mm/t) 0.05	0.1	0.15	0.2	0.25	0.3	Depth of Cut (mm)
K	gray cast iron	IS26	•	•			○	○	○	○				○	○			~ 6.0
		IS45	•	o			○	○						○	○			~ 6.0
	ductile cast iron	IS45C	•	o		○	○							○	○			~ 6.0

For inserts see pages 104-106
For tools see pages 111-112

F90TN

- Economical and multifunctional.
- TNGN 1604 style inserts with 6 cutting edges.
- Low cutting force.
- Offers both economic value and multifunctionality.
- Equipped with TNGN 1604 style inserts that boast six cutting edges, maximizing efficiency and tool life.
- Delivers low cutting force, resulting in reduced tool wear and improved machining performance.

Recommended Cutting Conditions

	Workpiece Material	Grade	Dry	Wet	Cutting Speed (m/min) 350	500	650	800	950	1100	1250	Feed (mm/t) 0.05	0.1	0.15	0.2	0.25	0.3	Depth of Cut (mm)
K	gray cast iron	IS26	•	•			○	○	○	○				○	○			~ 6.0
		IS45	•	o			○	○						○	○			~ 6.0
	ductile cast iron	IS45C	•	o		○	○							○	○			~ 6.0

For inserts see page 65
For tools see page 113

Milling with ISCAR Grades by Application

General Guidelines for Successful Milling

- Select the best grade for the application
- Select cutter diameter 15 times greater than the workpiece width
- Eliminate overhang to increase stability
- Choose the strongest nose radius
- No coolant use compressed air
- Check clamp and part rigidity

Guidelines for Successful Milling by Material:
Heat Resistant Alloy / PH Stainless Steel

- Down or climb milling where the chip thins upon exit is the preferred method for HNBA materials
- Reduce feed rate 50% upon entrance and exit
- Do not recut side walls as this can cause work hardening
- Use balanced shell mill adapter or shrink fit for end-mills
- As DOC gets thinner the feed must be increased to compensate for heat loss
- Use RPG geometries if tool pressure is a problem
- E002, E004 edge preparation recommended

Hardened Steel / Die Mold / Chilled Iron / Overlay

- Larger edge preparations need to be used
- Speed is reduced as hardness goes up

Cast Iron / Ductile Cast Iron

- Parts that are cast are more difficult to machine than forged decrease feed rates by 25%
- Maximize feed rates for gray cast irons

Troubleshooting

Workpiece Material	Insert Composition	Grade	Problem	Solution					
				Speed	Feed	DOC	Edge Prep.	Insert Grade	Others
Hardened Steel	ceramics	IN16C IW10	chipping	—	↘	—	wider	—	—
			break	↘	↘	—	—	—	—
Cast Iron	silicon nitride	IS26 IS45C	chipping	↘	↘	—	wider	—	—
			break	↘	↘	↘	—	tougher	larger radius
			themal crack	↘	↘	—	—	—	—
			crater wear		—	—	shaper	—	—
Heat Resistant Alloy	SiAlON	IS45 IS14	notching	↗	↗	vary / ↘	wider	—	pre-chamfer parts
			flank wear	↘	↗	—	—	harder	—
			chipping	—	—		wider	tougher	—
			break	↘	—	↘	—	tougher	—
			themal pressure	—	—	—	—	—	use RPG insert

Solid Ceramic Endmill

Endmills

- Experience incredibly fast machining speeds for HRSA (heat-resistant super alloy) materials with our long-lasting SiAlON grade "IS45".
- Achieve over 15 times higher productivity compared to a carbide end-mill.
- We offer options of 4, 6, and 8 flutes to meet your specific needs.
- Our patent pending design ensures exceptional toughness at the cutting edge.

Ceramics Specialist's Design:

Helix Angle
4-flute: toughness
6 -flute: less tool pressure and better chip evacuation

IS45 (SiAlON)
well balanced for toughness and wear resistance

Flute
- optimized for HRSA
- excellent toughness

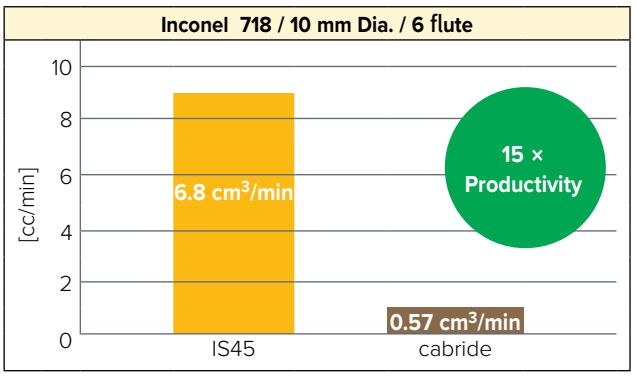
Bottom edge
the unique shape of the bottom edge enhances the toughness and durability of our product

For Maximum Productivity when Cutting HRSA

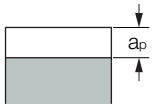
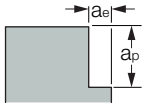
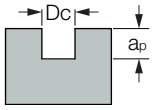
- It is recommended to perform a continuous cut, as an interrupted cut may result in chipping or breakage.
- When using a hydraulic or shrink chuck, blow air to the arbor body, don't blow air to the endmill itself.
- Ensure a minimum speed of 300 m/min is maintained. (don't run at lower speed.)
- For ramping cuts, a recommended angle of 1.5 degrees is suggested. It is recommended to run at a 50% lower feed rate during ramping cuts.
- It is important to continue the machining process even if you observe built-up edge (bue). Removing bue may lead to chipping or breakage at the cutting edge.
- Keep in mind that high-speed machining work hardens the material. Hence, it is recommended to leave at least 0.3 mm of material for the finishing process.

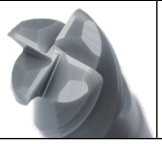
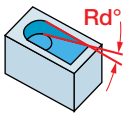
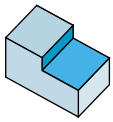
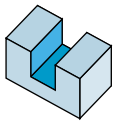
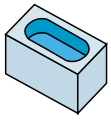
Test Report

Work Material	inconel 718
Cutting Speed	ceramics - (IS45) 200 m/min
	carbide - 40 m/min
Feed	0.03 mm/t
Depth of Cut	3.0 mm
Coolant	dry

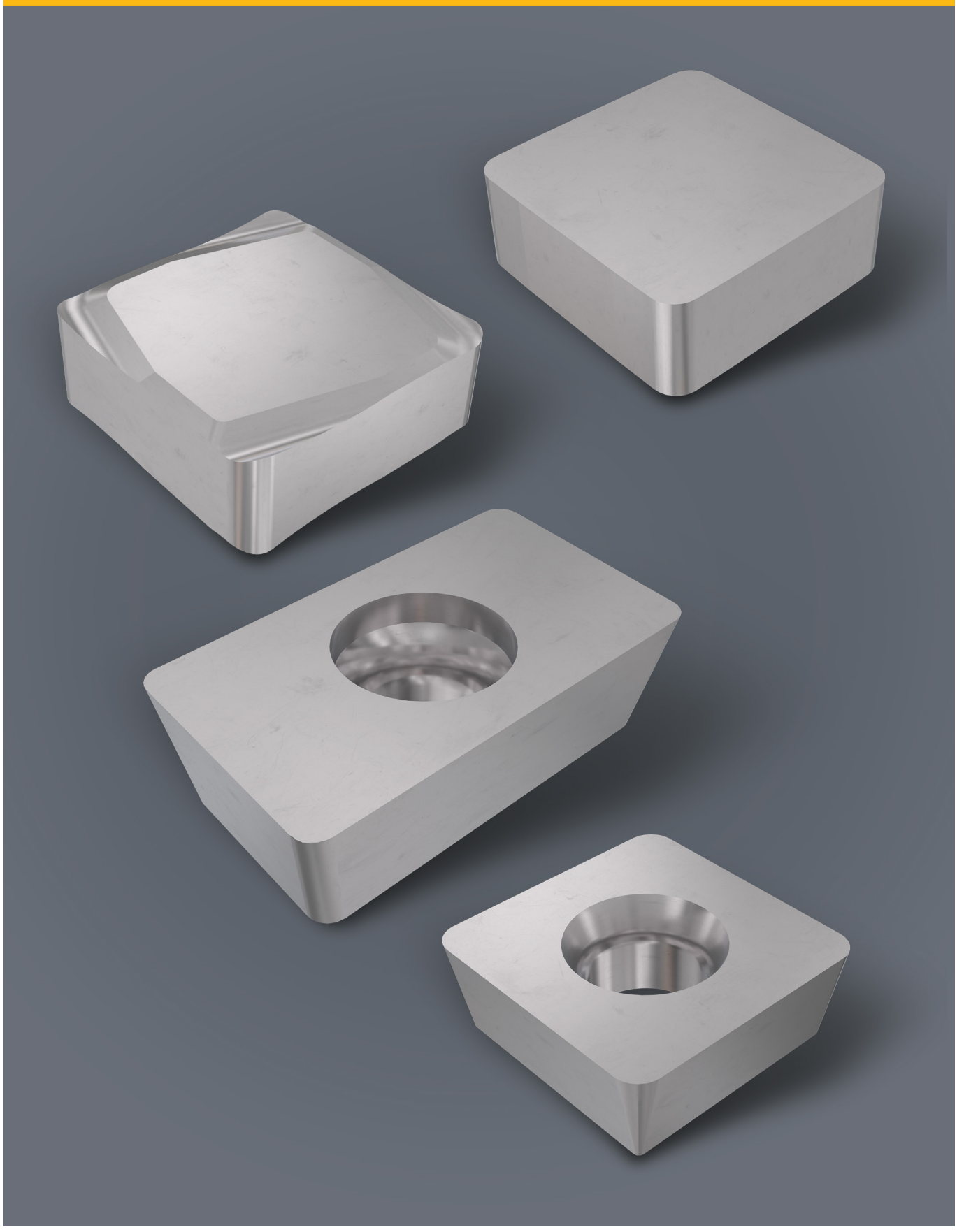


Recommended Cutting Conditions for HRSA Material

Application	Grade	ØDc	Flute	Cutting Speed (m/min) 150 600 1000	Feed (mm/t)	Depth of Cut a_p (mm)	Width of Cut a_e (mm)	Coolant
face milling 	IS45	8 mm	4/6		0.03	1.2	—	dry
		10 mm				1.5		
		12 mm				1.8		
		16 mm				2.4		
		20 mm				3.0		
side milling 	IS45	8 mm	4/6		0.03	4.0	0.8	dry
		10 mm				5.0	1.0	
		12 mm				6.0	1.2	
		16 mm				8.0	1.6	
		20 mm				10.0	2.0	
slotting 	IS45	8 mm	4		0.03	2.0	—	dry
		10 mm				2.5		
		12 mm				3.0		
		16 mm				4.0		
		8 mm	6		0.03	1.2	—	dry
		10 mm				1.5		
		12 mm				1.8		
		16 mm				2.4		

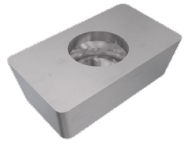
4-Flute	6-Flute	Application			
					

CERAMIC MILLING INSERTS

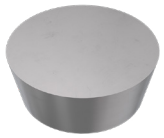


Ceramic Milling Inserts - Index

APCW 1604 (CER) 103



RPGN (CER) 103



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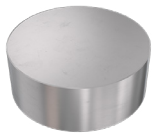

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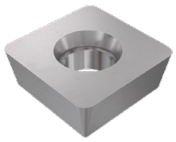
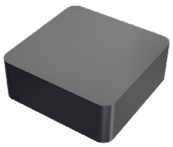


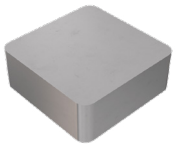
SNGF (CER) 104

SNGN (CER) 105



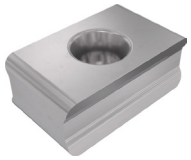
SNGN-AN (CER) 105

SNGN-EN (CER) 105



SNGN-ZN (CER) 106

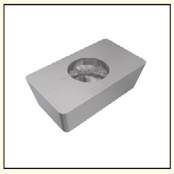
T488 LNHU (CER) 106

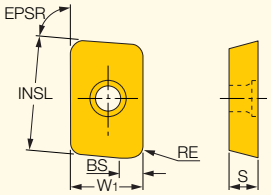


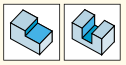
ISCAR CER-LINE

APCW 1604 (CER)

Radial Clamped Ceramic Insert
Used for High-Speed Machining
Gray and Nodular Cast Iron







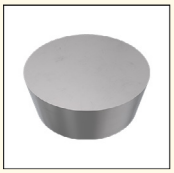
Designation	Dimensions W1	INSL	S	RE	EPSR	BS	Silicon Nitride IS45C	IS26	Recommended Machining Data a_p (mm)	f_z (mm/t)
APCW 1604PDTR T01020	9.53	16.46	4.76	0.80	85.0	2.60		●	0.80-14.00	0.05-0.20
APCW 1604PDTRT01020	9.53	16.46	4.76	0.80	85.0	2.60	●		0.80-14.00	0.05-0.20
APCW 160408 T01020	9.53	16.46	4.76	0.80	85.0	-	●	●	0.80-14.00	0.05-0.20
APCW 160412 T01020	9.53	16.46	4.76	1.20	85.0	-	●	●	1.20-14.00	0.05-0.20
APCW 160416 T01020	9.53	16.46	4.76	1.60	85.0	-		●	1.60-14.00	0.05-0.20
APCW 160420 T01020	9.53	16.46	4.76	2.00	85.0	-	●	●	1.60-14.00	0.05-0.20

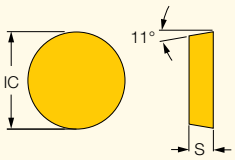
For tools, see pages: E90-AP16 (109) • F90-AP16 (109)

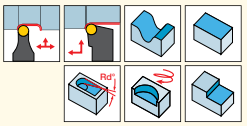
ISCAR CER-LINE

RPGN (CER)

Positive Round Ceramic
Inserts for Machining Cast Iron
and Heat-Resistant Alloys







Designation	Dimensions IC	S	Silicon Nitride IS14	IS15	IS45	Recommended Machining Data a_p (mm)	f_z (mm/rev)
RPGN 060200 E004	6.35	2.38	●	●	●	1.00-1.50	0.08-0.15
RPGN 060200 T00520	6.35	2.38			●	1.00-1.50	0.08-0.15
RPGN 060200 T01020	6.35	2.38	●	●	●	1.00-1.50	0.08-0.15
RPGN 090300 E004	9.53	3.18	●	●	●	1.00-2.00	0.08-0.15
RPGN 090300 T01020	9.53	3.18	●	●	●	1.00-2.00	0.08-0.15
RPGN 120400 E004	12.70	4.76	●	●	●	1.00-3.00	0.08-0.15
RPGN 120400 T01020	12.70	4.76	●	●	●	1.00-3.00	0.08-0.15

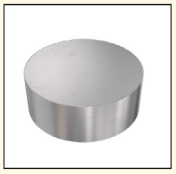
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

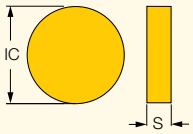
For tools, see pages: ERP (110)

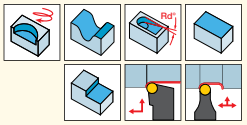
ISCAR CER-LINE

RNGN (CER)

Negative Round Double-Sided Ceramic Inserts for Machining Cast Iron, Hardened Steel, and Heat-Resistant Alloys







Designation	Dimensions IC	S	Bidemics IS05	IS10	Whisker IW10	Silicon Nitride IS14	IS15	IS45C	IS45	IS55	IS26	Alumina IN10	IN16	IN16C	IN20	Recommended Machining Data a_p (mm)	f_z (mm/t)
RNGN 120700 E004	12.70	7.94	•	•	•	•	•		•	•						0.05-3.00	0.05-0.50
RNGN 120700 T01020	12.70	7.94	•	•	•	•	•	•		•	•					0.10-4.50	0.07-0.50
RNGN 120700 T00520	12.70	7.94			•				•							0.05-3.00	0.05-0.50
RNGN 120700 P20015	12.70	7.94										•	•		•	0.05-3.00	0.05-0.50
RNGN 120700 S02025	12.70	7.94												•		0.05-3.00	0.05-0.50
RNGN 120700 T02025	12.70	7.94												•		0.05-3.00	0.05-0.50

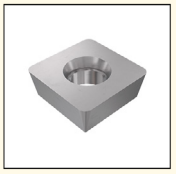
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

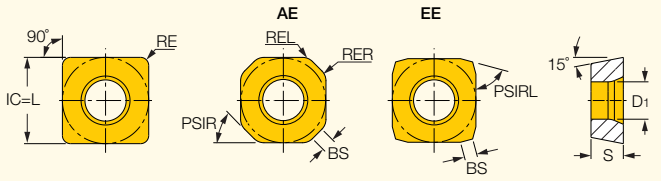
For tools, see pages: • CRDNN-F (74) • CRGNR/L (254) • FRN (110)

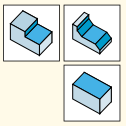
ISCAR CER-LINE

SDCW (CER)

Ceramic Square Inserts for Machining Cast Iron







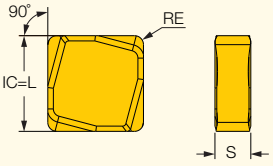
Designation	Dimensions L	S	BS	D1	PSIR	PSIRL	RE	REL	RER	Silicon Nitride IS45C	IS26	Recommended Machining Data a_p (mm)	f_z (mm/t)
SDCW 1204AE T01020	12.70	4.76	2.40	5.50	45.0	-	-	1.20	1.20	•	•	1.20-6.00	0.05-0.20
SDCW 1204EE RT01020	12.70	4.76	1.40	5.50	-	75.0	-	-	-	•	•	0.50-6.00	0.05-0.20
SDCW 120408 T01020	12.70	4.76	-	5.50	-	-	0.80	-	-	•	•	0.80-6.00	0.05-0.20

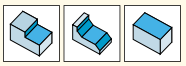
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

ISCAR CER-LINE

SNGF (CER)

Radial Double-Sided Ceramic Face Milling Inserts with a Chipbreaker





Designation	Dimensions IC	S	RE	Silicon Nitride IS45C	IS26	Recommended Machining Data a_p (mm)	f_z (mm/t)
SNGF 120412 T01020RC	12.70	4.76	1.20	•	•	1.20-5.00	0.05-0.20

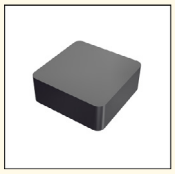
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

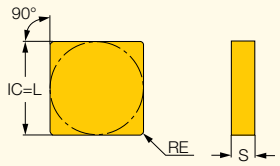
For tools, see pages: F45SN (111) • F75SN (111) • F88SN (112) • F90SN (112)

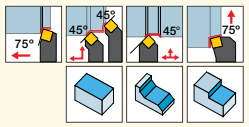
ISCAR CER-LINE

SNGN (CER)

Negative Square Double-Sided Ceramic Inserts for Machining Cast Iron, Hardened Steel and Heat-Resistant Alloys







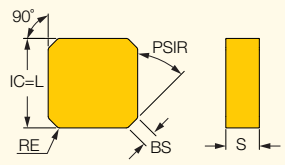
Designation	Dimensions IC	S	RE	Silicon Nitride IS15	IS45C	IS45	IS26	Alumina IN6	IN10	IN16C	IN18	Recommended Machining Data a_p (mm)	f_z (mm/t)
SNGN 120404 S02025	12.70	4.76	0.40							•		0.05-2.00	0.05-0.20
SNGN 120408 S02025	12.70	4.76	0.80							•		0.05-3.00	0.05-0.30
SNGN 120408 T01020	12.70	4.76	0.80		•	•	•	•	•		•	0.05-3.00	0.05-0.30
SNGN 120408 T02020	12.70	4.76	0.80				•					0.05-3.00	0.05-0.30
SNGN 120412 S02025	12.70	4.76	1.20							•		0.05-4.00	0.05-0.45
SNGN 120412 T01020	12.70	4.76	1.20		•	•	•	•	•		•	0.05-4.00	0.05-0.45
SNGN 120416 T01020	12.70	4.76	1.60		•	•	•	•	•		•	0.50-5.00	0.05-0.50
SNGN 120416 T02020	12.70	4.76	1.60				•					0.50-5.00	0.05-0.50

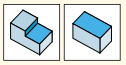
For tools, see pages: CSDNN-CE/CEA (255) • CSDNN-F/X (74) • CSKNR/L-F/X (75) • CSRNR/L-F/X (75) • CSSNR/L-F/X (76) • CSXNR/L-F/X (76) • CSYNR/L-F/X (77) • F45SN (111) • F75SN (111) • F88SN (112) • F90SN (112) • S-CSSNR/L-X (80)

ISCAR CER-LINE

SNGN-AN (CER)

Negative Square Double-Sided Ceramic Inserts for Machining Cast Iron, Hardened Steel and Heat-Resistant Alloys





Designation	Dimensions IC	S	RE	PSIR	BS	Silicon Nitride IS45C	IS26	Recommended Machining Data a_p (mm)	f_z (mm/t)
SNGN 1204AN T01020	12.70	4.76	0.50	45.0	2.00	•	•	0.50-5.00	0.05-0.20

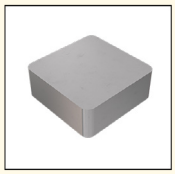
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

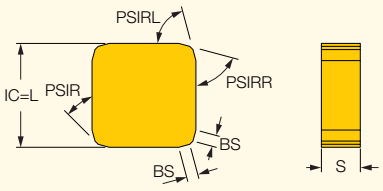
For tools, see pages: F45SN (111)

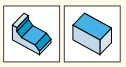
ISCAR CER-LINE

SNGN-EN (CER)

Negative Square Double-Sided Ceramic Inserts for Machining Cast Iron, Hardened Steel and Heat-Resistant Alloys







Designation	Dimensions IC	S	PSIRR	PSIRL	PSIR	BS	Silicon Nitride IS45C	IS26	Recommended Machining Data a_p (mm)	f_z (mm/t)
SNGN 1204EN T01020	12.70	4.76	75.0	75.0	45.0	1.40	•	•	0.50-5.00	0.05-0.20

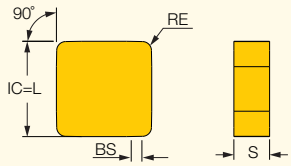
• For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

For tools, see pages: F75SN (111)

ISCAR CER-LINE

SNGN-ZN (CER)

Radial Double-Sided Ceramic Face Milling Inserts Used for High-Speed Machining Gray and Nodular Cast Iron



Designation	Dimensions IC	S	RE	L	BS	Silicon Nitride IS45C	IS26	Recommended Machining Data a_p (mm)	f_z (mm/t)
SNGN 1204ZN T01025	12.70	4.76	1.20	12.70	2.00	•	•	1.20-5.00	0.05-0.20
SNGN 1204ZN T01020	12.70	4.76	1.20	12.70	2.00	•	•	1.20-5.00	0.05-0.20

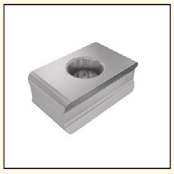
- For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

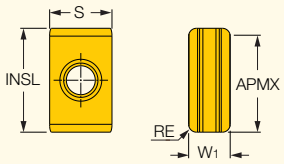
For tools, see pages: F88SN (112)

ISCAR CER-LINE

T488 LNHU (CER)

Tangentially Clamped Ceramic Insert for Machining Gray and Ductile Iron





Designation	Dimensions INSL	S	RE	W1	APMX	Silicon Nitride IS45C	IS26	Recommended Machining Data a_p (mm)	f_z (mm/t)
T488 LNHU 160608N	15.88	6.35	0.80	9.53	14.00	•	•	0.80-14.00	0.05-0.20
T488 LNHU 160612N	15.88	6.35	1.20	9.53	14.00	•	•	1.20-14.00	0.05-0.20
T488 LNHU 160616N	15.88	6.35	1.60	9.53	14.00	•	•	1.60-14.00	0.05-0.20

- For user guide and cutting speed recommendations, see pages 4,12-48,50-52, 323-324,335-336

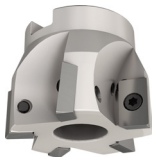
For tools, see pages: T488 FLN (113)

CERAMIC MILLING TOOLS PRELUDE

Ceramic Milling Tools - Index

F90-AP16 109

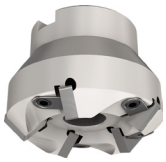
E90-AP16 109



ERP 110

FRN 110

F45SN 111



F75SN 111

F88SN 112

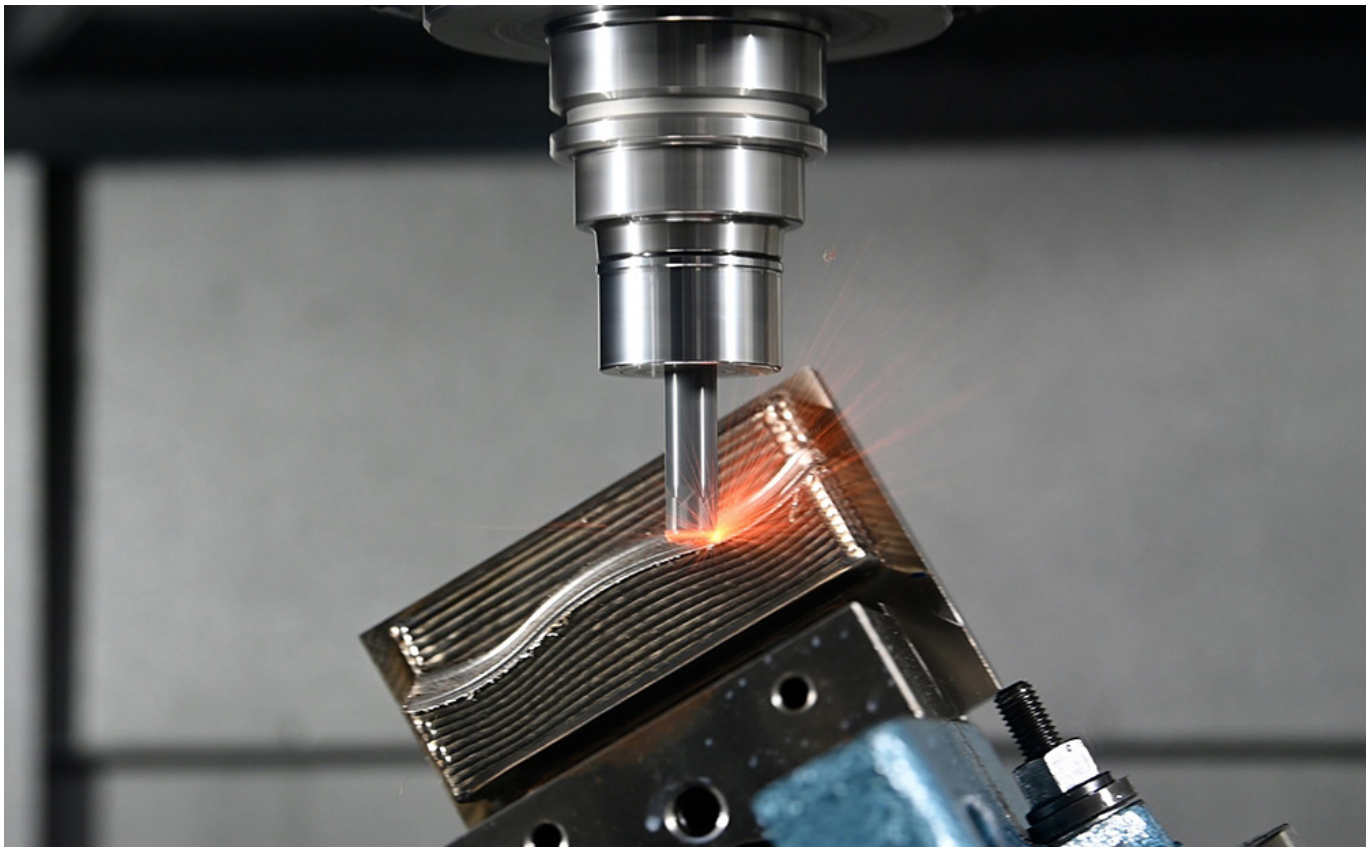
F90SN 112

F90TN 113

T488 FLN 113

EC-E4 (CER) 114

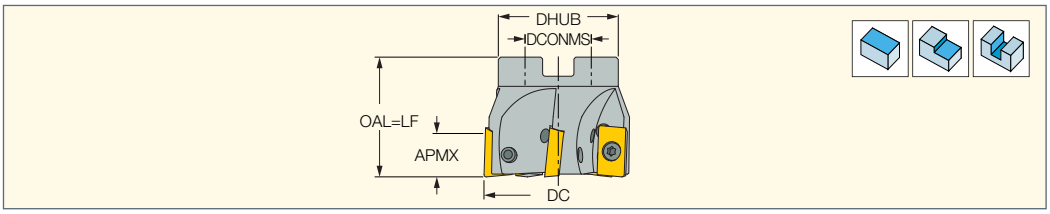
EC-E6 (CER) 114



ISCAR CER LINE

F90-AP16

90° Face Mills Carrying
APCW 1604 Inserts



Designation	DC	CICT(1)	APMX	DHUB	DCONMS	OAL	Arbor	kg
F90 D040-04-16-AP16	40.00	4	14.00	35.00	16.00	40.00	A	0.20
F90 D050-05-22-AP16	50.00	5	14.00	45.00	22.00	40.00	A	0.30
F90 D063-06-22-AP16	63.00	6	14.00	58.00	22.00	50.00	A	1.40
F90 D080-08-27-AP16	80.00	8	14.00	58.00	27.00	50.00	A	1.90

- For user guide, see pages 96, 329-330,333-336

(1) Number of inserts

For inserts, see pages: APCW 1604 (CER) (103)

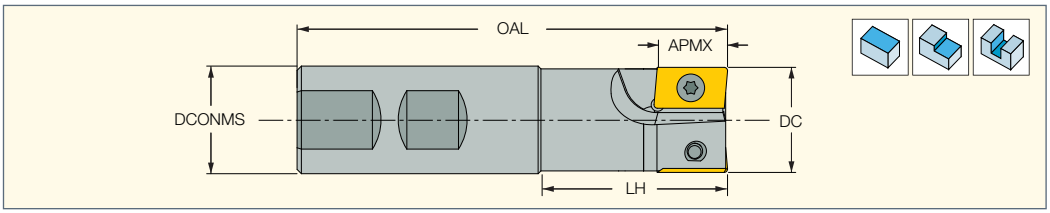
Spare Parts

Designation			
F90-AP16	SR M4X9-4H	BLD T15/S7	SW6-SD

ISCAR CER LINE

E90-AP16

90° Endmills Carrying
APCW 1604 Inserts



Designation	DC	CICT(1)	APMX	LH	DCONMS	OAL	Shank(2)	kg
E90 D020-01-W20-AP16	20.00	1	14.00	30.0	20.00	100.00	W	0.20
E90 D025-02-W25-AP16	25.00	2	14.00	30.0	25.00	100.00	W	0.30
E90 D032-02-W32-AP16	32.00	2	14.00	35.0	32.00	110.00	W	0.50
E90 D040-04-W32-AP16	40.00	4	14.00	37.0	32.00	110.00	W	0.60

- For user guide, see pages 96, 329-330,333-336

(1) Number of inserts (or edges for solid tool)

(2) W-Weldon

For inserts, see pages: APCW 1604 (CER) (103)

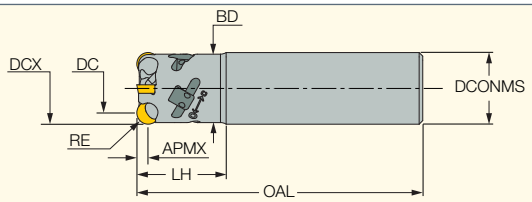
Spare Parts

Designation			
E90-AP16	SR M4X9-4H	BLD T15/S7	SW6-SD

CERMILL

ERP

Endmills Carrying Single-Sided Ceramic Round Inserts



Designation	DCX[1]	DC	RE	APMX	CICT[2]	LH	OAL	BD	DCONMS	RMPX°[3]	Shank[4]	MIID[5]
ERP D010A016-03-C16-06	16.00	9.65	3.18	3.17	3	25.0	80.00	15.00	16.00	2.5	C	RPGN 06
ERP D014A020-04-C20-06	20.00	13.65	3.18	3.17	4	30.0	80.00	19.00	20.00	4.0	C	RPGN 06
ERP D019A025-05-C25-06	25.00	18.65	3.18	3.17	5	40.0	100.00	24.00	25.00	3.5	C	RPGN 06

- For user guide and cutting conditions see page 96

[1] Cutting diameter maximum
[2] Number of inserts (or edges for solid tool)
[3] Maximum ramping angle
[4] C-Cylindrical
[5] Master insert identification

For inserts, see pages: RPGN (CER) (103)

Spare Parts

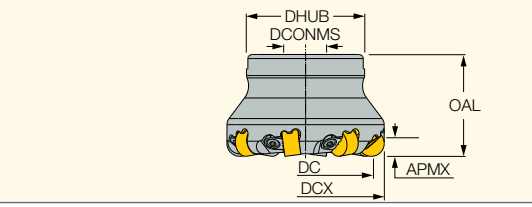
Designation			
ERP	CL-D4-L9-M3X0.5	NUT-D4.5-L6-M3X0.5	CW 1.7-L20*

* Optional, to be ordered separately

ISCAR CERLINE

FRN

Face Mill for Wedge-Clamped Double-Sided Round Inserts



Designation	DCX[1]	DC	APMX	OAL	DCONMS	DHUB	Arbor	CICT[2]	MDN[3]	MDX[4]	RMPX°[5]	kg
FRN D038A050-05-22-12	50.00	37.30	3.00	40.00	22.00	45.00	A	5	87.30	99.00	0.4	0.46
FRN D051A063-06-22-12	63.00	50.30	3.00	40.00	22.00	47.00	A	6	113.30	125.00	0.3	0.63
FRN D068A080-07-27-12	80.00	67.30	3.00	50.00	27.00	58.00	A	7	147.30	159.00	0.3	0.85

- For user guide and cutting conditions see page 94
- Radius for programing: 6.35

[1] Cutting diameter maximum
[2] Number of inserts
[3] Machinable diameter minimum for interpolation
[4] Machinable diameter maximum for interpolation
[5] Maximum ramping angle

For inserts, see pages: RNGN (CER) (104) • RNGN HS (CBN) (156) • RNGN HS (PCD) (205) • RNGN S (CBN) (156)

Spare Parts

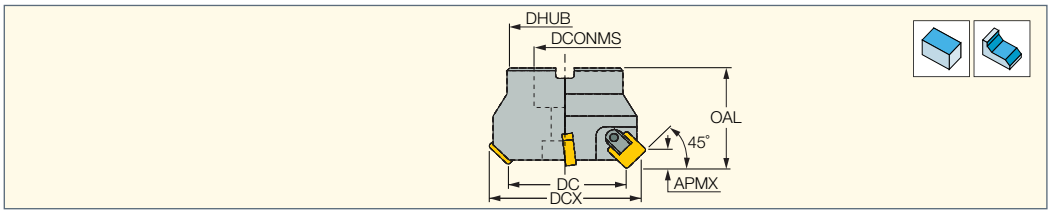
Designation			
FRN	WEDGE SCREW[a]	LW 1207C	T-W3

[a] Recommended tightening torque:4.8 Nm

ISCAR CERLINE

F45SN

45° Face Mills with Wedge Clamp for Negative SNGN 12 Ceramic Inserts



Designation	DC	DCX(1)	APMX	OAL	CICT(2)	DHUB	DCONMS	Arbor	kg
F45SN D50-05-22-12	50.00	58.00	8.00	50.00	5	45.00	22.00	A	0.78
F45SN D63-06-22-12	63.00	72.00	8.00	50.00	6	58.00	22.00	A	0.93
F45SN D80-08-27-12	80.00	95.00	8.00	50.00	8	62.00	27.00	A	1.21
F45SN D100-10-32-12	100.00	120.00	8.00	50.00	10	62.00	32.00	A	1.66
F45SN D125-13-40-12	125.00	146.00	8.00	50.00	13	83.00	40.00	A	2.80

- For user guide, see pages 97, 329-330,333-336

(1) Cutting diameter maximum

(2) Number of inserts

For inserts, see pages: SNGF (CER) (104) • SNGN (CER) (105) • SNGN-AN (CER) (105)

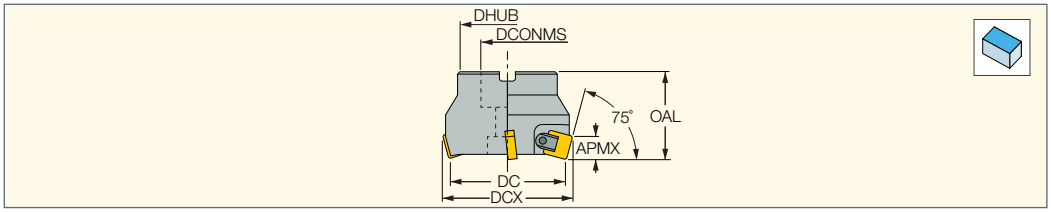
Spare Parts

Designation				
F45SN	WS M6X1-L16 R/L	BLD T15/S7	SW6-SD	LW 5225-M5

ISCAR CERLINE

F75SN

75° Face Mills with Wedge Clamp for Negative SNGN 12 Ceramic Inserts



Designation	DC	DCX(1)	CICT(2)	APMX	OAL	DHUB	DCONMS	Arbor	kg
F75SN D50-05-22-12	50.00	57.00	5	12.00	50.00	45.00	22.00	A	0.65
F75SN D63-06-22-12	63.00	70.00	6	12.00	50.00	58.00	22.00	A	0.79
F75SN D80-08-27-12	80.00	87.00	8	12.00	50.00	62.00	27.00	A	1.06
F75SN D100-10-32-12	100.00	107.00	10	12.00	50.00	62.00	32.00	A	1.39
F75SN D125-13-40-12	125.00	132.00	13	12.00	50.00	83.00	40.00	A	2.56

- For user guide see pages 97, 329-330,333-336

(1) Cutting diameter maximum

(2) Number of inserts

For inserts, see pages: SNGF (CER) (104) • SNGN (CER) (105) • SNGN-EN (CER) (105)

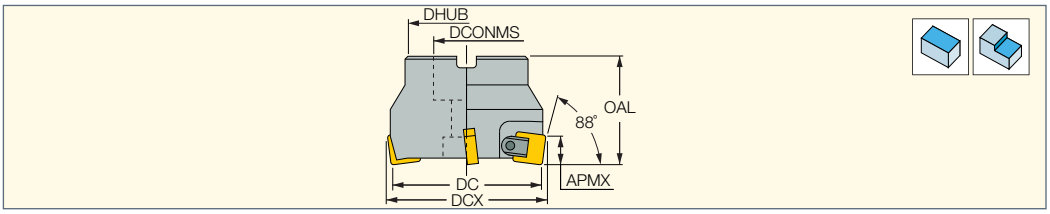
Spare Parts

Designation				
F75SN	WS M6X1-L16 R/L	BLD T15/S7	SW6-SD	LW 5225-M5

ISCAR CER-LINE

F88SN

88° Face Mills with Wedge Clamp for Negative SNGN 12 Ceramic Inserts



Designation	DC	DCX(1)	CICT(2)	DCONMS	DHUB	APMX	OAL	Arbor	kg
F88SN D50-05-22-12	50.00	51.00	5	22.00	45.00	12.00	50.00	A	0.65
F88SN D63-06-22-12	63.00	64.00	6	22.00	58.00	12.00	50.00	A	0.79
F88SN D80-08-27-12	80.00	81.00	8	27.00	62.00	12.00	50.00	A	1.06
F88SN D100-10-32-12	100.00	101.00	10	32.00	62.00	12.00	50.00	A	1.39
F88SN D125-13-40-12	125.00	126.00	13	40.00	83.00	12.00	58.00	A	2.56
F88SN D160-16-40-12	156.00	161.00	16	40.00	100.00	12.00	60.00	A	4.10

- For user guide see pages 97, 329-330,333-336

(1) Cutting diameter maximum

(2) Number of inserts

For inserts, see pages: SNGF (CER) (104) • SNGN (CER) (105) • SNGN-ZN (CER) (106)

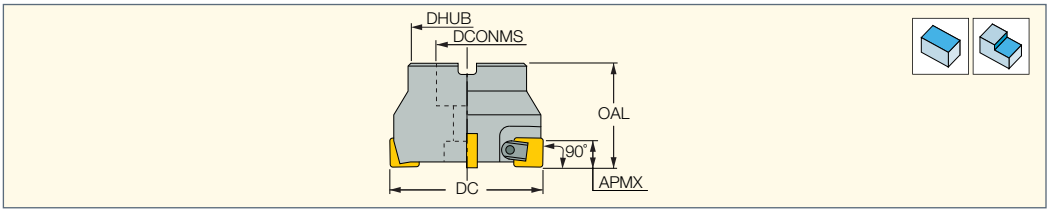
Spare Parts

Designation				
F88SN	WS M6X1-L16 R/L	BLD T15/S7	SW6-SD	LW 5225-M5

ISCAR CER-LINE

F90SN

90° Face Mills with Wedge Clamp for Negative SNGN 12 Ceramic Inserts



Designation	DC	CICT(1)	DCONMS	DHUB	APMX	OAL	Arbor	kg
F90SN D050-05-22-12	50.00	5	22.00	45.00	12.70	50.00	A	0.65
F90SN D063-06-22-12	63.00	6	22.00	58.00	12.70	50.00	A	0.79

- For user guide see pages 97, 329-330,333-336

(1) Number of inserts (or edges for solid tool)

For inserts, see pages: SNGF (CER) (104) • SNGN (CER) (105)

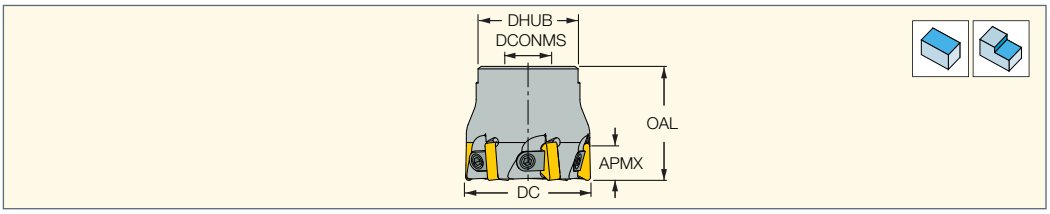
Spare Parts

Designation				
F90SN	WS M6X1-L16 R/L	BLD T15/S7	SW6-SD	LW 5225-M5

ISCAR CER-LINE

F90TN

Face Mill for Wedge-Clamp Triangular Double-Sided TNGN 1604 Inserts with 6 Cutting Edges



Designation	DC	CICT(1)	APMX	DHUB	DCONMS	OAL	Arbor	kg
F90TN D40-04-22-R-16	40.00	4	16.00	38.00	22.00	50.00	A	0.70
F90TN D50-06-22-R-16	50.00	6	16.00	41.00	22.00	50.00	A	0.78
F90TN D63-08-22-R-16	63.00	8	16.00	48.00	22.00	50.00	A	0.93
F90TN D80-10-27-R-16	80.00	10	16.00	60.00	27.00	50.00	A	1.21
F90TN D100-14-32-R-16	100.00	14	16.00	80.00	32.00	50.00	A	1.66
F90TN D125-16-40-R-16	125.00	16	16.00	89.00	40.00	63.00	A	2.80

- For user guide see pages 97, 329-330,333-336

(1) Number of inserts

For inserts, see pages: TNGN (CER) (65)

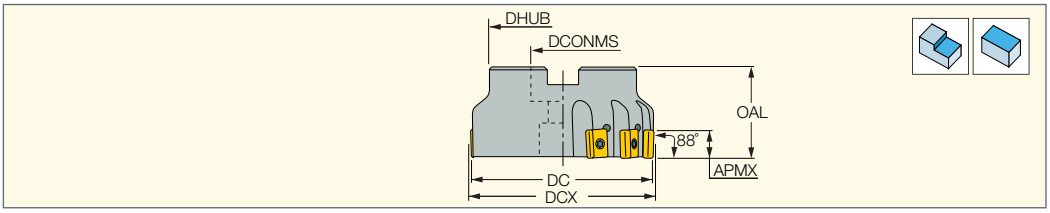
Spare Parts

Designation				
F90TN D40-04-22-R-16	WS 0512	BLD T15/S7	SW6-SD	LW 6336
F90TN D50-06-22-R-16	WS M6X1-L16 R/L	BLD T15/S7	SW6-SD	LW 6226-M6
F90TN D63-08-22-R-16	WS M6X1-L16 R/L	BLD T15/S7	SW6-SD	LW 6226-M6
F90TN D80-10-27-R-16	WS M6X1-L16 R/L	BLD T15/S7	SW6-SD	LW 6226-M6
F90TN D100-14-32-R-16	WS M6X1-L16 R/L	BLD T15/S7	SW6-SD	LW 6226-M6
F90TN D125-16-40-R-16	WS M6X1-L16 R/L	BLD T15/S7	SW6-SD	LW 6226-M6

ISCAR CER-LINE

T488 FLN

88° Face Mills Carrying LN..1606... Tangentially Clamped Inserts



Designation	DC	DCX(1)	CICT(2)	APMX	OAL	DHUB	DCONMS	Arbor	kg
T488 FLN D080-10-27-R-16	80.00	83.00	10	14.00	50.00	58.00	27.00	A	1.10
T488 FLN D100-13-32-R-16	100.00	103.00	13	14.00	50.00	77.00	32.00	A	1.80
T488 FLN D125-16-40-R-16	125.00	128.00	16	14.00	58.00	77.00	40.00	A	3.10

- Wiper inserts are used on face mill cutters, provide improved surface finish, eliminate the use of other finishing cutters.
- For user guide, see pages 96, 329-330,333-336

(1) Cutting diameter maximum

(2) Number of inserts (or edges for solid tool)

For inserts, see pages: T488 LNHU (CER) (106)

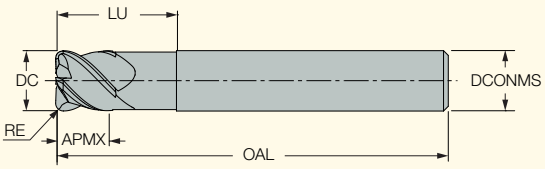
Spare Parts

Designation			
T488 FLN	SR M4X0.7-L12	BLD T15/S7	SW6-SD

ISCAR CER-LINE

EC-E4 (CER)

Solid Ceramic Endmills
with 4 Flutes for Machining
Nickel-Based Alloy Materials



Designation	Dimensions									IS45
	DC	APMX	LU	OAL	DCONMS	RE	NOF(1)	RMPX°(2)	Shank(3)	
EC-E4 08-060/16R1N60CE	8.00	6.00	16.00	60.00	8.00	1.00	4	1.5	C	●
EC-E4 10-075/20R1.25N65CE	10.00	7.50	20.00	65.00	10.00	1.25	4	1.5	C	●
EC-E4 12-09/2024R1.5N70CE	12.00	9.00	24.00	70.00	12.00	1.50	4	1.5	C	●

• For user guide, see pages 99-100, 329-330,333-336

(1) Number of flutes

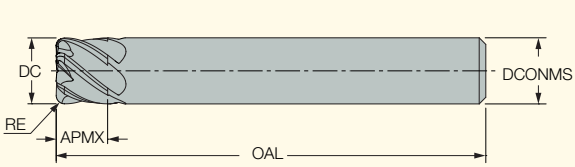
(2) Maximum ramping angle

(3) C-Cylindrical

ISCAR CER-LINE

EC-E6 (CER)

Solid Ceramic Endmills
with 6 Flutes for Machining
Nickel-Based Alloy Materials



Designation	Dimensions								IS45
	DC	APMX	OAL	DCONMS	RE	NOF(1)	RMPX°(2)	Shank(3)	
EC-E6 08-060-R1N60CE	8.00	6.00	60.00	8.00	1.00	6	1.5	C	●
EC-E6 10-075-R1.25N65CE	10.00	7.50	65.00	10.00	1.25	6	1.5	C	●
EC-E6 12-09-R1.5N70CE	12.00	9.00	70.00	12.00	1.50	6	1.5	C	●

• For user guide, see pagess 99-100, 329-330,333-336

(1) Number of flutes

(2) Maximum ramping angle

(3) C-Cylindrical

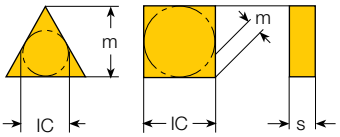
CBN INSERTS PRELUDE

ISO Insert Nomenclature / Identification Key Codes for CBN Indexable Inserts

1. Shape

	R	75°	E	80°	W
90°	S	55°	D		L
60°	T	35°	V	55°	K
80°/100	C	25°	Y	80°	Q

3. Tolerance



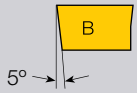
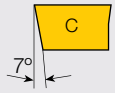
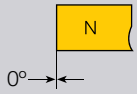
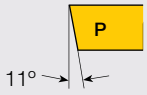
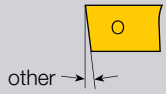
	m		S	IC	
E		±0.025	±0.025		±0.025
G		±0.025	±0.13		±0.025
M	from	±0.08	±0.13	from	±0.05
	to	±0.18(1)		to	±0.13(1)
U	from	±0.13	±0.13	from	±0.08
	to	±0.38(1)		to	±0.25(1)

(1) Exact tolerance depends on insert size

IC	Tolerance in mm			
	on m		on IC	
	Class M	Class U	Class M	Class U
6.35	±0.08	±0.13	±0.05	±0.08
9.52	±0.08	±0.13	±0.05	±0.08
12.70	±0.13	±0.20	±0.08	±0.13
15.87	±0.15	±0.27	±0.10	±0.18
19.05	±0.15	±0.27	±0.10	±0.18
25.40	±0.18	±0.38	±0.13	±0.25

1	2	3	4
C	N	G	A

2. Clearance Angle

Symbol	Relief angle
B	
C	
N	
P	
O	

4. Type

Symbol	Hole	Shape of Hole	Chipbreaker	Shape
N	without	-	without	
R			single- sided	
F			double- sided	
A	with	cylindrical hole	without	
M			single- sided	
G			double- sided	
W		partly cylindrical hole, single-side 40° ~ 60° countersink	without	
T			single- sided	
Q		partly cylindrical hole, double-side 40° ~ 60° countersink	without	
U			double- sided	
B		partly cylindrical hole, single-side 70° ~ 90° countersink	without	
H			single- sided	
C		partly cylindrical hole, double-side 70° ~ 90° countersink	without	
J			double- sided	
X	special			

5. Codes for Cutting Edge Length or for Inscribed Circle Diameters

Diameter of Inscribed Circle d (mm)	Metric System – Shapes H	O	P	S	T	C	D	E	F	M	V	W	R
3.97					06			T3			07		
4.76					08			04			08		
5.56				05	09	05	06	05	07	05	09	03	
6.35	03	02	04	06	11	06	07	06	08	06	11	04	06
7.94	04	03	05	07	13	08	09	08	10	07	13	05	07
9.525	05	04	07	09	16	09	11	09	12	09	16	06	09
12.7	07	05	09	12	22	12	15	13	16	12	22	08	12
15.875	09	06	11	15	27	16	19	16	20	15	27	10	15
19.05	11	07	13	19	33	19	23	19	24	19	33	13	19
25.4	14	10	18	25	44	25	31	26	33	25	44	17	25
31.75	18	13	23	31	54	32	38	32	41	31	54	21	31

8. Edge Preparation

	Code	Shape
Sharp Edge	F	
Honed Edge	E	
T-land/Chamfer (Angular Grinding)	T	
Chamfer + Honed (Angular Grinding + Round Honing)	S	
Double Chamfer + Honed (2-step Chamfering + Round Honing)	P	

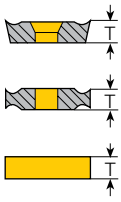
9. Hand of Insert

Symbol	Hand
R	right hand
L	left hand
N	neutral

5	6	7	8	9	10		11
12	04	08	S	(N)	-	4MT	FM

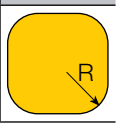
6. Codes for Thickness

Thickness S (mm)	Metric System
1.59	01
1.98	T1
2.38	02
3.18	03
3.97	T3
4.76	04
5.56	05
6.35	06
7.94	07
9.52	09
12.7	12



7. Codes for Corner Radii

For Corner R	
Corner-R Nominal Value (mm)	Metric System
sharp corner 0	00
0.1	01
0.2	02
0.3	03
0.4	04
0.6	06
0.8	08
1	10
1.2	12
1.5	15
1.6	16
2	20
2.4	24
3.2	32
other radii	X
for round inserts	M0*
	00*



Notes :"00"(double zero) is used for insert circle diameter indicated in inches. " M0" is used for insert circle diameter indicated in millimeters

10. No. of Cutting Edges or Style

Symbol	No. of Cutting Edges
HS	half-solid (full-face)
S	solid
L	length (full-edge)
MT	1 mini-tipped cutting edge
2MT	2 mini-tipped cutting edges
3MT	3 mini-tipped cutting edges
4MT	4 mini-tipped cutting edges
6MT	6 cutting edges

11. Chipbreaker

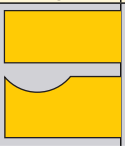
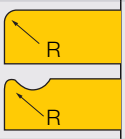
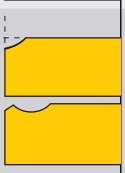
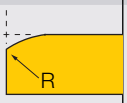
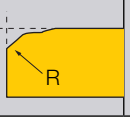
Symbol	Description
FM	CBN - finishing
MM	CBN - medium
MR	CBN - roughing

Cutting Edge Specification

Edge Specification

CBN- and PCD/CVD-diamond-cutting materials are ultra-hard materials that require a specific cutting edge treatment. To assure extended insert tool life, choose the correct cutting edge type to the material and apllication type.

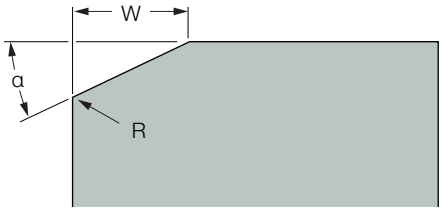
ISCAR grades recommendation by material standard type for PCD/CVD-diamond = F and for CBN = S. For each task **ISCAR** recommends testing the application beforehand. **ISCAR**'s service team will provide you with advice and support in choosing the appropriate solution.

	Code	Shape	Description
Sharp Edge	F		A sharp cutting edge and positive cutting angle are recommended when using PCD for aluminum or other nonferrous materials. The advantages are less forces and built up edge.
Honed Edge	E		Honing is used to protect the cutting edge against breakage and chipping. Hone size is more difficult to control than chamfers, but popular for HRSA's. The advantage over chamfers is noticeable in case of finishing applications with low feedrates.
T-land/Chamfer (Angular Grinding)	T		Chamfers increase the wedge angle of the cutting edge and the stability of the cutting edge in hard machining applications. The larger the T-land width and angle, the higher the cutting forces.
Chamfer + Honed (Angular Grinding + Round Honing)	S		First choice for hard part turning. Stronger than T-land. Feed must be greater than hone size. The chamfer stabilizes the cutting edge by increasing its wedge angle. The cutting forces are increased by this chamfer. Honing the chamfer improves the cutting edge's performance and prevents breakage and chipping.
Double Chamfer + Honed (2-step Chamfering + Round Honing)	P		Chamfers increase the wedge angle of the cutting edge and the cutting edge's stability. Chamfering increases cutting forces. In the case of extreme conditions applied to the cutting edge a combination of the double chamfering and honing (micro geometry) are recommended.

Series	Workpiece Material	Grade	Negative/ Positive	Standard						Semi - Standard (Low Cutting Forces)						Semi - Standard (Strong Edge Preparation)					
				Identification Code	R 0.2 - R 0.4		R 0.8 - R 1.2		Honing	Identification Code	R 0.2 - R 0.4		R 0.8 - R 1.2		Honing	Identification Code	R 0.2 - R 0.4		R 0.8 - R 1.2		Honing
					A (°)	W (mm)	A (°)	W (mm)			A (°)	W (mm)	A (°)	W (mm)			A (°)	W (mm)	A (°)	W (mm)	
Uncoated CBN	H Hardened Steel	BI05H	neg/pos	S	25	0.12	25	0.15	0.015	LS	15	0.12	15	0.15	0.015	HS	35	0.12	35	0.15	0.015
		BI15H	neg/pos	S	25	0.12	25	0.15	0.015	LS	15	0.12	15	0.15	0.015	HS	35	0.12	35	0.15	0.015
		BI25H	neg/pos	S	25	0.12	25	0.15	0.015	LS	15	0.12	15	0.15	0.015	HS	35	0.12	35	0.15	0.015
		BI30H	neg/pos	S	20	0.1	20	0.1	0.015	LS	10	0.1	10	0.1	0.015	HS	35	0.12	35	0.15	0.015
	K Cast Iron	BI30H	neg/pos	S	20	0.1	20	0.1	0.015	LS	10	0.1	10	0.1	0.015	HS	35	0.1	35	0.1	0.015
		BI30K	neg/pos	S	20	0.2	20	0.2	0.015	S	20	0.2	20	0.2	0.015	S	20	0.2	20	0.2	0.015
	S Super Alloys	BI05S	neg/pos	S	(1)	(1)	(1)	(1)	0.015	S	(1)	(1)	(1)	(1)	0.015	S	(1)	(1)	(1)	(1)	0.015
		BI15S	neg/pos	S	(1)	(1)	(1)	(1)	0.015	S	(1)	(1)	(1)	(1)	0.015	S	(1)	(1)	(1)	(1)	0.015
	Sintered Metal	BI10S	neg/pos	S	15(2)	0.1	15	0.1	0.025	LE	(1)	(1)	(1)	(1)	0.025	HS	25	0.1	25	0.1	0.025
		BI20S	neg/pos	S	15	0.1	15	0.1	0.025	LE	(1)	(1)	(1)	(1)	0.025	HS	25	0.1	25	0.1	0.025
Coated CBN	H Hardened Steel	BI05HC	neg/pos	S	25	0.12	25	0.15	0.015	LS	15	0.12	15	0.15	0.015	HS	35	0.12	35	0.15	0.015
		BI15HC	neg/pos	S	25	0.12	25	0.15	0.015	LS	15	0.12	15	0.15	0.015	HS	35	0.12	35	0.15	0.015
		BI25HC	neg/pos	S	25	0.12	25	0.15	0.015	LS	15	0.12	15	0.15	0.015	HS	35	0.12	35	0.15	0.015
		BI30HC	neg/pos	S	20	0.1	20	0.1	0.015	LS	10	0.1	10	0.1	0.015	HS	35	0.12	35	0.15	0.015
	K Cast Iron	BI30KC	neg/pos	S	20	0.2	20	0.2	0.015	S	20	0.2	20	0.2	0.015	S	20	0.2	20	0.2	0.015
Uncoated PCD	N PCD	ID4	neg/pos	F	(1)	(1)	(1)	(1)	(1)	F	(1)	(1)	(1)	(1)	(1)	F	(1)	(1)	(1)	(1)	(1)
		ID5	neg/pos	F	(1)	(1)	(1)	(1)	(1)	F	(1)	(1)	(1)	(1)	(1)	F	(1)	(1)	(1)	(1)	(1)
		ID8	neg/pos	F	(1)	(1)	(1)	(1)	(1)	F	(1)	(1)	(1)	(1)	(1)	F	(1)	(1)	(1)	(1)	(1)

(1) without
(2) angular

Identification Code for Edge Preparation for Standard and Special Inserts



S	0 1 2	2 0
Cutting Edge: **T-** chamfered **S-** chamfered + honing **P-** double chamfered + honing **E-** honing	**W-** negative land width	**A:** negative land angle

Negative land angle: α

Example: S01220 → 20°/0,12 mm width negative land with honing

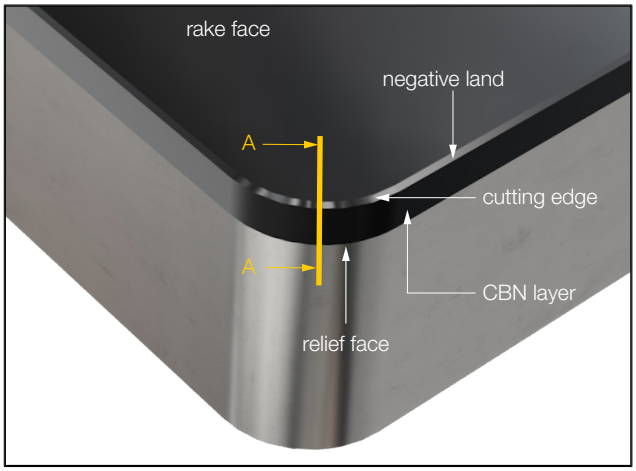
Edge Specification

All **ISCAR** inserts have optimal cutting-edge preparation for a variety of grades and geometries. This prevents cutting edge breakage caused by strong stresses during the machining process of metals with a high hardness, such as hardened steel. **ISCAR** hardened steel provides a wide variety of grades and edge preparation combinations for hardened steel, cast iron, and sintered metal machining.

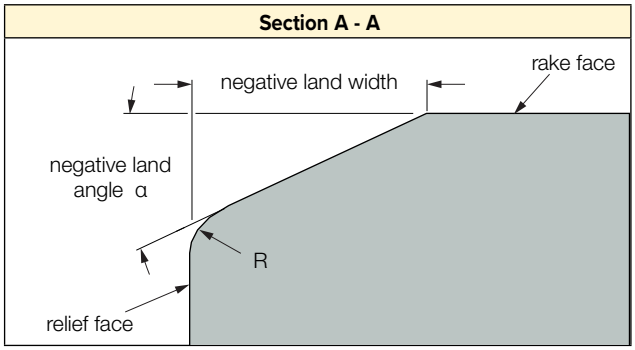
Edge-Preparation Method

Standard	S	standard type for CBN				+	W	wiper	+	MR	CBN chip breaker (rough)
	F	standard type for PCD								MM	CBN chip breaker rough to semi-finish
SEMI Standard	L	low cutting	+	F	sharp edge					MF	CBN chip breaker (finish)
	H	strong edge		E	honed edge						
				S	chamfer + honed edge						

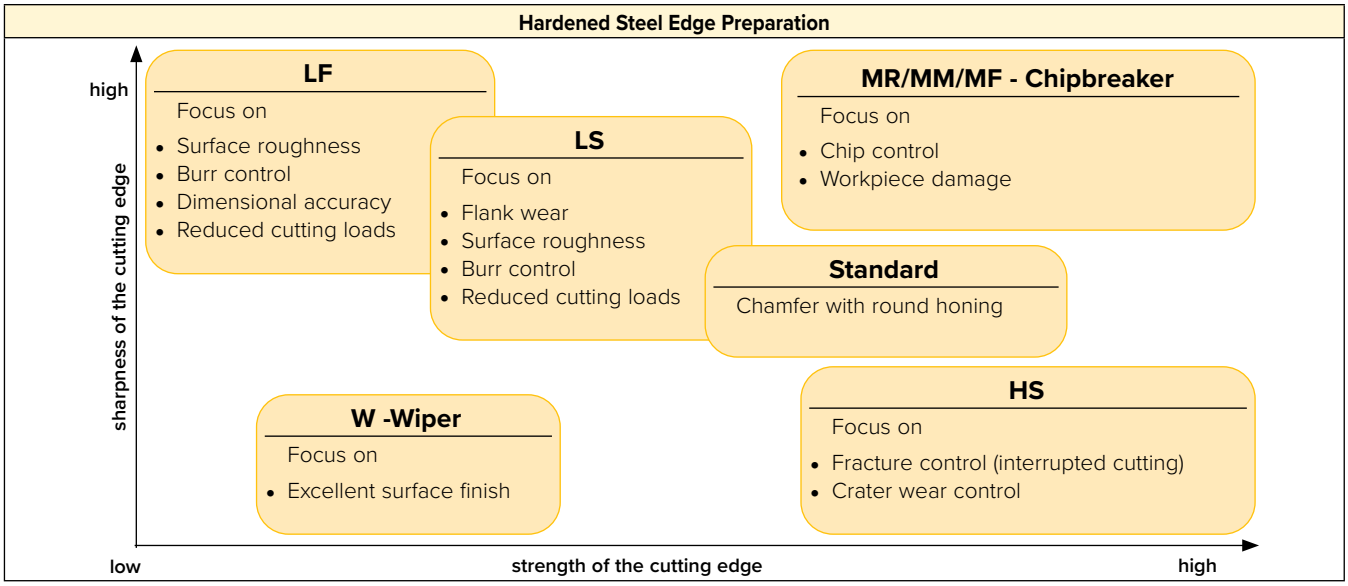
Detailed View of Cutting Edge



Section A - A

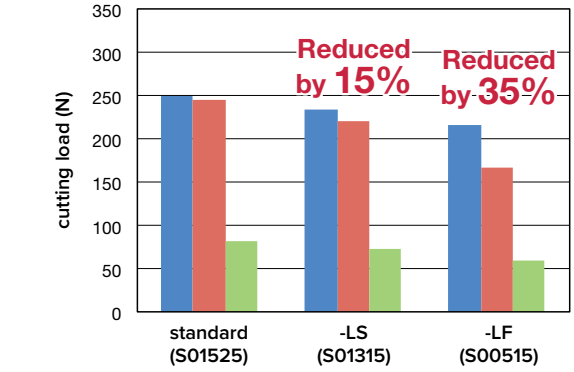


Hardened Steel Edge Preparation



Edge Preparation - Cutting Loads

The-LS and -LF edge preparations provide reduced cutting loads on the insert compared to standard edge preparation.

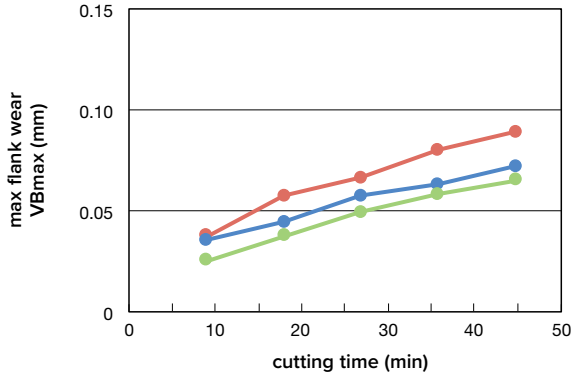


Cutting (tangential) force
Radial force
Feed (axial) force

Cutting Speed: V_c = 100 m/min
Feed: f = 0.3 mm/rev
Depth of Cut: a_p = 0.2 mm
Coolant: dry
Workpiece Material: steel JIS SCM 415 (~DIN W.-Nr. 1.7262), HRC 60

Edge Preparation - Flank Wear

The -L and -LF edge preparations provide reduced flank wear on the insert with standard edge preparation.

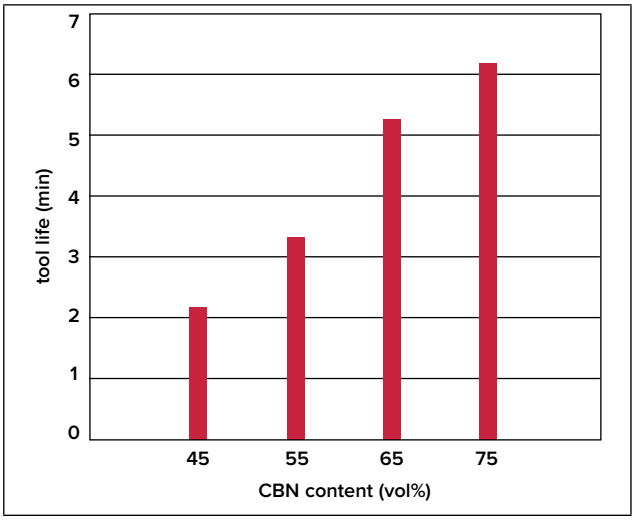


Standard
-L
-LF

Cutting Speed: V_c = 130 m/min
Feed: f = 0.15 mm/rev
Depth of Cut: a_p = 0.2 mm
Coolant: wet
Workpiece Material: steel JIS SCM 415 (~DIN W.-Nr. 1.7262), HRC 60

Specifications of Cutting-Edge Preparation

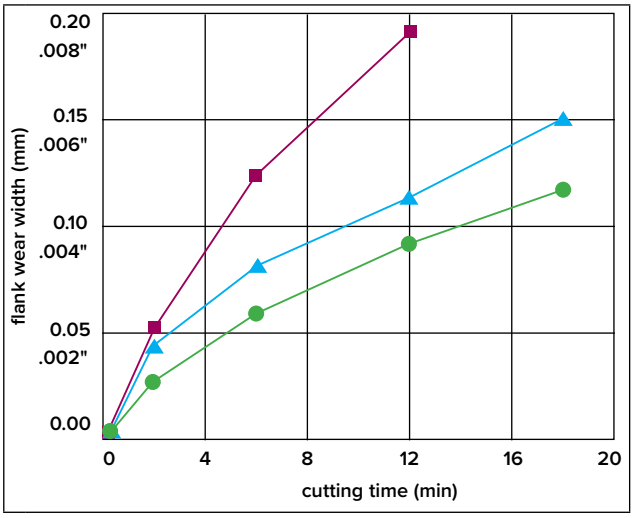
Interrupted Cutting



Cutting Conditions
cutting speed: v_c = 180 m/min
depth of cut: a_p = 0.1 mm
feed: f = 0.1 mm/rev
coolant: dry
workpiece material: SCM435

High CBN Content
↓
high fracture resistance

Continuous Cutting



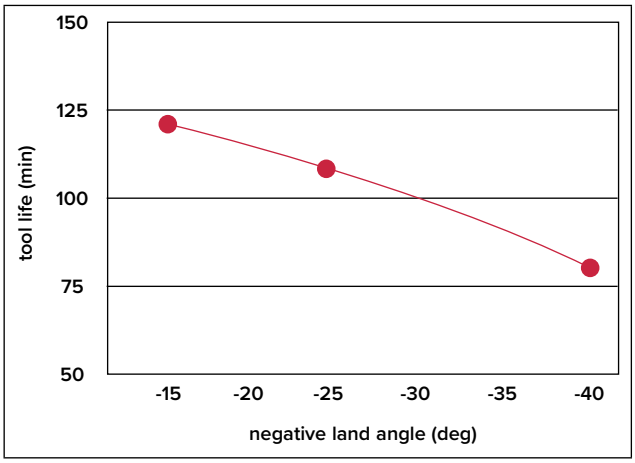
CBN content (vol%)
■ 75
▲ 65
● 45

Cutting Conditions
cutting speed: V_c = 180 m/min
depth of cut: a_p = 0.2 mm
feed: f = 0.1 mm/rev
coolant: wet
workpiece material: SCM415

Low CBN Content
↓
high wear resistance

Edge Preparation - Continuous Cutting

The smaller the negative land angle is, the more wear resistant the cutting edge will have in continuous cuts.

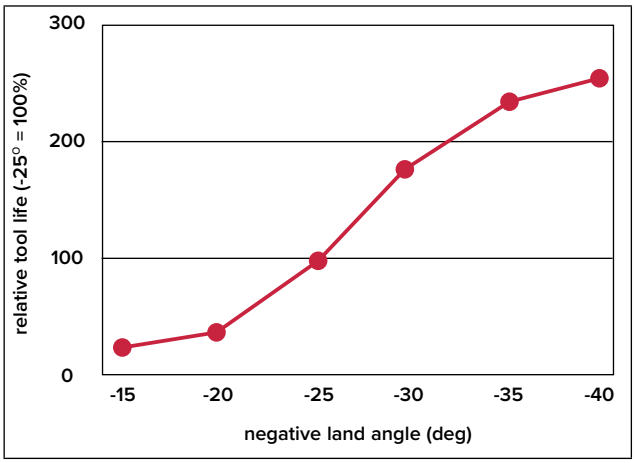


Cutting Conditions
cutting speed: v_c = 100 m/min
depth of cut: a_p = 0.25 mm
feed: f = 0.1 mm/rev
coolant: dry
continuous cutting
workpiece material: SCM415
criteria: VB max=0.15 mm

Edge Preparations
width: 0.13 mm
angles: -15, -25, and -40°
honed to: R0.01~0.02 mm (R.0004" ~ .0008")

Edge Preparation - Interrupted Cutting

The larger the negative land angle is, the more fracture resistant the cutting edge will have in interrupted cuts.

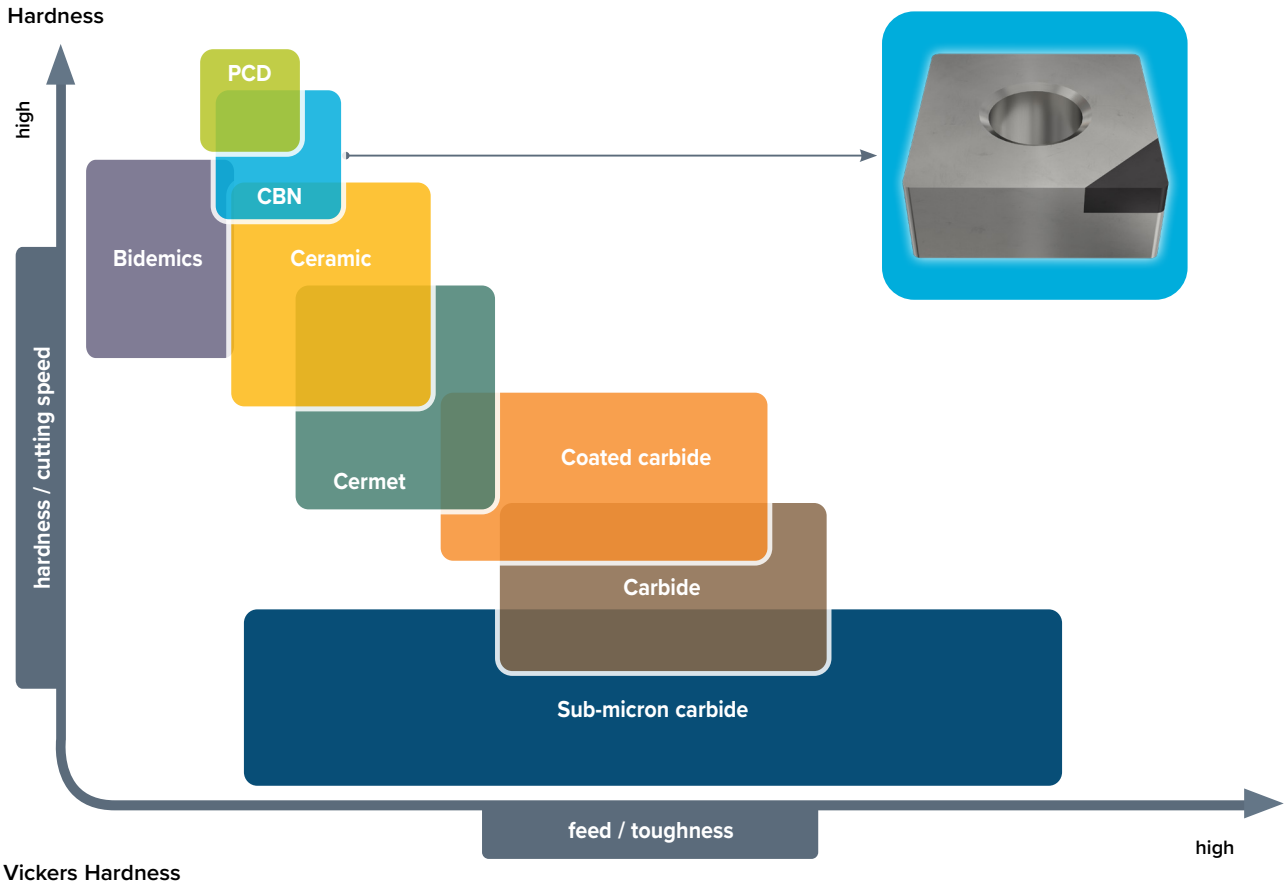


Cutting Conditions
cutting speed: V_c = 100 m/min
depth of cut: a_p = 0.25 mm
feed: f = 0.15 mm/rev
coolant: dry
workpiece material: SCM415
criteria: fracture

Edge Preparations
width: 0.13 mm
angles: -15, -20, -25, -30, -35, and -40°
honed to: R0.01~0.02 mm

Material Hardness Scale

To machine materials with a high hardness level of 65 HRC,
inserts with a higher level of hardness than carbide inserts are required.



CBN

Cubic-boron-nitride (CBN) is the 2nd hardest cutting material after poly-crystalline-diamond (PCD).

Compared to PCD, CBN is chemically passive when used in ferrous materials.

CBN is not found in nature. It is a synthetic material produced as a result of a high temperature and pressure process.

The finished product consists of one carbide layer and one CBN layer. The combination of the two materials is called cubic-boron-nitride (CBN) wafer.

CBN was developed to compete with the finish-grinding process of hardened ferrous materials (45-68 HRC) for economical curtting of up to 80-250 m/min.
CBN is also used in gray cast iron applications, chilled cast iron and ductile cast irons and their alloys.

Cutting tools made of CBN sintered materials are created by mixing CBN (cubic boron nitride) with ceramics that are hard as diamonds. Together these materials are sintered at extremely high pressure and temperatures.

Diamond has a higher affinity for iron than CBN.

Sintered CBN provides improved cutting performance, particularly for high-speed machining materials like hardened steel, cast iron, and sintered alloys, due to its low affinity and high hardness qualities.

CBN ISCAR Sets - New Generation ISCAR Inserts Provide a More Effective Method of Machining Hardened Steels

In addition to the existing CBN product range, **ISCAR** is extending the product line by adding new grades, and by increasing boosting the diversity of products.

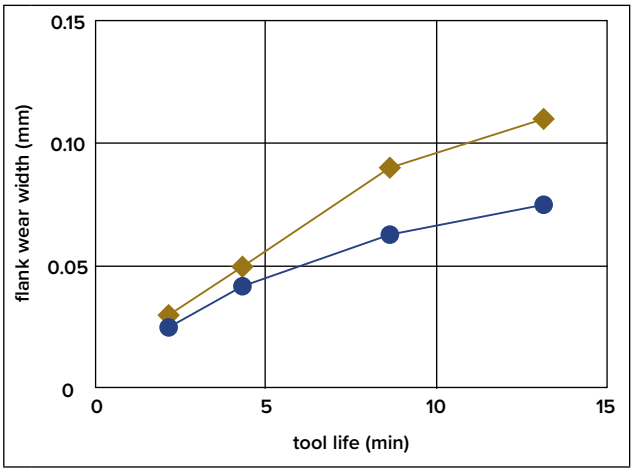
A new series of high-performance grades was created in combination with new grades as well as heat and wear resistant coatings for a variety of new and hard CBN substrates.

The new inserts are multifaceted and economical. Select the CBN insert most suited for your application, and excel your hard part machining processes.

Coolant Effect – Continuous and Interrupted Cutting

Coolant Effect - Continuous Cutting

Wet cutting improves tool life under continuous cutting operations.



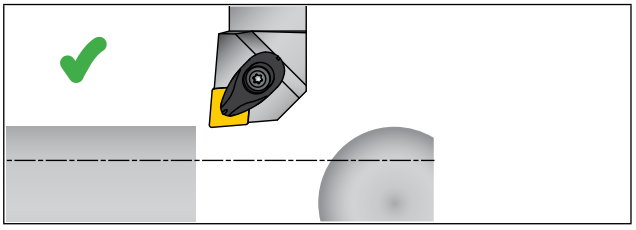
Cutting Conditions

cutting speed: V_c = 180 m/min

depth of cut: a_p = 0.2 mm

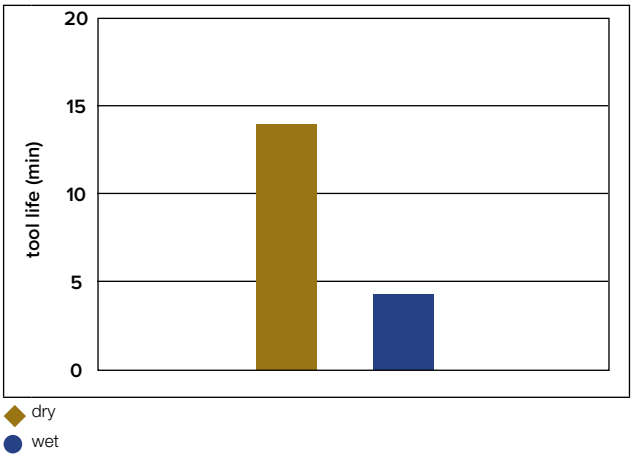
feed: f = 0.1 mm/rev

workpiece material: SCM415



Coolant Effect - Interrupted Cutting

Dry cutting improves tool life in interrupted cutting operations.



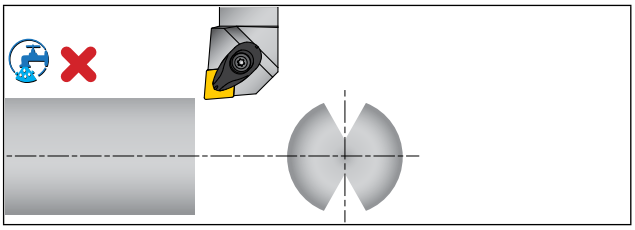
Cutting Conditions

cutting speed: V_c = 150 m/min

depth of cut: a_p = 0.2 mm

feed: f = 0.2 mm/rev

workpiece material: SCM415

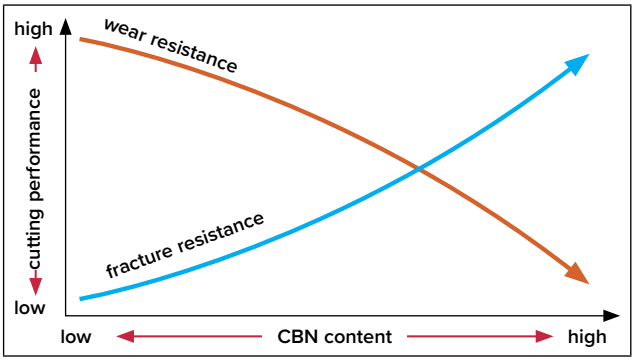


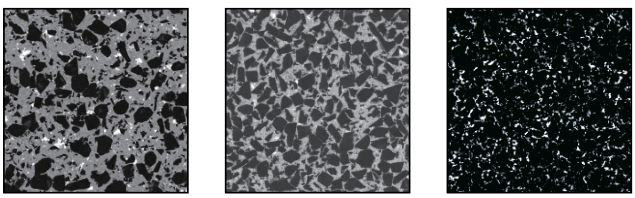
Use of Coolant

	Dry	Wet
Continuous cutting	✗	✓
Interrrupted cutting	✓	✗

CBN Content Affects Wear And Fracture Resistance

Higher CBN content grades are more resistant to fractures when turning hardened steel, whereas lower CBN content grades are more wear resistant.

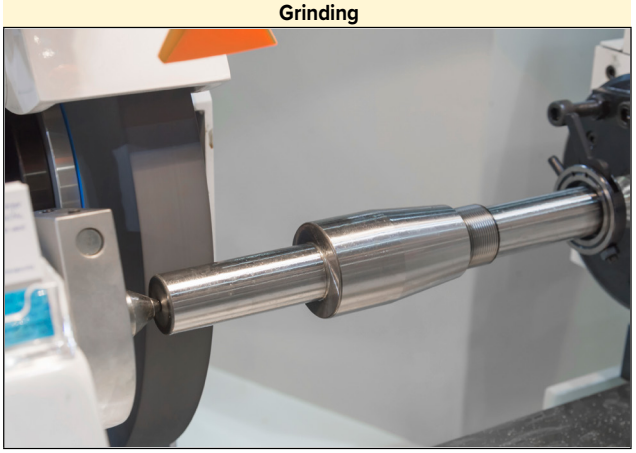




Grinding Vs. Hard Turning

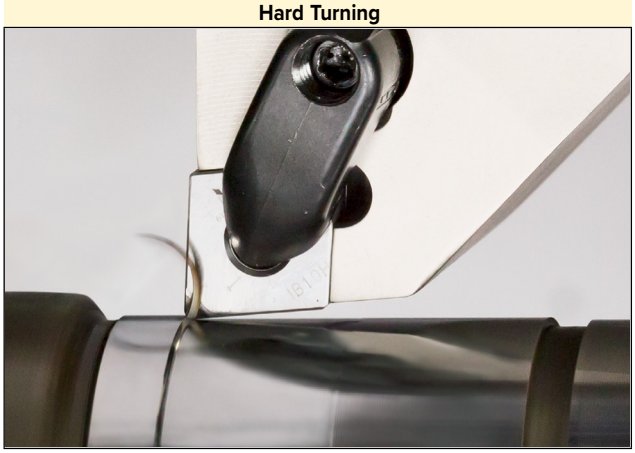
An important advantage in using CBN inserts enables replacing the slow and expensive grinding operations of hardened parts. Turning with CBN inserts significantly reduces the cost per part compared to grinding. **ISCAR**'s global sales figures have shown that customers are changing their finishing processes from grinding to turning with CBN inserts, particularly in the automotive industries.

Grinding

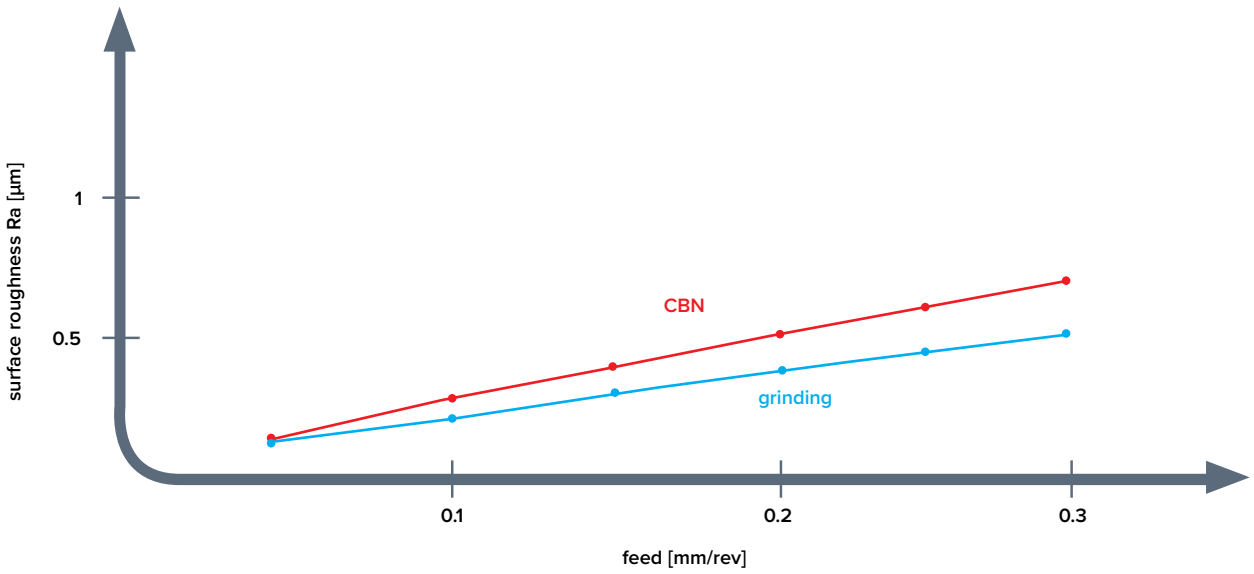


- Size tolerance specifications beyond the capability of turning
- Surface finish requirements too tight for hard turning

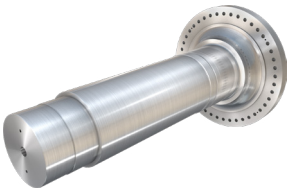
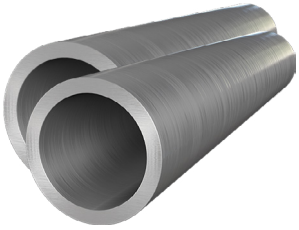
Hard Turning

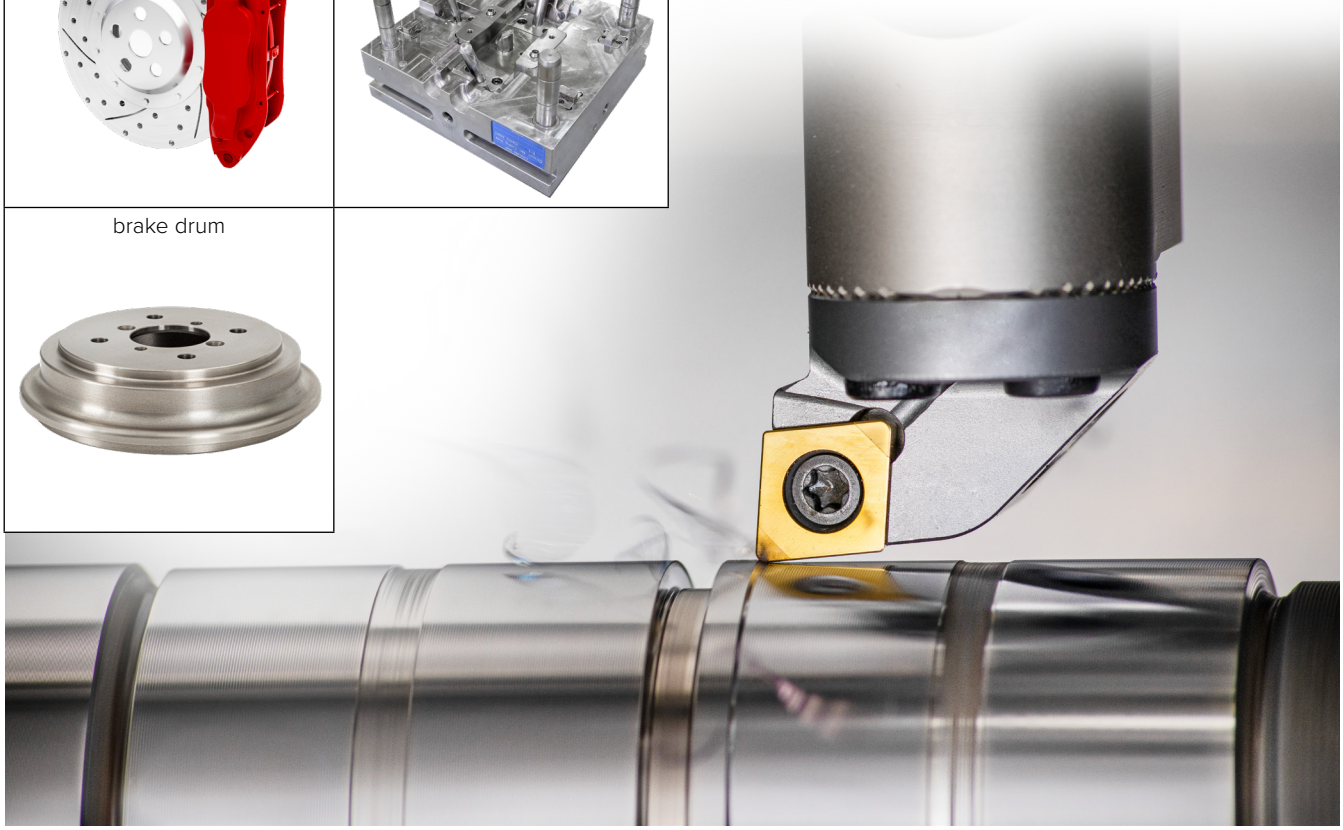


- Size tolerance specifications beyond the capability of turning
- Complex geometry that makes single-point turning more practical
- Relatively high metal removal rates
- Dry machining
- Faster machine setup
- Faster cycle times
- Inner and outer diameter machining on one machine



CBN- Typical Parts

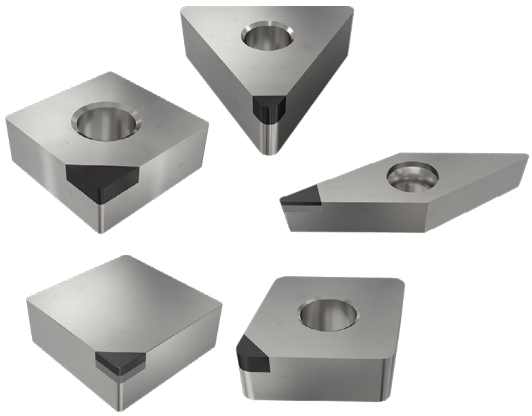
Cast Iron	Hardened Steel	Super Alloy	Sintered Materials
pump parts	shafts 	turbine disc	transmission part sprocket
rolls 	bearings	aircraft fastener	
hydraulic components	gears		
brake disc	die and mold parts		
brake drum			



CBN Inserts Types MT /L /HS /S

MT

Mini-Tipped Turning Inserts
Multi Cornered / One-Use Inserts

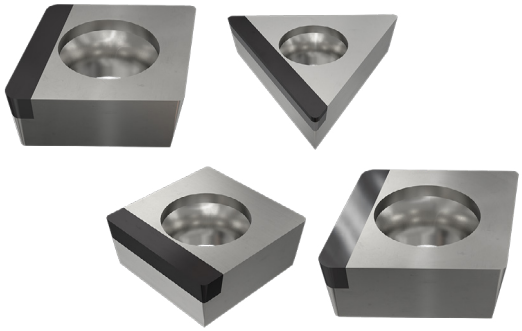


Characteristics / Features

- One-use type inserts improve machining efficiency by using each cutting edge to its full potential.
- Smaller and more economic CBN tip.
- Cost reduction - more cutting edges per insert.
- Multi - cornered inserts have a single piece of **ISCAR**-CBN mounted on every useable corner.
- Single-sided inserts use the top corners while double-sided inserts use both top and bottom corners.
- Square, diamond shaped inserts have 4 corners (quadro), and triangular inserts have 3 corners (triple).

L

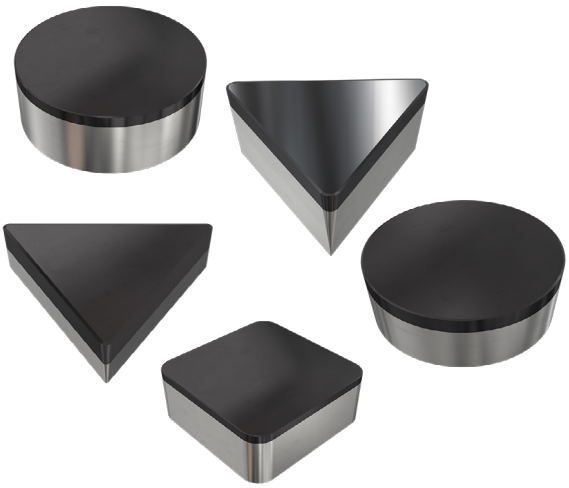
Full Edge Tipped Inserts



- Full-edge tipped CBN for maximized productivity.
- Triangular shaped inserts with full-edge tipped CBN.
- Square shaped inserts with right-hand or Left-hand full-edge tipped CBN.
- Increased stability.

HS

Half Solid CBN Inserts



Characteristics / Features

- Top layer of CBN with a carbide base provide multiple cutting edges.
- High hardness produced with a special binder.

Advantages

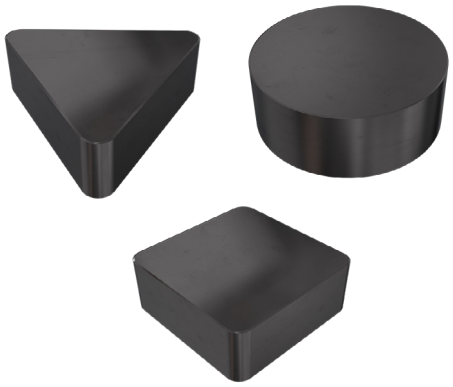
- Excellent wear resistance, impact resistance, thermal stability and chemical stability for metal processing.
- Excellent cost performance, 30%-50% saved compared to carbide inserts.
- Excellent surface quality, turning instead of grinding.
- Solid material ensures high degree of mechanical strength.
- Superior cutting tool material with extreme hardness conditions.
- Lower machining cost and fewer tool changes.
- High machining efficiency 5-10 times more compared to carbide and ceramic inserts.

Applications

Solid CBN inserts can be widely used in diverse industries, such as automotive parts, roll industry, gear industry, bearing industry, wind power generation, air conditioning compressors and more. The workpiece material is mostly cast iron and hardened steel: automotive engine, brake disc, brake drum, pulley, cylinder block, cylinder liner, pump, cast iron rolls. hardened steel: industrial gears, wind power bearings, bearings, drive shaft, crushing hammer cylinder, slurry pump.

S

Full Solid CBN Inserts (BI30K/BI30KC)



Characteristics / Features

- Multiple covered CBN inserts for aggressive machining conditions.

Advantages

- Excellent wear resistance, impact resistance, thermal stability and chemical stability of metal processing.
- Excellent corrosion resistance.
- Strong thermal stability.
- Provides high speed and efficient machining for roughing applications.
- Excellent cost performance, 30%-50% saved compared to carbide inserts.
- Excellent surface quality, turning instead of grinding.
- Solid material ensures high degree of mechanical strength.
- Superior cutting tool material under extreme hardness conditions.
- Lower machining cost and fewer tool changes.
- High machining efficiency with 5-10 times of carbide and ceramic inserts.

Applications of Solid CBN Inserts

Cast iron: automotive parts engine, brake disc, brake drum, pulley, cylinder block, cylinder liner, pump, cast iron rolls. roll (metallurgical roller, mill rolls) bearing, slurry pump, wind power generation, air conditioning compressor, heavy mining machine and others industrial hardened steel: industrial gears, wind power bearings, bearings, drive shaft, crushing hammer cylinder, slurry pump.

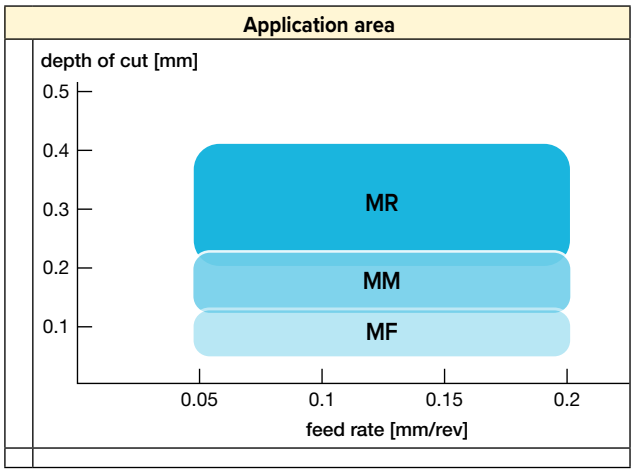
CBN Chipbreaker MF /MM /MR Types

The chipbreaker assures proper chip flow at all times. **ISCAR**'s different CBN-chipbreaker geometries- are the adequate solution for each application for hard machining.

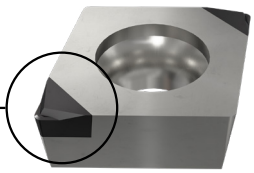
Characteristics / Features

- While MM and FM kinds are ideal for polishing hardened steel, MR types are ideal for removing aggressive carbide layers.
- MT - "mini tipped" -one-use insert with chipbreaker.
- With **ISCAR**'s various MT - chipbreaker geometries, we have the adequate solution for each application and through perfect chip control in the hard machining.
- Prevents long chips and workpiece damage.
- Provides a process-stable and reliable production.

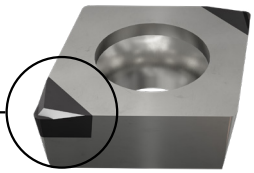
MF- for fine - medium processing. MM- for medium processing. MR- for roughing machining.



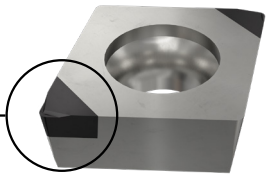
MR
MR for rough machining



MM
MM for rough to semi-finish machining



MF
MF for finish machining



Wiper Insert

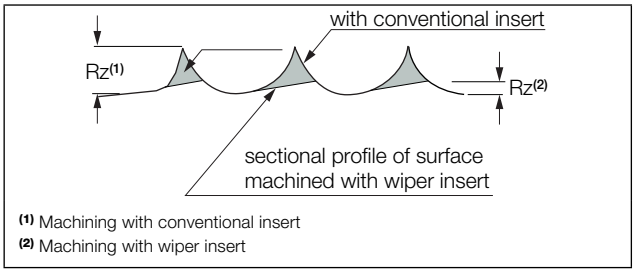
Characteristics / Features Wiper Insert

A finishing wiper edge is created where the straight cut edge and corner radius intersect.

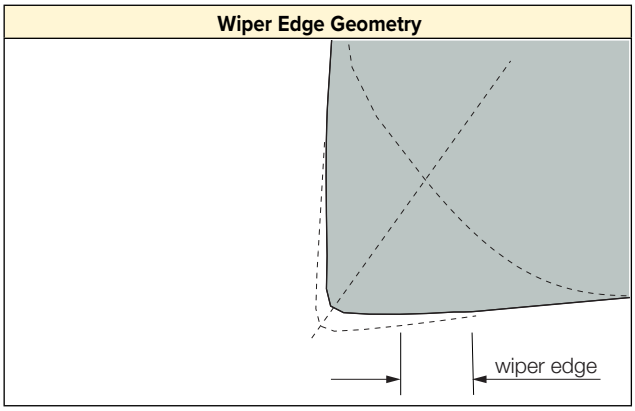
Effect of the Wiper Edge:

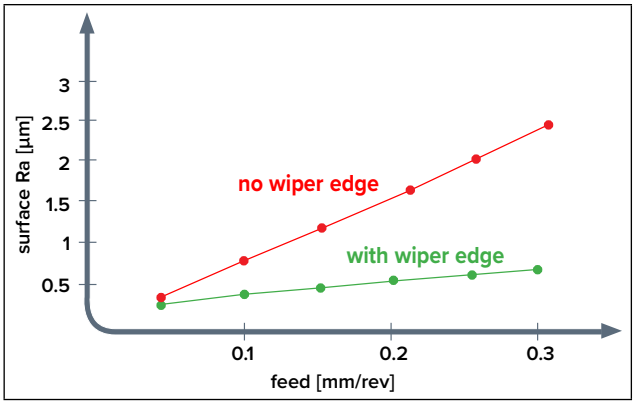
- **Improve Efficiency**
  High feed rates not only save machining times but also allow for the combination of roughing and finishing processes.
- **Increased Tool Life**
  When high feed conditions are used, the time required to cut one component is reduced, allowing more components to be machined with each insert. Furthermore, the fast feed rate reduces friction, slowing the course of wear and extending the tool life of the insert.
- **Improving Chip Control**
  Chip control is enhanced when feed rates are high because the chips produced have a tendency to thicken and break more easily.
- **Improving Surface Finish**
  The workpiece material's surface finish can be enhanced while using the same machining parameters as conventional inserts but with a higher feed rate.

Profiles of Surface Roughness



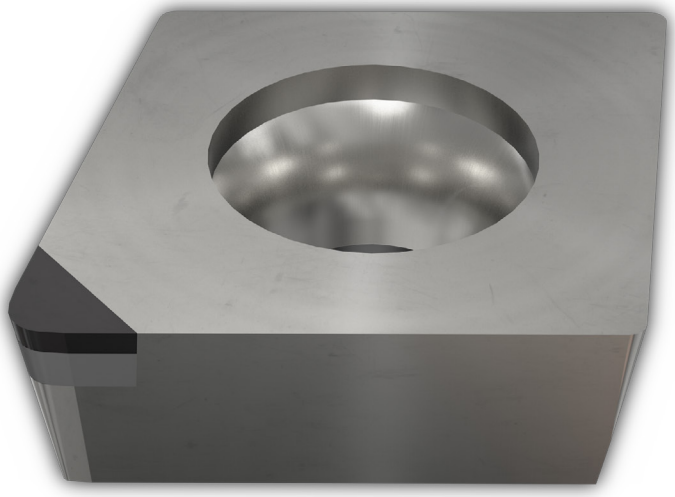
(1) Machining with conventional insert
(2) Machining with wiper insert





Cutting Condition

CNGA 432T W-MT BO05H wiper insert
v_c=150 m/min, a_p=0.2 mm
Material: steel ALSi O1 (~DIN W.-Nr 1.2510), HRC 64



CBN Grades

H Hardened Materials

Guide for CBN Grades
Grade Guide – Hardened Steel - Uncoated

BI05H
- The uncoated CBN grade with maximum wear resistance for high-speed machining.
- Offers exceptional tool life in both continuous and light-interrupted cutting.
- Improved fracture resistance with focus on wear resistance.

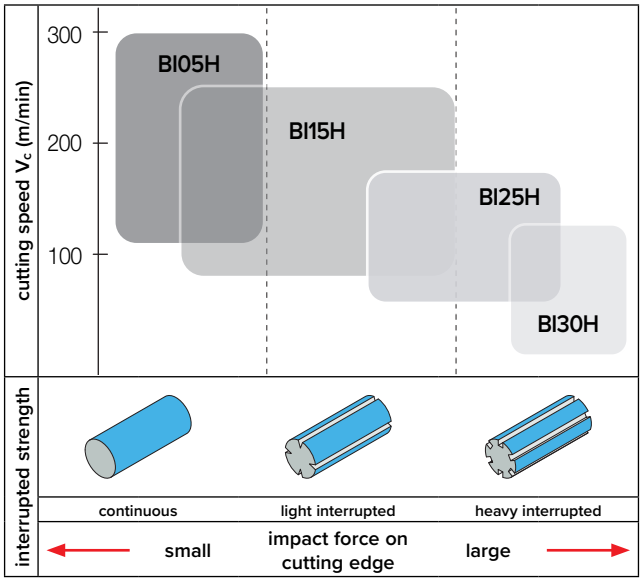
BI15H
- A general-purpose uncoated CBN grade that can be used for machining typical hardened steel.
- Provides consistent tool life in all cutting applications, from continuous to light to medium interrupted.
- Excellent levels of fracture resistance and wear resistance.
- Combination of wear resistance and thermal stability.
- High speed and interrupted machining of hardened steel.

BI25H
- First recommendation for hardened steel machining.
- Medium to heavy interrupted hardened steel machining.
- Stable and long-lasting tool life in heavy, interrupted cutting, possesses excellent fracture resistance.
- Uniform microstructure with a uniform distribution of CBN particles within a ceramic binder matrix.
- Fine CBN grains and an engineered ceramic matrix give the material a high degree of toughness.

BI30H
- CBN particles are densely sintered for maximum CBN content possible resulting in high wear and breakage resistance in heavy interrupted cut.
- Machining most kinds of cast iron and powder metal alloy.
- Extreme wear resistance and superior chipping resistance as a result of high fine CBN content.

General Features
- Uncoated **ISCAR** CBN with a recently-invented, ultra-pure Ceramic binder for low content CBN inserts or Metal binder for high CBN content inserts, tool life is maintained across a wide spectrum of hardened steel machining thanks to the linked effects of fracture and wear resistance.
- Inserts are available in single,multi-corner, full-edge and full-face configurations.

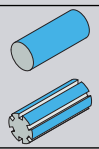
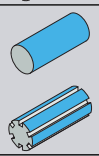
Application Range



Recommended Cutting Conditions

Grade	Cutting Speed V_c (m/min)			Feed f (mm/rev)			Depth of Cut a_p (mm)		
	min.	Optimum	max.	min.	Optimum	max.	min.	Optimum	max.
BI05H	120-200-300			0.03-0.1-0.2			0.05-0.1-0.2		
BI15H	80-160-250			0.05-0.15-0.25			0.05-0.2-0.3		
BI25H	50-100-160			0.05-0.15-0.25			0.05-0.3-0.5		
BI30H	30-80-130			0.05-0.15-0.25			0.05-0.3-0.5		

Recommended Cutting Conditions for Uncoated CBN Grades

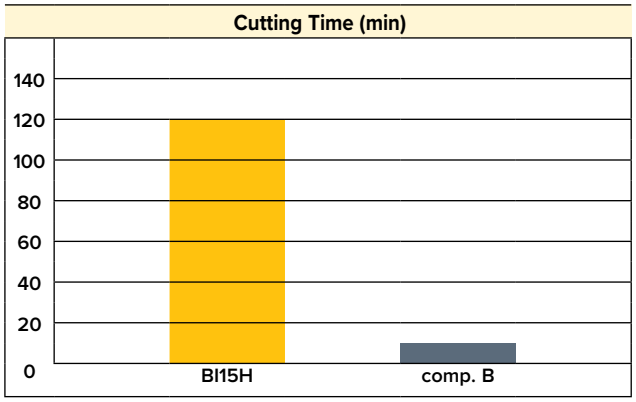
Workpiece Material	Grade	Cutting Mode	Application	CBN Content (%)	Cutting Speed (m/min)			Feed (mm/rev)	Depth of Cut (mm)	Grade Instruction
					Continuous Cut	Light Interrupted	Heavy Interrupted			
H	BI05H	high speed continuous hard turning		55%	120-300	-	-	0.03-0.2	0.05-0.2	Achieves the highest level of wear and fracture resistance. Suitable for cutting at a high speed.
	BI15H	continuous and light interrupted		65%	80-250	80-160	-	0.05-0.25	0.05-0.3	A multi-purpose grade with a high level of wear and fracture resistance for machining hardened steel.
	BI25H	tough grade for interrupted cutting		75%	-	80-160	50-130	0.05-0.25	0.05-0.5	Attains the strongest cutting edge possible. Suitable for cutting with medium to heavy interruptions
	BI30H	toughest grade for hard interrupted cut		95%	-	-	30-130	0.05-0.25	0.05-0.5	Attains the strongest cutting edge possible. Suitable for cutting with heavy interruptions.

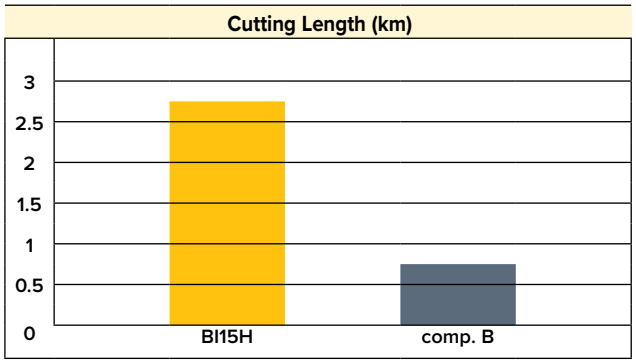
Test Reports

BI15H

Material	alloy steel
Hardness	HRC 55~60
Size	Ø100 X 300 mm
Path	flank wear after 10 path cutting
Speed	150 m/min
D.O.C	0.4 mm
Feed	0.1 mm/rev
Coolant	dry
Insert type	CNGA 120408S BI15H

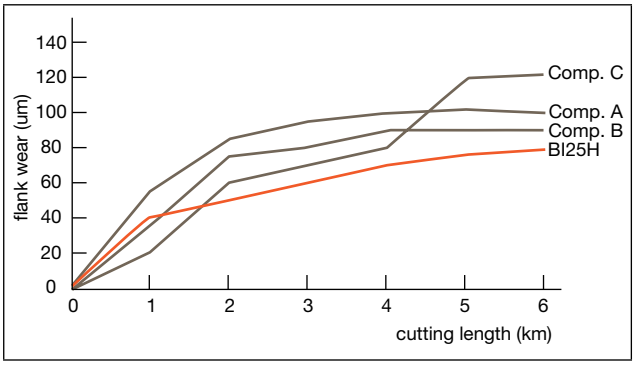
Result	Cutting Time (min)	Cutting Length (km)
BI15H	117.9	2.68
Comp. B	6.02	0.9

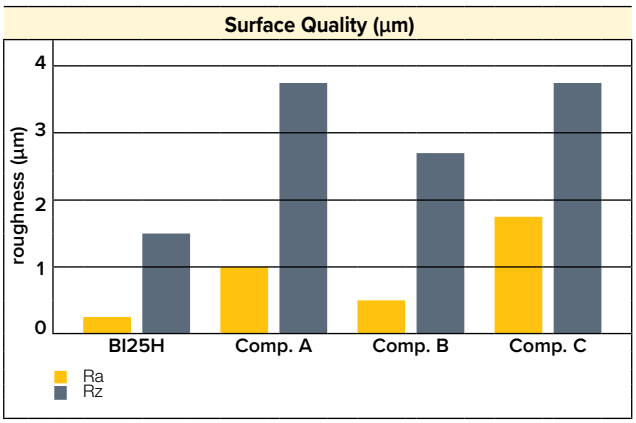




BI25H

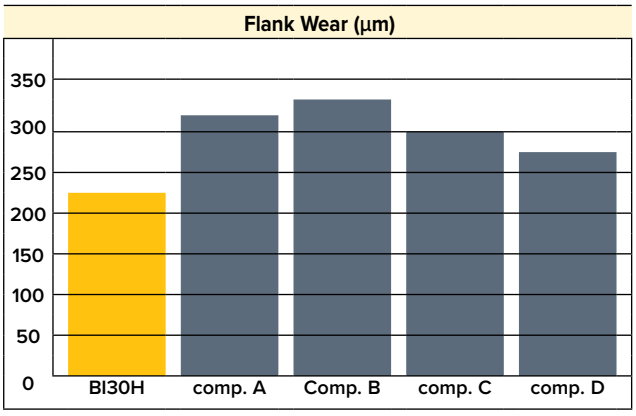
Material	41CrMo4 (DIN)/4140 (ASTM)/SCM440H (JIS)
Type	interrupted turning
Speed	170 m/min
Feed	0.1 mm/rev
D.O.C	0.2 mm
Coolant	dry
Insert type	DNGA 150408S BI25H





BI30H

Material	gray cast iron
Speed	500 m/min
DOC	0.25 mm
Feed	0.1 mm/rev
Coolant	dry
Insert type	CNGA 120408S BI30H
Holder type	PCLNR 2525M-12



Grade Guide – Hardened Steel - Coated

BI05HC
- The gold standard for high-precision machining.
- High notch wear resistance coating on a hard CBN substrate allows for consistent, high-quality surface roughness.
- Long tool life, superior surface roughness, and stable machining are achieved.

BI15HC
- A general-purpose coated CBN grade first choice for hardened steel machining.
- Ultimate resistance to wear and fracture.
- The first recommendation for the machining of hardened steel.
- Excellent wear and fracture resistance.
- The coating, along with a tough CBN substrate, combines wear resistance and hardness to achieve stable machining.

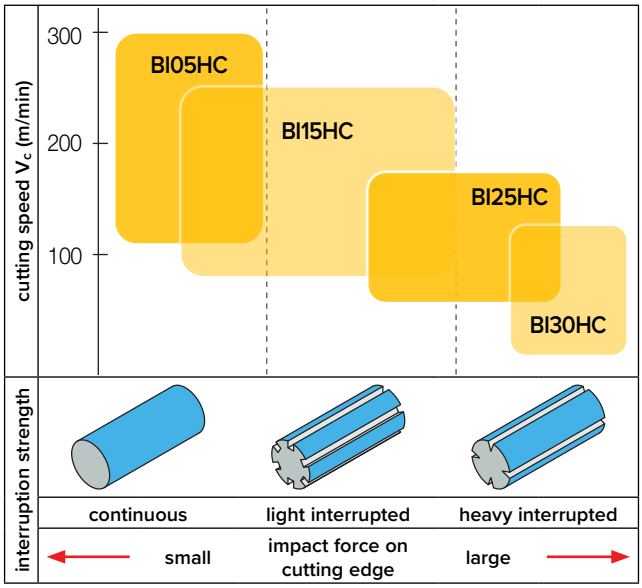
BI25HC
- Extra-tough CBN substrate with a highly wear-resistant coating.
- Excellent tool life, even in situations requiring both continuous and interrupted machining.
- Even in high-efficiency, interrupted machining, the tool life is long and stable.

BI30HC
- Stable and long tool life in heavy interrupted cutting.
- Stable and long tool life with superior fracture resistance and a high wear resistance coating that prevents fractures, which are common during interrupted cutting.

Coatings
- According to each application, we offer suitable coating solutions and layer systems for coating CBN tools possibility to further improve performance of a CBN tool.
- Coated CBN edges minimize abrasive wear and reduce the danger of a built-up edge.
- The smooth layer surface leads to a reduction of the friction and therefore enables an improved chip flow. A coating can also serve to visualize the wear at the cutting edge and detect already used cutting edges.

General Features
- Coated **ISCAR** CBN with a recently-invented, ultra-pure ceramic binder. Tool life is maintained across a wide spectrum of hardened steel machining thanks to the linked effects of fracture and wear resistance.
- Inserts are available in single, multi-corner, full-edge and full-face configurations.

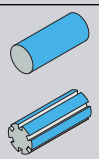
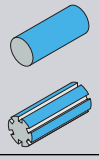
Application Range



Recommended Cutting Conditions

Grade	Cutting Speed V_c (m/min)			Feed f (mm/rev)			Depth of Cut a_p (mm)		
	min.	Optimum	max.	min.	Optimum	max.	min.	Optimum	max.
BI05HC	120-**200**-300			0.03-**0.15**-0.25			0.05-**0.2**-0.3		
BI15HC	80-**180**-270			0.05-**0.2**-0.25			0.05-**0.2**-0.3		
BI25HC	50-**120**-170			0.05-**0.2**-0.25			0.05-**0.3**-0.5		
BI30HC	30-**100**-140			0.05-**0.2**-0.25			0.05-**0.3**-0.5		

Recommended Cutting Conditions for Coated CBN Grades

Workpiece Material	Grade	Cutting Mode	Application	CBN Content (%)	Cutting Speed (m/min) Continuous Cut	Light Interrupted	Heavy Interrupted	Feed (mm/rev)	Depth of Cut (mm)	Grade Instruction
H	BI05HC	high speed continuous hard turning		55%	120-300	-	-	0.03-0.2	0.05-0.2	Achieves the highest level of wear and fracture resistance. Suitable for cutting at a high speed.
	BI15HC	continuous and light interrupted		65%	80-250	80-160	-	0.05-0.25	0.05-0.3	A multi-purpose grade with a high level of wear and fracture resistance for machining hardened steel.
	BI25HC	tough grade for interrupted cutting		75%	-	80-160	50-130	0.05-0.25	0.05-0.5	Attains the strongest cutting edge possible. Suitable for cutting with medium to heavy interruptions.
	BI30HC	toughest grade for hard interrupted cut		95%	-	-	30-130	0.05-0.25	0.05-0.5	Attains the strongest cutting edge possible. Suitable for cutting with heavy interruptions.

Grade Guide –Cast Iron - Coated and Uncoated

BI30H

- This grade is ideal for cast iron and powder metal finishing applications.
- Machining most kinds of cast iron.
- The strength of CBN particles provide excellent chipping resistance, ensure stable performance and increased tool life for highly efficient machining of cast iron.
- Excellent wear and thermal crack resistance when machining gray cast iron at high speeds.

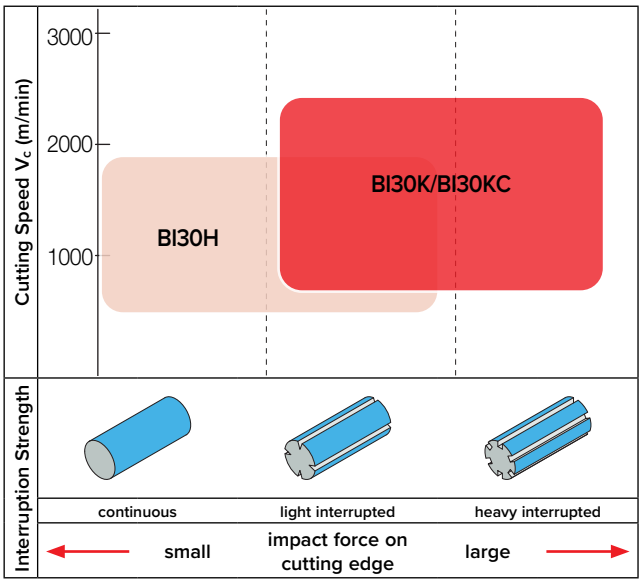
BI30K/BI30KC

- Solid CBN with excellent wear resistance suppresses flank wear when machining difficult-to-cut cast iron and hardened steel.
- Ideal for roughing and depth of cut of 0.5 mm and above, can also be used for roughing and finishing gray cast iron.
- Rough machining cast iron and powder metal alloy.
- Extreme wear resistance with high content of coarse CBN grain.

General Features

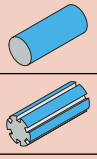
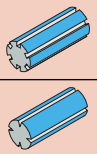
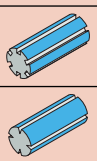
- Allows a wide range of machining types from finishing to roughing of cast iron, exotic alloy cast iron, and hardened steel.
- Since all BI30K inserts are CBN sintered bodies, there are no limits to the depths of cut as with CBN brazed tools, allowing machining with large depths of cut.
- For rough machining of cast iron, high-speed, machining, can be achieved with CBN tools.

Application Range



Recommended Cutting Conditions

Workpiece Material	Grade	Cutting Speed vc (m/min) min.	Cutting Speed vc (m/min) Optimum	Cutting Speed vc (m/min) max.	Feed f (mm/rev) min.	Feed f (mm/rev) Optimum	Feed f (mm/rev) max.	Depth of Cut a_p (mm)
Cast Iron	BI30H	500	**1250**	1900	0.1	**0.2**	0.3	≤5.0
	BI30K	500	**1200**	1800	0.1	**0.3**	0.5	≤5.0
	BI30KC	500	**1250**	1900	0.1	**0.3**	0.5	≤5.0
Ductile Cast Iron	BI30H	80	**150**	300	0.1	**0.2**	0.5	≤3.0
	BI30K	80	**130**	200	0.1	**0.25**	0.5	≤3.0
	BI30KC	80	**140**	250	0.1	**0.3**	0.5	≤3.0
Hardened Steel	BI30H	50	**100**	150	0.1	**0.3**	0.4	≤5.0
	BI30K	50	**100**	150	0.1	**0.25**	0.3	≤5.0
	BI30KC	80	**100**	200	0.1	**0.25**	0.3	≤5.0

Workpiece Material	Grade	Cutting Mode	Application	CBN Content (%)	Cutting Speed (m/min) Continuous Cut	Cutting Speed (m/min) Light Interrupted	Cutting Speed (m/min) Heavy Interrupted	Feed (mm/rev)	Depth of Cut (mm)	Grade Instruction
K	BI30H	continuous to light interrupted finishing		95%	500-1800	500-1800	-	0.1-0.30	0.05-0.50	Solid CBN construction grade with high thermal shock resistance.
	BI30K	new solid CBN grade for large DOC turning		93%	-	500-1800	500-1800	0.05-0.5	0.05-5.0	Excellent wear and fracture resistance grade with a 100% solid CBN structure.
	BI30KC	new coated solid CBN grade for large DOC turning		93%	-	550-1900	550-1900	0.1-0.5	0.05-5.0	Coated solid CBN excellent wear and fracture resistance grade with a 100% solid CBN structure.

Grade Guide –Super Alloys - Uncoated

BI05S

- Excellent wear resistance and thermal stability.
- Suitable for high-speed machining inconel.
- Suitable for fine-finishing.
- For continuous and lightly interrupted cutting of the majority of automotive steels. Excellent abrasion resistance makes it the ideal choice for cold work tool steels and specific valve seat alloys. Also recommended for finishing abrasive high strength cast irons.

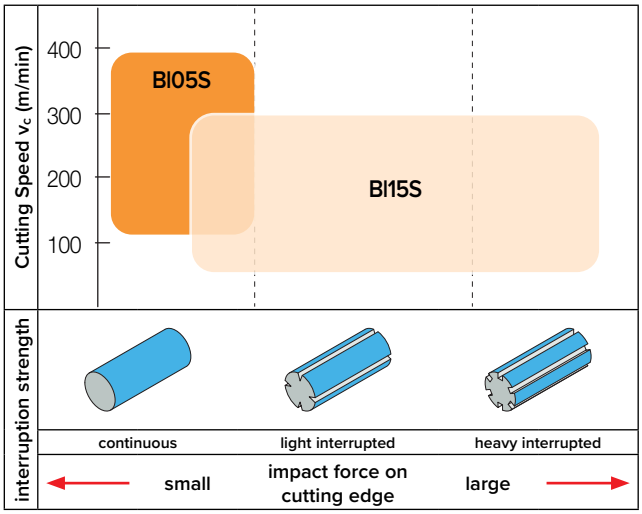
BI15S

- General-purpose grade suitable for typical super alloys applications.
- Provides stable tool life in everything from continuous cutting to interrupted cutting.
- New grade BI15S has been specially developed for turning and milling difficult-to-machine aerospace materials.
- Among other things, you can machine these materials with this CBN grade:
  Ni, Co, Fe and Cr alloys and inconel 718

General Features

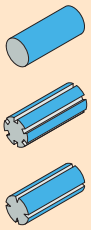
- The new CBN grades significantly increases machining efficiency by enabling high speed machining of titanium alloys that were previously challenging to work with traditional equipment.
- **ISCAR**'s new grades for machining super alloys are mainly used in the aerospace industry, but also in medical technology.
- They are characterized by high chemical and thermal wear resistance which makes them perfect for use at high speeds and ensures maximum process reliability.

Application Range



Recommended Cutting Conditions

Grade	Cutting Speed V_c (m/min)			Feed F (mm/rev)			Depth of Cut a_p (mm)		
	min.	Optimum	max.	min.	Optimum	max.	min.	Optimum	max.
BI05S	120-	**260**	-400	0.05-	**0.15**	-0.25	0.05-	**0.27**	-0.5
BI15S	70-	**180**	-300	0.05-	**0.15**	-0.25	0.10-	**0.30**	-0.50

Workpiece Material	Grade	Cutting Mode	Application	CBN Content (%)	Cutting Speed (m/min)			Feed (mm/rev)	Depth of Cut (mm)	Grade Instruction
					Continuous Cut	Light Interrupted	Heavy Interrupted			
S	BI05S	high speed continuous cut		50%	120-400	-	-	0.05-0.25	0.05-0.50	Excellent abrasion resistance makes it the optimal choice for continuous and lightly interrupted cutting of super alloys materials.
	BI15S	high speed continuous cut		65%	100-300	70-200	70-200	0.05-0.25	0.10-0.50	Low CBN content grades for super alloys materials. light to heavy interrupted machining of super alloys materials. A high degree of toughness is provided with fine CBN grains and a designed ceramic matrix.

Sintered Materials

Grade Guide – Sintered Materials - Uncoated

BI10S

- A finishing grade for sintered materials provides the ideal combination between fracture resistance and cutting-edge sharpness.
- The edge sharpness in sintered alloy machining is outstanding. Burrs and tearing are reduced as a result of the specific binder's enhanced CBN particle/binder boundary strength and **ISCAR**'s unique sintering process. Standard improved binding strength between CBN particles.
- Extreme chip resistance is excellent for heavily interrupted cutting of all abrasive and hard workpiece materials.

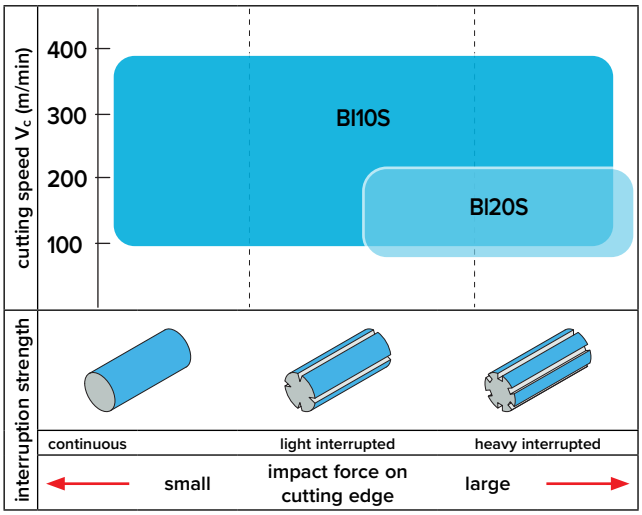
BI20S

- A rough grade for sintered materials showing superior wear and fracture resistance.
- With a standard type of cutting-edge variations, sintered alloys of various shapes can be machined efficiently.
- High performance is also demonstrated when cutting tough materials like rolls, high speed steel, and heat resistant alloys.
- When cast iron is being machined at a high speed, it displays good thermal resistance.

General Features

- High CBN concentration that provides higher wear resistance also provides superior fracture resistance by strengthening the bonds between CBN particles.
- For high-speed finishing operations, BI10S and BI20S offer reliable and accurate results and are perfect for finishing to rough sintered materials.

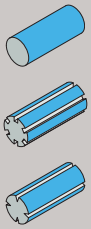
Application Range



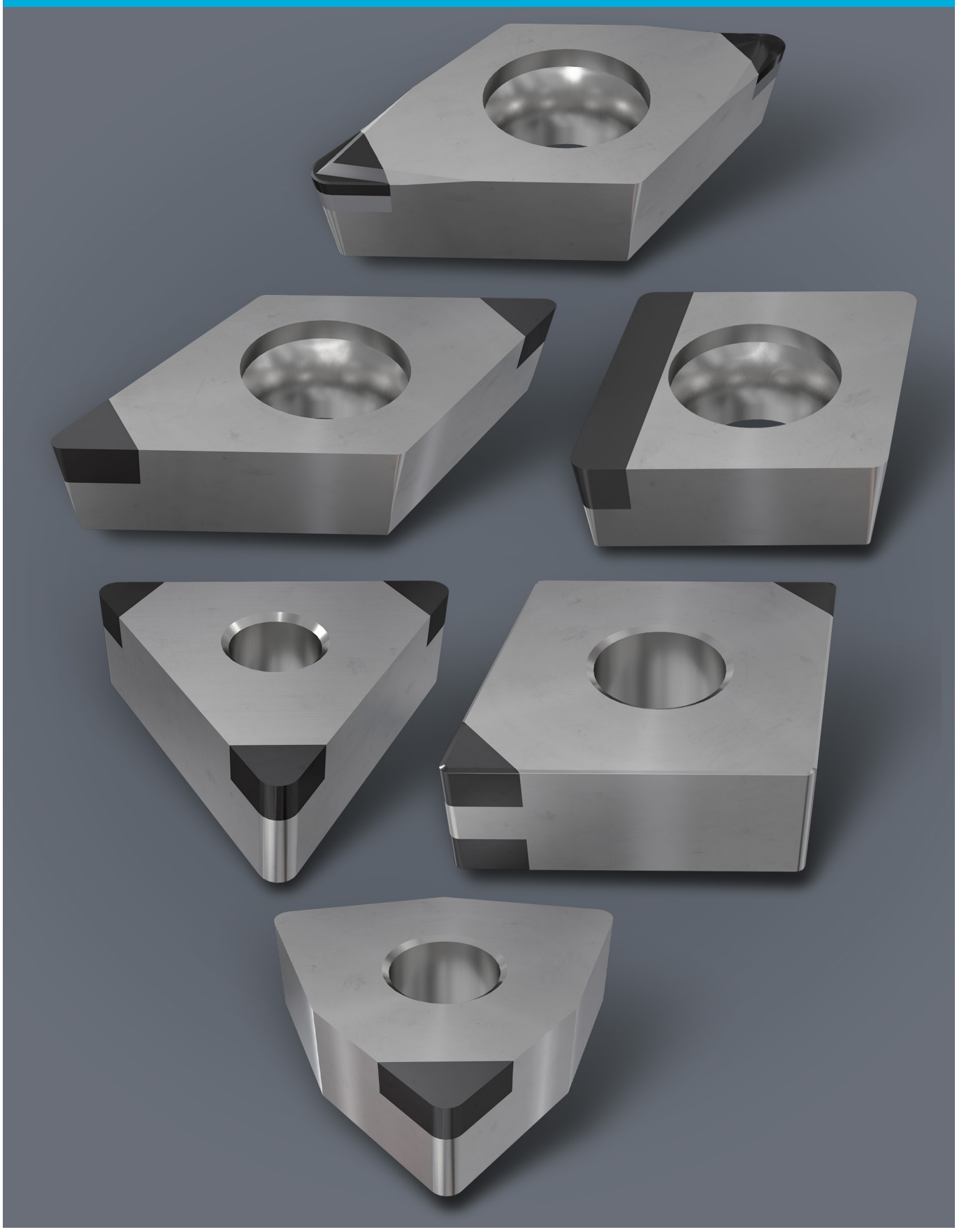
Recommended Cutting Conditions

Grade	Cutting Speed V_c (m/min)			Feed F (mm/rev)			Depth of Cut a_p (mm)		
	min.	Optimum	max.	min.	Optimum	max.	min.	Optimum	max.
BI10S	100-**250**-400			0.05-**0.15**-0.3			0.05-**0.25**-0.5		
BI20S	70-**135**-200			0.05-**0.15**-0.3			0.05-**0.25**-0.5		

BI10S	
Industry	automotive
Part	guide sleeve
Material	SINT D39
Tool	special
Insert	DCGW 11T308 S01325
Grade	BI10S
v_c	210
f	0.16
a_p	0.5
Cooling	no
Operation	axial turning
Machine	CNC lathe
Tool life ISCAR	3500
Tool life Comp.	1300

Workpiece Material	Grade	Cutting Mode	Application	CBN Content (%)	Cutting Speed (m/min)			Feed (mm/rev)	Depth of Cut (mm)	Grade Instruction
					Continuous Cut	Light Interrupted	Heavy Interrupted			
Sintered Metal	BI10S	high wear resistance grade		85%	100-400	100-400	100-300	0.05-0.30	0.05-0.50	Grade suited for finishing sintered alloys, balances optimum cutting edge sharpness with fracture resistance.
	BI20S	for interrupted cut		95%	-	70-200	70-200	0.05-0.30	0.05-0.50	Uncoated grade of sintered materials shows better wear and fracture resistance during roughing.

CBN TURNING INSERTS



CBN Turning Inserts - Index

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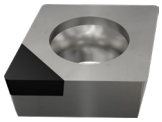

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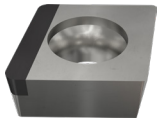

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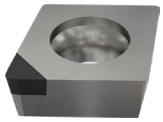

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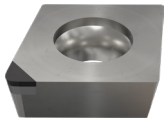

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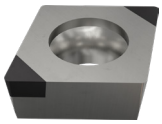

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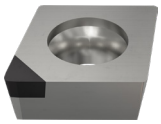

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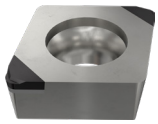

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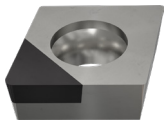

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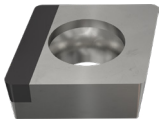

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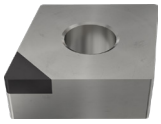

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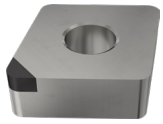

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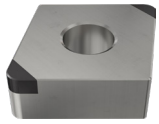

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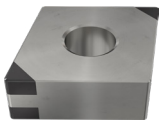

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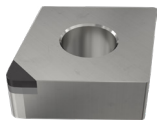

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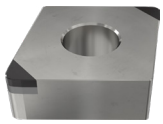

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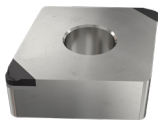

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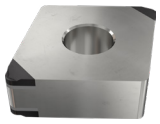

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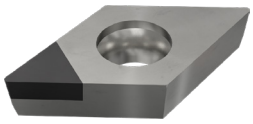

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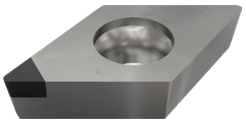

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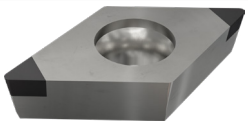

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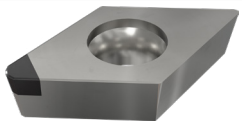

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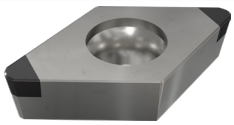

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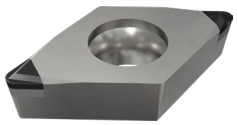

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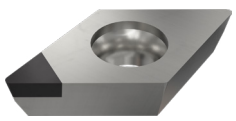

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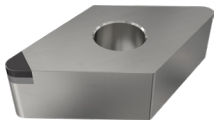

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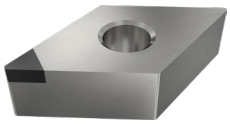

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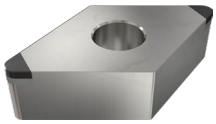

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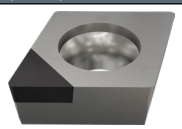
DNGA 2MT MM (CBN) 153

DNGA 4MT MM (CBN) 153

ECGW (CBN) 153


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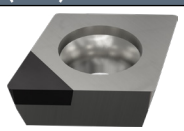

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RCGW HS (CBN) 155

RPGN HS (CBN) 155

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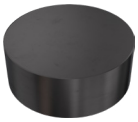

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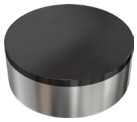

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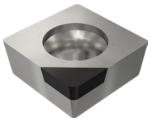

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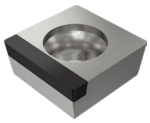

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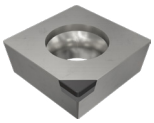

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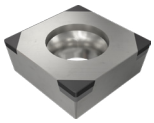

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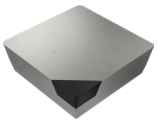

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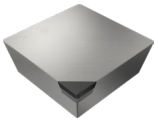

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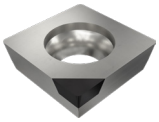

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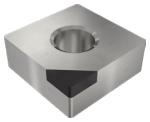

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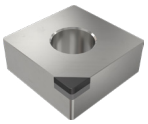

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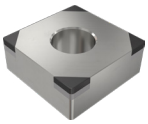

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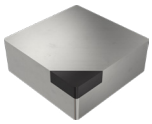

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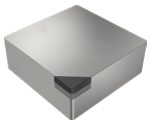

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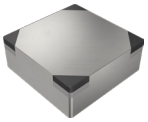

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SNGN HS (CBN) 163

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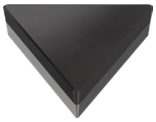

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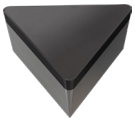

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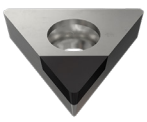

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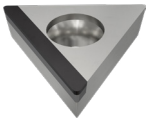

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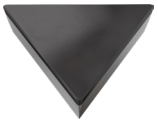
TCGW -3MT (CBN) 165

TPGN MT (CBN) 166

TPGN -3MT (CBN) 166

TPGN (CBN) 167

TPGN HS (CBN) 167


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TPGW MT (CBN) 168

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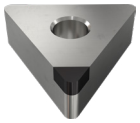
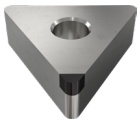
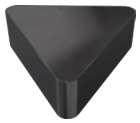


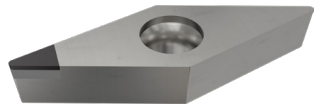
TNGA MT (CBN) 169


TNGA -3MT (CBN) 169

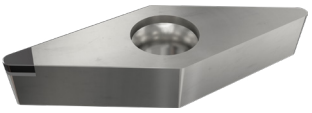
TNGN (CBN) 170

TNGN S (CBN) 170


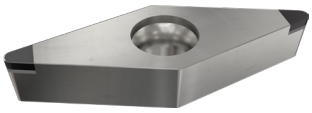
VBGW (CBN) 171



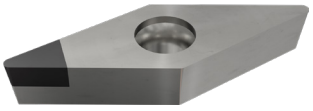
VBGW MT (CBN) 171



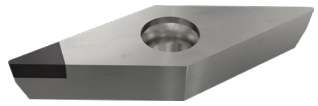
VBGW 2MT (CBN) 172



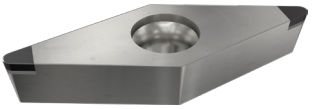
VCGW (CBN) 172



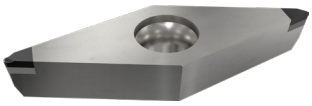
VCGW MT (CBN) 173



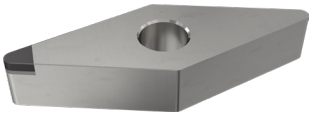
VCGW 2MT (CBN) 173



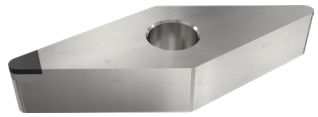
VCGW 2MT MM (CBN) 174



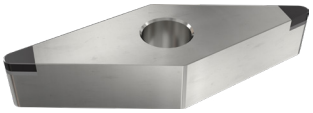
VNGA (CBN) 174



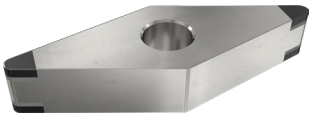
VNGA MT (CBN) 175



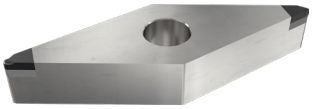
VNGA 2MT (CBN) 175



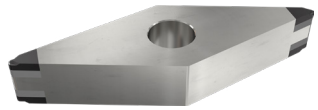
VNGA 4MT (CBN) 175



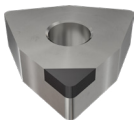
VNGA 2MT MM (CBN) 176



VNGA 4MT MM (CBN) 176



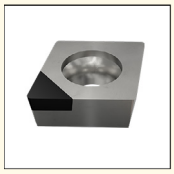
WNGA (CBN) 176

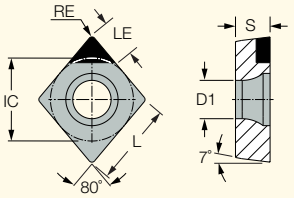


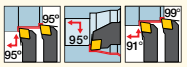
ISCAR CBN LINE

CCGW (CBN)

Positive 80° Rhombic Inserts with CBN Tips with a Flat Rake Angle for Hardened Steel and Cast Iron







Designation	Dimensions						Hard ↔ Tough								Recommended Machining Data	
	L	IC	S	RE	LE	D1	BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	a_p (mm)	f (mm/rev)
CCGW 060202S	6.40	6.35	2.38	0.20	3.00	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 060204S	6.40	6.35	2.38	0.40	3.00	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 060208S	6.40	6.35	2.38	0.80	3.00	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 090304S	9.70	9.52	3.18	0.40	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 090308S	9.70	9.52	3.18	0.80	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 09T302S	9.70	9.52	3.97	0.20	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 09T304S	9.70	9.52	3.97	0.40	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 09T308S	9.70	9.52	3.97	0.80	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 120402S	12.90	12.70	4.76	0.20	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 120404S	12.90	12.70	4.76	0.40	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 120408S	12.90	12.70	4.76	0.80	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 120412S	12.90	12.70	4.76	1.20	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

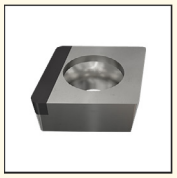
• For user guide and cutting speed recommendations, see pages 116-136

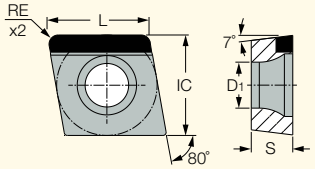
For tools, see pages: A/E/S-SCLCR/L (284) • AVC-SCLCR/L (285) • C#-SCLCR/L-JHP (244) • E-SCLCR/L-HEAD (285) • IHCR (286) • IHRF (286) • IHRF-BW (287) • IHSR (288) • IHSR-BW (289) • NQCH-SCACR/L-S-JHP (244) • PCLCR/L-S (235) • PCLCR/L-S-JHP (236) • PCLCR/L-S-JHP-MC (236) • SCACR/L-S (242) • SCLCR-PAD (243) • SCLCR/L (243) • SCLCR/L-PAD-JHP (243)

ISCAR CBN LINE

CCGW R/L-L (CBN)

Positive 80° Rhombic Inserts with Full-Edge CBN Tips (Right or Left Hand) for Hardened Steels and Cast Iron





Designation	Dimensions					Hard ↔ Tough								Recommended Machining Data	
	L	IC	S	RE	D1	BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	a_p (mm)	f (mm/rev)
CCGW 060202S L-L	6.40	6.35	2.38	0.20	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 060202S R-L	6.40	6.35	2.38	0.20	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 060204S L-L	6.40	6.35	2.38	0.40	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 060204S R-L	6.40	6.35	2.38	0.40	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 09T302S L-L	9.70	9.52	3.97	0.20	4.40			●	●	●	●	●	●	0.05-0.30	0.05-0.25
CCGW 09T302S R-L	9.70	9.52	3.97	0.20	4.40			●	●	●	●	●	●	0.05-0.30	0.05-0.25
CCGW 09T304S L-L	9.70	9.52	3.97	0.40	4.40			●	●	●	●	●	●	0.05-0.30	0.05-0.25
CCGW 09T304S R-L	9.70	9.52	3.97	0.40	4.40			●	●	●	●	●	●	0.05-0.30	0.05-0.25
CCGW 09T308S L-L	9.70	9.52	3.97	0.80	4.40			●	●	●	●	●	●	0.05-0.30	0.05-0.25
CCGW 09T308S R-L	9.70	9.52	3.97	0.80	4.40			●	●	●	●	●	●	0.05-0.30	0.05-0.25
CCGW 120404S L-L	12.90	12.70	4.76	0.40	5.50			●	●	●	●	●	●	0.05-0.30	0.05-0.25
CCGW 120404S R-L	12.90	12.70	4.76	0.40	5.50			●	●	●	●	●	●	0.05-0.30	0.05-0.25
CCGW 120408S L-L	12.90	12.70	4.76	0.80	5.50			●	●	●	●	●	●	0.05-0.30	0.05-0.25
CCGW 120408S R-L	12.90	12.70	4.76	0.80	5.50			●	●	●	●	●	●	0.05-0.30	0.05-0.25

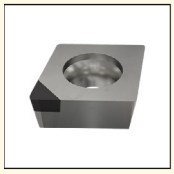
• For user guide and cutting speed recommendations, see pages 116-136

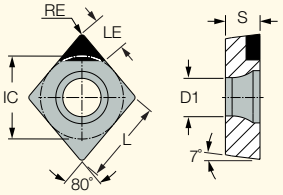
For tools, see pages: A/E/S-SCLCR/L (284) • AVC-SCLCR/L (285) • C#-SCLCR/L-JHP (244) • E-SCLCR/L-HEAD (285) • IHCR (286) • IHRF (286) • IHRF-BW (287) • IHRF-CH (287) • IHSR (288) • IHSR-BW (289) • NQCH-SCACR/L-S-JHP (244) • PCLCR/L-S (235) • PCLCR/L-S-JHP (236) • PCLCR/L-S-JHP-MC (236) • SCACR/L-S (242) • SCLCR-PAD (243) • SCLCR/L (243) • SCLCR/L-PAD-JHP (243)

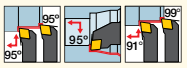
ISCAR CBN LINE

CCGW W (CBN)

Positive 80° Rhombic Inserts with a CBN Top Corner Tip and Wiper for Hardened Steels and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
CCGW 09T302S W	9.70	9.52	3.97	0.20	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 09T304S W	9.70	9.52	3.97	0.40	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 09T308S W	9.70	9.52	3.97	0.80	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

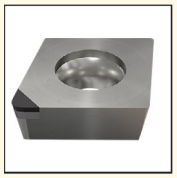
- For user guide and cutting speed recommendations, see pages 116-136

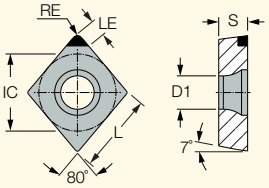
For tools, see pages: A/E/S-SCLCR/L (284) • AVC-SCLCR/L (285) • C#-SCLCR/L-JHP (244) • E-SCLCR/L-HEAD (285) • IHCR (286) • IHRF (286) • IHRF-BW (287) • IHSR (288) • IHSR-BW (289) • NQCH-SCACR/L-S-JHP (244) • PCLCR/L-S (235) • PCLCR/L-S-JHP (236) • PCLCR/L-S-JHP-MC (236) • SCACR/L-S (242) • SCLCR-PAD (243) • SCLCR/L (243) • SCLCR/L-PAD-JHP (243)

ISCAR CBN LINE

CCGW MT (CBN)

Positive 80° Rhombic Inserts with a Single CBN Mini Tip Flat Rake Angle for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
CCGW 060202S-MT	6.40	6.35	2.38	0.20	2.70	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 060204S-MT	6.40	6.35	2.38	0.40	2.70	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 09T302S-MT	9.70	9.52	3.97	0.20	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 09T304S-MT	9.70	9.52	3.97	0.40	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 09T308S-MT	9.70	9.52	3.97	0.80	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 120402S-MT	12.90	12.70	4.76	0.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 120404S-MT	12.90	12.70	4.76	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 120408S-MT	12.90	12.70	4.76	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

- For user guide and cutting speed recommendations, see pages 116-136

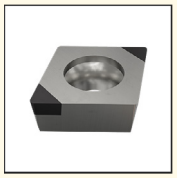
For tools, see pages: A/E/S-SCLCR/L (284) • AVC-SCLCR/L (285) • C#-SCLCR/L-JHP (244) • E-SCLCR/L-HEAD (285) • IHCR (286) • IHRF (286) • IHRF-BW (287) • IHSR (288) • IHSR-BW (289) • NQCH-SCACR/L-S-JHP (244) • PCLCR/L-S (235) • PCLCR/L-S-JHP (236) • PCLCR/L-S-JHP-MC (236) • SCACR/L-S (242) • SCLCR-PAD (243) • SCLCR/L (243) • SCLCR/L-PAD-JHP (243)

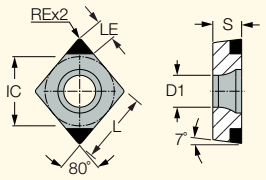
Material		H								K		
		Hard Materials								Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted					▲	▲	▲	▲		▲	▲
	Light interrupted			▲	▲	▲	▲	▲	▲	▲	▲	▲
	Continuous	▲	▲	▲	▲					▲	▲	▲

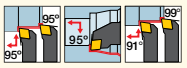
ISCAR CBN LINE

CCGW 2MT (CBN)

Positive 80° Rhombic Inserts with 2 CBN Mini Tips and Flat Rake Angle for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
CCGW 060202S-2MT	6.40	6.35	2.38	0.20	2.70	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 060204S-2MT	6.40	6.35	2.38	0.40	2.70	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 09T304S-2MT	9.70	9.52	3.97	0.40	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 09T308S-2MT	9.70	9.52	3.97	0.80	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 120404S-2MT	12.90	12.70	4.76	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 120408S-2MT	12.90	12.70	4.76	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

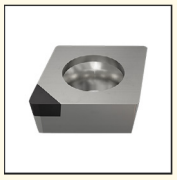
- For user guide and cutting speed recommendations, see pages 116-136

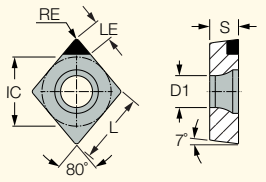
For tools, see pages: A/E/S-SCLCR/L (284) • AVC-SCLCR/L (285) • C#-SCLCR/L-JHP (244) • E-SCLCR/L-HEAD (285) • IHCR (286) • IHRF (286) • IHRF-BW (287) • IHSR (288) • IHSR-BW (289) • NQCH-SCACR/L-S-JHP (244) • PCLCR/L-S (235) • PCLCR/L-S-JHP (236) • PCLCR/L-S-JHP-MC (236) • SCACR/L-S (242) • SCLCR-PAD (243) • SCLCR/L (243) • SCLCR/L-PAD-JHP (243)

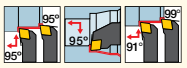
ISCAR CBN LINE

CCGW W-MT (CBN)

Positive 80° Rhombic Inserts with a Single CBN Wiper, Mini Tip and Flat Rake Angle for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
CCGW 060202S W-MT	6.40	6.35	2.38	0.20	2.70	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 060204S W-MT	6.40	6.35	2.38	0.40	2.70	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 09T304S W-MT	9.70	9.52	3.97	0.40	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CCGW 09T308S W-MT	9.70	9.52	3.97	0.80	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

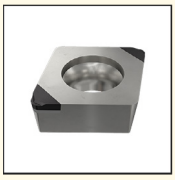
- For user guide and cutting speed recommendations, see pages 116-136

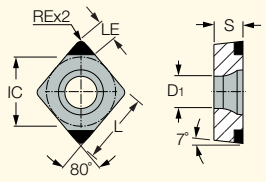
For tools, see pages: A/E/S-SCLCR/L (284) • AVC-SCLCR/L (285) • C#-SCLCR/L-JHP (244) • E-SCLCR/L-HEAD (285) • IHCR (286) • IHRF (286) • IHRF-BW (287) • IHSR (288) • IHSR-BW (289) • NQCH-SCACR/L-S-JHP (244) • PCLCR/L-S (235) • PCLCR/L-S-JHP (236) • PCLCR/L-S-JHP-MC (236) • SCACR/L-S (242) • SCLCR-PAD (243) • SCLCR/L (243) • SCLCR/L-PAD-JHP (243)

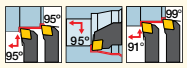
ISCAR CBN LINE

CCGW 2MT MM (CBN)

Positive 80° Rhombic Inserts with 2 MM Chipbreaking CBN Mini Tips for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
CCGW 09T304S-2MT MM	9.70	9.52	3.97	0.40	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.35	0.04-0.25
CCGW 09T308S-2MT MM	9.70	9.52	3.97	0.80	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25

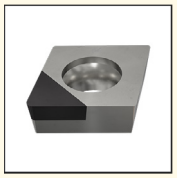
- For user guide and cutting speed recommendations, see pages 116-136

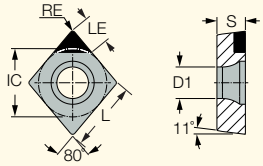
For tools, see pages: A/E/S-SCLCR/L (284) • AVC-SCLCR/L (285) • C#-SCLCR/L-JHP (244) • E-SCLCR/L-HEAD (285) • IHCR (286) • IHRF (286) • IHRF-BW (287) • IHSR (288) • IHSR-BW (289) • NQCH-SCACR/L-S-JHP (244) • PCLCR/L-S (235) • PCLCR/L-S-JHP (236) • PCLCR/L-S-JHP-MC (236) • SCACR/L-S (242) • SCLCR-PAD (243) • SCLCR/L (243) • SCLCR/L-PAD-JHP (243)

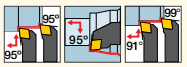
ISCAR CBN LINE

CPGW (CBN)

Positive 80° Rhombic Inserts with CBN Top Corner Tip for Hardened Steel and Cast Iron







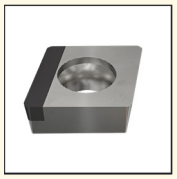
Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
CPGW 05T102S	5.60	5.56	1.98	0.20	3.00	2.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
CPGW 05T104S	5.60	5.56	1.98	0.40	3.00	2.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
CPGW 060202S	6.40	6.35	2.38	0.20	3.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
CPGW 060204S	6.40	6.35	2.38	0.40	3.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
CPGW 09T304S	9.70	9.52	3.97	0.40	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
CPGW 09T308S	9.70	9.52	3.97	0.80	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
CPGW 090304S	9.70	9.52	3.18	0.40	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
CPGW 090308S	9.70	9.52	3.18	0.80	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
CPGW 120404S	12.90	12.70	4.76	0.40	4.00	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
CPGW 120408S	12.90	12.70	4.76	0.80	4.00	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

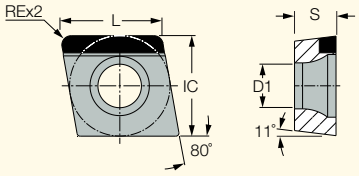
• For user guide and cutting speed recommendations, see pages 116-136

ISCAR CBN LINE

CPGW R/L-L (CBN)

Positive 80° Rhombic Inserts with Full-Edge CBN Tip (Right or Left Hand) for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	D1	Hard ↔ Tough BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
CPGW 060202S L-L	6.40	6.35	2.38	0.20	2.80	•	•	•	•	•	•	0.05-0.30	0.05-0.25
CPGW 060202S R-L	6.40	6.35	2.38	0.20	2.80	•	•	•	•	•	•	0.05-0.30	0.05-0.25
CPGW 060204S L-L	6.40	6.35	2.38	0.40	2.80	•	•	•	•	•	•	0.05-0.30	0.05-0.25
CPGW 060204S R-L	6.40	6.35	2.38	0.40	2.80	•	•	•	•	•	•	0.05-0.30	0.05-0.25
CPGW 09T302S L-L	9.70	9.52	3.97	0.20	4.40	•	•	•	•	•	•	0.05-0.30	0.05-0.25
CPGW 09T302S R-L	9.70	9.52	3.97	0.20	4.40	•	•	•	•	•	•	0.05-0.30	0.05-0.25
CPGW 09T304S L-L	9.70	9.52	3.97	0.40	4.40	•	•	•	•	•	•	0.05-0.30	0.05-0.25
CPGW 09T304S R-L	9.70	9.52	3.97	0.40	4.40	•	•	•	•	•	•	0.05-0.30	0.05-0.25
CPGW 120404S L-L	12.90	12.70	4.76	0.40	5.50	•	•	•	•	•	•	0.05-0.30	0.05-0.25
CPGW 120404S R-L	12.90	12.70	4.76	0.40	5.50	•	•	•	•	•	•	0.05-0.30	0.05-0.25
CPGW 120408S L-L	12.90	12.70	4.76	0.80	5.50	•	•	•	•	•	•	0.05-0.30	0.05-0.25
CPGW 120408S R-L	12.90	12.70	4.76	0.80	5.50	•	•	•	•	•	•	0.05-0.30	0.05-0.25

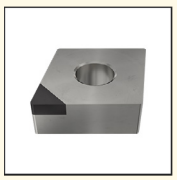
• For user guide and cutting speed recommendations, see pages 116-136

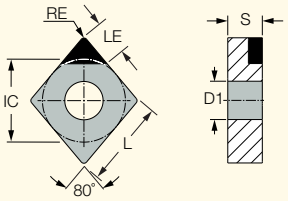
Material		H Hard Materials								K Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted					↑	↑	↑	↑		↑	↑
	Light interrupted			↑	↑	↑	↑	↑	↑	↑		
	Continuous	↑	↑	↑	↑					↑	↑	↑

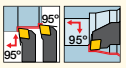
ISCAR CBN LINE

CNGA (CBN)

Negative 80° Rhombic Inserts with Negative Relief Angles and Single CBN Tip for Finishing Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGA 120401S	12.90	12.70	4.76	0.10	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CNGA 120402S	12.90	12.70	4.76	0.20	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CNGA 120403S	12.90	12.70	4.76	0.30	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CNGA 120406S	12.90	12.70	4.76	0.60	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CNGA 120404S	12.90	12.70	4.76	0.40	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CNGA 120410S	12.90	12.70	4.76	1.00	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CNGA 120408S	12.90	12.70	4.76	0.80	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CNGA 120412S	12.90	12.70	4.76	1.20	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CNGA 120416S	12.90	12.70	4.76	1.60	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

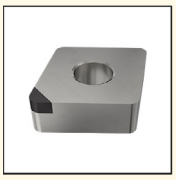
- For user guide and cutting speed recommendations, see pages 116-136

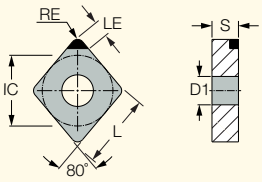
For tools, see pages: A/S-PCLNR/L (282) • A/S-PCLNR/L-X/G (283) • C#-MULNR/L-MW (268) • C#-PCLNR/L-12-JHP (241) • C#-PCLNR/L-X (241) • C#-PCLNR/L-X-JHP (242) • DCLNR/L (234) • DCLNR/L-JHP-MC (235) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PCLNR/L (237) • PCLNR/L-12-JHP (237) • PCLNR/L-X (238) • PCLNR/L-X-JHP (239) • PCLNR/L-X-JHP-MC (240) • S-DCLNR/L (282) • S-MULNR-MW (297)

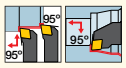
ISCAR CBN LINE

CNGA MT (CBN)

Negative 80° Rhombic Inserts with a Single CBN Mini Tip for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGA 120402S-MT	12.90	12.70	4.76	0.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CNGA 120408S-MT	12.90	12.70	4.76	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CNGA 120412S-MT	12.90	12.70	4.76	1.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

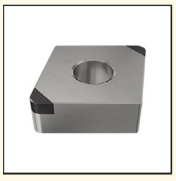
- For user guide and cutting speed recommendations, see pages 116-136

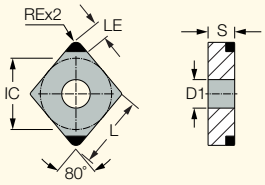
For tools, see pages: A/S-PCLNR/L (282) • A/S-PCLNR/L-X/G (283) • C#-MULNR/L-MW (268) • C#-PCLNR/L-12-JHP (241) • C#-PCLNR/L-X (241) • C#-PCLNR/L-X-JHP (242) • DCLNR/L (234) • DCLNR/L-JHP-MC (235) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PCLNR/L (237) • PCLNR/L-12-JHP (237) • PCLNR/L-X (238) • PCLNR/L-X-JHP (239) • PCLNR/L-X-JHP-MC (240) • S-DCLNR/L (282) • S-MULNR-MW (297)

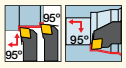
ISCAR CBN LINE

CNGA 2MT (CBN)

Negative 80° Rhombic Inserts with 2 CBN Mini Tips and Flat Rake Angle for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGA 120402S-2MT	12.90	12.70	4.76	0.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CNGA 120404S-2MT	12.90	12.70	4.76	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
CNGA 120408S-2MT	12.90	12.70	4.76	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

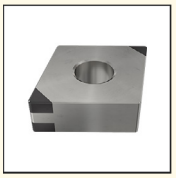
- For user guide and cutting speed recommendations, see pages 116-136

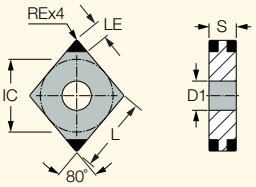
For tools, see pages: A/S-PCLNR/L (282) • A/S-PCLNR/L-X/G (283) • C#-MULNR/L-MW (268) • C#-PCLNR/L-12-JHP (241) • C#-PCLNR/L-X (241) • C#-PCLNR/L-X-JHP (242) • DCLNR/L (234) • DCLNR/L-JHP-MC (235) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PCLNR/L (237) • PCLNR/L-12-JHP (237) • PCLNR/L-X (238) • PCLNR/L-X-JHP (239) • PCLNR/L-X-JHP-MC (240) • S-DCLNR/L (282) • S-MULNR-MW (297)

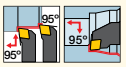
ISCAR CBN LINE

CNGA 4MT (CBN)

Negative 80° Rhombic Inserts with 4 CBN Mini Tips and Flat Rake Angle for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGA 120404S-4MT	12.90	12.70	4.76	0.40	2.70	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
CNGA 120408S-4MT	12.90	12.70	4.76	0.80	2.70	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
CNGA 120412S-4MT	12.90	12.70	4.76	1.20	2.70	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

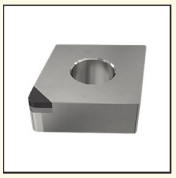
• For user guide and cutting speed recommendations, see pages 116-136

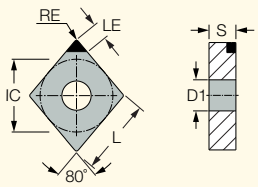
For tools, see pages: A/S-PCLNR/L (282) • A/S-PCLNR/L-X/G (283) • C#-MULNR/L-MW (268) • C#-PCLNR/L-12-JHP (241) • C#-PCLNR/L-X (241) • C#-PCLNR/L-X-JHP (242) • DCLNR/L (234) • DCLNR/L-JHP-MC (235) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PCLNR/L (237) • PCLNR/L-12-JHP (237) • PCLNR/L-X (238) • PCLNR/L-X-JHP (239) • PCLNR/L-X-JHP-MC (240) • S-DCLNR/L (282) • S-MULNR-MW (297)

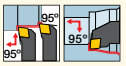
ISCAR CBN LINE

CNGA W-MT (CBN)

Negative 80° Rhombic Inserts with a Single CBN Wiper with a Mini Tip for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGA 120404S W-MT	12.90	12.70	4.76	0.40	2.70	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
CNGA 120408S W-MT	12.90	12.70	4.76	0.80	2.70	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

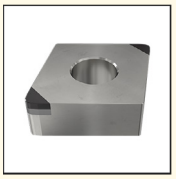
• For user guide and cutting speed recommendations, see pages 116-136

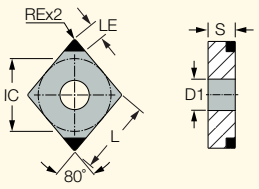
For tools, see pages: A/S-PCLNR/L (282) • A/S-PCLNR/L-X/G (283) • C#-MULNR/L-MW (268) • C#-PCLNR/L-12-JHP (241) • C#-PCLNR/L-X (241) • C#-PCLNR/L-X-JHP (242) • DCLNR/L (234) • DCLNR/L-JHP-MC (235) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PCLNR/L (237) • PCLNR/L-12-JHP (237) • PCLNR/L-X (238) • PCLNR/L-X-JHP (239) • PCLNR/L-X-JHP-MC (240) • S-DCLNR/L (282) • S-MULNR-MW (297)

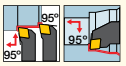
ISCAR CBN LINE

CNGA W-2MT (CBN)

Negative 80° Rhombic Inserts with 2 CBN Wiper and Mini Tip for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGA 120408S W-2MT	12.90	12.70	4.76	0.80	2.70	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

• For user guide and cutting speed recommendations, see pages 116-136

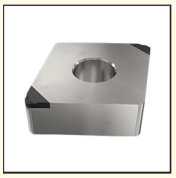
For tools, see pages: A/S-PCLNR/L (282) • A/S-PCLNR/L-X/G (283) • C#-MULNR/L-MW (268) • C#-PCLNR/L-12-JHP (241) • C#-PCLNR/L-X (241) • C#-PCLNR/L-X-JHP (242) • DCLNR/L (234) • DCLNR/L-JHP-MC (235) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PCLNR/L (237) • PCLNR/L-12-JHP (237) • PCLNR/L-X (238) • PCLNR/L-X-JHP (239) • PCLNR/L-X-JHP-MC (240) • S-DCLNR/L (282) • S-MULNR-MW (297)

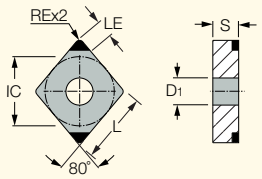
Material		H								K		
		Hard Materials								Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted					▲	▲	▲	▲		▲	▲
	Light interrupted			▲	▲	▲	▲	▲	▲	▲	▲	▲
	Continuous	▲	▲	▲	▲					▲	▲	▲

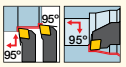
ISCAR CBN LINE

CNGA 2MT MM (CBN)

Negative 80° Rhombic Inserts with 2 MM Chipbreaking CBN Mini Tips for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGA 120404S-2MT MM	12.90	12.70	4.76	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
CNGA 120408S-2MT MM	12.90	12.70	4.76	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
CNGA 120412S-2MT MM	12.90	12.70	4.76	1.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.30	0.03-0.25

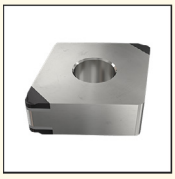
• For user guide and cutting speed recommendations, see pages 116-136

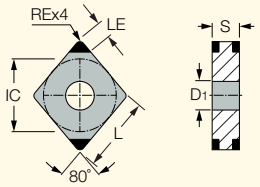
For tools, see pages: A/S-PCLNR/L (282) • A/S-PCLNR/L-X/G (283) • C#-MULNR/L-MW (268) • C#-PCLNR/L-12-JHP (241) • C#-PCLNR/L-X (241) • C#-PCLNR/L-X-JHP (242) • DCLNR/L (234) • DCLNR/L-JHP-MC (235) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PCLNR/L (237) • PCLNR/L-12-JHP (237) • PCLNR/L-X (238) • PCLNR/L-X-JHP (239) • PCLNR/L-X-JHP-MC (240) • S-DCLNR/L (282) • S-MULNR-MW (297)

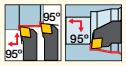
ISCAR CBN LINE

CNGA 4MT MM (CBN)

Negative 80° Rhombic Inserts with 4 MM Chipbreaking CBN Mini Tips for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Tough ↔ Hard BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGA 120404S-4MT MM	12.90	12.70	4.76	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
CNGA 120408S-4MT MM	12.90	12.70	4.76	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
CNGA 120412S-4MT MM	12.90	12.70	4.76	1.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25

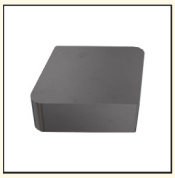
• For user guide and cutting speed recommendations, see pages 116-136

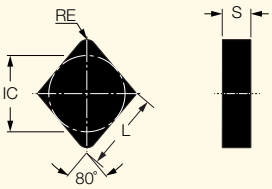
For tools, see pages: A/S-PCLNR/L (282) • A/S-PCLNR/L-X/G (283) • C#-MULNR/L-MW (268) • C#-PCLNR/L-12-JHP (241) • C#-PCLNR/L-X (241) • C#-PCLNR/L-X-JHP (242) • DCLNR/L (234) • DCLNR/L-JHP-MC (235) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PCLNR/L (237) • PCLNR/L-12-JHP (237) • PCLNR/L-X (238) • PCLNR/L-X-JHP (239) • PCLNR/L-X-JHP-MC (240) • S-DCLNR/L (282) • S-MULNR-MW (297)

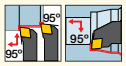
ISCAR CBN LINE

CNGN S (CBN)

Negative 80° Rhombic Solid CBN Inserts for High-Feed High-Depth Roughing & High-Speed Finishing of Cast Iron







Designation	Dimensions L	IC	S	RE	Tough ↔ Hard BI30K	BI30KC	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGN 090304S-S	9.70	9.52	3.18	0.40	●	●	0.05-5.00	0.05-0.50
CNGN 090308S-S	9.70	9.52	3.18	0.80	●	●	0.05-5.00	0.05-0.50
CNGN 090312S-S	9.70	9.52	3.18	1.20	●	●	0.05-5.00	0.05-0.50
CNGN 120408S-S	12.90	12.70	4.76	0.80	●	●	0.05-5.00	0.05-0.50
CNGN 120412S-S	12.90	12.70	4.76	1.20	●	●	0.05-5.00	0.05-0.50
CNGN 120416S-S	12.90	12.70	4.76	1.60	●	●	0.05-5.00	0.05-0.50

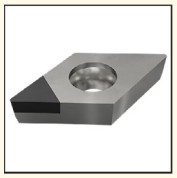
• For user guide and cutting speed recommendations, see pages 116-136

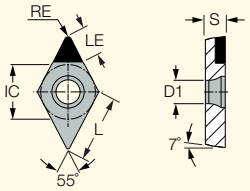
For tools, see pages: CCBNR/L-F/X (71) • CCKNR/L-F/X (71) • CCLNR/L-F/X (72) • S-CCLNR/L-F/X (78)

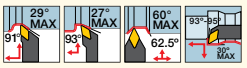
ISCAR CBN LINE

DCGW (CBN)

Positive 55° Rhombic Inserts with CBN Top Corner Tip for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
DCGW 070202S	7.75	6.35	2.38	0.20	3.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 070204S	7.75	6.35	2.38	0.40	3.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 070208S	7.75	6.35	2.38	0.80	3.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 11T302S	11.60	9.52	3.97	0.20	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 11T304S	11.60	9.52	3.97	0.40	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 11T308S	11.60	9.52	3.97	0.80	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 150404S	15.50	12.70	4.76	0.40	4.00	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 150408S	15.50	12.70	4.76	0.80	4.00	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

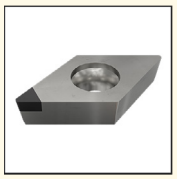
• For user guide and cutting speed recommendations, see pages 116-136

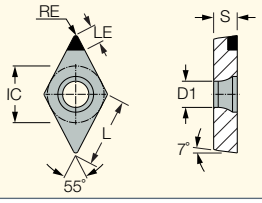
For tools, see pages: A/E/S-SDUCR/L (292) • AVC-SDUCR/L (293) • AVC-SDUCR/L-VH (293) • C#-SDJCR-JHP (253) • C#-SDJCR/L (252) • C#-SDNCN (253) • E-SDUCR/L-HEAD (292) • NQCH-SDACR/L-S-JHP (253) • NQCH-Y-SDJCR-S-JHP (254) • PDACR/L-S (247) • PDACR/L-S-JHP (247) • PDACR/L-S-JHP-MC (248) • SDACR/L-S (250) • SDHCR/L-S (250) • SDJCR-PAD (251) • SDJCR/L (250) • SDJCR/L-PAD-JHP (251) • SDNCN (251) • Y-SDJCR-S (252) • Y-SDJCR-S-JHP (252)

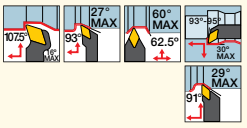
ISCAR CBN LINE

DCGW MT (CBN)

Positive 55° Rhombic Inserts with a Single CBN Mini Tip for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
DCGW 070202S-MT	7.75	6.35	2.38	0.20	2.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 070204S-MT	7.75	6.35	2.38	0.40	2.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 11T302S-MT	11.60	9.52	3.97	0.20	2.70	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 11T304S-MT	11.60	9.52	3.97	0.40	2.70	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 11T308S-MT	11.60	9.52	3.97	0.80	2.70	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

• For user guide and cutting speed recommendations, see pages 116-136

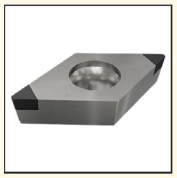
For tools, see pages: A/E/S-SDUCR/L (292) • AVC-SDUCR/L (293) • AVC-SDUCR/L-VH (293) • C#-SDJCR-JHP (253) • C#-SDJCR/L (252) • C#-SDNCN (253) • E-SDUCR/L-HEAD (292) • NQCH-SDACR/L-S-JHP (253) • NQCH-Y-SDJCR-S-JHP (254) • PDACR/L-S (247) • PDACR/L-S-JHP (247) • PDACR/L-S-JHP-MC (248) • SDACR/L-S (250) • SDHCR/L-S (250) • SDJCR-PAD (251) • SDJCR/L (250) • SDJCR/L-PAD-JHP (251) • SDNCN (251) • Y-SDJCR-S (252) • Y-SDJCR-S-JHP (252)

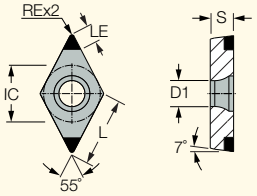
Material		H								K		
		Hard Materials								Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted					▲	▲	▲	▲		▲	▲
	Light interrupted			▲	▲	▲	▲	▲	▲	▲	▲	▲
	Continuous	▲	▲	▲	▲					▲	▲	▲

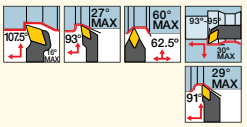
ISCAR CBN LINE

DCGW 2MT (CBN)

Positive 55° Rhombic Inserts with 2 CBN Mini Tips for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
DCGW 070202S-2MT	7.75	6.35	2.38	0.20	2.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 070204S-2MT	7.75	6.35	2.38	0.40	2.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 070208S-2MT	7.75	6.35	2.38	0.80	2.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 11T302S-2MT	11.60	9.52	3.97	0.20	2.70	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 11T304S-2MT	11.60	9.52	3.97	0.40	2.70	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 11T308S-2MT	11.60	9.52	3.97	0.80	2.70	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

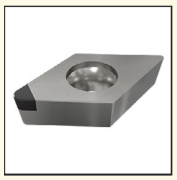
• For user guide and cutting speed recommendations, see pages 116-136

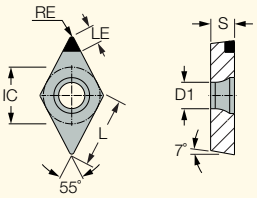
For tools, see pages: A/E/S-SDUCR/L (292) • AVC-SDUCR/L (293) • AVC-SDUCR/L-VH (293) • C#-SDJCR-JHP (253) • C#-SDJCR/L (252) • C#-SDNCN (253) • E-SDUCR/L-HEAD (292) • NQCH-SDACR/L-S-JHP (253) • NQCH-Y-SDJCR-S-JHP (254) • PDACR/L-S (247) • PDACR/L-S-JHP (247) • PDACR/L-S-JHP-MC (248) • SDACR/L-S (250) • SDHCR/L-S (250) • SDJCR-PAD (251) • SDJCR/L (250) • SDJCR/L-PAD-JHP (251) • SDNCN (251) • Y-SDJCR-S (252) • Y-SDJCR-S-JHP (252)

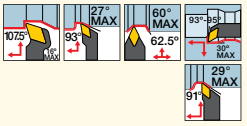
ISCAR CBN LINE

DCGW W-MT (CBN)

Positive 55° Rhombic Inserts with a Single CBN Mini Tip and Wiper for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
DCGW 11T304S W-MT	11.60	9.52	3.97	0.40	2.70	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 11T308S W-MT	11.60	9.52	3.97	0.80	2.70	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

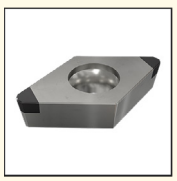
• For user guide and cutting speed recommendations, see pages 116-136

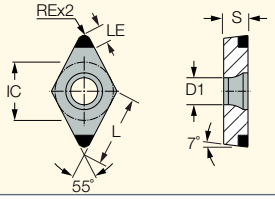
For tools, see pages: A/E/S-SDUCR/L (292) • AVC-SDUCR/L (293) • AVC-SDUCR/L-VH (293) • C#-SDJCR-JHP (253) • C#-SDJCR/L (252) • C#-SDNCN (253) • NQCH-SDACR/L-S-JHP (253) • NQCH-Y-SDJCR-S-JHP (254) • PDACR/L-S (247) • PDACR/L-S-JHP (247) • PDACR/L-S-JHP-MC (248) • SDACR/L-S (250) • SDHCR/L-S (250) • SDJCR/L (250) • SDJCR/L-PAD-JHP (251) • SDNCN (251) • Y-SDJCR-S (252) • Y-SDJCR-S-JHP (252)

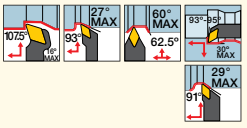
ISCAR CBN LINE

DCGW W-2MT (CBN)

Positive 55° Rhombic Inserts with 2 CBN Mini Tips and Wiper for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
DCGW 11T304S W-2MT	11.60	9.52	3.97	0.40	2.70	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DCGW 11T308S W-2MT	11.60	9.52	3.97	0.80	2.70	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

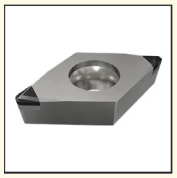
• For user guide and cutting speed recommendations, see pages 116-136

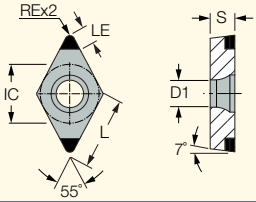
For tools, see pages: A/E/S-SDUCR/L (292) • AVC-SDUCR/L (293) • AVC-SDUCR/L-VH (293) • C#-SDJCR-JHP (253) • C#-SDJCR/L (252) • C#-SDNCN (253) • NQCH-SDACR/L-S-JHP (253) • NQCH-Y-SDJCR-S-JHP (254) • PDACR/L-S (247) • PDACR/L-S-JHP (247) • PDACR/L-S-JHP-MC (248) • SDACR/L-S (250) • SDHCR/L-S (250) • SDJCR/L (250) • SDJCR/L-PAD-JHP (251) • SDNCN (251) • Y-SDJCR-S (252) • Y-SDJCR-S-JHP (252)

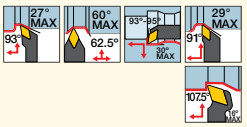
ISCAR CBN LINE

DCGW 2MT MM (CBN)

Positive 55° Rhombic Inserts with 2 MM Chipbreaking CBN Mini Tips for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
DCGW 11T304S-2MT MM	11.60	9.52	3.97	0.40	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
DCGW 11T308S-2MT MM	11.60	9.52	3.97	0.80	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25

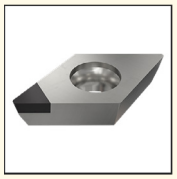
• For user guide and cutting speed recommendations, see pages 116-136

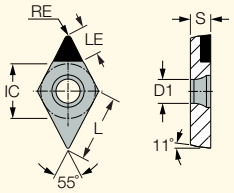
For tools, see pages: A/E/S-SDUCR/L (292) • AVC-SDUCR/L (293) • AVC-SDUCR/L-VH (293) • C#-SDJCR-JHP (253) • C#-SDJCR/L (252) • C#-SDNCN (253) • NQCH-SDACR/L-S-JHP (253) • NQCH-Y-SDJCR-S-JHP (254) • PDACR/L-S (247) • PDACR/L-S-JHP (247) • PDACR/L-S-JHP-MC (248) • SDACR/L-S (250) • SDHCR/L-S (250) • SDJCR/L (250) • SDJCR/L-PAD-JHP (251) • SDNCN (251) • Y-SDJCR-S (252) • Y-SDJCR-S-JHP (252)

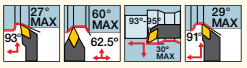
ISCAR CBN LINE

DPGW (CBN)

Positive 55° Rhombic Inserts with Single CBN Top Corner Tip for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
DPGW 070202S	7.75	6.35	2.38	0.20	3.00	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
DPGW 070204S	7.75	6.35	2.38	0.40	3.00	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
DPGW 070208S	7.75	6.35	2.38	0.80	3.00	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
DPGW 11T302S	11.60	9.52	3.97	0.20	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
DPGW 11T304S	11.60	9.52	3.97	0.40	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
DPGW 11T308S	11.60	9.52	3.97	0.80	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

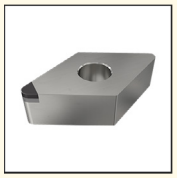
• For user guide and cutting speed recommendations, see pages 116-136

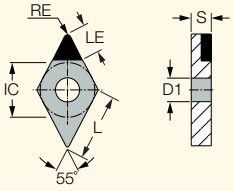
Material		H Hard Materials								K Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted					▲	▲	▲	▲		▲	▲
	Light interrupted			▲	▲					▲		
	Continuous	▲	▲									

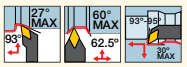
ISCAR CBN LINE

DNGA (CBN)

Negative 55° Rhombic Inserts & Negative Relief Angle with Single CBN Tip for Finishing Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
DNGA 150404S	15.50	12.70	4.76	0.40	4.00	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DNGA 150408S	15.50	12.70	4.76	0.80	4.00	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DNGA 150412S	15.50	12.70	4.76	1.20	4.00	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DNGA 150604S	15.50	12.70	6.35	0.40	4.00	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DNGA 150608S	15.50	12.70	6.35	0.80	4.00	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DNGA 150612S	15.50	12.70	6.35	1.20	4.00	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

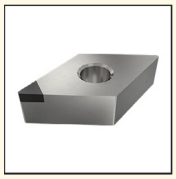
- For user guide and cutting speed recommendations, see pages 116-136

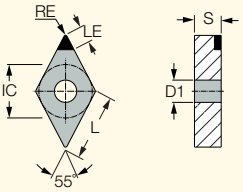
For tools, see pages: A/S-PDUNR/L (291) • AVC-DDUNR/L (290) • AVC-DDUNR/L-VH (291) • C#-DDJNR/L (246) • C#-PDJNR/L-JHP (249) • DDJNR/L (245) • DDJNR/L-JHP-MC (245) • HSK A63WH-DDJNR/L (246) • HSK A63WH-DDNNN (246) • PDJNR/L (248) • PDJNR/L-JHP (249) • S-DDUNR/L (290)

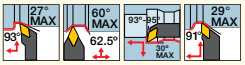
ISCAR CBN LINE

DNGA MT (CBN)

Negative 55° Rhombic Inserts with a Single CBN Mini Tip for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
DNGA 150402S-MT	15.50	12.70	4.76	0.20	2.70	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DNGA 150404S-MT	15.50	12.70	4.76	0.40	2.70	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DNGA 150408S-MT	15.50	12.70	4.76	0.80	2.70	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DNGA 150602S-MT	15.50	12.70	6.35	0.20	2.70	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DNGA 150604S-MT	15.50	12.70	6.35	0.40	2.70	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
DNGA 150608S-MT	15.50	12.70	6.35	0.80	2.70	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

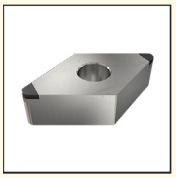
- For user guide and cutting speed recommendations, see pages 116-136

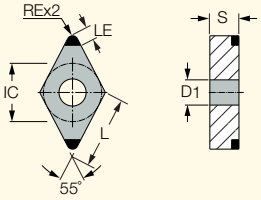
For tools, see pages: A/S-PDUNR/L (291) • AVC-DDUNR/L (290) • AVC-DDUNR/L-VH (291) • C#-DDJNR/L (246) • C#-PDJNR/L-JHP (249) • DDJNR/L (245) • DDJNR/L-JHP-MC (245) • HSK A63WH-DDJNR/L (246) • HSK A63WH-DDNNN (246) • PDJNR/L (248) • PDJNR/L-JHP (249) • S-DDUNR/L (290)

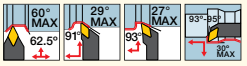
ISCAR CBN LINE

DNGA 2MT (CBN)

Negative 55° Rhombic Inserts with 2 CBN Mini Tips and Wiper for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
DNGA 150402S-2MT	15.50	12.70	4.76	0.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
DNGA 150404S-2MT	15.50	12.70	4.76	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
DNGA 150408S-2MT	15.50	12.70	4.76	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
DNGA 150412S-2MT	15.50	12.70	4.76	1.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
DNGA 150602S-2MT	15.50	12.70	6.35	0.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
DNGA 150604S-2MT	15.50	12.70	6.35	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
DNGA 150608S-2MT	15.50	12.70	6.35	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
DNGA 150612S-2MT	15.50	12.70	6.35	1.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

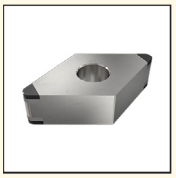
• For user guide and cutting speed recommendations, see pages 116-136

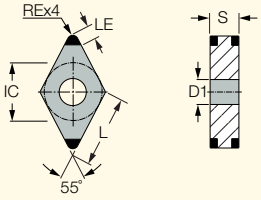
For tools, see pages: A/S-PDUNR/L (291) • AVC-DDUNR/L (290) • AVC-DDUNR/L-VH (291) • C#-DDJNR/L (246) • C#-PDJNR/L-JHP (249) • DDJNR/L (245) • DDJNR/L-JHP-MC (245) • HSK A63WH-DDJNR/L (246) • HSK A63WH-DDNNN (246) • PDJNR/L (248) • PDJNR/L-JHP (249) • S-DDUNR/L (290)

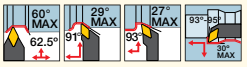
ISCAR CBN LINE

DNGA 4MT (CBN)

Negative 55° Rhombic Inserts with 4 CBN Mini Tips and Wiper for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
DNGA 150604S-4MT	15.50	12.70	6.35	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
DNGA 150608S-4MT	15.50	12.70	6.35	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
DNGA 150612S-4MT	15.50	12.70	6.35	1.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

• For user guide and cutting speed recommendations, see pages 116-136

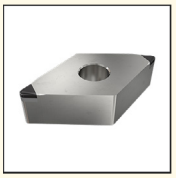
For tools, see pages: A/S-PDUNR/L (291) • AVC-DDUNR/L (290) • AVC-DDUNR/L-VH (291) • C#-DDJNR/L (246) • C#-PDJNR/L-JHP (249) • DDJNR/L (245) • DDJNR/L-JHP-MC (245) • HSK A63WH-DDJNR/L (246) • HSK A63WH-DDNNN (246) • PDJNR/L (248) • PDJNR/L-JHP (249) • S-DDUNR/L (290)

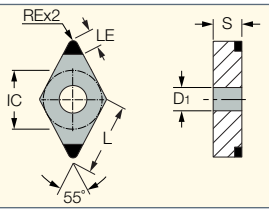
Material		H								K		
		Hard Materials								Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted					▲	▲	▲	▲		▲	▲
	Light interrupted			▲	▲	▲	▲	▲	▲	▲		
	Continuous	▲	▲	▲	▲							

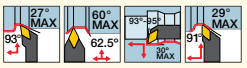
ISCAR CBN LINE

DNGA 2MT MM (CBN)

Negative 55° Rhombic Inserts with 2 MM Chipbreaking CBN Mini Tips for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
DNGA 150404S-2MT MM	15.50	12.70	4.76	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
DNGA 150408S-2MT MM	15.50	12.70	4.76	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
DNGA 150412S-2MT MM	15.50	12.70	4.76	1.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
DNGA 150604S-2MT MM	15.50	12.70	6.35	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
DNGA 150608S-2MT MM	15.50	12.70	6.35	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
DNGA 150612S-2MT MM	15.50	12.70	6.35	1.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25

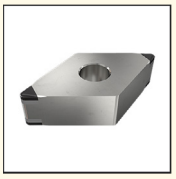
- For user guide and cutting speed recommendations, see pages 116-136

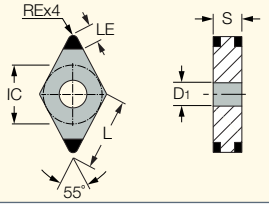
For tools, see pages: A/S-PDUNR/L (291) • AVC-DDUNR/L (290) • AVC-DDUNR/L-VH (291) • C#-DDJNR/L (246) • C#-PDJNR/L-JHP (249) • DDJNR/L (245) • DDJNR/L-JHP-MC (245) • HSK A63WH-DDJNR/L (246) • HSK A63WH-DDNNN (246) • PDJNR/L (248) • PDJNR/L-JHP (249) • S-DDUNR/L (290)

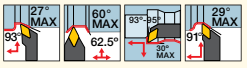
ISCAR CBN LINE

DNGA 4MT MM (CBN)

Negative 55° Rhombic Inserts with 4 MM Chipbreaking CBN Mini Tips for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
DNGA 150404S-4MT MM	15.50	12.70	4.76	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
DNGA 150408S-4MT MM	15.50	12.70	4.76	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
DNGA 150412S-4MT MM	15.50	12.70	4.76	1.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
DNGA 150604S-4MT MM	15.50	12.70	6.35	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
DNGA 150608S-4MT MM	15.50	12.70	6.35	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
DNGA 150612S-4MT MM	15.50	12.70	6.35	1.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25

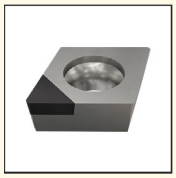
- For user guide and cutting speed recommendations, see pages 116-136

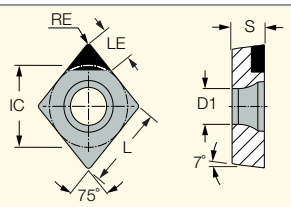
For tools, see pages: A/S-PDUNR/L (291) • AVC-DDUNR/L (290) • AVC-DDUNR/L-VH (291) • C#-DDJNR/L (246) • C#-PDJNR/L-JHP (249) • DDJNR/L (245) • DDJNR/L-JHP-MC (245) • HSK A63WH-DDJNR/L (246) • HSK A63WH-DDNNN (246) • PDJNR/L (248) • PDJNR/L-JHP (249) • S-DDUNR/L (290)

ISCAR CBN LINE

ECGW (CBN)

Positive 75° Rhombic Inserts with Single CBN Top Corner Tip for Hardened Steel and Cast Iron





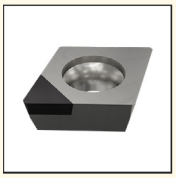
Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
ECGW 09T304S	9.80	9.52	3.97	0.40	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
ECGW 09T308S	9.80	9.52	3.97	0.80	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
ECGW 12T304S	13.10	12.70	3.97	0.40	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
ECGW 12T308S	13.10	12.70	3.97	0.80	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

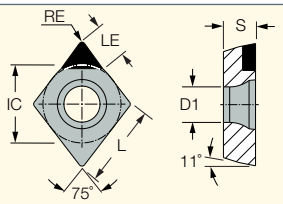
- For user guide and cutting speed recommendations, see pages 116-136

ISCAR CBN LINE

EPGW (CBN)

Positive 75° Rhombic Inserts with Single CBN Top Corner Tip for Hardened Steel and Cast Iron





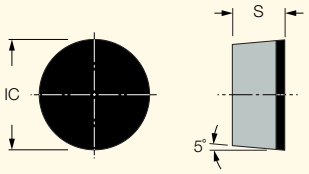
Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
EPGW 040202S	4.80	4.76	2.38	0.20	2.50	2.15	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
EPGW 040204S	4.80	4.76	2.38	0.40	2.50	2.15	●	●			●	●	●	●	0.05-0.20	0.03-0.20
EPGW 060204S	6.50	6.35	2.38	0.40	3.00	2.80	●	●	●	●	●	●			0.05-0.20	0.03-0.20
EPGW 060202S	6.50	6.35	2.38	0.20	3.00	2.80			●	●	●	●	●	●	0.05-0.30	0.05-0.25
EPGW 080302S	8.30	7.94	3.18	0.20	4.00	3.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
EPGW 080304S	8.30	7.94	3.18	0.40	4.00	3.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
EPGW 080308S	8.30	7.94	3.18	0.80	4.00	3.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

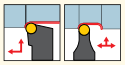
• For user guide and cutting speed recommendations, see pages 116-136

ISCAR CBN LINE

RBGN HS (CBN)

Positive Round Type Half Solid Top CBN Inserts





Designation	Dimensions IC	S	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
RBGN 060200S-HS	6.35	2.38	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RBGN 070200S-HS	7.94	2.38	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RBGN 090300S-HS	9.52	3.18	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RBGN 120300S-HS	12.70	3.18	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RBGN 120400S-HS	12.70	4.76	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

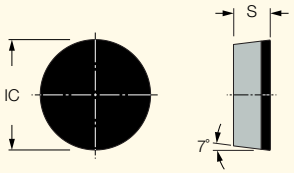
• For user guide and cutting speed recommendations, see pages 116-136

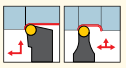
Material		H								K		
		Hard Materials								Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted											
	Light interrupted											
	Continuous											

ISCAR CBN LINE

RCGN HS (CBN)

Positive Round Type Half
Solid Top CBN Inserts





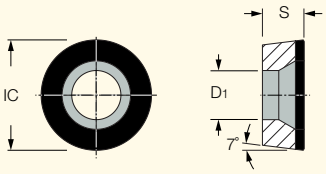
Designation	Dimensions IC	S	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
RCGN 090300S-HS	9.52	3.18	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RCGN 120300S-HS	12.70	3.18	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RCGN 120400S-HS	12.70	4.76	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

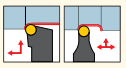
• For user guide and cutting speed recommendations, see pages 116-136

ISCAR CBN LINE

RCGW HS (CBN)

Positive Round Type Half
Solid Top CBN Inserts





Designation	Dimensions IC	S	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
RCGW 0602M0S-HS	6.00	2.38	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RCGW 0803M0S-HS	8.00	3.18	3.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RCGW 1003M0S-HS	10.00	3.18	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

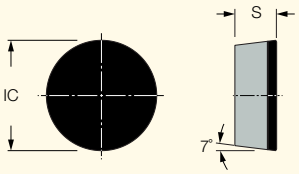
• For user guide and cutting speed recommendations, see pages 116-136

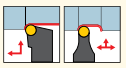
For tools, see pages: SRDCN (254) • SRGCR/L (255)

ISCAR CBN LINE

RPGN HS (CBN)

Positive Round Type Half
Solid Top CBN Inserts





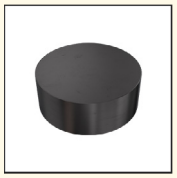
Designation	Dimensions IC	S	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
RPGN 060200S-HS	6.35	2.38	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RPGN 070200S-HS	7.94	2.38	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RPGN 090300S-HS	9.52	3.18	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RPGN 120300S-HS	12.70	3.18	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RPGN 120400S-HS	12.70	4.76					●		●		0.05-0.50	0.05-0.25

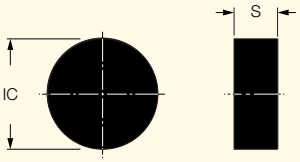
• For user guide and cutting speed recommendations, see pages 116-136

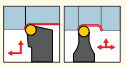
ISCAR CBN LINE

RNGN S (CBN)

Negative Round Type Solid CBN Inserts for Cast Iron Machining







Designation	Dimensions IC	S	Hard ↔ Tough BI30K	BI30KC	Recommended Machining Data a_p (mm)	f (mm/rev)
RNGN 0903M0S-S	9.00	3.18	●	●	0.05-5.00	0.05-0.50
RNGN 090300S-S	9.52	3.18	●	●	0.05-5.00	0.05-0.50
RNGN 1203M0S-S	12.00	3.18	●	●	0.05-5.00	0.05-0.50
RNGN 120300S-S	12.70	3.18	●	●	0.05-5.00	0.05-0.50
RNGN 120400S-S	12.70	4.76	●	●	0.05-5.00	0.05-0.50

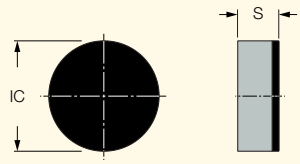
• For user guide and cutting speed recommendations, see pages 116-136

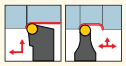
For tools, see pages: • CRDNN-F (74) • CRGNR/L (254) • FRN (110)

ISCAR CBN LINE

RNGN HS (CBN)

Negative Round Type Half Solid Top CBN Inserts





Designation	Dimensions IC	S	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
RNGN 0903M0S-HS	9.00	3.18	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RNGN 090300S-HS	9.52	3.18	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RNGN 1203M0S-HS	12.00	3.18	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RNGN 120300S-HS	12.70	3.18	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RNGN 1204M0S-HS	12.00	4.76	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
RNGN 120400S-HS	12.70	4.76	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

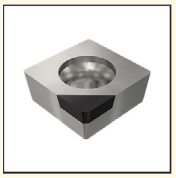
• For user guide and cutting speed recommendations, see pages 116-136

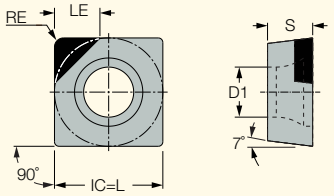
Material		H Hard Materials								K Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted					▲	▲	▲	▲		▲	▲
	Light interrupted			▲	▲	▲	▲	▲	▲	▲	▲	▲
	Continuous	▲	▲	▲	▲					▲	▲	▲

ISCAR CBN LINE

SCGW (CBN)

Positive Square Inserts with Single CBN Top Corner Tip for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
SCGW 060202S	6.35	6.35	2.38	0.20	3.00	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SCGW 060204S	6.35	6.35	2.38	0.40	3.00	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SCGW 09T302S	9.52	9.52	3.97	0.20	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SCGW 09T304S	9.52	9.52	3.97	0.40	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SCGW 09T308S	9.52	9.52	3.97	0.80	4.00	4.40	●	●	●	●	●	●			0.05-0.20	0.03-0.20
SCGW 090302S	9.52	9.52	3.18	0.20	4.00	4.40	●	●			●	●	●	●	0.05-0.20	0.03-0.20
SCGW 090304S	9.52	9.52	3.18	0.40	4.00	4.40			●	●	●	●	●	●	0.05-0.30	0.05-0.25
SCGW 090308S	9.52	9.52	3.18	0.80	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SCGW 120404S	12.70	12.70	4.76	0.40	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SCGW 120408S	12.70	12.70	4.76	0.80	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

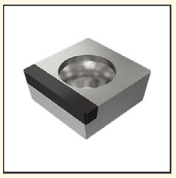
- For user guide and cutting speed recommendations, see pages 116-136

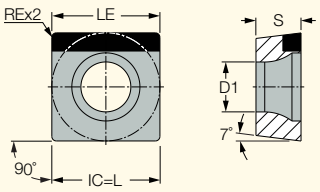
For tools, see pages: IHPR (294) • SSBCR/L (261) • SSSCR/L (261)

ISCAR CBN LINE

SCGW L (CBN)

Positive Square Inserts with Full-Edge CBN Tip (Right or Left Hand) for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	D1	Hard ↔ Tough BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
SCGW 060202S-L	6.35	6.35	2.38	0.20	2.80	●	●	●	●	●	●	0.05-0.30	0.05-0.25
SCGW 060204S-L	6.35	6.35	2.38	0.40	2.80	●	●	●	●	●	●	0.05-0.30	0.05-0.25
SCGW 09T302S-L	9.52	9.52	3.97	0.20	4.40			●	●	●	●	0.05-0.30	0.05-0.25
SCGW 09T304S-L	9.52	9.52	3.97	0.40	4.40	●	●	●	●	●	●	0.05-0.30	0.05-0.25
SCGW 09T308S-L	9.52	9.52	3.97	0.80	4.40	●	●	●	●	●	●	0.05-0.30	0.05-0.25
SCGW 120404S-L	12.70	12.70	4.76	0.40	5.50	●	●	●	●	●	●	0.05-0.30	0.05-0.25
SCGW 120408S-L	12.70	12.70	4.76	0.80	5.50	●	●	●	●	●	●	0.05-0.30	0.05-0.25

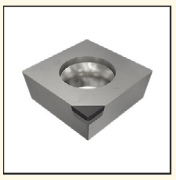
- For user guide and cutting speed recommendations, see pages 116-136

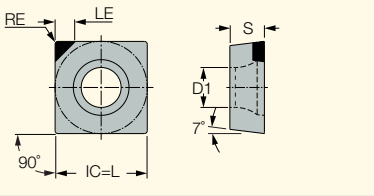
For tools, see pages: IHPR (294) • SSBCR/L (261) • SSSCR/L (261)

ISCAR CBN LINE

SCGW MT (CBN)

Positive Square Inserts with a Single CBN Mini Tip for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
SCGW 09T302S-MT	9.52	9.52	3.97	0.20	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SCGW 09T304S-MT	9.52	9.52	3.97	0.40	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SCGW 09T308S-MT	9.52	9.52	3.97	0.80	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SCGW 120404S-MT	12.70	12.70	4.76	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SCGW 120408S-MT	12.70	12.70	4.76	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SCGW 120412S-MT	12.70	12.70	4.76	1.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

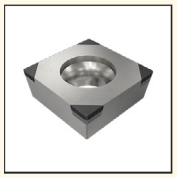
- For user guide and cutting speed recommendations, see pages 116-136

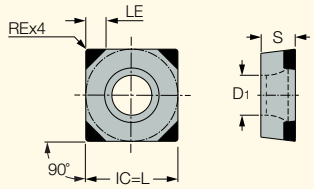
For tools, see pages: IHPR (294) • SSBCR/L (261) • SSSCR/L (261)

ISCAR PCD LINE

SCGW 4MT (CBN)

Positive Square Inserts with Single 4 CBN Mini Tips for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
SCGW 120404S-4MT	12.70	12.70	4.76	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SCGW 120408S-4MT	12.70	12.70	4.76	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SCGW 120412S-4MT	12.70	12.70	4.76	1.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

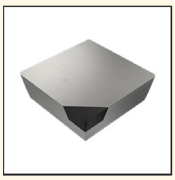
- For user guide and cutting speed recommendations, see pages 116-136

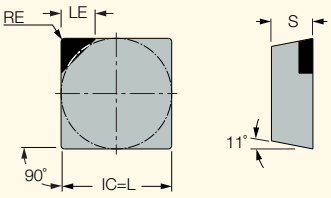
For tools, see pages: IHPR (294) • SSBCR/L (261) • SSSCR/L (261)

ISCAR CBN LINE

SPGN (CBN)

Positive Square Inserts with Single CBN Top Corner Tip for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
SPGN 070202S	7.94	7.94	2.38	0.20	3.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGN 070204S	7.94	7.94	2.38	0.40	3.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGN 090302S	9.52	9.52	3.18	0.20	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGN 090304S	9.52	9.52	3.18	0.40	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGN 120304S	12.70	12.70	3.18	0.40	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGN 120308S	12.70	12.70	3.18	0.80	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGN 120404S	12.70	12.70	4.76	0.40	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGN 120408S	12.70	12.70	4.76	0.80	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

- For user guide and cutting speed recommendations, see pages 116-136

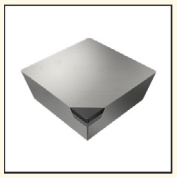
For tools, see pages: CSDPN (256) • CSSPR/L (256) • S-CSKPR (294)

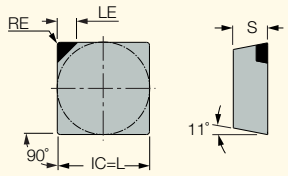
Material		H								K		
		Hard Materials								Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted											
	Light interrupted											
	Continuous											

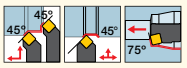
ISCAR CBN LINE

SPGN MT (CBN)

Positive Square Inserts with a Single CBN Mini Tip for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
SPGN 120304S-MT	12.70	12.70	3.18	0.40	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGN 120308S-MT	12.70	12.70	3.18	0.80	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGN 120404S-MT	12.70	12.70	4.76	0.40	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGN 120408S-MT	12.70	12.70	4.76	0.80	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

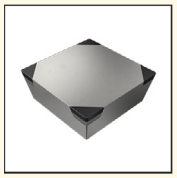
• For user guide and cutting speed recommendations, see pages 116-136

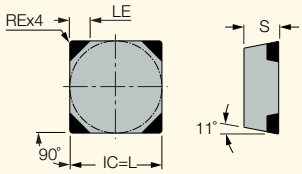
For tools, see pages: CSDPN (256) • CSSPR/L (256) • S-CSKPR (294)

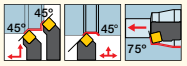
ISCAR CBN LINE

SPGN 4MT (CBN)

Positive Square Inserts with Single 4 CBN Mini Tips for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
SPGN 120304S-4MT	12.70	12.70	3.18	0.40	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGN 120308S-4MT	12.70	12.70	3.18	0.80	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGN 120404S-4MT	12.70	12.70	4.76	0.40	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGN 120408S-4MT	12.70	12.70	4.76	0.80	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGN 120412S-4MT	12.70	12.70	4.76	1.20	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

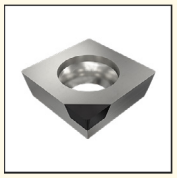
• For user guide and cutting speed recommendations, see pages 116-136

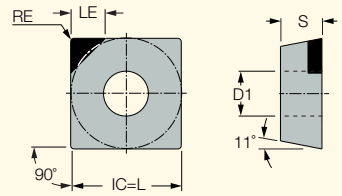
For tools, see pages: CSDPN (256) • CSSPR/L (256) • S-CSKPR (294)

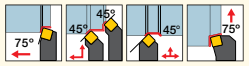
ISCAR CBN LINE

SPGW (CBN)

Positive Square Inserts with Single CBN Top Corner Tip for Hardened Steel and Cast Iron







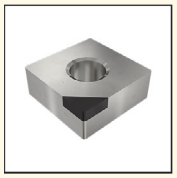
Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
SPGW 070302S	7.94	7.94	3.18	0.20	3.00	3.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGW 070304S	7.94	7.94	3.18	0.40	3.00	3.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGW 09T302S	9.52	9.52	3.97	0.20	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGW 09T304S	9.52	9.52	3.97	0.40	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGW 09T308S	9.52	9.52	3.97	0.80	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGW 090302S	9.52	9.52	3.18	0.20	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGW 090304S	9.52	9.52	3.18	0.40	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGW 090308S	9.52	9.52	3.18	0.80	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGW 120402S	12.70	12.70	4.76	0.20	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGW 120404S	12.70	12.70	4.76	0.40	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SPGW 120408S	12.70	12.70	4.76	0.80	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

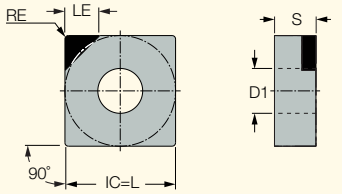
• For user guide and cutting speed recommendations, see pages 116-136

ISCAR CBN LINE

SNGA (CBN)

Negative Square Inserts with Single CBN Top Corner Tip for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGA 090304S	9.52	9.52	3.18	0.40	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SNGA 090308S	9.52	9.52	3.18	0.80	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SNGA 120404S	12.70	12.70	4.76	0.40	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SNGA 120408S	12.70	12.70	4.76	0.80	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

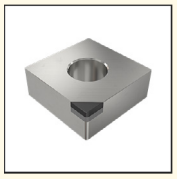
• For user guide and cutting speed recommendations, see pages 116-136

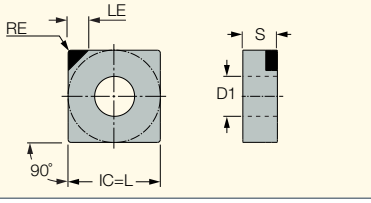
For tools, see pages: C#-MULNR/L-MW (268) • DSBNR/L (256) • DSDNN (257) • DSKNR/L (257) • DSSNR/L (257) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PSBNR/L (258) • PSDNN (258) • PSDNN-JHP (259) • PSKNR/L (259) • PSSNR/L (260) • PSSNR/L-JHP (260)

ISCAR CBN LINE

SNGA MT (CBN)

Negative Square Inserts with a Single CBN Mini Tip for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGA 120404S-MT	12.70	12.70	4.76	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SNGA 120408S-MT	12.70	12.70	4.76	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

• For user guide and cutting speed recommendations, see pages 116-136

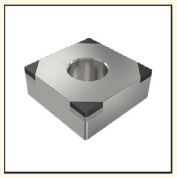
For tools, see pages: C#-MULNR/L-MW (268) • DSBNR/L (256) • DSDNN (257) • DSKNR/L (257) • DSSNR/L (257) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PSBNR/L (258) • PSDNN (258) • PSDNN-JHP (259) • PSKNR/L (259) • PSSNR/L (260) • PSSNR/L-JHP (260)

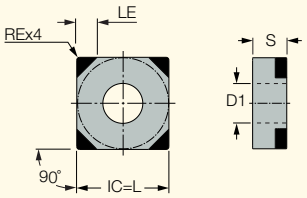
Material		H Hard Materials								K Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted					▲	▲	▲	▲		▲	▲
	Light interrupted			▲	▲	▲	▲	▲	▲	▲		
	Continuous	▲	▲	▲	▲					▲	▲	▲

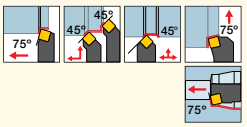
ISCAR CBN LINE

SNGA 4MT (CBN)

Negative Square Inserts with Single 4 CBN Mini Tips for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGA 120404S-4MT	12.70	12.70	4.76	0.40	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SNGA 120408S-4MT	12.70	12.70	4.76	0.80	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SNGA 120412S-4MT	12.70	12.70	4.76	1.20	2.70	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

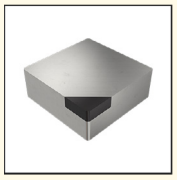
- For user guide and cutting speed recommendations, see pages 116-136

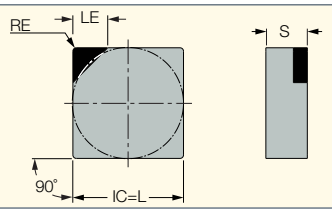
For tools, see pages: C#-MULNR/L-MW (268) • DSBNR/L (256) • DSDNN (257) • DSKNR/L (257) • DSSNR/L (257) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PSBNR/L (258) • PSDNN (258) • PSDNN-JHP (259) • PSKNR/L (259) • PSSNR/L (260) • PSSNR/L-JHP (260)

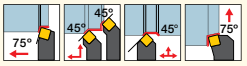
ISCAR CBN LINE

SNGN (CBN)

Negative Square Inserts with Single CBN Top Corner Tip for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGN 090304S	9.52	9.52	3.18	0.40	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 090308S	9.52	9.52	3.18	0.80	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 120304S	12.70	12.70	3.18	0.40	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 120308S	12.70	12.70	3.18	0.80	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 120404S	12.70	12.70	4.76	0.40	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 120408S	12.70	12.70	4.76	0.80	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

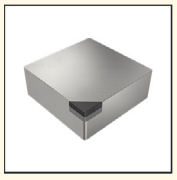
- For user guide and cutting speed recommendations, see pages 116-136

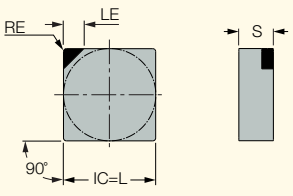
For tools, see pages: CSDNN-CE/CEA (255) • CSDNN-F/X (74) • CSKNR/L-F/X (75) • CSRNR/L-F/X (75) • CSSNR/L-F/X (76) • CSXNR/L-F/X (76) • CSYNR/L-F/X (77)

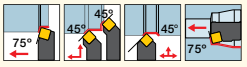
ISCAR CBN LINE

SNGN MT (CBN)

Negative Square Inserts with a Single CBN Mini Tip for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGN 120404S-MT	12.70	12.70	4.76	0.40	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 120408S-MT	12.70	12.70	4.76	0.80	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

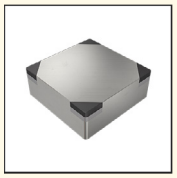
- For user guide and cutting speed recommendations, see pages 116-136

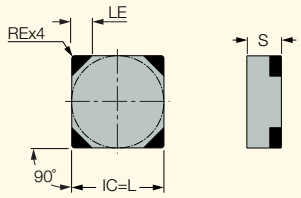
For tools, see pages: CSDNN-CE/CEA (255) • CSDNN-F/X (74) • CSKNR/L-F/X (75) • CSRNR/L-F/X (75) • CSSNR/L-F/X (76) • CSXNR/L-F/X (76) • CSYNR/L-F/X (77)

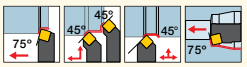
ISCAR CBN LINE

SNGN 4MT (CBN)

Negative Square Inserts with Single 4 CBN Mini Tips for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGN 120404S-4MT	12.70	12.70	4.76	0.40	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 120408S-4MT	12.70	12.70	4.76	0.80	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 120412S-4MT	12.70	12.70	4.76	1.20	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

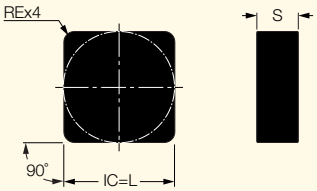
• For user guide and cutting speed recommendations, see pages 116-136

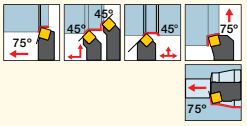
For tools, see pages: CSDNN-CE/CEA (255) • CSDNN-F/X (74) • CSKNR/L-F/X (75) • CSRNR/L-F/X (75) • CSSNR/L-F/X (76) • CSXNR/L-F/X (76) • CSYNR/L-F/X (77)

ISCAR CBN LINE

SNGN S (CBN)

Negative Square Solid CBN Inserts for Cast Iron Machining





Designation	Dimensions L	IC	S	RE	Hard ↔ Tough BI30K	BI30KC	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGN 090304S-S	9.52	9.52	3.18	0.40	●	●	0.05-5.00	0.05-0.50
SNGN 090308S-S	9.52	9.52	3.18	0.80	●	●	0.05-5.00	0.05-0.50
SNGN 090312S-S	9.52	9.52	3.18	1.20	●	●	0.05-5.00	0.05-0.50
SNGN 090316S-S	9.52	9.52	3.18	1.60	●	●	0.05-5.00	0.05-0.50
SNGN 090404S-S	9.52	9.52	4.76	0.40	●	●	0.05-5.00	0.05-0.50
SNGN 090408S-S	9.52	9.52	4.76	0.80	●	●	0.05-5.00	0.05-0.50
SNGN 090412S-S	9.52	9.52	4.76	1.20	●	●	0.05-5.00	0.05-0.50
SNGN 090416S-S	9.52	9.52	4.76	1.60	●	●	0.05-5.00	0.05-0.50
SNGN 120404S-S	12.70	12.70	4.76	0.40	●	●	0.05-5.00	0.05-0.50
SNGN 120408S-S	12.70	12.70	4.76	0.80	●	●	0.05-5.00	0.05-0.50
SNGN 120412S-S	12.70	12.70	4.76	1.20	●	●	0.05-5.00	0.05-0.50
SNGN 120416S-S	12.70	12.70	4.76	1.60	●	●	0.05-5.00	0.05-0.50

• For user guide and cutting speed recommendations, see pages 116-136

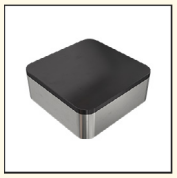
For tools, see pages: CSDNN-CE/CEA (255) • CSDNN-F/X (74) • CSKNR/L-F/X (75) • CSRNR/L-F/X (75) • CSSNR/L-F/X (76) • CSXNR/L-F/X (76) • CSYNR/L-F/X (77)

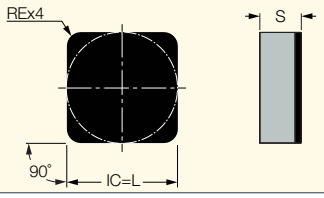
Material		H								K		
		Hard Materials								Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted					▲	▲	▲	▲		▲	▲
	Light interrupted			▲	▲					▲		
	Continuous	▲	▲									

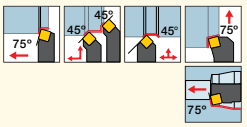
ISCAR CBN LINE

SNGN HS (CBN)

Negative Square Type Half Solid Top CBN Inserts







Designation	Dimensions L	IC	S	RE	Hard ↔ Tough BI05H	BI15H	BI25H	BI30H	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGN 090304S-HS	9.52	9.52	3.18	0.40	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 090308S-HS	9.52	9.52	3.18	0.80	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 090312S-HS	9.52	9.52	3.18	1.20	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 090316S-HS	9.52	9.52	3.18	1.60	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 120304S-HS	12.70	12.70	3.18	0.40	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 120308S-HS	12.70	12.70	3.18	0.80	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 120312S-HS	12.70	12.70	3.18	1.20	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 120316S-HS	12.70	12.70	3.18	1.60	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 120404S-HS	12.70	12.70	4.76	0.40	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 120408S-HS	12.70	12.70	4.76	0.80	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 120412S-HS	12.70	12.70	4.76	1.20	●	●	●	●	0.05-0.20	0.03-0.20
SNGN 120416S-HS	12.70	12.70	4.76	1.60	●	●	●	●	0.05-0.20	0.03-0.20

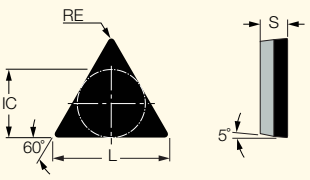
• For user guide and cutting speed recommendations, see pages 116-136

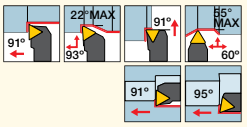
For tools, see pages: CSDNN-CE/CEA (255) • CSDNN-F/X (74) • CSKNR/L-F/X (75) • CSRNR/L-F/X (75) • CSSNR/L-F/X (76) • CSXNR/L-F/X (76) • CSYNR/L-F/X (77)

ISCAR CBN LINE

TBGN HS (CBN)

Positive 60° Triangular Type Half Solid Top CBN Inserts





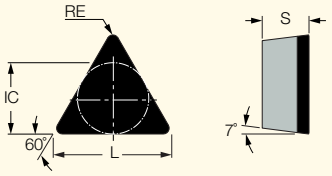
Designation	Dimensions L	IC	S	RE	Hard ↔ Tough BI05H	BI15H	BI25H	BI30H	Recommended Machining Data a_p (mm)	f (mm/rev)
TBGN 060101S-HS	6.90	3.97	1.59	0.10	●	●	●	●	0.05-0.20	0.03-0.20
TBGN 060102S-HS	6.90	3.97	1.59	0.20	●	●	●	●	0.05-0.20	0.03-0.20
TBGN 060104S-HS	6.90	3.97	1.59	0.40	●	●	●	●	0.05-0.20	0.03-0.20
TBGN 060108S-HS	6.90	3.97	1.59	0.80	●	●	●	●	0.05-0.20	0.03-0.20

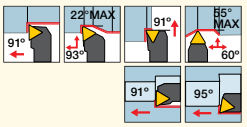
• For user guide and cutting speed recommendations, see pages 116-136

ISCAR CBN LINE

TCGN HS (CBN)

Positive 60° Triangular Half Solid Top CBN Inserts





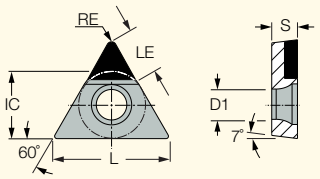
Designation	Dimensions L	IC	S	RE	Hard ↔ Tough BI05H	BI15H	BI25H	BI30H	Recommended Machining Data a_p (mm)	f (mm/rev)
TCGN 060102S-HS	6.90	3.97	1.59	0.20	●	●	●		0.05-0.20	0.03-0.20
TCGN 060104S-HS	6.90	3.97	1.59	0.40	●	●	●	●	0.05-0.20	0.03-0.20
TCGN 060108S-HS	6.90	3.97	1.59	0.80	●	●	●	●	0.05-0.20	0.03-0.20

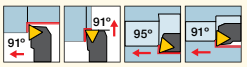
- For user guide and cutting speed recommendations, see pages 116-136

ISCAR CBN LINE

TCGW (CBN)

Positive 60° Triangular Inserts with Single CBN Top Corner Tip for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
TCGW 090202S	9.60	5.56	2.38	0.20	3.00	2.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 090204S	9.60	5.56	2.38	0.40	3.00	2.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 090208S	9.60	5.56	2.38	0.80	3.00	2.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 110202S	11.00	6.35	2.38	0.20	4.00	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 110204S	11.00	6.35	2.38	0.40	4.00	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 110208S	11.00	6.35	2.38	0.80	4.00	2.80	●	●	●	●	●	●	●	●	0.05-0.30	0.05-0.25
TCGW 130304S	13.70	7.94	3.18	0.40	4.00	3.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 130308S	13.70	7.94	3.18	0.80	4.00	3.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 16T302S	16.50	9.52	3.97	0.20	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 16T304S	16.50	9.52	3.97	0.40	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 16T308S	16.50	9.52	3.97	0.80	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 16T312S	16.50	9.52	3.97	1.20	4.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

- For user guide and cutting speed recommendations, see pages 116-136

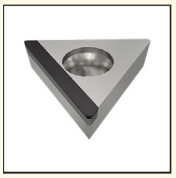
For tools, see pages: E-STFCR-HEAD (296) • S-MTLCR/L-W (295) • S-STFCR/L (296) • S-STLCR/L (297) • STFCR/L (266) • STGCR/L (267)

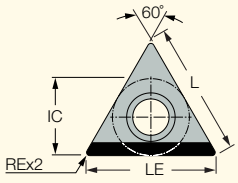
Material		H								K		
		Hard Materials								Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted					▲	▲	▲	▲		▲	▲
	Light interrupted			▲	▲	▲	▲	▲	▲	▲	▲	▲
	Continuous	▲	▲	▲	▲					▲	▲	▲

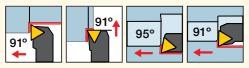
ISCAR CBN LINE

TCGW L (CBN)

Positive 60° Triangular Inserts with Full-Edge CBN Tip (Right or Left Hand) for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Tough ↔ Hard BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
TCGW 090202S-L	9.60	5.56	2.38	0.20	9.34	2.50	●	●	●	●	●	●	0.05-0.30	0.05-0.25
TCGW 090204S-L	9.60	5.56	2.38	0.40	9.04	2.50	●	●	●	●	●	●	0.05-0.30	0.05-0.25
TCGW 110202S-L	11.00	6.35	2.38	0.20	10.71	2.80	●	●	●	●	●	●	0.05-0.30	0.05-0.25
TCGW 110204S-L	11.00	6.35	2.38	0.40	10.41	2.80	●	●	●	●	●	●	0.05-0.30	0.05-0.25
TCGW 110208S-L	11.00	6.35	2.38	0.80	9.83	2.80	●	●	●	●	●	●	0.05-0.30	0.05-0.25
TCGW 16T302S-L	16.50	9.52	3.97	0.20	16.20	4.40	●	●	●	●	●	●	0.05-0.30	0.05-0.25
TCGW 16T304S-L	16.50	9.52	3.97	0.40	15.91	4.40	●	●	●	●	●	●	0.05-0.30	0.05-0.25
TCGW 16T308S-L	16.50	9.52	3.97	0.80	15.33	4.40	●	●	●	●	●	●	0.05-0.30	0.05-0.25

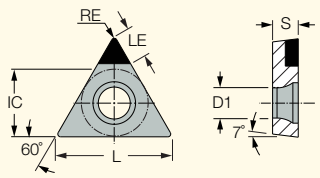
- For user guide and cutting speed recommendations, see pages 116-136

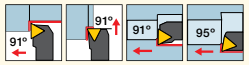
For tools, see pages: E-STFCR-HEAD (296) • S-MTLCR/L-W (295) • S-STFCR/L (296) • S-STLCR/L (297) • STFCR/L (266) • STGCR/L (267)

ISCAR CBN LINE

TCGW MT (CBN)

Positive 60° Triangular Inserts with Single CBN Mini Tips for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
TCGW 090202S-MT	9.60	5.56	2.38	0.20	2.70	2.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 090204S-MT	9.60	5.56	2.38	0.40	2.70	2.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 110202S-MT	11.00	6.35	2.38	0.20	2.70	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 110204S-MT	11.00	6.35	2.38	0.40	2.70	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 110208S-MT	11.00	6.35	2.38	0.80	2.70	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 130304S-MT	13.70	7.94	3.18	0.40	2.70	3.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 130308S-MT	13.70	7.94	3.18	0.80	2.70	3.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 16T302S-MT	16.50	9.52	3.97	0.20	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 16T304S-MT	16.50	9.52	3.97	0.40	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 16T308S-MT	16.50	9.52	3.97	0.80	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 16T312S-MT	16.50	9.52	3.97	1.20	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

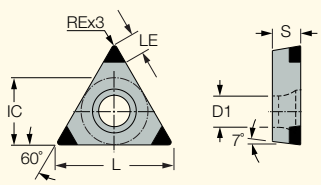
- For user guide and cutting speed recommendations, see pages 116-136

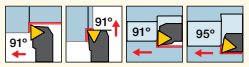
For tools, see pages: E-STFCR-HEAD (296) • S-MTLCR/L-W (295) • S-STFCR/L (296) • S-STLCR/L (297) • STFCR/L (266) • STGCR/L (267)

ISCAR CBN LINE

TCGW -3MT (CBN)

Positive 60° Triangular Inserts with 3 CBN Single Mini Tips for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
TCGW 16T304S -3MT	16.50	9.52	3.97	0.40	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TCGW 16T308S -3MT	16.50	9.52	3.97	0.80	2.70	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

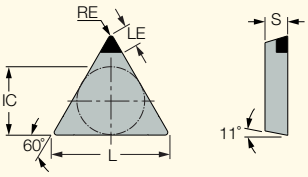
- For user guide and cutting speed recommendations, see pages 116-136

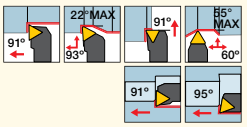
For tools, see pages: S-MTLCR/L-W (295) • S-STLCR/L (297) • STFCR/L (266) • STGCR/L (267)

ISCAR CBN LINE

TPGN MT (CBN)

Positive 60° Triangular Inserts with a Single CBN Mini Tip for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
TPGN 110202S-MT	11.00	6.35	2.38	0.20	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 110204S-MT	11.00	6.35	2.38	0.40	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 110208S-MT	11.00	6.35	2.38	0.80	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 110302S-MT	11.00	6.35	3.18	0.20	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 110304S-MT	11.00	6.35	3.18	0.40	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 110308S-MT	11.00	6.35	3.18	0.80	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 160304S-MT	16.50	9.52	3.18	0.40	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 160308S-MT	16.50	9.52	3.18	0.80	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

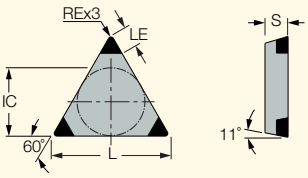
• For user guide and cutting speed recommendations, see pages 116-136

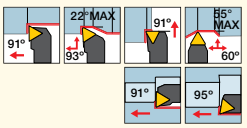
For tools, see pages: CTFPR/L (261) • CTGPR/L (262) • S-CTFPR/L (294)

ISCAR CBN LINE

TPGN -3MT (CBN)

Positive 60° Triangular Inserts with 3 CBN Single Mini Tips for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
TPGN 160304S -3MT	16.50	9.52	3.18	0.40	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 160308S -3MT	16.50	9.52	3.18	0.80	2.70	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

• For user guide and cutting speed recommendations, see pages 116-136

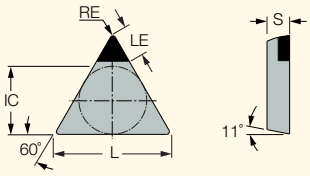
For tools, see pages: CTFPR/L (261) • CTGPR/L (262) • S-CTFPR/L (294)

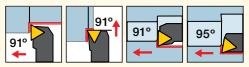
Material		H								K		
		Hard Materials								Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted											
	Light interrupted											
	Continuous											

ISCAR CBN LINE

TPGN (CBN)

Positive 60° Triangular Inserts
with Single CBN Top Corner Tip
for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	Tough ↔ Hard BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
TPGN 090202S	9.60	5.56	2.38	0.20	3.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 090204S	9.60	5.56	2.38	0.40	3.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 090208S	9.60	5.56	2.38	0.80	3.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 110202S	11.00	6.35	2.38	0.20	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 110204S	11.00	6.35	2.38	0.40	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 110208S	11.00	6.35	2.38	0.80	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 110302S	11.00	6.35	3.18	0.20	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 110304S	11.00	6.35	3.18	0.40	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 110308S	11.00	6.35	3.18	0.80	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 160304S	16.50	9.52	3.18	0.40	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 160308S	16.50	9.52	3.18	0.80	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

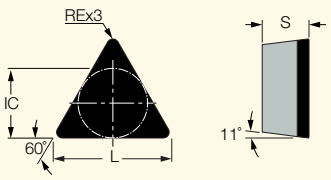
• For user guide and cutting speed recommendations, see pages 116-136

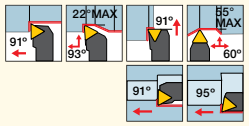
For tools, see pages: CTFPR/L (261) • CTGPR/L (262) • S-CTFPR/L (294)

ISCAR CBN LINE

TPGN HS (CBN)

Positive 60° Triangular Half
Solid Top CBN Inserts





Designation	Dimensions L	IC	S	RE	Hard ↔ Tough BI05H	BI15H	BI25H	BI30H	Recommended Machining Data a_p (mm)	f (mm/rev)
TPGN 090202S-HS	9.60	5.56	2.38	0.20	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 090204S-HS	9.60	5.56	2.38	0.40	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 090208S-HS	9.60	5.56	2.38	0.80	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 110302S-HS	11.00	6.35	3.18	0.20	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 110304S-HS	11.00	6.35	3.18	0.40	●	●	●	●	0.05-0.20	0.03-0.20
TPGN 110308S-HS	11.00	6.35	3.18	0.80	●	●	●	●	0.05-0.20	0.03-0.20

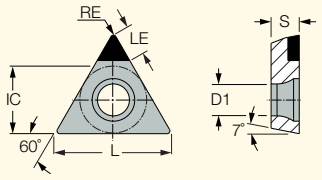
• For user guide and cutting speed recommendations, see pages 116-136

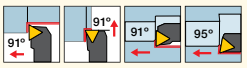
For tools, see pages: CTFPR/L (261) • CTGPR/L (262) • S-CTFPR/L (294)

ISCAR CBN LINE

TPGW (CBN)

Positive 60° Triangular Inserts with Single CBN Top Corner Tip for Hardened Steel and Cast Iron





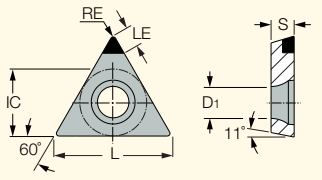
Designation	Dimensions L	IC	S	RE	LE	D1	Tough ↔ Hard BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
TPGW 110202S	11.00	6.35	2.38	0.20	4.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TPGW 110204S	11.00	6.35	2.38	0.40	4.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TPGW 110208S	11.00	6.35	2.38	0.80	4.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TPGW 110302S	11.00	6.35	3.18	0.20	4.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TPGW 110304S	11.00	6.35	3.18	0.40	4.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TPGW 110308S	11.00	6.35	3.18	0.80	4.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TPGW 16T304S	16.50	9.52	3.97	0.40	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TPGW 16T308S	16.50	9.52	3.97	0.80	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TPGW 160404S	16.50	9.52	4.76	0.40	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TPGW 160408S	16.50	9.52	4.76	0.80	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

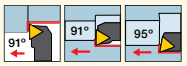
• For user guide and cutting speed recommendations, see pages 116-136

ISCAR CBN LINE

TPGW MT (CBN)

Positive 60° Triangular Inserts with a Single CBN Mini Tip for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
TPGW 110202S-MT	11.00	6.35	2.38	0.20	2.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TPGW 110204S-MT	11.00	6.35	2.38	0.40	2.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TPGW 110302S-MT	11.00	6.35	3.18	0.20	2.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TPGW 110304S-MT	11.00	6.35	3.18	0.40	2.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

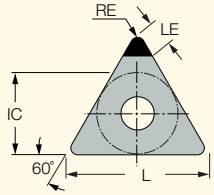
• For user guide and cutting speed recommendations, see pages 116-136

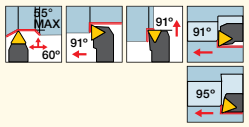
Material		H								K		
		Hard Materials								Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted					▲	▲	▲	▲		▲	▲
	Light interrupted			▲	▲					▲		
	Continuous	▲	▲									

ISCAR CBN LINE

TNGA (CBN)

Negative 60° Triangular Inserts with Single CBN Top Corner Tip for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	D1	Tough ↔ Hard BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
TNGA 110304S	11.00	6.35	3.18	0.40	4.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TNGA 110308S	11.00	6.35	3.18	0.80	4.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TNGA 160304S	16.50	9.52	3.18	0.40	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TNGA 160308S	16.50	9.52	3.18	0.80	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TNGA 160403S	16.50	9.52	4.76	0.30	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TNGA 160404S	16.50	9.52	4.76	0.40	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TNGA 160408S	16.50	9.52	4.76	0.80	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TNGA 160410S	16.50	9.52	4.76	1.00	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TNGA 160412S	16.50	9.52	4.76	1.20	4.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TNGA 220404S	22.00	12.70	4.76	0.40	4.00	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TNGA 220408S	22.00	12.70	4.76	0.80	4.00	5.50	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

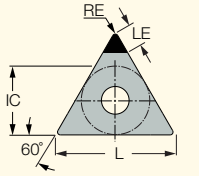
• For user guide and cutting speed recommendations, see pages 116-136

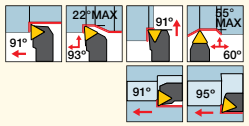
For tools, see pages: A-PTFNR/L-X/G (295) • C#-DTGNR/L (262) • DTGNR/L (262) • MTENN-W (263) • MTJNR/L-W (263) • PTFNR/L (264) • PTGNR/L (264) • PTGNR/L-X (265) • PTGNR/L-X-JHP (265) • PTGNR/L-X-JHP-MC (266) • S-MTLNR/L-W (295) • S-PTFNR/L (296)

ISCAR CBN LINE

TNGA MT (CBN)

Negative 60° Triangular Inserts with a Single CBN Mini Tip for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
TNGA 160404S-MT	16.50	9.52	4.76	0.40	2.70	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TNGA 160408S-MT	16.50	9.52	4.76	0.80	2.70	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

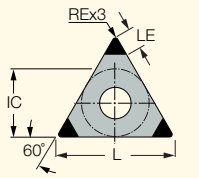
• For user guide and cutting speed recommendations, see pages 116-136

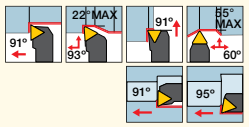
For tools, see pages: A-PTFNR/L-X/G (295) • DTGNR/L (262) • MTENN-W (263) • MTJNR/L-W (263) • PTFNR/L (264) • PTGNR/L (264) • PTGNR/L-X (265) • PTGNR/L-X-JHP (265) • PTGNR/L-X-JHP-MC (266) • S-MTLNR/L-W (295) • S-PTFNR/L (296)

ISCAR CBN LINE

TNGA -3MT (CBN)

Negative 60° Triangular Inserts with 3 CBN Single Mini Tips for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
TNGA 160404S -3MT	16.50	9.52	4.76	0.40	2.70	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
TNGA 160408S -3MT	16.50	9.52	4.76	0.80	2.70	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

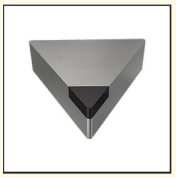
• For user guide and cutting speed recommendations, see pages 116-136

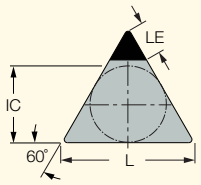
For tools, see pages: A-PTFNR/L-X/G (295) • DTGNR/L (262) • MTENN-W (263) • MTJNR/L-W (263) • PTFNR/L (264) • PTGNR/L (264) • PTGNR/L-X (265) • PTGNR/L-X-JHP (265) • PTGNR/L-X-JHP-MC (266) • S-MTLNR/L-W (295) • S-PTFNR/L (296)

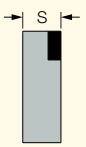
ISCAR CBN LINE

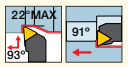
TNGN (CBN)

Negative 60° Triangular Inserts with Single CBN Top Corner for Hardened Steel and Cast Iron









Designation	Dimensions L	IC	S	RE	LE	Tough ↔ Hard BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
TNGN 110304S	11.00	6.35	3.18	0.40	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TNGN 110308	11.00	6.35	3.18	0.80	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TNGN 130304S	13.70	7.94	3.18	0.40	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TNGN 130308S	13.70	7.94	3.18	0.80	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TNGN 160304S	16.50	9.52	3.18	0.40	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TNGN 160308S	16.50	9.52	3.18	0.80	4.00	●		●		●		●		0.05-0.20	0.03-0.20
TNGN 160404S	16.50	9.52	4.76	0.40	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
TNGN 160408S	16.50	9.52	4.76	0.80	4.00	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

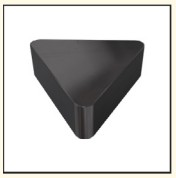
- For user guide and cutting speed recommendations, see pages 116-136

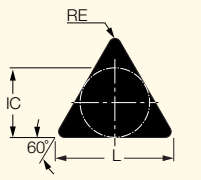
For tools, see pages: CTFNR/L-F (73) • CTGNR/L-F (74)

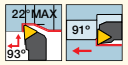
ISCAR CBN LINE

TNGN S (CBN)

Negative 60° Triangular Solid Top CBN for Cast Iron Machining







Designation	Dimensions L	IC	S	RE	Hard ↔ Tough BI30K	BI30KC	Recommended Machining Data a_p (mm)	f (mm/rev)
TNGN 110302S-S	11.00	6.35	3.18	0.20	●	●	0.05-5.00	0.05-0.50
TNGN 110304S-S	11.00	6.35	3.18	0.40	●	●	0.05-5.00	0.05-0.50
TNGN 110308S-S	11.00	6.35	3.18	0.80	●	●	0.05-5.00	0.05-0.50
TNGN 110310S-S	11.00	6.35	3.18	1.00	●	●	0.05-5.00	0.05-0.50
TNGN 110312S-S	11.00	6.35	3.18	1.20	●	●	0.05-5.00	0.05-0.50

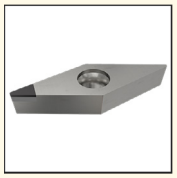
- For user guide and cutting speed recommendations, see pages 116-136

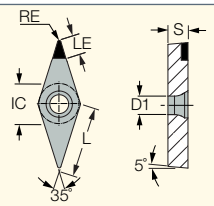
Material		H								K		
		Hard Materials								Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted					▲	▲	▲	▲		▲	▲
	Light interrupted			▲	▲	▲	▲	▲	▲	▲	▲	▲
	Continuous	▲	▲	▲	▲					▲	▲	▲

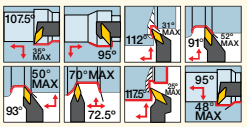
ISCAR CBN LINE

VBGW (CBN)

Positive 35° Rhombic Inserts with Single CBN Top Corner Tip for Hardened Steel and Cast Iron







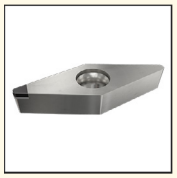
Designation	Dimensions						Hard ↔ Tough								Recommended Machining Data	
	L	IC	S	RE	LE	D1	BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	a_p (mm)	f (mm/rev)
VBGW 110201S	11.10	6.35	2.38	0.10	3.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 110202S	11.10	6.35	2.38	0.20	3.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 110204S	11.10	6.35	2.38	0.40	3.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 110302S	11.10	6.35	3.18	0.20	3.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 110304S	11.10	6.35	3.18	0.40	3.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 110308S	11.10	6.35	3.18	0.80	3.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 160402S	16.60	9.52	4.76	0.20	4.50	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 160404S	16.60	9.52	4.76	0.40	4.50	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 160408S	16.60	9.52	4.76	0.80	4.50	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 160412S	16.60	9.52	4.76	1.20	4.50	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

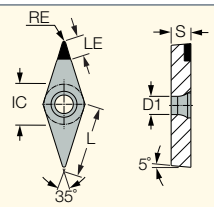
• For user guide and cutting speed recommendations, see pages 116-136

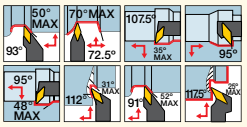
ISCAR CBN LINE

VBGW MT (CBN)

Positive 35° Rhombic Inserts with a Single CBN Mini Tip for Hardened Steel and Cast Iron







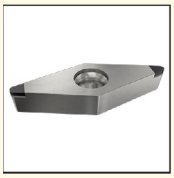
Designation	Dimensions						Hard ↔ Tough								Recommended Machining Data	
	L	IC	S	RE	LE	D1	BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	a_p (mm)	f (mm/rev)
VBGW 110201S-MT	11.10	6.35	2.38	0.10	3.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 110202S-MT	11.10	6.35	2.38	0.20	3.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 110204S-MT	11.10	6.35	2.38	0.40	3.00	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 160402S-MT	16.60	9.52	4.76	0.20	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 160404S-MT	16.60	9.52	4.76	0.40	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 160408S-MT	16.60	9.52	4.76	0.80	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 160412S-MT	16.60	9.52	4.76	1.20	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

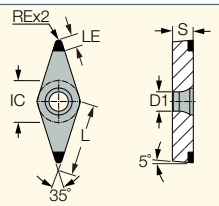
• For user guide and cutting speed recommendations, see pages 116-136

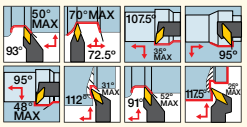
ISCAR CBN LINE

VBGW 2MT (CBN)

Positive 35° Rhombic Inserts with 2 Single CBN Mini Tips for Hardened Steel and Cast Iron







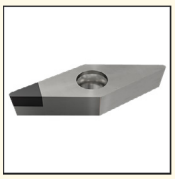
Designation	Dimensions L	IC	S	RE	LE	D1	Tough ↔ Hard BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
VBGW 160402S-2MT	16.60	9.52	4.76	0.20	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 160404S-2MT	16.60	9.52	4.76	0.40	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VBGW 160408S-2MT	16.60	9.52	4.76	0.80	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

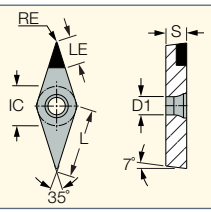
- For user guide and cutting speed recommendations, see pages 116-136

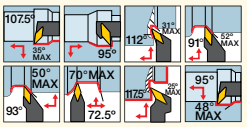
ISCAR CBN LINE

VCGW (CBN)

Positive 35° Rhombic Inserts with a Single CBN Tip and Flat Rake Angle for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
VCGW 070202S	6.92	3.97	2.38	0.20	3.70	2.15	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VCGW 070204S	6.92	3.97	2.38	0.40	3.70	2.15	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VCGW 070208S	6.92	3.97	2.38	0.80	3.70	2.15	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VCGW 110302S	11.10	6.35	3.18	0.20	3.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VCGW 110304S	11.10	6.35	3.18	0.40	3.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VCGW 110308S	11.10	6.35	3.18	0.80	3.70	2.80	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VCGW 130302S	13.10	7.94	3.18	0.20	4.50	3.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VCGW 130304S	13.10	7.94	3.18	0.40	4.50	3.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VCGW 160402S	16.60	9.52	4.76	0.20	4.50	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VCGW 160404S	16.60	9.52	4.76	0.40	4.50	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VCGW 160408S	16.60	9.52	4.76	0.80	4.50	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VCGW 160412S	16.60	9.52	4.76	1.20	4.50	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

- For user guide and cutting speed recommendations, see pages 116-136

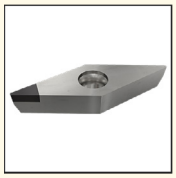
For tools, see pages: A/S-SVLBCR/L (298) • A/S-SVLFCR/L; A-SVUCR/L (298) • A/S-SVQCR/L (299) • AVC-SVLCR/L (299) • AVC-SVLCR/L-VH (299) • AVC-SVPCR/L (300) • AVC-SVQCR/L (300) • AVC-SVUCR/L (300) • C#-SVJCR/L (275) • C#-SVJCR/L-JHP (275) • C#-SVVCN (276) • HSK A63WH-SVJCR/L (276) • NQCH-SVACR/L-S-JHP (276) • NQCH-Y-SVJCR-S-JHP (276) • PVACR/L-S (271) • PVACR/L-S-JHP (271) • PVACR/L-S-JHP-MC (272) • SVACR/L-S (272) • SVJCR-PAD (273) • SVJCR/L (272) • SVJCR/L-16-JHP (273) • SVJCR/L-PAD-JHP (273) • SVPCR/L-S (274) • SVVCN (274) • SVXCR/L (274) • Y-SVJCR-S (274) • Y-SVJCR-S-JHP (275)

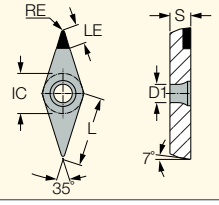
Material		H								K		
		Hard Materials								Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted					▲	▲	▲	▲		▲	▲
	Light interrupted			▲	▲	▲	▲	▲	▲	▲	▲	▲
	Continuous	▲	▲	▲	▲					▲	▲	▲

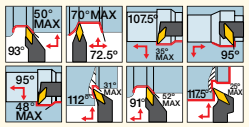
ISCAR CBN LINE

VCGW MT (CBN)

Positive 35° Rhombic Inserts with a Single CBN Mini Tip for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
VCGW 110302S-MT	11.10	6.35	3.18	0.20	3.00	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
VCGW 110304S-MT	11.10	6.35	3.18	0.40	3.00	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
VCGW 160402S-MT	16.60	9.52	4.76	0.20	3.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
VCGW 160404S-MT	16.60	9.52	4.76	0.40	3.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
VCGW 160408S-MT	16.60	9.52	4.76	0.80	3.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
VCGW 160412S-MT	16.60	9.52	4.76	1.20	3.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

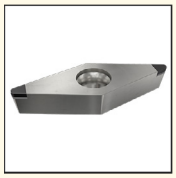
- For user guide and cutting speed recommendations, see pages 116-136

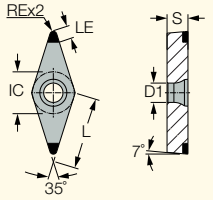
For tools, see pages: A/S-SVLBCR/L (298) • A/S-SVLFCR/L; A-SVUCR/L (298) • A/S-SVQCR/L (299) • AVC-SVLCR/L (299) • AVC-SVLCR/L-VH (299) • AVC-SVPCR/L (300) • AVC-SVQCR/L (300) • C#-SVJCR/L (275) • C#-SVJCR/L-JHP (275) • C#-SVVCN (276) • HSK A63WH-SVJCR/L (276) • NQCH-SVACR/L-S-JHP (276) • NQCH-Y-SVJCR-S-JHP (276) • PVACR/L-S (271) • PVACR/L-S-JHP (271) • PVACR/L-S-JHP-MC (272) • SVACR/L-S (272) • SVJCR-PAD (273) • SVJCR/L (272) • SVJCR/L-16-JHP (273) • SVJCR/L-PAD-JHP (273) • SVPCR/L-S (274) • SVVCN (274) • SVXCR/L (274) • Y-SVJCR-S (274) • Y-SVJCR-S-JHP (275)

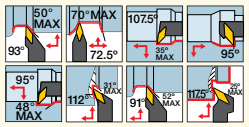
ISCAR CBN LINE

VCGW 2MT (CBN)

Positive 35° Rhombic Inserts with 2 Single CBN Mini Tips for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
VCGW 110302S-2MT	11.10	6.35	3.18	0.20	3.00	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
VCGW 110304S-2MT	11.10	6.35	3.18	0.40	3.00	2.80	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
VCGW 130302S-2MT	13.10	7.94	3.18	0.20	3.00	3.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
VCGW 130304S-2MT	13.10	7.94	3.18	0.40	3.00	3.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
VCGW 160404S-2MT	16.60	9.52	4.76	0.40	3.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
VCGW 160408S-2MT	16.60	9.52	4.76	0.80	3.00	4.40	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

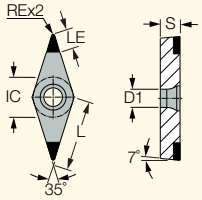
- For user guide and cutting speed recommendations, see pages 116-136

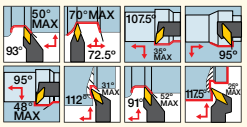
For tools, see pages: A/S-SVLBCR/L (298) • A/S-SVLFCR/L; A-SVUCR/L (298) • A/S-SVQCR/L (299) • AVC-SVLCR/L (299) • AVC-SVLCR/L-VH (299) • AVC-SVPCR/L (300) • AVC-SVQCR/L (300) • C#-SVJCR/L (275) • C#-SVJCR/L-JHP (275) • C#-SVVCN (276) • HSK A63WH-SVJCR/L (276) • NQCH-SVACR/L-S-JHP (276) • NQCH-Y-SVJCR-S-JHP (276) • PVACR/L-S (271) • PVACR/L-S-JHP (271) • PVACR/L-S-JHP-MC (272) • SVACR/L-S (272) • SVJCR-PAD (273) • SVJCR/L (272) • SVJCR/L-16-JHP (273) • SVJCR/L-PAD-JHP (273) • SVPCR/L-S (274) • SVVCN (274) • SVXCR/L (274) • Y-SVJCR-S (274) • Y-SVJCR-S-JHP (275)

ISCAR CBN LINE

VCGW 2MT MM (CBN)

Positive 35° Rhombic Inserts with 2 MM Chipbreaking CBN Mini Tips for Hardened Steel and Cast Iron





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
VCGW 160404S-2MT MM	16.60	9.52	4.76	0.40	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.40	0.05-0.25
VCGW 160408S-2MT MM	16.60	9.52	4.76	0.80	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.40	0.05-0.25

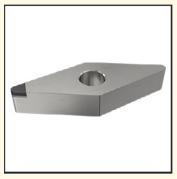
• For user guide and cutting speed recommendations, see pages 116-136

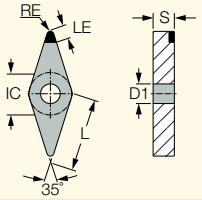
For tools, see pages: A/S-SVLBCR/L (298) • A/S-SVLFCR/L; A-SVUCR/L (298) • A/S-SVQCR/L (299) • AVC-SVLCR/L (299) • AVC-SVLCR/L-VH (299) • AVC-SVPCR/L (300) • AVC-SVQCR/L (300) • C#-SVJCR/L (275) • C#-SVJCR/L-JHP (275) • C#-SVVCN (276) • HSK A63WH-SVJCR/L (276) • SVJCR/L (272) • SVJCR/L-16-JHP (273) • SVVCN (274) • SVXCR/L (274)

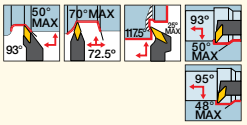
ISCAR CBN LINE

VNGA (CBN)

Negative 35° Rhombic Inserts with a Single CBN Tip and Flat Rake Angle for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
VNGA 160403S	16.60	9.52	4.76	0.30	4.50	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VNGA 160402S	16.60	9.52	4.76	0.20	4.50	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VNGA 160406S	16.60	9.52	4.76	0.60	4.50	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VNGA 160404S	16.60	9.52	4.76	0.40	4.50	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VNGA 160410S	16.60	9.52	4.76	1.00	4.50	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VNGA 160408S	16.60	9.52	4.76	0.80	4.50	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VNGA 160412S	16.60	9.52	4.76	1.20	4.50	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

• For user guide and cutting speed recommendations, see pages 116-136

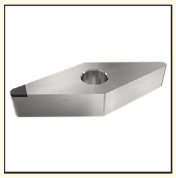
For tools, see pages: MVJNR/L (270) • MVVNN (270)

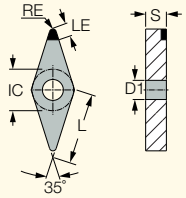
Material		H Hard Materials								K Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted					↑	↑	↑	↑		↑	↑
	Light interrupted			↑	↑	↑	↑	↑	↑	↑	↑	↑
	Continuous	↑	↑	↑	↑					↑	↑	↑

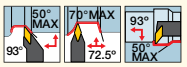
ISCAR CBN LINE

VNGA MT (CBN)

Negative 35° Rhombic Inserts with a Single CBN Mini Tip for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
VNGA 160402S-MT	16.60	9.52	4.76	0.20	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VNGA 160404S-MT	16.60	9.52	4.76	0.40	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VNGA 160408S-MT	16.60	9.52	4.76	0.80	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

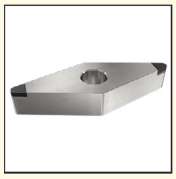
• For user guide and cutting speed recommendations, see pages 116-136

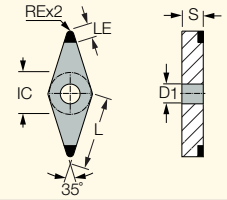
For tools, see pages: MVJNR/L (270) • MVVNN (270)

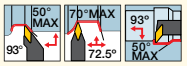
ISCAR CBN LINE

VNGA 2MT (CBN)

Negative 35° Rhombic Inserts with 2 Single CBN Mini Tips for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
VNGA 160402S-2MT	16.60	9.52	4.76	0.20	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VNGA 160404S-2MT	16.60	9.52	4.76	0.40	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VNGA 160408S-2MT	16.60	9.52	4.76	0.80	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

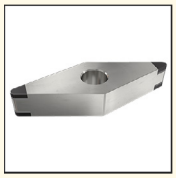
• For user guide and cutting speed recommendations, see pages 116-136

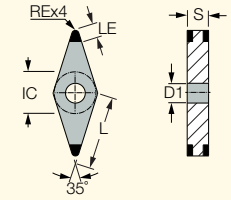
For tools, see pages: MVJNR/L (270) • MVVNN (270)

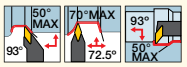
ISCAR CBN LINE

VNGA 4MT (CBN)

Negative 35° Rhombic Inserts with 4 Single CBN Mini Tips for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
VNGA 160404S-4MT	16.60	9.52	4.76	0.40	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20
VNGA 160408S-4MT	16.60	9.52	4.76	0.80	3.00	4.40	•	•	•	•	•	•	•	•	0.05-0.20	0.03-0.20

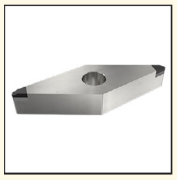
• For user guide and cutting speed recommendations, see pages 116-136

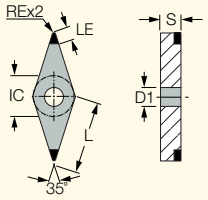
For tools, see pages: MVJNR/L (270) • MVVNN (270)

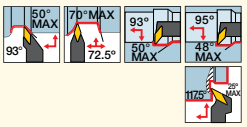
ISCAR CBN LINE

VNGA 2MT MM (CBN)

Negative 35° Rhombic Inserts with 2 MM Chipbreaking CBN Mini Tips for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
VNGA 160404S-2MT MM	16.60	9.52	4.76	0.40	3.00	4.40	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
VNGA 160408S-2MT MM	16.60	9.52	4.76	0.80	3.00	4.40	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
VNGA 160412S-2MT MM	16.60	9.52	4.76	1.20	3.00	4.40	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25

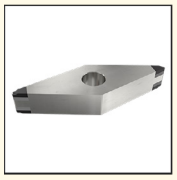
- For user guide and cutting speed recommendations, see pages 116-136

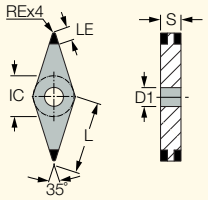
For tools, see pages: MVJNR/L (270) • MVVNN (270)

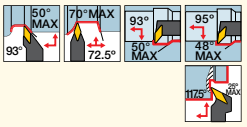
ISCAR CBN LINE

VNGA 4MT MM (CBN)

Negative 35° Rhombic Inserts with 4 MM Chipbreaking CBN Mini Tips for Hardened Steel and Cast Iron







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
VNGA 160404S-4MT MM	16.60	9.52	4.76	0.40	3.00	4.40	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
VNGA 160408S-4MT MM	16.60	9.52	4.76	0.80	3.00	4.40	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25
VNGA 160412S-4MT MM	16.60	9.52	4.76	1.20	3.00	4.40	●	●	●	●	●	●	●	●	0.05-0.40	0.05-0.25

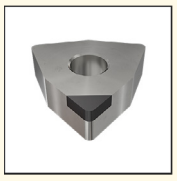
- For user guide and cutting speed recommendations, see pages 116-136

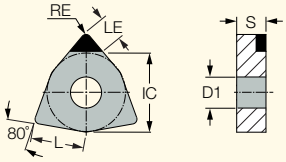
For tools, see pages: MVJNR/L (270) • MVVNN (270)

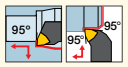
ISCAR CBN LINE

WNGA (CBN)

Negative 80° Trigon Inserts with a Single CBN Tip and Flat Rake Angle for Hardened Steel and Cast Iron







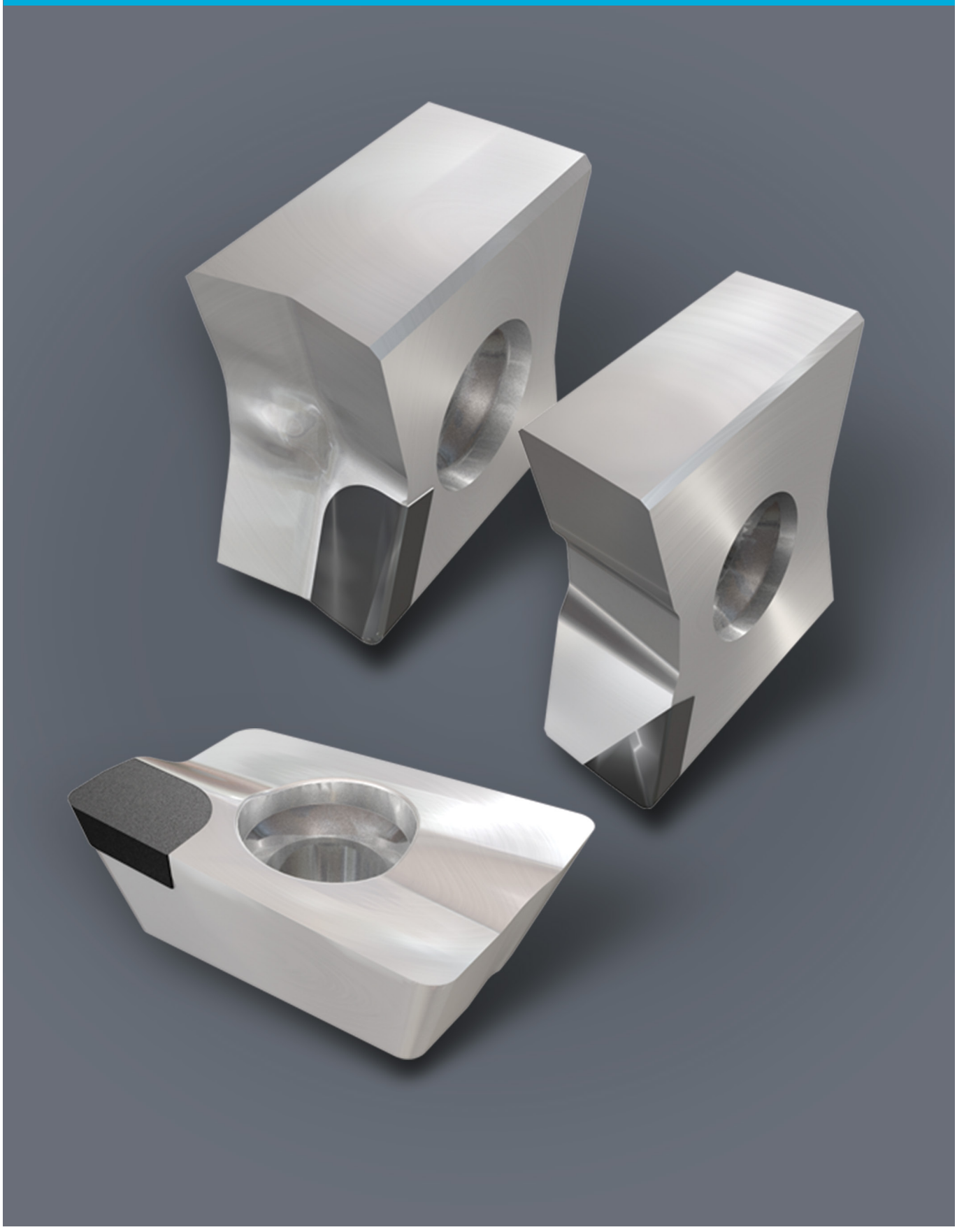
Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	Recommended Machining Data a_p (mm)	f (mm/rev)
WNGA 080404S	8.69	12.70	4.76	0.40	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
WNGA 080408S	8.69	12.70	4.76	0.80	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20
WNGA 080412S	8.69	12.70	4.76	1.20	4.00	5.50	●	●	●	●	●	●	●	●	0.05-0.20	0.03-0.20

- For user guide and cutting speed recommendations, see pages 116-136

For tools, see pages: A/S-MWLNR/L-W (301) • A/S-PWLNR/L (302) • C#-MULNR/L-MW (268) • C#-PWLNR/L-08-JHP (281) • DWLNR/L (277) • DWLNR/L-JHP-MC (277) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • MWLNR/L-W (278) • PWLNR/L (278) • PWLNR/L-08-JHP (279) • PWLNR/L-X (279) • PWLNR/L-X-JHP (280) • PWLNR/L-X-JHP-MC (281) • S-DWLNR/L (301) • S-MULNR-MW (297)

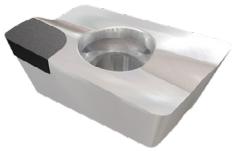
Material		H Hard Materials								K Cast Iron		
Grade		BI05H	BI05HC	BI15H	BI15HC	BI25H	BI25HC	BI30H	BI30HC	BI30H	BI30K	BI30KC
	Heavy interrupted					▲	▲	▲	▲		▲	▲
	Light interrupted			▲	▲	▲	▲	▲	▲	▲		
	Continuous	▲	▲	▲	▲							

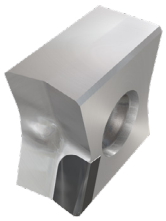
CBN MILLING INSERTS

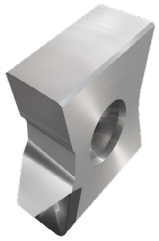


CBN Milling Inserts - Index

ADKW (CBN)	179
LNAW-11 (CBN)	179
LNAW-15 (CBN)	180



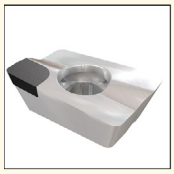


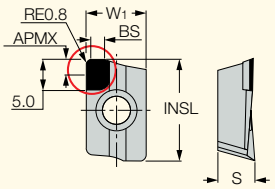


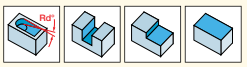
HELI2000

ADKW (CBN)

Single Corner R.H. Inserts with an IB85 PCBN Brazed Tip for Machining Hard Materials



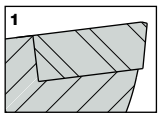


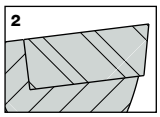


Designation	Dimensions W1	INSL	S	BS	APMX	Fig.	IB85	Recommended Machining Data a_p (mm)	f_z (mm/t)
ADKW 1505 PDER	9.60	16.18	5.83	1.45	4.50	2	●	0.10-2.00	0.10-0.25
ADKW 1505 PDTR	9.60	16.18	5.83	1.45	4.50	1	●	0.10-2.00	0.10-0.25

- Inserts are supplied with spare screws.

For tools, see pages: F90AD-SFR (314) • HM90 E90AD-15 (315) • HM90 E90AD-M-15 (316) • HM90 E90AD-M-15-JHP (316) • HM90 E90AD-MM-15-JHP (317) • HM90 F90A-15 (318) • HM90 F90A-15-JHP (319)

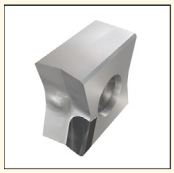


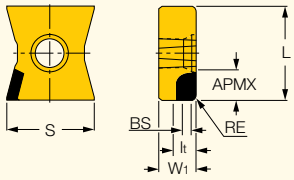


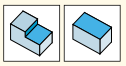
TANGMILL TANGENTIAL LINE

LNAW-11 (CBN)

Tangentially Clamped Inserts with a PCBN Brazed Tip for Machining Hard Materials







Single R.H. cutting edge insert

Designation	Dimensions W1	S	RE	L	APMX	BS	lt	IB85	Recommended Machining Data a_p (mm)	f_z (mm/t)
LNAW 1106PNTR-S	6.00	11.80	0.80	11.17	5.00	1.20	2.8	●	0.05-2.00	0.10-0.25
LNAW 1106PN-R-S	6.00	11.90	0.80	11.17	5.00	1.20	2.8	●	0.05-2.00	0.10-0.25

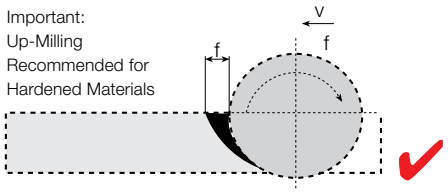
- LNAW PN-R.. is 0.03 mm edge-honed for finishing applications, while the LNAW PNTR... has a chamfered edge for rough milling applications.
- The inserts are supplied with spare screws.

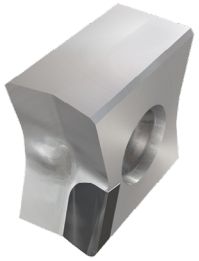
For tools, see pages: F90LN-N11 (305)

CBN Recommended Machining Conditions

	Grade DOC mm	Material	IB85 V_c m/min	Feed mm/tooth	Cutting Edge
K	<0.5	Grey cast iron 200-280 HBN	500-1500	0.1-0.3	Chamfer Hone
	0.5-2.0		500-1100	0.1-0.25	Chamfer
	<0.5	CGI	400-600	0.1-0.2	Hone
S	0.5-2.0	Co based > 35 HRc Ni based > 35 HRc Fe based > 35 HRc Cr based > 35 HRc	150-200 120-150 60-120 50-75	0.05-0.15	Chamfer
H	<0.5	Hard steels > 45 HRc	80-180	0.1-0.25	Chamfer
	<2	Hard cast iron Ni hard	80-200	0.1-0.15	Chamfer
P	<2	Bearing steel	180-220	0.05-0.25	Chamfer
	<2	Ferrous powder metal	150-300	0.1-0.15	Chamfer

Important:
Up-Milling
Recommended for
Hardened Materials

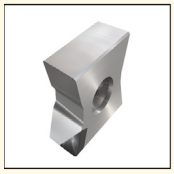


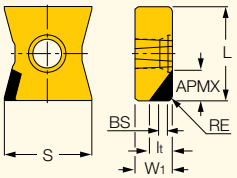


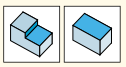
TANGMILL TANGENTIAL LINE

LNAW-15 (CBN)

Tangentially Clamped Inserts with a PCBN Brazed Tip for Machining Hard Materials





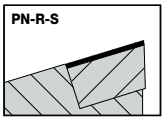


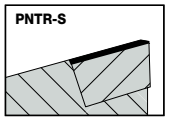
Single R.H. cutting edge insert

Designation	Dimensions W1	S	RE	L	APMX	BS	lt	IB85	Recommended Machining Data a_p (mm)	f_z (mm/t)
LNAW 1506PN-R-S	6.00	14.00	0.80	15.00	5.00	1.60	3.8	●	0.05-2.00	0.10-0.25
LNAW 1506PNTR-S	6.00	13.90	0.80	15.00	5.00	1.60	3.8	●	0.05-2.00	0.10-0.25

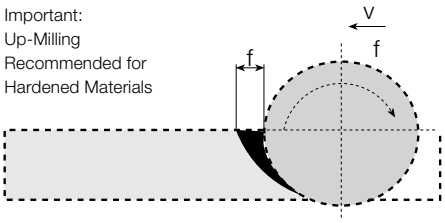
- LNAW PN-R.. is 0.03 mm edge-honed for finishing applications, while the LNAW PNTR... has a chamfered edge for rough milling applications.
- The inserts are supplied with spare screws.

For tools, see pages: F90LN-N15 (306) • SSB-LN15-R/L (320)





Important:
Up-Milling
Recommended for
Hardened Materials



CBN
Recommended Machining Conditions

Grade	DOC mm	Material	IB85 Vc m/min	IB85 Feed mm/tooth	IB85 Cutting Edge	IB55 Vc m/min	IB55 Feed mm/tooth	IB55 Cutting Edge
K	<0.5	Grey cast iron 200-280 HBN	500-1500	0.1-0.3	Chamfer Hone			
	0.5-2.0		500-1100	0.1-0.25	Chamfer			
	<0.5	CGI	400-600	0.1-0.2	Hone			
S	0.5-2.0	Co based > 35 HRc Ni based > 35 HRc Fe based > 35 HRc Cr based > 35 HRc	150-200 120-150 60-120 50-75	0.05-0.15	Chamfer			
H	<0.5	Hard steels > 45 HRc	80-180	0.1-0.25	Chamfer	80-220	0.1-0.25	Chamfer
	<2	Hard cast iron Ni hard	80-200	0.1-0.15	Chamfer			
P	<2	Bearing steel	180-220	0.05-0.25	Chamfer	180-220	0.1-0.15	Chamfer
	<2	Ferrous powder metal	150-300	0.1-0.15	Chamfer	250-360	0.1-0.15	Chamfer

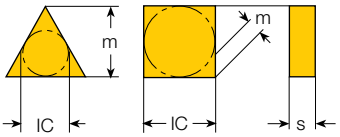
PCD INSERTS PRELUDE

ISO Insert Nomenclature / Identification Key Codes for PCD Indexable Inserts

1. Shape

	R	75°	E	80°	W
90°	S	55°	D		L
60°	T	35°	V	55°	K
80°/100	C	25°	Y	80°	Q

3. Tolerance



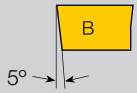
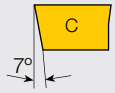
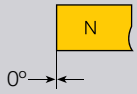
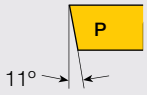
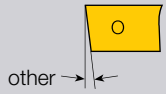
	m		S	IC	
E		±0.025	±0.025		±0.025
G		±0.025	±0.13		±0.025
M	from	±0.08	±0.13	from	±0.05
	to	±0.18(1)		to	±0.13(1)
U	from	±0.13	±0.13	from	±0.08
	to	±0.38(1)		to	±0.25(1)

(1) Exact tolerance depends on insert size

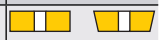
IC	Tolerance in mm			
	on m		on IC	
	Class M	Class U	Class M	Class U
6.35	±0.08	±0.13	±0.05	±0.08
9.52	±0.08	±0.13	±0.05	±0.08
12.70	±0.13	±0.20	±0.08	±0.13
15.87	±0.15	±0.27	±0.10	±0.18
19.05	±0.15	±0.27	±0.10	±0.18
25.40	±0.18	±0.38	±0.13	±0.25

1	2	3	4
C	N	G	A

2. Clearance Angle

Symbol	Relief angle
B	
C	
N	
P	
O	

4. Type

Symbol	Hole	Shape of Hole	Chipbreaker	Shape
N	without	-	without	
R			single- sided	
F			double- sided	
A	with	cylindrical hole	without	
M			single- sided	
G			double- sided	
W		partly cylindrical hole, single-side 40° ~ 60° countersink	without	
T			single- sided	
Q		partly cylindrical hole, double-side 40° ~ 60° countersink	without	
U			double- sided	
B		partly cylindrical hole, single-side 70° ~ 90° countersink	without	
H			single- sided	
C		partly cylindrical hole, double-side 70° ~ 90° countersink	without	
J			double- sided	
X	special			

5. Codes for Cutting Edge Length or for Inscribed Circle Diameters

Diameter of Inscribed Circle d (mm)	Metric System – Shapes H	O	P	S	T	C	D	E	F	M	V	W	R
3.97					06			T3			07		
4.76					08			04			08		
5.56				05	09	05	06	05	07	05	09	03	
6.35	03	02	04	06	11	06	07	06	08	06	11	04	06
7.94	04	03	05	07	13	08	09	08	10	07	13	05	07
9.525	05	04	07	09	16	09	11	09	12	09	16	06	09
12.7	07	05	09	12	22	12	15	13	16	12	22	08	12
15.875	09	06	11	15	27	16	19	16	20	15	27	10	15
19.05	11	07	13	19	33	19	23	19	24	19	33	13	19
25.4	14	10	18	25	44	25	31	26	33	25	44	17	25
31.75	18	13	23	31	54	32	38	32	41	31	54	21	31

8. Edge Preparation

	Code	Shape
Sharp Edge	F	
Honed Edge	E	
T-land/Chamfer (Angular Grinding)	T	
Chamfer + Honed (Angular Grinding + Round Honing)	S	
Double Chamfer + Honed (2-step Chamfering + Round Honing)	P	

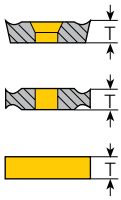
9. Hand of Insert

Symbol	Hand
R	right hand
L	left hand
N	neutral

5	6	7	8	9		10	11
12	04	08	S	(N)	-	MT	FM

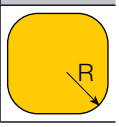
6. Codes for Thickness

Thickness S (mm)	Metric System
1.59	01
1.98	T1
2.38	02
3.18	03
3.97	T3
4.76	04
5.56	05
6.35	06
7.94	07
9.52	09
12.7	12



7. Codes for Corner Radii

For Corner R	
Corner-R Nominal Value (mm)	Metric System
sharp corner 0	00
0.1	01
0.2	02
0.3	03
0.4	04
0.6	06
0.8	08
1	10
1.2	12
1.5	15
1.6	16
2	20
2.4	24
3.2	32
other radii	X
for round inserts	M0*
	00*



Notes :"00"(double zero) is used for insert circle diameter indicated in inches. " M0" is used for insert circle diameter indicated in millimeters

10. No. of Cutting Edges or Style

Symbol	No. of Cutting Edges
HS	half-solid (full-face)
S	solid
L	length (full-edge)
MT	1 mini-tipped cutting edge

11. Chipbreaker

Symbol	Description
MD	PCD - medium
RD	PCD - roughing

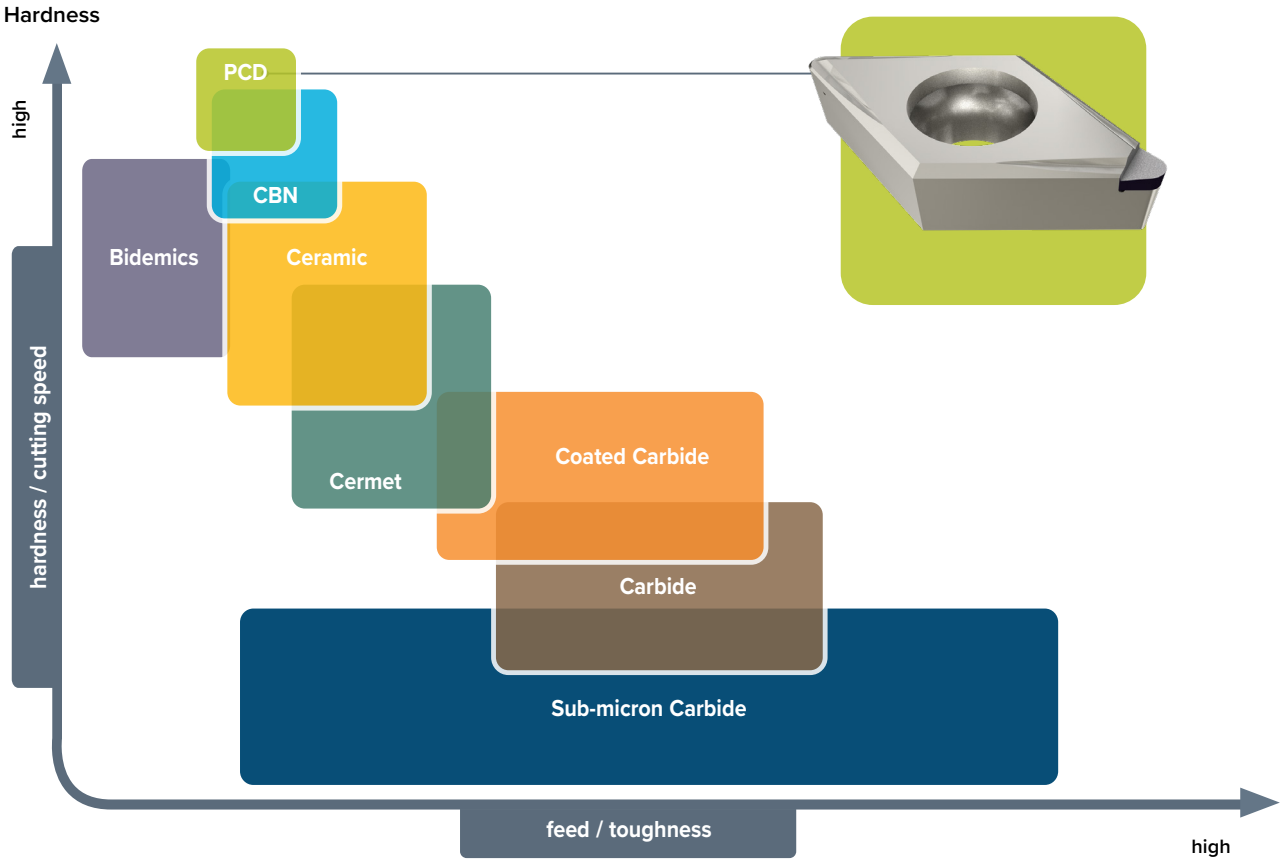
PCD (Sintered Diamond)

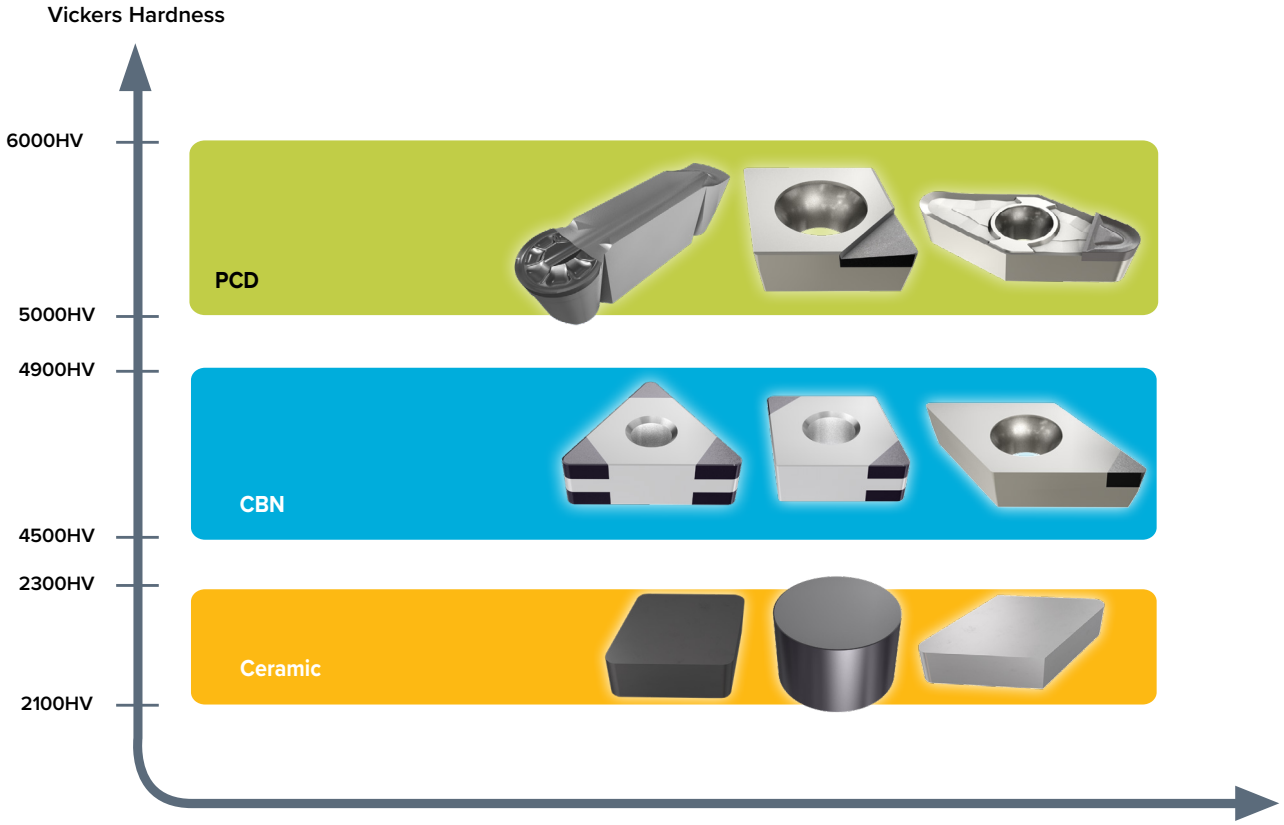
Diamonds, the hardest material in world: back in 1955 scientists developed diamonds in jewelry quality. With physical properties and sizes up to 1 carat, these synthetic diamonds had never been seen before. Containing 99,9% graphite isotope C12 these diamonds conduct heat 50% faster than natural diamond and 850 times faster than copper. They are known for the best heat conductivity and have a very high resistance against breakage when used in high-energy-lasers. But to use this diamonds for jewelry is not economical because the production is very expensive and their properties are better used in technical applications. Since 1958 synthetic diamonds are produced based on graphite in a huge high-pressure and temperature press under 60-70 kilobar and temperatures around 1200-1500 °C. Through the years this process was continuously improved.

Synthetic diamonds and later cubic-boron-nitride which is produced in a similar way is the bases for polycrystalline cutting materials. These materials are used to machine different workpiece materials like stone, wood, synthetic materials and non-ferrous materials. Nowadays it's impossible to imagine machining difficult workpiece, materials without these „polycrystallines". In the beginning the main objective was the development of grinding materials. In 1972 the technology was found to bind these only a few micron in size in a special matrix and produce polycrystalline cutting edges. About one year later this technology was transferred to cubic-boron-nitride. The polycrystalline structure is randomly oriented and homogeneous. The hardness and wear resistance is consistent in each direction. This is a main difference to natural single crystal diamonds that have harder and softer areas which could be the source for cleavage crack initiation. This means that a specific orientation of the cutting edge is not necessary to obtain high and consistent tool life. When using cutting materials such as carbide or ceramic and the tool life requirements are not realized, polycrystalline cutting materials can be the solution. By using advanced cutting materials, improvements to cutting parameters and tool life of higher hardness and wear resistance could be realized. Especially if high cutting speeds, tool life, and precision are required, PCD and CBN can serve as significant advantages.

Materials on Hardness Scales

PCD is characterized by a hardness that is comparable to natural diamond, and it can achieve hardness of 6000HV and more.





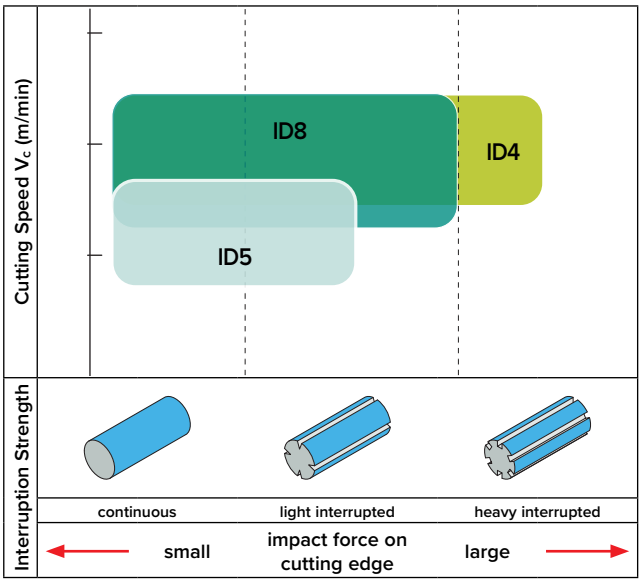
PCD Grades

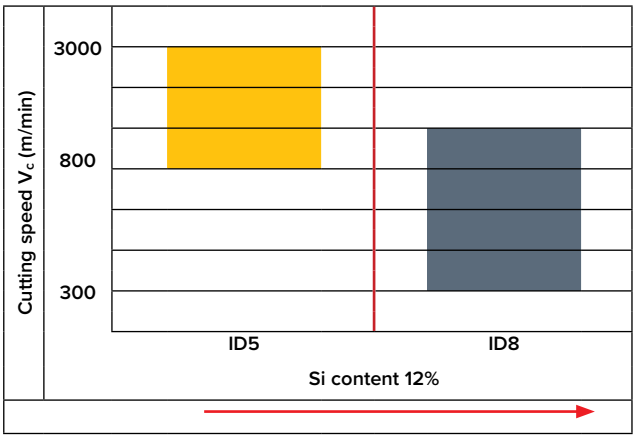
N Nonferrous Materials

PCD (Sintered Diamond)

Suitable for materials such as aluminum alloy, non-ferrous metals, and fiber-reinforced plastics. Suitable for extremely high-speed finishing.

Application Range





Insert Grades

Grades	Features
ID4	PCD fine grain, increased surface requirements, micro-erosion tools, well suited for milling. PCD grain size<1µm with great toughness, usable also for interrupted cut fine grain diamond particles, fracture resistance and cutting edge sharpness are excellent. Ideal for milling and rough cutting of aluminium alloys where extreme chip resistance is required, also for machining titanium and composties. Sub-micron grain size, ID4's ultra-fine grain structure is suitable for applications where mirror finishes are required due to its extreme edge sharpness/retention.
ID5	PCD medium grain, standard PCD quality, ALSi max. 12%. grain size 10µm to use for normal aluminium applications good balance of wear resistance and flexural strength.
ID8	PCD mixed grain, increased wear resistance, ALSi > 12%, tools with a high amount of abrasive fillers. Grain size from 3 - 30µm for high abrasive materials, excellent abrasive wear resistance, and fracture resistance. Use when ID5 is inadequate. Application areas include MMC, high silicon aluminium alloys, high strength cast irons and bi-metal applications. Excellent abrasion resistance and good thermal stability. A multi-modal PCD with grain sizes of 2um to 25um which gives ID8 excellent wear resistance, edge strength and edge quality.

Standard Cutting Conditions

ISO	Material		V_c (m/min)	DOC a_p (mm)	f mm/rev	ID4	ID5	ID8
N	aluminum alloys: aluminum si<12%	semi-finish	800-3000	0.3-5.0	0.1-0.6	—	✓	—
		finish	800-3000	0.05-1.0	0.03-0.2	—	✓	✓
		milling	800-3500	0.1-2.5	0.05-0.3	—	✓	—
	aluminum alloys: aluminum si>12%	semi-finish	300-900	0.1-2.5	0.1-0.4	—	—	✓
		finish	300-900	0.05-0.8	0.03-0.2	—	—	✓
		milling	400-1000	0.1-2.0	0.05-0.3	—	✓	✓
	copper alloys: bronze, brass, tin-foil, copper, zinc alloys, magnesium alloys	semi-finish	600-1200	0.5-2.0	0.1-0.4		✓	
		finish	700-1500	0.05-0.5	0.05-0.4	—	✓	✓
		milling	700-1200	0.1-2.5	0.1-0.3		✓	—
	carbide up to 15% cobalt	semi-finish	20-25	0.1-0.5	0.1-0.3		✓	—
		finish	20-30	0.05-0.2	0.05-0.2		✓	—
	ebonite, glass, plastic-materials ceramic, graphite, fiber-glass	semi-finish	80-1000	1.0-5.0	0.1-0.4		✓	✓
		finish	80-1500	0.1-2.0	0.05-0.3	—	✓	✓
		milling	200-1000	0.1-5.0	0.1-0.3		✓	✓
	wood	finish	2000-5000		0.05-1.0		✓	✓
		milling	2000-5000		0.05-1.0	—	✓	✓

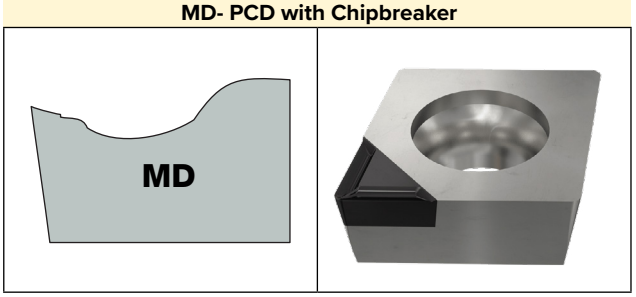
✓ First choice
— Second choice

PCD Chipbreaker Inserts MD/RD Types

General Features

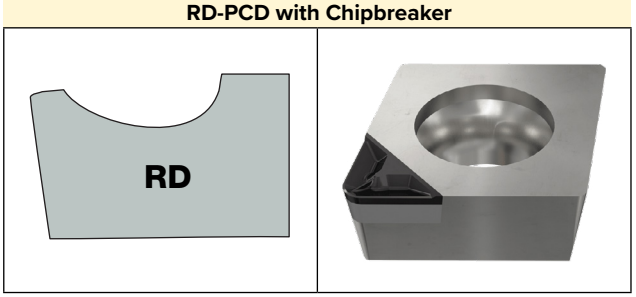
- Chipbreaker formed directly on the PCD segment delivers superior chip control. Provides good chip control in semi-finish and finishing of auminum alloys.
- Drastically increases work efficiency and solves chip control issues.
- Corner of R0.2 and R0.4 inserts are available enabling the machining of corners with a small radius.

MD- PCD with Chipbreaker



Used for better chip control and decreasing the cutting forces especially when machining low silicon aluminum. MED is used in low and medium depths of cut.

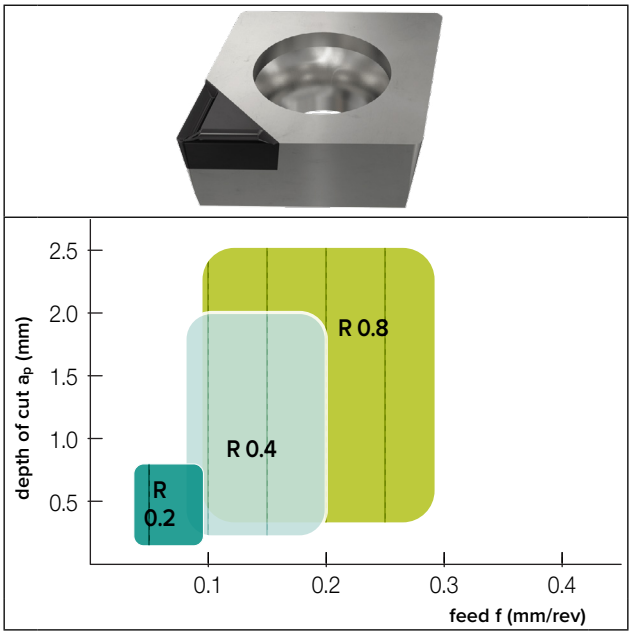
RD-PCD with Chipbreaker



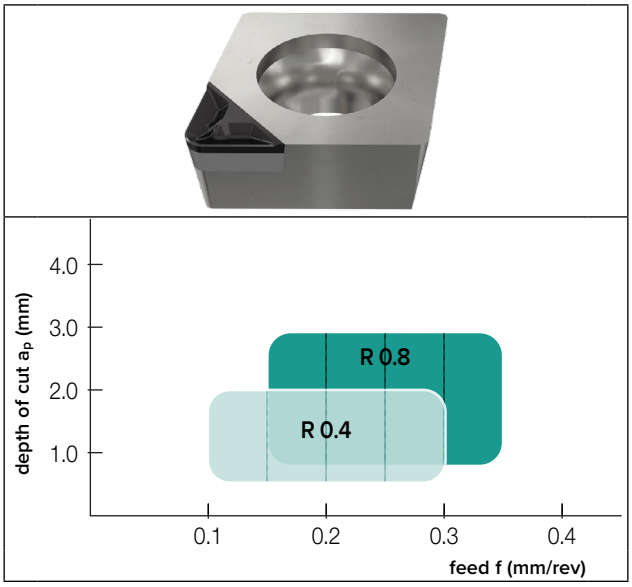
Additional negative chamfer for better chip control and reduced cutting forces in roughing applications. Minimized risk of vibrations.

for Fine - Medium Machining					
MD	radius (mm)	R0.2	R0.4	R0.8	
	f (mm/rev)	0.04 - 0.1	0.08 - 0.2	0.1 - 0.3	
	a_p (mm)	0.05 - 0.6	0.1 - 2.0	0.3 - 2.5	
for Rough Machining					
RD	radius (mm)		R0.4	R0.8	
	f (mm/rev)		0.1 - 0.25	0.15 - 0.35	
	a_p (mm)		0.4 - 2.0	0.6 - 3.0	

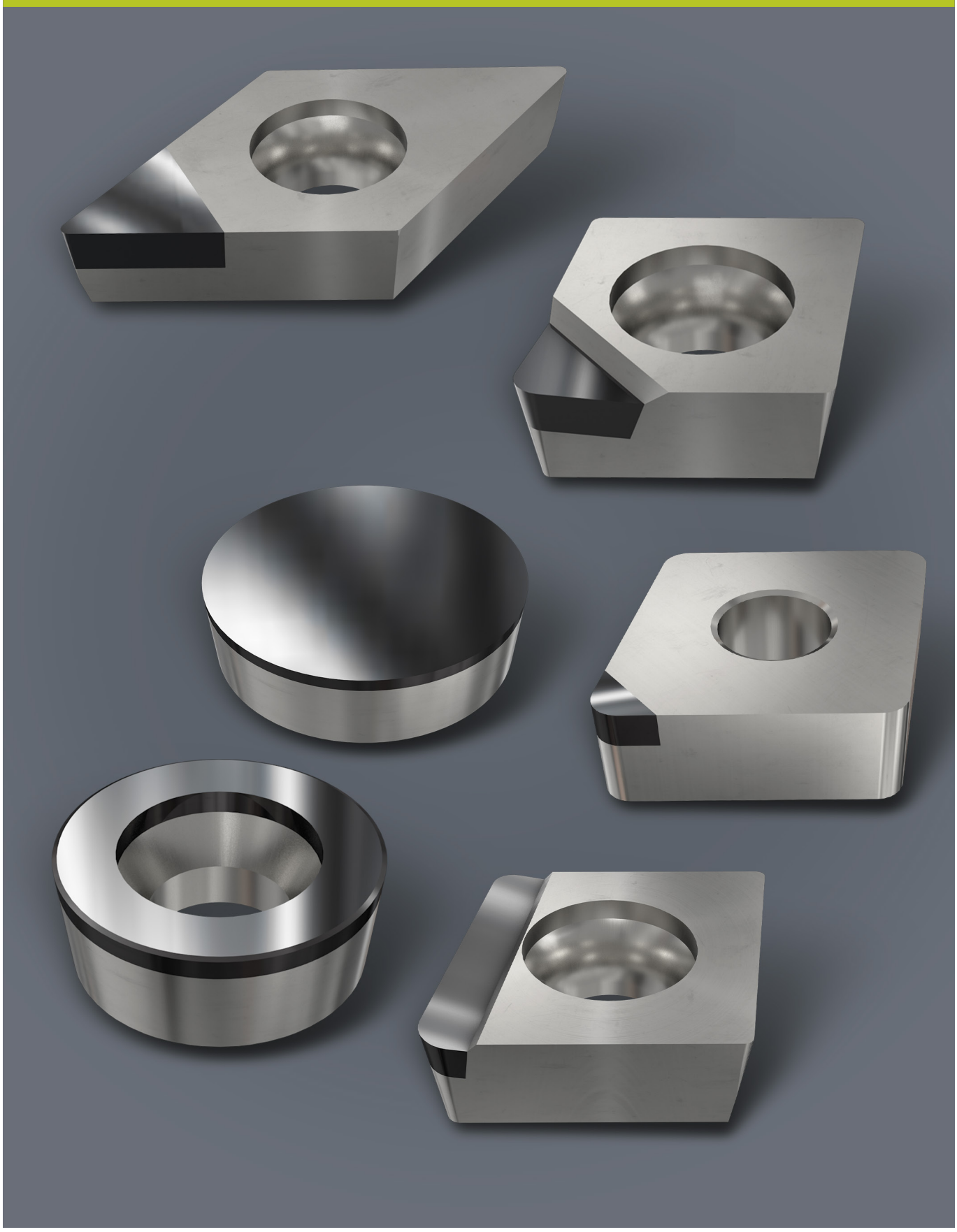
Application Range for MD Chipbreaker



Application Range for RD Chipbreaker



PCD TURNING INSERTS



PCD Turning Inserts - Index

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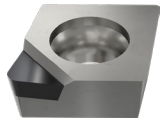

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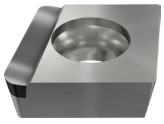

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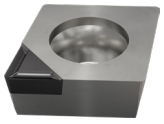

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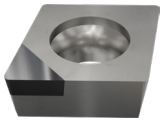

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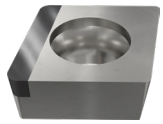

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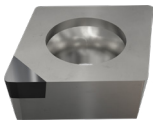

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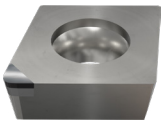

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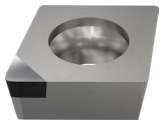

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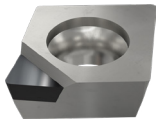

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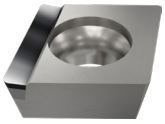

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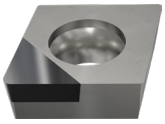

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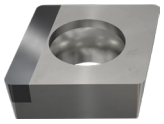

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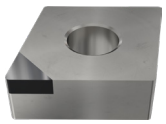

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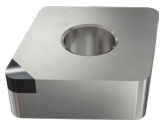

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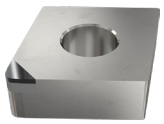

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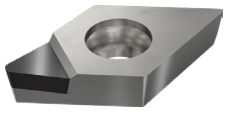

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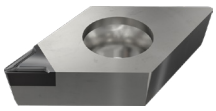

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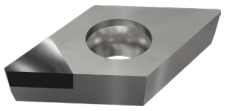

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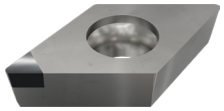

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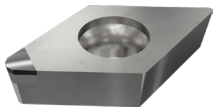

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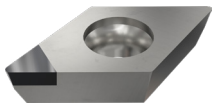

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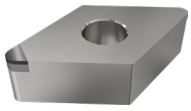

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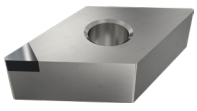

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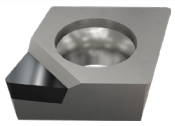

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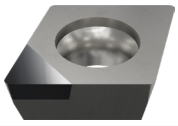

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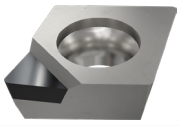

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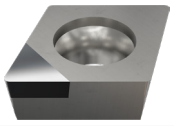

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RCGN HS (PCD) 204

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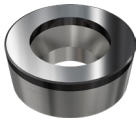

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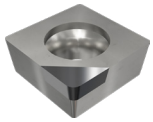

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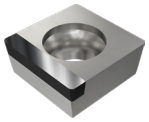

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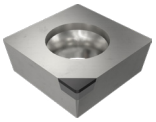

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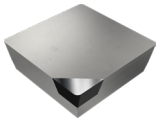

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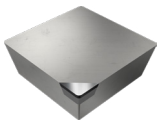

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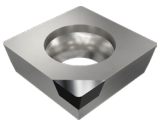

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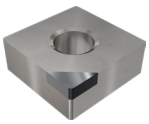

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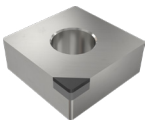

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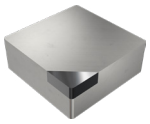

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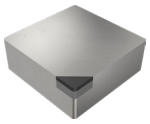

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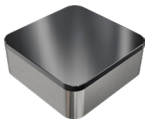

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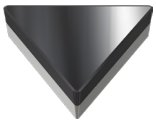

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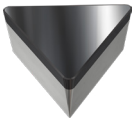

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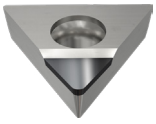

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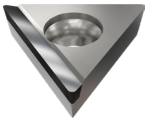


TCGT MD/RD (PCD) 212

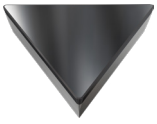
TCGW (PCD) 212

TCGW L (PCD) 213

TCGW MT (PCD) 213

TPGN (PCD) 214

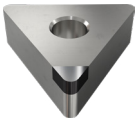
TPGN MT (PCD) 214

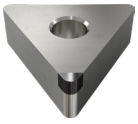
TPGN HS (PCD) 215


TPGT (PCD) 215

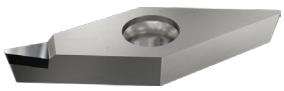
TPGW (PCD) 216

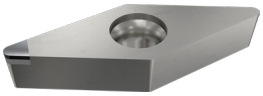
TPGW MT (PCD) 216

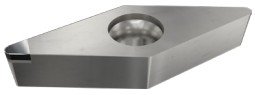
TNGA (PCD) 217


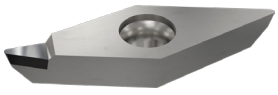
TNGA MT (PCD) 217


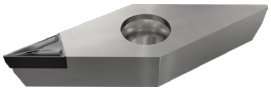
TNGN (PCD) 217

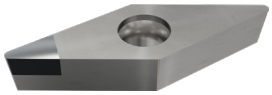
VBGT (PCD) 218


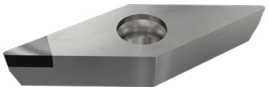
VBGW (PCD) 218


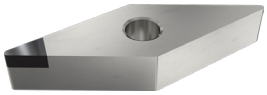
VBGW MT (PCD) 219


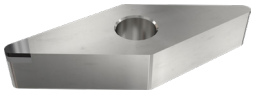
VCGT (PCD) 219


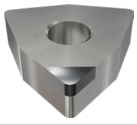
VCGT MD/RD (PCD) 220


VCGW (PCD) 220


VCGW MT (PCD) 221


VNGA (PCD) 221


VNGA MT (PCD) 222


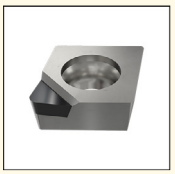
WNGA (PCD) 222


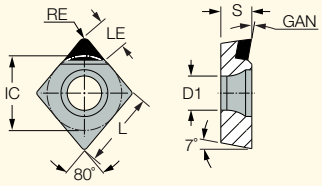
PCD ISO-Turn

ISCAR PCD LINE

CCGT (PCD)

Positive 80° Rhombic Inserts with PCD Tip with a Positive Rake Angle for Finishing Non-Ferrous Materials





Designation	Dimensions L	IC	S	RE	LE	D1	GAN	Tough ↔ Hard ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
CCGT 060202F	6.40	6.35	2.38	0.20	3.00	2.80	7.0	●	●	●	0.05-2.80	0.03-0.60
CCGT 060204F	6.40	6.35	2.38	0.40	3.00	2.80	7.0	●	●	●	0.05-2.80	0.03-0.60
CCGT 060208F	6.40	6.35	2.38	0.80	3.00	2.80	7.0	●	●	●	0.05-2.80	0.03-0.60
CCGT 09T302F	9.70	9.52	3.97	0.20	4.00	4.40	10.0	●	●	●	0.05-3.80	0.03-0.60
CCGT 09T304F	9.70	9.52	3.97	0.40	4.00	4.40	10.0	●	●	●	0.05-3.80	0.03-0.60
CCGT 09T308F	9.70	9.52	3.97	0.80	4.00	4.40	10.0	●	●	●	0.05-3.80	0.03-0.60
CCGT 120402F	12.90	12.70	4.76	0.20	4.00	5.50	10.0	●	●	●	0.05-3.80	0.03-0.60
CCGT 120404F	12.90	12.70	4.76	0.40	4.00	5.50	10.0	●	●	●	0.05-3.80	0.03-0.60
CCGT 120408F	12.90	12.70	4.76	0.80	4.00	5.50	10.0	●	●	●	0.05-3.80	0.03-0.60

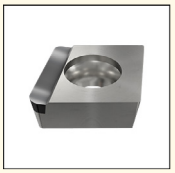
- For user guide and cutting speed recommendations, see pages 182-187

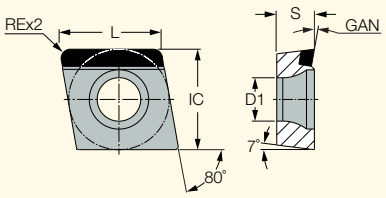
For tools, see pages: A/E/S-SCLCR/L (284) • AVC-SCLCR/L (285) • C#-SCLCR/L-JHP (244) • E-SCLCR/L-HEAD (285) • IHCR (286) • IHRF (286) • IHRF-BW (287) • IHSR (288) • IHSR-BW (289) • NQCH-SCACR/L-S-JHP (244) • PCLCR/L-S (235) • PCLCR/L-S-JHP (236) • PCLCR/L-S-JHP-MC (236) • SCACR/L-S (242) • SCLCR-PAD (243) • SCLCR/L (243) • SCLCR/L-PAD-JHP (243)

ISCAR PCD LINE

CCGT R/L-L (PCD)

Positive 80° Rhombic Inserts with Full-Edge PCD Tips (Right or Left Hand) for Finishing Non-Ferrous Materials





Designation	Dimensions L	IC	S	RE	D1	GAN	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
CCGT 060202F R-L	6.40	6.35	2.38	0.20	2.80	7.0	●	●	●	0.05-6.30	0.03-0.60
CCGT 060204F R-L	6.40	6.35	2.38	0.40	2.80	7.0	●	●	●	0.05-6.30	0.03-0.60
CCGT 09T302F R-L	9.70	9.52	3.97	0.20	4.40	10.0	●	●	●	0.05-9.50	0.03-0.60
CCGT 09T304F R-L	9.70	9.52	3.97	0.40	4.40	10.0	●	●	●	0.05-9.50	0.03-0.60
CCGT 120404F R-L	12.90	12.70	4.76	0.40	5.50	10.0	●	●	●	0.05-12.60	0.03-0.60
CCGT 120408F R-L	12.90	12.70	4.76	0.80	5.50	10.0	●	●	●	0.05-12.60	0.03-0.60
CCGT 060202F L-L	6.40	6.35	2.38	0.20	2.80	7.0	●	●	●	0.05-6.30	0.03-0.60
CCGT 060204F L-L	6.40	6.35	2.38	0.40	2.80	7.0	●	●	●	0.05-6.30	0.03-0.60
CCGT 09T302F L-L	9.70	9.52	3.97	0.20	4.40	10.0	●	●	●	0.05-9.50	0.03-0.60
CCGT 09T304F L-L	9.70	9.52	3.97	0.40	4.40	10.0	●	●	●	0.05-9.50	0.03-0.60
CCGT 120404F L-L	12.90	12.70	4.76	0.40	5.50	10.0	●	●	●	0.05-12.60	0.03-0.60
CCGT 120408F L-L	12.90	12.70	4.76	0.80	5.50	10.0	●	●	●	0.05-12.60	0.03-0.60

- For user guide and cutting speed recommendations, see pages 182-187
- Use left-hand inserts for left-hand external tools and for right-hand internal tools

For tools, see pages: A/E/S-SCLCR/L (284) • AVC-SCLCR/L (285) • C#-SCLCR/L-JHP (244) • E-SCLCR/L-HEAD (285) • IHCR (286) • IHRF (286) • IHRF-BW (287) • IHRF-CH (287) • IHSR (288) • IHSR-BW (289) • NQCH-SCACR/L-S-JHP (244) • PCLCR/L-S (235) • PCLCR/L-S-JHP (236) • PCLCR/L-S-JHP-MC (236) • SCACR/L-S (242) • SCLCR-PAD (243) • SCLCR/L (243) • SCLCR/L-PAD-JHP (243)

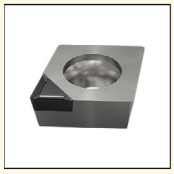
Material		N Non-Ferrous Materials		
Grade		ID5*	ID8	ID4
Tougher ↕ Harder	Heavy interrupted			↑
	Light interrupted	↑	↑	
	Continuous			

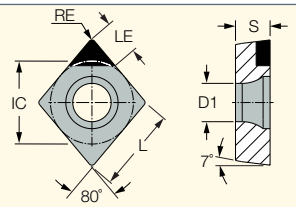
* First choice

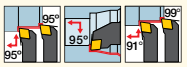
ISCAR PCD LINE

CCGT MD/RD (PCD)

Positive 80° Rhombic Inserts with 2 Types MD/RD Chipbreaking PCD Tips for Non-Ferrous Materials Finishing & Medium App.







Designation	Dimensions L	IC	S	RE	LE	D1	Tough ↔ Hard ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
CCGT 060202F MD	6.40	6.35	2.38	0.20	3.00	2.80	●	●	●	0.05-2.00	0.03-0.60
CCGT 060204F MD	6.40	6.35	2.38	0.40	3.00	2.80	●	●	●	0.05-2.00	0.03-0.60
CCGT 060208F MD	6.40	6.35	2.38	0.80	3.00	2.80	●	●	●	0.05-2.50	0.03-0.60
CCGT 09T302F MD	9.70	9.52	3.97	0.20	4.00	4.40	●	●	●	0.05-2.00	0.03-0.60
CCGT 09T304F MD	9.70	9.52	3.97	0.40	4.00	4.40	●	●	●	0.05-2.00	0.03-0.60
CCGT 09T308F MD	9.70	9.52	3.97	0.80	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
CCGT 060202F RD	6.40	6.35	2.38	0.20	3.00	2.80	●	●	●	0.05-2.00	0.03-0.60
CCGT 060204F RD	6.40	6.35	2.38	0.40	3.00	2.80	●	●	●	0.05-2.00	0.03-0.60
CCGT 060208F RD	6.40	6.35	2.38	0.80	3.00	2.80	●	●	●	0.05-2.50	0.03-0.60
CCGT 09T302F RD	9.70	9.52	3.97	0.20	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
CCGT 09T304F RD	9.70	9.52	3.97	0.40	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
CCGT 09T308F RD	9.70	9.52	3.97	0.80	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60

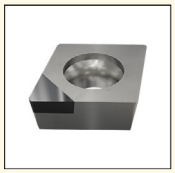
• For user guide and cutting speed recommendations, see pages 182-187

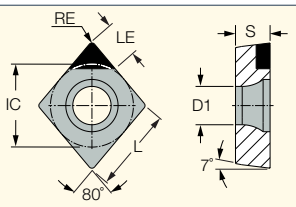
For tools, see pages: A/E/S-SCLCR/L (284) • AVC-SCLCR/L (285) • C#-SCLCR/L-JHP (244) • E-SCLCR/L-HEAD (285) • IHCR (286) • IHRF (286) • IHRF-BW (287) • IHSR (288) • IHSR-BW (289) • NQCH-SCACR/L-S-JHP (244) • PCLCR/L-S (235) • PCLCR/L-S-JHP (236) • PCLCR/L-S-JHP-MC (236) • SCACR/L-S (242) • SCLCR-PAD (243) • SCLCR/L (243) • SCLCR/L-PAD-JHP (243)

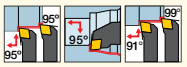
ISCAR PCD LINE

CCGW (PCD)

Positive 80° Rhombic Inserts with PCD Tips with a Flat Rake Angle for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
CCGW 060202F	6.40	6.35	2.38	0.20	3.00	2.80	●	●	●	0.05-2.00	0.03-0.60
CCGW 060204F	6.40	6.35	2.38	0.40	3.00	2.80	●	●	●	0.05-2.00	0.03-0.60
CCGW 060208F	6.40	6.35	2.38	0.80	3.00	2.80	●	●	●	0.05-2.50	0.03-0.60
CCGW 09T302F	9.70	9.52	3.97	0.20	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
CCGW 09T304F	9.70	9.52	3.97	0.40	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
CCGW 09T308F	9.70	9.52	3.97	0.80	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
CCGW 090304F	9.70	9.52	3.18	0.40	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
CCGW 090308F	9.70	9.52	3.18	0.80	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
CCGW 120402F	12.90	12.70	4.76	0.20	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60
CCGW 120404F	12.90	12.70	4.76	0.40	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60
CCGW 120408F	12.90	12.70	4.76	0.80	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60
CCGW 120412F	12.90	12.70	4.76	1.20	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60

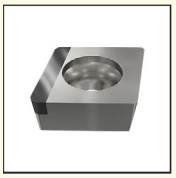
• For user guide and cutting speed recommendations, see pages 182-187

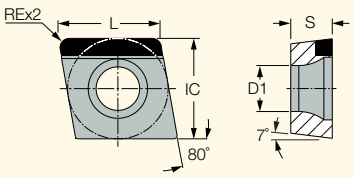
For tools, see pages: A/E/S-SCLCR/L (284) • AVC-SCLCR/L (285) • C#-SCLCR/L-JHP (244) • E-SCLCR/L-HEAD (285) • IHCR (286) • IHRF (286) • IHRF-BW (287) • IHSR (288) • IHSR-BW (289) • NQCH-SCACR/L-S-JHP (244) • PCLCR/L-S (235) • PCLCR/L-S-JHP (236) • PCLCR/L-S-JHP-MC (236) • SCACR/L-S (242) • SCLCR-PAD (243) • SCLCR/L (243) • SCLCR/L-PAD-JHP (243)

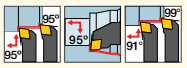
ISCAR PCD LINE

CCGW R/L-L (PCD)

Positive 80° Rhombic Inserts with Full-Edge PCD Tips (Right or Left Hand) for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
CCGW 060202F L-L	6.40	6.35	2.38	0.20	2.80	●	●	●	0.05-6.30	0.03-0.60
CCGW 060202F R-L	6.40	6.35	2.38	0.20	2.80	●	●	●	0.05-6.30	0.03-0.60
CCGW 060204F L-L	6.40	6.35	2.38	0.40	2.80	●	●	●	0.05-6.30	0.03-0.60
CCGW 060204F R-L	6.40	6.35	2.38	0.40	2.80	●	●	●	0.05-6.30	0.03-0.60
CCGW 09T302F L-L	9.70	9.52	3.97	0.20	4.40	●	●	●	0.05-9.50	0.03-0.60
CCGW 09T302F R-L	9.70	9.52	3.97	0.20	4.40	●	●	●	0.05-9.50	0.03-0.60
CCGW 09T304F L-L	9.70	9.52	3.97	0.40	4.40	●	●	●	0.05-9.50	0.03-0.60
CCGW 09T304F R-L	9.70	9.52	3.97	0.40	4.40	●	●	●	0.05-9.50	0.03-0.60
CCGW 09T308F L-L	9.70	9.52	3.97	0.80	4.40	●	●	●	0.05-9.50	0.03-0.60
CCGW 09T308F R-L	9.70	9.52	3.97	0.80	4.40	●	●	●	0.05-9.50	0.03-0.60
CCGW 120404F L-L	12.90	12.70	4.76	0.40	5.50	●	●	●	0.05-12.60	0.03-0.60
CCGW 120404F R-L	12.90	12.70	4.76	0.40	5.50	●	●	●	0.05-12.60	0.03-0.60
CCGW 120408F L-L	12.90	12.70	2.80	0.80	5.50	●	●	●	0.05-12.60	0.03-0.60
CCGW 120408F R-L	12.90	12.70	4.76	0.80	5.50	●	●	●	0.05-12.60	0.03-0.60

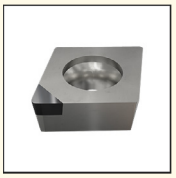
• For user guide and cutting speed recommendations, see pages 182-187

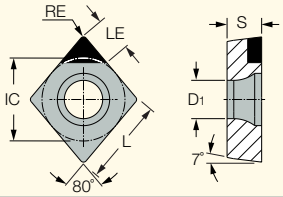
For tools, see pages: A/E/S-SCLCR/L (284) • AVC-SCLCR/L (285) • C#-SCLCR/L-JHP (244) • E-SCLCR/L-HEAD (285) • IHCR (286) • IHRF (286) • IHRF-BW (287) • IHRF-CH (287) • IHSR (288) • IHSR-BW (289) • NQCH-SCACR/L-S-JHP (244) • PCLCR/L-S (235) • PCLCR/L-S-JHP (236) • PCLCR/L-S-JHP-MC (236) • SCACR/L-S (242) • SCLCR-PAD (243) • SCLCR/L (243) • SCLCR/L-PAD-JHP (243)

ISCAR PCD LINE

CCGW W (PCD)

Positive 80° Rhombic Inserts with a PCD Top Corner Tip and Wiper for Finishing Non-Ferrous Materials





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
CCGW 09T302F W	9.70	9.52	3.97	0.20	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
CCGW 09T304F W	9.70	9.52	3.97	0.40	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
CCGW 09T308F W	9.70	9.52	3.97	0.80	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60

• For user guide and cutting speed recommendations, see pages 182-187

For tools, see pages: A/E/S-SCLCR/L (284) • AVC-SCLCR/L (285) • C#-SCLCR/L-JHP (244) • E-SCLCR/L-HEAD (285) • IHCR (286) • IHRF (286) • IHRF-BW (287) • IHSR (288) • IHSR-BW (289) • NQCH-SCACR/L-S-JHP (244) • PCLCR/L-S (235) • PCLCR/L-S-JHP (236) • PCLCR/L-S-JHP-MC (236) • SCACR/L-S (242) • SCLCR-PAD (243) • SCLCR/L (243) • SCLCR/L-PAD-JHP (243)

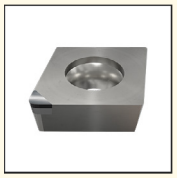
Material		N Non-Ferrous Materials		
Grade		ID5*	ID8	ID4
Tougher ↕ Harder	Heavy interrupted			↑
	Light interrupted	↑	↑	
	Continuous			

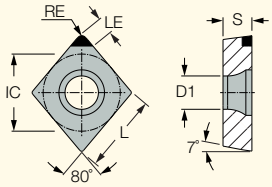
* First choice

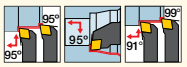
ISCAR PCD LINE

CCGW MT (PCD)

Positive 80° Rhombic Inserts with a Single PCD Mini Tip Flat Rake Angle for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
CCGW 060202F-MT	6.40	6.35	2.38	0.20	2.70	2.80	●	●	●	0.05-2.00	0.03-0.60
CCGW 060204F-MT	6.40	6.35	2.38	0.40	2.70	2.80	●	●	●	0.05-2.00	0.03-0.60
CCGW 09T302F-MT	9.70	9.52	3.97	0.20	2.70	4.40	●	●	●	0.05-2.00	0.03-0.60
CCGW 09T304F-MT	9.70	9.52	3.97	0.40	2.70	4.40	●	●	●	0.05-2.00	0.03-0.60
CCGW 09T308F-MT	9.70	9.52	3.97	0.80	2.70	4.40	●	●	●	0.05-2.00	0.03-0.60
CCGW 120402F-MT	12.90	12.70	4.76	0.20	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60
CCGW 120404F-MT	12.90	12.70	4.76	0.40	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60
CCGW 120408F-MT	12.90	12.70	4.76	0.80	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60

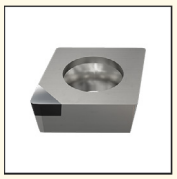
• For user guide and cutting speed recommendations, see pages 182-187

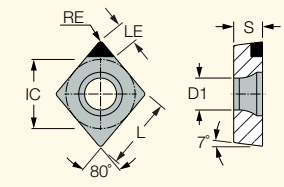
For tools, see pages: A/E/S-SCLCR/L (284) • AVC-SCLCR/L (285) • C#-SCLCR/L-JHP (244) • E-SCLCR/L-HEAD (285) • IHCR (286) • IHRF (286) • IHRF-BW (287) • IHSR (288) • IHSR-BW (289) • NQCH-SCACR/L-S-JHP (244) • PCLCR/L-S (235) • PCLCR/L-S-JHP (236) • PCLCR/L-S-JHP-MC (236) • SCACR/L-S (242) • SCLCR-PAD (243) • SCLCR/L (243) • SCLCR/L-PAD-JHP (243)

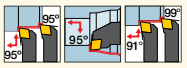
ISCAR PCD LINE

CCGW W-MT (PCD)

Positive 80° Rhombic Inserts with a Single PCD Wiper, Mini Tip and Flat Rake Angle for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
CCGW 060202F W-MT	6.40	6.35	2.38	0.20	2.70	2.80	●	●	●	0.05-0.50	0.03-0.60
CCGW 060204F W-MT	6.40	6.35	2.38	0.40	2.70	2.80	●	●	●	0.05-0.50	0.03-0.60
CCGW 09T304F W-MT	9.70	9.52	3.97	0.40	2.70	4.40	●	●	●	0.05-0.50	0.03-0.60
CCGW 09T308F W-MT	9.70	9.52	3.97	0.80	2.70	4.40	●	●	●	0.05-0.50	0.03-0.60

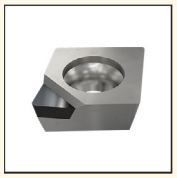
• For user guide and cutting speed recommendations, see pages 182-187

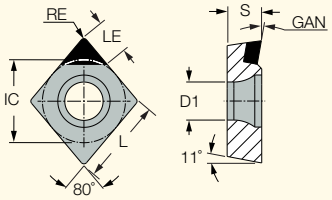
For tools, see pages: A/E/S-SCLCR/L (284) • AVC-SCLCR/L (285) • C#-SCLCR/L-JHP (244) • E-SCLCR/L-HEAD (285) • IHCR (286) • IHRF (286) • IHRF-BW (287) • IHSR (288) • IHSR-BW (289) • NQCH-SCACR/L-S-JHP (244) • PCLCR/L-S (235) • PCLCR/L-S-JHP (236) • PCLCR/L-S-JHP-MC (236) • SCACR/L-S (242) • SCLCR-PAD (243) • SCLCR/L (243) • SCLCR/L-PAD-JHP (243)

ISCAR PCD LINE

CPGT (PCD)

Positive 80° Rhombic Inserts with PCD Top Corner Tip and Positive Rake for Finishing Non-Ferrous Materials





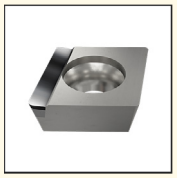
Designation	Dimensions L	IC	S	RE	LE	D1	GAN	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
CPGT 060202F	6.40	6.35	2.38	0.20	3.00	2.80	7.0	●	●	●	0.05-1.50	0.03-0.60
CPGT 060204F	6.40	6.35	2.38	0.40	3.00	2.80	7.0	●	●	●	0.05-2.00	0.03-0.60
CPGT 09T304F	9.70	9.52	3.97	0.40	4.00	4.40	10.0	●	●	●	0.05-2.50	0.03-0.60
CPGT 09T308F	9.70	9.52	3.97	0.80	4.00	4.40	10.0	●	●	●	0.05-2.50	0.03-0.60
CPGT 120404F	12.90	12.70	4.76	0.40	4.00	5.50	10.0	●	●	●	0.05-3.00	0.03-0.60
CPGT 120408F	12.90	12.70	4.76	0.80	4.00	5.50	10.0	●	●	●	0.05-3.00	0.03-0.60

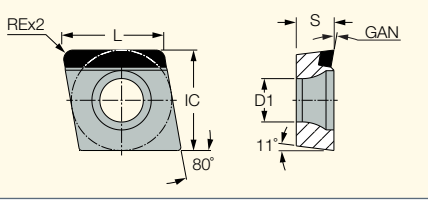
• For user guide and cutting speed recommendations, see pages 182-187

ISCAR PCD LINE

CPGT R/L-L (PCD)

Positive 80° Rhombic Inserts with Full-Edge PCD Tip Positive Rake for Finishing Non-Ferrous Materials





Designation	Dimensions L	IC	S	RE	D1	GAN	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
CPGT 060202F L-L	6.40	6.35	2.38	0.20	2.80	7.0	●	●	●	0.05-6.30	0.03-0.60
CPGT 060202F R-L	6.40	6.35	2.38	0.20	2.80	7.0	●	●	●	0.05-6.30	0.03-0.60
CPGT 060204F L-L	6.40	6.35	2.38	0.40	2.80	7.0	●	●	●	0.05-6.30	0.03-0.60
CPGT 060204F R-L	6.40	6.35	2.38	0.40	2.80	7.0	●	●	●	0.05-6.30	0.03-0.60
CPGT 09T302F L-L	9.70	9.52	3.97	0.20	4.40	10.0	●	●	●	0.05-9.50	0.03-0.60
CPGT 09T302F R-L	9.70	9.52	3.97	0.20	4.40	10.0	●	●	●	0.05-9.50	0.03-0.60
CPGT 09T304F L-L	9.70	9.52	3.97	0.40	4.40	10.0	●	●	●	0.05-9.50	0.03-0.60
CPGT 09T304F R-L	9.70	9.52	3.97	0.40	4.40	10.0	●	●	●	0.05-9.50	0.03-0.60
CPGT 120404F L-L	12.90	12.70	4.76	0.40	5.50	10.0	●	●	●	0.05-12.60	0.03-0.60
CPGT 120404F R-L	12.90	12.70	4.76	0.40	5.50	10.0	●	●	●	0.05-12.60	0.03-0.60
CPGT 120408F L-L	12.90	12.70	4.76	0.80	5.50	10.0	●	●	●	0.05-12.60	0.03-0.60
CPGT 120408F R-L	12.90	12.70	4.76	0.80	5.50	10.0	●	●	●	0.05-12.60	0.03-0.60

• For user guide and cutting speed recommendations, see pages 182-187

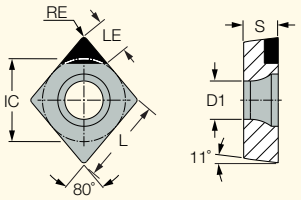
Material		N Non-Ferrous Materials		
Grade		ID5*	ID8	ID4
Tougher ↕ Harder	Heavy interrupted			▲
	Light interrupted	▲	▲	
	Continuous			

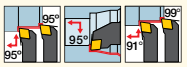
* First choice

ISCAR PCD LINE

CPGW (PCD)

Positive 80° Rhombic Inserts with PCD Top Corner Tip for Finishing Non-Ferrous Materials





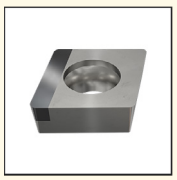
Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
CPGW 05T102F	5.60	5.56	1.98	0.20	3.00	2.50	●	●	●	0.05-1.50	0.03-0.60
CPGW 05T104F	5.60	5.56	1.98	0.40	3.00	2.50	●	●	●	0.05-0.50	0.03-0.60
CPGW 060202F	6.40	6.35	2.38	0.20	3.00	2.80	●	●	●	0.05-0.50	0.03-0.60
CPGW 060204F	6.40	6.35	2.38	0.40	3.00	2.80	●	●	●	0.05-0.50	0.03-0.60
CPGW 09T304F	9.70	9.52	3.97	0.40	4.00	4.40	●	●	●	0.05-2.50	0.03-0.60
CPGW 09T308F	9.70	9.52	3.97	0.80	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
CPGW 090304F	9.70	9.52	3.18	0.40	4.00	4.40	●	●	●	0.05-2.50	0.03-0.60
CPGW 090308F	9.70	9.52	3.18	0.80	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
CPGW 120404F	12.90	12.70	4.76	0.40	4.00	5.50	●	●	●	0.05-2.50	0.03-0.60
CPGW 120408F	12.90	12.70	4.76	0.80	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60

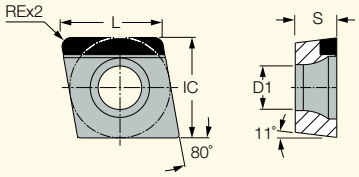
• For user guide and cutting speed recommendations, see pages 182-187

ISCAR PCD LINE

CPGW R/L-L (PCD)

Positive 80° Rhombic Inserts with Full-Edge PCD Tip (Right or Left Hand) for Finishing Non-Ferrous Materials





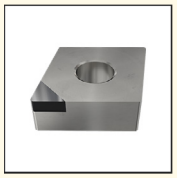
Designation	Dimensions L	IC	S	RE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
CPGW 060202F L-L	6.40	6.35	2.38	0.20	2.80	●	●	●	0.05-6.30	0.03-0.60
CPGW 060202F R-L	6.40	6.35	2.38	0.20	2.80	●	●	●	0.05-6.30	0.03-0.60
CPGW 060204F L-L	6.40	6.35	2.38	0.40	2.80	●	●	●	0.05-6.30	0.03-0.60
CPGW 060204F R-L	6.40	6.35	2.38	0.40	2.80	●	●	●	0.05-6.30	0.03-0.60
CPGW 09T302F L-L	9.70	9.52	3.97	0.20	4.40	●	●	●	0.05-9.50	0.03-0.60
CPGW 09T302F R-L	9.70	9.52	3.97	0.20	4.40	●	●	●	0.05-9.50	0.03-0.60
CPGW 09T304F L-L	9.70	9.52	3.97	0.40	4.40	●	●	●	0.05-9.50	0.03-0.60
CPGW 09T304F R-L	9.70	9.52	3.97	0.40	4.40	●	●	●	0.05-9.50	0.03-0.60
CPGW 120404F L-L	12.90	12.70	4.76	0.40	5.50	●	●	●	0.05-12.60	0.03-0.60
CPGW 120404F R-L	12.90	12.70	4.76	0.40	5.50	●	●	●	0.05-12.60	0.03-0.60
CPGW 120408F L-L	12.90	12.70	4.76	0.80	5.50	●	●	●	0.05-12.60	0.03-0.60
CPGW 120408F R-L	12.90	12.70	4.76	0.80	5.50	●	●	●	0.05-12.60	0.03-0.60

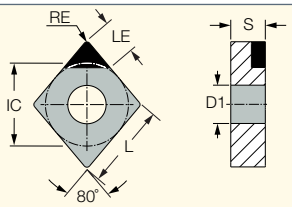
• For user guide and cutting speed recommendations, see pages 182-187

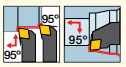
ISCAR PCD LINE

CNGA (PCD)

Negative 80° Rhombic Inserts with Negative Relief Angle and Single PCD Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGA 120401F	12.90	12.70	4.76	0.10	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60
CNGA 120402F	12.90	12.70	4.76	0.20	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60
CNGA 120403F	12.90	12.70	4.76	0.30	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60
CNGA 120406F	12.90	12.70	4.76	0.60	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60
CNGA 120404F	12.90	12.70	4.76	0.40	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60
CNGA 120410F	12.90	12.70	4.76	1.00	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60
CNGA 120408F	12.90	12.70	4.76	0.80	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60
CNGA 120412F	12.90	12.70	4.76	1.20	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60
CNGA 120416F	12.90	12.70	4.76	1.60	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60

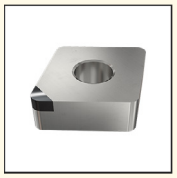
• For user guide and cutting speed recommendations, see pages 182-187

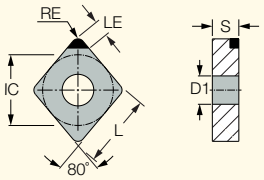
For tools, see pages: A/S-PCLNR/L (282) • A/S-PCLNR/L-X/G (283) • C#-MULNR/L-MW (268) • C#-PCLNR/L-12-JHP (241) • C#-PCLNR/L-X (241) • C#-PCLNR/L-X-JHP (242) • DCLNR/L (234) • DCLNR/L-JHP-MC (235) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PCLNR/L (237) • PCLNR/L-12-JHP (237) • PCLNR/L-X (238) • PCLNR/L-X-JHP (239) • PCLNR/L-X-JHP-MC (240) • S-DCLNR/L (282) • S-MULNR-MW (297)

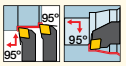
ISCAR PCD LINE

CNGA MT (PCD)

Negative 80° Rhombic Inserts with a Single PCD Mini Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGA 120402F-MT	12.90	12.70	4.76	0.20	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60
CNGA 120408F-MT	12.90	12.70	4.76	0.80	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60
CNGA 120412F-MT	12.90	12.70	4.76	1.20	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60

• For user guide and cutting speed recommendations, see pages 182-187

For tools, see pages: A/S-PCLNR/L (282) • A/S-PCLNR/L-X/G (283) • C#-MULNR/L-MW (268) • C#-PCLNR/L-12-JHP (241) • C#-PCLNR/L-X (241) • C#-PCLNR/L-X-JHP (242) • DCLNR/L (234) • DCLNR/L-JHP-MC (235) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PCLNR/L (237) • PCLNR/L-12-JHP (237) • PCLNR/L-X (238) • PCLNR/L-X-JHP (239) • PCLNR/L-X-JHP-MC (240) • S-DCLNR/L (282) • S-MULNR-MW (297)

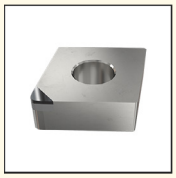
Material			N Non-Ferrous Materials		
Grade			ID5*	ID8	ID4
Tougher ↕ Harder		Heavy interrupted			↑
		Light interrupted	↑	↑	
		Continuous			

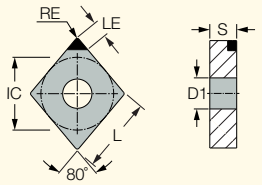
* First choice

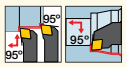
ISCAR PCD LINE

CNGA W-MT (PCD)

Negative 80° Rhombic Inserts with a Single CBN Wiper and Mini Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
CNGA 120404F W-MT	12.90	12.70	4.76	0.40	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60
CNGA 120408F W-MT	12.90	12.70	4.76	0.80	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60

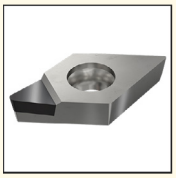
• For user guide and cutting speed recommendations, see pages 182-187

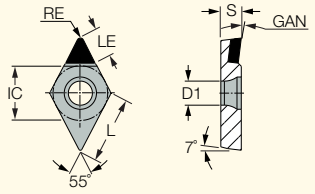
For tools, see pages: A/S-PCLNR/L (282) • A/S-PCLNR/L-X/G (283) • C#-MULNR/L-MW (268) • C#-PCLNR/L-12-JHP (241) • C#-PCLNR/L-X (241) • C#-PCLNR/L-X-JHP (242) • DCLNR/L (234) • DCLNR/L-JHP-MC (235) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PCLNR/L (237) • PCLNR/L-12-JHP (237) • PCLNR/L-X (238) • PCLNR/L-X-JHP (239) • PCLNR/L-X-JHP-MC (240) • S-DCLNR/L (282) • S-MULNR-MW (297)

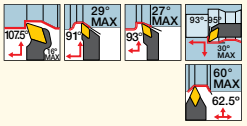
ISCAR PCD LINE

DCGT (PCD)

Positive 55° Rhombic Inserts with PCD Top Corner Tip and Positive Rake for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	GAN	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
DCGT 070202F	7.75	6.35	2.38	0.20	3.00	2.80	7.0	●	●	●	0.05-1.50	0.03-0.60
DCGT 070204F	7.75	6.35	2.38	0.40	3.00	2.80	7.0	●	●	●	0.05-2.00	0.03-0.60
DCGT 070208F	7.75	6.35	2.38	0.80	3.00	2.80	7.0	●	●	●	0.05-2.50	0.03-0.60
DCGT 11T302F	11.60	9.52	3.97	0.20	4.00	4.40	10.0	●	●	●	0.05-1.50	0.03-0.60
DCGT 11T304F	11.60	9.52	3.97	0.40	4.00	4.40	10.0	●	●	●	0.05-2.00	0.03-0.60
DCGT 11T308F	11.60	9.52	3.97	0.80	4.00	4.40	10.0	●	●	●	0.05-2.50	0.03-0.60

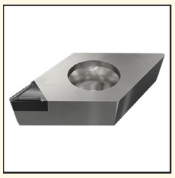
• For user guide and cutting speed recommendations, see pages 182-187

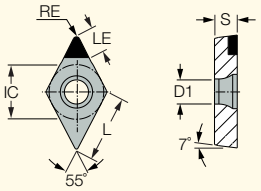
For tools, see pages: A/E/S-SDUCR/L (292) • AVC-SDUCR/L (293) • AVC-SDUCR/L-VH (293) • C#-SDJCR-JHP (253) • C#-SDJCR/L (252) • C#-SDNCN (253) • E-SDUCR/L-HEAD (292) • NQCH-SDACR/L-S-JHP (253) • NQCH-Y-SDJCR-S-JHP (254) • PDACR/L-S (247) • PDACR/L-S-JHP (247) • PDACR/L-S-JHP-MC (248) • SDACR/L-S (250) • SDHCR/L-S (250) • SDJCR-PAD (251) • SDJCR/L (250) • SDJCR/L-PAD-JHP (251) • SDNCN (251) • Y-SDJCR-S (252) • Y-SDJCR-S-JHP (252)

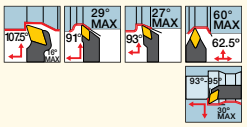
ISCAR PCD LINE

DCGT MD/RD (PCD)

Positive 55° Rhombic Inserts with MD/RD Chipbreaking PCD Tips for Non-Ferrous Materials Finishing & Medium App.







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
DCGT 070202F MD	7.75	6.35	2.38	0.20	3.00	2.80	●	●	●	0.05-1.50	0.03-0.60
DCGT 070202F RD	7.75	6.35	2.38	0.20	3.00	2.80	●	●	●	0.05-1.50	0.03-0.60
DCGT 070204F MD	7.75	6.35	2.38	0.40	3.00	2.80	●	●	●	0.05-2.00	0.03-0.60
DCGT 070204F RD	7.75	6.35	2.38	0.40	3.00	2.80	●	●	●	0.05-2.00	0.03-0.60
DCGT 070208F MD	7.75	6.35	2.38	0.80	3.00	2.80	●	●	●	0.05-2.50	0.03-0.60
DCGT 070208F RD	7.75	6.35	2.38	0.80	3.00	2.80	●	●	●	0.05-2.50	0.03-0.60
DCGT 11T302F MD	11.60	9.52	3.97	0.20	4.00	4.40	●	●	●	0.05-1.50	0.03-0.60
DCGT 11T302F RD	11.60	9.52	3.97	0.20	4.00	4.40	●	●	●	0.05-1.50	0.03-0.60
DCGT 11T304F MD	11.60	9.52	3.97	0.40	4.00	4.40	●	●	●	0.05-2.00	0.03-0.60
DCGT 11T304F RD	11.60	9.52	3.97	0.40	4.00	4.40	●	●	●	0.05-2.00	0.03-0.60
DCGT 11T308F MD	11.60	9.52	3.97	0.80	4.00	4.40	●	●	●	0.05-2.50	0.03-0.60
DCGT 11T308F RD	11.60	9.52	3.97	0.80	4.00	4.40	●	●	●	0.05-2.50	0.03-0.60

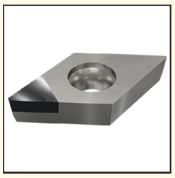
• For user guide and cutting speed recommendations, see pages 182-187

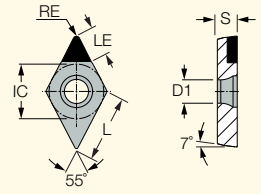
For tools, see pages: A/E/S-SDUCR/L (292) • AVC-SDUCR/L (293) • AVC-SDUCR/L-VH (293) • C#-SDJCR-JHP (253) • C#-SDJCR/L (252) • C#-SDNCN (253) • E-SDUCR/L-HEAD (292) • NQCH-SDACR/L-S-JHP (253) • NQCH-Y-SDJCR-S-JHP (254) • PDACR/L-S (247) • PDACR/L-S-JHP (247) • PDACR/L-S-JHP-MC (248) • SDACR/L-S (250) • SDHCR/L-S (250) • SDJCR-PAD (251) • SDJCR/L (250) • SDJCR/L-PAD-JHP (251) • SDNCN (251) • Y-SDJCR-S (252) • Y-SDJCR-S-JHP (252)

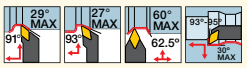
ISCAR PCD LINE

DCGW (PCD)

Positive 55° Rhombic Inserts with PCD Top Corner Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
DCGW 070202F	7.75	6.35	2.38	0.20	3.00	2.80	●	●	●	0.05-1.50	0.03-0.60
DCGW 070204F	7.75	6.35	2.38	0.40	3.00	2.80	●	●	●	0.05-2.00	0.03-0.60
DCGW 070208F	7.75	6.35	2.38	0.80	3.00	2.80	●	●	●	0.05-2.50	0.03-0.60
DCGW 11T302F	11.60	9.52	3.97	0.20	4.00	4.40	●	●	●	0.05-1.50	0.03-0.60
DCGW 11T304F	11.60	9.52	3.97	0.40	4.00	4.40	●	●	●	0.05-2.00	0.03-0.60
DCGW 11T308F	11.60	9.52	3.97	0.80	4.00	4.40	●	●	●	0.05-2.50	0.03-0.60
DCGW 150404F	15.50	12.70	4.76	0.40	4.00	5.50	●	●	●	0.05-2.50	0.03-0.60
DCGW 150408F	15.50	12.70	4.76	0.80	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60

• For user guide and cutting speed recommendations, see pages 182-187

For tools, see pages: A/E/S-SDUCR/L (292) • AVC-SDUCR/L (293) • AVC-SDUCR/L-VH (293) • C#-SDJCR-JHP (253) • C#-SDJCR/L (252) • C#-SDNCN (253) • E-SDUCR/L-HEAD (292) • NQCH-SDACR/L-S-JHP (253) • NQCH-Y-SDJCR-S-JHP (254) • PDACR/L-S (247) • PDACR/L-S-JHP (247) • PDACR/L-S-JHP-MC (248) • SDACR/L-S (250) • SDHCR/L-S (250) • SDJCR-PAD (251) • SDJCR/L (250) • SDJCR/L-PAD-JHP (251) • SDNCN (251) • Y-SDJCR-S (252) • Y-SDJCR-S-JHP (252)

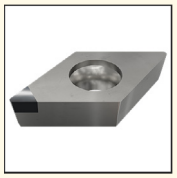
Material			N		
			Non-Ferrous Materials		
Grade			ID5*	ID8	ID4
Tougher		Heavy interrupted			
↕		Light interrupted	▲	▲	▲
Harder		Continuous			

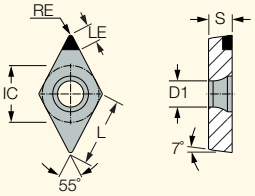
* First choice

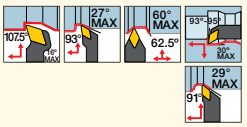
ISCAR PCD LINE

DCGW MT (PCD)

Positive 55° Rhombic Inserts with a Single PCD Mini Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
DCGW 070202F-MT	7.75	6.35	2.38	0.20	2.70	2.80	●	●	●	0.05-2.00	0.03-0.60
DCGW 070204F-MT	7.75	6.35	2.38	0.40	2.70	2.80	●	●	●	0.05-2.00	0.03-0.60
DCGW 11T302F-MT	11.60	9.52	3.97	0.20	2.70	4.40	●	●	●	0.05-2.00	0.03-0.60
DCGW 11T304F-MT	11.60	9.52	3.97	0.40	2.70	4.40	●	●	●	0.05-2.00	0.03-0.60
DCGW 11T308F-MT	11.60	9.52	3.97	0.80	2.70	4.40	●	●	●	0.05-2.00	0.03-0.60

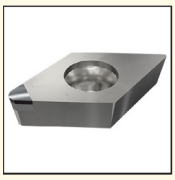
• For user guide and cutting speed recommendations, see pages 182-187

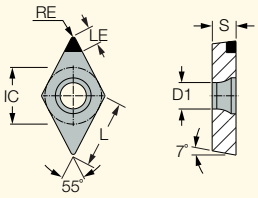
For tools, see pages: A/E/S-SDUCR/L (292) • AVC-SDUCR/L (293) • AVC-SDUCR/L-VH (293) • C#-SDJCR-JHP (253) • C#-SDJCR/L (252) • C#-SDNCN (253) • E-SDUCR/L-HEAD (292) • NQCH-SDACR/L-S-JHP (253) • NQCH-Y-SDJCR-S-JHP (254) • PDACR/L-S (247) • PDACR/L-S-JHP (247) • PDACR/L-S-JHP-MC (248) • SDACR/L-S (250) • SDHCR/L-S (250) • SDJCR-PAD (251) • SDJCR/L (250) • SDJCR/L-PAD-JHP (251) • SDNCN (251) • Y-SDJCR-S (252) • Y-SDJCR-S-JHP (252)

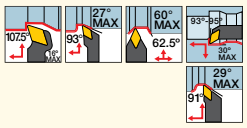
ISCAR PCD LINE

DCGW W-MT (PCD)

Positive 55° Rhombic Inserts with a Single PCD Mini Tip and Wiper for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
DCGW 11T304F W-MT	11.60	9.52	3.97	0.40	2.70	4.40	●	●	●	0.05-2.00	0.03-0.60
DCGW 11T308F W-MT	11.60	9.52	3.97	0.80	2.70	4.40	●	●	●	0.05-2.00	0.03-0.60

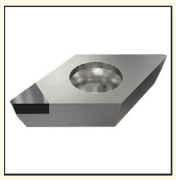
• For user guide and cutting speed recommendations, see pages 182-187

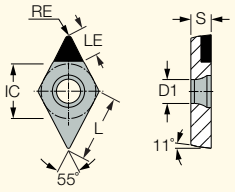
For tools, see pages: A/E/S-SDUCR/L (292) • AVC-SDUCR/L (293) • AVC-SDUCR/L-VH (293) • C#-SDJCR-JHP (253) • C#-SDJCR/L (252) • C#-SDNCN (253) • NQCH-SDACR/L-S-JHP (253) • NQCH-Y-SDJCR-S-JHP (254) • PDACR/L-S (247) • PDACR/L-S-JHP (247) • PDACR/L-S-JHP-MC (248) • SDACR/L-S (250) • SDHCR/L-S (250) • SDJCR/L (250) • SDJCR/L-PAD-JHP (251) • SDNCN (251) • Y-SDJCR-S (252) • Y-SDJCR-S-JHP (252)

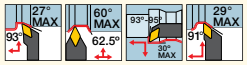
ISCAR PCD LINE

DPGW (PCD)

Positive 55° Rhombic Inserts with Single PCD Top Corner Tip for Finishing Non-Ferrous Materials







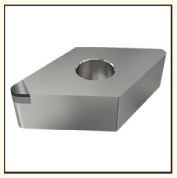
Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
DPGW 070202F	7.75	6.35	2.38	0.20	3.00	2.80	●	●	●	0.05-1.50	0.03-0.60
DPGW 070204F	7.75	6.35	2.38	0.40	3.00	2.80	●	●	●	0.05-2.00	0.03-0.60
DPGW 070208F	7.75	6.35	2.38	0.80	3.00	2.80	●	●	●	0.05-2.50	0.03-0.60
DPGW 11T302F	11.60	9.52	3.97	0.20	4.00	4.40	●	●	●	0.05-1.50	0.03-0.60
DPGW 11T304F	11.60	9.52	3.97	0.40	4.00	4.40	●	●	●	0.05-2.00	0.03-0.60
DPGW 11T308F	11.60	9.52	3.97	0.80	4.00	4.40	●	●	●	0.05-2.50	0.03-0.60

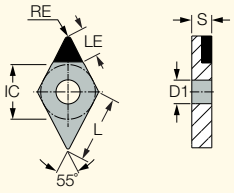
• For user guide and cutting speed recommendations, see pages 182-187

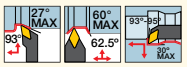
ISCAR PCD LINE

DNGA (PCD)

Negative 55° Rhombic Inserts & Negative Relief Angle with Single PCD Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
DNGA 150404F	15.50	12.70	4.76	0.40	4.00	5.50	●	●	●	0.05-2.50	0.03-0.60
DNGA 150408F	15.50	12.70	4.76	0.80	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60
DNGA 150412F	15.50	12.70	4.76	1.20	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60
DNGA 150604F	15.50	12.70	6.35	0.40	4.00	5.50	●	●	●	0.05-2.50	0.03-0.60
DNGA 150608F	15.50	12.70	6.35	0.80	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60
DNGA 150612F	15.50	12.70	6.35	1.20	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60

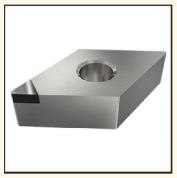
• For user guide and cutting speed recommendations, see pages 182-187

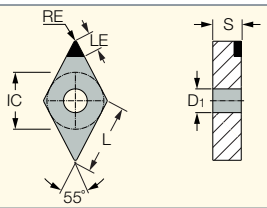
For tools, see pages: A/S-PDUNR/L (291) • AVC-DDUNR/L (290) • AVC-DDUNR/L-VH (291) • C#-DDJNR/L (246) • C#-PDJNR/L-JHP (249) • DDJNR/L (245) • DDJNR/L-JHP-MC (245) • HSK A63WH-DDJNR/L (246) • HSK A63WH-DDNNN (246) • PDJNR/L (248) • PDJNR/L-JHP (249) • S-DDUNR/L (290)

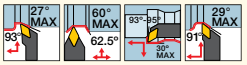
ISCAR PCD LINE

DNGA MT (PCD)

Negative 55° Rhombic Inserts with a Single PCD Mini Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
DNGA 150402F-MT	15.50	12.70	4.76	0.20	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60
DNGA 150404F-MT	15.50	12.70	4.76	0.40	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60
DNGA 150408F-MT	15.50	12.70	4.76	0.80	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60
DNGA 150602F-MT	15.50	12.70	6.35	0.20	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60
DNGA 150604F-MT	15.50	12.70	6.35	0.40	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60
DNGA 150608F-MT	15.50	12.70	6.35	0.80	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60

• For user guide and cutting speed recommendations, see pages 182-187

For tools, see pages: A/S-PDUNR/L (291) • AVC-DDUNR/L (290) • AVC-DDUNR/L-VH (291) • C#-DDJNR/L (246) • C#-PDJNR/L-JHP (249) • DDJNR/L (245) • DDJNR/L-JHP-MC (245) • HSK A63WH-DDJNR/L (246) • HSK A63WH-DDNNN (246) • PDJNR/L (248) • PDJNR/L-JHP (249) • S-DDUNR/L (290)

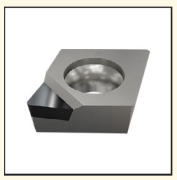
Material		N Non-Ferrous Materials		
Grade		ID5*	ID8	ID4
Tougher ↕ Harder	Heavy interrupted			▲
	Light interrupted	▲	▲	
	Continuous			

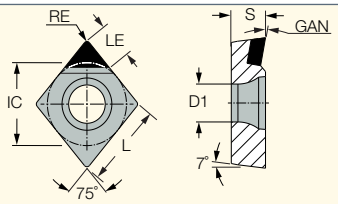
* First choice

ISCAR PCD LINE

ECGT (PCD)

Positive 75° Rhombic Inserts with Single PCD Top Corner Tip and Positive Rake for Finishing Non-Ferrous Materials





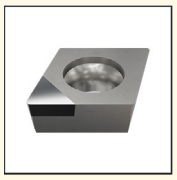
Designation	Dimensions L	IC	S	RE	LE	D1	GAN	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
ECGT 09T304F	9.80	9.52	3.97	0.40	4.00	4.40	10.0	●	●	●	0.05-2.50	0.03-0.60
ECGT 09T308F	9.80	9.52	3.97	0.80	4.00	4.40	10.0	●	●	●	0.05-3.00	0.03-0.60
ECGT 12T304F	13.10	12.70	3.97	0.40	4.00	5.50	10.0	●	●	●	0.05-2.50	0.03-0.60
ECGT 12T308F	13.10	12.70	3.97	0.80	4.00	5.50	10.0	●	●	●	0.05-2.50	0.03-0.60

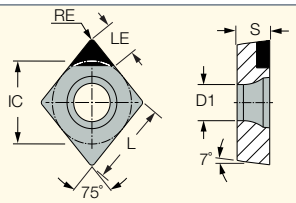
• For user guide and cutting speed recommendations, see pages 182-187

ISCAR PCD LINE

ECGW (PCD)

Positive 75° Rhombic Inserts with Single PCD Top Corner Tip for Finishing Non-Ferrous Materials





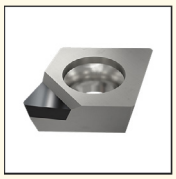
Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
ECGW 09T304F	9.80	9.52	3.97	0.40	4.00	4.40	●	●	●	0.05-2.50	0.03-0.60
ECGW 09T308F	9.80	9.52	3.97	0.80	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
ECGW 12T304F	13.10	12.70	3.97	0.40	4.00	5.50	●	●	●	0.05-2.50	0.03-0.60
ECGW 12T308F	13.10	12.70	3.97	0.80	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60

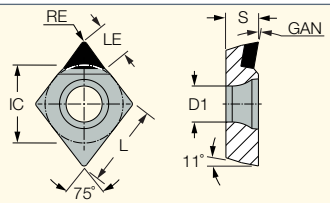
• For user guide and cutting speed recommendations, see pages 182-187

ISCAR PCD LINE

EPGT (PCD)

Positive 75° Rhombic Inserts with Single PCD Top Corner Tip and Positive Rake for Finishing Non-Ferrous Materials





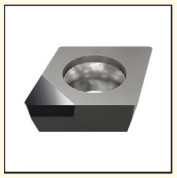
Designation	Dimensions L	IC	S	RE	LE	D1	GAN	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
EPGT 080302F	8.30	7.94	3.18	0.20	4.00	3.40	10.0	●	●	●	0.05-1.50	0.03-0.60
EPGT 080304F	8.30	7.94	3.18	0.40	4.00	3.40	10.0	●	●	●	0.05-2.00	0.03-0.60
EPGT 080308F	8.30	7.94	3.18	0.80	4.00	3.40	10.0	●	●	●	0.05-3.00	0.03-0.60

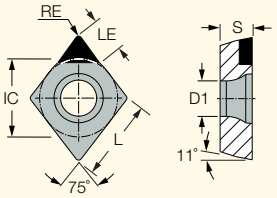
• For user guide and cutting speed recommendations, see pages 182-187

ISCAR PCD LINE

EPGW (PCD)

Positive 75° Rhombic Inserts with Single PCD Top Corner Tip for Finishing Non-Ferrous Materials





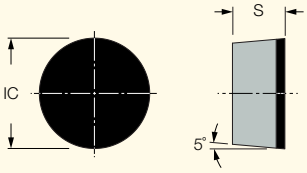
Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
EPGW 040202F	4.80	4.76	2.38	0.20	2.50	2.15	●	●	●	0.05-1.50	0.03-0.60
EPGW 040204F	4.80	4.76	2.38	0.40	2.50	2.15	●	●	●	0.05-2.00	0.03-0.60
EPGW 060204F	6.50	6.35	2.38	0.40	3.00	2.80	●	●	●	0.05-2.00	0.03-0.60
EPGW 060202F	6.50	6.35	2.38	0.20	3.00	2.80	●	●	●	0.05-1.50	0.03-0.60
EPGW 080302F	8.30	7.94	3.18	0.20	4.00	3.40	●	●		0.05-1.50	0.03-0.60
EPGW 080304F	8.30	7.94	3.18	0.40	4.00	3.40	●		●	0.05-2.00	0.03-0.60
EPGW 080308F	8.30	7.94	3.18	0.80	4.00	3.40		●	●	0.05-3.00	0.03-0.60

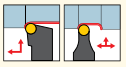
• For user guide and cutting speed recommendations, see pages 182-187

ISCAR PCD LINE

RBGN HS (PCD)

Positive Round Type Half Solid Top CBN Inserts





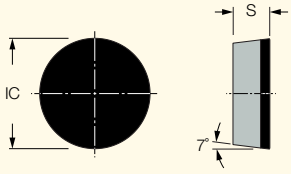
Designation	Dimensions IC	S	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
RBGN 060200F-HS	6.35	2.38	●	●	●	0.05-2.00	0.03-0.60
RBGN 070200F-HS	7.94	2.38	●	●	●	0.05-2.50	0.03-0.60
RBGN 090300F-HS	9.52	3.18	●	●	●	0.05-3.00	0.03-0.60
RBGN 120300F-HS	12.70	3.18	●	●	●	0.05-4.00	0.03-0.60
RBGN 120400F-HS	12.70	4.76	●	●	●	0.05-4.00	0.03-0.60

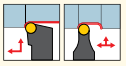
• For user guide and cutting speed recommendations, see pages 182-187

ISCAR PCD LINE

RCGN HS (PCD)

Positive Round Type Half Solid Top PCD Inserts





Designation	Dimensions IC	S	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
RCGN 090300F-HS	9.52	3.18	●	●	●	0.05-3.00	0.03-0.60
RCGN 120300F-HS	12.70	3.18	●	●	●	0.05-4.00	0.03-0.60
RCGN 120400F-HS	12.70	4.76	●	●	●	0.05-4.00	0.03-0.60

• For user guide and cutting speed recommendations, see pages 182-187

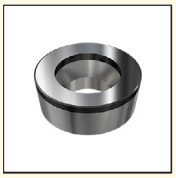
Material			N Non-Ferrous Materials		
Grade			ID5*	ID8	ID4
Tougher		Heavy interrupted			▲
↕		Light interrupted	▲	▲	
Harder		Continuous			

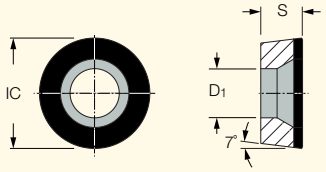
* First choice

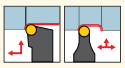
ISCAR PCD LINE

RCGW HS (PCD)

Positive Round Type Half
Solid Top PCD Inserts







Designation	Dimensions IC	S	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
RCGW 0602M0F-HS	6.00	2.38	2.80	•	•	•	0.05-3.00	0.03-0.60
RCGW 0803M0F-HS	8.00	3.18	3.40	•	•	•	0.05-4.00	0.03-0.60
RCGW 1003M0F-HS	10.00	3.18	4.40	•	•	•	0.05-4.00	0.03-0.60

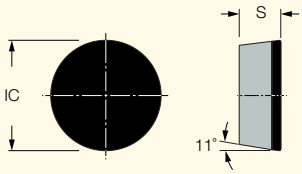
• For user guide and cutting speed recommendations, see pages 182-187

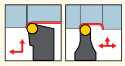
For tools, see pages: SRDCN (254) • SRGCR/L (255)

ISCAR PCD LINE

RPGN HS (PCD)

Positive Round Type Half
Solid Top PCD Inserts





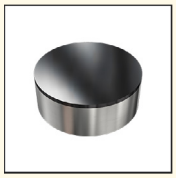
Designation	Dimensions IC	S	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
RPGN 060200F-HS	6.35	2.38	•	•	•	0.05-3.00	0.03-0.60
RPGN 070200F-HS	7.94	2.38	•	•	•	0.05-3.00	0.03-0.60
RPGN 090300F-HS	9.52	3.18	•	•	•	0.05-3.50	0.03-0.60
RPGN 120300F-HS	12.70	3.18	•	•	•	0.05-4.00	0.03-0.60
RPGN 120400F-HS	12.70	4.76	•	•	•	0.05-4.00	0.03-0.60

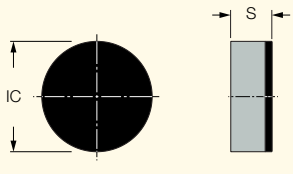
• For user guide and cutting speed recommendations, see pages 182-187

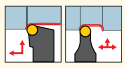
ISCAR PCD LINE

RNGN HS (PCD)

Negative Round Type Half
Solid Top PCD Inserts







Designation	Dimensions IC	S	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
RNGN 0903M0F-HS	9.00	3.18	•	•	•	0.05-3.00	0.03-0.60
RNGN 090300F-HS	9.52	3.18	•	•	•	0.05-3.00	0.03-0.60
RNGN 1203M0F-HS	12.00	3.18	•	•	•	0.05-4.00	0.03-0.60
RNGN 120300F-HS	12.70	3.18	•	•	•	0.05-4.00	0.03-0.60
RNGN 1204M0F-HS	12.00	4.76	•	•	•	0.05-4.00	0.03-0.60
RNGN 120400F-HS	12.70	4.76	•	•	•	0.05-4.00	0.03-0.60

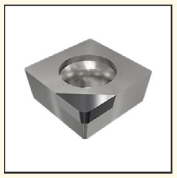
• For user guide and cutting speed recommendations, see pages 182-187

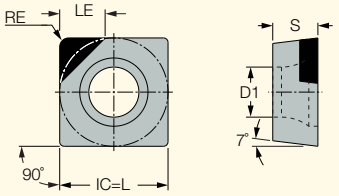
For tools, see pages: • CRDNN-F (74) • CRGNR/L (254) • FRN (110)

ISCAR PCD LINE

SCGW (PCD)

Positive Square Inserts with Single PCD Top Corner Tip for Finishing Non-Ferrous Materials





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
SCGW 060202F	6.35	6.35	2.38	0.20	3.00	2.80		●	●	0.05-1.50	0.03-0.60
SCGW 060204F	6.35	6.35	2.38	0.40	3.00	2.80	●	●	●	0.05-2.00	0.03-0.60
SCGW 09T302F	9.52	9.52	3.97	0.20	4.00	4.40	●	●	●	0.05-1.50	0.03-0.60
SCGW 09T304F	9.52	9.52	3.97	0.40	4.00	4.40	●	●	●	0.05-2.00	0.03-0.60
SCGW 09T308F	9.52	9.52	3.97	0.80	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
SCGW 090302F	9.52	9.52	3.18	0.20	4.00	4.40	●	●	●	0.05-1.50	0.03-0.60
SCGW 090304F	9.52	9.52	3.18	0.40	4.00	4.40	●	●	●	0.05-2.00	0.03-0.60
SCGW 090308F	9.52	9.52	3.18	0.80	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
SCGW 120404F	12.70	12.70	4.76	0.40	4.00	5.50	●	●		0.05-2.00	0.03-0.60
SCGW 120408F	12.70	12.70	4.76	0.80	4.00	5.50	●		●	0.05-2.50	0.03-0.60

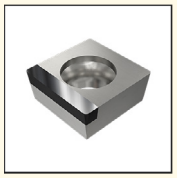
• For user guide and cutting speed recommendations, see pages 182-187

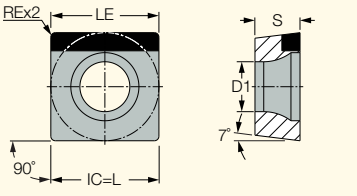
For tools, see pages: IHPR (294) • SSBCR/L (261) • SSSCR/L (261)

ISCAR PCD LINE

SCGW L (PCD)

Positive Square Inserts with Full-Edge PCD Tip (Right or Left Hand) for Finishing Non-Ferrous Materials





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
SCGW 060202F-L	6.35	6.35	2.38	0.20	6.35	2.80	●	●	●	0.05-6.30	0.03-0.60
SCGW 060204F-L	6.35	6.35	2.38	0.40	6.35	2.80	●	●	●	0.05-6.30	0.03-0.60
SCGW 09T302F-L	9.52	9.52	3.97	0.20	9.52	4.40	●	●	●	0.05-9.50	0.03-0.60
SCGW 09T304F-L	9.52	9.52	3.97	0.40	9.52	4.40	●	●	●	0.05-9.50	0.03-0.60
SCGW 09T308F-L	9.52	9.52	3.97	0.80	9.52	4.40	●	●	●	0.05-9.50	0.03-0.60
SCGW 120404F-L	12.70	12.70	4.76	0.40	12.70	5.50	●	●	●	0.05-12.70	0.03-0.60
SCGW 120408F-L	12.70	12.70	4.76	0.80	12.70	5.50	●	●	●	0.05-12.70	0.03-0.60

• For user guide and cutting speed recommendations, see pages 182-187

For tools, see pages: IHPR (294) • SSBCR/L (261) • SSSCR/L (261)

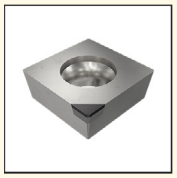
Material			N Non-Ferrous Materials		
Grade			ID5*	ID8	ID4
Tougher ↕ Harder	⚙	Heavy interrupted			▲
	⚙	Light interrupted	▲	▲	▲
	●	Continuous	▲	▲	▲

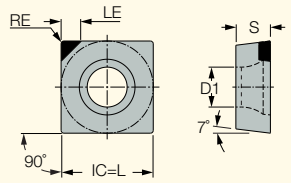
* First choice

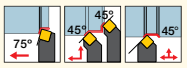
ISCAR PCD LINE

SCGW MT (PCD)

Positive Square Inserts with a Single PCD Mini Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
SCGW 09T302F-MT	9.52	9.52	3.97	0.20	2.70	4.40	●	●	●	0.05-2.00	0.03-0.60
SCGW 09T304F-MT	9.52	9.52	3.97	0.40	2.70	4.40	●	●	●	0.05-2.00	0.03-0.60
SCGW 09T308F-MT	9.52	9.52	3.97	0.80	2.70	4.40	●	●	●	0.05-2.00	0.03-0.60
SCGW 120404F-MT	12.70	12.70	4.76	0.40	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60
SCGW 120408F-MT	12.70	12.70	4.76	0.80	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60
SCGW 120412F-MT	12.70	12.70	4.76	1.20	2.70	5.50	●	●	●	0.05-2.00	0.03-0.60

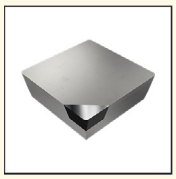
- For user guide and cutting speed recommendations, see pages 182-187

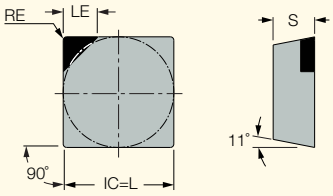
For tools, see pages: IHPR (294) • SSBCR/L (261) • SSSCR/L (261)

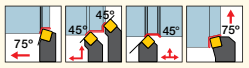
ISCAR PCD LINE

SPGN (PCD)

Positive Square Inserts with Single PCD Top Corner Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
SPGN 070202F	7.94	7.94	2.38	0.20	3.00	●	●	●	0.05-2.50	0.03-0.60
SPGN 070204F	7.94	7.94	2.38	0.40	3.00	●	●	●	0.05-2.50	0.03-0.60
SPGN 090302F	9.52	9.52	3.18	0.20	4.00	●	●	●	0.05-3.00	0.03-0.60
SPGN 090304F	9.52	9.52	3.18	0.40	4.00	●	●	●	0.05-3.00	0.03-0.60
SPGN 120304F	12.70	12.70	3.18	0.40	4.00	●	●	●	0.05-3.00	0.03-0.60
SPGN 120308F	12.70	12.70	3.18	0.80	4.00	●	●	●	0.05-3.00	0.03-0.60
SPGN 120404F	12.70	12.70	4.76	0.40	4.00	●	●	●	0.05-4.00	0.03-0.60
SPGN 120408F	12.70	12.70	4.76	0.80	4.00	●	●	●	0.05-4.00	0.03-0.60

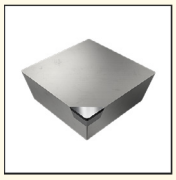
- For user guide and cutting speed recommendations, see pages 182-187

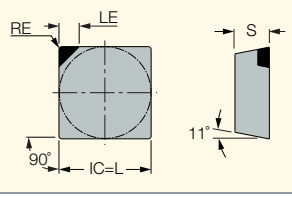
For tools, see pages: CSDPN (256) • CSSPR/L (256) • S-CSKPR (294)

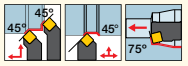
ISCAR PCD LINE

SPGN MT (PCD)

Positive Square Inserts with a Single PCD Mini Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
SPGN 120304F-MT	12.70	12.70	3.18	0.40	2.70	●	●	●	0.05-0.50	0.03-0.60
SPGN 120308F-MT	12.70	12.70	3.18	0.80	2.70	●	●	●	0.05-0.50	0.03-0.60
SPGN 120404F-MT	12.70	12.70	4.76	0.40	2.70	●	●	●	0.05-0.50	0.03-0.60
SPGN 120408F-MT	12.70	12.70	4.76	0.80	2.70	●	●	●	0.05-0.50	0.03-0.60

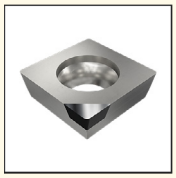
- For user guide and cutting speed recommendations, see pages 182-187

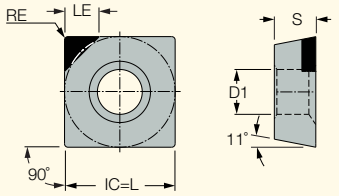
For tools, see pages: CSDPN (256) • CSSPR/L (256) • S-CSKPR (294)

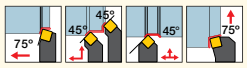
ISCAR PCD LINE

SPGW (PCD)

Positive Square Inserts with Single PCD Top Corner Tip for Finishing Non-Ferrous Materials







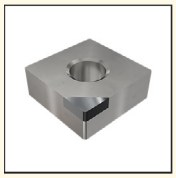
Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
SPGW 070302F	7.94	7.94	3.18	0.20	3.00	3.40	●	●	●	0.05-0.50	0.03-0.60
SPGW 070304F	7.94	7.94	3.18	0.40	3.00	3.40	●	●	●	0.05-0.50	0.03-0.60
SPGW 09T302F	9.52	9.52	3.97	0.20	4.00	4.40	●	●	●	0.05-0.50	0.03-0.60
SPGW 09T304F	9.52	9.52	3.97	0.40	4.00	4.40	●	●	●	0.05-0.50	0.03-0.60
SPGW 09T308F	9.52	9.52	3.97	0.80	4.00	4.40	●	●	●	0.05-0.50	0.03-0.60
SPGW 090302F	9.52	9.52	3.18	0.20	4.00	4.40	●	●	●	0.05-0.50	0.03-0.60
SPGW 090304F	9.52	9.52	3.18	0.40	4.00	4.40	●	●	●	0.05-0.50	0.03-0.60
SPGW 090308F	9.52	9.52	3.18	0.80	4.00	4.40	●	●	●	0.05-0.50	0.03-0.60
SPGW 120402F	12.70	12.70	4.76	0.20	4.00	5.50	●	●	●	0.05-0.50	0.03-0.60
SPGW 120404F	12.70	12.70	4.76	0.40	4.00	5.50	●	●	●	0.05-0.50	0.03-0.60
SPGW 120408F	12.70	12.70	4.76	0.80	4.00	5.50	●	●	●	0.05-0.50	0.03-0.60

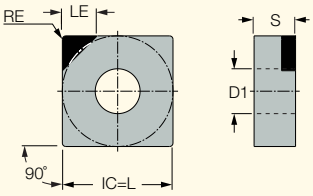
• For user guide and cutting speed recommendations, see pages 182-187

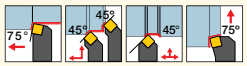
ISCAR PCD LINE

SNGA (PCD)

Negative Square Inserts with Single PCD Top Corner Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGA 090304F	9.52	9.52	3.18	0.40	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
SNGA 090308F	9.52	9.52	3.18	0.80	4.00	4.40	●	●	●	0.05-3.00	0.03-0.60
SNGA 120404F	12.70	12.70	4.76	0.40	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60
SNGA 120408F	12.70	12.70	4.76	0.80	4.00	5.50	●	●	●	0.05-3.00	0.03-0.60

• For user guide and cutting speed recommendations, see pages 182-187

For tools, see pages: C#-MULNR/L-MW (268) • DSBNR/L (256) • DSDNN (257) • DSKNR/L (257) • DSSNR/L (257) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PSBNR/L (258) • PSDNN (258) • PSDNN-JHP (259) • PSKNR/L (259) • PSSNR/L (260) • PSSNR/L-JHP (260)

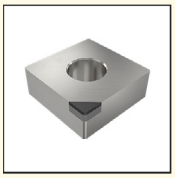
Material			N		
			Non-Ferrous Materials		
Grade			ID5*	ID8	ID4
Tougher		Heavy interrupted			
↕		Light interrupted			
Harder		Continuous			

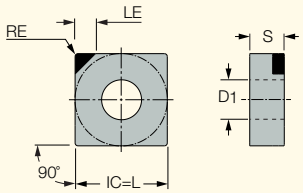
* First choice

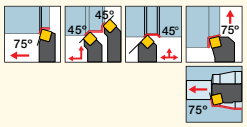
ISCAR PCD LINE

SNGA MT (PCD)

Negative Square Inserts with a Single PCD Mini Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGA 120404F-MT	12.70	12.70	4.76	0.40	2.70	5.50	●	●	●	0.05-0.50	0.03-0.60
SNGA 120408F-MT	12.70	12.70	4.76	0.80	2.70	5.50	●	●	●	0.05-0.50	0.03-0.60

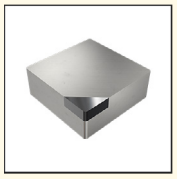
• For user guide and cutting speed recommendations, see pages 182-187

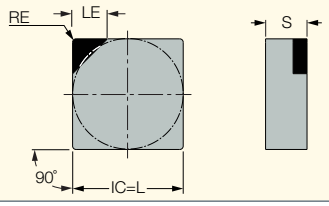
For tools, see pages: C#-MULNR/L-MW (268) • DSBNR/L (256) • DSDNN (257) • DSKNR/L (257) • DSSNR/L (257) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • PSBNR/L (258) • PSDNN (258) • PSDNN-JHP (259) • PSKNR/L (259) • PSSNR/L (260) • PSSNR/L-JHP (260)

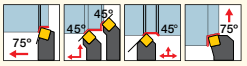
ISCAR PCD LINE

SNGN (PCD)

Negative Square Inserts with Single PCD Top Corner Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGN 090304F	9.52	9.52	3.18	0.40	4.00	●	●	●	0.05-3.00	0.03-0.60
SNGN 090308F	9.52	9.52	3.18	0.80	4.00	●	●	●	0.05-3.00	0.03-0.60
SNGN 120304F	12.70	12.70	3.18	0.40	4.00	●	●	●	0.05-3.00	0.03-0.60
SNGN 120308F	12.70	12.70	3.18	0.80	4.00	●	●	●	0.05-3.00	0.03-0.60
SNGN 120404F	12.70	12.70	4.76	0.40	4.00	●	●	●	0.05-3.00	0.03-0.60
SNGN 120408F	12.70	12.70	4.76	0.80	4.00	●	●	●	0.05-3.00	0.03-0.60

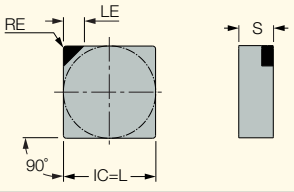
• For user guide and cutting speed recommendations, see pages 182-187

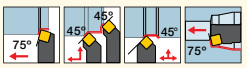
For tools, see pages: CSDNN-CE/CEA (255) • CSDNN-F/X (74) • CSKNR/L-F/X (75) • CSRNR/L-F/X (75) • CSSNR/L-F/X (76) • CSXNR/L-F/X (76) • CSYNR/L-F/X (77)

ISCAR PCD LINE

SNGN MT (PCD)

Negative Square Inserts with a Single PCD Mini Tip for Finishing Non-Ferrous Materials





Designation	Dimensions L	IC	S	RE	LE	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGN 120404F-MT	12.70	12.70	4.76	0.40	2.70	●	●	●	0.05-0.50	0.03-0.60
SNGN 120408F-MT	12.70	12.70	4.76	0.80	2.70	●	●	●	0.05-0.50	0.03-0.60

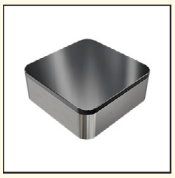
• For user guide and cutting speed recommendations, see pages 182-187

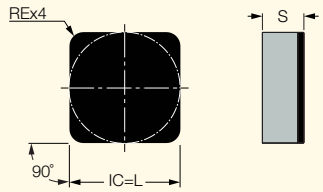
For tools, see pages: CSDNN-CE/CEA (255) • CSDNN-F/X (74) • CSKNR/L-F/X (75) • CSRNR/L-F/X (75) • CSSNR/L-F/X (76) • CSXNR/L-F/X (76) • CSYNR/L-F/X (77)

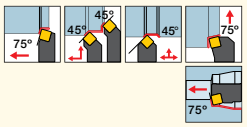
ISCAR PCD LINE

SNGN HS (PCD)

Negative Square Type Half Solid Top PCD Inserts







Designation	Dimensions L	IC	S	RE	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
SNGN 090304F-HS	9.52	9.52	3.18	0.40	●	●	●	0.05-9.00	0.03-0.60
SNGN 090308F-HS	9.52	9.52	3.18	0.80	●	●	●	0.05-9.00	0.03-0.60
SNGN 090312F-HS	9.52	9.52	3.18	1.20	●	●	●	0.05-9.00	0.03-0.60
SNGN 090316F-HS	9.52	9.52	3.18	1.60	●	●	●	0.05-9.00	0.03-0.60
SNGN 120304F-HS	12.70	12.70	3.18	0.40	●	●	●	0.05-11.00	0.03-0.60
SNGN 120308F-HS	12.70	12.70	3.18	0.80	●	●	●	0.05-11.00	0.03-0.60
SNGN 120312F-HS	12.70	12.70	3.18	1.20	●	●	●	0.05-11.00	0.03-0.60
SNGN 120316F-HS	12.70	12.70	3.18	1.60	●	●	●	0.05-11.00	0.03-0.60
SNGN 120404F-HS	12.70	12.70	4.76	0.40	●	●	●	0.05-11.00	0.03-0.60
SNGN 120408F-HS	12.70	12.70	4.76	0.80	●	●	●	0.05-11.00	0.03-0.60
SNGN 120412F-HS	12.70	12.70	4.76	1.20	●	●	●	0.05-11.00	0.03-0.60
SNGN 120416F-HS	12.70	12.70	4.76	1.60	●	●	●	0.05-11.00	0.03-0.60

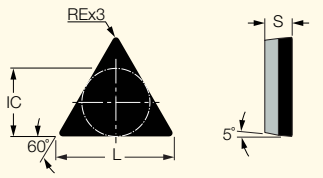
• For user guide and cutting speed recommendations, see pages 182-187

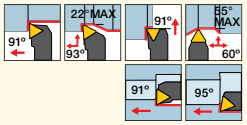
For tools, see pages: CSDNN-CE/CEA (255) • CSDNN-F/X (74) • CSKNR/L-F/X (75) • CSRNR/L-F/X (75) • CSSNR/L-F/X (76) • CSXNR/L-F/X (76) • CSYNR/L-F/X (77)

ISCAR PCD LINE

TBGN HS (PCD)

Positive 60° Triangular Type Half Solid Top PCD Inserts





Designation	Dimensions L	IC	S	RE	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TBGN 060101F-HS	6.90	3.97	1.59	0.10	●	●	●	0.05-6.00	0.03-0.60
TBGN 060102F-HS	6.90	3.97	1.59	0.20	●	●	●	0.05-6.00	0.03-0.60
TBGN 060104F-HS	6.90	3.97	1.59	0.40	●	●	●	0.05-6.00	0.03-0.60
TBGN 060108F-HS	6.90	3.97	1.59	0.80	●	●	●	0.05-6.00	0.03-0.60

• For user guide and cutting speed recommendations, see pages 182-187

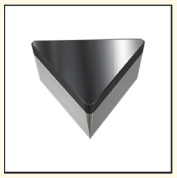
Material			N Non-Ferrous Materials		
Grade			ID5*	ID8	ID4
Tougher ↕ Harder	⬡	Heavy interrupted			▲
	⬡	Light interrupted	▲	▲	
	●	Continuous			

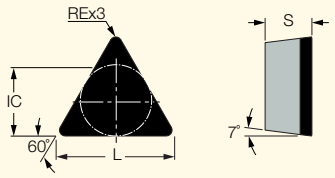
* First choice

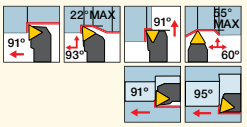
ISCAR PCD LINE

TCGN HS (PCD)

Positive 60° Triangular Half Solid Top PCD Inserts







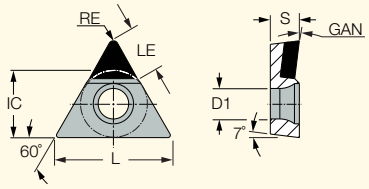
Designation	Dimensions L	IC	S	RE	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TCGN 060102F-HS	6.90	3.97	1.59	0.20	●	●	●	0.05-6.00	0.03-0.60
TCGN 060104F-HS	6.90	3.97	1.59	0.40	●	●	●	0.05-6.00	0.03-0.60
TCGN 060108F-HS	6.90	3.97	1.59	0.80	●	●	●	0.05-6.00	0.03-0.60

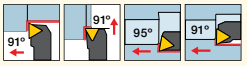
• For user guide and cutting speed recommendations, see pages 182-187

ISCAR PCD LINE

TCGT (PCD)

Positive 60° Triangular Inserts with Single PCD Top Corner Tip and Positive Rake for Finishing Non-Ferrous Materials





Designation	Dimensions L	IC	S	RE	LE	D1	GAN	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TCGT 090202F	9.60	5.56	2.38	0.20	3.00	2.50	7.0	●	●	●	0.05-0.50	0.03-0.60
TCGT 090204F	9.60	5.56	2.38	0.40	3.00	2.50	7.0	●	●	●	0.05-0.50	0.03-0.60
TCGT 090208F	9.60	5.56	2.38	0.80	3.00	2.50	7.0	●	●	●	0.05-0.50	0.03-0.60
TCGT 110202F	11.00	6.35	2.38	0.20	4.00	2.80	7.0	●	●	●	0.05-0.50	0.03-0.60
TCGT 110204F	11.00	6.35	2.38	0.40	4.00	2.80	7.0	●	●	●	0.05-0.50	0.03-0.60
TCGT 110208F	11.00	6.35	2.38	0.80	4.00	2.80	7.0	●	●	●	0.05-0.50	0.03-0.60
TCGT 16T304F	16.50	9.52	3.97	0.40	4.00	4.40	10.0	●	●	●	0.05-1.00	0.03-0.60
TCGT 16T308F	16.50	9.52	3.97	0.80	4.00	4.40	10.0	●	●	●	0.05-1.00	0.03-0.60

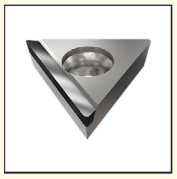
• For user guide and cutting speed recommendations, see pages 182-187

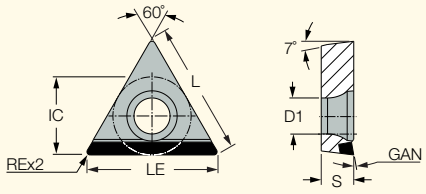
For tools, see pages: E-STFCR-HEAD (296) • S-MTLCR/L-W (295) • S-STFCR/L (296) • S-STLCR/L (297) • STFCR/L (266) • STGCR/L (267)

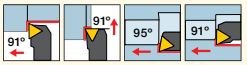
ISCAR PCD LINE

TCGT L (PCD)

Positive 60° Triangular Inserts with Full-Edge PCD Tip (Right or Left Hand) for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	GAN	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TCGT 090202F-L	9.60	5.56	2.38	0.20	9.34	2.50	7.0	●	●	●	0.05-9.00	0.03-0.60
TCGT 090204F-L	9.60	5.56	2.38	0.40	9.04	2.50	7.0	●	●	●	0.05-9.00	0.03-0.60
TCGT 110202F-L	11.00	6.35	2.38	0.20	10.71	2.80	7.0	●	●	●	0.05-10.40	0.03-0.60
TCGT 110204F-L	11.00	6.35	2.38	0.40	10.41	2.80	7.0	●	●	●	0.05-10.40	0.03-0.60
TCGT 110208F-L	11.00	6.35	2.38	0.80	9.83	2.80	7.0	●	●	●	0.05-9.50	0.03-0.60
TCGT 16T302F-L	16.50	9.52	3.97	0.20	16.20	4.40	10.0	●	●	●	0.05-15.90	0.03-0.60
TCGT 16T304F-L	16.50	9.52	3.97	0.40	15.91	4.40	10.0	●	●	●	0.05-15.90	0.03-0.60
TCGT 16T308F-L	16.50	9.52	3.97	0.80	15.33	4.40	10.0	●	●	●	0.05-15.30	0.03-0.60

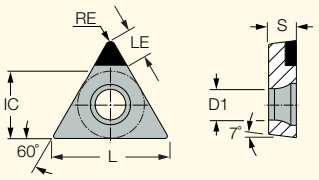
• For user guide and cutting speed recommendations, see pages 182-187

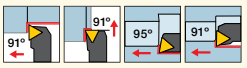
For tools, see pages: E-STFCR-HEAD (296) • S-MTLCR/L-W (295) • S-STFCR/L (296) • S-STLCR/L (297) • STFCR/L (266) • STGCR/L (267)

ISCAR PCD LINE

TCGT MD/RD (PCD)

Positive 60° Triangular Inserts with MD/RD Chipbreaking PCD Tips for Non-Ferrous Metals Finishing & Medium App.





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TCGT 110202F MD	11.00	6.35	2.38	0.20	4.00	2.80	•	•	•	0.05-1.00	0.03-0.60
TCGT 110202F RD	11.00	6.35	2.38	0.20	4.00	2.80	•	•	•	0.05-1.00	0.03-0.60
TCGT 110204F MD	11.00	6.35	2.38	0.40	4.00	2.80	•	•	•	0.05-1.00	0.03-0.60
TCGT 110204F RD	11.00	6.35	2.38	0.40	4.00	2.80	•	•	•	0.05-1.00	0.03-0.60
TCGT 110208F MD	11.00	6.35	2.38	0.80	4.00	2.80	•	•	•	0.05-1.00	0.03-0.60
TCGT 110208F RD	11.00	6.35	2.38	0.80	4.00	2.80	•	•	•	0.05-1.00	0.03-0.60
TCGT 16T304F MD	16.50	9.52	3.97	0.40	4.00	4.40	•	•	•	0.05-1.00	0.03-0.60
TCGT 16T304F RD	16.50	9.52	3.97	0.40	4.00	4.40	•	•	•	0.05-1.00	0.03-0.60
TCGT 16T308F MD	16.50	9.52	3.97	0.80	4.00	4.40	•	•	•	0.05-1.00	0.03-0.60
TCGT 16T308F RD	16.50	9.52	3.97	0.80	4.00	4.40	•	•	•	0.05-1.00	0.03-0.60

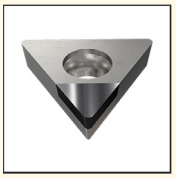
• For user guide and cutting speed recommendations, see pages 182-187

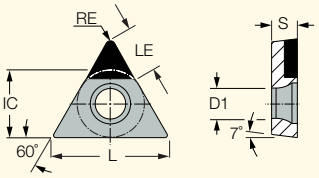
For tools, see pages: E-STFCR-HEAD (296) • S-MTLCR/L-W (295) • S-STFCR/L (296) • S-STLCR/L (297) • STFCR/L (266) • STGCR/L (267)

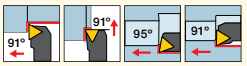
ISCAR PCD LINE

TCGW (PCD)

Positive 60° Triangular Inserts with Single PCD Top Corner Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TCGW 090202F	9.60	5.56	2.38	0.20	3.00	2.50	•	•	•	0.05-0.50	0.03-0.60
TCGW 090204F	9.60	5.56	2.38	0.40	3.00	2.50	•	•	•	0.05-0.50	0.03-0.60
TCGW 090208F	9.60	5.56	2.38	0.80	3.00	2.50	•	•	•	0.05-0.50	0.03-0.60
TCGW 110202F	11.00	6.35	2.38	0.20	4.00	2.80	•	•	•	0.05-1.00	0.03-0.60
TCGW 110204F	11.00	6.35	2.38	0.40	4.00	2.80	•	•	•	0.05-1.00	0.03-0.60
TCGW 110208F	11.00	6.35	2.38	0.80	4.00	2.80	•	•	•	0.05-1.00	0.03-0.60
TCGW 130304F	13.70	7.94	3.18	0.40	4.00	3.40	•	•	•	0.05-1.00	0.03-0.60
TCGW 130308F	13.70	7.94	3.18	0.80	4.00	3.40	•	•	•	0.05-1.00	0.03-0.60
TCGW 16T302F	16.50	9.52	3.97	0.20	4.00	4.40	•	•	•	0.05-1.00	0.03-0.60
TCGW 16T304F	16.50	9.52	3.97	0.40	4.00	4.40	•	•	•	0.05-1.00	0.03-0.60
TCGW 16T308F	16.50	9.52	3.97	0.80	4.00	4.40	•	•	•	0.05-1.00	0.03-0.60
TCGW 16T312F	16.50	9.52	3.97	1.20	4.00	4.40	•	•	•	0.05-1.00	0.03-0.60

• For user guide and cutting speed recommendations, see pages 182-187

For tools, see pages: E-STFCR-HEAD (296) • S-MTLCR/L-W (295) • S-STFCR/L (296) • S-STLCR/L (297) • STFCR/L (266) • STGCR/L (267)

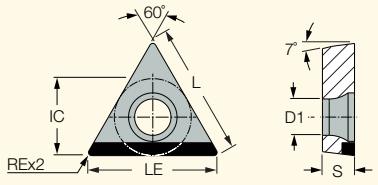
Material		N Non-Ferrous Materials		
Grade		ID5*	ID8	ID4
Tougher ↕ Harder	Heavy interrupted			▲
	Light interrupted	▲	▲	
	Continuous			

* First choice

ISCAR PCD LINE

TCGW L (PCD)

Positive 60° Triangular Inserts with Full-Edge PCD Tip (Right or Left Hand) for Finishing Non-Ferrous Materials



Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TCGW 090202F-L	9.60	5.56	2.38	0.20	9.34	2.50	●	●	●	0.05-9.00	0.03-0.60
TCGW 090204F-L	9.60	5.56	2.38	0.40	9.04	2.50	●	●	●	0.05-9.00	0.03-0.60
TCGW 110202F-L	11.00	6.35	2.38	0.20	10.71	2.80	●	●	●	0.05-10.40	0.03-0.60
TCGW 110204F-L	11.00	6.35	2.38	0.40	10.41	2.80	●	●	●	0.05-10.40	0.03-0.60
TCGW 110208F-L	11.00	6.35	2.38	0.80	9.83	2.80	●	●	●	0.05-9.50	0.03-0.60
TCGW 16T302F-L	16.50	9.52	3.97	0.20	16.20	4.40	●	●	●	0.05-15.90	0.03-0.60
TCGW 16T304F-L	16.50	9.52	3.97	0.40	15.91	4.40	●	●	●	0.05-15.90	0.03-0.60
TCGW 16T308F-L	16.50	9.52	3.97	0.80	15.33	4.40	●	●	●	0.05-15.30	0.03-0.60

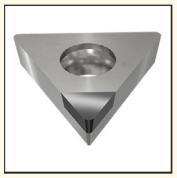
• For user guide and cutting speed recommendations, see pages 182-187

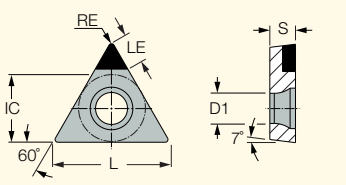
For tools, see pages: E-STFCR-HEAD (296) • S-MTLCR/L-W (295) • S-STFCR/L (296) • S-STLCR/L (297) • STFCR/L (266) • STGCR/L (267)

ISCAR PCD LINE

TCGW MT (PCD)

Positive 60° Triangular Inserts with a Single PCD Mini Tip for Finishing Non-Ferrous Materials





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TCGW 090202F-MT	9.60	5.56	2.38	0.20	2.70	2.50	●	●	●	0.05-0.50	0.03-0.60
TCGW 090204F-MT	9.60	5.56	2.38	0.40	2.70	2.50	●	●	●	0.05-0.50	0.03-0.60
TCGW 110202F-MT	11.00	6.35	2.38	0.20	2.70	2.80	●	●	●	0.05-0.50	0.03-0.60
TCGW 110204F-MT	11.00	6.35	2.38	0.40	2.70	2.80	●	●	●	0.05-0.50	0.03-0.60
TCGW 110208F-MT	11.00	6.35	2.38	0.80	2.70	2.80	●	●	●	0.05-0.50	0.03-0.60
TCGW 130304F-MT	13.70	7.94	3.18	0.40	2.70	3.40	●	●	●	0.05-0.50	0.03-0.60
TCGW 130308F-MT	13.70	7.94	3.18	0.80	2.70	3.40	●	●	●	0.05-0.50	0.03-0.60
TCGW 16T302F-MT	16.50	9.52	3.97	0.20	2.70	4.40	●	●	●	0.05-0.50	0.03-0.60
TCGW 16T304F-MT	16.50	9.52	3.97	0.40	2.70	4.40	●	●	●	0.05-0.50	0.03-0.60
TCGW 16T308F-MT	16.50	9.52	3.97	0.80	2.70	4.40	●	●	●	0.05-0.50	0.03-0.60
TCGW 16T312F-MT	16.50	9.52	3.97	1.20	2.70	4.40	●	●	●	0.05-0.50	0.03-0.60

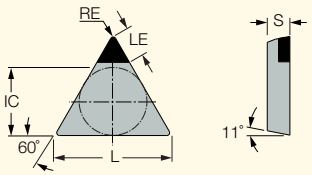
• For user guide and cutting speed recommendations, see pages 182-187

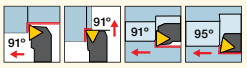
For tools, see pages: E-STFCR-HEAD (296) • S-MTLCR/L-W (295) • S-STFCR/L (296) • S-STLCR/L (297) • STFCR/L (266) • STGCR/L (267)

ISCAR PCD LINE

TPGN (PCD)

Positive 60° Triangular Inserts with a Single PCD Tip for Machining Non-Ferrous Materials





Designation	Dimensions L	IC	S	RE	LE	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TPGN 090202F	9.60	5.56	2.38	0.20	3.00	●	●	●	0.05-0.50	0.03-0.60
TPGN 090204F	9.90	5.56	2.38	0.40	3.00	●	●	●	0.05-0.50	0.03-0.60
TPGN 090208F	9.60	5.56	2.38	0.80	3.00	●	●	●	0.05-0.50	0.03-0.60
TPGN 110202F	11.00	6.35	2.38	0.20	4.00	●	●	●	0.05-1.00	0.03-0.60
TPGN 110204F	11.00	6.35	2.38	0.40	4.00	●	●	●	0.05-1.00	0.03-0.60
TPGN 110208F	11.00	6.35	2.38	0.80	4.00	●	●	●	0.05-1.00	0.03-0.60
TPGN 110302F	11.00	6.35	3.18	0.20	4.00	●	●	●	0.05-1.00	0.03-0.60
TPGN 110304F	11.00	6.35	3.18	0.40	4.00	●	●	●	0.05-1.00	0.03-0.60
TPGN 110308F	11.00	6.35	3.18	0.80	4.00	●	●	●	0.05-1.00	0.03-0.60
TPGN 160304F	16.50	9.52	3.18	0.40	4.00	●	●	●	0.05-1.00	0.03-0.60
TPGN 160308F	16.50	9.52	3.18	0.80	4.00	●	●	●	0.05-1.00	0.03-0.60

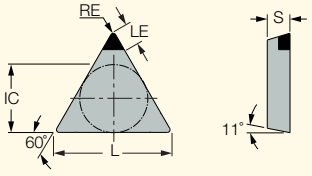
• For user guide and cutting speed recommendations, see pages 182-187

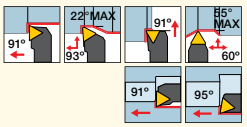
For tools, see pages: CTFPR/L (261) • CTGPR/L (262) • S-CTFPR/L (294)

ISCAR PCD LINE

TPGN MT (PCD)

Positive 60° Triangular Inserts with a Single PCD Mini Tip for Finishing Non-Ferrous Materials





Designation	Dimensions L	IC	S	RE	LE	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TPGN 110202F-MT	11.00	6.35	2.38	0.20	2.70	●	●	●	0.05-0.50	0.03-0.60
TPGN 110204F-MT	11.00	6.35	2.38	0.40	2.70	●	●	●	0.05-0.50	0.03-0.60
TPGN 110208F-MT	11.00	6.35	2.38	0.80	2.70	●	●	●	0.05-0.50	0.03-0.60
TPGN 110302F-MT	11.00	6.35	3.18	0.20	2.70	●	●	●	0.05-0.50	0.03-0.60
TPGN 110304F-MT	11.00	6.35	3.18	0.40	2.70	●	●	●	0.05-0.50	0.03-0.60
TPGN 110308F-MT	11.00	6.35	3.18	0.80	2.70	●	●	●	0.05-0.50	0.03-0.60
TPGN 160304F-MT	16.50	9.52	3.18	0.40	2.70	●	●	●	0.05-0.50	0.03-0.60
TPGN 160308F-MT	16.50	9.52	3.18	0.80	2.70	●	●	●	0.05-0.50	0.03-0.60

• For user guide and cutting speed recommendations, see pages 182-187

For tools, see pages: CTFPR/L (261) • CTGPR/L (262) • S-CTFPR/L (294)

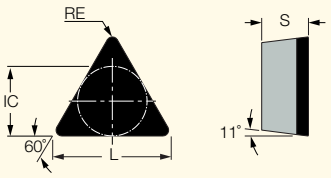
Material		N Non-Ferrous Materials		
Grade		ID5*	ID8	ID4
Tougher	Heavy interrupted			▲
↕	Light interrupted	▲	▲	
Harder	Continuous			

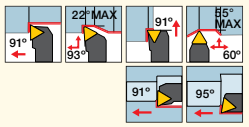
* First choice

ISCAR PCD LINE

TPGN HS (PCD)

Positive 60° Triangular Half Solid Top PCD Inserts





Designation	Dimensions L	IC	S	RE	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TPGN 090202F-HS	9.60	5.56	2.38	0.20	●	●	●	0.05-9.00	0.03-0.60
TPGN 090204F-HS	9.60	5.56	2.38	0.40	●	●	●	0.05-9.00	0.03-0.60
TPGN 090208F-HS	9.60	5.56	2.38	0.80	●	●	●	0.05-9.00	0.03-0.60
TPGN 110302F-HS	11.00	6.35	3.18	0.20	●	●	●	0.05-10.00	0.03-0.60
TPGN 110304F-HS	11.00	6.35	3.18	0.40	●	●	●	0.05-10.00	0.03-0.60
TPGN 110308F-HS	11.00	6.35	3.18	0.80	●	●	●	0.05-10.00	0.03-0.60

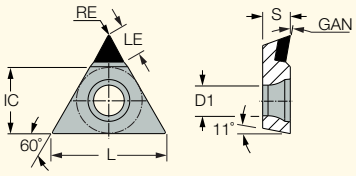
- For user guide and cutting speed recommendations, see pages 182-187

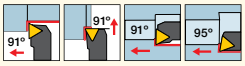
For tools, see pages: CTFPR/L (261) • CTGPR/L (262) • S-CTFPR/L (294)

ISCAR PCD LINE

TPGT (PCD)

Positive 60° Triangular Inserts with a Single PCD Tip for machining Non-Ferrous Materials





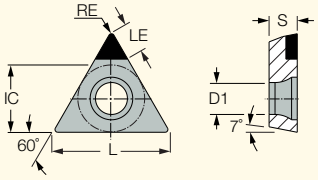
Designation	Dimensions L	IC	S	RE	LE	D1	GAN	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TPGT 110302F	11.00	6.35	3.18	0.20	4.00	2.80	10.0	●	●	●	0.05-1.00	0.03-0.60
TPGT 110304F	11.00	6.35	3.18	0.40	4.00	2.80	10.0	●	●	●	0.05-1.00	0.03-0.60
TPGT 110308F	11.00	6.35	3.18	0.80	4.00	2.80	10.0	●	●	●	0.05-1.00	0.03-0.60
TPGT 16T304F	16.50	9.52	3.97	0.40	4.00	4.40	10.0	●	●	●	0.05-1.00	0.03-0.60
TPGT 16T308F	16.50	9.52	3.97	0.80	4.00	4.40	10.0	●	●	●	0.05-1.00	0.03-0.60
TPGT 160404F	16.50	9.52	4.76	0.40	4.00	4.40	10.0	●	●	●	0.05-1.00	0.03-0.60
TPGT 160408F	16.50	9.52	4.76	0.80	4.00	4.40	10.0	●	●	●	0.05-1.00	0.03-0.60

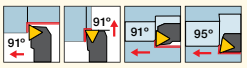
- For user guide and cutting speed recommendations, see pages 182-187

ISCAR PCD LINE

TPGW (PCD)

Positive 60° Triangular Inserts with a Single PCD Tip for machining Non-Ferrous Materials





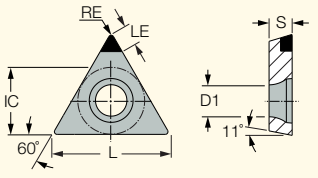
Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TPGW 110202F	11.00	6.35	2.38	0.20	4.00	2.80	●	●	●	0.05-1.00	0.03-0.60
TPGW 110204F	11.00	6.35	2.38	0.40	4.00	2.80	●	●	●	0.05-1.00	0.03-0.60
TPGW 110208F	11.00	6.35	2.38	0.80	4.00	2.80	●	●	●	0.05-1.00	0.03-0.60
TPGW 110302F	11.00	6.35	3.18	0.20	4.00	2.80	●	●	●	0.05-1.00	0.03-0.60
TPGW 110304F	11.00	6.35	3.18	0.40	4.00	2.80	●	●	●	0.05-1.00	0.03-0.60
TPGW 110308F	11.00	6.35	3.18	0.80	4.00	2.80	●	●	●	0.05-1.00	0.03-0.60
TPGW 16T304F	16.50	9.52	3.97	0.40	4.00	4.40	●	●	●	0.05-1.00	0.03-0.60
TPGW 16T308F	16.50	9.52	3.97	0.80	4.00	4.40	●	●	●	0.05-1.00	0.03-0.60
TPGW 160404F	16.50	9.52	4.76	0.40	4.00	4.40	●	●	●	0.05-1.00	0.03-0.60
TPGW 160408F	16.50	9.52	4.76	0.80	4.00	4.40	●	●	●	0.05-1.00	0.03-0.60

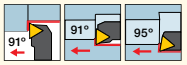
• For user guide and cutting speed recommendations, see pages 182-187

ISCAR PCD LINE

TPGW MT (PCD)

Positive 60° Triangular Inserts with a Single PCD Mini Tip for Finishing Non-Ferrous Materials





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TPGW 110202F-MT	11.00	6.35	2.38	0.20	2.70	2.80	●	●	●	0.05-0.50	0.03-0.60
TPGW 110204F-MT	11.00	6.35	2.38	0.40	2.70	2.80	●	●	●	0.05-0.50	0.03-0.60
TPGW 110302F-MT	11.00	6.35	3.18	0.20	2.70	2.80	●	●	●	0.05-0.50	0.03-0.60
TPGW 110304F-MT	11.00	6.35	3.18	0.40	2.70	2.80	●	●	●	0.05-0.50	0.03-0.60

• For user guide and cutting speed recommendations, see pages 182-187

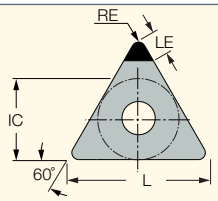
Material			N Non-Ferrous Materials		
Grade			ID5*	ID8	ID4
Tougher		Heavy interrupted			▲
↕		Light interrupted	▲	▲	
Harder		Continuous			

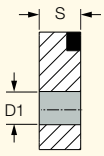
* First choice

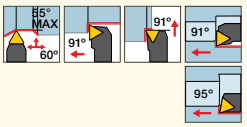
ISCAR PCD LINE

TNGA (PCD)

Negative 60° Triangular Inserts with a Single PCD Tip for Machining Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TNGA 110304F	11.00	6.35	3.18	0.40	4.00	2.80	●	●	●	0.05-1.00	0.03-0.60
TNGA 110308F	11.00	6.35	3.18	0.80	4.00	2.80	●	●	●	0.05-1.00	0.03-0.60
TNGA 160304F	16.50	9.52	3.18	0.40	4.00	4.40	●	●	●	0.05-1.00	0.03-0.60
TNGA 160308F	16.50	9.52	3.18	0.80	4.00	4.40	●	●	●	0.05-1.00	0.03-0.60
TNGA 160403F	16.50	9.52	4.76	0.30	4.00	4.40	●	●	●	0.05-1.00	0.03-0.60
TNGA 160404F	16.50	9.52	4.76	0.40	4.00	4.40	●	●	●	0.05-1.00	0.03-0.60
TNGA 160408F	16.50	9.52	4.76	0.80	4.00	4.40	●	●	●	0.05-1.00	0.03-0.60
TNGA 160410F	16.50	9.52	4.76	1.00	4.00	4.40	●	●	●	0.05-1.00	0.03-0.60
TNGA 160412F	16.50	9.52	4.76	1.20	4.00	4.40	●	●	●	0.05-1.00	0.03-0.60
TNGA 220404F	22.00	12.70	4.76	0.40	4.00	5.50	●	●	●	0.05-1.00	0.03-0.60
TNGA 220408F	22.00	12.70	4.76	0.80	4.00	5.50	●	●	●	0.05-1.00	0.03-0.60

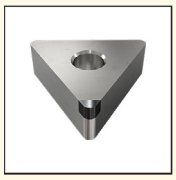
• For user guide and cutting speed recommendations, see pages 182-187

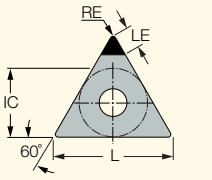
For tools, see pages: A-PTFNR/L-X/G (295) • C#-DTGNR/L (262) • DTGNR/L (262) • MTENN-W (263) • MTJNR/L-W (263) • PTFNR/L (264) • PTGNR/L (264) • PTGNR/L-X (265) • PTGNR/L-X-JHP (265) • PTGNR/L-X-JHP-MC (266) • S-MTLNR/L-W (295) • S-PTFNR/L (296)

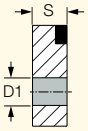
ISCAR PCD LINE

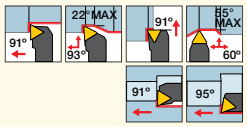
TNGA MT (PCD)

Negative 60° Triangular Inserts with a Single PCD Mini Tip for Finishing Non-Ferrous Materials









Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TNGA 160404F-MT	16.50	9.52	4.76	0.40	2.70	4.40	●	●	●	0.05-0.50	0.03-0.60
TNGA 160408F-MT	16.50	9.52	4.76	0.80	2.70	4.40	●	●	●	0.05-0.50	0.03-0.60

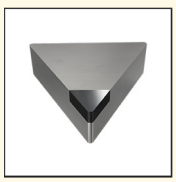
• For user guide and cutting speed recommendations, see pages 182-187

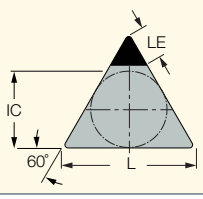
For tools, see pages: A-PTFNR/L-X/G (295) • DTGNR/L (262) • MTENN-W (263) • MTJNR/L-W (263) • PTFNR/L (264) • PTGNR/L (264) • PTGNR/L-X (265) • PTGNR/L-X-JHP (265) • PTGNR/L-X-JHP-MC (266) • S-MTLNR/L-W (295) • S-PTFNR/L (296)

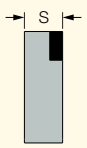
ISCAR PCD LINE

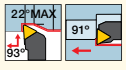
TNGN (PCD)

Negative 60° Triangular Inserts with a Single PCD Tip for Machining Non-Ferrous Materials









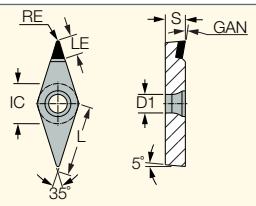
Designation	Dimensions L	IC	S	RE	LE	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
TNGN 110304F	11.00	6.35	3.18	0.40	4.00	●	●	●	0.05-1.00	0.03-0.60
TNGN 110308F	11.00	6.35	3.18	0.80	4.00	●	●	●	0.05-1.00	0.03-0.60
TNGN 130304F	13.70	7.94	3.18	0.40	4.00	●	●	●	0.05-1.00	0.03-0.60
TNGN 130308F	13.70	7.94	3.18	0.80	4.00	●	●	●	0.05-1.00	0.03-0.60
TNGN 160304F	16.50	9.52	3.18	0.40	4.00	●	●	●	0.05-1.00	0.03-0.60
TNGN 160308F	16.50	9.52	3.18	0.80	4.00	●	●	●	0.05-1.00	0.03-0.60
TNGN 160404F	16.50	9.52	4.76	0.40	4.00	●	●	●	0.05-1.00	0.03-0.60
TNGN 160408F	16.50	9.52	4.76	0.80	4.00	●	●	●	0.05-1.00	0.03-0.60

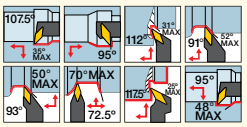
• For user guide and cutting speed recommendations, see pages 182-187

ISCAR PCD LINE

VBGT (PCD)

Positive 35° Rhombic Inserts with PCD Top Corner Tip and Positive Rake for Finishing Non-Ferrous Materials





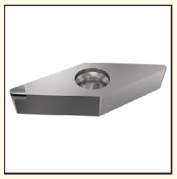
Designation	Dimensions L	IC	S	RE	LE	D1	GAN	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
VBGT 110302F	11.10	6.35	3.18	0.20	3.70	2.80	10.0	●	●	●	0.05-1.00	0.03-0.60
VBGT 110304F	11.10	6.35	3.18	0.40	3.70	2.80	10.0	●	●	●	0.05-1.00	0.03-0.60
VBGT 160402F	16.60	9.52	4.76	0.20	4.50	4.40	10.0	●	●	●	0.05-1.00	0.03-0.60
VBGT 160404F	16.60	9.52	4.76	0.40	4.50	4.40	10.0	●	●	●	0.05-1.00	0.03-0.60
VBGT 160408F	16.60	9.52	4.76	0.80	4.50	4.40	10.0	●	●	●	0.05-1.00	0.03-0.60

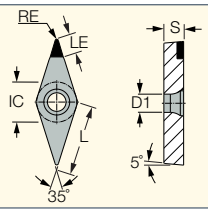
• For user guide and cutting speed recommendations, see pages 182-187

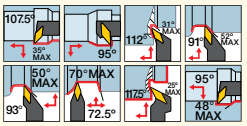
ISCAR PCD LINE

VBGW (PCD)

Positive 35° Rhombic Inserts with Single PCD Top Corner Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
VBGW 110201F	11.10	6.35	2.38	0.10	3.70	2.80	●	●	●	0.05-1.00	0.03-0.60
VBGW 110202F	11.10	6.35	2.38	0.20	3.70	2.80	●	●	●	0.05-1.00	0.03-0.60
VBGW 110204F	11.10	6.35	2.38	0.40	3.70	2.80	●	●	●	0.05-1.00	0.03-0.60
VBGW 110302F	11.10	6.35	3.18	0.20	3.70	2.80	●	●	●	0.05-1.00	0.03-0.60
VBGW 110304F	11.10	6.35	3.18	0.40	3.70	2.80	●	●	●	0.05-1.00	0.03-0.60
VBGW 110308F	11.10	6.35	3.18	0.80	3.70	2.80	●	●	●	0.05-1.00	0.03-0.60
VBGW 160402F	16.60	9.52	4.76	0.20	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VBGW 160404F	16.60	9.52	4.76	0.40	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VBGW 160408F	16.60	9.52	4.76	0.80	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VBGW 160412F	16.60	9.52	4.76	1.20	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60

• For user guide and cutting speed recommendations, see pages 182-187

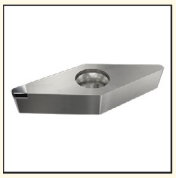
Material		N Non-Ferrous Materials		
Grade		ID5*	ID8	ID4
Tougher ↕ Harder	Heavy interrupted			▲
	Light interrupted	▲	▲	
	Continuous			

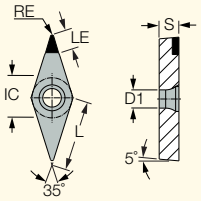
* First choice

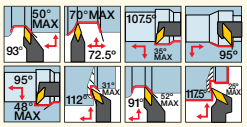
ISCAR PCD LINE

VBGW MT (PCD)

Positive 35° Rhombic Inserts with a Single PCD Mini Tip for Finishing Non-Ferrous Materials







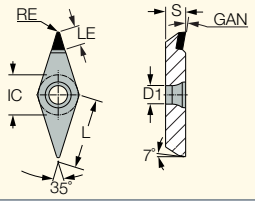
Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
VBGW 110201F-MT	11.10	6.35	2.38	0.10	3.00	2.80	●	●	●	0.05-0.50	0.03-0.60
VBGW 110202F-MT	11.10	6.35	2.38	0.20	3.00	2.80	●	●	●	0.05-0.50	0.03-0.60
VBGW 110204F-MT	11.10	6.35	2.38	0.40	3.00	2.80	●	●	●	0.05-0.50	0.03-0.60
VBGW 160402F-MT	16.60	9.52	4.76	0.20	3.00	4.40	●	●	●	0.05-0.50	0.03-0.60
VBGW 160404F-MT	16.60	9.52	4.76	0.40	3.00	4.40	●	●	●	0.05-0.50	0.03-0.60
VBGW 160408F-MT	16.60	9.52	4.76	0.80	3.00	4.40	●	●	●	0.05-0.50	0.03-0.60
VBGW 160412F-MT	16.60	9.52	4.76	1.20	3.00	4.40	●	●	●	0.05-0.50	0.03-0.60

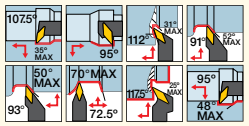
• For user guide and cutting speed recommendations, see pages 182-187

ISCAR PCD LINE

VCGT (PCD)

Positive 35° Rhombic Inserts with PCD Top Corner Tip and Positive Rake for Finishing Non-Ferrous Materials





Designation	Dimensions L	IC	S	RE	LE	D1	GAN	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
VCGT 070202F	6.92	3.97	2.38	0.20	3.70	2.15	7.0	●	●	●	0.05-1.00	0.03-0.60
VCGT 070204F	6.92	3.97	2.38	0.40	3.70	2.15	7.0	●	●	●	0.05-1.00	0.03-0.60
VCGT 110302F	11.10	6.35	3.18	0.20	3.70	2.80	10.0	●	●	●	0.05-1.00	0.03-0.60
VCGT 110304F	11.10	6.35	3.18	0.40	3.70	2.80	10.0	●	●		0.05-1.00	0.03-0.60
VCGT 130302F	13.10	7.94	3.18	0.20	4.50	3.40	10.0	●	●	●	0.05-1.00	0.03-0.60
VCGT 130304F	13.10	7.94	3.18	0.40	4.50	3.40	10.0	●	●	●	0.05-1.00	0.03-0.60
VCGT 160402F	16.60	9.52	4.76	0.20	4.50	4.40	10.0	●	●	●	0.05-1.00	0.03-0.60
VCGT 160404F	16.60	9.52	4.76	0.40	4.50	4.40	10.0	●	●	●	0.05-1.00	0.03-0.60
VCGT 160408F	16.60	9.52	4.76	0.80	4.50	4.40	10.0	●	●	●	0.05-1.00	0.03-0.60
VCGT 160412F	16.60	9.52	4.76	1.20	4.50	4.40	10.0	●	●	●	0.05-1.00	0.03-0.60

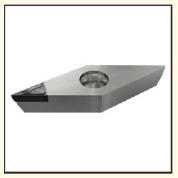
• For user guide and cutting speed recommendations, see pages 182-187

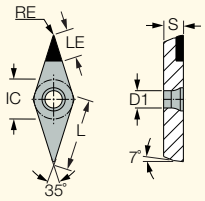
For tools, see pages: A/S-SVLBCR/L (298) • A/S-SVLFCR/L; A-SVUCR/L (298) • A/S-SVQCR/L (299) • AVC-SVLCR/L (299) • AVC-SVLCR/L-VH (299) • AVC-SVPCR/L (300) • AVC-SVQCR/L (300) • AVC-SVUCR/L (300) • C#-SVJCR/L (275) • C#-SVJCR/L-JHP (275) • C#-SVVCN (276) • HSK A63WH-SVJCR/L (276) • NQCH-SVACR/L-S-JHP (276) • NQCH-Y-SVJCR-S-JHP (276) • PVACR/L-S (271) • PVACR/L-S-JHP (271) • PVACR/L-S-JHP-MC (272) • SVACR/L-S (272) • SVJCR-PAD (273) • SVJCR/L (272) • SVJCR/L-16-JHP (273) • SVJCR/L-PAD-JHP (273) • SVPCR/L-S (274) • SVVCN (274) • SVXCR/L (274) • Y-SVJCR-S (274) • Y-SVJCR-S-JHP (275)

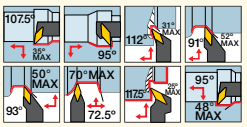
ISCAR PCD LINE

VCGT MD/RD (PCD)

Positive 35° Rhombic Inserts with MD/RD Chipbreaking PCD Tips for Non-Ferrous Materials Finishing & Medium App.







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
VCGT 110302F MD	11.10	6.35	3.18	0.20	3.70	2.80	●	●	●	0.05-1.00	0.03-0.60
VCGT 110302F RD	11.10	6.35	3.18	0.20	3.70	2.80	●	●	●	0.05-1.00	0.03-0.60
VCGT 110304F MD	11.10	6.35	3.18	0.40	3.70	2.80	●	●	●	0.05-1.00	0.03-0.60
VCGT 110304F RD	11.10	6.35	3.18	0.40	3.70	2.80	●	●	●	0.05-1.00	0.03-0.60
VCGT 110308F MD	11.10	6.35	3.18	0.80	3.70	2.80	●	●	●	0.05-1.00	0.03-0.60
VCGT 110308F RD	11.10	6.35	3.18	0.80	3.70	2.80	●	●	●	0.05-1.00	0.03-0.60
VCGT 160402F MD	16.60	9.52	4.76	0.20	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VCGT 160402F RD	16.60	9.52	4.76	0.20	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VCGT 160404F MD	16.60	9.52	4.76	0.40	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VCGT 160404F RD	16.60	9.52	4.76	0.40	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VCGT 160408F MD	16.60	9.52	4.76	0.80	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VCGT 160408F RD	16.60	9.52	4.76	0.80	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VCGT 160412F MD	16.60	9.52	4.76	1.20	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VCGT 160412F RD	16.60	9.52	4.76	1.20	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60

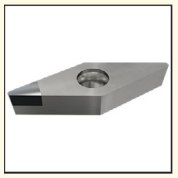
• For user guide and cutting speed recommendations, see pages 182-187

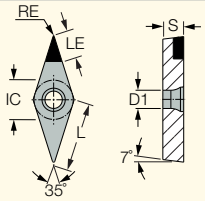
For tools, see pages: A/S-SVLBCR/L (298) • A/S-SVLFCR/L; A-SVUCR/L (298) • A/S-SVQCR/L (299) • AVC-SVLCR/L (299) • AVC-SVLCR/L-VH (299) • AVC-SVPCR/L (300) • AVC-SVQCR/L (300) • AVC-SVUCR/L (300) • C#-SVJCR/L (275) • C#-SVJCR/L-JHP (275) • C#-SVVCN (276) • HSK A63WH-SVJCR/L (276) • NQCH-SVACR/L-S-JHP (276) • NQCH-Y-SVJCR-S-JHP (276) • PVACR/L-S (271) • PVACR/L-S-JHP (271) • PVACR/L-S-JHP-MC (272) • SVACR/L-S (272) • SVJCR-PAD (273) • SVJCR/L (272) • SVJCR/L-16-JHP (273) • SVJCR/L-PAD-JHP (273) • SVPCR/L-S (274) • SVVCN (274) • SVXCR/L (274) • Y-SVJCR-S (274) • Y-SVJCR-S-JHP (275)

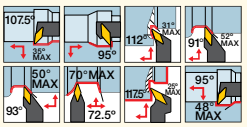
ISCAR PCD LINE

VCGW (PCD)

Positive 35° Rhombic Inserts with a Single PCD Tip and Flat Rake Angle for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
VCGW 070202F	6.92	3.97	2.38	0.20	3.70	2.15	●	●	●	0.05-1.00	0.03-0.60
VCGW 070204F	6.92	3.97	2.38	0.40	3.70	2.15	●	●	●	0.05-1.00	0.03-0.60
VCGW 070208F	6.92	3.97	2.38	0.80	3.70	2.15	●	●	●	0.05-1.00	0.03-0.60
VCGW 110302F	11.10	6.35	3.18	0.20	3.70	2.80	●	●	●	0.05-1.00	0.03-0.60
VCGW 110304F	11.10	6.35	3.18	0.40	3.70	2.80	●	●	●	0.05-1.00	0.03-0.60
VCGW 110308F	11.10	6.35	3.18	0.80	3.70	2.80	●	●	●	0.05-1.00	0.03-0.60
VCGW 130302F	13.10	7.94	3.18	0.20	4.50	3.40	●	●	●	0.05-1.00	0.03-0.60
VCGW 130304F	13.10	7.94	3.18	0.40	4.50	3.40	●	●	●	0.05-1.00	0.03-0.60
VCGW 160402F	16.60	9.52	4.76	0.20	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VCGW 160404F	16.60	9.52	4.76	0.40	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VCGW 160408F	16.60	9.52	4.76	0.80	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VCGW 160412F	16.60	9.52	4.76	1.20	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60

• For user guide and cutting speed recommendations, see pages 182-187

For tools, see pages: A/S-SVLBCR/L (298) • A/S-SVLFCR/L; A-SVUCR/L (298) • A/S-SVQCR/L (299) • AVC-SVLCR/L (299) • AVC-SVLCR/L-VH (299) • AVC-SVPCR/L (300) • AVC-SVQCR/L (300) • AVC-SVUCR/L (300) • C#-SVJCR/L (275) • C#-SVJCR/L-JHP (275) • C#-SVVCN (276) • HSK A63WH-SVJCR/L (276) • NQCH-SVACR/L-S-JHP (276) • NQCH-Y-SVJCR-S-JHP (276) • PVACR/L-S (271) • PVACR/L-S-JHP (271) • PVACR/L-S-JHP-MC (272) • SVACR/L-S (272) • SVJCR-PAD (273) • SVJCR/L (272) • SVJCR/L-16-JHP (273) • SVJCR/L-PAD-JHP (273) • SVPCR/L-S (274) • SVVCN (274) • SVXCR/L (274) • Y-SVJCR-S (274) • Y-SVJCR-S-JHP (275)

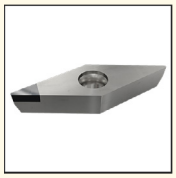
Material			N
			Non-Ferrous Materials
Grade			ID5*	ID8	ID4
Tougher ↕ Harder		Heavy interrupted			↑
		Light interrupted	↑	↑	
		Continuous			

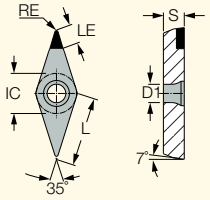
* First choice

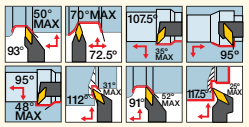
ISCAR PCD LINE

VCGW MT (PCD)

Positive 35° Rhombic Inserts with a Single PCD Mini Tip for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
VCGW 110302F-MT	11.10	6.35	3.18	0.20	3.00	2.80	●	●	●	0.05-0.50	0.03-0.60
VCGW 110304F-MT	11.10	6.35	3.18	0.40	3.00	2.80	●	●	●	0.05-0.50	0.03-0.60
VCGW 160402F-MT	16.60	9.52	4.76	0.20	3.00	4.40	●	●	●	0.05-0.50	0.03-0.60
VCGW 160404F-MT	16.60	9.52	4.76	0.40	3.00	4.40	●	●	●	0.05-0.50	0.03-0.60
VCGW 160408F-MT	16.60	9.52	4.76	0.80	3.00	4.40	●	●	●	0.05-0.50	0.03-0.60
VCGW 160412F-MT	16.60	9.52	4.76	1.20	3.00	4.40	●	●	●	0.05-0.50	0.03-0.60

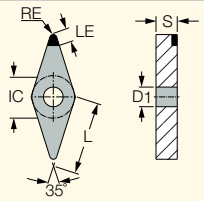
- For user guide and cutting speed recommendations, see pages 182-187

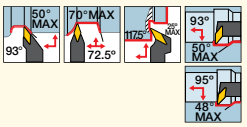
For tools, see pages: A/S-SVLBCR/L (298) • A/S-SVLFCR/L; A-SVUCR/L (298) • A/S-SVQCR/L (299) • AVC-SVLCR/L (299) • AVC-SVLCR/L-VH (299) • AVC-SVPCR/L (300) • AVC-SVQCR/L (300) • AVC-SVUCR/L (300) • C#-SVJCR/L (275) • C#-SVJCR/L-JHP (275) • C#-SVVCN (276) • HSK A63WH-SVJCR/L (276) • NQCH-SVACR/L-S-JHP (276) • NQCH-Y-SVJCR-S-JHP (276) • PVACR/L-S (271) • PVACR/L-S-JHP (271) • PVACR/L-S-JHP-MC (272) • SVACR/L-S (272) • SVJCR-PAD (273) • SVJCR/L (272) • SVJCR/L-16-JHP (273) • SVJCR/L-PAD-JHP (273) • SVPCR/L-S (274) • SVVCN (274) • SVXCR/L (274) • Y-SVJCR-S (274) • Y-SVJCR-S-JHP (275)

ISCAR PCD LINE

VNGA (PCD)

Negative 35° Rhombic Inserts with a Single PCD Tip and Flat Rake Angle for Finishing Non-Ferrous Materials





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
VNGA 160402F	16.60	9.52	4.76	0.20	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VNGA 160403F	16.60	9.52	4.76	0.30	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VNGA 160404F	16.60	9.52	4.76	0.40	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VNGA 160406F	16.60	9.52	4.76	0.60	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VNGA 160408F	16.60	9.52	4.76	0.80	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VNGA 160410F	16.60	9.52	4.76	1.00	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60
VNGA 160412F	16.60	9.52	4.76	1.20	4.50	4.40	●	●	●	0.05-1.00	0.03-0.60

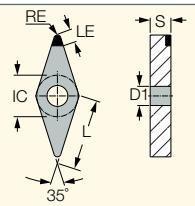
- For user guide and cutting speed recommendations, see pages 182-187

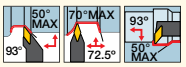
For tools, see pages: MVJNR/L (270) • MVVNN (270)

ISCAR PCD LINE

VNGA MT (PCD)

Negative 35° Rhombic Inserts with a Single PCD Mini Tip for Finishing Non-Ferrous Materials





Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
VNGA 160402F-MT	16.60	9.52	4.76	0.20	3.00	4.40	●	●	●	0.05-0.50	0.03-0.60
VNGA 160404F-MT	16.60	9.52	4.76	0.40	3.00	4.40	●	●	●	0.05-0.50	0.03-0.60
VNGA 160408F-MT	16.60	9.52	4.76	0.80	3.00	4.40	●	●	●	0.05-0.50	0.03-0.60

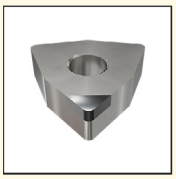
• For user guide and cutting speed recommendations, see pages 182-187

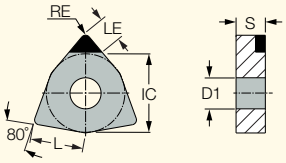
For tools, see pages: MVJNR/L (270) • MVVNN (270)

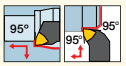
ISCAR PCD LINE

WNGA (PCD)

Negative 80° Trigon Inserts with a Single PCD Tip and Flat Rake Angle for Finishing Non-Ferrous Materials







Designation	Dimensions L	IC	S	RE	LE	D1	Hard ↔ Tough ID8	ID5	ID4	Recommended Machining Data a_p (mm)	f (mm/rev)
WNGA 080404F	8.69	12.70	4.76	0.40	4.00	5.50	●	●	●	0.05-1.00	0.03-0.60
WNGA 080408F	8.69	12.70	4.76	0.80	4.00	5.50	●	●	●	0.05-1.00	0.03-0.60
WNGA 080412F	8.69	12.70	4.76	1.20	4.00	5.50	●	●	●	0.05-1.00	0.03-0.60

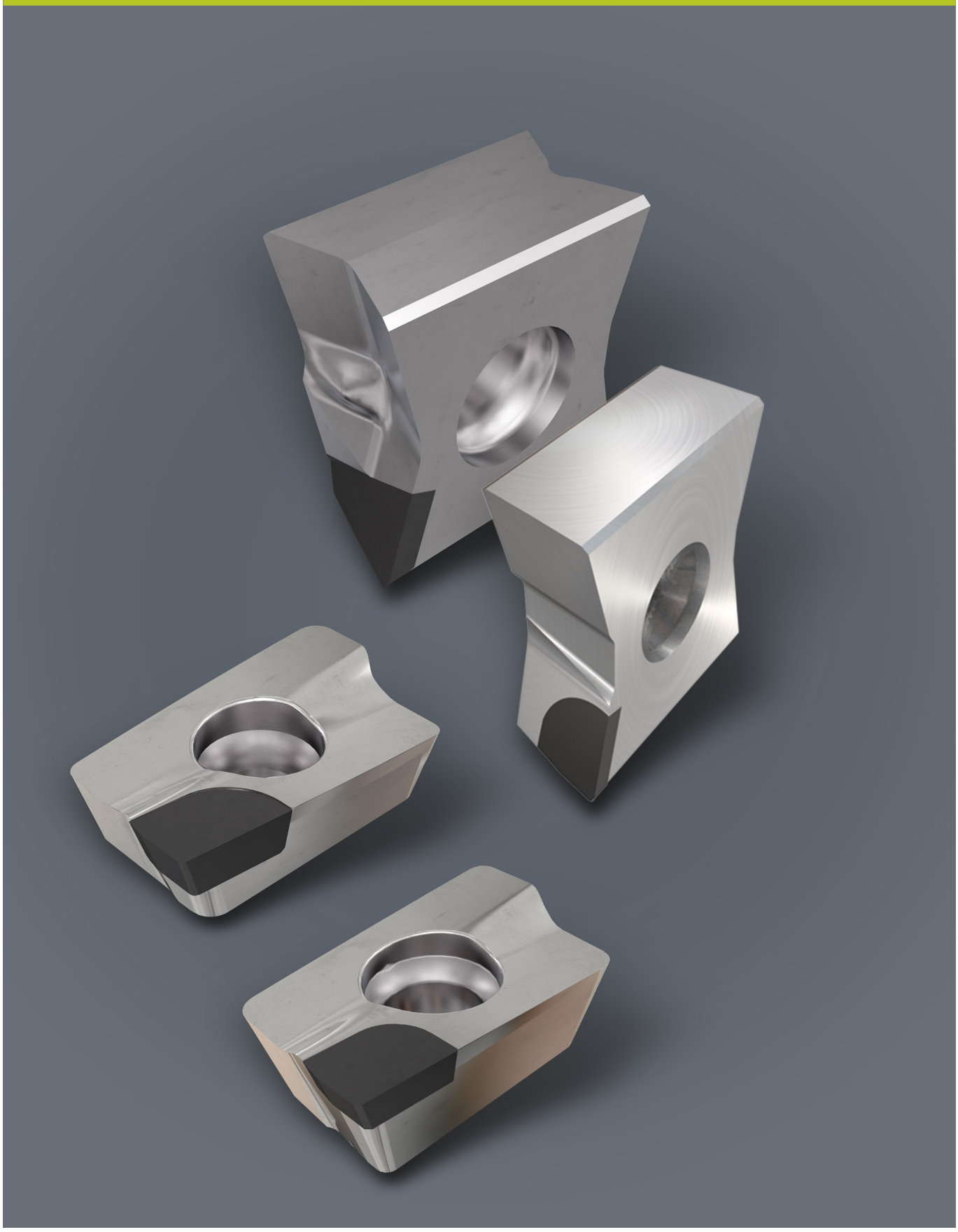
• For user guide and cutting speed recommendations, see pages 182-187

For tools, see pages: A/S-MWLNR/L-W (301) • A/S-PWLNR/L (302) • C#-MULNR/L-MW (268) • C#-PWLNR/L-08-JHP (281) • DWLNR/L (277) • DWLNR/L-JHP-MC (277) • HSK A63WH-MULNR-J12MWX2 (269) • HSK A63WH-MULNR/L-MW (268) • HSK A63WH-MUMNN-MW (269) • MULNR/L-12MW (267) • MWLNR/L-W (278) • PWLNR/L (278) • PWLNR/L-08-JHP (279) • PWLNR/L-X (279) • PWLNR/L-X-JHP (280) • PWLNR/L-X-JHP-MC (281) • S-DWLNR/L (301) • S-MULNR-MW (297)

Material			N Non-Ferrous Materials		
Grade			ID5*	ID8	ID4
Tougher ↕ Harder		Heavy interrupted			↑
		Light interrupted	↑	↑	
		Continuous			

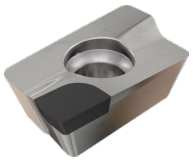
* First choice

PCD MILLING INSERTS

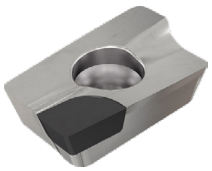


PCD Milling Inserts - Index

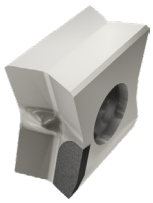
ADKW (PCD) 225



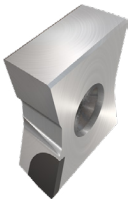
APKW 100304 PDR (PCD) 225



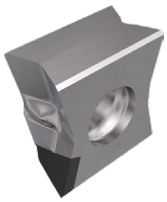
LNAR 1106 (PCD) 226



LNAR 1506 PN-R-S (PCD) 226



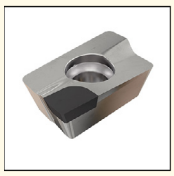
LNAR 1106PN-R-S-W (PCD) 226

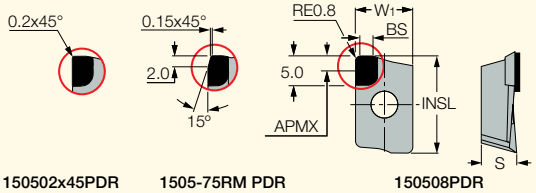


HELI2000

ADKW (PCD)

Single Corner R.H. PCD Tipped Inserts for Milling Aluminum





Designation	Dimensions W1	INSL	S	APMX	BS	Tough ↔ Hard ID8	ID5	Recommended Machining Data a_p (mm)	f_z (mm/t)
ADKW 1505-75RM PDR	9.60	16.18	5.83	4.50	2.00		•	0.10-2.00	0.10-0.25
ADKW 150502X45 PDR	9.60	16.18	5.83	4.50	2.00		•	0.10-2.00	0.10-0.25
ADKW 150508 PDR	9.60	16.18	5.83	4.50	1.52	•	•	0.10-2.00	0.10-0.25

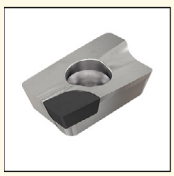
• The inserts are supplied with spare screws.

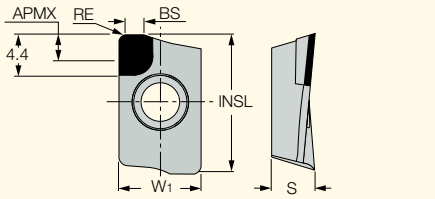
For tools, see pages: F90AD-SFR (314) • HM90 E90AD-15 (315) • HM90 E90AD-M-15 (316) • HM90 E90AD-M-15-JHP (316) • HM90 E90AD-MM-15-JHP (317) • HM90 F90A-15 (318) • HM90 F90A-15-JHP (319)

HELIMILL

APKW 100304 PDR (PCD)

Single R.H. PCD Tipped Insert for Milling Aluminum





Designation	Dimensions W1	INSL	APMX	S	RE	BS	Tough ↔ Hard ID8	ID5
APKW 100304 PDR (1)	6.76	11.47	3.50	3.50	0.40	1.52	•	•

• Use ID5 for aluminum alloys with <12% silicon. • The inserts are supplied with spare screws.

(1) Important: use only on tools with diameters of 25 mm and larger

For tools, see pages: HM90 E90A-10 (307) • HM90 E90A-M-10 (311) • HM90 E90A-MM-10-JHP (310) • HM90 F90AP-10 (312) • HM90 F90AP-10-JHP (313) • HM90 F90AP-AMT (313)

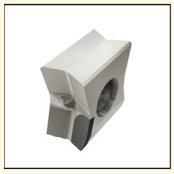
PCD
Recommended Machining Conditions

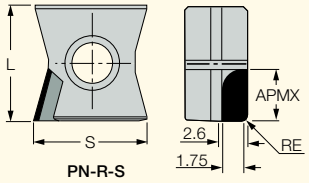
	Grade	D.O.C. (a_p) mm	Material	V_c m/min	Feed mm/tooth	Cutting Edge
N	ID5	<2.0	Aluminum alloys <12% silicon	300-3000	0.05-0.25	Sharp
		<2.0	Chipboard, fiberboard and plastics	2000-3000		
		<2.0	Copper alloys and brass	500-1500		
N	ID8	<2.0	Aluminum>12% silicon	250-1000		
		<2.0	Aluminum<12% silicon	300-3000		
		<2.0	Chipboard, fiberboard and plastics	2000-3000		
			MMC	200-600		

TANGMILL TANGENTIAL LINE

LNAR 1106 (PCD)

Tangentially Clamped Milling Inserts with a Brazed PCD Tip for Machining Aluminum





Single R.H. cutting edge PCD insert

Designation	Dimensions W1	L	S	RE	Ch	a°	APMX	Tough ↔ Hard ID8	ID5	Recommended Machining Data a_p (mm)	f_z (mm/t)
LNAR 110604PN-R-S	6.00	11.11	10.76	0.40	-	90	5.00	●	●	0.10-2.00	0.10-0.25
LNAR 110604X45PN-R-S	6.00	11.11	10.70	-	0.4	45	5.00	●	●	0.10-2.00	0.10-0.25
LNAR 110620X75PN-R-S	6.00	11.11	10.72	-	0.15	75	5.00		●	0.10-2.00	0.10-0.25

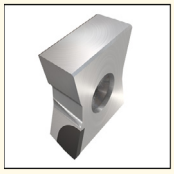
- The chamfered corner used for reduced chipping on the machined component edges • Use ID5 for aluminum alloys with <12% silicon
- Use ID8 for aluminum alloys with >12% silicon. • The inserts are supplied with spare screws.

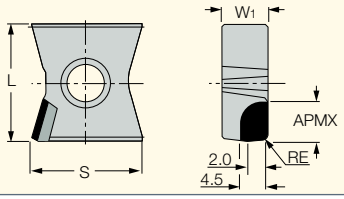
For tools, see pages: F90LN-N11 (305)

TANGMILL TANGENTIAL LINE

LNAR 1506 PN-R-S (PCD)

Tangentially Clamped Insert with a Brazed PCD Tip for Machining Aluminum





Designation	Dimensions W1	L	S	RE	APMX	Tough ↔ Hard ID8	ID5	Recommended Machining Data a_p (mm)	f_z (mm/t)
LNAR 150604PN-R-S	6.00	15.06	14.00	0.40	5.00	●	●	0.05-2.00	0.10-0.25

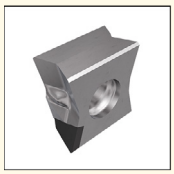
- The insert features a single R.H. cutting edge • Use ID5 for aluminum alloys with less than 12% silicon and ID8 for aluminum alloys with more than 12% silicon
- The inserts are supplied with spare screws

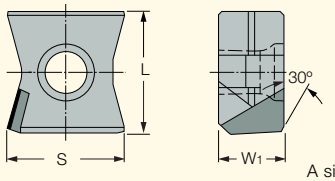
For tools, see pages: F90LN-N15 (306)

TANGMILL TANGENTIAL LINE

LNAR 1106PN-R-S-W (PCD)

Tangentially Clamped Wiper Milling Inserts with a Brazed PCD Tip for Machining Aluminum

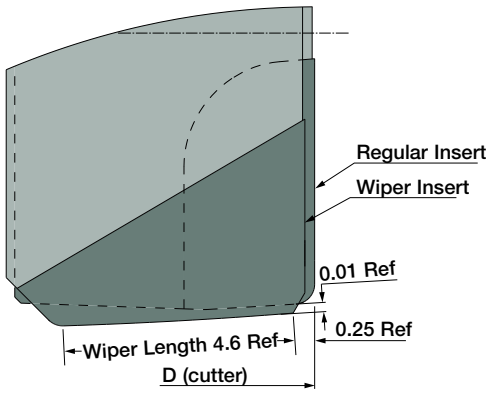




A single R.H. cutting edge PCD insert

Designation	Dimensions W1	L	S	ID5	Recommended Machining Data f_z (mm/t)
LNAR 1106PN-R-S-W	5.98	11.26	10.75	●	0.10-0.25

- The chamfered corner is used for reduced chipping on the machined component edges. • The wiper insert should not be used with LNAR 110620x75PN-R-S inserts.

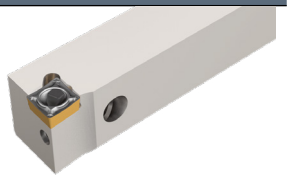


TOOLS FOR TURNING CBN & PCD - INDEX

Tools for Turning CBN & PCD - Index

DCLNR/L 234

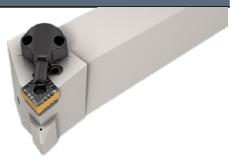
DCLNR/L-JHP-MC 235

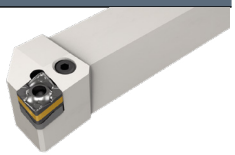
PCLCR/L-S 235


PCLCR/L-S-JHP 236

PCLCR/L-S-JHP-MC 236

PCLNR/L 237

PCLNR/L-12-JHP 237


PCLNR/L-X 238


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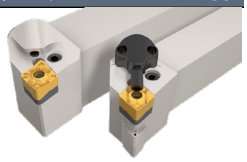
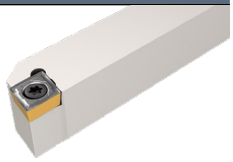


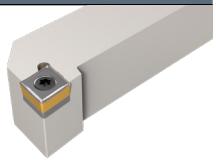
PCLNR/L-X-JHP-MC 240

C#-PCLNR/L-12-JHP 241

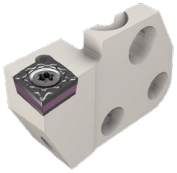
C#-PCLNR/L-X 241

C#-PCLNR/L-X-JHP 242

SCACR/L-S 242


SCLCR/L 243


SCLCR/L-PAD-JHP 243

SCLCR-PAD 243


C#-SCLCR/L-JHP 244

NQCH-SCACR/L-S-JHP 244

DDJNR/L 245

DDJNR/L-JHP-MC 245

C#-DDJNR/L 246

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HSK A63WH-DDNNN 246

PDACR/L-S 247

PDACR/L-S-JHP 247

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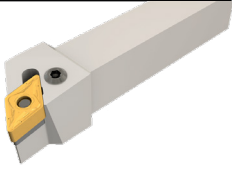
PDJNR/L 248


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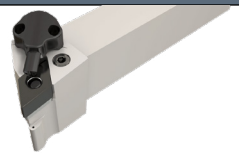

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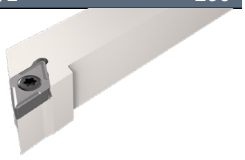
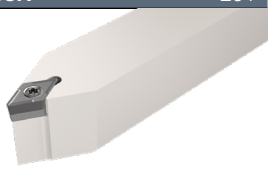
SDACR/L-S 250

SDHCR/L-S 250

SDJCR/L 250


SDJCR/L-PAD-JHP 251

SDJCR-PAD 251

SDNCN 251


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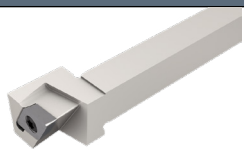


Y-SDJCR-S-JHP 252

C#-SDJCR/L 252

C#-SDJCR-JHP 253

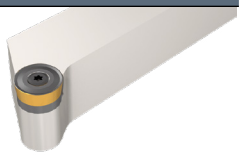
C#-SDNCN 253

NQCH-SDACR/L-S-JHP 253

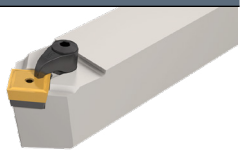
NQCH-Y-SDJCR-S-JHP 254

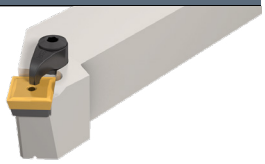
CRGNR/L 254

SRDCN 254

SRGCR/L 255


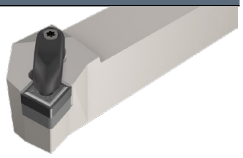
CSDNN-CE/CEA 255

CSDPN 256


CSSPR/L 256


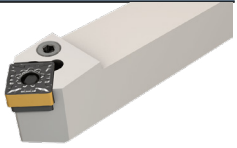
DSBNR/L 256

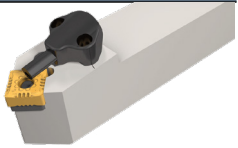
DSDNN 257

DSKNR/L 257


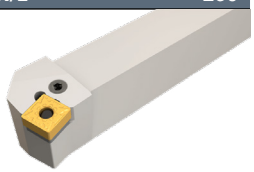
DSSNR/L 257

PSBNR/L 258

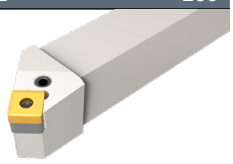
PSDNN 258


PSDNN-JHP 259


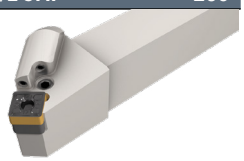
PSKNR/L 259



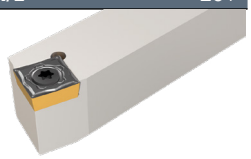
PSSNR/L 260



PSSNR/L-JHP 260



SSBCR/L 261



SSSCR/L 261

CTFPR/L 261

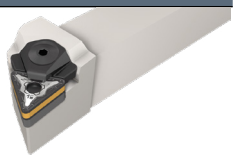
CTGPR/L 262

DTGNR/L 262

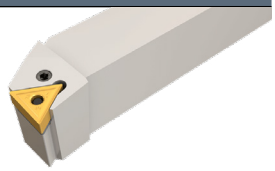
C#-DTGNR/L 262

MTENN-W 263

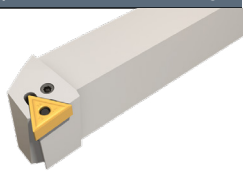
MTJNR/L-W 263



PTFNR/L 264



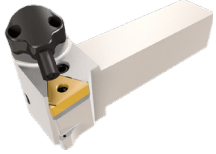
PTGNR/L 264



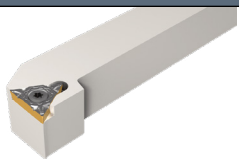
PTGNR/L-X 265

PTGNR/L-X-JHP 265

PTGNR/L-X-JHP-MC 266



STFCR/L 266



STGCR/L 267

MULNR/L-12MW 267

C#-MULNR/L-MW 268

HSK A63WH-MULNR/L-MW 268

HSK A63WH-MULNR-J12MWX2 269

HSK A63WH-MUMNN-MW 269

MVJNR/L 270

MVVNN 270

PVACR/L-S 271

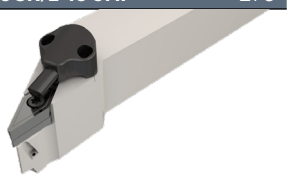
PVACR/L-S-JHP 271

PVACR/L-S-JHP-MC 272

SVACR/L-S 272

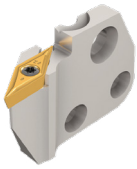
SVJCR/L 272

SVJCR/L-16-JHP 273



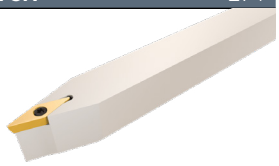
SVJCR/L-PAD-JHP 273

SVJCR-PAD 273



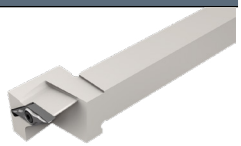
SVPCR/L-S 274

SVVCN 274



SVXCR/L 274

Y-SVJCR-S 274



Y-SVJCR-S-JHP 275

C#-SVJCR/L 275

C#-SVJCR/L-JHP 275

C#-SVVCN 276

HSK A63WH-SVJCR/L 276

NQCH-SVACR/L-S-JHP 276

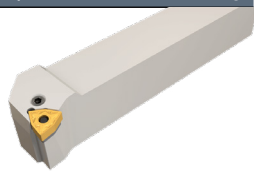
NQCH-Y-SVJCR-S-JHP 276

DWLNR/L 277

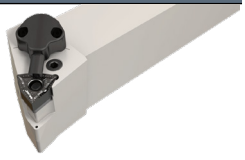
DWLNR/L-JHP-MC 277

MWLNR/L-W 278

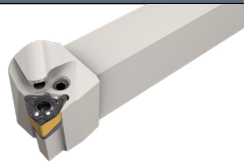
PWLNR/L 278



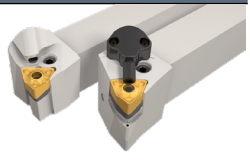
PWLNR/L-08-JHP 279



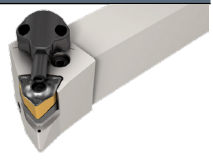
PWLNR/L-X 279



PWLNR/L-X-JHP 280



PWLNR/L-X-JHP-MC 281



C#-PWLNR/L-08-JHP 281

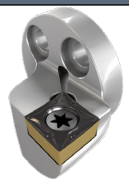
S-DCLNR/L 282

A/S-PCLNR/L 282

A/S-PCLNR/L-X/G 283

A/E/S-SCLCR/L 284

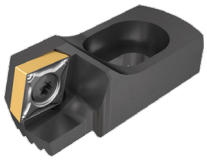
E-SCLCR/L-HEAD 285

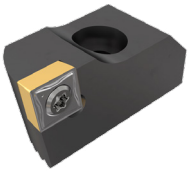
AVC-SCLCR/L 285


IHCR 286

IHRF 286

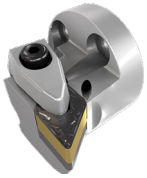
IHRF-BW 287

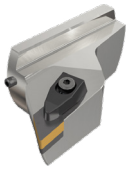
IHRF-CH 287


IHSR 288


IHSR-BW 289

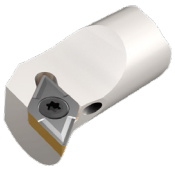
S-DDUNR/L 290

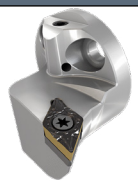
AVC-DDUNR/L 290


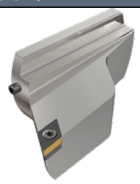
AVC-DDUNR/L-VH 291


A/S-PDUNR/L 291

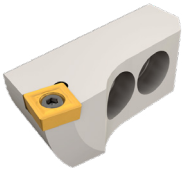
A/E/S-SDUCR/L 292

E-SDUCR/L-HEAD 292


AVC-SDUCR/L 293


AVC-SDUCR/L-VH 293


S-CSKPR 294

IHPR 294


S-CTFPR/L 294

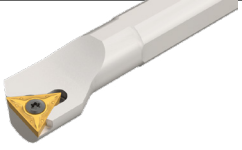
S-MTLCR/L-W 295

S-MTLNR/L-W 295

A-PTFNR/L-X/G 295

S-PTFNR/L 296

E-STFCR-HEAD 296

S-STFCR/L 296


S-STLCR/L 297

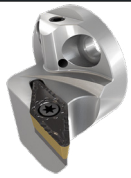
S-MULNR-MW 297

A/S-SVLBCR/L 298

A/S-SVLFCR/L; A-SVUCR/L 298

A/S-SVQCR/L 299

AVC-SVLCR/L 299



AVC-SVLCR/L-VH 299

AVC-SVPCR/L 300

AVC-SVQCR/L 300

AVC-SVUCR/L 300

S-DWLNR/L 301

A/S-MWLNR/L-W 301

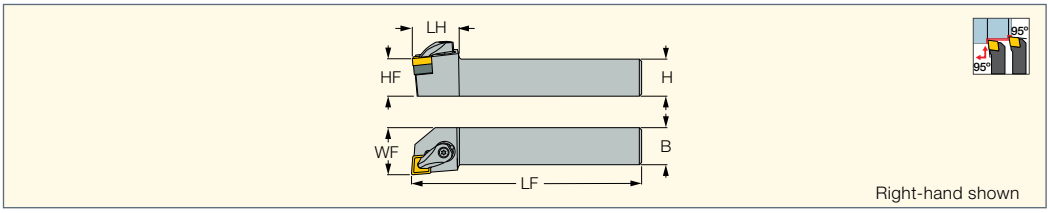
A/S-PWLNR/L 302

External Tools

ISOTURN

DCLNR/L

R-Clamp Tools with 95°
Lead Angle Carrying 80°
Negative Rhombic Inserts



Designation	H	HF	B	LF	LH	WF	Insert
DCLNR/L 2020K-12	20.0	20.0	20.0	125.00	35.0	25.00	CNGA 1204
DCLNR/L 2525M-12	25.0	25.0	25.0	150.00	35.0	32.00	CNGA 1204
DCLNR/L 3232P-12	32.0	32.0	32.0	170.00	35.0	40.00	CNGA 1204

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • CNGG (CER) (55) • CNGA (CER) (54)

Spare Parts

Designation										
DCLNR/L 2020K-12	RCT 443	TCH 4[(a)]*		SR 14-506 M4X0.7	LCGR-4		SR 10400270-25.5	T-15/5		
DCLNR/L 2525M-12	RCT 443	TCH 4[(a)]*		SR 14-506 M4X0.7	LCGR-4		SR 10400270-25.5	T-15/5		
DCLNR/L 3232P-12	RCT 443	TCH 4[(a)]*		SR 14-506 M4X0.7	LCGR-4		SR 10400270-25.5	T-15/5		

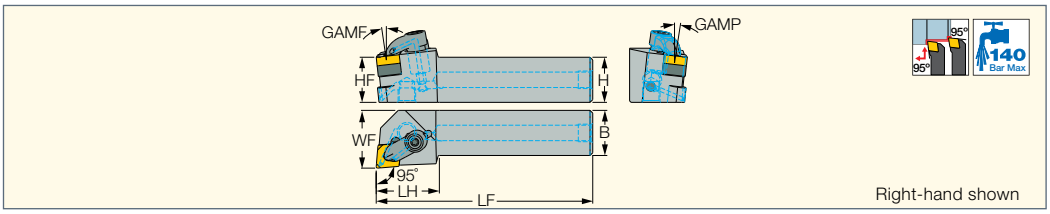
* Optional, to be ordered separately

[(a)] TCH 4 seat for CNMX 1207.. (CNMX 45.) insert.

JETRTURN RIGID CLAMP

DCLNR/L-JHP-MC

Rigid Clamp Tools with Channels for High-Pressure Coolant Carrying 80° Rhombic Inserts



Designation	B	H	HF	LF	LH	WF	GAMP	GAMF	MIID[1]
DCLNR/L 2020X-12-JHP-MC	20.0	20.0	20.0	105.00	35.0	25.00	6.0	6.0	CNGA 1204
DCLNR/L 2525X-12-JHP-MC	25.0	25.0	25.0	120.00	35.0	32.00	6.0	6.0	CNGA 1204

[1] Master insert identification

For inserts, see pages: CNGA (CBN) (145) • CNGA (CER) (54) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • CNGG (CER) (55)

Spare Parts

Designation						
DCLNR/L 2020X-12-JHP-MC	RCT 443	TCH 4[a]*	PLG G1/8 TL360	OR 4X3 NBR70	SR 14-506 M4X0.7	LCGR/L-C-4JC SET
DCLNR/L 2525X-12-JHP-MC	RCT 443	TCH 4[a]*	PLG G1/8 TL360	OR 4X3 NBR70	SR 14-506 M4X0.7	LCGR/L-C-4JC SET

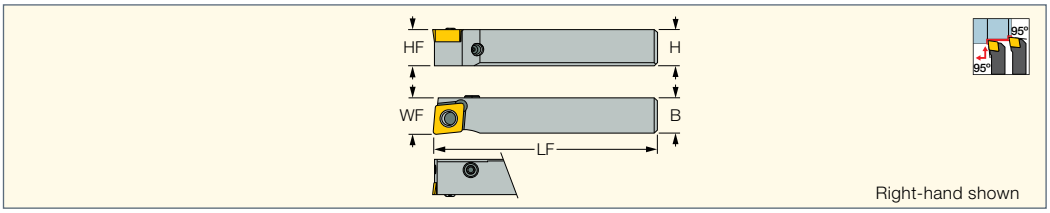
* Optional, to be ordered separately

[a] For CNMX 1207.. (CNMX 45.) inserts

ISOTURN

PCLCR/L-S

Side Lever Lock Tools Carrying 80° Positive Rhombic Inserts for Swiss Automatic Machines



Designation	H	HF	B	LF	WF	Insert				
PCLCR 0808M-06S	8.0	8.0	8.0	150.00	8.00	CC.. 0602	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5
PCLCR/L 1010M-06S	10.0	10.0	10.0	150.00	10.20	CC.. 0602	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5
PCLCR/L 1212M-06S	12.0	12.0	12.0	150.00	12.20	CC.. 0602	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5
PCLCR/L 1616M-06S	16.0	16.0	16.0	150.00	16.20	CC.. 0602	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5
PCLCR/L 1012M-09S	10.0	10.0	12.0	150.00	12.20	CC.. 09T3	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5
PCLCR/L 1212M-09S	12.0	12.0	12.0	150.00	12.20	CC.. 09T3	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5
PCLCR/L 1616M-09S	16.0	16.0	16.0	150.00	16.20	CC.. 09T3	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5
PCLCR/L 2020K-09S	20.0	20.0	20.0	125.00	20.20	CC.. 09T3	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5

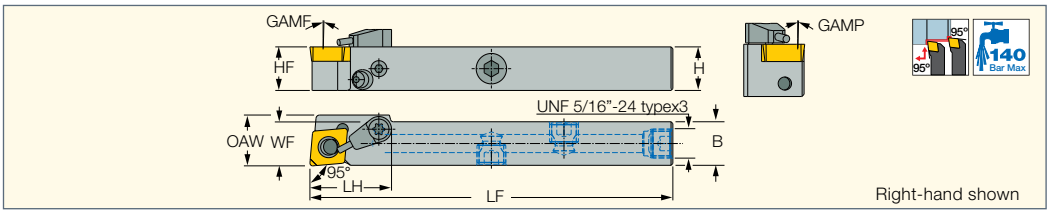
• The clamping screw may by transferred to the opposite side if needed

For inserts, see pages: CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

ISOTURN

PCLCR/L-S-JHP

Tools with Channels for High Pressure Coolant Carrying 80° Positive Rhombic Inserts for Swiss Automatic Machines



Designation	H	HF	B	LF	LH	WF	OAW	GAMP	GAMF	Insert
PCLCR/L 1010H-06S-JHP	10.0	10.0	10.0	100.00	22.3	10.20	-	0.0	0.0	CC.. 0602
PCLCR/L 1212H-09S-JHP	12.0	12.0	12.0	100.00	22.3	12.20	14.00	0.0	0.0	CC.. 09T3
PCLCR/L 1616K-09S-JHP	16.0	16.0	16.0	125.00	22.3	16.20	-	0.0	0.0	CC.. 09T3
PCLCR/L 2020K-09S-JHP	20.0	20.0	20.0	125.00	22.3	20.20	-	0.0	0.0	CC.. 09T3

- For user guide, see pages 327-328,331-332,335-336

For inserts, see pages: CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

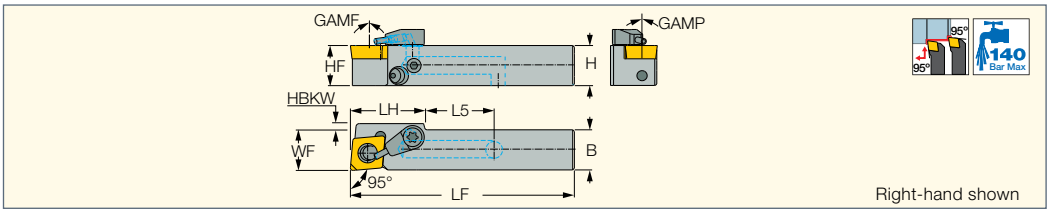
Spare Parts

Designation						
PCLCR/L 1010H-06S-JHP	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5	SR 5/16XUNF-TL-S	S-CU-JHP-A SET
PCLCR/L 1212H-09S-JHP	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5	SR 5/16UNF TL360	S-CU-JHP-A SET
PCLCR/L 1616K-09S-JHP	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5	SR 5/16UNF TL360	S-CU-JHP-A SET
PCLCR/L 2020K-09S-JHP	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5	SR 5/16UNF TL360	S-CU-JHP-A SET

ISOTURN

PCLCR/L-S-JHP-MC

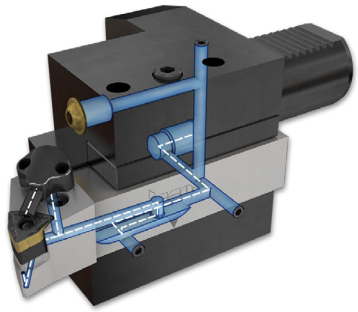
Tools with Channels for High-Pressure Coolant Carrying 80° Positive Rhombic Inserts for Swiss Automatic Machines



Designation	H	HF	B	LF	LH	L5	WF	HBKW	GAMP	GAMF	Insert
PCLCR/L 1212X-09S-JHP-MC	12.0	12.0	12.0	67.00	23.0	20.00	12.20	1.80	0.0	0.0	CC.. 09T3
PCLCR/L 1616X-09S-JHP-MC	16.0	16.0	16.0	71.00	23.0	17.00	16.20	-	0.0	0.0	CC.. 09T3

- For user guide, see pages 327-328,331-332,335-336

For inserts, see pages: • CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)



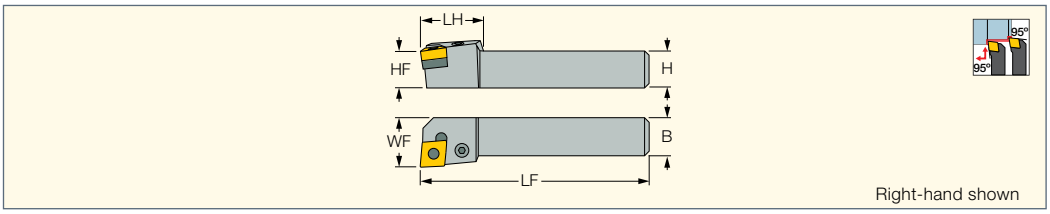
Spare Parts

Designation						
PCLCR/L-S-JHP-MC	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5	SR 5/16UNF TL360	S-CU-JHP-A SET

ISOTURN

PCLNR/L

Lever Lock Tools Carrying 80°
Negative Rhombic Inserts



Designation	H	HF	B	LF	LH	WF	Insert
PCLNR/L 2020K-12	20.0	20.0	20.0	125.00	27.5	25.00	CNGA 1204..
PCLNR/L 2525M-12	25.0	25.0	25.0	150.00	27.8	32.00	CNGA 1204..
PCLNR/L 3232P-12	32.0	32.0	32.0	170.00	27.6	40.00	CNGA 1204..
PCLNR/L 3232P-19	32.0	32.0	32.0	170.00	38.0	40.00	CNGA 1906..
PCLNR/L 4040S-25	40.0	40.0	40.0	250.00	47.0	50.00	CNGA 2509..
PCLNR 5050T-25	50.0	50.0	50.0	300.00	47.0	60.00	CNGA 2509..

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146)
• CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199)
• CNGG (CER) (55) • CNGA (CER) (54)

Spare Parts

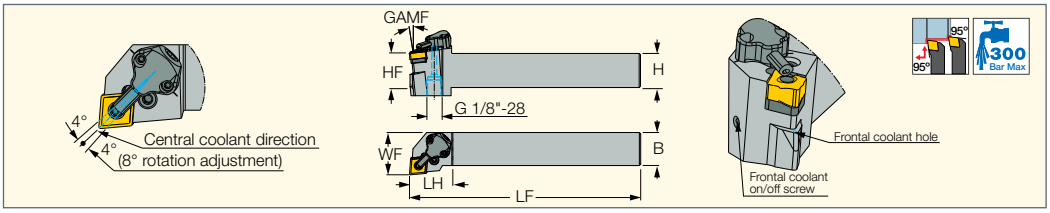
Designation							
PCLNR/L 2020K-12	TCN 423		SP 4	LR 4	SR 117-2010	HW 3.0	PN 3-4
PCLNR/L 2525M-12	TCN 423		SP 4	LR 4	SR 117-2010	HW 3.0	PN 3-4
PCLNR/L 3232P-12	TCN 423		SP 4	LR 4	SR 117-2010	HW 3.0	PN 3-4
PCLNR/L 3232P-19	TCN 63		SP 66	LR 6	SR 10402352	HW 4.0	
PCLNR/L 4040S-25	TCN 84N	TCN 85N*	SP 8	LR 8	SR 10402264	HW 5.0	
PCLNR 5050T-25	TCN 84N	TCN 85N*	SP 8	LR 8	SR 10402264	HW 5.0	

* Optional, to be ordered separately

ISOTURN

PCLNR/L-12-JHP

Lever Lock Tools with
Channels for High-Pressure
Coolant Carrying 80°
Negative Rhombic Inserts



Designation	H	HF	B	LF	LH	WF	GAMF	Insert
PCLNR/L 2525M-12-JHP	25.0	25.0	25.0	150.00	33.0	32.00	-6.0	CNGA 1204
PCLNR/L 3232P-12-JHP	32.0	32.0	32.0	170.00	33.0	40.00	-6.0	CNGA 1204

• For user guide, see pages 327-328,331-332,335-336

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146)
• CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199)
• CNGG (CER) (55) • CNGA (CER) (54)

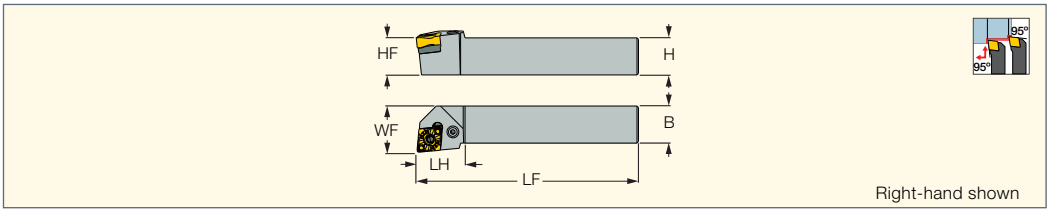
Spare Parts

Designation										
PCLNR/L-12-JHP	TCN 423	SP 4	LR 4	SR 117-2010	PN 3-4	CU-CW-JHP	SR M4X4 DIN913 TL360	HW 2.0	HW 3.0	T-8/5

HELITURN LD

PCLNR/L-X

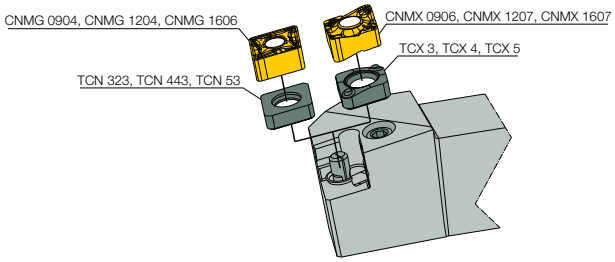
Lever Lock Tools Carrying
CNMX/CNGA 80°
Rhombic Inserts



Designation	B	H	LF	LH	WF	Insert
PCLNR/L 2525M-09X	25.0	25.0	150.00	25.0	32.00	CNGA 0904
PCLNR/L 2020K-12X	20.0	20.0	125.00	31.0	25.00	CNGA 1204
PCLNR/L 2525M-12X	25.0	25.0	150.00	31.0	32.00	CNGA 1204
PCLNR/L 3232P-12X	32.0	32.0	170.00	32.0	40.00	CNGA 1204
PCLNR/L 3232P-16X	32.0	32.0	170.00	32.0	40.00	CNGA 1606

• Supplied with TCX 3 seat for CNMX 0906.. inserts and TCN 323 seat for CNGA 0904.. inserts, TCX 4 seat for CNMX 1207.. inserts and TCN 443 seat for CNGA 1204.. inserts, TCX 5 seat for CNMX 1607.. inserts and TCN 53 seat for CNGA 1606.. inserts.

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • CNGG (CER) (55)



Spare Parts

Designation								
PCLNR/L 2020K-09X	TCX 3[a]	TCN 323	SP 3	LR 3	SR 117-2014	HW 2.5	PN 3-4	
PCLNR/L 2525M-09X	TCX 3[a]	TCN 323	SP 3	LR 3	SR 117-2014	HW 2.5	PN 3-4	
PCLNR/L 2020K-12X	TCX 4	TCN 443	SP 4	LR 4DH	SR 117-2010	HW 3.0	PN 3-4L	LR 4DHTL (MR INJ)*
PCLNR/L 2525M-12X	TCX 4	TCN 443	SP 4	LR 4DH	SR 117-2010	HW 3.0	PN 3-4L	LR 4DHTL (MR INJ)*
PCLNR/L 3232P-12X	TCX 4	TCN 443	SP 4	LR 4DH	SR 117-2010	HW 3.0	PN 3-4L	LR 4DHTL (MR INJ)*
PCLNR/L 3232P-16X	TCX 5	TCN 53	SP 5	LR 5	SR LCS 5	HW 3.0	SPP 5-6	

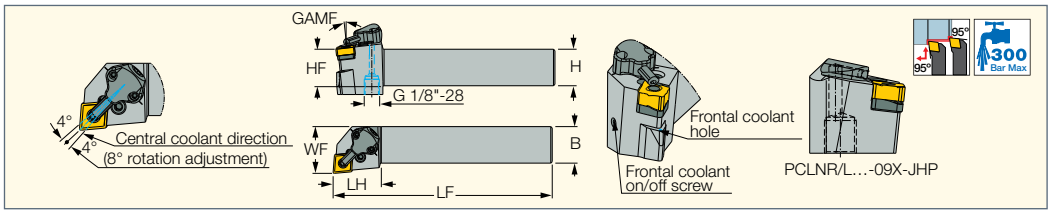
* Optional, to be ordered separately

[a] For CNMX 0906.. (CNMX 34.) inserts

HELITURN LD

PCLNR/L-X-JHP

Lever Lock Tools with Channels for High-Pressure Coolant Carrying CNMX/ CNGA 80° Rhombic Inserts



Designation	B	H	HF	LF	LH	WF	GAMF	Insert
PCLNR/L 1616H-09X-JHP	16.0	16.0	16.0	100.00	20.0	20.00	-6.0	CNGA 0904
PCLNR/L 2020K-09X-JHP	20.0	20.0	20.0	125.00	25.0	25.00	-6.0	CNGA 0904
PCLNR/L 2525M-09X-JHP	25.0	25.0	25.0	150.00	25.0	32.00	-6.0	CNGA 0904
PCLNR/L 2525M-12X-JHP	25.0	25.0	25.0	150.00	25.0	32.00	-6.0	CNGA 1204
PCLNR/L 3232P-12X-JHP	32.0	32.0	32.0	170.00	33.0	40.00	-6.0	CNGA 1204

- Supplied with TCX 3 seat for CNMX 0906.. inserts and TCN 323 seat for CNGA 0904.. inserts. TCX 4 seat for CNMX 1207.. inserts and TCN 443 seat for CNGA 1204.. inserts.
- For user guide, see pages 327-328,331-332,335-336

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • CNGG (CER) (55) • CNGA (CER) (54)

Spare Parts

Designation													
PCLNR/L 1616H-09X-JHP	TCX 3[a]	TCN 323[c]	SP 3	LR 3	SR 117-2014	PN 3-4				HW 2.5		
PCLNR/L 2020K-09X-JHP	TCX 3[a]	TCN 323[c]	SP 3	LR 3	SR 117-2014	PN 3-4				HW 2.5		
PCLNR/L 2525M-09X-JHP	TCX 3[a]	TCN 323[c]	SP 3	LR 3	SR 117-2014	PN 3-4				HW 2.5		
PCLNR/L 2525M-12X-JHP	TCX 4[b]	TCN 443[d]	SP 4	LR 4DH	SR 117-2010	PN 3-4L	CU-CW-JHP	T-8/5	LR 4DHTL (MR INJ)*	HW 2.0	HW 3.0	SR M4X4 DIN913 TL360
PCLNR/L 3232P-12X-JHP	TCX 4[b]	TCN 443[d]	SP 4	LR 4DH	SR 117-2010	PN 3-4L	CU-CW-JHP	T-8/5	LR 4DHTL (MR INJ)*	HW 2.0	HW 3.0	SR M4X4 DIN913 TL360

* Optional, to be ordered separately

[a] For CNMX 0906.. (CNMX 34.) inserts

[b] For CNMX 1207.. (CNMX 45.) inserts

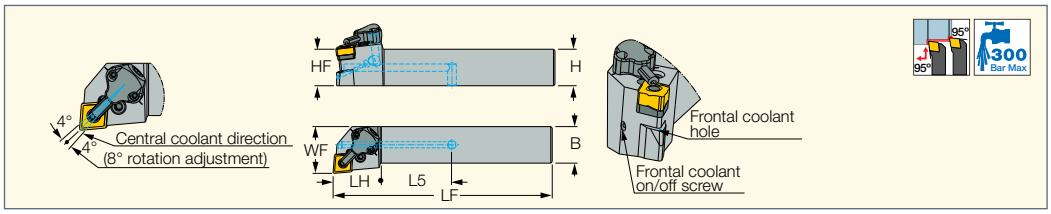
[c] For CNGA 0904.. (CNGA 33.) inserts

[d] For CNGA 1204.. (CNGA 43.) inserts

HELITURN LD

PCLNR/L-X-JHP-MC

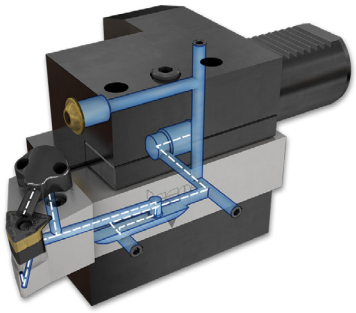
Lever Lock Tools with Bottom Inlets for High-Pressure Coolant Channels Carrying CNMX/ CNGA 80° Rhombic Inserts



Designation	B	H	HF	LF	LH	L5	WF	Insert
PCLNR/L 2020X-09X-JHP-MC	20.0	20.0	20.0	97.00	27.0	29.00	25.00	CNGA 0904
PCLNR/L 2525X-09X-JHP-MC	25.0	25.0	25.0	118.00	33.0	35.00	32.00	CNGA 0904
PCLNR/L 2020X-12X-JHP-MC	20.0	20.0	20.0	97.00	27.0	29.00	25.00	CNGA 1204
PCLNR/L 2525X-12X-JHP-MC	25.0	25.0	25.0	118.00	33.0	35.00	32.00	CNGA 1204

- Supplied with TCX 3 seat for CNMX 0906.. inserts and TCN 323 seat for CNGA 0904.. inserts. TCX 4 seat for CNMX 1207.. inserts and TCN 443 seat for CNGA 1204.. inserts.
- For user guide, see pages 327-328,331-332,335-336

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • CNGG (CER) (55) • CNGA (CER) (54)



Spare Parts

Designation													
PCLNR/L 2020X-09X-JHP-MC	TCX 3[a]	TCN 323[c]	SP 3	LR 3	SR 117-2014	PN 3-4	HW 2.5	CU-CW-JHP	SR M5X5 DIN913 TL360		T-8/5		
PCLNR/L 2525X-09X-JHP-MC	TCX 3[a]	TCN 323[c]	SP 3	LR 3	SR 117-2014	PN 3-4	HW 2.5	CU-CW-JHP	SR M5X5 DIN913 TL360		T-8/5		
PCLNR/L 2020X-12X-JHP-MC	TCX 4[b]	TCN 443[d]	SP 4	LR 4DH	SR 117-2010	PN 3-4L	HW 2.5	CU-CW-JHP	SR M5X5 DIN913 TL360	HW 3.0	T-8/5	LR 4DHTL (MR INJ)*	
PCLNR/L 2525X-12X-JHP-MC	TCX 4[b]	TCN 443[d]	SP 4	LR 4DH	SR 117-2010	PN 3-4L	HW 2.5	CU-CW-JHP	SR M5X5 DIN913 TL360	HW 3.0	T-8/5	LR 4DHTL (MR INJ)*	

* Optional, to be ordered separately

[a] For CNMX 0906.. (CNMX 34.) inserts

[b] For CNMX 1207.. (CNMX 45.) inserts

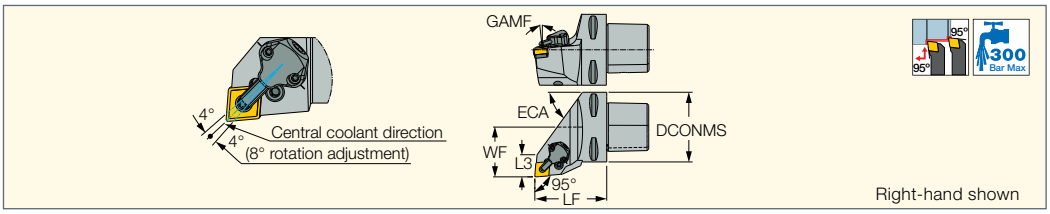
[c] For CNGA 0904.. (CNGA 33.) inserts

[d] For CNGA 1204.. (CNGA 43.) inserts

ISOTURN

C#-PCLNR/L-12-JHP

Lever Lock Tools with Channels for High-Pressure Coolant and CAMFIX Shanks Carrying 80° Negative Rhombic Inserts



Designation	DCONMS	WF	LF	L3	ECA	GAMF	Insert	DCP(1)	CP(2)
C6 PCLNR/L-45065-12-JHP	63.00	45.00	65.00	20.00	54.0	-6.0	CNGA 1204	1	300

- For user guide, see pages 327-328,331-332,335-336

(1) 1 - Slot for data chip, 0 - Without slot for data chip

(2) Coolant pressure (Bar)

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • CNGG (CER) (55) • CNGA (CER) (54)

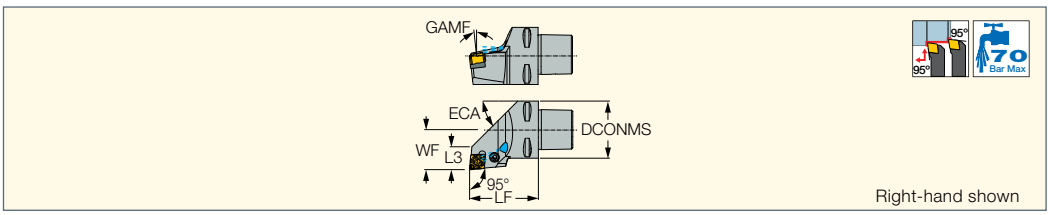
Spare Parts

Designation								
C6 PCLNR/L-45065-12-JHP	TCN 423	SP 4	LR 4	SR 117-2010	PN 3-4	CU-CW-JHP	HW 3.0	T-8/5

HELITURN LD

C#-PCLNR/L-X

Lever Lock Tools with CAMFIX Exchangeable Shanks Carrying CNMX and CNGA Rhombic Inserts



Designation	DCONMS	WF	LF	GAMF	L3	ECA	Insert	CP(2)	DCP(3)
C4 PCLNR/L-27050-12X (1)	40.00	27.00	50.00	6.0	20.00	40.0	CNGA 1204	70	1
C5 PCLNR/L-35060-12X (1)	50.00	35.00	60.00	6.0	20.00	45.0	CNGA 1204	70	1
C6 PCLNR/L-45065-12X (1)	63.00	45.00	65.00	6.0	20.00	54.0	CNGA 1204	70	1
C4 PCLNR/L-27050-16X	40.00	27.00	50.00	6.0	21.00	40.0	CNGA 1606	70	1
C5 PCLNR/L-35060-16X	50.00	35.00	60.00	6.0	21.00	45.0	CNGA 1606	70	1
C6 PCLNR/L-45065-16X	63.00	45.00	65.00	6.0	21.00	54.0	CNGA 1606	70	1

(1) Supplied with TCX 4 seat for CNMX 1207.. inserts and TCN 443 seat for CNGA 1204.. inserts.

(2) Coolant pressure (Bar)

(3) 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • CNGG (CER) (55) • CNGA (CER) (54)

Spare Parts

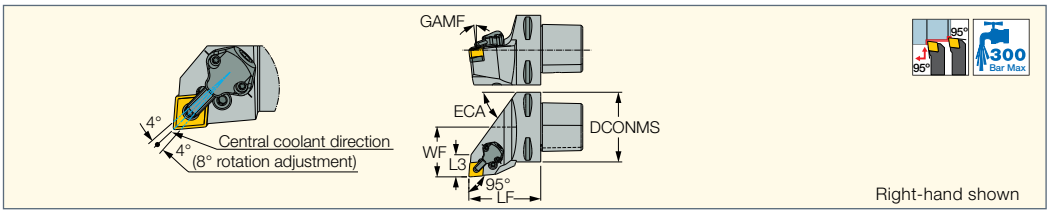
Designation									
C4 PCLNR/L-27050-12X	TCX 4	TCN 443	SP 4	PN 3-4L	LR 4DH	SR 117-2010	HW 3.0	EZ 62	LR 4DHTL (MR INJ)*
C5 PCLNR/L-35060-12X	TCX 4	TCN 443	SP 4	PN 3-4L	LR 4DH	SR 117-2010	HW 3.0	EZ 83	LR 4DHTL (MR INJ)*
C6 PCLNR/L-45065-12X	TCX 4	TCN 443	SP 4	PN 3-4L	LR 4DH	SR 117-2010	HW 3.0	EZ 83	LR 4DHTL (MR INJ)*
C4 PCLNR/L-27050-16X	TCX 5	TCN 53	SP 5	SPP 5-6	LR 5	SR LCS 5	HW 3.0	EZ 104	
C5 PCLNR/L-35060-16X	TCX 5	TCN 53	SP 5	SPP 5-6	LR 5	SR LCS 5	HW 3.0	EZ 125	
C6 PCLNR/L-45065-16X	TCX 5	TCN 53	SP 5	SPP 5-6	LR 5	SR LCS 5	HW 3.0	EZ 125	

* Optional, to be ordered separately

HELITURN LD

C#-PCLNR/L-X-JHP

Lever Lock Tools with CAMFIX Shanks and Channels for High-Pressure Coolant Carrying CNMX or CNGA Inserts



Designation	DCONMS	WF	LF	L3	ECA	GAMF	Insert	CP(3)	DCP(4)
C3 PCLNR-22045-09X-JHP (1)	32.00	22.00	45.00	22.00	45.0	-6.0	CNGA 0904	300	0
C4 PCLNR/L-27050-09X-JHP (1)	40.00	27.00	50.00	24.00	45.0	-6.0	CNGA 0904	300	1
C5 PCLNR/L-35060-09X-JHP (1)	50.00	35.00	60.00	26.00	45.0	-6.0	CNGA 0904	300	1
C4 PCLNR/L-27050-12X-JHP (2)	40.00	27.00	50.00	18.00	54.0	-6.0	CNGA 1204	300	1
C5 PCLNR/L-35060-12X-JHP (2)	50.00	35.00	60.00	20.00	50.0	-6.0	CNGA 1204	300	1
C6 PCLNR/L-45065-12X-JHP (2)	63.00	45.00	65.00	20.00	54.0	-6.0	CNGA 1204	300	1

• For user guide, see pages 327-328,331-332,335-336

(1) Supplied with TCX 3 seat for CNMX 0906.. inserts and TCN 323 seat for CNGA 0904.. inserts.

(2) Supplied with TCX 4 seat for CNMX 1207.. inserts and TCN 443 seat for CNGA 1204.. inserts.

(3) Coolant pressure (Bar)

(4) 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • CNGG (CER) (55) • CNGA (CER) (54)

Spare Parts

Designation										
C3 PCLNR-22045-09X-JHP	TCX 3(a)	TCN 323	SP 3	LR 3	SR 117-2014	PN 3-4	CU-CW-JHP		T-8/5	HW 2.5
C4 PCLNR/L-27050-09X-JHP	TCX 3(a)	TCN 323	SP 3	LR 3	SR 117-2014	PN 3-4	CU-CW-JHP		T-8/5	HW 2.5
C5 PCLNR/L-35060-09X-JHP	TCX 3(a)	TCN 323	SP 3	LR 3	SR 117-2014	PN 3-4	CU-CW-JHP		T-8/5	HW 2.5
C4 PCLNR/L-27050-12X-JHP	TCX 4	TCN 443	SP 4	LR 4DH	SR 117-2010	PN 3-4L	CU-CW-JHP	LR 4DHTL (MR INJ)*	T-8/5	HW 3.0
C5 PCLNR/L-35060-12X-JHP	TCX 4	TCN 443	SP 4	LR 4DH	SR 117-2010	PN 3-4L	CU-CW-JHP	LR 4DHTL (MR INJ)*	T-8/5	HW 3.0
C6 PCLNR/L-45065-12X-JHP	TCX 4	TCN 443	SP 4	LR 4DH	SR 117-2010	PN 3-4L	CU-CW-JHP	LR 4DHTL (MR INJ)*	T-8/5	HW 3.0

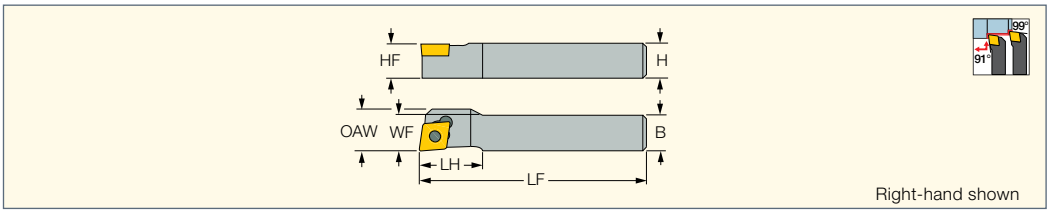
* Optional, to be ordered separately

(a) For CNMX 0906.. (CNMX 34.) inserts

ISOTURN

SCACR/L-S

Screw Lock Tools Carrying 80° Diamond Inserts with 7° Clearance Angle for Swiss-Type Machines



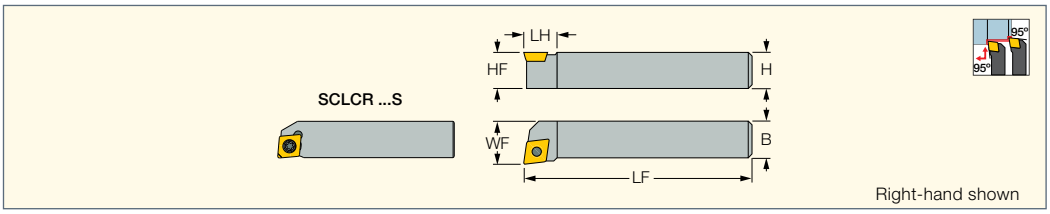
Designation	H	HF	B	LF	LH	WF	OAW	Insert		
SCACR/L 0808K-06S	8.0	8.0	8.0	125.00	8.0	8.20	-	CC.. 0602	SR 14-548	T-7/5
SCACR 1010K-06S	10.0	10.0	10.0	150.00	-	10.00	-	CC.. 0602	SR 14-548	T-7/5
SCACR/L 1616K-06S	16.0	16.0	16.0	125.00	-	16.20	-	CC.. 0602	SR 14-548	T-7/5
SCACR/L 1010K-09S	10.0	10.0	10.0	125.00	15.2	10.20	-	CC.. 09T3	SR 16-236	T-15/5
SCACR 1212K-09S	12.0	12.0	12.0	125.00	14.0	12.15	12.50	CC.. 09T3	SR 16-236	T-15/5
SCACR/L 1616K-09S	16.0	16.0	16.0	125.00	-	16.20	-	CC.. 09T3	SR 16-236	T-15/5

For inserts, see pages: • CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

ISOTURN

SCLCR/L

Screw Lock Tools Carrying 80° Diamond Inserts with 7° Clearance Angle



Designation	H	HF	B	LF	LH	WF	Insert					
SCLCR/L 0808F-06	8.0	8.0	8.0	80.00	10.0	10.00	CC.. 0602	SR 14-548	T-7/5			
SCLCR/L 1010F-06	10.0	10.0	10.0	80.00	10.0	12.00	CC.. 0602	SR 14-548	T-7/5			
SCLCR/L 1212F-09	12.0	12.0	12.0	80.00	14.0	16.00	CC.. 09T3	SR 16-236	T-15/5			
SCLCR 1212M-09S (1)	12.0	12.0	12.0	150.00	11.5	12.15	CC.. 09T3	SR 16-236	T-15/5			
SCLCR/L 1616H-09	16.0	16.0	16.0	100.00	14.0	20.00	CC.. 09T3	SR 16-236	T-15/5			
SCLCR 1616M-09S (1)	16.0	16.0	16.0	150.00	11.5	16.15	CC.. 09T3	SR 16-236	T-15/5			
SCLCR/L 2020K-12	20.0	20.0	20.0	125.00	18.0	25.00	CC.. 1204	SR 16-212	T-20/5			
SCLCR/L 2525M-12	25.0	25.0	25.0	150.00	20.0	32.00	CC.. 1204	SR 16-212	T-20/5	TCC 4-2	SR TC-4	HW 3.0

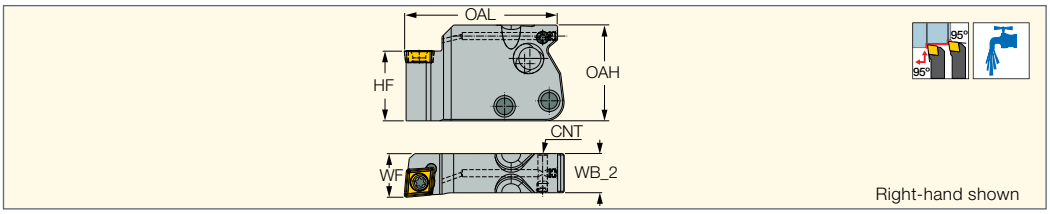
(1) For Swiss-type machines

For inserts, see pages: • CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

ISOTURN

SCLCR/L-PAD-JHP

Screw Lock Adapter with High-Pressure Coolant Mounts 80° Diamond Inserts with 7° Clearance Angle



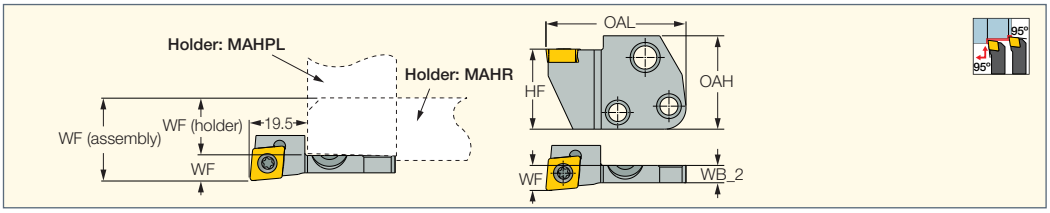
Designation	HF	OAL	OAH	WF	WB_2	Insert	CNT			
SCLCR/L-09-PAD-JHP	24.0	52.80	33.00	15.00	10.0	CCGT/CCGT 09T3	M4	T-15/5	SR M4X4 DIN913 TL360	SR 16-236

For inserts, see pages: • CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

MODULAR GRIP

SCLCR-PAD

Screw Lock Adapter Carrying 80° Diamond Inserts with 7° Clearance Angle



Designation	HF	OAL	OAH	WF	WB_2	Insert		
SCLCR-09-PAD	24.0	42.00	28.00	7.50	5.2	CCGT 09T3	SR 16-236	T-15/5

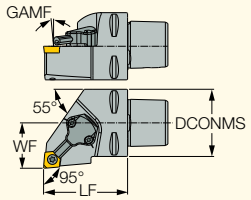
• WF(assembly) = WF(holder) + WF

For inserts, see pages: CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

ISOTURN

C#-SCLCR/L-JHP

Screw Clamp Tools with CAMFIX Shanks and Channels for High-Pressure Coolant Carrying Positive 80° Rhombic Inserts



Right-hand shown

Designation	DCONMS	WF	LF	GAMF	Insert	CP(1)	DCP(2)
C3 SCLCR-22045-09-JHP	32.00	22.00	45.00	0.0	CC.. 09T3	300	0
C4 SCLCR/L 27050-09-JHP	40.00	27.00	50.00	0.0	CC.. 09T3	300	1
C5 SCLCR/L 35060-09-JHP	50.00	35.00	60.00	0.0	CC.. 09T3	300	1

- For user guide, see pages 327-328,331-332,335-336

(1) Coolant pressure (Bar)

(2) 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

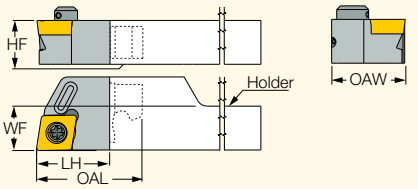
Spare Parts

Designation				
C3 SCLCR-22045-09-JHP	SR 16-236	T-15/5	CU-CW-JHP	T-8/5
C4 SCLCR/L 27050-09-JHP	SR 16-236	T-15/5	CU-CW-JHP	T-8/5
C5 SCLCR/L 35060-09-JHP	SR 16-236	T-15/5	CU-CW-JHP	T-8/5

NEOSWISS

NQCH-SCACR/L-S-JHP

Screw Lock JETCUT Modular Heads Carrying 7° Clearance 80° Rhombic Inserts for Swiss-Type Machines



Right hand tool shown

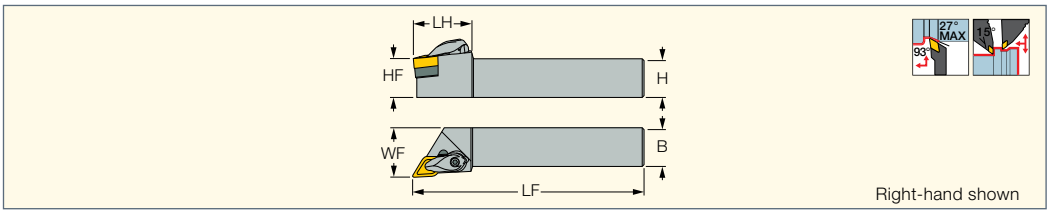
Designation	WF	HF	LH	OAL	OAW	Insert		
NQCH12-SCACR/L-09S-JHP	12.15	12.0	20.0	28.80	20.15	CC.. 09T3	SR 16-236	T-15/5
NQCH16-SCACR/L-09S-JHP	16.15	16.0	20.0	28.80	20.15	CC.. 09T3	SR 16-236	T-15/5

For inserts, see pages: • CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

ISOTURN

DDJNR/L

R-Clamp Tools with 93° Lead Angle Carrying 55° Negative Rhombic Inserts



Designation	H	HF	B	LF	LH	WF	Insert
DDJNR/L 1616H-11	16.0	16.0	16.0	100.00	30.0	20.00	DNGA 1104
DDJNR/L 2020K-11	20.0	20.0	20.0	125.00	30.0	25.00	DNGA 1104
DDJNR/L 2525M-11	25.0	25.0	25.0	150.00	30.0	32.00	DNGA 1104
DDJNR/L 2020K-15	20.0	20.0	20.0	125.00	39.0	25.00	DNGA 1506
DDJNR/L 2525M-15	25.0	25.0	25.0	150.00	40.0	32.00	DNGA 1506
DDJNR/L 3232P-15	32.0	32.0	32.0	170.00	41.0	40.00	DNGA 1506

For inserts, see pages: DNGA (CBN) (151) • DNGA (PCD) (202) • DNGA 2MT (CBN) (152) • DNGA 2MT MM (CBN) (153) • DNGA 4MT (CBN) (152) • DNGA 4MT MM (CBN) (153) • DNGA MT (CBN) (151) • DNGA MT (PCD) (202) • DNGA (CER) (56)

Spare Parts

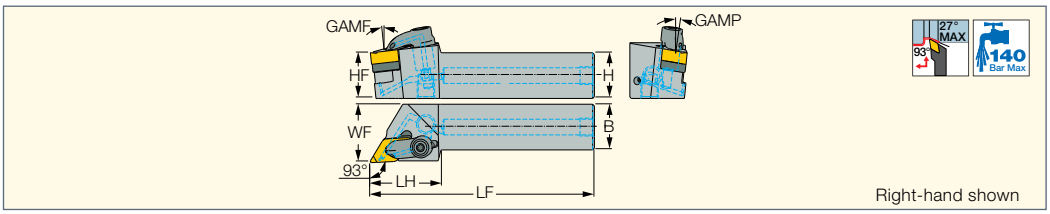
Designation								
DDJNR/L 1616H-11	RDT 3-2		SR 40085I	LCGR-3	SR RC3	HW 2.5	KSP 3	
DDJNR/L 2020K-11	RDT 3-2		SR 40085I	LCGR-3	SR RC3	HW 2.5	KSP 3	
DDJNR/L 2525M-11	RDT 3-2		SR 40085I	LCGR-3	SR RC3	HW 2.5	KSP 3	
DDJNR/L 2020K-15	RDT 433	RDT 443*	SR 14-506 M4X0.7	LCGR-4	SR 10400270-25.5			T-15/5
DDJNR/L 2525M-15	RDT 433	RDT 443*	SR 14-506 M4X0.7	LCGR-4	SR 10400270-25.5			T-15/5
DDJNR/L 3232P-15	RDT 433	RDT 443*	SR 14-506 M4X0.7	LCGR-4	SR 10400270-25.5			T-15/5

* Optional, to be ordered separately

JETRTURN RIGID CLAMP

DDJNR/L-JHP-MC

Rigid Clamp Tools with Channels for High-Pressure Coolant Carrying 55° Rhombic Inserts



Designation	B	H	HF	LF	LH	WF	GAMP	GAMF	MIID[1]
DDJNR/L 2020X-15-JHP-MC	20.0	20.0	20.0	110.00	40.0	25.00	6.0	6.0	DNGA 1506
DDJNR/L 2525X-15-JHP-MC	25.0	25.0	25.0	125.00	40.0	32.00	6.0	6.0	DNGA 1506

[1] Master insert identification

For inserts, see pages: DNGA (CBN) (151) • DNGA (CER) (56) • DNGA (PCD) (202) • DNGA 2MT (CBN) (152) • DNGA 2MT MM (CBN) (153) • DNGA 4MT (CBN) (152) • DNGA 4MT MM (CBN) (153) • DNGA MT (CBN) (151) • DNGA MT (PCD) (202) • DNGG (CER) (57)

Spare Parts

Designation						
DDJNL 2020X-15-JHP-MC	RDT 433	RDT 443*	LCGR/L-4JC SET[a]	PLG G1/8 TL360	SR 14-506 M4X0.7	OR 4X3 NBR70
DDJNR/L 2020X-15-JHP-MC	RDT 433	RDT 443*	LCGR/L-4JC SET[a]	PLG G1/8 TL360	SR 14-506 M4X0.7	OR 4X3 NBR70

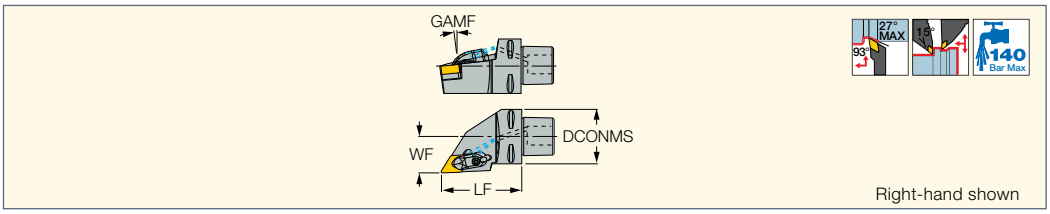
* Optional, to be ordered separately

[a] Recommended tightening torque 4Nm for R-Clamp Screw

ISOTURN

C#-DDJNR/L

Tools with CAMFIX Exchangeable Tapered Shanks Carrying Negative 55° Rhombic Inserts



Designation	DCONMS	WF	LF	Insert	GAMF	CP(1)	DCP(2)
C4 DDJNR/L-27060-15	40.00	27.00	60.00	DN..15	6.0	140	1
C5 DDJNR/L-35060-15	50.00	35.00	60.00	DN..15	6.0	140	1
C6 DDJNR/L-45065-15	63.00	45.00	65.00	DN..15	6.0	140	1

- Use RDT 443 seat for DN.. 1504.. inserts

(1) Coolant pressure (Bar)

(2) 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: DNGA (CBN) (151) • DNGA (PCD) (202) • DNGA 2MT (CBN) (152) • DNGA 2MT MM (CBN) (153) • DNGA 4MT (CBN) (152) • DNGA 4MT MM (CBN) (153) • DNGA MT (CBN) (151) • DNGA MT (PCD) (202) • DNGG (CER) (57) • DNGA (CER) (56)

Spare Parts

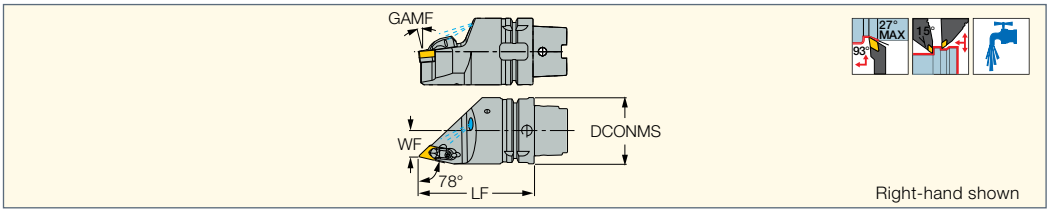
Designation							
C4 DDJNL-27060-15	RDT 433	RDT 443*	T-15/5	LCGR-4	SR 10400270-25.5	SR 14-506 M4X0.7	EZ 62
C4 DDJNR-27060-15	RDT 433	RDT 443*	T-15/5	LCGR-4	SR 10400270-25.5	SR 14-506 M4X0.7	EZ 62
C5 DDJNL-35060-15	RDT 433	RDT 443*	T-15/5	LCGR-4	SR 10400270-25.5	SR 14-506 M4X0.7	EZ 83
C5 DDJNR-35060-15	RDT 433	RDT 443*	T-15/5	LCGR-4	SR 10400270-25.5	SR 14-506 M4X0.7	EZ 83
C6 DDJNR/L-45065-15	RDT 433	RDT 443*	T-15/5	LCGR-4	SR 10400270-25.5	SR 14-506 M4X0.7	EZ 104

* Optional, to be ordered separately

R-CLAMP

HSK A63WH-DDJNR/L

R-Clamp Turning Tools with HSK Taper Shank Carrying Negative DNGA Inserts for 15° Mounting on Turn-Mill Machines



Designation	DCONMS	LF	WF	Insert	GAMF	DCP(2)							
HSK A63WH DDJNR/L J15 (1)	63.00	110.00	25.00	DN.. 15	7.5	0	RDT 433	RDT 443*	SR 14-506 M4X0.7	LCGR-4	SR 10400270-25.5	T-15/5	EZ 104

- Complies with ICTM standard (ISO 12164-3). • A cooling tube must be used with all coolant through HSK spindles (should be ordered separately).
- For user guide, see pages 327-328,331-332,335-336

(1) RDT 443 for DN__ 1504.. insert.

(2) 1 - Slot for data chip, 0 - Without slot for data chip

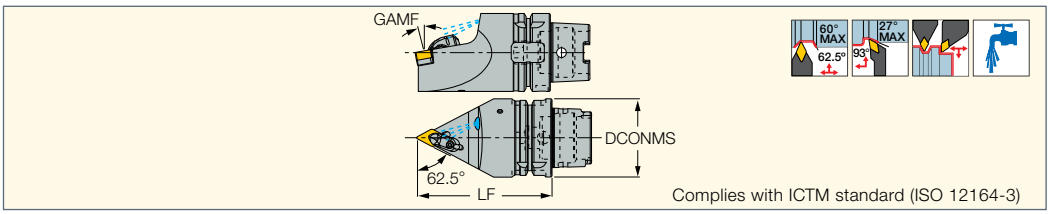
* Optional, to be ordered separately

For inserts, see pages: DNGA (CBN) (151) • DNGA (PCD) (202) • DNGA 2MT (CBN) (152) • DNGA 2MT MM (CBN) (153) • DNGA 4MT (CBN) (152) • DNGA 4MT MM (CBN) (153) • DNGA MT (CBN) (151) • DNGA MT (PCD) (202) • DNGG (CER) (57) • DNGA (CER) (56)

R-CLAMP

HSK A63WH-DDNNN

R-Clamp Turning Tools with HSK Taper Shank Carrying Negative DNGA Inserts



Designation	LF	Insert	GAMF	DCP(2)	DCONMS							
HSK A63WH DDNNN J15 (1)	110.00	DN.. 15	10.0	0	63.00	RDT 433	RDT 443*	SR 14-506 M4X0.7	LCGR-4	SR 10400270-25.5(a)	T-15/5	EZ 104

- A cooling tube must be used with all coolant through HSK spindles (should be ordered separately). • For user guide, see pages 327-328,331-332,335-336

(1) RDT 443 for DN__ 1504.. insert.

(2) 1 - Slot for data chip, 0 - Without slot for data chip

* Optional, to be ordered separately

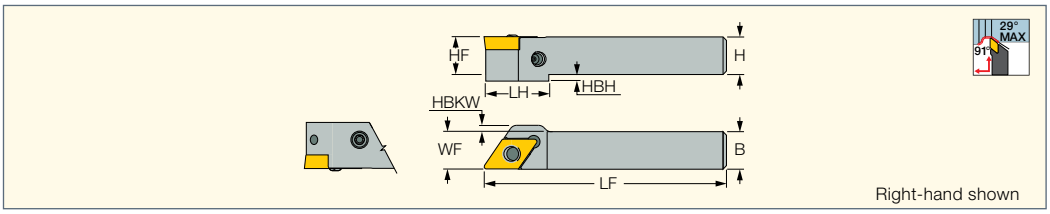
(a) Recommended tightening torque:3 N*m

For inserts, see pages: DNGA (CBN) (151) • DNGA (PCD) (202) • DNGA 2MT (CBN) (152) • DNGA 2MT MM (CBN) (153) • DNGA 4MT (CBN) (152) • DNGA 4MT MM (CBN) (153) • DNGA MT (CBN) (151) • DNGA MT (PCD) (202) • DNGG (CER) (57) • DNGA (CER) (56)

ISOTURN

PDACR/L-S

Side Lever Lock Tools Carrying
55° Positive Rhombic Inserts
for Swiss Automatic Machines



Designation	H	HF	LH	HBH	B	LF	WF	HBKW	Insert				
PDACR/L 0808M-07S	8.0	8.0	16.0	2.0	8.0	150.00	8.00	-	DC..0702	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5
PDACR/L 1010M-07S	10.0	10.0	-	-	10.0	150.00	10.00	-	DC..0702	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5
PDACR/L 1212M-07S	12.0	12.0	-	-	12.0	150.00	12.00	-	DC..0702	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5
PDACR/L 1616M-07S	16.0	16.0	-	-	16.0	150.00	16.00	-	DC..0702	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5
PDACR/L 1012M-11S	10.0	10.0	22.0	2.5	12.0	150.00	12.00	2.00	DC..11T3	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5
PDACR/L 1212M-11S	12.0	12.0	-	-	12.0	150.00	12.00	2.00	DC..11T3	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5
PDACR/L 1616M-11S	16.0	16.0	-	-	16.0	150.00	16.00	-	DC..11T3	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5
PDACR/L 2020K-11S	20.0	20.0	-	-	20.0	125.00	20.00	-	DC..11T3	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5

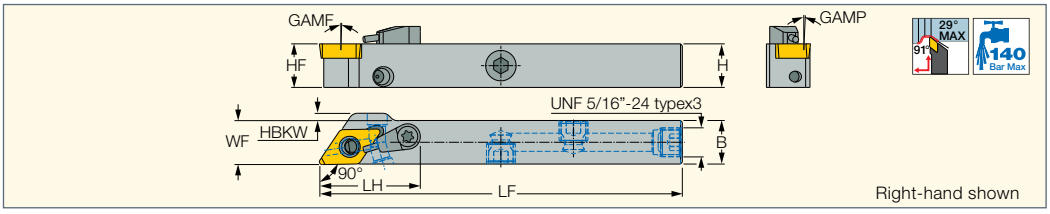
- The clamping screw may by transferred to the opposite side if needed

For inserts, see pages: DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149)
• DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

ISOTURN

PDACR/L-S-JHP

Tools with Channels for
High-Pressure Coolant Carrying
55° Positive Rhombic Inserts
for Swiss Automatic Machines



Designation	H	HF	B	LF	LH	WF	HBKW	GAMP	GAMF	Insert
PDACR/L 1010H-07S-JHP	10.0	10.0	10.0	100.00	20.4	10.20	6.10	0.0	0.0	DC..0702
PDACR/L 1212H-11S-JHP	12.0	12.0	12.0	100.00	28.0	12.20	2.00	0.0	0.0	DC..11T3
PDACR/L 1616K-11S-JHP	16.0	16.0	16.0	125.00	28.0	16.20	-	0.0	0.0	DC..11T3
PDACR/L 2020K-11S-JHP	20.0	20.0	20.0	125.00	28.0	20.20	-	0.0	0.0	DC..11T3

- For user guide, see pages 327-328,331-332,335-336

For inserts, see pages: DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149)
• DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

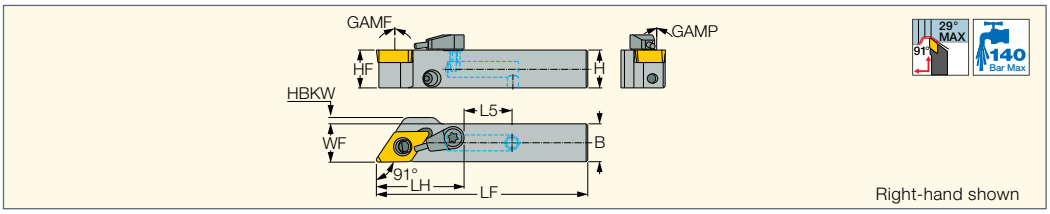
Spare Parts

Designation						
PDACR/L 1010H-07S-JHP	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5	SR 5/16XUNF-TL-S	S-CU-JHP-A SET
PDACR/L 1212H-11S-JHP	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5	SR 5/16UNF TL360	S-CU-JHP-A SET
PDACR/L 1616K-11S-JHP	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5	SR 5/16UNF TL360	S-CU-JHP-A SET
PDACR/L 2020K-11S-JHP	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5	SR 5/16UNF TL360	S-CU-JHP-A SET

ISOTURN

PDACR/L-S-JHP-MC

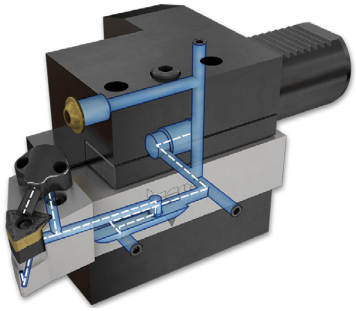
Tools with Channels for High-Pressure Coolant Carrying 55° Positive Rhombic Inserts for Swiss Automatic Machines



Designation	H	HF	B	LF	LH	L5	WF	HBKW	GAMP	GAMF	Insert
PDACR/L 1212X-11S-JHP-MC	12.0	12.0	12.0	67.00	28.0	15.00	12.20	2.00	0.0	0.0	DC..11T3
PDACR/L 1616X-11S-JHP-MC	16.0	16.0	16.0	76.00	28.0	17.00	16.20	-	0.0	0.0	DC..11T3

• For user guide, see pages 327-328,331-332,335-336

For inserts, see pages: • DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)



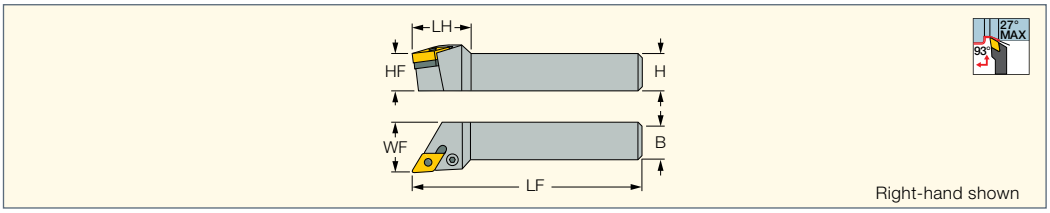
Spare Parts

Designation						
PDACR/L-S-JHP-MC	SL LV-3	SL PI-3	SR 10400150	HW 2.5/5	SR 5/16UNF TL360	S-CU-JHP-A SET

ISOTURN

PDJNR/L

Lever Lock Tools Carrying 55° Negative Rhombic Inserts



Designation	H	HF	B	LF	LH	WF	Insert
PDJNR/L 1616H-11	16.0	16.0	16.0	100.00	30.0	20.00	DNGA 1104
PDJNR/L 2020K-11	20.0	20.0	20.0	125.00	30.0	25.00	DNGA 1104
PDJNR/L 2525M-11	25.0	25.0	25.0	150.00	30.0	32.00	DNGA 1104
PDJNR/L 2020K-15	20.0	20.0	20.0	125.00	34.0	25.00	DNGA 1506
PDJNR/L 2525M-15	25.0	25.0	25.0	150.00	34.0	32.00	DNGA 1506
PDJNR/L 3232P-15	32.0	32.0	32.0	170.00	34.0	40.00	DNGA 1506

For inserts, see pages: DNGA (CBN) (151) • DNGA (PCD) (202) • DNGA 2MT (CBN) (152) • DNGA 2MT MM (CBN) (153) • DNGA 4MT (CBN) (152) • DNGA 4MT MM (CBN) (153) • DNGA MT (CBN) (151) • DNGA MT (PCD) (202) • DNGG (CER) (57) • DNGA (CER) (56)

Spare Parts

Designation							
PDJNR/L 1616H-11	TDN 322		SP 3	PN 3-4	LR 3D	SR 117-2014	HW 2.5/5
PDJNR/L 2020K-11	TDN 322		SP 3	PN 3-4	LR 3D	SR 117-2014	HW 2.5/5
PDJNR/L 2525M-11	TDN 322		SP 3	PN 3-4	LR 3D	SR 117-2014	HW 2.5/5
PDJNR/L 2020K-15	TDN 422	TDN 432[(a)]*	SP 4	PN 3-4	LR 4D	SR 117-2010	HW 3.0
PDJNR/L 2525M-15	TDN 422	TDN 432[(a)]*	SP 4	PN 3-4	LR 4D	SR 117-2010	HW 3.0
PDJNR/L 3232P-15	TDN 422	TDN 432[(a)]*	SP 4	PN 3-4	LR 4D	SR 117-2010	HW 3.0

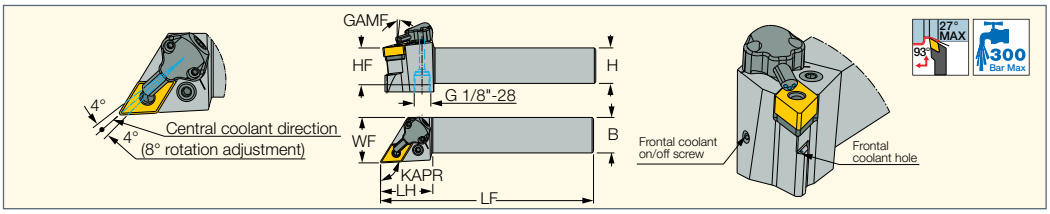
* Optional, to be ordered separately

[(a)] Use for DNGA 1504.. inserts.

ISOTURN

PDJNR/L-JHP

Lever Lock Tools with Channels for High-Pressure Coolant Carrying 55° Negative Rhombic Inserts



Designation	B	H	HF	LF	LH	WF	GAMF	KAPR(1)	Insert
PDJNR/L 2525M-11-JHP	25.0	25.0	25.0	150.00	36.0	32.00	-6.0	93.0	DNGA 1104
PDJNR/L 2525M-15-JHP	25.0	25.0	25.0	150.00	36.0	32.00	-6.0	93.0	DNGA 1506

• For user guide, see pages 327-328,331-332,335-336

(1) Tool cutting edge angle

For inserts, see pages: DNGA (CBN) (151) • DNGA (PCD) (202) • DNGA 2MT (CBN) (152) • DNGA 2MT MM (CBN) (153) • DNGA 4MT (CBN) (152) • DNGA 4MT MM (CBN) (153) • DNGA MT (CBN) (151) • DNGA MT (PCD) (202) • DNGG (CER) (57) • DNGA (CER) (56)

Spare Parts

Designation											
PDJNR/L 2525M-11-JHP	TDN 322		PN 3-4	LR 3D	SR 117-2014	SP 3	CU-D-JHP	SR M4X4 DIN913 TL360	T-8/5	HW 2.0	HW 2.5/5
PDJNR/L 2525M-15-JHP	TDN 422	TDN 432(a)*	PN 3-4	LR 4D	SR 117-2010	SP 4	CU-D-JHP	SR M4X4 DIN913 TL360	T-8/5	HW 2.0	HW 3.0

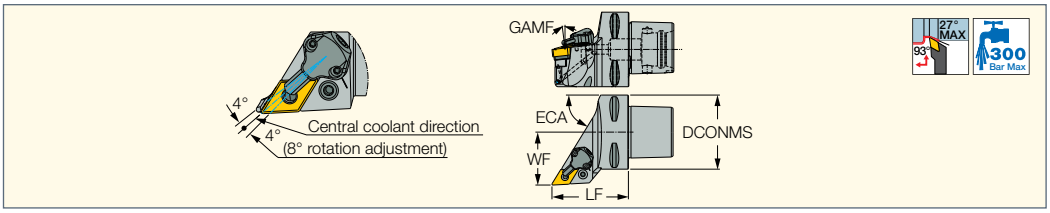
* Optional, to be ordered separately

(a) Use for DNGA 1504.. inserts

ISOTURN

C#-PDJNR/L-JHP

Lever Lock Tools with CAMFIX Exchangeable Shanks and Channels for High-Pressure Coolant Carrying Negative 55° Insert



Designation	DCONMS	WF	LF	GAMF	ECA	Insert	CP(1)	DCP(2)
C3 PDJNR-22045-11-JHP	32.00	22.00	45.00	-6.0	58.0	DN.. 11..	300	0
C4 PDJNR/L 27050-11-JHP	40.00	27.00	50.00	-6.0	58.0	DN.. 11..	300	1
C5 PDJNR/L 35060-11-JHP	50.00	35.00	60.00	-6.0	58.0	DN.. 11..	300	1
C4 PDJNR/L 27055-15-JHP	40.00	27.00	55.00	-6.0	58.0	DN.. 15..	300	1
C5 PDJNR/L 35060-15-JHP	50.00	35.00	60.00	-6.0	58.0	DN.. 15..	300	1
C6 PDJNR/L 45065-15-JHP	63.00	45.00	65.00	-6.0	58.0	DN.. 15..	300	1

• For user guide, see pages 327-328,331-332,335-336

(1) Coolant pressure (Bar)

(2) 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: DNGA (CBN) (151) • DNGA (PCD) (202) • DNGA 2MT (CBN) (152) • DNGA 2MT MM (CBN) (153) • DNGA 4MT (CBN) (152) • DNGA 4MT MM (CBN) (153) • DNGA MT (CBN) (151) • DNGA MT (PCD) (202) • DNGG (CER) (57) • DNGA (CER) (56)

Spare Parts

Designation									
C3 PDJNR-22045-11-JHP	TDN 322		LR 3D	SR 117-2014	SP 3	PN 3-4	CU-D-JHP	T-8/5	HW 2.5/5
C4 PDJNR/L 27050-11-JHP	TDN 322		LR 3D	SR 117-2014	SP 3	PN 3-4	CU-D-JHP	T-8/5	HW 2.5/5
C5 PDJNR/L 35060-11-JHP	TDN 322		LR 3D	SR 117-2014	SP 3	PN 3-4	CU-D-JHP	T-8/5	HW 2.5/5
C4 PDJNR/L 27055-15-JHP	TDN 422	TDN 432(a)*	LR 4D	SR 117-2010	SP 4	PN 3-4	CU-D-JHP	T-8/5	HW 3.0
C5 PDJNR/L 35060-15-JHP	TDN 422	TDN 432(a)*	LR 4D	SR 117-2010	SP 4	PN 3-4	CU-D-JHP	T-8/5	HW 3.0
C6 PDJNR/L 45065-15-JHP	TDN 422	TDN 432(a)*	LR 4D	SR 117-2010	SP 4	PN 3-4	CU-D-JHP	T-8/5	HW 3.0

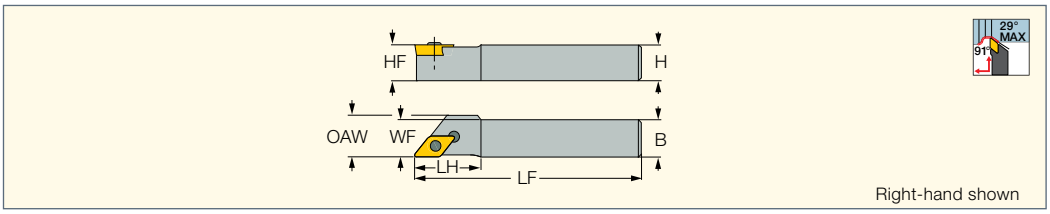
* Optional, to be ordered separately

(a) Use for DNGA 1504.. inserts

ISOTURN

SDACR/L-S

Screw Lock Tools Carrying 55° Diamond Inserts with 7° Clearance Angle



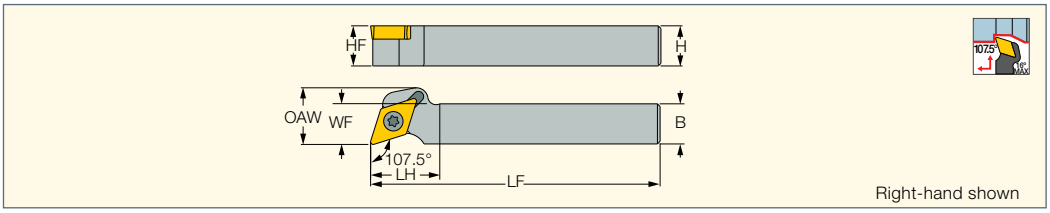
Designation	H	HF	B	LF	LH	WF	OAW	Insert		
SDACR/L 1010K-07S	10.0	10.0	10.0	125.00	12.0	10.20	10.20	DC..0702	SR 14-548	T-7/5
SDACR/L 1212K-07S	12.0	12.0	12.0	125.00	12.0	12.20	12.20	DC..0702	SR 14-548	T-7/5
SDACR/L 1212K-11S	12.0	12.0	12.0	125.00	17.6	12.20	12.20	DC..11T3	SR 16-236 P	T-15/5
SDACR/L 1616K-11S	16.0	16.0	16.0	125.00	17.6	16.20	16.20	DC..11T3	SR 16-236 P	T-15/5

For inserts, see pages: DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

ISOTURN

SDHCR/L-S

Screw Lock Tools Carrying 55° Diamond Inserts with 7° Clearance Angle for Swiss-Type Machines



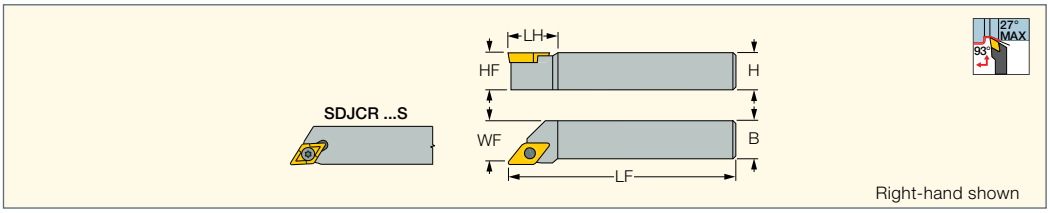
Designation	H	HF	B	LF	LH	WF	OAW	Insert		
SDHCR/L 1010K-07S	10.0	10.0	10.0	125.00	12.5	10.20	-	DC..0702	SR 14-548	T-7/5
SDHCR/L 1212K-07S	12.0	12.0	12.0	125.00	12.0	12.20	-	DC..0702	SR 14-548	T-7/5
SDHCR/L 1616K-07S	16.0	16.0	16.0	125.00	12.0	16.20	-	DC..0702	SR 14-548	T-7/5
SDHCR/L 1212K-11S	12.0	12.0	12.0	125.00	19.0	12.20	17.00	DC..11T3	SR 16-236	T-15/5
SDHCR/L 1616K-11S	16.0	16.0	16.0	125.00	20.0	16.20	-	DC..11T3	SR 16-236	T-15/5

For inserts, see pages: DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

ISOTURN

SDJCR/L

Screw Lock Tools Carrying 55° Diamond Inserts with 7° Clearance Angle



Designation	H	HF	B	LF	LH	WF	Insert					
SDJCR/L 0808F-07	8.0	8.0	8.0	80.00	11.5	10.00	DC..0702	SR 14-548	T-7/5			
SDJCR/L 1010F-07	10.0	10.0	10.0	80.00	11.5	12.00	DC..0702	SR 14-548	T-7/5			
SDJCR 1010M-07S (1)	10.0	10.0	10.0	150.00	10.6	10.15	DC..0702	SR 14-548	T-7/5			
SDJCR/L 1212K-07S (1)	12.0	12.0	12.0	125.00	10.6	12.15	DC..0702	SR 14-548	T-7/5			
SDJCR/L 1616K-07S (1)	16.0	16.0	16.0	125.00	10.6	16.15	DC..0702	SR 14-548	T-7/5			
SDJCR/L 1010K-11S (1)	10.0	10.0	10.0	125.00	20.5	10.15	DC..11T3	SR 16-236	T-15/5			
SDJCR/L 1212F-11	12.0	12.0	12.0	80.00	20.0	16.00	DC..11T3	SR 16-236 P	T-15/5			
SDJCR 1212M-11S (1)	12.0	12.0	12.0	150.00	12.5	12.15	DC..11T3	SR 16-236 P	T-15/5			
SDJCR/L 1616H-11	16.0	16.0	16.0	100.00	20.0	20.00	DC..11T3	SR 16-236 P	T-15/5			
SDJCR 1616M-11S (1)	16.0	16.0	16.0	150.00	12.5	16.15	DC..11T3	SR 16-236 P	T-15/5			
SDJCR/L 2020K-11	20.0	20.0	20.0	125.00	20.0	25.00	DC..11T3	SR 16-236 P	T-15/5			
SDJCR/L 2525M-11	25.0	25.0	25.0	150.00	20.0	32.00	DC..11T3	SR 16-236 P	T-15/5	TDC 3-1P	SR TC-3P	HW 4.0

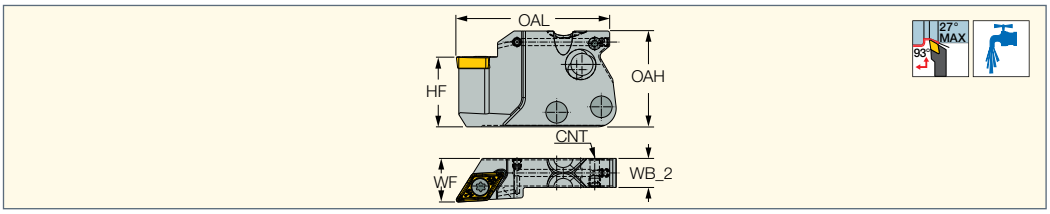
(1) For Swiss-type machines

For inserts, see pages: • DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

ISOTURN

SDJCR/L-PAD-JHP

Screw Lock Adapter with High-Pressure Coolant Mounts 55° Diamond Inserts with 7° Clearance Angle



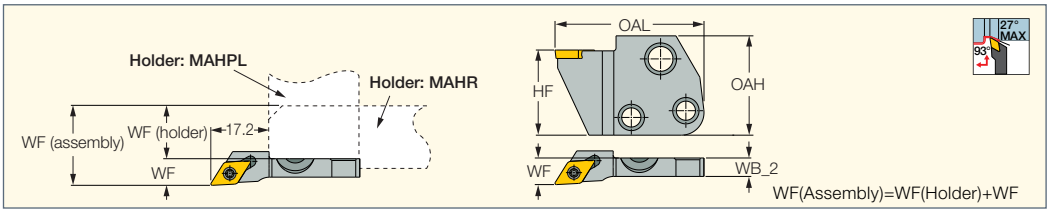
Designation	HF	OAL	OAH	WF	WB_2	Insert	CNT			
SDJCR/L-07-PAD-JHP	24.0	52.80	33.00	15.00	10.0	DCGT 0702	M4	T-7/5	SR 14-548	SR M4X4 DIN913 TL360
SDJCR/L-11-PAD-JHP	24.0	52.80	33.00	15.00	10.0	DCGT 11T3	M4	T-15/5	SR 16-236 P	SR M4X4 DIN913 TL360

For inserts, see pages: • DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

MODULAR-GRIP

SDJCR-PAD

Screw Lock Adapter Carrying 55° Diamond Inserts with 7° Clearance Angle



Designation	HF	OAH	OAL	WF	WB_2	Insert		
SDJCR-07-PAD	24.0	28.0	42.00	7.50	5.2	DCGT 0702	SR 14-548	T-7/5

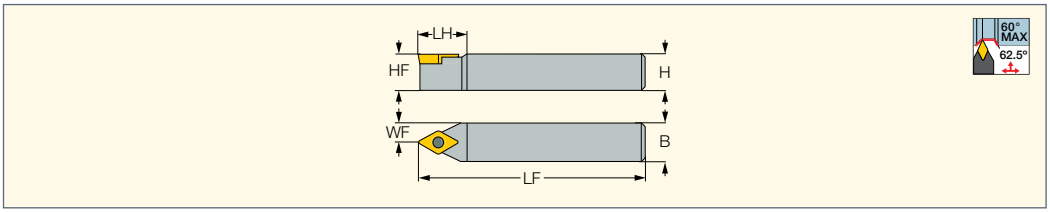
• WF (assembly) = WF (holder) + WF

For inserts, see pages: DCGT (PCD) (199) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201)

ISOTURN

SDNCN

Screw Lock Tools Carrying 55° Diamond Inserts with 7° Clearance Angle



Designation	H	HF	B	LF	LH	WF	Insert						
SDNCN 0808F-07	8.0	8.0	8.0	80.00	14.0	4.00	DC..0702	SR 14-548	T-7/5				
SDNCN 1010F-07	10.0	10.0	10.0	80.00	14.5	5.00	DC..0702	SR 14-548	T-7/5				
SDNCN 1010K-11S [1]	10.0	10.0	10.0	120.00	20.0	5.00	DC..11T3	SR 16-236	T-15/5				
SDNCN 1212F-11	12.0	12.0	12.0	80.00	21.3	6.00	DC..11T3	SR 16-236 P	T-15/5				
SDNCN 1616H-11	16.0	16.0	16.0	100.00	21.0	8.00	DC..11T3	SR 16-236 P	T-15/5				
SDNCN 2020K-11	20.0	20.0	20.0	125.00	21.0	10.00	DC..11T3	SR 16-236 P	T-15/5				
SDNCN 2525M-11	25.0	25.0	25.0	150.00	30.0	12.50	DC..11T3	SR 16-236 P	T-15/5	TDC 3-1P	SR TC-3P	HW 4.0	

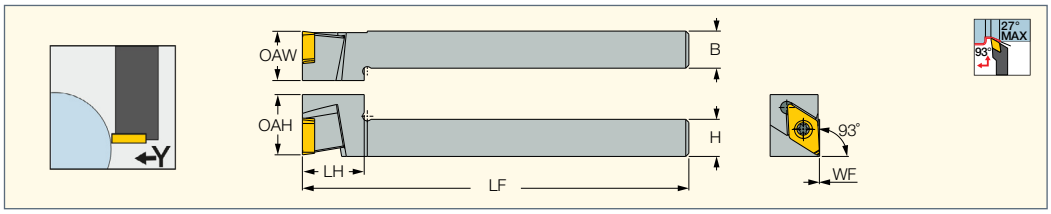
[1] For Swiss-type machines

For inserts, see pages: DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

NEOYSWISS AXIS

Y-SDJCR-S

Y-Axis Screw Lock Integral Tools Carrying 55° Rhombic Inserts with 7° Clearance Angle



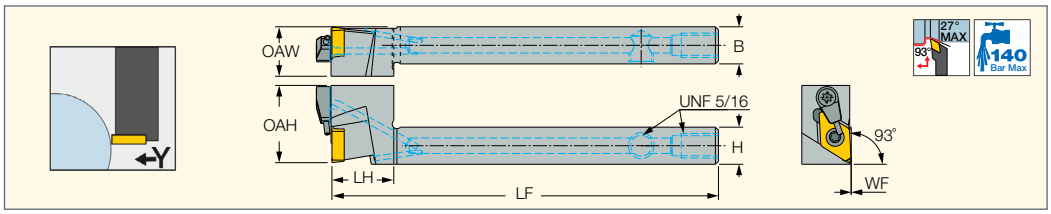
Designation	H	B	LF	LH	OAH	OAW	WF	Insert		
Y-SDJCR 1212K-11S	12.0	12.0	125.00	21.0	20.00	16.00	0.00	DCGT 11T3..	SR 35080I	T-15/5
Y-SDJCR 1616K-11S	16.0	16.0	125.00	21.0	20.00	16.00	0.00	DCGT 11T3..	SR 35080I	T-15/5

For inserts, see pages: • DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

NEOYSWISS AXIS

Y-SDJCR-S-JHP

Y-Axis Screw Lock JETCUT Integral Tools Carrying 55° Rhombic Inserts with 7° Clearance Angle for Swiss-Type Machines



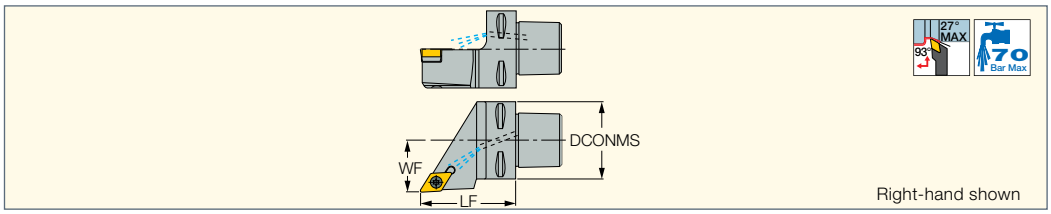
Designation	H	B	LF	LH	OAH	OAW	WF	Insert					
Y-SDJCR 1212K-11S-JHP	12.0	12.0	125.00	21.0	25.50	16.00	0.00	DCGT 11T3..	SR 35080I	T-15/5	HW 5/32"	SR 5/16UNF TL360	S-CU-JHP-A SET
Y-SDJCR 1616K-11S-JHP	16.0	16.0	125.00	21.0	25.50	16.00	0.00	DCGT 11T3..	SR 35080I	T-15/5	HW 5/32"	SR 5/16UNF TL360	S-CU-JHP-A SET

For inserts, see pages: • DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

ISOTURN

C#-SDJCR/L

Screw Lock Tools with CAMFIX Exchangeable Shanks Carrying 55° Rhombic Inserts with 7° Clearance Angle



Designation	DCONMS	WF	LF	Insert	CP(1)	DCP(2)						
C4 SDJCR-27050-11	40.00	27.00	50.00	DC.. 11T3	70	1	TDC 3-1P	SR TC-3P	HW 4.0	SR 16-236 P	T-15/5	EZ 83
C5 SDJCR-35060-11	50.00	35.00	60.00	DC.. 11T3	70	1	TDC 3-1P	SR TC-3P	HW 4.0	SR 16-236 P	T-15/5	EZ 104

(1) Coolant pressure (Bar)

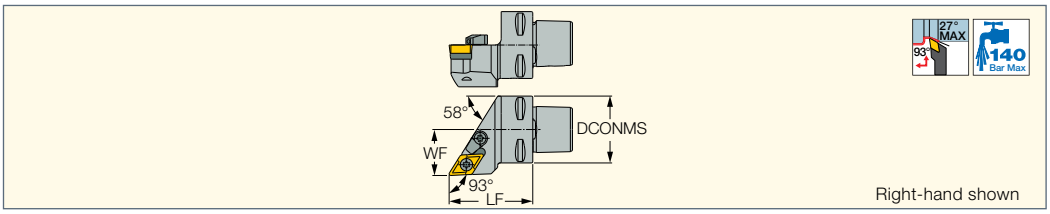
(2) 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

ISOTURN

C#-SDJCR-JHP

Screw Clamp Tools with CAMFIX Shanks and Channels for High-Pressure Coolant Carrying Positive 55° Rhombic Inserts



Designation	DCONMS	WF	LF	Insert	CP(1)	DCP(2)
C3 SDJCR-22040-11-JHP	32.00	22.00	40.00	DC.. 11T3	140	0

- For user guide, see pages 327-328,331-332,335-336

(1) Coolant pressure (Bar)

(2) 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

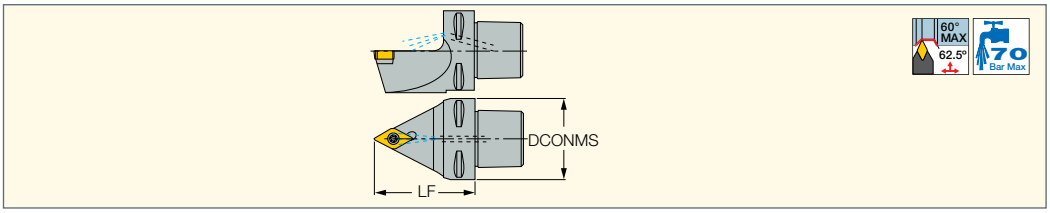
Spare Parts

Designation								
C3 SDJCR-22040-11-JHP	TDC 3-1P	SR TC-3P	SR 16-236 P	T-15/5	CH-1.9D-JHP	WASHER 4.2X5.6X0.5	SR M4X4 DIN913 TL360	HW 4.0

ISOTURN

C#-SDNCN

Screw Lock Tools with CAMFIX Exchangeable Shanks Carrying 55° Rhombic Inserts with 7° Clearance Angle



Designation	DCONMS	LF	Insert	CP(1)	DCP(2)						
C4 SDNCN-00050-11	40.00	50.00	DC.. 11T3	70	1	TDC 3-1P	SR TC-3P	HW 4.0	SR 16-236 P	T-15/5	EZ 104

(1) Coolant pressure (Bar)

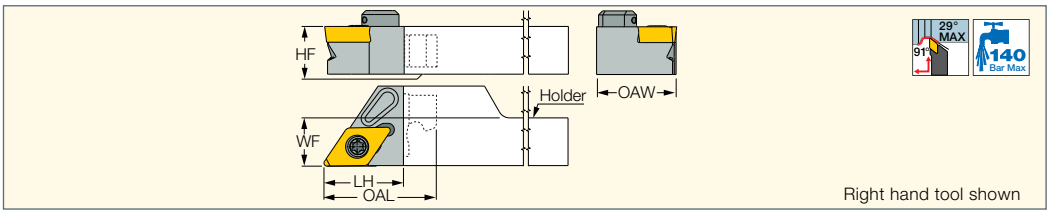
(2) 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

NEOSWISS

NQCH-SDACR/L-S-JHP

Screw Lock JETCUT Modular Heads Carrying 7° Clearance 55° Rhombic Inserts for Swiss-Type Machines



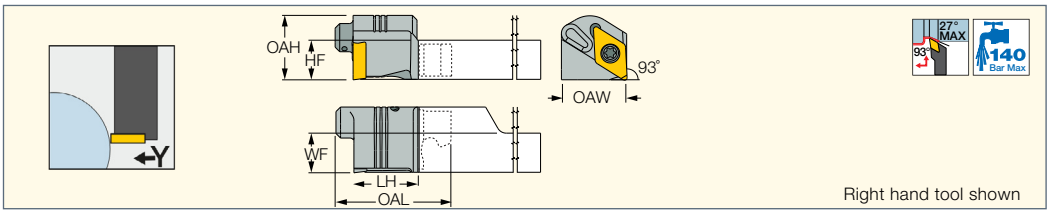
Designation	WF	HF	LH	OAL	OAW	Insert		
NQCH12-SDACR/L-11S-JHP	12.15	12.0	20.0	28.80	20.15	DC.. 11T3	SR 16-236 P	T-15/5
NQCH16-SDACR/L-11S-JHP	16.15	16.0	20.0	28.80	20.15	DC.. 11T3	SR 16-236 P	T-15/5

For inserts, see pages: • DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

NEOSWISS

NQCH-Y-SDJCR-S-JHP

Y-Axis Screw Lock JETCUT Modular Heads Carrying 55° Rhombic Inserts with 7° Clearance Angle for Swiss-Type Machines



Right hand tool shown

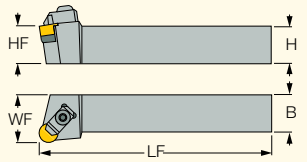
Designation	WF	HF	LH	OAL	OAW	OAH	Insert		
NQCH12-Y-SDJCR-11S-JHP	12.15	12.2	20.0	34.30	20.00	19.60	DC.. 11T3	SR 16-236 P	T-15/5
NQCH16-Y-SDJCR-11S-JHP	16.15	16.2	20.0	34.30	20.00	18.20	DC.. 11T3	SR 16-236 P	T-15/5

For inserts, see pages: • DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

ISOTURN

CRGNR/L

Clamp Lock Tools Carrying Round Negative Ceramic Inserts



Right-hand shown

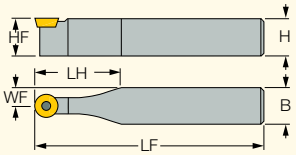
Designation	H	HF	B	LF	WF	Insert					
CRGNR/L 2525M-12CE	25.0	25.0	25.0	150.00	32.00	RNGN 120700	S 43	SR M5X0.8X10	BCL 6 CLAMP	SR M6X1X25ISO7380	HW 4.0
CRGNR/L 2525M-12CEA	25.0	25.0	25.0	150.00	32.00	RNGN 120400	S 43	SR M5X0.8X10	BCL 6 CLAMP	SR M6X1X25ISO7380	HW 4.0
CRGNR/L 3225P-12CE	32.0	32.0	25.0	170.00	32.00	RNGN 120700	S 43	SR M5X0.8X10	BCL 6 CLAMP	SR M6X1X25ISO7380	HW 4.0

For inserts, see pages: RNGN (CER) (104) • RNGN HS (PCD) (205) • RNGN S (CBN) (156)

ISOTURN

SRDCN

Screw Lock Neutral Tools Carrying Round Inserts with 7° Clearance Angle



Designation	H	HF	B	LF	LH	WF	Insert
SRDCN 1616H-08	16.0	16.0	16.0	100.00	33.0	8.00	RCGW 0803MO
SRDCN 2020K-10	20.0	20.0	20.0	125.00	38.0	10.00	RCGW 10T3MO
SRDCN 2525M-12	25.0	25.0	25.0	150.00	50.0	12.50	RCGW 1204MO
SRDCN 3225P-12	32.0	32.0	25.0	170.00	50.0	12.50	RCGW 1204MO
SRDCN 3225P-16	32.0	32.0	25.0	170.00	50.0	12.50	RCGW 1606MO
SRDCN 3232P-20	32.0	32.0	32.0	170.00	50.0	16.00	RCGW 2006MO

For inserts, see pages: • RCGW HS (CBN) (155) • RCGW HS (PCD) (205)

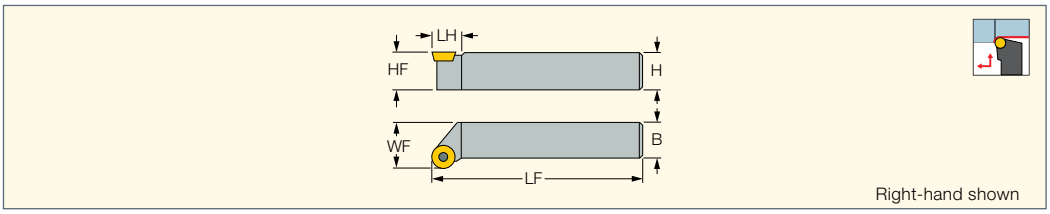
Spare Parts

Designation							
SRDCN 1616H-08	SR 14-513	T-8/5					
SRDCN 2020K-10	SR 16-236	T-15/5					
SRDCN 2525M-12	SR 16-212	T-20/5	TRC 4-0	SR TC-4	HW 3.0		
SRDCN 3225P-12	SR 16-212	T-20/5	TRC 4-0	SR TC-4	HW 3.0		
SRDCN 3225P-16	SR 16-212	T-20/5	TRC 5-0	SR TC-4	HW 3.0		
SRDCN 3232P-20	SR 14-519		TRC 6-0	SR TC-6	HW 4.0	BLD T20/S7	SW6-T-SH

ISOTURN

SRGCR/L

Screw Lock Tools Carrying Round Inserts with 7° Clearance Angle



Designation	H	HF	B	LF	LH	WF	Insert
SRGCR/L 1616H-08	16.0	16.0	16.0	100.00	11.0	20.00	RCGW 0803MO
SRGCR/L 2020K-10	20.0	20.0	20.0	125.00	14.0	25.00	RCGW 10T3MO
SRGCR 2525M-10	25.0	25.0	25.0	150.00	18.0	32.00	RCGW 10T3MO
SRGCR/L 2525M-12	25.0	25.0	25.0	150.00	18.0	32.00	RCGW 1204MO
SRGCR/L 2525M-16	25.0	25.0	25.0	150.00	20.0	32.00	RCGW 1606MO
SRGCR/L 3232P-20	32.0	32.0	32.0	170.00	25.0	40.00	RCGW 2006MO

For inserts, see pages: • RCGW HS (CBN) (155) • RCGW HS (PCD) (205)

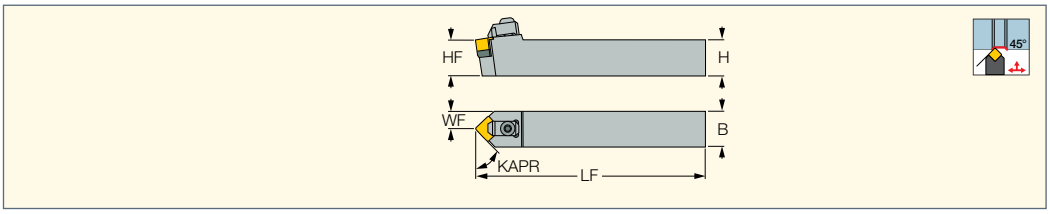
Spare Parts

Designation							
SRGCR/L 1616H-08	SR 14-513			T-8/5			
SRGCR/L 2020K-10	SR 16-236			T-15/5			
SRGCR 2525M-10	SR 16-236	TRC 3-0	SR TC-3	T-15/5			
SRGCR/L 2525M-12	SR 16-212	TRC 4-0	SR TC-4	T-20/5	HW 3.0		
SRGCR/L 2525M-16	SR 16-212	TRC 5-0	SR TC-4	T-20/5	HW 3.0		
SRGCR/L 3232P-20	SR 14-519	TRC 6-0	SR TC-6		HW 4.0	BLD T20/S7	SW6-T-SH

ISOTURN

CSDNN-CE/CEA

45° Lead Angle Tools Carrying Square Ceramic Inserts



Designation	H	HF	B	LF	WF	KAPR[1]	Insert
CSDNN 2020K-12CEA	20.0	20.0	20.0	125.00	10.00	45.0	SNGN 1204
CSDNN 2525M-12CEA	25.0	25.0	25.0	150.00	12.50	45.0	SNGN 1204

[1] Tool cutting edge angle

For inserts, see pages: SNGN (CBN) (161) • SNGN (CER) (105) • SNGN (PCD) (209) • SNGN 4MT (CBN) (162) • SNGN HS (CBN) (163) • SNGN HS (PCD) (210) • SNGN MT (CBN) (161) • SNGN MT (PCD) (209) • SNGN S (CBN) (162)

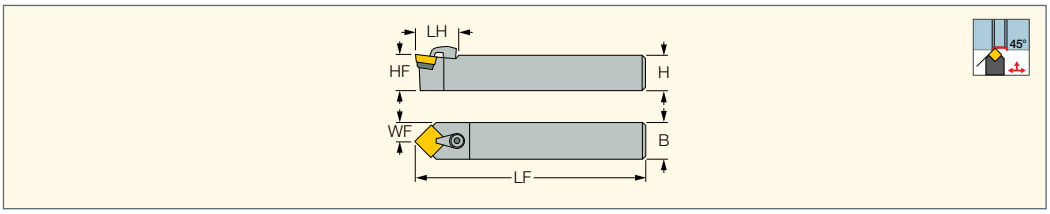
Spare Parts

Designation						
CSDNN 2020K-12CEA	S 40 (SEAT)	SR M5X0.8X10	BCL 6 CLAMP	SR M6X1X25ISO7380	HW 4.0	
CSDNN 2525M-12CEA	S 40 (SEAT)	SR M5X0.8X10	BCL 6 CLAMP	SR M6X1X25ISO7380	HW 4.0	HW 3.0

ISOTURN

CSDPN

45° Lead Angle Clamp Lock Tools Carrying 11° Clearance Square Inserts



Designation	H	HF	B	LF	LH	WF	Insert				
CSDPN 2020K-12	20.0	20.0	20.0	125.00	30.0	10.00	SPGN 1203	ISQP 162[a]	SP 16	LC 30 SET 1	HW 3.0
CSDPN 2525M-12	25.0	25.0	25.0	150.00	30.0	12.50	SPGN 1203	ISQP 162[a]	SP 16	LC 30 SET 1	HW 3.0

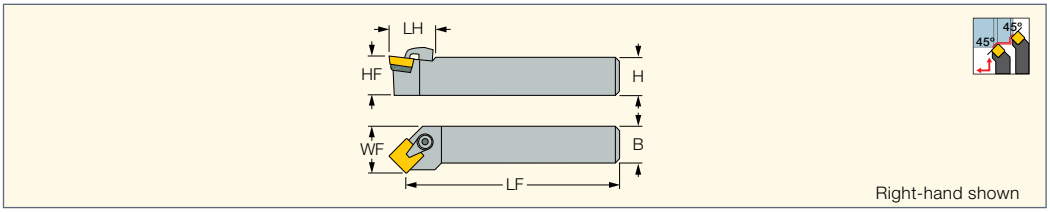
[a] Use ISQP 163 seat for inserts with corner radii 1.6-2.4 mm

For inserts, see pages: SPGN (CBN) (158) • SPGN (PCD) (207) • SPGN 4MT (CBN) (159) • SPGN MT (CBN) (159) • SPGN MT (PCD) (207)

ISOTURN

CSSPR/L

Clamp Lock Tools Carrying 11° Clearance Square Inserts for Longitudinal and Face Turning



Designation	H	HF	B	LF	LH	WF	Insert				
CSSPR 1212F-09	12.0	12.0	12.0	80.00	21.0	16.00	SPGN 0903			LC 15 SET 1	HW 2.5
CSSPR 1616H-12 [1]	16.0	16.0	16.0	100.00	26.0	20.00	SPGN 1203	ISQP 162	SP 16	LC 30 SET 2	HW 3.0
CSSPR 2020K-12 [1]	20.0	20.0	20.0	125.00	26.0	25.00	SPGN 1203	ISQP 162	SP 16	LC 30 SET 1	HW 3.0
CSSPR/L 2525M-12 [1]	25.0	25.0	25.0	150.00	28.0	32.00	SPGN 1203	ISQP 162	SP 16	LC 30 SET 1	HW 3.0

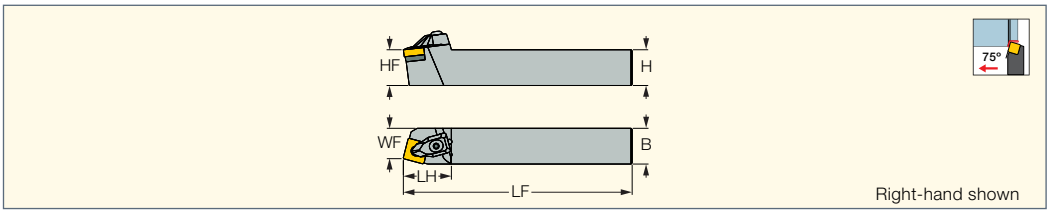
[1] ISQP 163 for inserts with corner radii 1.6-2.4 mm.

For inserts, see pages: SPGN (CBN) (158) • SPGN (PCD) (207) • SPGN 4MT (CBN) (159) • SPGN MT (CBN) (159) • SPGN MT (PCD) (207)

ISOTURN

DSBNR/L

75° Lead Angle R-Clamp Tools Carrying Negative Square Inserts



Designation	H	HF	B	LF	LH	WF	Insert
DSBNR/L 2525M-12	25.0	25.0	25.0	150.00	38.0	22.00	SNGA 1204
DSBNL 3232P-12	32.0	32.0	32.0	170.00	38.0	27.00	SNGA 1204
DSBNR/L 2525M-15	25.0	25.0	25.0	150.00	40.0	22.00	SNGA 1506
DSBNR/L 3232P-19	32.0	32.0	32.0	170.00	43.0	27.00	SNGA 1906
DSBNR/L 4040S-19	40.0	40.0	40.0	250.00	43.0	37.00	SNGA 1906

For inserts, see pages: SNGA (CBN) (160) • SNGA (PCD) (208) • SNGA 4MT (CBN) (161) • SNGA MT (CBN) (160) • SNGA MT (PCD) (209) • SNGA (CER) (62)

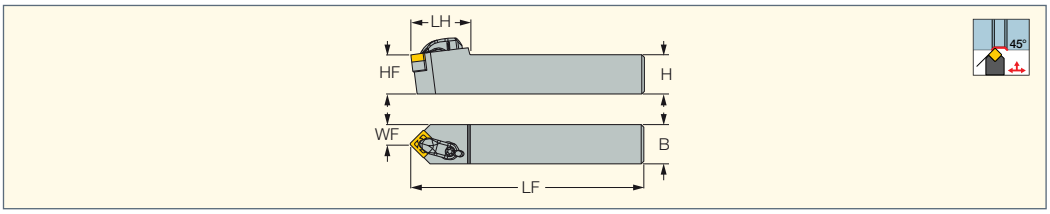
Spare Parts

Designation								
DSBNR/L 2525M-12	RST 443	SR 14-506 M4X0.7	LCGR-4	SR 10400270-25.5				T-15/5
DSBNL 3232P-12	RST 443	SR 14-506 M4X0.7	LCGR-4	SR 10400270-25.5				T-15/5
DSBNR/L 2525M-15	RST 54	SR 10402265	LCGR-5		SR 10402267	KSP 5	HW 4.0	
DSBNR/L 3232P-19	RST 634	SR 10402266	LCGR-6		SR 10402267	KSP 5	HW 4.0	
DSBNR/L 4040S-19	RST 634	SR 10402266	LCGR-6		SR 10402267	KSP 5	HW 4.0	

ISOTURN

DSDNN

45° Lead Angle R-Clamp External Turning Tools Carrying ISO Negative SNGA Inserts



Designation	H	HF	B	LF	LH	WF	Insert
DSDNN 2525M-12	25.0	25.0	25.0	150.00	38.0	12.80	SNGA 1204
DSDNN 2525M-15	25.0	25.0	25.0	150.00	42.0	12.50	SNGA 1506
DSDNN 3232P-19	32.0	32.0	32.0	170.00	44.0	16.00	SNGA 1906

For inserts, see pages: SNGA (CBN) (160) • SNGA (PCD) (208) • SNGA 4MT (CBN) (161) • SNGA MT (CBN) (160) • SNGA MT (PCD) (209) • SNGA (CER) (62)

Spare Parts

Designation									
DSDNN 2525M-12	RST 443	RST 443R/L SET[a]*	SR 14-506 M4X0.7	LCGR-4	SR 10400270-25.5				T-15/5
DSDNN 2525M-15	RST 54		SR 10402265	LCGR-5		SR 10402267	KSP 5	HW 4.0	
DSDNN 3232P-19	RST 634		SR 10402266	LCGR-6		SR 10402267	KSP 5	HW 4.0	

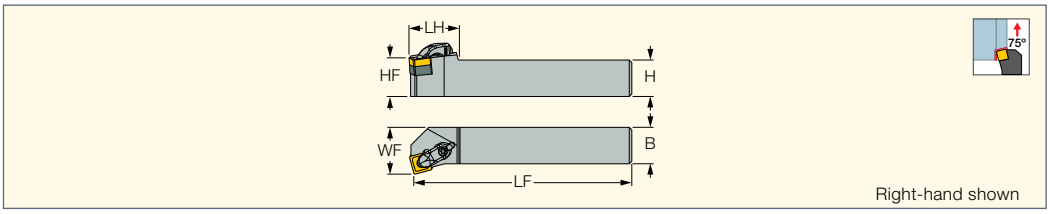
* Optional, to be ordered separately

[a] Optional, required for SNGA ...-EM-R/M inserts

ISOTURN

DSKNR/L

75° Lead Angle R-Clamp Face Turning Tools Carrying ISO Negative SNGA Inserts



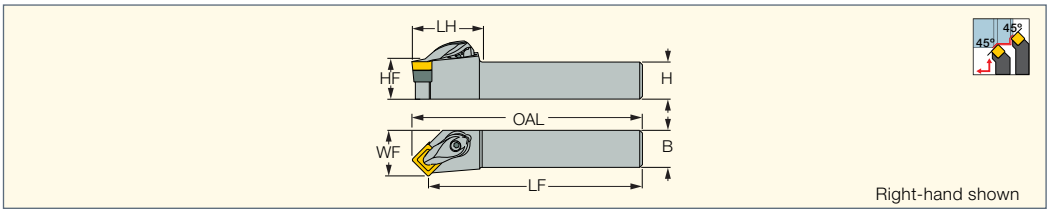
Designation	H	HF	B	LF	LH	WF	Insert					
DSKNR/L 2525M-12	25.0	25.0	25.0	150.00	31.0	32.00	SNGA 1204	RST 443	T-15/5	SR 10400270-25.5	LCGR-4	SR 14-506 M4X0.7

For inserts, see pages: SNGA (CBN) (160) • SNGA (PCD) (208) • SNGA 4MT (CBN) (161) • SNGA MT (CBN) (160) • SNGA MT (PCD) (209) • SNGA (CER) (62)

ISOTURN

DSSNR/L

45° Lead Angle R-Clamp Tools Carrying Negative Square Inserts for Longitudinal and Facing Applications



Designation	H	HF	B	LF	LH	WF	OAL	Insert
DSSNR/L 2020K-12 [1]	20.0	20.0	20.0	125.00	38.0	25.00	133.30	SNGA 1204
DSSNR/L 2525M-12 [1]	25.0	25.0	25.0	150.00	39.0	32.00	158.30	SNGA 1204
DSSNR/L 3232P-15	32.0	32.0	32.0	170.00	34.0	40.00	170.00	SNGA 1506
DSSNR/L 3232P-19	32.0	32.0	32.0	170.00	38.0	40.00	170.00	SNGA 1906

[1] Using SNGA.....-EM-M/R inserts requires the use of RST 443R/L SET.

For inserts, see pages: SNGA (CBN) (160) • SNGA (PCD) (208) • SNGA 4MT (CBN) (161) • SNGA MT (CBN) (160) • SNGA MT (PCD) (209) • SNGA (CER) (62)

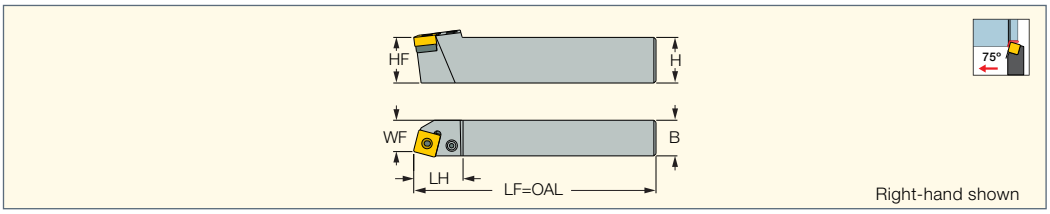
Spare Parts

Designation								
DSSNR/L 2020K-12	RST 443	SR 14-506 M4X0.7	LCGR-4	SR 10400270-25.5				T-15/5
DSSNR/L 2525M-12	RST 443	SR 14-506 M4X0.7	LCGR-4	SR 10400270-25.5				T-15/5
DSSNR/L 3232P-15	RST 54	SR 10402265	LCGR-5		SR 10402267	KSP 5	HW 4.0	
DSSNR/L 3232P-19	RST 634	SR 10402266	LCGR-6		SR 10402267	KSP 5	HW 4.0	

ISOTURN

PSBNR/L

Lever Lock 75° Lead Angle Turning Tools Carrying ISO Negative Square Inserts



Designation	H	HF	B	LF	LH	WF	Insert
PSBNR/L 2020K-09	20.0	20.0	20.0	125.00	20.0	17.00	SNGA 0904
PSBNR/L 2525M-09	25.0	25.0	25.0	150.00	20.0	22.00	SNGA 0904
PSBNR 2525M-12	25.0	25.0	25.0	150.00	26.8	22.00	SNGA 1204
PSBNR/L 3232P-19	32.0	32.0	32.0	170.00	39.0	27.00	SNGA 1906
PSBNR/L 4040S-25 (1)	40.0	40.0	40.0	250.00	48.0	35.00	SNGA 2507

(1) For SN.. 2509... inserts, use TSN 84 seat

For inserts, see pages: SNGA (CBN) (160) • SNGA (PCD) (208) • SNGA 4MT (CBN) (161) • SNGA MT (CBN) (160) • SNGA MT (PCD) (209) • SNGA (CER) (62)

Spare Parts

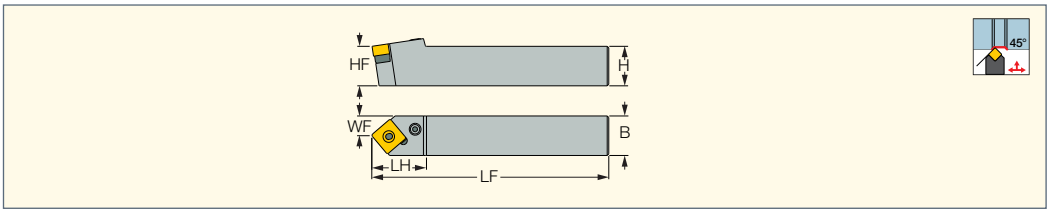
Designation							
PSBNR/L 2020K-09	TSN 323	TSN 333	SP 3	PN 3-3L	LR 3	SR 117-2014	HW 2.5
PSBNR/L 2525M-09	TSN 323	TSN 333	SP 3	PN 3-3L	LR 3	SR 117-2014	HW 2.5
PSBNR 2525M-12	TSN 423		SP 4	PN 3-4	LR 4	SR 117-2010	HW 3.0
PSBNR/L 3232P-19	RST 634		SP 66		LR 6	SR 10402352	HW 4.0
PSBNR/L 4040S-25	TSN 84N	TSN 85N*	SP 8		LR 8	SR 10402264	HW 5.0

* Optional, to be ordered separately

ISOTURN

PSDNN

45° Lead Angle Lever Lock External Turning Tools Carrying ISO Negative SNGA Inserts



Designation	H	HF	B	LF	LH	WF	Insert
PSDNN 2020K-12	20.0	20.0	20.0	125.00	27.0	10.00	SNGA 1204
PSDNN 2525M-12	25.0	25.0	25.0	150.00	27.0	12.50	SNGA 1204
PSDNN 3232P-19	32.0	32.0	32.0	170.00	41.0	16.00	SNGA 1906
PSDNN 4040S-25 (1)	40.0	40.0	40.0	250.00	49.0	20.00	SNGA 2507

(1) For SN.. 2509... inserts, use TSN 84 seat

For inserts, see pages: SNGA (CBN) (160) • SNGA (PCD) (208) • SNGA 4MT (CBN) (161) • SNGA MT (CBN) (160) • SNGA MT (PCD) (209) • SNGA (CER) (62)

Spare Parts

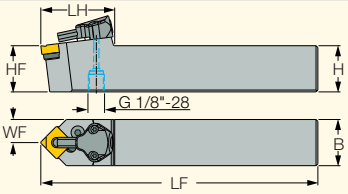
Designation							
PSDNN 2020K-12	TSN 423		SP 4	PN 3-4	LR 4	SR 117-2010	HW 3.0
PSDNN 2525M-12	TSN 423		SP 4	PN 3-4	LR 4	SR 117-2010	HW 3.0
PSDNN 3232P-19	RST 634		SP 66		LR 6	SR 10402352	HW 4.0
PSDNN 4040S-25	TSN 84N	TSN 85N*	SP 8		LR 8	SR 10402264	

* Optional, to be ordered separately

ISOTURN

PSDNN-JHP

45° Lead Angle Lever Lock Tools with Channels for High-Pressure Coolant Carrying ISO Negative SNGA Inserts



Designation	H	HF	B	LF	LH	WF	Insert
PSDNN 2525M-12-JHP	25.0	25.0	25.0	150.00	40.0	12.50	SNGA 1204

- For user guide, see pages 327-328,331-332,335-336

For inserts, see pages: SNGA (CBN) (160) • SNGA (PCD) (208) • SNGA 4MT (CBN) (161) • SNGA MT (CBN) (160) • SNGA MT (PCD) (209)
• SNGA (CER) (62)

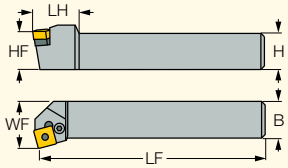
Spare Parts

Designation								
PSDNN 2525M-12-JHP	TSN 423	SP 4	PN 3-4	LR 4	SR 117-2010	CU-CW-JHP	HW 3.0	T-8/5

ISOTURN

PSKNR/L

75° Lead Angle Lever Lock Tools Carrying ISO Negative Square Inserts for Face Turning



Right-hand shown

Designation	H	HF	B	LF	LH	WF	Insert
PSKNR/L 2525M-12	25.0	25.0	25.0	150.00	23.5	32.00	SNGA 1204

For inserts, see pages: SNGA (CBN) (160) • SNGA (PCD) (208) • SNGA 4MT (CBN) (161) • SNGA MT (CBN) (160) • SNGA MT (PCD) (209)
• SNGA (CER) (62)

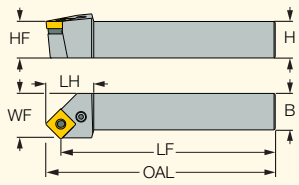
Spare Parts

Designation						
PSKNR/L	TSN 423	LR 4	SR 117-2010	HW 3.0	SP 4	PN 3-4

ISOTURN

PSSNR/L

45° Lead Angle Lever Lock Tools Carrying Negative Square Inserts for Longitudinal and Facing Applications



Right-hand shown

Designation	H	HF	B	LF	LH	OAL	WF	Insert
PSSNR/L 2020K-09	20.0	20.0	20.0	125.00	25.0	131.40	25.00	SNGA 0904
PSSNR/L 2525M-09	25.0	25.0	25.0	150.00	25.0	156.40	32.00	SNGA 0904
PSSNR/L 2020K-12	20.0	20.0	20.0	125.00	29.0	133.30	25.00	SNGA 1204
PSSNR/L 2525M-12	25.0	25.0	25.0	150.00	29.0	158.30	32.00	SNGA 1204
PSSNR/L 3232P-19	32.0	32.0	32.0	157.50	42.0	170.00	40.00	SNGA 1906
PSSNR/L 4040S-19	40.0	40.0	40.0	237.50	42.0	250.00	50.00	SNGA 1906
PSSNR/L 4040S-2507 (1)	40.0	40.0	40.0	234.00	53.0	250.00	50.00	SNGA 2507

(1) For SN.. 2509... inserts, use TSN 84 seat

For inserts, see pages: SNGA (CBN) (160) • SNGA (PCD) (208) • SNGA 4MT (CBN) (161) • SNGA MT (CBN) (160) • SNGA MT (PCD) (209) • SNGA (CER) (62)

Spare Parts

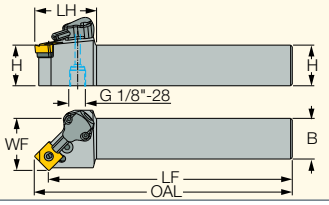
Designation							
PSSNR/L 2020K-09	TSN 323	TSN 333	SP 3	LR 3	SR 117-2014	HW 2.5	PN 3-3L
PSSNR/L 2525M-09	TSN 323	TSN 333	SP 3	LR 3	SR 117-2014	HW 2.5	PN 3-3L
PSSNR/L 2020K-12	TSN 423		SP 4	LR 4	SR 117-2010	HW 3.0	PN 3-4
PSSNR/L 2525M-12	TSN 423		SP 4	LR 4	SR 117-2010	HW 3.0	PN 3-4
PSSNR/L 3232P-19	RST 634		SP 66	LR 6	SR 10402352	HW 4.0	
PSSNR/L 4040S-19	RST 634		SP 66	LR 6	SR 10402352	HW 4.0	
PSSNR/L 4040S-2507	TSN 85	TSN 84*	SP 8	LR 8	SR 10402264	HW 5.0	

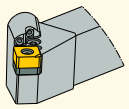
* Optional, to be ordered separately

ISOTURN

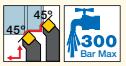
PSSNR/L-JHP

45° Tools with Channels for High-Pressure Coolant Carrying Negative Square Inserts for Longitudinal and Facing Turning





Inside coolant for PSSNR/L... 09

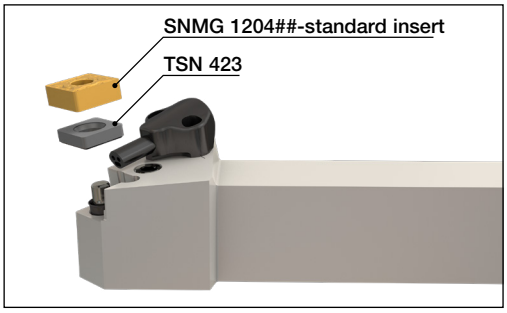


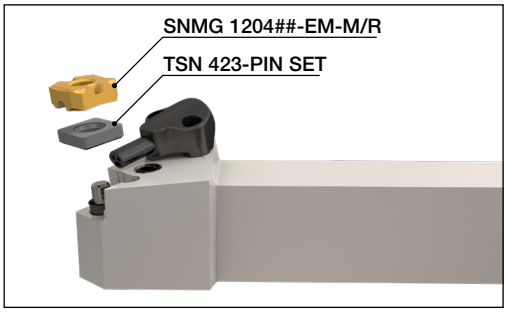
Right-hand shown

Designation	H	B	LF	LH	WF	OAL	Insert
PSSNR/L 2020K-09-JHP	20.0	20.0	125.00	35.0	25.00	131.40	SNGA 09..
PSSNR/L 2525M-12-JHP	25.0	25.0	150.00	38.0	32.00	158.40	SNGA 1204

• For user guide, see pages 327-328,331-332,335-336

For inserts, see pages: SNGA (CBN) (160) • SNGA (PCD) (208) • SNGA 4MT (CBN) (161) • SNGA MT (CBN) (160) • SNGA MT (PCD) (209) • SNGA (CER) (62)





Spare Parts

Designation										
PSSNR/L 2020K-09-JHP	TSN 323	TSN 333	SP 3	PN 3-3L	LR 3	SR 117-2014			HW 2.5	
PSSNR/L 2525M-12-JHP	TSN 423	TSN 423M SET[a]*	SP 4	PN 3-4	LR 4	SR 117-2010	OR 6.4X0.9N	CU-S-JHP	HW 3.0	T-8/5

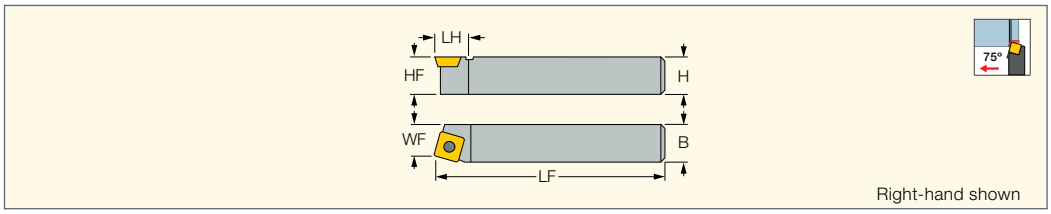
* Optional, to be ordered separately

(a) When SNGA-EM-M/-R inserts are used, replace the standard seat.

ISOTURN

SSBCR/L

75° Lead Angle Screw Lock Tools Carrying Square Inserts with 7° Clearance Angle



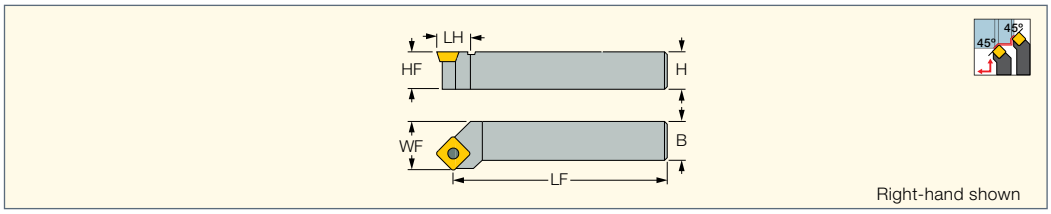
Designation	H	HF	B	LF	LH	WF	Insert					
SSBCR/L 1616H-09	16.0	16.0	16.0	100.00	15.0	13.00	SC.. 09T3	SR 16-236	T-15/5			
SSBCR/L 2020K-12	20.0	20.0	20.0	125.00	19.0	17.00	SC..1204	SR 16-212	T-20/5			
SSBCR/L 2525M-12	25.0	25.0	25.0	150.00	19.0	22.00	SC..1204	SR 16-212	T-20/5	TSC 4-2	SR TC-4	HW 3.0

For inserts, see pages: SCGW (CBN) (157) • SCGW (PCD) (206) • SCGW 4MT (CBN) (158) • SCGW L (CBN) (157) • SCGW L (PCD) (206) • SCGW MT (CBN) (157) • SCGW MT (PCD) (207)

ISOTURN

SSSCR/L

45° Lead Angle Screw Lock Tools Carrying Square Inserts with 7° Clearance Angle



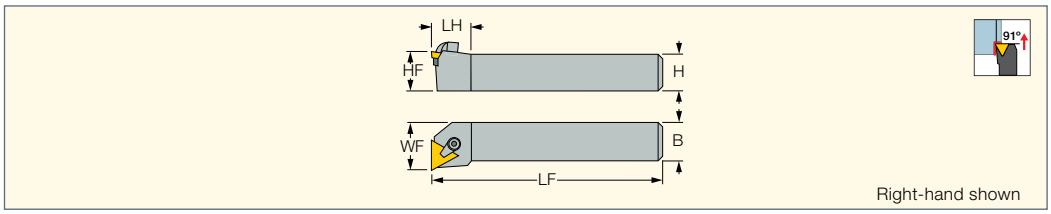
Designation	H	HF	B	LF	LH	WF	Insert					
SSSCR/L 1212F-09	12.0	12.0	12.0	80.00	18.0	16.00	SC.. 09T3	SR 16-236	T-15/5			
SSSCR/L 1616H-09	16.0	16.0	16.0	100.00	18.0	20.00	SC.. 09T3	SR 16-236	T-15/5			
SSSCR/L 2020K-12	20.0	20.0	20.0	125.00	22.0	25.00	SC.. 1204	SR 16-212	T-20/5			
SSSCR/L 2525M-12	25.0	25.0	25.0	150.00	25.0	32.00	SC.. 1204	SR 16-212	T-20/5	TSC 4-2	SR TC-4	HW 3.0

For inserts, see pages: SCGW (CBN) (157) • SCGW (PCD) (206) • SCGW 4MT (CBN) (158) • SCGW L (CBN) (157) • SCGW L (PCD) (206) • SCGW MT (CBN) (157) • SCGW MT (PCD) (207)

ISOTURN

CTFPR/L

Clamp Lock Tools Carrying 11° Clearance Triangular Inserts for Face Turning



Designation	H	HF	B	LF	LH	WF	Insert
CTFPR 1212F-11	12.0	12.0	12.0	80.00	16.0	16.00	TPGN 1103
CTFPR/L 1616H-11	16.0	16.0	16.0	100.00	16.0	20.00	TPGN 1103
CTFPR 2020K-16	20.0	20.0	20.0	125.00	22.0	25.00	TPGN 1603
CTFPR/L 2525M-16	25.0	25.0	25.0	150.00	22.0	32.00	TPGN 1603

For inserts, see pages: TPGN (CBN) (167) • TPGN (CER) (63) • TPGN (PCD) (214) • TPGN -3MT (CBN) (166) • TPGN HS (CBN) (167) • TPGN HS (PCD) (215) • TPGN MT (CBN) (166) • TPGN MT (PCD) (214)

Spare Parts

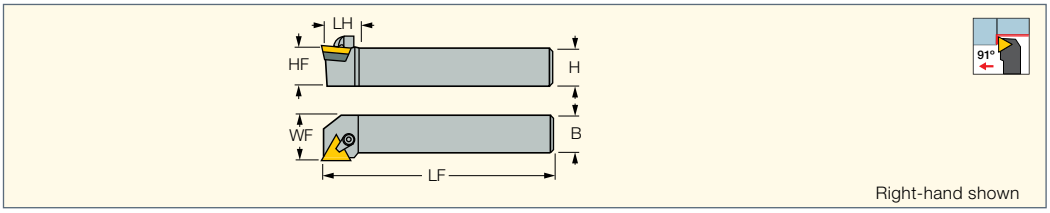
Designation					
CTFPR 1212F-11		HW 2.5		LC 15 SET 1	
CTFPR/L 1616H-11		HW 2.5		LC 15 SET 1	
CTFPR 2020K-16	ITBP 122	HW 3.0	SP 16	LC 30 SET 1	ITBP 123*
CTFPL 2525M-16	ITBP 122	HW 3.0	SP 16	LC 30 SET 1	
CTFPR 2525M-16	ITBP 122	HW 3.0	SP 16	LC 30 SET 1	ITBP 123*

* Optional, to be ordered separately

ISOTURN

CTGPR/L

Clamp Lock Tools Carrying 11° Clearance Triangular Inserts



Designation	H	HF	B	LF	LH	WF	Insert					
CTGPR/L 1212F-11	12.0	12.0	12.0	80.00	17.0	16.00	TPGN 1103				LC 15 SET 1	HW 2.5
CTGPR 1616H-11	16.0	16.0	16.0	100.00	16.0	20.00	TPGN 1103				LC 15 SET 1	HW 2.5
CTGPR/L 2020K-16	20.0	20.0	20.0	125.00	26.0	25.00	TPGN 1603	ITBP 122	ITBP 123*	SP 16[a]	LC 30 SET 1	HW 3.0
CTGPR/L 2525M-16	25.0	25.0	25.0	150.00	26.0	32.00	TPGN 1603	ITBP 122	ITBP 123*	SP 16[a]	LC 30 SET 1	HW 3.0

* Optional, to be ordered separately

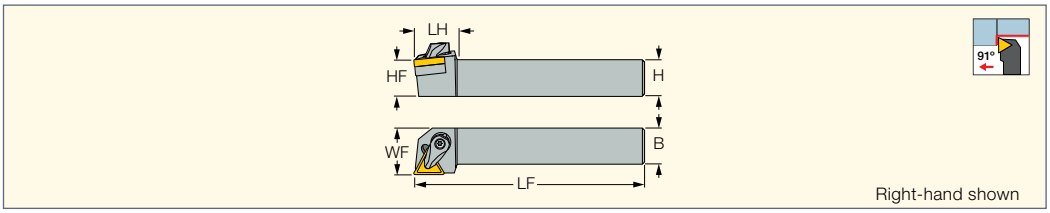
[a] Use ITBP 123 seat for inserts with corner radii 1.6-2.4 mm

For inserts, see pages: TPGN (CBN) (167) • TPGN (CER) (63) • TPGN (PCD) (214) • TPGN -3MT (CBN) (166) • TPGN HS (CBN) (167) • TPGN HS (PCD) (215) • TPGN MT (CBN) (166) • TPGN MT (PCD) (214)

ISOTURN

DTGNR/L

91° Lead Angle R-Clamp External Turning Tools Carrying Negative Triangular Inserts



Designation	H	HF	B	LF	LH	WF	Insert
DTGNR/L 2020K-16	20.0	20.0	20.0	125.00	25.0	25.00	TNGA 1604
DTGNR/L 2525M-16	25.0	25.0	25.0	150.00	25.0	32.00	TNGA 1604
DTGNR 2525M-22	25.0	25.0	25.0	150.00	32.0	32.00	TNGA 2204

For inserts, see pages: • TNGA (CBN) (169) • TNGA (PCD) (217) • TNGA -3MT (CBN) (169) • TNGA MT (CBN) (169) • TNGA MT (PCD) (217) • TNGA (CER) (64)

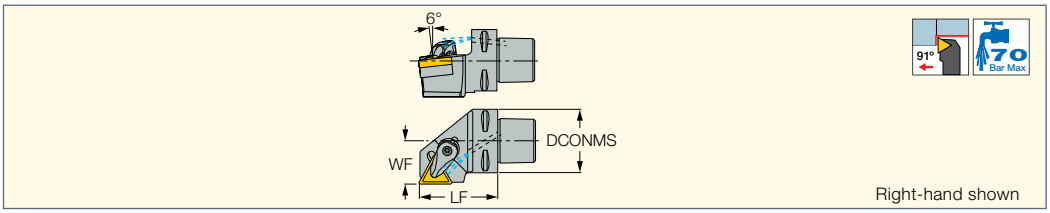
Spare Parts

Designation								
DTGNR/L 2020K-16	RTT 322	SR 35080I	LCGR-3		SR RC3	KSP 3	HW 2.5	
DTGNR/L 2525M-16	RTT 322	SR 35080I	LCGR-3		SR RC3	KSP 3	HW 2.5	
DTGNR 2525M-22	RTT 443	SR 14-506 M4X0.7	LCGR-4	SR 10400270-25.5				T-15/5

ISOTURN

C#-DTGNR/L

91° Lead R-Clamp External Turning Tools with CAMFIX Exchangeable Shanks Carrying Negative Triangular Inserts



Designation	DCONMS	WF	LF	Insert	CP[1]	DCP[2]						
C6 DTGNR/L-45065-22	63.00	45.00	65.00	TN.. 22	70	1	RTT 443	SR 14-506 M4X0.7	LCGR-4	SR 10400270-25.5	T-15/5	EZ 104

[1] Coolant pressure (Bar)

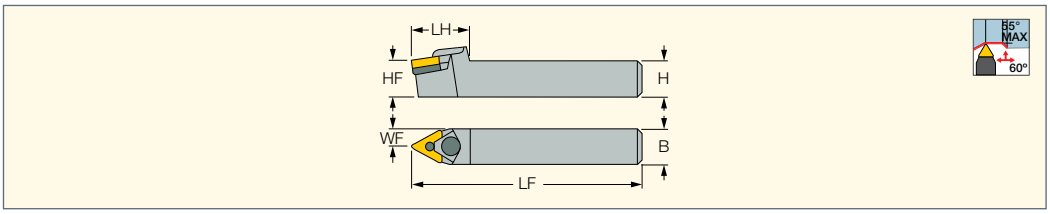
[2] 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: TNGA (CBN) (169) • TNGA (PCD) (217) • TNGA (CER) (64)

ISOTURN

MTENN-W

Neutral Wedge Lock Turning Tools Carrying Negative Triangular Inserts



Designation	H	HF	B	LF	LH	WF	Insert
MTENN 1618H-16W-M	16.0	16.0	18.0	100.00	32.0	9.00	TNGA 1604
MTENN 2020K-16W-M	20.0	20.0	20.0	125.00	35.0	10.00	TNGA 1604
MTENN 2525M-16W-M	25.0	25.0	25.0	150.00	32.0	12.50	TNGA 1604
MTENN 2525M-22W	25.0	25.0	25.0	150.00	40.0	12.50	TNGA 2204
MTENN 3232P-22W	32.0	32.0	32.0	170.00	40.0	16.00	TNGA 2204

For inserts, see pages: • TNGA (CBN) (169) • TNGA (PCD) (217) • TNGA -3MT (CBN) (169) • TNGA MT (CBN) (169) • TNGA MT (PCD) (217) • TNGA (CER) (64)

Spare Parts

Designation										
MTENN 1618H-16W-M	TTT 322N	TTT 332N[a]*	ZNW 3WNS			LC 291N CLAMP		E RING N	SR 17-317NS	HW 3.0
MTENN 2020K-16W-M	TTT 322N	TTT 332N[a]*	ZNW 3WN			LC 291N CLAMP		E RING N	SR 17-317N	HW 3.0
MTENN 2525M-16W-M	TTT 322N	TTT 332N[a]*	ZNW 3WN			LC 291N CLAMP		E RING N	SR 17-317N	HW 3.0
MTENN 2525M-22W	TTT 434		ZNW 4	HW 2.5	LC 281 SET 1		SR 17-295			HW 3.0
MTENN 3232P-22W	TTT 434		ZNW 4	HW 2.5	LC 281 SET 1		SR 17-295			HW 3.0

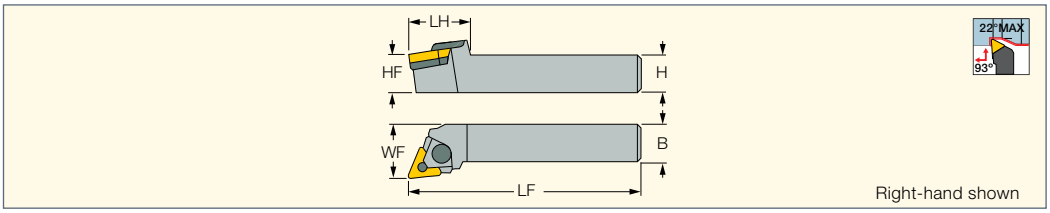
* Optional, to be ordered separately

[a] Use for inserts TNGA 1603.. 3.18 mm thick

ISOTURN

MTJNR/L-W

93° Lead Angle Wedge Lock Turning Tools Carrying Negative Triangular Inserts



Designation	H	HF	B	LF	LH	WF	Insert
MTJNR/L 1616H-16W-M	16.0	16.0	16.0	100.00	32.0	20.00	TNGA 1604
MTJNR/L 2020K-16W-M	20.0	20.0	20.0	125.00	32.0	25.00	TNGA 1604
MTJNR/L 2525M-16W-M	25.0	25.0	25.0	150.00	32.0	32.00	TNGA 1604
MTJNR/L 2525M-22W	25.0	25.0	25.0	150.00	38.0	32.00	TNGA 2204
MTJNR/L 3225P-22W	32.0	32.0	25.0	170.00	38.0	32.00	TNGA 2204

For inserts, see pages: • TNGA (CBN) (169) • TNGA (PCD) (217) • TNGA -3MT (CBN) (169) • TNGA MT (CBN) (169) • TNGA MT (PCD) (217) • TNGA (CER) (64)

Spare Parts

Designation										
MTJNR/L 1616H-16W-M	TTT 322N	TTT 332N[a]*	ZNW 3WNS			LC 291N CLAMP		E RING N	SR 17-317NS	HW 3.0
MTJNR/L 2020K-16W-M	TTT 322N	TTT 332N[a]*	ZNW 3WN	HW 2.5		LC 291N CLAMP		E RING N	SR 17-317N	HW 3.0
MTJNR/L 2525M-16W-M	TTT 322N	TTT 332N[a]*	ZNW 3WN			LC 291N CLAMP		E RING N	SR 17-317N	HW 3.0
MTJNR/L 2525M-22W	TTT 434		ZNW 4	HW 2.5	LC 281 SET 1		SR 17-295			HW 3.0
MTJNR/L 3225P-22W	TTT 434		ZNW 4	HW 2.5	LC 281 SET 1		SR 17-295			HW 3.0

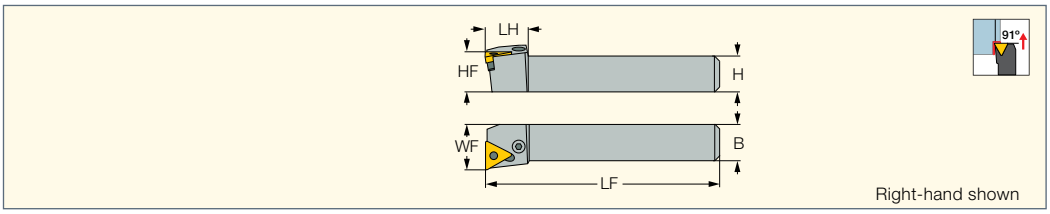
* Optional, to be ordered separately

[a] Use for inserts TNGA 1603.. 3.18 mm thick

ISOTURN

PTFNR/L

91° Lead Angle Lever Lock Face Turning Tools Carrying Negative Triangular Inserts



Designation	H	HF	B	LF	LH	WF	Insert
PTFNR/L 2020K-16	20.0	20.0	20.0	125.00	20.0	25.00	TNGA 16..
PTFNR/L 2525M-16	25.0	25.0	25.0	150.00	20.0	32.00	TNGA 16..
PTFNR/L 2525M-22	25.0	25.0	25.0	150.00	26.0	32.00	TNGA 2204

For inserts, see pages: • TNGA (CBN) (169) • TNGA (PCD) (217) • TNGA -3MT (CBN) (169) • TNGA MT (CBN) (169) • TNGA MT (PCD) (217) • TNGA (CER) (64)

Spare Parts

Designation							
PTFNR/L 2020K-16	TTN 322	TTN 332[(a)]*	LR 3	SR 117-2014	HW 2.5/5	SP 3	PN 3-4
PTFNR/L 2525M-16	TTN 322	TTN 332[(a)]*	LR 3	SR 117-2014	HW 2.5/5	SP 3	PN 3-4
PTFNR/L 2525M-22	TTN 422		LR 4	SR 117-2010	HW 3.0	SP 4	PN 3-4

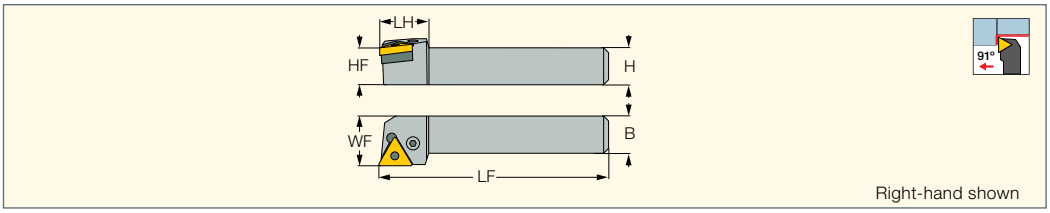
* Optional, to be ordered separately

(a) TTN 332 for inserts 3.18 mm thick.

ISOTURN

PTGNR/L

91° Lead Angle Lever Lock External Turning Tools Carrying Negative Triangular Inserts



Designation	H	HF	B	LF	LH	WF	Insert
PTGNR/L 2020K-16	20.0	20.0	20.0	125.00	22.0	25.00	TNGA 16..
PTGNR/L 2525M-16	25.0	25.0	25.0	150.00	22.0	32.00	TNGA 16..
PTGNR/L 2525M-22	25.0	25.0	25.0	150.00	32.0	32.00	TNGA 2204
PTGNR 3232P-22	32.0	32.0	32.0	170.00	32.0	40.00	TNGA 2204

For inserts, see pages: • TNGA (CBN) (169) • TNGA (PCD) (217) • TNGA -3MT (CBN) (169) • TNGA MT (CBN) (169) • TNGA MT (PCD) (217)

Spare Parts

Designation							
PTGNR/L 2020K-16	TTN 322	TTN 332[(a)]*	SP 3	LR 3	SR 117-2014	HW 2.5/5	PN 3-4
PTGNR/L 2525M-16	TTN 322	TTN 332[(a)]*	SP 3	LR 3	SR 117-2014	HW 2.5/5	PN 3-4
PTGNR/L 2525M-22	TTN 422		SP 4	LR 4	SR 117-2010	HW 3.0	PN 3-4
PTGNR 3232P-22	TTN 422		SP 4	LR 4	SR 117-2010	HW 3.0	PN 3-4

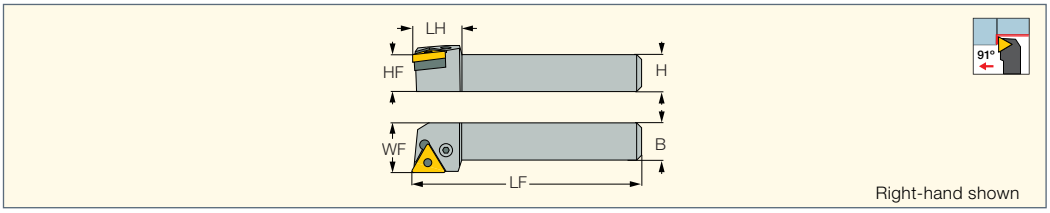
* Optional, to be ordered separately

(a) TTN 332 for inserts 3.18 mm thick

HELITURN LD

PTGNR/L-X

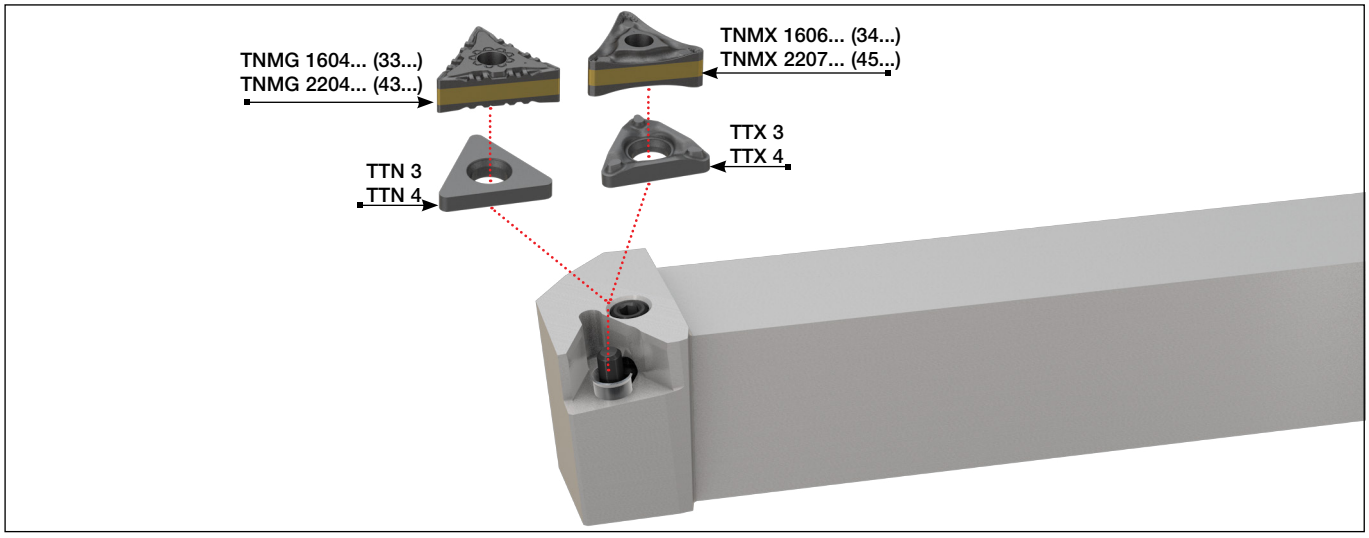
91° Lead Angle Lever Lock External Turning Tools Carrying Negative Triangular Inserts



Designation	H	HF	B	LF	LH	WF	Insert
PTGNR/L 2020K-16X	20.0	20.0	20.0	125.00	20.0	25.00	TNGA 1604
PTGNR/L 2525M-16X	25.0	25.0	25.0	150.00	20.0	32.00	TNGA 1604
PTGNR/L 2525M-22X	25.0	25.0	25.0	150.00	32.0	32.00	TNGA 2204
PTGNR/L 3232P-22X	32.0	32.0	32.0	170.00	32.0	40.00	TNGA 2204

• Use TTX 3 seat for TNMX 1606.. inserts and TTN 3 seat for TNGA 1604.. inserts

For inserts, see pages: • TNGA (CBN) (169) • TNGA (PCD) (217) • TNGA -3MT (CBN) (169) • TNGA MT (CBN) (169) • TNGA MT (PCD) (217) • TNGA (CER) (64)



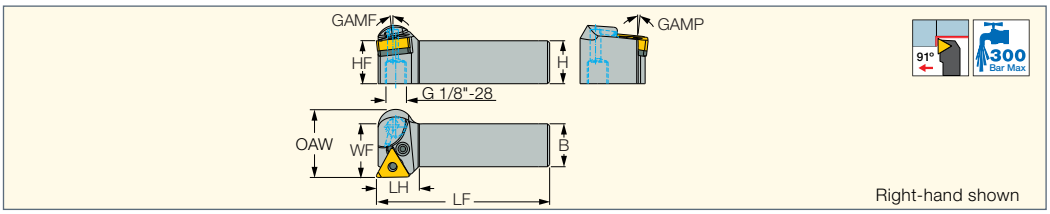
Spare Parts

Designation							
PTGNR/L 2020K-16X	TTX 3	TTN 3	SP 3	LR 3	SR 117-2014	HW 2.5	PN 3-4
PTGNR/L 2525M-16X	TTX 3	TTN 3	SP 3	LR 3	SR 117-2014	HW 2.5	PN 3-4
PTGNR/L 2525M-22X	TTX-4	TTN-4	SP 4	LR 4DH	SR 117-2010	HW 3.0	PN 3-4L
PTGNR/L 3232P-22X	TTX-4	TTN-4	SP 4	LR 4DH	SR 117-2010	HW 3.0	PN 3-4L

HELITURN LD

PTGNR/L-X-JHP

91° Lead Lever Lock Tools with Channels for High-Pressure Coolant Carrying Negative Triangular Inserts



Designation	H	HF	B	LF	LH	WF	OAW	GAMP	GAMF	Insert
PTGNR/L 2020K-16X-JHP	20.0	20.0	20.0	125.00	20.0	25.00	31.70	-6.0	-6.0	TNGA 1604
PTGNR/L 2525M-16X-JHP	25.0	25.0	25.0	150.00	20.0	32.00	-	-6.0	-6.0	TNGA 1604

• Supplied with TTX 3 seat for TNMX 1606.. inserts and TTN 3 seat for TNGA 1604.. inserts • For user guide, see pages 327-328,331-332,335-336

For inserts, see pages: TNGA (CBN) (169) • TNGA (PCD) (217) • TNGA -3MT (CBN) (169) • TNGA MT (CBN) (169) • TNGA MT (PCD) (217) • TNGA (CER) (64)

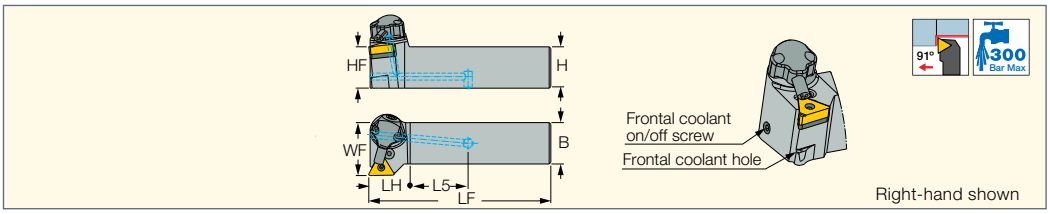
Spare Parts

Designation							
PTGNR/L-X-JHP	TTX 3	TTN 3	SP 3	LR 3	SR 117-2014	HW 2.5	PN 3-4

HELITURN LD

PTGNR/L-X-JHP-MC

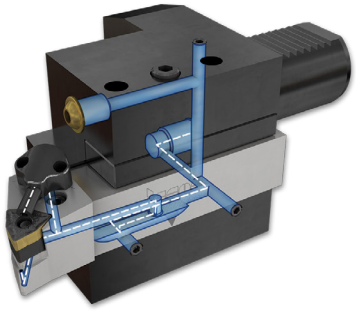
Tools with Bottom Inlets for High-Pressure Coolant Carrying TNMX and TNGA Triangular Inserts



Designation	H	HF	B	LF	LH	L5	WF	Insert
PTGNR/L 2020X-16X-JHP-MC	20.0	20.0	20.0	95.00	25.0	29.00	25.00	TNGA 1604
PTGNR/L 2525X-16X-JHP-MC	25.0	25.0	25.0	110.00	25.0	35.00	32.00	TNGA 1604

• Supplied with TTX 3 seat for TNMX 1606.. inserts and TTN 3 seat for TNGA 1604.. inserts. • For user guide, see pages 327-328,331-332,335-336

For inserts, see pages: TNGA (CBN) (169) • TNGA (PCD) (217) • TNGA -3MT (CBN) (169) • TNGA MT (CBN) (169) • TNGA MT (PCD) (217)



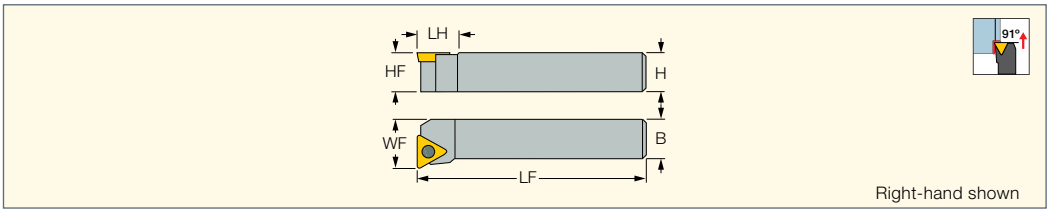
Spare Parts

Designation										
PTGNR/L-X-JHP-MC	TTX 3	TTN 3	SP 3	LR 3	SR 117-2014	T-8/5	SR M5X5 DIN913 TL360	PN 3-4	HW 2.5	CU-S-JHP

ISOTURN

STFCR/L

Screw Lock Tools Carrying Triangular Inserts with 7° Clearance Angle for Face Turning



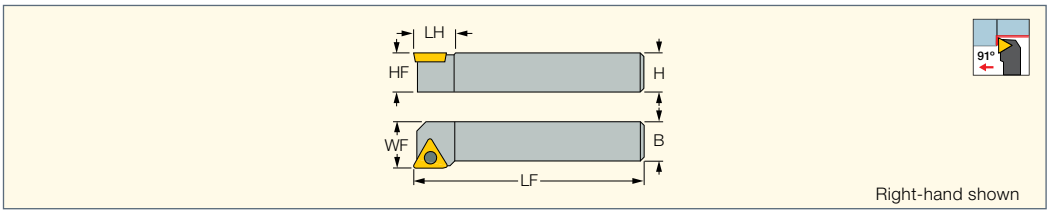
Designation	H	HF	B	LF	LH	WF	Insert					
STFCR/L 1212F-11	12.0	12.0	12.0	80.00	13.0	16.00	TC.. 1102	SR 14-548	T-7/5			
STFCR/L 2020K-16	20.0	20.0	20.0	125.00	18.0	25.00	TC.. 16T3	SR 16-236	T-15/5			
STFCR/L 2525M-16	25.0	25.0	25.0	150.00	20.0	32.00	TC.. 16T3	SR 16-236	T-15/5	TTC 3-2	SR TC-3	HW 2.5

For inserts, see pages: TCGT (PCD) (211) • TCGT L (PCD) (211) • TCGT MD/RD (PCD) (212) • TCGW (CBN) (164) • TCGW (PCD) (212) • TCGW -3MT (CBN) (165) • TCGW L (CBN) (165) • TCGW L (PCD) (213) • TCGW MT (CBN) (165) • TCGW MT (PCD) (213)

ISOTURN

STGCR/L

91° Lead Angle Screw Lock Tools Carrying Triangular Inserts with 7° Clearance Angle



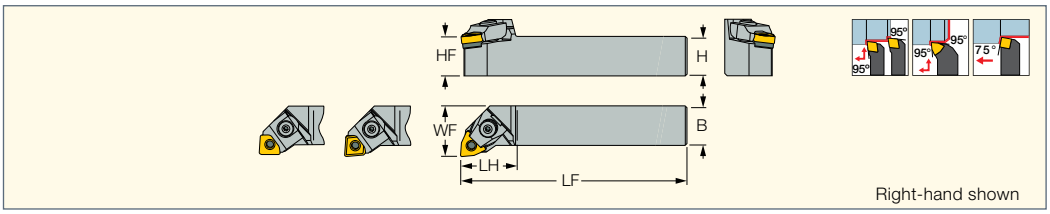
Designation	H	HF	B	LF	LH	WF	Insert					
STGCR/L 1212F-11	12.0	12.0	12.0	80.00	13.0	16.00	TC.. 1102	SR 14-548	T-7/5			
STGCR/L 1616H-11	16.0	16.0	16.0	100.00	13.0	20.00	TC.. 1102	SR 14-548	T-7/5			
STGCR/L 2020K-16	20.0	20.0	20.0	125.00	18.0	25.00	TC.. 16T3	SR 16-236	T-15/5			
STGCR/L 2525M-16	25.0	25.0	25.0	150.00	18.0	32.00	TC.. 16T3	SR 16-236	T-15/5	TTC 3-2	SR TC-3	HW 2.5

For inserts, see pages: TCGT (PCD) (211) • TCGT L (PCD) (211) • TCGT MD/RD (PCD) (212) • TCGW (CBN) (164) • TCGW (PCD) (212) • TCGW -3MT (CBN) (165) • TCGW L (CBN) (165) • TCGW L (PCD) (213) • TCGW MT (CBN) (165) • TCGW MT (PCD) (213)

MULTI-WEDGE

MULNR/L-12MW

MULTI-WEDGE Lock External Tools Carrying 80° Negative Rhombic or Trigon or Square Inserts

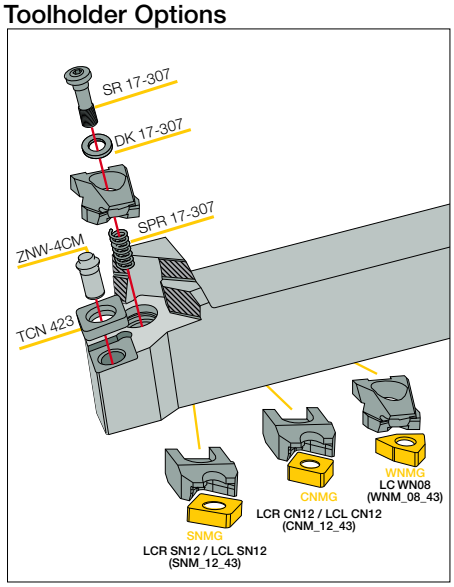


Designation	H	HF	B	LF	LH	WF
MULNR/L 2525M-12MW	25.0	25.0	25.0	150.00	35.0	32.00

• The wedge for the WNGA insert is supplied with the holder, order the others separately

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • SNGA (CBN) (160) • SNGA (PCD) (208) • SNGA 4MT (CBN) (161) • SNGA MT (CBN) (160) • SNGA MT (PCD) (209) • WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66) • CNGA (CER) (54) • SNGA (CER) (62)

Toolholder Options



Spare Parts

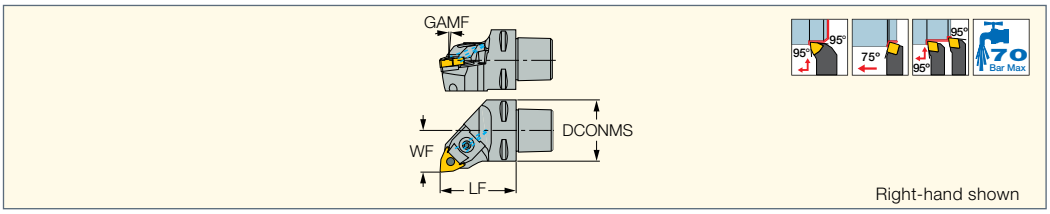
Designation										
MULNR/L 2525M-12MW	TCN 423	ZNW 4CM	LC WN08	LCR/L CN12*	LCR/L SN12*	SR 17-307	SR M4X8	HW 3.0	DK 17-307	SPR 17-307

* Optional, to be ordered separately.

MULTI-WEDGE

C#-MULNR/L-MW

MULTI-WEDGE Tools with CAMFIX Exchangeable Shanks Carrying 80° Negative Rhombic or Trigon or Square Inserts



Designation	DCONMS	WF	LF	GAMF	Insert	DCP(1)
C4 MULNR/L 27050-12MW	40.00	27.00	50.00	6.0	W/C/SNGA 1204..	1
C5 MULNR/L 35060-12MW	50.00	35.00	60.00	6.0	W/C/SNGA 1204..	1
C6 MULNR/L-45065-12MW	63.00	45.00	65.00	6.0	W/C/SNGA 1204..	1

- R.H. wedge for R.H. tool, L.H. wedge for L.H. tool

(1) 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • SNGA (CBN) (160) • SNGA (PCD) (208) • SNGA 4MT (CBN) (161) • SNGA MT (CBN) (160) • SNGA MT (PCD) (209) • WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66) • CNGA (CER) (54) • SNGA (CER) (62)

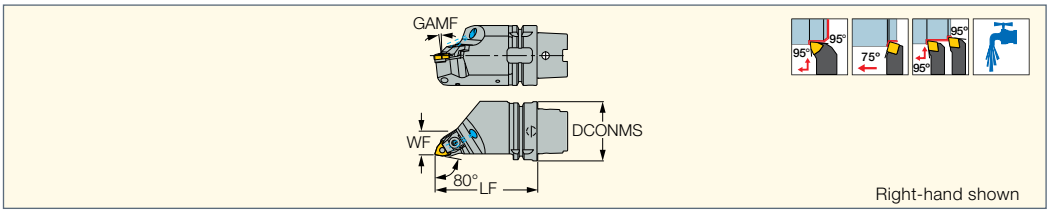
Spare Parts

Designation								
C4 MULNR/L 27050-12MW	TCN 423	ZNW 4CMI	LC WN08	HW 3.0	SR 17-307	DK 17-307	SPR 17-307	EZ 62
C5 MULNR/L 35060-12MW	TCN 423	ZNW 4CMI	LC WN08	HW 3.0	SR 17-307	DK 17-307	SPR 17-307	EZ 83
C6 MULNR/L-45065-12MW	TCN 423	ZNW 4CMI	LC WN08	HW 3.0	SR 17-307	DK 17-307	SPR 17-307	EZ 104

MULTI-WEDGE

HSK A63WH-MULNR/L-MW

MULTI-WEDGE Toolholders with HSK Taper Shanks for 80° Rhombic, Trigon and Square Inserts



Designation	DCONMS	LF	WF	GAMF	Insert	DCP(1)
HSK A63WH MULNR/L J12MW	63.00	110.00	25.00	-6.0	W/C/SNGA 1204	0

- Complies with ICTM standard (ISO 12164-3) • A cooling tube must be used with all coolant through HSK spindles (should be ordered separately)
- For user guide, see pages 327-328,331-332,335-336

(1) 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199)• CNGG (CER) (55) • SNGA (CBN) (160) • SNGA (PCD) (208) • SNGA 4MT (CBN) (161) • SNGA MT (CBN) (160) • SNGA MT (PCD) (209) • WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66) • CNGA (CER) (54) • SNGA (CER) (62)

Spare Parts

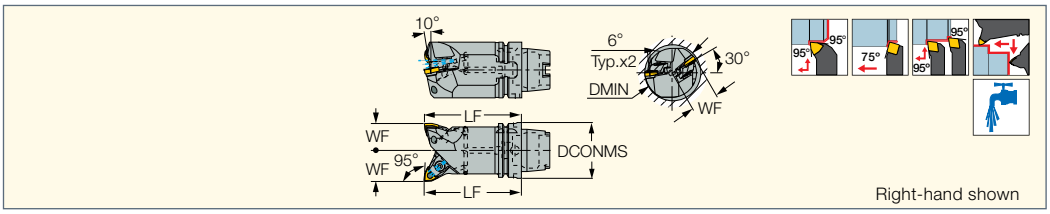
Designation											
HSK A63WH MULNR/L J12MW	TCN 423	LCR/L CN12*	LCR/L SN12*	LC WN08	ZNW 4CM	SR 17-307	HW 3.0	DK 17-307	SPR 17-307	SR M4X8	EZ 104

* Optional, to be ordered separately

MULTI-WEDGE

HSK A63WH-MULNR-J12MWX2

MULTI-WEDGE Twin Toolholders with HSK Taper Shanks for 80° Rhombic, Trigon and Square Inserts



Designation	DCONMS	LF	WF	DMIN	Insert	DCP(1)
HSK A63WH-MULNR-J12MWX2	63.00	110.00	35.00	72.00	W/C/SNGA 1204	0

- Complies with ICTM standard (ISO 12164-3) • A cooling tube must be used with all coolant through HSK spindles (should be ordered separately).
- For user guide, see pages 327-328,331-332,335-336

(1) 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • CNGG (CER) (55) • SNGA (CBN) (160) • SNGA (PCD) (208) • SNGA 4MT (CBN) (161) • SNGA MT (CBN) (160) • SNGA MT (PCD) (209) • WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66) • CNGA (CER) (54) • SNGA (CER) (62)

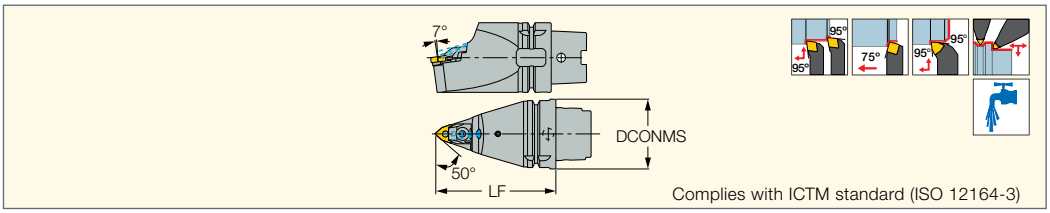
Spare Parts

Designation							
HSK A63WH-MULNR-J12MWX2	TCN 423	LC WN08	ZNW 4CMI	DK 17-307	SPR 17-307	SR 17-307	HW 3.0

MULTI-WEDGE

HSK A63WH-MUMNN-MW

MULTI-WEDGE Tools with HSK Exchangeable Shanks Carrying 80° Negative Rhombic or Trigon or Square Inserts



Designation	DCONMS	LF	Insert	DCP(1)
HSK A63WH MUMNN J12MW	63.00	110.00	W/C/SNGA 1204	0

- A cooling tube must be used with all coolant through HSK spindles (should be ordered separately). • For user guide, see pages 327-328,331-332,335-336

(1) 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • SNGA (CBN) (160) • SNGA (PCD) (208) • SNGA 4MT (CBN) (161) • SNGA MT (CBN) (160) • SNGA MT (PCD) (209) • WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66) • SNGA (CER) (62)

Spare Parts

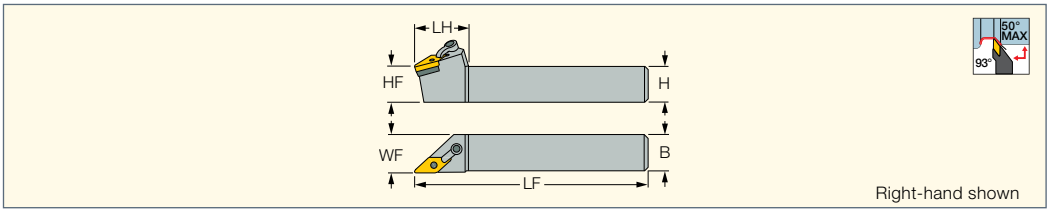
Designation											
HSK A63WH MUMNN J12MW	LC WN08	LCR CN12*	LCR SN12*	TCN 423	ZNW 4CM	SR 17-307	HW 3.0	DK 17-307	SPR 17-307	EZ 83	SR M4X8

* Optional, to be ordered separately

ISOTURN

MVJNR/L

Pin and Clamp Tools Carrying
35° Negative Rhombic Inserts



Designation	H	HF	B	LF	LH	WF	Insert
MVJNR/L 2020K-16	20.0	20.0	20.0	125.00	41.0	25.00	VNGA 1604
MVJNR/L 2525M-16	25.0	25.0	25.0	150.00	41.0	32.00	VNGA 1604

For inserts, see pages: VNGA (CBN) (174) • VNGA (PCD) (221) • VNGA 2MT (CBN) (175) • VNGA 2MT MM (CBN) (176) • VNGA 4MT (CBN) (175) • VNGA 4MT MM (CBN) (176) • VNGA MT (CBN) (175) • VNGA MT (PCD) (222) • VNGA (CER) (65)

Spare Parts

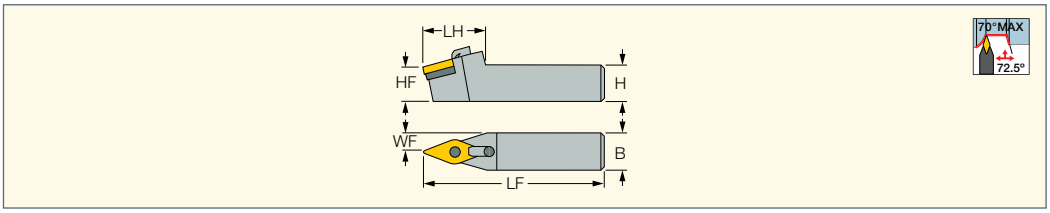
Designation								
MVJNR/L	IVSN 322	IVSN 323[a]*	IYSN 322[b]*	NL 34-L	HW 5/32"	CL 30-INJ	XNS 510	HW 5/64"

* Optional, to be ordered separately
[a] Use for VNGA 160412 inserts
[b] Use for YNMG inserts

ISOTURN

MVVNN

Pin and Clamp Tools Carrying
35° Negative Rhombic Inserts



Designation	H	HF	B	LF	LH	WF	Insert
MVVNN 2020K-16	20.0	20.0	20.0	125.00	48.0	10.00	VNGA 1604..
MVVNN 2525M-16	25.0	25.0	25.0	150.00	48.0	12.50	VNGA 1604..

For inserts, see pages: VNGA (CBN) (174) • VNGA (PCD) (221) • VNGA 2MT (CBN) (175) • VNGA 2MT MM (CBN) (176) • VNGA 4MT (CBN) (175) • VNGA 4MT MM (CBN) (176) • VNGA MT (CBN) (175) • VNGA MT (PCD) (222) • VNGA (CER) (65)

Spare Parts

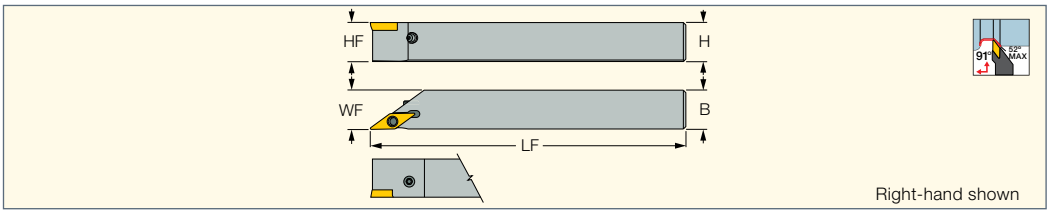
Designation								
MVVNN	IVSN 322	IVSN 323[a]*	IYSN 322[b]*	NL 34-L	CL 30-INJ	XNS 510	HW 5/32"	HW 5/64"

* Optional, to be ordered separately
[a] Use for VNGA 160412 inserts
[b] Use for YNMG inserts

ISOTURN

PVACR/L-S

Side Lever Lock Tools Carrying 35° Positive Rhombic Inserts for Swiss Automatic Machines



Designation	H	HF	B	LF	WF	Insert				
PVACR/L 0808M-11S	8.0	8.0	8.0	150.00	8.00	VC..1103	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5
PVACR/L 1010M-11S	10.0	10.0	10.0	150.00	10.20	VC..1103	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5
PVACR/L 1212M-11S	12.0	12.0	12.0	150.00	12.20	VC..1103	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5
PVACR/L 1616M-11S	16.0	16.0	16.0	150.00	16.20	VC..1103	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5
PVACR 2020K-11S	20.0	20.0	20.0	125.00	20.20	VC..1103	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5

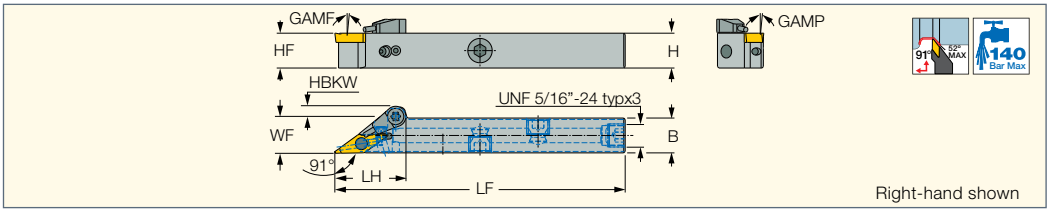
- The clamping screw may by transferred to the opposite side if needed

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

ISOTURN

PVACR/L-S-JHP

Tools with Channels for High Pressure Coolant Carrying 35° Positive Rhombic Inserts for Swiss Automatic Machines



Designation	H	HF	B	LF	LH	WF	HBKW	GAMP	GAMF	Insert
PVACR 1010H-11S-JHP	10.0	10.0	10.0	100.00	20.0	10.20	5.80	0.0	0.0	VC..1103
PVACR/L 1212H-11S-JHP	12.0	12.0	12.0	100.00	20.0	12.20	3.80	0.0	0.0	VC..1103
PVACR/L 1616K-11S-JHP	16.0	16.0	16.0	125.00	20.0	16.20	-	0.0	0.0	VC..1103
PVACR/L 2020K-11S-JHP	20.0	20.0	20.0	125.00	25.0	20.20	-	0.0	0.0	VC..1103

- For user guide, see pages 327-328,331-332,335-336

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

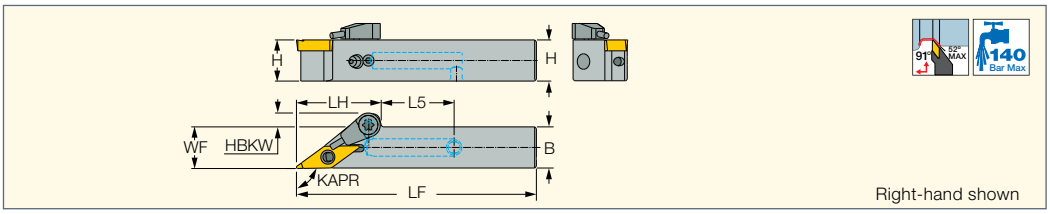
Spare Parts

Designation							
PVACR 1010H-11S-JHP	SR 5/16XUNF-TL-S	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5		S-CU-JHP-A SET
PVACR/L 1212H-11S-JHP		SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5	SR 5/16UNF TL360	S-CU-JHP-A SET
PVACR/L 1616K-11S-JHP		SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5	SR 5/16UNF TL360	S-CU-JHP-A SET
PVACR 2020K-11S-JHP		SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.5/5	SR 5/16UNF TL360	S-CU-JHP-A SET

ISOTURN

PVACR/L-S-JHP-MC

Tools with Channels for High Pressure Coolant Carrying 35° Positive Rhombic Inserts for Swiss Automatic Machines

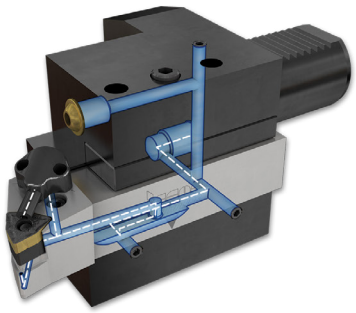


Designation	H	B	LF	LH	L5	WF	HBKW	Insert	KAPR(1)
PVACR/L 1212X-11S-JHP-MC	12.0	12.0	70.00	25.0	21.00	12.20	3.80	VC..1103	91.0
PVACR/L 1616X-11S-JHP-MC	16.0	16.0	73.00	26.0	16.00	16.20	-	VC..1103	91.0

- For user guide, see pages 327-328,331-332,335-336

(1) Tool cutting edge angle

For inserts, see pages: • VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)



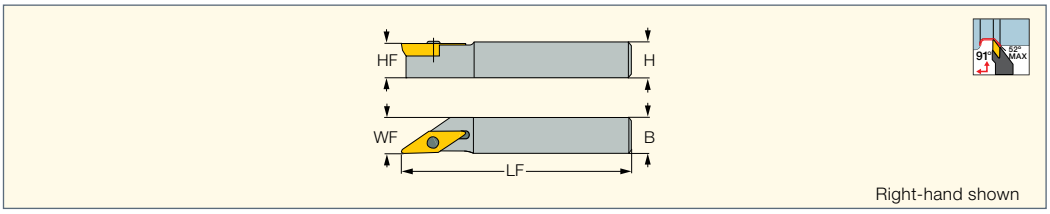
Spare Parts

Designation						
PVACR/L-S-JHP-MC	SL LV-2	SL PI-2 PIN	SR 10400611	HW 2.0/5	SR 5/16UNF TL360	S-CU-JHP-A SET

ISOTURN

SVACR/L-S

91° Lead Angle Screw Lock Tools Carrying 35° Diamond Inserts with 7° Clearance Angle



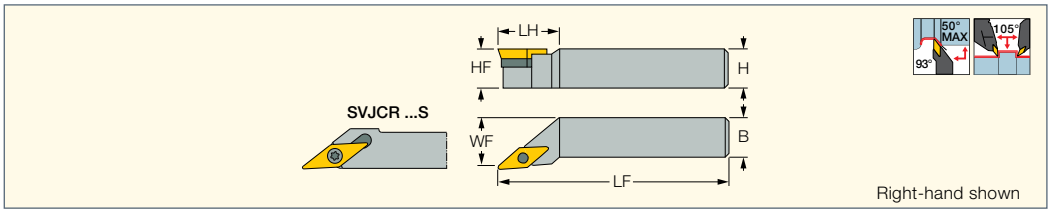
Designation	H	B	HF	LF	WF	Insert		
SVACR 1010M-11S	10.0	10.0	10.0	150.00	10.15	VC..11..	SR 14-560	T-8/5
SVACR/L 1212K-11S	12.0	12.0	12.0	125.00	12.00	VC..11..	SR 14-560	T-8/5
SVACR 1616K-11S	16.0	16.0	16.0	125.00	16.00	VC..11..	SR 14-560	T-8/5
SVACR/L 1212K-13S	12.0	12.0	12.0	125.00	12.00	VC..13..	SR 14-513	T-8/5
SVACR/L 1616K-13S	16.0	16.0	16.0	125.00	16.00	VC..13..	SR 14-513	T-8/5
SVACR/L 2020K-13S	20.0	20.0	20.0	125.00	20.00	VC..13..	SR 14-513	T-8/5

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

ISOTURN

SVJCR/L

93° Lead Angle Screw Lock Tools Carrying 35° Diamond Inserts with 7° Clearance Angle



Designation	H	HF	B	LF	LH	WF	Insert				
SVJCR/L 0808K-11S (1)	8.0	8.0	8.0	125.00	11.5	8.20	VC..1103	SR 14-560	T-8/5		
SVJCR/L 1010K-11S (1)	10.0	10.0	10.0	125.00	22.0	10.20	VC..1103	SR 14-560	T-8/5		
SVJCR/L 1212K-11S (1)	12.0	12.0	12.0	125.00	-	12.20	VC..1103	SR 14-560	T-8/5		
SVJCR/L 1616K-11	16.0	16.0	16.0	125.00	25.0	20.00	VC..1103	SR 14-560	T-8/5		
SVJCR/L 2020K-11	20.0	20.0	20.0	125.00	30.0	25.00	VC..1103	SR 14-560	T-8/5		
SVJCR/L 2525M-11	25.0	25.0	25.0	150.00	30.0	32.00	VC..1103	SR 14-560	T-8/5		
SVJCR/L 2020K-16	20.0	20.0	20.0	125.00	30.0	25.00	VC..1604	SR 16-236 P	T-15/5	TVC 3-1	SR TC-3
SVJCR/L 2525M-16	25.0	25.0	25.0	150.00	30.0	32.00	VC..1604	SR 16-236 P	T-15/5	TVC 3-1	SR TC-3

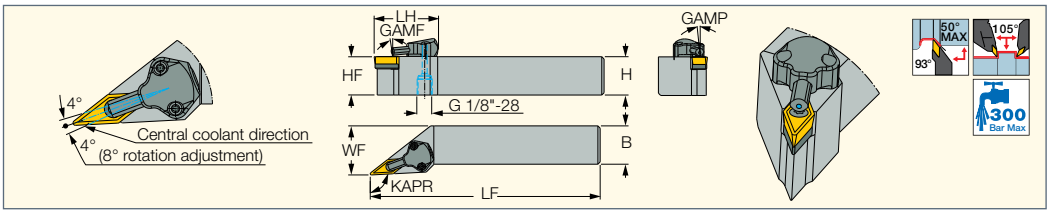
(1) For Swiss-type machines

For inserts, see pages: • VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW 2MT MM (CBN) (174) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

ISOTURN

SVJCR/L-16-JHP

Screw Lock Tools with Channels for High-Pressure Coolant Carrying 35° Rhombic Inserts with 7° Clearance Angle



Designation	H	B	HF	LF	LH	WF	KAPR(1)	GAMP	GAMF	Insert
SVJCR/L 2525M-16-JHP	25.0	25.0	25.0	150.00	42.0	32.00	93.0	0.0	0.0	VCGT 1604

- For user guide, see pages 327-328,331-332,335-336

(1) Tool cutting edge angle

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW 2MT MM (CBN) (174) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

Spare Parts

Designation								
SVJCR/L 2525M-16-JHP	TVC 3-1	SR TC-3	SR 16-236 P	CU-V-JHP	TVC 3-04675(a)*	T-15/5	HW 2.5	T-8/5

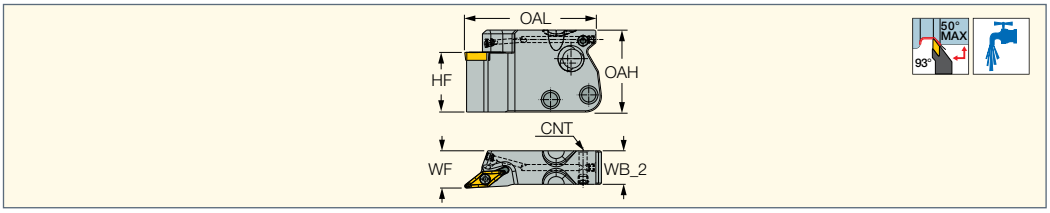
* Optional, to be ordered separately

(a) Rhombic seat for inserts with radius 1.2, should be ordered separately

ISOTURN

SVJCR/L-PAD-JHP

Screw Lock Adapter with High-Pressure Coolant Mounts 35° Diamond Inserts with a 7° Clearance Angle



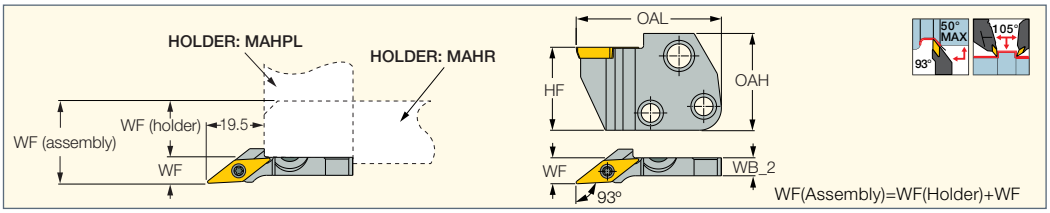
Designation	HF	OAL	OAH	WF	WB_2	Insert	CNT			
SVJCR/L-11-PAD-JHP	24.0	52.80	33.00	15.00	10.0	VC.. 1103	M4	T-8/5	SR M4X4 DIN913 TL360	SR 14-560

For inserts, see pages: • VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

MODULARGRIP

SVJCR-PAD

93° Lead Angle Screw Lock Adapters Carrying 35° Diamond Inserts with 7° Clearance Angle



Designation	HF	OAH	OAL	WF	WB_2	Insert		
SVJCR-11-PAD	24.0	28.0	42.00	7.50	5.2	VC.. 1103	SR 14-560	T-8/5

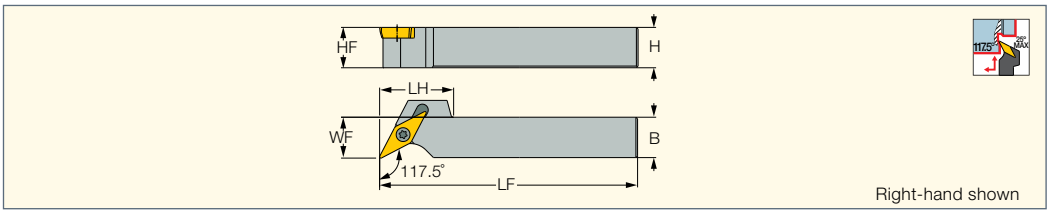
- WF(assembly) = WF(holder) + WF

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

ISOTURN

SVPCR/L-S

117° Lead Angle Screw Lock Tools Carrying 35° Diamond Inserts with 7° Clearance Angle



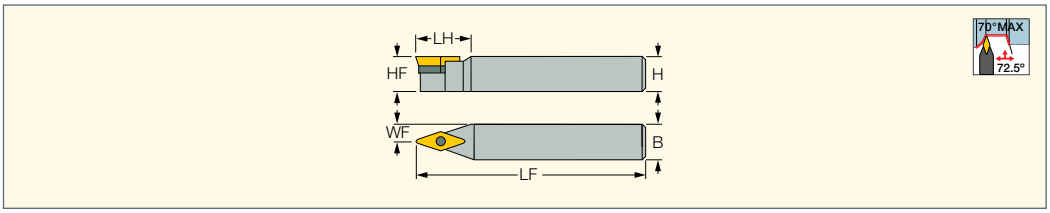
Designation	H	HF	B	LF	LH	WF	Insert		
SVPCR/L 1212K-11S	12.0	12.0	12.0	125.00	19.0	12.20	VC..1103	SR 14-560	T-8/5
SVPCR/L 1616K-11S	16.0	16.0	16.0	125.00	-	16.20	VC..1103	SR 14-560	T-8/5

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

ISOTURN

SVVCN

72.5° Lead Angle Screw Lock Tools Carrying 35° Diamond Inserts with 7° Clearance Angle



Designation	H	HF	B	LF	LH	WF	Insert				
SVVCN 0808K-11S (1)	8.0	8.0	8.0	125.00	-	4.30	VC..1103	SR 14-560	T-8/5		
SVVCN 1010K-11S (1)	10.0	10.0	10.0	125.00	-	5.30	VC..1103	SR 14-560	T-8/5		
SVVCN 1212K-11S (1)	12.0	12.0	12.0	125.00	-	6.30	VC..1103	SR 14-560	T-8/5		
SVVCN 1616K-11S (1)	16.0	16.0	16.0	125.00	-	8.30	VC..1103	SR 14-560	T-8/5		
SVVCN 2020K-16	20.0	20.0	20.0	125.00	34.0	10.00	VC..1604	SR 16-236 P	T-15/5	TVC 3-1	SR TC-3
SVVCN 2525M-16	25.0	25.0	25.0	150.00	38.1	12.50	VC..1604	SR 16-236 P	T-15/5	TVC 3-1	SR TC-3

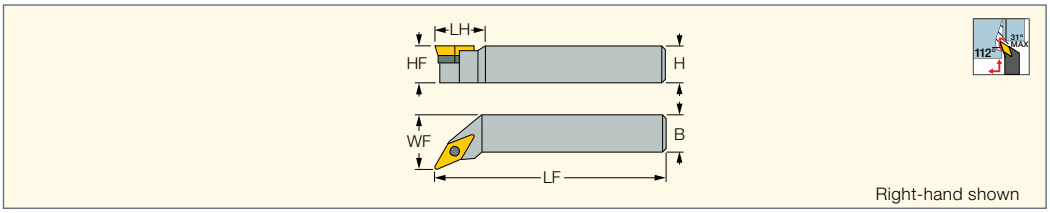
(1) For Swiss-type machines

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW 2MT MM (CBN) (174) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

ISOTURN

SVXCR/L

112° Lead Angle Screw Lock Tools Carrying 35° Diamond Inserts with 7° Clearance Angle



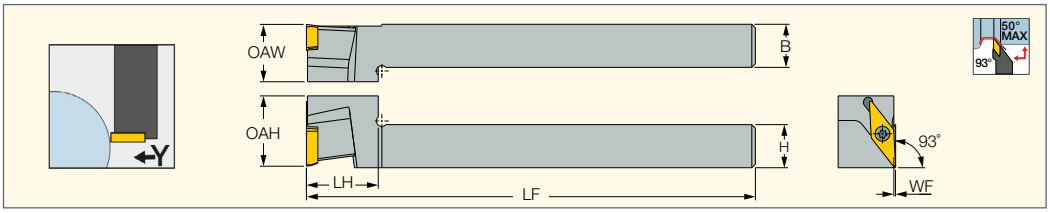
Designation	H	HF	B	LF	LH	WF	Insert				
SVXCR/L 2020K-16	20.0	20.0	20.0	125.00	25.0	25.00	VC..1604	TVC 3-1	SR TC-3	HW 2.5	SR 16-236 P
SVXCR/L 2525M-16	25.0	25.0	25.0	150.00	30.0	32.00	VC..1604	TVC 3-1	SR TC-3	HW 2.5	SR 16-236 P

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW 2MT MM (CBN) (174) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

NEOYSWISS AXIS

Y-SVJCR-S

Y-Axis Screw Lock Integral Tools Carrying 7° Clearance 35° Rhombic Inserts for Swiss-Type Machines



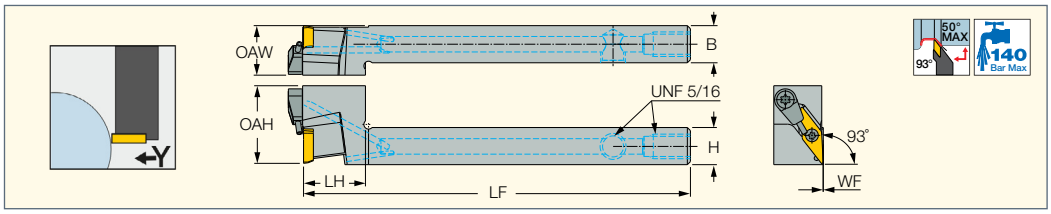
Designation	H	B	LF	LH	OAH	OAW	WF	Insert		
Y-SVJCR 1212K-11S	12.0	12.0	125.00	21.0	20.00	16.00	0.00	VCGT 1103..	T-7/5	SO 250651
Y-SVJCR 1616K-11S	16.0	16.0	125.00	21.0	20.00	16.00	0.00	VCGT 1103..	T-7/5	SO 250651

For inserts, see pages: • VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

NEOYSWISS AXIS

Y-SVJCR-S-JHP

Y-Axis Screw Lock JETCUT Integral Tools Carrying 7° Clearance 35° Rhombic Inserts for Swiss-Type Machines



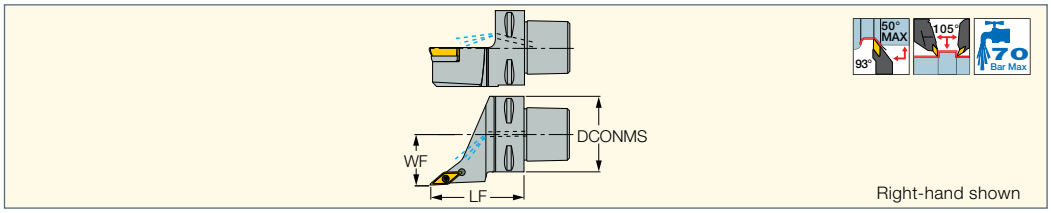
Designation	H	B	LF	LH	OAH	OAW	WF	Insert					
Y-SVJCR 1212K-11S-JHP	12.0	12.0	125.00	21.0	25.50	16.00	0.00	VCGT 1103..	T-7/5	HW 5/32"	SR 5/16UNF TL360	S-CU-JHP-A SET	SO 250651
Y-SVJCR 1616K-11S-JHP	16.0	16.0	125.00	21.0	25.50	16.00	0.00	VCGT 1103..	T-7/5	HW 5/32"	SR 5/16UNF TL360	S-CU-JHP-A SET	SO 250651

For inserts, see pages: • VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

ISOTURN

C#-SVJCR/L

Screw Lock Tools with CAMFIX Exchangeable Shanks Carrying 35° Rhombic Inserts with 7° Clearance Angle



Designation	DCONMS	WF	LF	Insert	CP(2)	DCP(1)						
C4 SVJCR/L-27050-11	40.00	27.00	50.00	VC.. 1103	70	1				SR 14-560/S M2.5X0.45	T-8/5	EZ 83
C4 SVJCR/L-27050-16	40.00	27.00	50.00	VC.. 1604	70	1	TVC 3-1	SR TC-3	HW 2.5	SR 16-236 P	T-15/5	EZ 83
C5 SVJCR-35060-11	50.00	35.00	60.00	VC.. 1103	70	1				SR 14-560/S M2.5X0.45	T-8/5	EZ 104
C5 SVJCR/L-35060-16	50.00	35.00	60.00	VC.. 1604	70	1	TVC 3-1	SR TC-3	HW 2.5	SR 16-236 P	T-15/5	EZ 104
C6 SVJCR/L-45065-16	63.00	45.00	65.00	VC.. 1604	70	1	TVC 3-1	SR TC-3	HW 2.5	SR 16-236 P	T-15/5	EZ 125

(1) 1 - Slot for data chip, 0 - Without slot for data chip

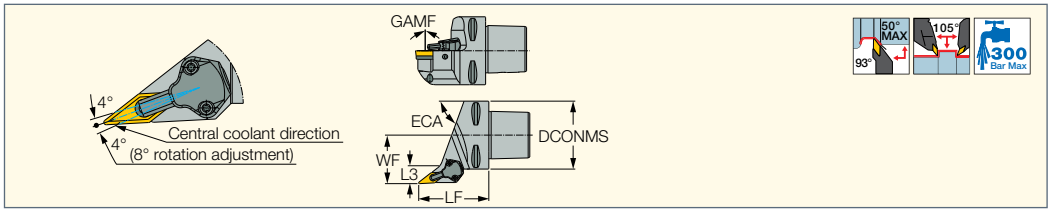
(2) Coolant pressure (Bar)

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW 2MT MM (CBN) (174) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

ISOTURN

C#-SVJCR/L-JHP

Screw Lock Tools with CAMFIX Exchangeable Shanks Carrying 35° Rhombic Inserts with 7° Clearance Angle



Designation	DCONMS	WF	LF	GAMF	ECA	L3	Insert	CP(1)	DCP(2)
C3 SVJCL 22040-11-JHP	32.00	22.00	40.00	0.0	55.0	-	VCGT 1103	300	0
C3 SVJCR-22040-11-JHP	32.00	22.00	40.00	0.0	55.0	-	VCGT 1103	300	0
C4 SVJCR/L-27055-16-JHP	40.00	27.00	55.00	0.0	55.0	-	VCGT 1604	300	1
C5 SVJCR/L-35060-16-JHP	50.00	35.00	60.00	0.0	55.0	-	VCGT 1604	300	1
C6 SVJCR-45065-16-JHP	63.00	45.00	65.00	0.0	70.0	16.80	VCGT 1604	300	1

• For user guide, see pages 327-328,331-332,335-336

(1) Coolant pressure (Bar)

(2) 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW 2MT MM (CBN) (174) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

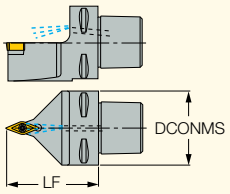
Spare Parts

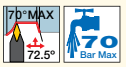
Designation							
C3 SVJCR-22040-11-JHP				SR 14-560	CH-1.9D-JHP	T-8/5	
C4 SVJCR/L-27055-16-JHP	TVC 3-1	SR TC-3	T-15/5	SR 16-236 P	CU-V-JHP	T-8/5	HW 2.5
C5 SVJCR/L-35060-16-JHP	TVC 3-1	SR TC-3	T-15/5	SR 16-236 P	CU-V-JHP	T-8/5	HW 2.5
C6 SVJCR-45065-16-JHP	TVC 3-1	SR TC-3	T-15/5	SR 16-236 P	CU-V-JHP	T-8/5	HW 2.5

ISOTURN

C#-SVVCN

Screw Lock Tools with CAMFIX Exchangeable Shanks Carrying 35° Rhombic Inserts with 7° Clearance Angle





Designation	DCONMS	LF	Insert	CP(2)	DCP(1)						
C4 SVVCN-00050-16	40.00	40.00	VC.. 1604	70	1	TVC 3-1	SR TC-3	HW 2.5	SR 16-236 P	T-15/5	EZ 83
C5 SVVCN-00060-16	50.00	50.00	VC.. 1604	70	1	TVC 3-1	SR TC-3	HW 2.5	SR 16-236 P	T-15/5	EZ 125

(1) 1 - Slot for data chip, 0 - Without slot for data chip

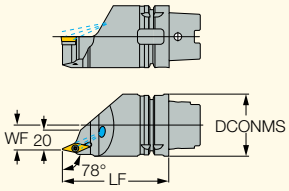
(2) Coolant pressure (Bar)

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW 2MT MM (CBN) (174) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

ISOTURN

HSK A63WH-SVJCR/L

Tools with HSK Exchangeable Tapered Shanks Carrying Positive 35° Inserts for Mounting at 15° on Turn-Mill Machines



Right-hand shown

Designation	DCONMS	LF	WF	Insert	DCP(1)						
HSK A63WH-SVJCR/L-J16	63.00	110.00	25.00	VC.. 1604	0	TVC 3-1	SR TC-3	HW 2.5	SR 16-236 P	T-15/5	EZ 104

- Complies with ICTM standard (ISO 12164-3). • A cooling tube must be used with all coolant through HSK spindles (should be ordered separately).
- For user guide, see pages 327-328,331-332,335-336

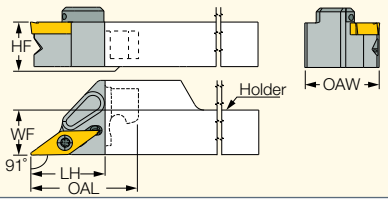
(1) 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW 2MT MM (CBN) (174) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

NEOSWISS

NQCH-SVACR/L-S-JHP

Screw Lock JETCUT Modular Heads Carrying 35° Rhombic Inserts with 7° Clearance Angle



Right hand tool shown

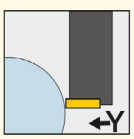
Designation	WF	HF	LH	OAL	OAW	Insert		
NQCH12-SVACR/L-11S-JHP	12.15	12.0	20.0	28.80	20.15	VC.. 1103..	SR 14-560	T-8/5
NQCH16-SVACR/L-11S-JHP	16.15	16.0	20.0	28.80	20.15	VC.. 1103..	SR 14-560	T-8/5

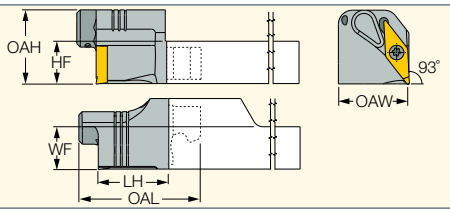
For inserts, see pages: • VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

NEOSWISS

NQCH-Y-SVJCR-S-JHP

Y-Axis Screw Lock JETCUT Modular Heads Carrying 35° Rhombic Inserts with 7° Clearance Angle for Swiss-Type Machines





Right hand tool shown

Designation	WF	HF	LH	OAL	OAW	OAH	Insert		
NQCH12-Y-SVJCR-11S-JHP	12.15	12.2	20.0	34.30	20.15	21.90	VC.. 1103	SR 14-560	T-8/5
NQCH16-Y-SVJCR-11S-JHP	16.15	16.2	20.0	34.30	20.15	21.10	VC.. 1103	SR 14-560	T-8/5

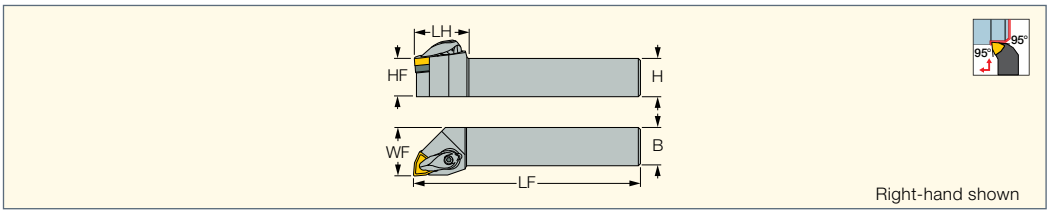
- For user guide, see pages 327-328,331-332,335-336

For inserts, see pages: • VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

ISOTURN

DWLNR/L

External 95° Lead Tools Carrying Negative WNGA Trigon Inserts



Designation	H	HF	B	LF	LH	WF	Insert
DWLNR/L 1616H-06	16.0	16.0	16.0	100.00	26.0	16.00	WNGA 0604
DWLNR/L 2020K-06	20.0	20.0	20.0	125.00	26.0	25.00	WNGA 0604
DWLNR/L 2525M-06	25.0	25.0	25.0	150.00	24.0	32.00	WNGA 0604
DWLNR/L 2020K-08	20.0	20.0	20.0	125.00	35.0	25.00	WNGA 0804
DWLNR/L 2525M-08	25.0	25.0	25.0	150.00	35.0	32.00	WNGA 0804
DWLNR/L 3232P-08	32.0	32.0	32.0	170.00	35.0	40.00	WNGA 0804

For inserts, see pages: WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66)

Spare Parts

Designation									
DWLNR/L 1616H-06	RWT 322	RWT 3-2[a]*		SR 40090I	LCGR-3	SR RC3	KSP 3		HW 2.5
DWLNR/L 2020K-06	RWT 322	RWT 3-2[a]*		SR 40090I	LCGR-3	SR RC3	KSP 3		HW 2.5
DWLNR/L 2525M-06	RWT 322	RWT 3-2[a]*		SR 40090I	LCGR-3	SR RC3	KSP 3		HW 2.5
DWLNR/L 2020K-08	RWT 443	RWT 443-TNM[b]*	TWH 4[c]*	SR 14-506 M4X0.7	LCGR-4	SR 10400270-25.5		T-15/5	
DWLNR/L 2525M-08	RWT 443	RWT 443-TNM[b]*	TWH 4[c]*	SR 14-506 M4X0.7	LCGR-4	SR 10400270-25.5		T-15/5	
DWLNR/L 3232P-08	RWT 443	RWT 443-TNM[b]*	TWH 4[c]*	SR 14-506 M4X0.7	LCGR-4	SR 10400270-25.5		T-15/5	

* Optional, to be ordered separately

[a] RWT 3-2 seat, for WNGA 06T3 insert

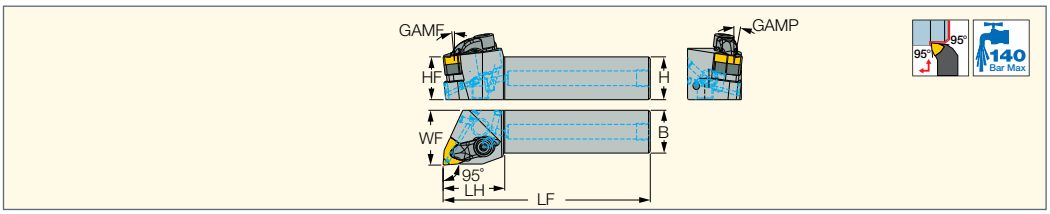
[b] RWT 443-TNM seat, for WNGA 0804...-TNM insert

[c] TWH 4 seat, for WNMX 0807... insert

JETRTURN RIGID CLAMP

DWLNR/L-JHP-MC

Rigid Clamp Tools with Channels for High-Pressure Coolant Carrying 80° Trigon Inserts



Designation	B	H	HF	LF	LH	WF	GAMP	GAMF	MIID[1]
DWLNR/L 2020X-08-JHP-MC	20.0	20.0	20.0	106.00	36.0	25.00	6.0	6.0	WNGA 0804
DWLNR/L 2525X-08-JHP-MC	25.0	25.0	25.0	121.00	36.0	32.00	6.0	6.0	WNGA 0804

[1] Master insert identification

For inserts, see pages: WNGA (CBN) (176) • WNGA (CER) (66) • WNGA (PCD) (222)

Spare Parts

Designation							
DWLNR/L 2020X-08-JHP-MC	RWT 443[a]	TWH 4[b]*	RWT 443-TNM[c]*	LCGR/L-4JC SET[d]	SR 14-506 M4X0.7	PLG G1/8 TL360	OR 4X3 NBR70
DWLNR/L 2525X-08-JHP-MC	RWT 443[a]	TWH 4[b]*	RWT 443-TNM[c]*	LCGR/L-4JC SET[d]	SR 14-506 M4X0.7	PLG G1/8 TL360	OR 4X3 NBR70

* Optional, to be ordered separately

[a] For WNGA 08... inserts

[b] For WNMX 08... inserts

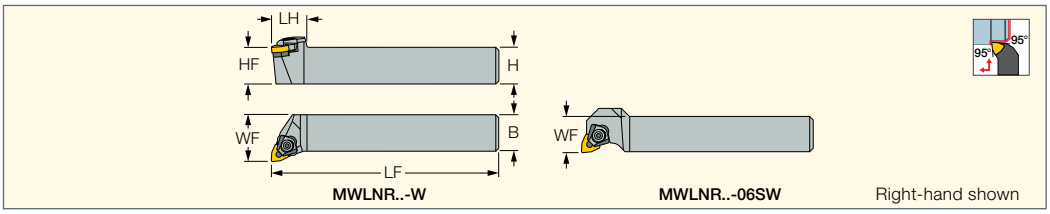
[c] For WNGA 08...-TNM inserts

[d] Recommended tightening torque 4Nm for R-Clamp Screw

ISOTURN

MWLNR/L-W

Top Wedge Lock External
Tools Carrying Trigon Inserts



Designation	H	HF	B	LF	LH	WF	Insert
MWLNR/L 1616H-06SW	16.0	16.0	16.0	100.00	23.0	16.00	WNGA 06T3
MWLNR/L 2020K-06W	20.0	20.0	20.0	125.00	25.0	25.00	WNGA 06T3
MWLNR/L 2525M-06W	25.0	25.0	25.0	150.00	25.0	32.00	WNGA 06T3
MWLNR/L 2020K-08W	20.0	20.0	20.0	125.00	30.0	25.00	WNGA 0804
MWLNR/L 2525M-08W	25.0	25.0	25.0	150.00	30.0	32.00	WNGA 0804
MWLNR/L 3232P-08W	32.0	32.0	32.0	170.00	35.0	40.00	WNGA 0804

For inserts, see pages: WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66)

Spare Parts

Designation						
MWLNR/L 1616H-06SW	IWSN 322W	IWSN 3-2W[a]*	ZNW 3W	SR 14-564	LC 250 SET 1	HW 2.5
MWLNR/L 2020K-06W	IWSN 322W	IWSN 3-2W[a]*	ZNW 3W	SR 14-564	LC 250 SET 1	HW 2.5
MWLNR/L 2525M-06W	IWSN 322W	IWSN 3-2W[a]*	ZNW 3W	SR 14-564	LC 250 SET 1	HW 2.5
MWLNR/L 2020K-08W	IWSN 433	IWSN 433M[b]*	ZNW 4W	SR M4X8	LC 252 SET 1	HW 3.0
MWLNR/L 2525M-08W	IWSN 433	IWSN 433M[b]*	ZNW 4W	SR M4X8	LC 252 SET 1	HW 3.0
MWLNR/L 3232P-08W	IWSN 433	IWSN 433M[b]*	ZNW 4W	SR M4X8	LC 252 SET 1	HW 3.0

* Optional, to be ordered separately

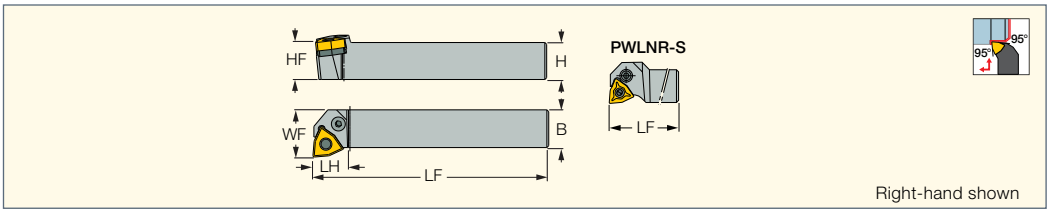
[a] Use IWSN 3-2W optional seat for WNGA 0604.. inserts

[b] Use IWSN 433M optional seat for WNGA 0804..-TNM inserts

ISOTURN

PWLNR/L

Lever Lock External
Turning Tools Carrying 80°
Negative Trigon Inserts



Designation	H	HF	B	LF	LH	WF	Insert
PWLNR/L 1616H-06	16.0	16.0	16.0	100.00	16.0	20.00	WN..06T3
PWLNR/L 1616H-06S [1]	16.0	16.0	16.0	100.00	20.3	16.00	WN..06T3
PWLNR/L 2020K-06	20.0	20.0	20.0	125.00	20.0	25.00	WN..06T3
PWLNR/L 2525M-06	25.0	25.0	25.0	150.00	20.0	32.00	WN..06T3
PWLNR/L 2020K-08	20.0	20.0	20.0	125.00	19.0	25.00	WN..0804
PWLNR/L 2525M-08	25.0	25.0	25.0	150.00	20.5	32.00	WN..0804
PWLNR/L 3232P-08	32.0	32.0	32.0	170.00	19.0	40.00	WN..0804

[1] Can be used on automatics

For inserts, see pages: WNGA (CBN) (176) • WNGA (PCD) (222)• WNGA (CER) (66)

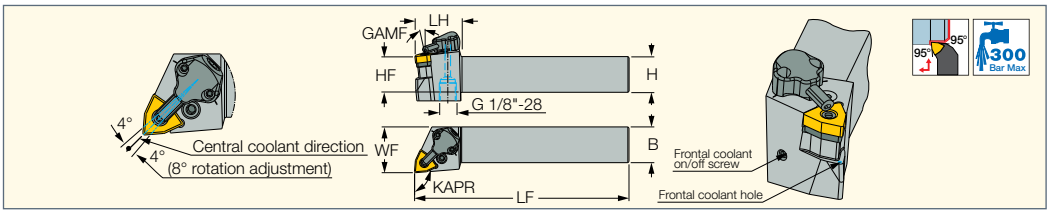
Spare Parts

Designation						
PWLNR/L 1616H-06	TWN 322	SP 3	PN 3-4	HW 2.5/5	SR 117-2014	LR 3
PWLNR/L 1616H-06S	TWN 322	SP 3	PN 3-4	HW 2.5/5	SR 117-2014	LR 3
PWLNR/L 2020K-06	TWN 322	SP 3	PN 3-4	HW 2.5/5	SR 117-2014	LR 3
PWLNR/L 2525M-06	TWN 322	SP 3	PN 3-4	HW 2.5/5	SR 117-2014	LR 3
PWLNR/L 2020K-08	TWN 423	SP 4	PN 3-4	HW 3.0	SR 117-2010	LR 4
PWLNR/L 2525M-08	TWN 423	SP 4	PN 3-4	HW 3.0	SR 117-2010	LR 4
PWLNR/L 3232P-08	TWN 423	SP 4	PN 3-4	HW 3.0	SR 117-2010	LR 4

ISOTURN

PWLNR/L-08-JHP

Lever Lock Tools with Channels for High-Pressure Coolant Carrying Trigon Inserts



Designation	H	HF	B	LF	LH	WF	GAMF	Insert
PWLNR/L 2525M-08-JHP	25.0	25.0	25.0	150.00	33.0	32.00	-6.0	WNGA 0804..
PWLNR/L 3232P-08-JHP	32.0	32.0	32.0	170.00	33.0	40.00	-6.0	WNGA 0804

• For user guide, see pages 327-328,331-332,335-336

For inserts, see pages: WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66)

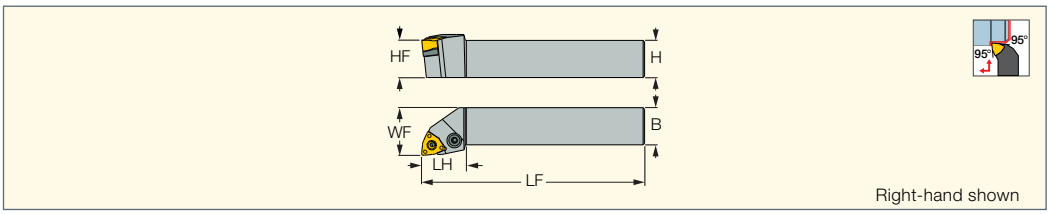
Spare Parts

Designation											
PWLNR/L-08-JHP	TWN 423	SP 4	PN 3-4	LR 4	SR 117-2010	SR M4X4 DIN913 TL360	CU-CW-JHP	HW 2.0	HW 3.0	T-8/5

HELITURN LD

PWLNR/L-X

Lever Lock External Turning Tools Carrying HELITURN LD WNMX or WNGA Trigon Inserts



Designation	H	HF	B	LF	LH	WF	Insert
PWLNR/L 2020K-06X (1)	20.0	20.0	20.0	125.00	25.0	25.00	WNMX 0606, WNGA 0604
PWLNR/L 2525M-06X (1)	25.0	25.0	25.0	150.00	25.0	32.00	WNMX 0606, WNGA 0604
PWLNR/L 2020K-08X (2)	20.0	20.0	20.0	125.00	30.0	25.00	WNMX 0807, WNGA 0804
PWLNR/L 2525M-08X (2)	25.0	25.0	25.0	150.00	30.0	32.00	WNMX 0807, WNGA 0804
PWLNR 3232P-08X (2)	32.0	32.0	32.0	170.00	30.0	40.00	WNMX 0807, WNGA 0804

(1) Supplied with TWX 3 seat for WNMX 0606.. inserts and TWN 3 seat for WNGA 0604.. inserts.

(2) Supplied with TWX 4 seat for WNMX 0807.. inserts and TWN 443 seat for WNGA 0804.. inserts.

For inserts, see pages: WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66)

Spare Parts

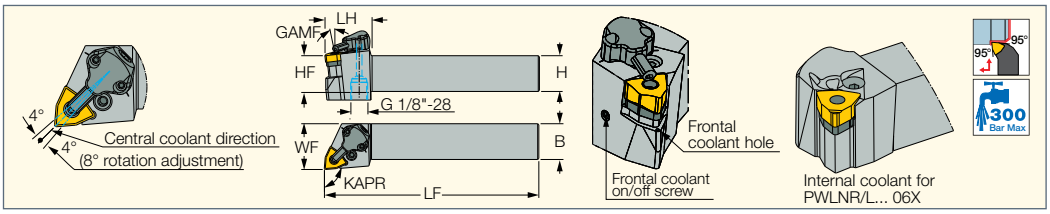
Designation								
PWLNR/L 2020K-06X	TWX 3	TWN 3	SP 3	LR 3	SR 117-2014	HW 2.5	PN 3-4	
PWLNR/L 2525M-06X	TWX 3	TWN 3	SP 3	LR 3	SR 117-2014	HW 2.5	PN 3-4	
PWLNR/L 2020K-08X	TWX 4	TWN 443	SP 4	LR 4DH	SR 117-2010	HW 3.0	PN 3-4L	LR 4DHTL (MR INJ)*
PWLNR/L 2525M-08X	TWX 4	TWN 443	SP 4	LR 4DH	SR 117-2010	HW 3.0	PN 3-4L	LR 4DHTL (MR INJ)*
PWLNR 3232P-08X	TWX 4	TWN 443	SP 4	LR 4DH	SR 117-2010	HW 3.0	PN 3-4L	LR 4DHTL (MR INJ)*

* Optional, to be ordered separately

HELITURN LD

PWLNR/L-X-JHP

Lever Lock Tools with Channels for High-Pressure Coolant Carrying HELITURN LD WNMX or WNGA Trigon Inserts



Designation	H	HF	B	LF	LH	WF	GAMF	KAPR[3]	Insert
PWLNR/L 2020K-06X-JHP [1]	20.0	20.0	20.0	125.00	25.0	25.00	-6.0	95.0	WNMX 0606, WNGA 0604
PWLNR/L 2525M-06X-JHP [1]	25.0	25.0	25.0	150.00	25.0	32.00	-6.0	95.0	WNMX 0606, WNGA 0604
PWLNR/L 2525M-08X-JHP [2]	25.0	25.0	25.0	150.00	33.0	32.00	-6.0	95.0	WNMX 0807, WNGA 0804
PWLNR/L 3232P-08X-JHP [2]	32.0	32.0	32.0	170.00	33.0	40.00	-6.0	95.0	WNMX 0807, WNGA 0804

- For user guide, see pages 327-328,331-332,335-336

[1] Supplied with TWX 3 seat for WNMX 0606.. inserts and TWN 3 seat for WNGA 0604.. inserts.

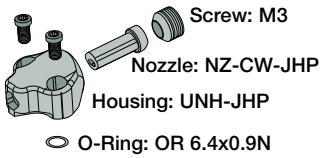
[2] Supplied with TWX 4 seat for WNMX 0807.. inserts and TWN 443 seat for WNGA 0804.. inserts.

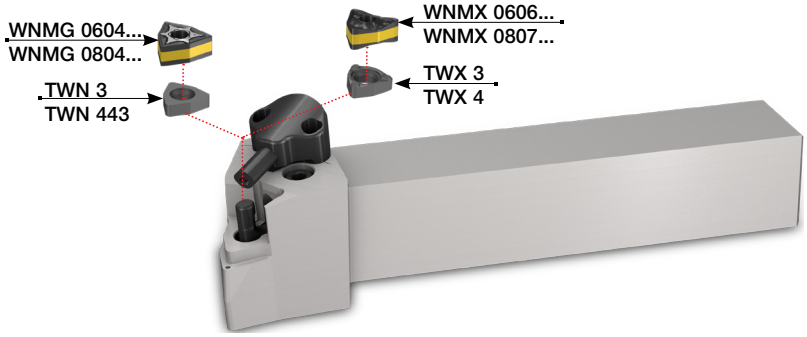
[3] Tool cutting edge angle

For inserts, see pages: WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66)

CU-CW-JHP

Screw: SR M3





Spare Parts

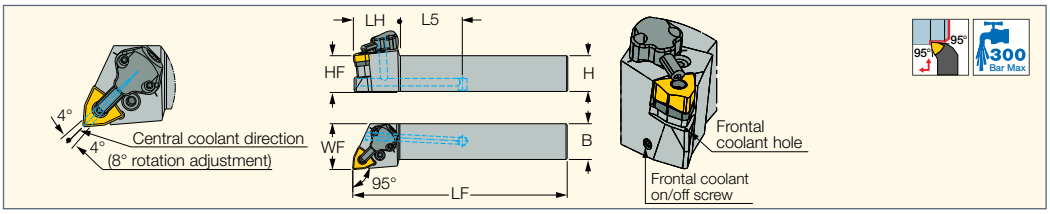
Designation													
PWLNR/L 2020K-06X-JHP	TWX 3	TWN 3	SP 3	LR 3	SR 117-2014	PN 3-4				HW 2.5		
PWLNR/L 2525M-06X-JHP	TWX 3	TWN 3	SP 3	LR 3	SR 117-2014	PN 3-4				HW 2.5		
PWLNR/L 2525M-08X-JHP	TWX 4	TWN 443	SP 4	LR 4DH	SR 117-2010	PN 3-4L	CU-CW-JHP	T-8/5	LR 4DHTL (MR INJ)*	HW 2.0	HW 3.0	SR M4X4 DIN913 TL360
PWLNR/L 3232P-08X-JHP	TWX 4	TWN 443	SP 4	LR 4DH	SR 117-2010	PN 3-4L	CU-CW-JHP	T-8/5	LR 4DHTL (MR INJ)*	HW 2.0	HW 3.0	SR M4X4 DIN913 TL360

* Optional, to be ordered separately

HELITURN LD

PWLNR/L-X-JHP-MC

Lever Lock Tools with Bottom Inlets for High-Pressure Coolant Channels Carrying HELITURN LD WNMX and WNGA Trigon Inserts



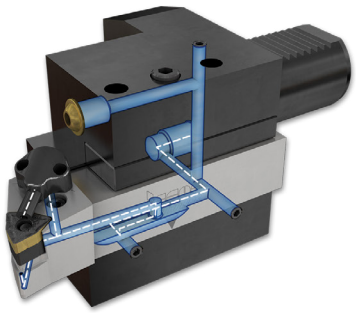
Designation	H	HF	B	LF	LH	L5	WF	Insert
PWLNR/L 2020X-06X-JHP-MC (1)	20.0	20.0	20.0	97.00	27.0	29.00	25.00	WNMX 0606, WNGA 0604
PWLNR/L 2525X-06X-JHP-MC (1)	25.0	25.0	25.0	118.00	33.0	35.00	32.00	WNMX 0606, WNGA 0604
PWLNR/L 2020X-08X-JHP-MC (2)	20.0	20.0	20.0	97.00	27.0	29.00	25.00	WNMX 0807, WNGA 0804
PWLNR/L 2525X-08X-JHP-MC (2)	25.0	25.0	25.0	118.00	33.0	35.00	32.00	WNMX 0807, WNGA 0804

- For user guide, see pages 327-328,331-332,335-336

(1) Supplied with TWX 3 seat for WNMX 0606.. inserts and TWN 3 seat for WNGA 0604.. inserts.

(2) Supplied with TWX 4 seat for WNMX 0807.. inserts and TWN 443 seat for WNGA 0804.. inserts.

For inserts, see pages: WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66)



Spare Parts

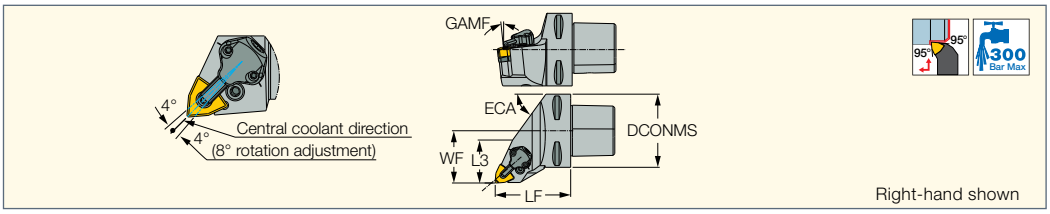
Designation												
PWLNR/L 2020X-06X-JHP-MC	TWX 3	TWN 3	SP 3	LR 3	SR 117-2014	PN 3-4	HW 2.5	CU-CW-JHP	T-8/5	SR M5X5 DIN913 TL360		
PWLNR/L 2525X-06X-JHP-MC	TWX 3	TWN 3	SP 3	LR 3	SR 117-2014	PN 3-4	HW 2.5	CU-CW-JHP	T-8/5	SR M5X5 DIN913 TL360		
PWLNR/L 2020X-08X-JHP-MC	TWX 4	TWN 443	SP 4	LR 4DH	SR 117-2010	PN 3-4L	HW 2.5	CU-CW-JHP	T-8/5	SR M5X5 DIN913 TL360	HW 3.0	LR 4DHTL (MR INJ)*
PWLNR/L 2525X-08X-JHP-MC	TWX 4	TWN 443	SP 4	LR 4DH	SR 117-2010	PN 3-4L	HW 2.5	CU-CW-JHP	T-8/5	SR M5X5 DIN913 TL360	HW 3.0	LR 4DHTL (MR INJ)*

* Optional, to be ordered separately

ISOTURN

C#-PWLNR/L-08-JHP

Lever Lock Tools with CAMFIX Exchangeable Shanks and Channels for High-Pressure Coolant Carrying Trigon Inserts



Designation	DCONMS	WF	OHN(1)	L3	ECA	GAMF	Insert	CP(2)	DCP(3)
C6 PWLNR/L-45065-08-JHP	63.00	45.00	65.00	37.00	55.0	-6.0	WNGA 08..	300	1

- For user guide, see pages 327-328,331-332,335-336

(1) Minimum overhang

(2) Coolant pressure (Bar)

(3) 1 - Slot for data chip, 0 - Without slot for data chip

For inserts, see pages: WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66)

Spare Parts

Designation									
C6 PWLNR/L-45065-08-JHP	TWN 423	SP 4	LR 4	SR 117-2010	T-8/5	PN 3-4	CU-CW-JHP	HW 3.0	LR 4DHTL (MR INJ)*

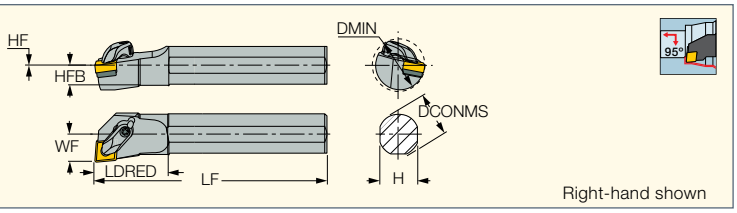
* Optional, to be ordered separately

Internal Tools

ISOTURN

S-DCLNR/L

R-Clamp Boring Bars Carrying Negative 80° Diamond Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	DMIN	HF	Insert
S25R DCLNR-12	25.00	200.00	45.0	23.0	12.3	17.00	36.00	0.8	CNGA 1204..
S32T DCLNR/L-12	32.00	300.00	45.0	28.0	15.8	22.00	40.00	1.8	CNGA 1204..
S40U DCLNR/L-12	40.00	350.00	55.0	36.0	19.8	27.00	48.00	1.8	CNGA 1204..

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • CNGG (CER) (55) • CNGA (CER) (54)

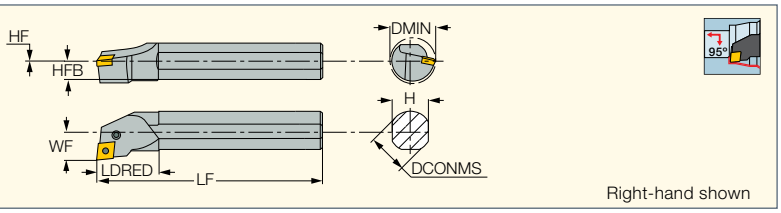
Spare Parts

Designation					
S-DCLNR/L	TCN 423	SP 4	LCGR-4	SR 10400270-25.5	T-15/5

ISOTURN

A/S-PCLNR/L

Lever Lock Boring Bars Carrying Negative 80° Rhombic Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	HF	CSP(1)	DMIN	Insert
A25R PCLNR/L-12	25.00	200.00	40.0	23.0	11.5	17.00	0.0	1	32.00	CNGA 1204..
S25S PCLNR/L-12	25.00	250.00	48.0	23.0	11.5	17.00	0.0	0	32.00	CNGA 1204..
A32T PCLNR/L-12	32.00	300.00	45.0	30.0	14.5	22.00	-0.5	1	40.00	CNGA 1204..
S32T PCLNR/L-12	32.00	300.00	51.0	30.0	14.5	22.00	-0.5	0	40.00	CNGA 1204..
S40U PCLNR/L-12	40.00	350.00	51.0	36.0	18.0	27.00	0.0	0	49.00	CNGA 1204..
S50W PCLNR-19	50.00	450.00	70.0	47.0	23.5	35.00	0.0	0	63.00	CNGA 1906..

(1) 0 - Without coolant supply, 1 - With coolant supply

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • CNGG (CER) (55) • CNGA (CER) (54)

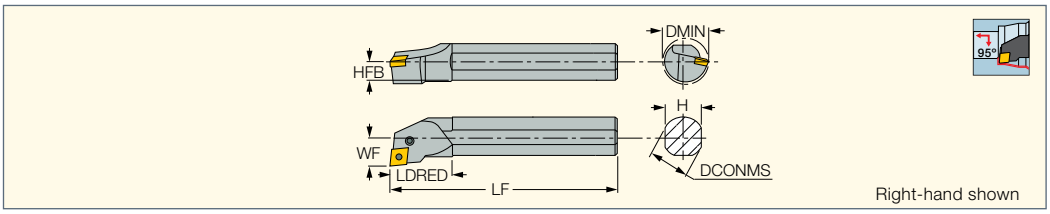
Spare Parts

Designation								
A25R PCLNR/L-12				LR 4M	SR 117-2011	HW 2.5/5		PL 25
S25S PCLNR/L-12				LR 4M	SR 117-2011	HW 2.5/5		
A32T PCLNR/L-12	TCN 423	SP 4	PN 3-4	LR 4	SR 117-2010	HW 2.0	HW 3.0	PL 32
S32T PCLNR/L-12	TCN 423	SP 4	PN 3-4	LR 4	SR 117-2010	HW 3.0		
S40U PCLNR/L-12	TCN 423	SP 4	PN 3-4	LR 4	SR 117-2010	HW 3.0		
S50W PCLNR-19	TCN 63	SP 66		LR 6	SR 10402352	HW 4.0		

HELITURN LD

A/S-PCLNR/L-X/G

Lever Lock Boring Bars Carrying Negative CNMX/CNGA 80° Rhombic Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	DMIN	CSP(5)	Insert
A16M PCLNR/L-09G (1)	16.00	150.00	30.0	15.0	7.5	11.00	21.00	1	CNGA 0904..
A20Q PCLNR/L-09G (1)	20.00	180.00	30.0	18.0	9.0	13.00	25.00	1	CNGA 0904..
A25R PCLNR/L-09X (2)	25.00	200.00	35.0	23.0	11.5	17.00	32.00	1	CNMX 0906, CNGA 0904
A32S PCLNR/L-09X (2)	32.00	250.00	40.0	29.0	14.5	22.00	40.00	1	CNMX 0906, CNGA 0904
A25R PCLNR/L-12X (3)	25.00	200.00	51.0	23.0	11.5	21.00	50.00	1	CNMX 1207, CNGA 1204
A32S PCLNR/L-12X (3)	32.00	250.00	51.0	29.0	14.5	21.00	54.00	1	CNMX 1207, CNGA 1204
S50W PCLNR-16X (4)	50.00	450.00	70.0	47.0	23.5	35.00	63.00	0	CNMX 1607, CNGA 1606

(1) For CNGA 0904.. inserts only

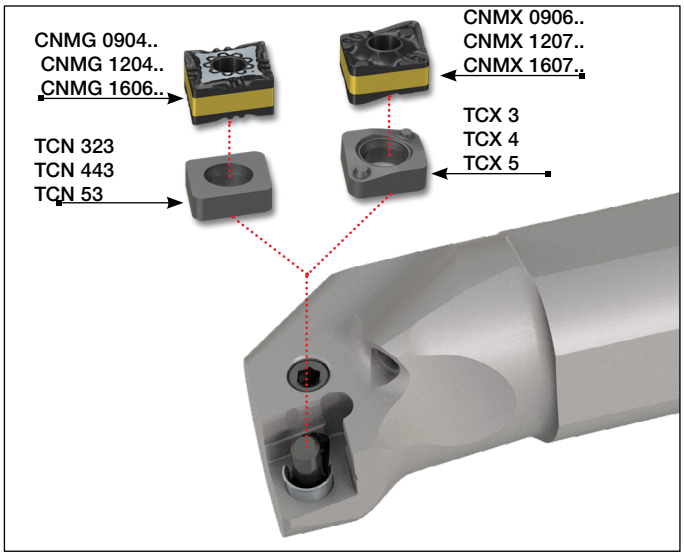
(2) Supplied with TCX 3 seat for CNMX 0906.. inserts and TCN 323 seat for CNGA 0904.. inserts.

(3) Supplied with TCX 4 seat for CNMX 1207.. inserts and TCN 443 seat for CNGA 1204.. inserts.

(4) Supplied with TCN 53 seat for CNGA 1606.. inserts. Use TCX 5 seat (optional) for CNMX 1607.. inserts.

(5) 0 - Without coolant supply, 1 - With coolant supply

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • CNGG (CER) (55) • CNGA (CER) (54)



Spare Parts

Designation									
A16M PCLNR/L-09G					LR 3S	SR 117-2009	HW 2.0	PL 16	
A20Q PCLNR/L-09G					LR 3S	SR 117-2009	HW 2.0	PL 20	
A25R PCLNR/L-09X	TCX 3[a]	TCN 323	SP 3	PN 3-4	LR 3	SR 117-2014	HW 2.5	PL 25	
A32S PCLNR/L-09X	TCX 3[a]	TCN 323	SP 3	PN 3-4	LR 3	SR 117-2014	HW 2.5	PL 32	
A25R PCLNR/L-12X	TCX 4	TCN 443	SP 4	PN 3-4L	LR 4DH	SR 117-2010	HW 3.0	PL 25	LR 4DHTL (MR INJ)*
A32S PCLNR/L-12X	TCX 4	TCN 443	SP 4	PN 3-4L	LR 4DH	SR 117-2010	HW 3.0	PL 32	LR 4DHTL (MR INJ)*
S50W PCLNR-16X	TCX 5*	TCN 53	SP 5		LR 5	SR LCS 5	HW 3.0		

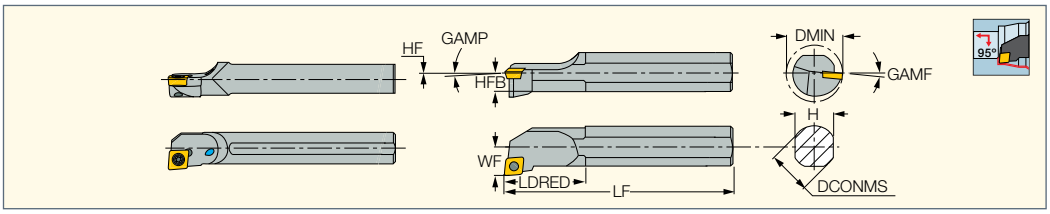
* Optional, to be ordered separately

[a] For CNMX 0906.. (CNMX 34.) inserts

ISOTURN

A/E/S-SCLCR/L

Screw Lock Boring Bars
Carrying 80° Rhombic Inserts
with 7° Clearance for 20 mm
Minimum Bore Diameter



Designation	DCONMS	LF	LDRED	WF	H	HFB	HF	DMIN	CSP(1)	GAMP	GAMF	Insert
A04F SCLCR/L-03	4.00	80.00	8.0	2.50	3.8	1.9	0.0	5.00	1	0.0	-15.0	CCGT 03X1
A05F SCLCR/L-03	5.00	80.00	9.0	3.00	4.8	2.4	0.0	6.00	1	0.0	-13.0	CCGT 03X1
A06G SCLCR/L-04	6.00	90.00	10.0	3.50	5.8	2.9	0.0	7.00	1	0.0	-13.0	CCGT 04T1
A07G SCLCR/L-04	7.00	90.00	11.0	4.00	6.8	3.4	0.0	8.00	1	0.0	-11.0	CCGT 04T1
A20R SCLCR/L-09	20.00	200.00	35.0	13.00	18.0	9.0	0.0	25.00	1	0.0	-4.0	CC.. 09T3
A25S SCLCR/L-09	25.00	250.00	35.0	17.00	23.0	11.5	0.0	32.00	1	0.0	-4.0	CC.. 09T3
E04G SCLCR/L-03	4.00	90.00	9.0	2.50	3.8	1.9	0.0	5.00	1	0.0	-15.0	CCGT 03X1
E05G SCLCR/L-03	5.00	90.00	10.0	3.00	4.8	2.4	0.0	6.00	1	0.0	-13.0	CCGT 03X1
E06H SCLCR/L-04	6.00	100.00	12.0	3.50	5.8	2.9	0.0	7.00	1	0.0	-13.0	CCGT 04T1
E07H SCLCR/L-04	7.00	100.00	14.0	4.00	6.8	3.4	0.0	8.00	1	0.0	-11.0	CCGT 04T1
E08K SCLCR/L-06	8.00	125.00	-	5.00	7.6	3.8	0.0	10.00	1	3.0	-11.0	CC.. 0602
E10M SCLCR/L-06	10.00	150.00	-	7.00	9.2	4.6	0.0	14.00	1	3.0	-7.0	CC.. 0602
E12Q SCLCR/L-06	12.00	180.00	-	9.00	11.0	5.5	0.0	16.00	1	0.0	-7.0	CC.. 0602
E16R SCLCR/L-06	16.00	200.00	-	11.00	14.0	7.0	0.0	20.00	1	0.0	-7.0	CC.. 0602
E16R SCLCR/L-09	16.00	200.00	-	11.00	15.0	7.5	0.0	20.00	1	0.0	-6.0	CC.. 09T3
S08K SCLCR/L-06	8.00	125.00	12.0	5.00	8.0	3.8	0.0	10.50	0	0.0	-11.0	CC.. 0602
S10L SCLCL-06	10.00	140.00	20.0	7.00	9.0	4.5	0.0	13.00	0	0.0	-7.0	CC.. 0602
S10L SCLCR-06	10.00	140.00	20.0	7.00	9.0	4.5	0.0	13.00	0	3.0	-7.0	CC.. 0602
S12M SCLCR/L-06	12.00	150.00	12.0	9.00	12.0	5.5	0.0	16.00	0	0.0	-7.0	CC.. 0602
S16Q SCLCR/L-09	16.00	180.00	45.0	11.00	15.0	7.5	0.0	20.00	0	0.0	-6.0	CC.. 09T3
S20R SCLCR/L-09	20.00	200.00	50.0	13.00	18.0	9.0	0.0	25.00	0	0.0	-4.0	CC.. 09T3
S25S SCLCR/L-09	25.00	250.00	55.0	17.00	23.0	11.5	0.0	35.00	0	0.0	-4.0	CC.. 09T3

- S - steel shank, A - steel shank with coolant hole, E - carbide shank with coolant hole

(1) 0 - Without coolant supply, 1 - With coolant supply

For inserts, see pages: CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

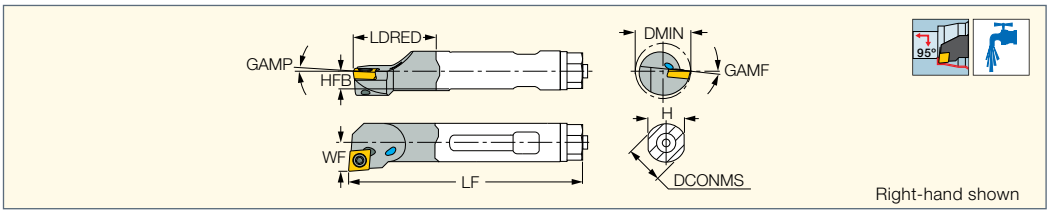
Spare Parts

Designation				
A04F SCLCR/L-03	CSTA-1.6			
A05F SCLCR/L-03	CSTA-1.6			
A06G SCLCR/L-04	CSTB-2			
A07G SCLCR/L-04	CSTB-2			
A20R SCLCR/L-09	SR 16-236	T-15/5	HW 2.0	PL 20
A25S SCLCR/L-09	SR 16-236	T-15/5	HW 2.0	PL 25
E04G SCLCR/L-03	CSTA-1.6			
E05G SCLCR/L-03	CSTA-1.6			
E06H SCLCR/L-04	CSTB-2			
E07H SCLCR/L-04	CSTB-2			
E08K SCLCR/L-06	SR 14-548	T-7/5		
E10M SCLCR/L-06	SR 14-548	T-7/5		
E12Q SCLCR/L-06	SR 14-548	T-7/5		
E16R SCLCR/L-06	SR 14-548	T-7/5		
E16R SCLCR/L-09	SR 16-236	T-15/5		
S08K SCLCR/L-06	SR 14-548	T-7/5		
S10L SCLCR/L-06	SR 14-548	T-7/5		
S12M SCLCR/L-06	SR 14-548	T-7/5		
S16Q SCLCR/L-09	SR 16-236/L8.6	T-15/5		
S20R SCLCR/L-09	SR 16-236	T-15/5		
S25S SCLCR/L-09	SR 16-236	T-15/5		

ISOTURN

E-SCLCR/L-HEAD

Screw Clamped Boring Heads Carrying 80° Rhombic Inserts with Positive 7° Clearance Mounted on Carbide Bars



Designation	DCONMS	LF	LDRED	H	HFB	WF	GAMP	GAMF	DMIN	Insert
E12 SCLCR/L-06 HEAD	12.00	179.00	24.8	11.0	5.5	9.00	0.0	-7.0	15.80	CCGT/CCGT 0602
E16 SCLCR-09 HEAD	16.00	200.00	37.0	15.0	7.5	11.00	0.0	-9.0	20.00	CCGT/CCGT 09T3

For inserts, see pages: CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

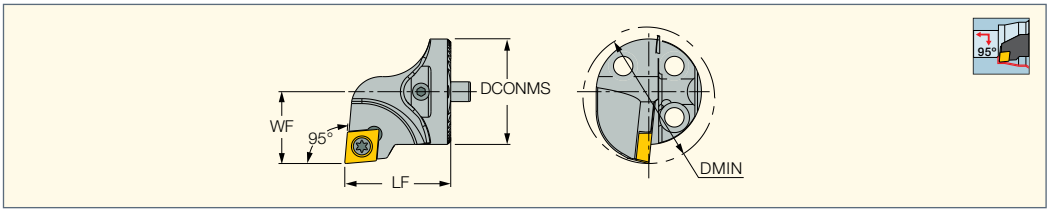
Spare Parts

Designation		
E12 SCLCR/L-06 HEAD	SR 14-548	T-7/5
E16 SCLCR-09 HEAD	SR 16-236	T-15/5

WHISPERLINE

AVC-SCLCR/L

Interchangeable Boring Heads Carrying 80° Rhombic Inserts with 7° Clearance



Designation	WF	DCONMS	DMIN	LF	CSP[2]	MIID[3]
AVC-D16-SCLCR/L-06	11.00	16.00	20.00	20.00	0	CCGT 2-1-14
AVC-D20-SCLCR/L-09	13.00	20.00	25.00	20.00	0	CCGT 3-2-M3M
AVC-D25-SCLCR/L-09	17.00	25.00	32.00	20.00	1	CCGT 3-2-M3M
AVC-D32-SCLCR/L-09	22.00	32.00	40.00	32.00	1	CCGT 3-2-M3M
AVC-D40-SCLCR/L-12T [1]	27.00	40.00	50.00	38.00	1	CCGT 432-SM

[1] DMIN of 50mm shank is DMIN of requested head + 10mm • DMIN of 60mm shanks is DMIN of requested head + 20mm

[2] 0 - Without coolant supply, 1 - With coolant supply

[3] Master insert identification

For inserts, see pages: CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

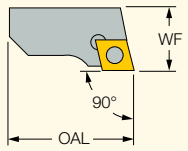
Spare Parts

Designation				
AVC-D16-SCLCR/L-06	SR 14-548*	T-7/5*		
AVC-D20-SCLCR/L-09	SR 16-236*	T-15/5*		
AVC-D25-SCLCR/L-09	SR 16-236*	T-15/5*		
AVC-D32-SCLCR/L-09	SR 16-236*	T-15/5		
AVC-D40-SCLCR/L-12T	SR 16-212*	T-20/5*	SR TC-4*	TCC 4-2*

* Optional, to be ordered separately

ITSBORE

IHCR
Boring Toolholders for MB Modular Boring System



Designation	DCN(1)	DCX(2)	WF	OAL	MIID(3)		
IHCR 28-38	28.0	38.0	12.30	23.00	CCGW 0602...	SR 14-548	T-7/5
IHCR 36-50	35.5	50.0	14.80	32.00	CCGW 0602...	SR 14-548	T-7/5
IHCR 36-50-09	36.0	50.0	14.80	32.00	CCGW 09T3...	SR 16-236	T-15/5
IHCR 50-68	50.0	68.0	18.70	40.00	CCGW 09T3...	SR 16-236	T-15/5
IHCR 50-68-12	50.0	68.0	18.70	40.00	CCGW 1204...	SR 16-212	T-20/5
IHCR 68-90	68.0	90.0	21.70	54.00	CCGW 1204...	SR 16-212	T-20/5
IHCR 90-120	90.0	120.0	26.70	70.50	CCGW 1204...	SR 16-212	T-20/5
IHCR 120-160	120.0	160.0	31.70	94.50	CCGW 1204...	SR 16-212	T-20/5
IHCR 160-800	160.0	800.0	31.70	130.00	CCGW 1204...	SR 16-212	T-20/5

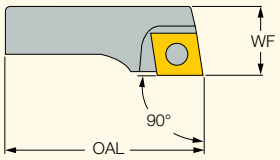
- For user guide, see pages 327-328,331-332,335-336

(1) Cutting diameter minimum
(2) Cutting diameter maximum
(3) Master insert identification

For inserts, see pages: • CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

ITSBORE

IHRF
80° Rhombic Insert Holders for Mounting on MB Fine Boring Heads



Designation	WF	OAL	DCN(1)	DCX(2)	MIID(3)		
IHRF 16	8.00	17.00	18.0	24.0	CCGW 0602...	SR 14-548	T-7/5
IHRF 20	8.50	21.00	22.0	30.0	CCGW 0602...	SR 14-548	T-7/5
IHRF 25	10.00	26.50	28.0	40.0	CCGW 0602...	SR 14-548	T-7/5
IHRF 32	11.50	34.50	35.0	53.0	CCGW 0602...	SR 14-548	T-7/5
IHRF 40	14.00	44.00	48.0	66.0	CCGW 09T3...	SR 16-236	T-15/5
IHRF 50	19.00	52.00	54.0	86.0	CCGW 09T3...	SR 16-236	T-15/5

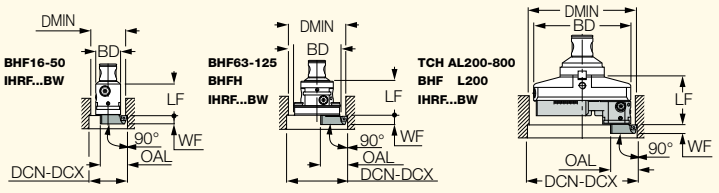
(1) Cutting diameter minimum
(2) Cutting diameter maximum
(3) Master insert identification

For inserts, see pages: • CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192 • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

ITSBORE

IHRF-BW

Back Face Turning Toolholders
for BHF Fine Boring Heads



Designation	SS [1]	BD	MIID[1]	DCN[2]	LF	DCX[3]	WF	OAL
IHRF 20-25BW	BHF MB16-16x34	16	CCGT 0602...	20	27.5	25	8	18
IHRF 24.5-32BW	BHF MB20-20x40	20	CCGT 0602...	24.5	33.5	32	8.5	22.5
IHRF 31.5-41.5BW	BHF MB25-25x50	25	CCGT 0602...	31.5	41.5	40.5	9.5	28.5
IHRF 38.5-51.5BW	BHF MB32-32x63	32	CCGT 0602...	38.5	53	51.5	11	35.5
IHRF 50.5-65BW	BHF MB40-40X80	40	CCGT 09T3...	50.5	68	65	13.5	46
IHRF 56-802BW	BHF MB50-50X60	50	CCGT 09T3...	56	62	87	17.5	53
	BHF MB63-63X87+BHFH...	75-93	CCGT 09T3...	82	70.5	127	17.5	53
	BHF MB80-80X94+BHFH...	93-135	CCGT 09T3...	100	79.5	162	17.5	53
	BHF MB80-125X114+BHFH...	133-400	CCGT 09T3...	140	98	502	17.5	53

• DMIM=(min bore diameter)=(DCN+BD+1)/2 • BD=Size of the boring head being used
[1] Master insert identification
[2] Cutting diameter minimum
[3] Cutting diameter maximum

For inserts, see pages: CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

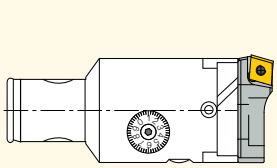
Spare Parts

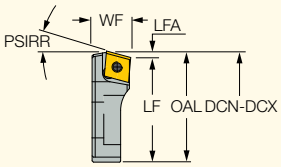
Designation		
IHRF-BW	SR 16-236	T-15/5

ITSBORE

IHRF-CH

Chamfering Tools for
BHF Boring Heads





Designation	DCN[1]	DCX[2]	LF	OAL	WF	LFA	PSIRR	MIID[3]
IHRF 20 CH15 22-29	22.00	29.00	22.30	24.00	11.00	1.70	15.0	CCGT 0602...
IHRF 20 CH30 22-29	22.00	29.00	20.80	24.00	9.00	3.20	30.0	CCGT 0602...
IHRF 40 CH60 48-63	48.00	63.00	39.10	47.50	16.50	8.40	60.0	CCGT 09T3...
IHRF 50 CH60 54-800	54.00	800.00	47.10	55.50	16.50	8.40	60.0	CCGT 09T3...

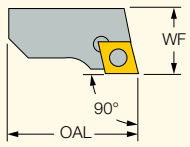
[1] Cutting diameter minimum
[2] Cutting diameter maximum
[3] Master insert identification

For inserts, see pages: CCGT R/L-L (PCD) (192) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194)

ITSBORE

IHSR

Rough Boring Tools
For Twin Radial / Axial
Edge Cutters Positioned
Opposite Finishing Tools



Designation	DCN[1]	DCX[2]	WF	OAL	MIID[3]			
IHSR 18-22	18.0	22.0	8.00	15.00	CCGT 0602...	SR 14-548	T-7/5	
IHSR 22-28	22.0	28.0	9.50	19.00	CCGT 0602...	SR 14-548	T-7/5	
IHSR 28-38	28.0	38.0	12.50	23.00	CCGT 0602...	SR 14-548	T-7/5	
IHSR 36-50	35.5	50.0	15.00	32.00	CCGT 0602...	SR 14-548	T-7/5	
IHSR 36-50-09	35.5	50.0	15.00	32.00	CCGT 09T3...	SR 16-236	T-15/5	
IHSR 50-68	50.0	68.0	19.00	40.00	CCGT 09T3...	SR 16-236	T-15/5	
IHSR 50-68-12	50.0	68.0	19.00	40.00	CCGT 1204...	SR 16-212	T-20/5	
IHSR 68-90	68.0	90.0	22.00	54.00	CCGT 1204...	SR 16-212	T-20/5	
IHSR 90-120	90.0	120.0	27.00	70.50	CCGT 1204...	SR 16-212	T-20/5	
IHSR 120-160	120.0	160.0	32.00	94.50	CCGT 1204...	SR 16-212	T-20/5	
IHSR 160-800	160.0	800.0	32.00	130.00	CCGT 1204...	SR 16-212	T-20/5	
IHSR 160-800-19	160.0	800.0	40.00	130.00	CNGA 1906...	SR 10402352		HW 4.0

• For user guide, see pages 327-328,331-332,335-336

[1] Cutting diameter minimum

[2] Cutting diameter maximum

[3] Master insert identification

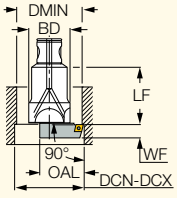
For inserts, see pages: • CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

ITSBORE

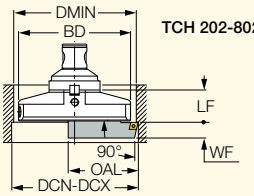
IHSR-BW

Back Face Turning Tools for
BHR Rough Boring Heads

BHR 20-200



TCH 202-802



Designation	SS[1]	BD	LF	WF	OAL	MIID[2]	DCN[3]	DCX[4]
IHSR 20-24 BW	BHR MB16-16	16.00	27.5	10.00	16.00	CCGT 0602...	20.00	24.00
IHSR 23.5-30BW	BHR MB20-20	20.00	32.5	11.00	19.50	CCGT 0602...	23.50	30.00
IHSR 29.5-40BW	BHR MB25-25	25.00	39.0	14.50	24.00	CCGT 0602...	29.50	40.00
IHSR 39-52 BW	BHR MB32-32	32.00	50.0	17.00	32.00	CCGT 09T3...	39.00	52.00
IHSR 51-70 BW	BHR MB40-40	40.00	63.5	21.00	42.00	CCGT 1204...	51.00	70.00
IHSR 69-92 BW	BHR MB50-50	55.00	80.5	24.50	57.00	CCGT 1204...	69.00	92.00
IHSR 91-122 BW	BHR MB63-63	72.00	100.5	28.50	76.00	CCGT 1204...	91.00	122.00
IHSR 121-162 BW	BHR MB80-80	95.00	110.5	31.50	101.00	CCGT 1204...	121.00	162.00
IHSR 161-802 BW	BHR MB80-80	95.00	110.5	31.50	122.00	CCGT 1204...	161.00	802.00

• DMIN=(min bore diameter)=(DCN+BD+1)/2 • BD=Size of the boring head being used • For user guide, see pages 327-328,331-332,335-336

[1] Suitable boring heads

[2] Master insert identification

[3] Cutting diameter minimum

[4] Cutting diameter maximum

For inserts, see pages: • CCGT (PCD) (192) • CCGT MD/RD (PCD) (193) • CCGT R/L-L (PCD) (192) • CCGW (CBN) (141) • CCGW (PCD) (193) • CCGW 2MT (CBN) (143) • CCGW 2MT MM (CBN) (143) • CCGW MT (CBN) (142) • CCGW MT (PCD) (195) • CCGW R/L-L (CBN) (141) • CCGW R/L-L (PCD) (194) • CCGW W (CBN) (142) • CCGW W (PCD) (194) • CCGW W-MT (CBN) (143) • CCGW W-MT (PCD) (195)

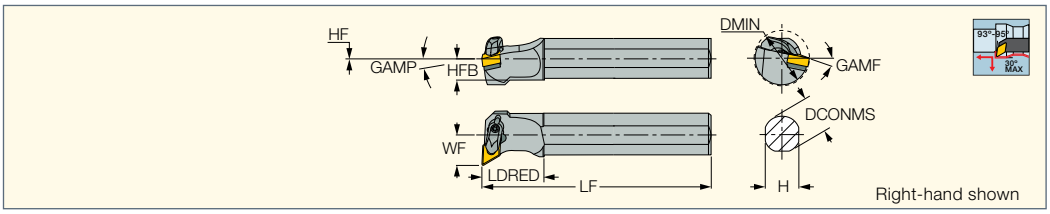
Spare Parts

Designation		
IHSR 20-24 BW	SR 14-548	T-7/5
IHSR 23.5-30BW	SR 14-548	T-7/5
IHSR 29.5-40BW	SR 14-548	T-7/5
IHSR 39-52 BW	SR 16-236	T-15/5
IHSR 51-70 BW	SR 16-212	T-20/5
IHSR 69-92 BW	SR 16-212	T-20/5
IHSR 91-122 BW	SR 16-212	T-20/5
IHSR 121-162 BW	SR 16-212	T-20/5
IHSR 161-802 BW	SR 16-212	T-20/5

ISOTURN

S-DDUNR/L

R-Clamp Boring Bars Carrying ISO Negative DNGA Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	DMIN	HF	GAMP	GAMF	Insert
S32T DDUNR/L-15	32.00	300.00	45.0	29.0	15.8	22.00	42.00	1.3	-6.0	-11.0	DNGA 1506
S40U DDUNR/L-15	40.00	350.00	50.0	36.0	19.8	27.00	48.00	1.8	-6.0	-10.0	DNGA 1506

For inserts, see pages: DNGA (CBN) (151) • DNGA (PCD) (202) • DNGA 2MT (CBN) (152) • DNGA 2MT MM (CBN) (153) • DNGA 4MT (CBN) (152) • DNGA 4MT MM (CBN) (153) • DNGA MT (CBN) (151) • DNGA MT (PCD) (202) • DNGG (CER) (57)• DNGA (CER) (56)

Spare Parts

Designation						
S-DDUNR/L	TDN 422[a]	TDN 432[b]*	SP 4	LCGR-4	SR 10400270-25.5	T-15/5

* Optional, to be ordered separately

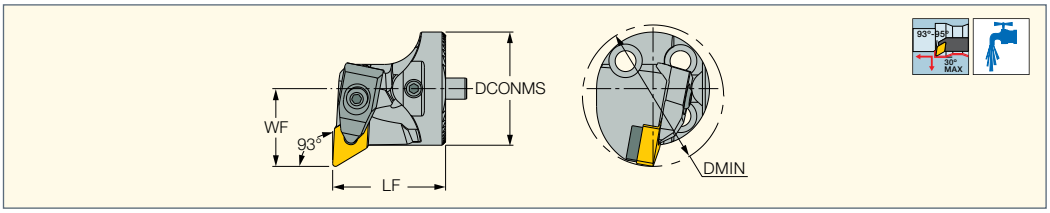
[a] Use for DNGA 1506.. inserts

[b] Use for DNGA 1504.. inserts

WHISPERLINE

AVC-DDUNR/L

Interchangeable Boring Heads Carrying 55° Rhombic Inserts



Designation	WF	DCONMS	DMIN	LF	MIID[2]	CSP[3]
AVC-D32-DDUNR/L-11T	22.00	32.00	40.00	32.00	DNGA 332-NF	1
AVC-D40-DDUNR/L-15T [1]	27.00	40.00	50.00	38.00	DNGA 442-F3M	1

[1] DMIN of 50mm shank is DMIN of requested head + 10mm • DMIN of 60mm shanks is DMIN of requested head + 20mm

[2] Master insert identification

[3] 0 - Without coolant supply, 1 - With coolant supply

For inserts, see pages: DNGA (CBN) (151) • DNGA (PCD) (202) • DNGA 2MT (CBN) (152) • DNGA 2MT MM (CBN) (153) • DNGA 4MT (CBN) (152) • DNGA 4MT MM (CBN) (153) • DNGA MT (CBN) (151) • DNGA MT (PCD) (202) • DNGA (CER) (56)

Spare Parts

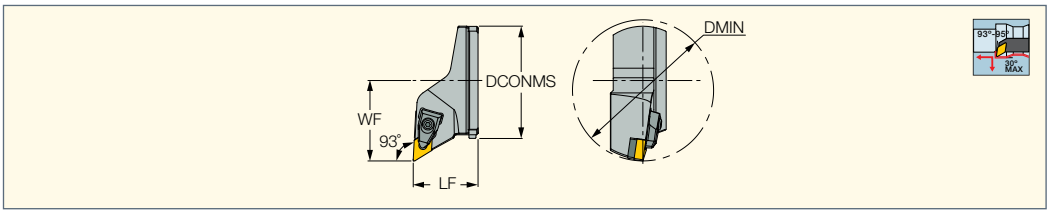
Designation								
AVC-D32-DDUNR/L-11T	RDT 3-2*		SR RC3*	SR 40085I*	HW 2.5*	T-15/5*	LCGR-3*	KSP 3*
AVC-D40-DDUNL-15T	RDT 433*	RDT 443*	DLS 4*	SR 14-506 M4X0.7*	HW 3.0	T-15/5*	DLM 4*	DSP 4*
AVC-D40-DDUNR-15T	RDT 433*	RDT 443*	DLS 4*	SR 14-506 M4X0.7*		T-15/5*	DLM 4*	DSP 4*

* Optional, to be ordered separately

WHISPERLINE

AVC-DDUNR/L-VH

Interchangeable Boring Heads
Carrying 55° Rhombic Inserts



Designation	WF	DCONMS	DMIN	LF	MIID[1]
AVC-D80-DDUNR/L-15T-VH	57.00	77.00	100.00	46.00	DNGA 442-F3M

[1] Master insert identification

For inserts, see pages: DNGA (CBN) (151) • DNGA (CER) (56) • DNGA (PCD) (202) • DNGA 2MT (CBN) (152) • DNGA 2MT MM (CBN) (153) • DNGA 4MT (CBN) (152) • DNGA 4MT MM (CBN) (153) • DNGA MT (CBN) (151) • DNGA MT (PCD) (202)

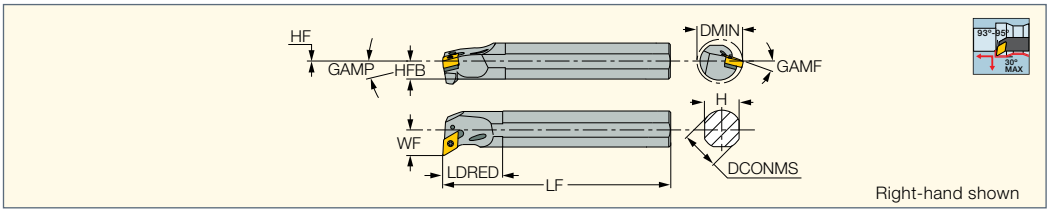
Spare Parts

Designation								
AVC-D80-DDUNL-15T-VH	RDT 443	RDT 433	HW 3.0	SR 14-506 M4X0.7	T-15/5	DSP 4	DLS 4	DLM 4

ISOTURN

A/S-PDUNR/L

Lever Lock Boring Bars Carrying
55° Negative Rhombic Inserts



Designation	DCONMS	LF	LDRED	H	HFB	HF	WF	GAMP	GAMF	DMIN	CSP[1]	Insert
A20Q PDUNR/L-11	20.00	180.00	35.0	18.0	9.2	0.2	16.00	-6.0	-14.0	27.00	1	DNGA 1104
A25R PDUNR/L-11	25.00	200.00	40.0	23.0	11.5	0.0	17.00	-6.0	-13.0	32.00	1	DNGA 1104
A32S PDUNR/L-11	32.00	250.00	45.0	29.0	14.5	0.0	22.00	-6.0	-11.0	40.00	1	DNGA 1104
S32T PDUNR/L-15	32.00	300.00	51.0	29.0	15.5	1.0	22.00	-6.0	-13.0	40.00	0	DNGA 1506
S40U PDUNR/L-15	40.00	350.00	50.0	36.0	18.0	0.0	27.00	-6.0	-11.5	50.00	0	DNGA 1506

[1] 0 - Without coolant supply, 1 - With coolant supply

For inserts, see pages: DNGA (CBN) (151) • DNGA (PCD) (202) • DNGA 2MT (CBN) (152) • DNGA 2MT MM (CBN) (153) • DNGA 4MT (CBN) (152) • DNGA 4MT MM (CBN) (153) • DNGA MT (CBN) (151) • DNGA MT (PCD) (202) • DNGG (CER) (57) • DNGA (CER) (56)

Spare Parts

Designation								
A20Q PDUNR/L-11				LR 3DS	SR 117-2011	HW 2.5/5	PL 20	
A25R PDUNR/L-11	TDN 3P2		SP 3	LR 3D	SR 117-2014	HW 2.5/5	PL 25	PN 3-4
A32S PDUNR/L-11	TDN 322		SP 3	LR 3D	SR 117-2014	HW 2.5/5	PL 32	PN 3-4
S32T PDUNR/L-15	TDN 422[a]	TDN 432[b]*	SP 4	LR 4D	SR 117-2010	HW 3.0		PN 3-4
S40U PDUNR/L-15	TDN 422[a]	TDN 432[b]*	SP 4	LR 4D	SR 117-2010	HW 3.0		PN 3-4

* Optional, to be ordered separately

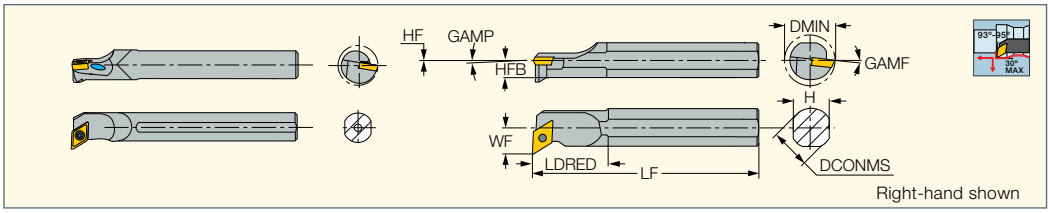
[a] Use for DNGA 1506.. inserts

[b] Use for DNGA 1504.. inserts

ISOTURN

A/E/S-SDUCR/L

Screw Lock Boring Bars
Carrying 55° Rhombic
Inserts with 7° Clearance



Designation	DCONMS	LF	LDRED	H	HFB	WF	HF	DMIN	GAMP	GAMF	Shank m.(1)	CSP(2)	Insert
A20R SDUCR/L-11	20.00	200.00	50.0	18.0	8.5	14.50	0.5	25.00	0.0	-6.0	S	1	DC.. 11T3
A25S SDUCR/L-11	25.00	250.00	45.0	23.0	12.0	17.00	0.5	32.00	0.0	-5.0	S	1	DC.. 11T3
E10M SDUCR/L-07	10.00	150.00	25.0	9.2	5.1	8.00	0.5	14.00	3.0	-7.0	C	1	DC.. 0702
E12Q SDUCR/L-07	12.00	180.00	-	11.0	5.5	9.00	0.0	16.00	0.0	-7.0	C	1	DC.. 0702
E16R SDUCR/L-07	16.00	200.00	-	15.0	8.1	11.00	0.6	20.00	0.0	-8.0	C	1	DC.. 0702
S10L SDUCR/L-07	10.00	140.00	18.0	9.2	5.0	8.00	0.4	14.00	-3.0	-9.0	S	0	DC.. 0702
S12M SDUCR/L-07	12.00	150.00	20.0	12.0	5.5	9.00	0.5	16.00	-7.0	-9.0	S	0	DC.. 0702
S16Q SDUCR/L-07	16.00	180.00	25.0	15.0	8.0	11.00	0.5	20.00	0.0	-8.0	S	0	DC.. 0702
S20R SDUCR/L-11	20.00	200.00	50.0	18.0	8.5	13.00	0.5	25.00	0.0	-6.0	S	0	DC.. 11T3
S25S SDUCR/L-11	25.00	250.00	55.0	23.0	12.0	17.00	0.5	32.00	0.0	-5.0	S	0	DC.. 11T3
A10K SDUCR/L-07	10.00	125.00	20.0	9.0	4.5	7.00	0.4	13.00	0.0	-10.0	A	1	DC.. 0702
A12M-SDUCR/L-07	12.00	150.00	24.0	11.0	5.5	9.30	0.5	16.00	0.0	-6.0	A	1	DC.. 0702
A16Q-SDUCR/L-07	16.00	180.00	32.0	15.0	7.5	11.30	0.5	20.00	0.0	-5.0	A	1	DC.. 0702

- S - steel shank, A - steel shank with coolant hole, E - carbide shank with coolant hole

(1) S-Steel, C-carbide

(2) 0 - Without coolant supply, 1 - With coolant supply

For inserts, see pages: DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

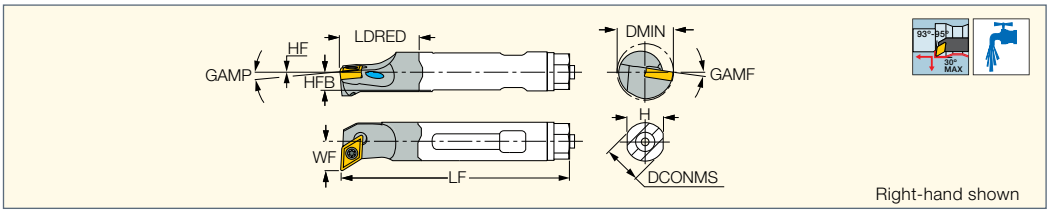
Spare Parts

Designation						
A20R SDUCR/L-11			HW 2.0	SR 16-236 P	T-15/5	PL 20
A25S SDUCR/L-11			HW 2.0	SR 16-236 P	T-15/5	PL 25
E10M SDUCR/L-07				SR 14-548	T-7/5	
E12Q SDUCR/L-07				SR 14-548	T-7/5	
E16R SDUCR/L-07				SR 14-548	T-7/5	
S10L SDUCR/L-07				SR 14-548	T-7/5	
S12M SDUCR/L-07				SR 14-548	T-7/5	
S16Q SDUCR/L-07				SR 14-548	T-7/5	
S20R SDUCR/L-11				SR 16-236 P	T-15/5	
S25S SDUCR/L-11	TDC 3-1P	SR TC-3P	HW 4.0	SR 16-236 P	T-15/5	
A10K SDUCR/L-07				SR 11201753-3S	T-8/5	
A12M-SDUCR/L-07				SR 11201753-3S	T-8/5	
A16Q-SDUCR/L-07				CSTB-2.5	T-8/5	

ISOTURN

E-SDUCR/L-HEAD

Interchangeable Screw
Clamped Boring Heads
Carrying 55° Rhombic Inserts
with Positive 7° Clearance
Mounted on Carbide Bars



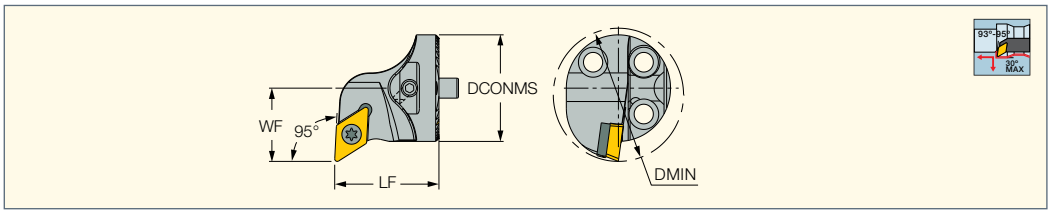
Designation	DCONMS	LF	LDRED	H	HFB	WF	HF	GAMP	GAMF	DMIN	Insert		
E12 SDUCR/L-07 HEAD	12.00	179.00	24.8	11.0	5.5	9.00	0.0	0.0	-9.0	15.80	DCGT 0702	SR 14-548	T-7/5
E16 SDUCR/L-07 HEAD	16.00	200.00	29.7	15.0	8.0	11.00	0.5	0.0	-9.0	20.00	DCGT 0702	SR 14-548	T-7/5

For inserts, see pages: DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201)

WHISPERLINE

AVC-SDUCR/L

Interchangeable Boring Heads Carrying 55° Rhombic Inserts with 7° Clearance



Designation	WF	DCONMS	DMIN	LF	CSP[2]	MIID[3]
AVC-D16-SDUCR/L-07	11.00	16.00	20.00	20.00	0	DCGT 2-1
AVC-D20-SDUCR/L-11	13.00	20.00	25.00	20.00	0	DCGT 3-2-14
AVC-D25-SDUCR/L-11	17.00	25.00	32.00	20.00	1	DCGT 3-2-14
AVC-D32-SDUCR/L-11T	22.00	32.00	40.00	32.00	1	DCGT 3-2-14
AVC-D40-SDUCR/L-11T [1]	27.00	40.00	50.00	32.00	1	DCGT 3-2-14

[1] DMIN of 50mm shank is DMIN of requested head + 10mm • DMIN of 60mm shanks is DMIN of requested head + 20mm

[2] 0 - Without coolant supply, 1 - With coolant supply

[3] Master insert identification

For inserts, see pages: • DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

Spare Parts

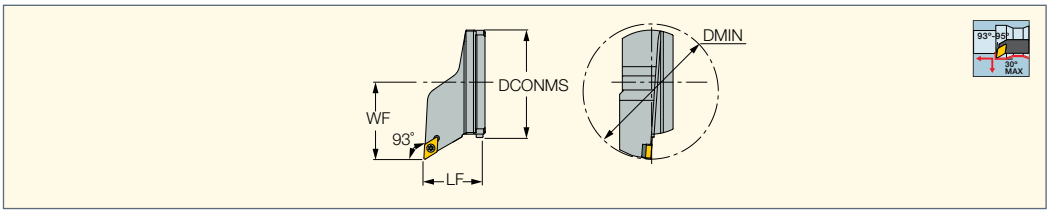
Designation				
AVC-D16-SDUCR/L-07	SR 14-548*	T-7/5*		
AVC-D20-SDUCL-11	SR 16-236 P*	T-15/5*		
AVC-D20-SDUCR-11	SR 16-236 P	T-15/5		
AVC-D25-SDUCL-11	SR 16-236 P*	T-15/5*		
AVC-D25-SDUCR-11	SR 16-236 P	T-15/5		
AVC-D32-SDUCR/L-11T	SR 16-236 P*	T-15/5*	SR TC-3P*	TDC 3-1P*
AVC-D40-SDUCR/L-11T	SR 16-236 P*	T-15/5*	SR TC-3P*	TDC 3-1P*

* Optional, to be ordered separately

WHISPERLINE

AVC-SDUCR/L-VH

Interchangeable Boring Heads Carrying 55° Rhombic Inserts with 7° Clearance



Designation	WF	DCONMS	DMIN	LF	MIID[1]
AVC-D80-SDUCR/L-11T-VH	57.00	77.00	100.00	45.00	DCGT 11T304

[1] Master insert identification

For inserts, see pages: • DCGT (PCD) (199) • DCGT MD/RD (PCD) (200) • DCGW (CBN) (148) • DCGW (PCD) (200) • DCGW 2MT (CBN) (149) • DCGW 2MT MM (CBN) (150) • DCGW MT (CBN) (148) • DCGW MT (PCD) (201) • DCGW W-2MT (CBN) (149) • DCGW W-MT (CBN) (149) • DCGW W-MT (PCD) (201)

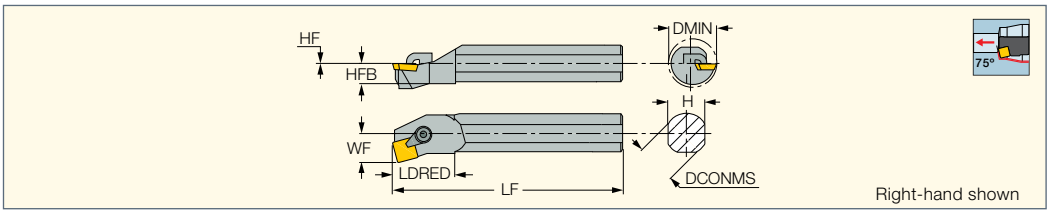
Spare Parts

Designation		
AVC-D80-SDUCL-11T-VH	HW 4.0	T-15/5

ISOTURN

S-CSKPR

Clamp Lock Boring Bars Carrying 11° Clearance Square Inserts



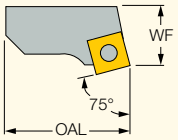
Designation	DCONMS	LF	LDRED	H	HFB	WF	HF	DMIN	Insert		
S16Q CSKPR-09	16.00	180.00	34.0	15.0	8.0	11.00	0.5	20.00	SPGN 0903	LC 15 SET 1	HW 2.5
S25S CSKPR-12	25.00	250.00	48.0	23.0	11.5	17.00	0.0	30.00	SPGN 1203	LC 30 SET 2	HW 3.0

For inserts, see pages: SPGN (CBN) (158) • SPGN (PCD) (207) • SPGN 4MT (CBN) (159) • SPGN MT (CBN) (159) • SPGN MT (PCD) (207)

ITSBORE

IHPR

75° Rough Boring Toolholders



Designation	DCN(1)	DCX(2)	WF	OAL	MIID(3)		
IHPR 36-50	35.5	50.0	15.00	32.00	SCGW 09T3...	SR 16-236	T-15/5
IHPR 50-68	50.0	68.0	19.00	40.00	SCGW 09T3...	SR 16-236	T-15/5
IHPR 68-90	68.0	90.0	22.00	53.90	SCGW 1204...	SR 16-212	T-20/5
IHPR 90-120	90.0	120.0	27.00	70.50	SCGW 1204...	SR 16-212	T-20/5
IHPR 120-160	120.0	160.0	32.00	94.50	SCGW 1204...	SR 16-212	T-20/5
IHPR 160-800	160.0	800.0	32.00	130.00	SCGW 1204...	SR 16-212	T-20/5

- For user guide, see pages 327-328,331-332,335-336

(1) Cutting diameter minimum

(2) Cutting diameter maximum

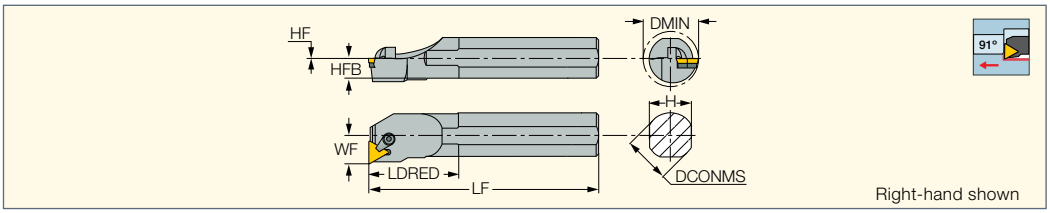
(3) Master insert identification

For inserts, see pages: • SCGW (CBN) (157) • SCGW (PCD) (206) • SCGW 4MT (CBN) (158) • SCGW L (CBN) (157) • SCGW L (PCD) (206) • SCGW MT (CBN) (157) • SCGW MT (PCD) (207)

ISOTURN

S-CTFPR/L

Clamp Lock Boring Bars Carrying 11° Clearance Triangular Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	HF	DMIN	Insert
S12L CTFPR/L-09	12.00	140.00	34.0	11.0	6.0	9.00	0.5	15.60	TPGN 0902
S16Q CTFPR/L-11	16.00	180.00	38.0	15.0	8.0	11.00	0.5	20.00	TPGN 1103
S20Q CTFPR-16	20.00	180.00	38.0	18.0	9.5	13.00	0.5	24.00	TPGN 1603
S20R CTFPR/L-16	20.00	200.00	46.0	18.0	9.5	13.00	0.5	24.00	TPGN 1603
S25R CTFPR-16	25.00	200.00	48.0	23.0	11.5	17.00	0.0	31.00	TPGN 1603
S25S CTFPR-16	25.00	250.00	48.0	23.0	11.5	17.00	0.0	31.00	TPGN 1603
S32T CTFPR/L-16	32.00	300.00	62.0	29.0	14.5	22.00	0.0	40.00	TPGN 1603
S40T CTFPR-16	40.00	300.00	62.0	36.0	18.0	27.00	0.0	48.00	TPGN 1603

For inserts, see pages: TPGN (CBN) (167) • TPGN (CER) (63) • TPGN (PCD) (214) • TPGN -3MT (CBN) (166) • TPGN HS (CBN) (167) • TPGN HS (PCD) (215) • TPGN MT (CBN) (166) • TPGN MT (PCD) (214)

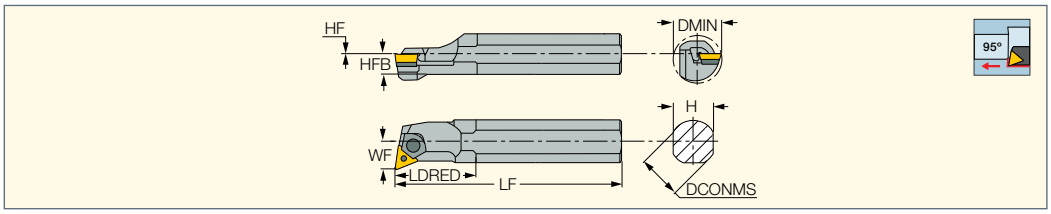
Spare Parts

Designation				
S12L CTFPR/L-09	LC12 SET1	HW 2.5		
S16Q CTFPR/L-11	LC 15 SET 1	HW 2.5		
S20Q CTFPR-16	LC 30 SET 2	HW 3.0		
S20R CTFPR/L-16	LC 30 SET 2	HW 3.0		
S25R CTFPR-16	LC 30 SET 2	HW 3.0		
S25S CTFPR-16	LC 30 SET 2	HW 3.0		
S32T CTFPR/L-16	LC 30 SET 1	HW 3.0	ITBP 122	SP 16
S40T CTFPR-16	LC 30 SET 1	HW 3.0	ITBP 122	SP 16

ISOTURN

S-MTLCR/L-W

Wedge Lock Boring Bars
Carrying 7° Clearance
Triangular Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	HF	DMIN	Insert
S25S MTLCR/L-16W	25.00	250.00	43.0	23.0	13.1	17.00	1.6	34.00	TC.. 16T3
S32T MTLCR/L-16W	32.00	300.00	45.0	29.0	14.5	22.00	0.0	39.00	TC.. 16T3

For inserts, see pages: TCGT (PCD) (211) • TCGT L (PCD) (211) • TCGT MD/RD (PCD) (212) • TCGW (CBN) (164) • TCGW (PCD) (212) • TCGW -3MT (CBN) (165) • TCGW L (CBN) (165) • TCGW L (PCD) (213) • TCGW MT (CBN) (165) • TCGW MT (PCD) (213)

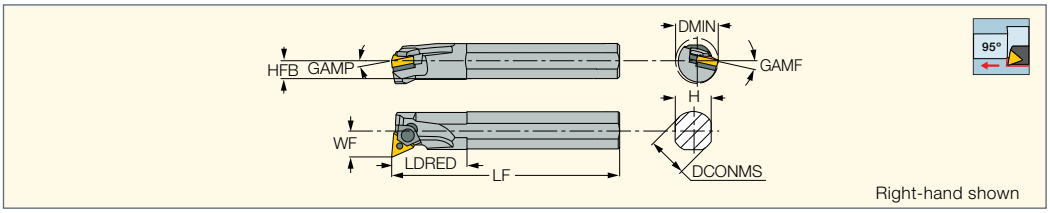
Spare Parts

Designation						
S-MTLCR/L-W	TTC 331	HW 2.0	ZNW 3C	LC 291-MIM SET 1	SR 17-319	HW 2.5

ISOTURN

S-MTLNR/L-W

95° Lead Angle Wedge
Lock Boring Bars Carrying
Negative Triangular Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	GAMP	GAMF	DMIN	Insert
S25S MTLNR/L-16W-M	25.00	250.00	40.0	23.0	11.5	17.00	-6.0	-12.0	32.00	TNGA 1604
S32T MTLNR/L-16W-M	32.00	300.00	50.0	30.0	15.0	22.00	-6.0	-12.0	40.00	TNGA 1604
S40U MTLNR/L-22W	40.00	350.00	50.0	36.0	18.0	27.00	-6.0	-10.0	49.00	TNGA 2204

For inserts, see pages: • TNGA (CBN) (169) • TNGA (PCD) (217) • TNGA -3MT (CBN) (169) • TNGA MT (CBN) (169) • TNGA MT (PCD) (217) • TNGA (CER) (64)

Spare Parts

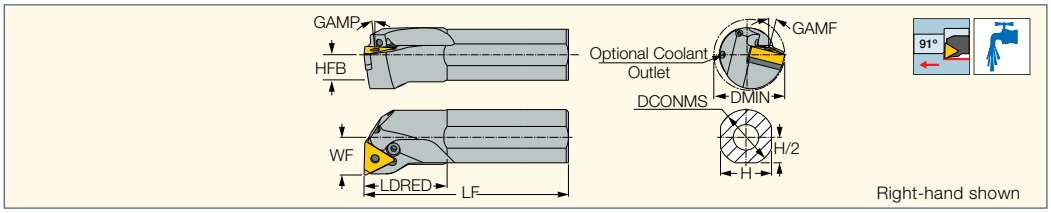
Designation								
S25S MTLNR/L-16W-M			ZNW 3WNS	SR 17-317NS		LC 291N CLAMP	HW 3.0	E RING N
S32T MTLNR/L-16W-M	TTT 322N	TTT 332N[(a)]*	ZNW 3WN	SR 17-317N		LC 291N CLAMP	HW 3.0	E RING N
S40U MTLNR/L-22W		TTT 434	ZNW 4	SR 17-295	HW 2.5	LC 281 SET 1	HW 3.0	

* Optional, to be ordered separately
[(a)] Use for TNGA 1603.. inserts

HELITURN LD

A-PTFNR/L-X/G

91° Lead Angle Lever Lock
Boring Bars Carrying Negative
TNMX or TNGA Triangular Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	GAMP	GAMF	DMIN	Insert
A16M PTFNR/L-16G	16.00	150.00	31.0	15.0	7.5	11.00	-12.0	-16.0	20.00	TNGA 1604
A20Q PTFNR/L-16G	20.00	180.00	31.0	18.0	9.0	13.00	-6.0	-14.0	25.00	TNGA 1604
A25S PTFNR/L-16X	25.00	250.00	37.5	23.0	11.5	17.00	-6.0	-14.0	32.00	TNGA 1604
A32T PTFNR/L-16X	32.00	300.00	48.0	29.0	14.5	22.00	-6.0	-12.0	40.00	TNGA 1604
A40U PTFNR/L-16X	40.00	350.00	50.0	36.0	18.0	27.00	-6.0	-12.0	50.00	TNGA 1604

• Use TTX 3 seat for TNMX 1606.. inserts and TTN 3 seat for TNGA 1604.. inserts

For inserts, see pages: • TNGA (CBN) (169) • TNGA (PCD) (217) • TNGA -3MT (CBN) (169) • TNGA MT (CBN) (169) • TNGA MT (PCD) (217) • TNGG (CER) (64) • TNGA (CER) (64)

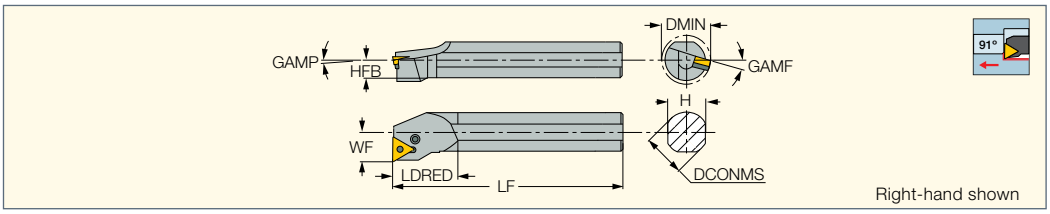
Spare Parts

Designation									
A16M PTFNR/L-16G					LR 3S	SR 117-2009		HW 2.0	PL 16
A20Q PTFNR/L-16G					LR 3S	SR 117-2009	SR M4X4 DIN913 TL360	HW 2.0	PL 20
A25S PTFNR/L-16X	TTX 3	TTN 3	SP 3	PN 3-4	LR 3	SR 117-2014	SR M4X4 DIN913 TL360	HW 2.5	PL 25
A32T PTFNR/L-16X	TTX 3	TTN 3	SP 3	PN 3-4	LR 3	SR 117-2014	SR M4X4 DIN913 TL360	HW 2.5	PL 32
A40U PTFNR/L-16X	TTX 3	TTN 3	SP 3	PN 3-4	LR 3	SR 117-2014	SR M4X4 DIN913 TL360	HW 2.5	PL 40

ISOTURN

S-PTFNR/L

91° Lead Angle Lever Lock Boring Bars Carrying Negative Triangular Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	GAMP	GAMF	DMIN	Insert
S20R PTFNR/L-11	20.00	200.00	32.0	18.0	9.0	13.00	-6.0	-14.0	24.00	TNGA 1103
S25S PTFNR/L-16	25.00	250.00	48.0	23.0	11.5	17.00	-6.0	-13.0	32.50	TNGA 1604
S32T PTFNR/L-16	32.00	300.00	63.0	30.0	15.0	22.00	-6.0	-10.0	40.00	TNGA 1604
S40U PTFNR-16	40.00	350.00	30.0	36.0	18.0	27.00	-6.0	-10.0	49.00	TNGA 1604
S40U PTFNR-22	40.00	350.00	62.0	36.0	18.0	27.00	-6.0	-10.0	49.00	TNGA 2204

For inserts, see pages: • TNGA (CBN) (169) • TNGA (PCD) (217) • TNGA -3MT (CBN) (169) • TNGA MT (CBN) (169) • TNGA MT (PCD) (217) • TNGA (CER) (64)

Spare Parts

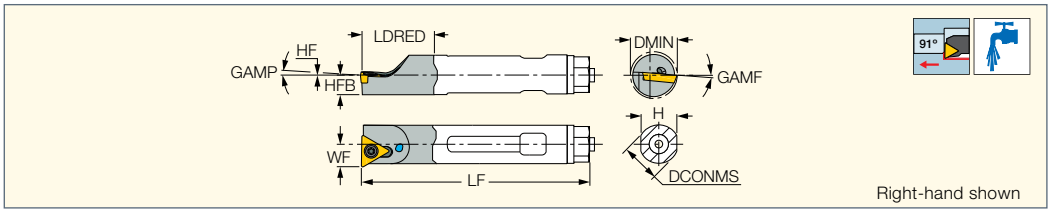
Designation							
S20R PTFNR/L-11				LR 2	SR 117-2015	HW 2.0/5	
S25S PTFNR/L-16	TTN 322	TTN 332*	SP 3	LR 3	SR 117-2014	HW 2.5/5	PN 3-4
S32T PTFNR/L-16	TTN 322	TTN 332*	SP 3	LR 3	SR 117-2014	HW 2.5/5	PN 3-4
S40U PTFNR-16	TTN 322		SP 3	LR 3	SR 117-2014	HW 2.5/5	PN 3-4
S40U PTFNR-22	TTN 422		SP 4	LR 4	SR 117-2010	HW 3.0	PN 3-4

* Optional, to be ordered separately

ISOTURN

E-STFCR-HEAD

Interchangeable Screw Clamped Boring Heads Carrying Positive 7° Clearance Triangular Inserts Mounted on Carbide Bars



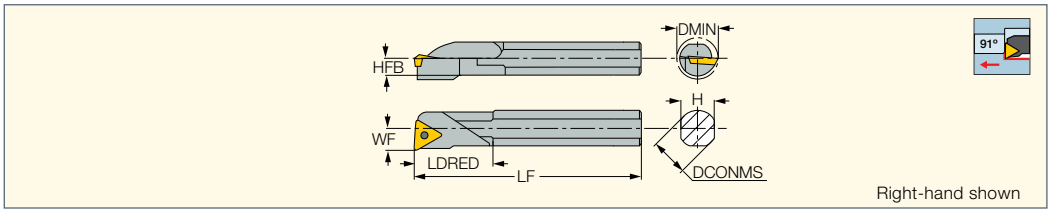
Designation	DCONMS	LF	LDRED	H	HFB	WF	HF	GAMP	GAMF	DMIN	Insert		
E12 STFCR-11 HEAD	12.00	179.00	24.8	11.0	6.0	6.80	0.0	0.0	-6.0	13.80	TCGT 1102	SR 14-548	T-7/5
E16 STFCR-11 HEAD	16.00	200.00	37.0	15.0	8.0	9.00	0.0	0.0	-6.0	20.00	TCGT 1102	SR 14-548	T-7/5

For inserts, see pages: TCGT (PCD) (211) • TCGT L (PCD) (211) • TCGT MD/RD (PCD) (212) • TCGW (CBN) (164) • TCGW (PCD) (212) • TCGW L (CBN) (165) • TCGW L (PCD) (213) • TCGW MT (CBN) (165) • TCGW MT (PCD) (213)

ISOTURN

S-STFCR/L

Screw Lock Boring Bars Carrying 7° Clearance Triangular Inserts



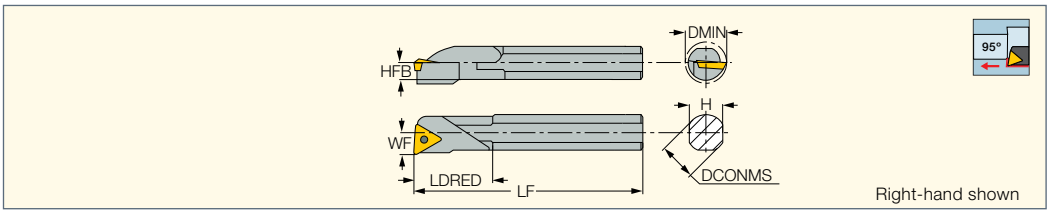
Designation	DCONMS	LF	LDRED	H	HFB	WF	DMIN	Insert		
S10K STFCR/L-11	10.00	125.00	29.0	9.0	4.5	7.00	13.00	TC.. 1102	SR 14-548	T-7/5
S12M STFCR/L-11	12.00	150.00	30.0	11.0	5.5	9.00	15.80	TC.. 1102	SR 14-548	T-7/5

For inserts, see pages: TCGT (PCD) (211) • TCGT L (PCD) (211) • TCGT MD/RD (PCD) (212) • TCGW (CBN) (164) • TCGW (PCD) (212) • TCGW L (CBN) (165) • TCGW L (PCD) (213) • TCGW MT (CBN) (165) • TCGW MT (PCD) (213)

ISOTURN

S-STLCR/L

Screw Clamp Boring Bars
Carrying 7° Clearance
Triangular Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	DMIN	Insert
S16Q STLCR/L-11	16.00	180.00	45.0	15.0	7.5	11.00	20.00	TC.. 1102
S20R STLCR/L-16	20.00	200.00	50.0	18.0	9.0	13.00	25.00	TC.. 16T3

For inserts, see pages: TCGT (PCD) (211) • TCGT L (PCD) (211) • TCGT MD/RD (PCD) (212) • TCGW (CBN) (164) • TCGW (PCD) (212) • TCGW -3MT (CBN) (165) • TCGW L (CBN) (165) • TCGW L (PCD) (213) • TCGW MT (CBN) (165) • TCGW MT (PCD) (213)

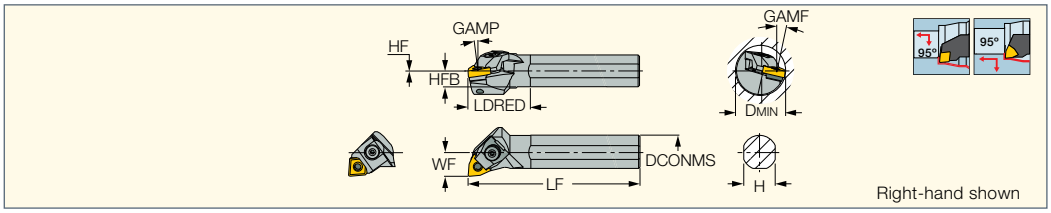
Spare Parts

Designation		
S16Q STLCR/L-11	SR 14-548	T-7/5
S20R STLCR/L-16	SR 16-236	T-15/5

MULTI-WEDGE

S-MULNR-MW

MULTI-WEDGE Lock Boring Bars
Carrying 80° Negative Rhombic,
Trigon or Square Inserts

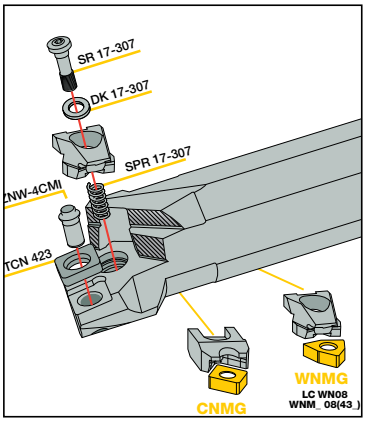


Designation	DCONMS	LF	LDRED	H	HFB	WF	HF	GAMP	GAMF	DMIN	Insert
S25T MULNR-12MW	25.00	300.00	45.0	23.0	11.6	17.00	-11.4	-6.0	-12.0	36.00	WM..0804/CN..1204

• Only LC WN08 is supplied with the boring bar. The other wedge should be ordered separately.

For inserts, see pages: CNGA (CBN) (145) • CNGA (PCD) (198) • CNGA 2MT (CBN) (145) • CNGA 2MT MM (CBN) (147) • CNGA 4MT (CBN) (146) • CNGA 4MT MM (CBN) (147) • CNGA MT (CBN) (145) • CNGA MT (PCD) (198) • CNGA W-2MT (CBN) (146) • CNGA W-MT (CBN) (146) • CNGA W-MT (PCD) (199) • CNGG (CER) (55) • WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66) • CNGA (CER) (54)

Toolholder Options



Spare Parts

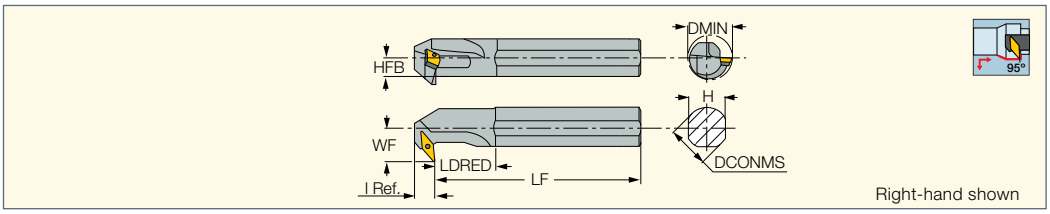
Designation								
S-MULNR-MW	TCN 423	ZNW 4CMI	LC WN08	LCR CN12*	SR 17-307	SPR 17-307	DK 17-307	HW 3.0

* Optional, to be ordered separately

ISOTURN

A/S-SVLBCR/L

Screw Lock Back Boring Bars Carrying 35° Rhombic Inserts with 7° Clearance



Designation	DCONMS	LF	LDRED	l Ref.	H	HFB	WF	DMIN	CSP(1)	Insert
A32T SVLBCR-16	32.00	300.00	76.5	18.50	29.0	14.5	27.50	40.00	1	VC.. 1604
S32T SVLBCR/L-16	32.00	300.00	63.2	18.50	29.0	14.5	22.00	40.00	0	VC.. 1604
S40U SVLBCR/L-16	40.00	350.00	60.0	20.00	36.0	18.0	27.00	49.50	0	VC.. 1604

(1) 0 - Without coolant supply, 1 - With coolant supply

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW 2MT MM (CBN) (174) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

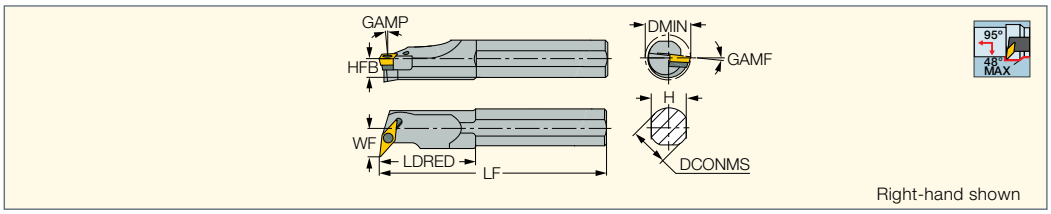
Spare Parts

Designation					
A/S-SVLBCR/L	TVC 3-1P	SR TC-3P	HW 4.0	SR 16-236 P	T-15/5

ISOTURN

A/S-SVLFCR/L; A-SVUCR/L

Screw Lock Boring Bars Carrying 35° Rhombic Inserts with 7° Clearance



Designation	DCONMS	LF	LDRED	H	HFB	WF	DMIN	GAMP	GAMF	CSP(2)	Insert
A32T SVUCR/L-16 (1)	32.00	300.00	50.0	29.0	14.5	22.00	40.00	0.0	-8.0	1	VC.. 1604
S32T SVLFCR/L-16	32.00	300.00	56.0	29.0	14.5	22.00	39.50	0.0	-8.0	0	VC.. 1604
S40U SVLFCR/L-16	40.00	350.00	-	36.0	18.0	27.00	49.00	0.0	-5.0	0	VC.. 1604
A40U SVLFCR/L-22	40.00	350.00	70.0	36.0	18.0	27.00	48.00	0.0	-8.0	1	VC.. 2205

(1) 93° approach angle

(2) 0 - Without coolant supply, 1 - With coolant supply

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW 2MT MM (CBN) (174) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

Spare Parts

Designation									
A32T SVUCR/L-16	TVC 3-1P	SR TC-3P	HW 4.0	SR 16-236 P	T-15/5	PL 32	TVC 3-04675(a)*	SR M3X3DIN913	HW 1.5
S32T SVLFCR/L-16	TVC 3-1P	SR TC-3P	HW 4.0	SR 16-236 P	T-15/5		TVC 3-04675(a)*		
S40U SVLFCR/L-16	TVC 3-1P	SR TC-3P	HW 4.0	SR 16-236 P	T-15/5		TVC 3-04675(a)*		
A40U SVLFCR/L-22	TVC 22T330	SR TC-3	HW 2.5	SR 14-536	T-20/5	PL 40			

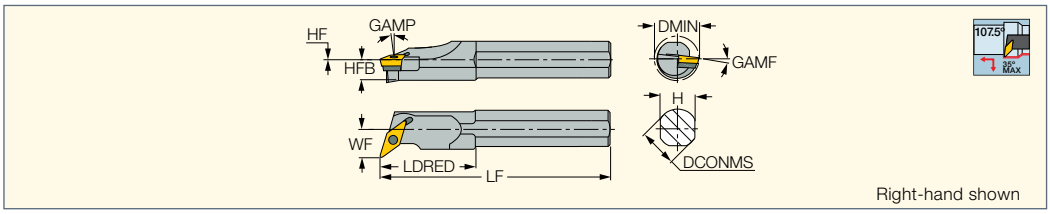
* Optional, to be ordered separately

(a) Rhombic seat for inserts with radius 1.2, should be ordered separately

ISOTURN

A/S-SVQCR/L

Screw Lock Boring Bars
Carrying 35° Rhombic
Inserts with 7° Clearance



Designation	DCONMS	LF	LDRED	H	HFB	WF	HF	DMIN	GAMP	GAMF	CSP(1)	Insert
S25S SVQCR/L-16	25.00	250.00	61.0	23.0	12.0	17.00	0.5	32.00	0.0	-5.0	0	VC.. 1604
S32T SVQCR/L-16	32.00	300.00	70.0	30.0	15.0	22.00	0.0	40.00	0.0	-5.0	0	VC.. 1604
A40U SVQCR/L-22	40.00	350.00	64.0	36.0	18.0	27.00	0.0	47.50	0.0	-8.0	1	VCGT 2205

(1) 0 - Without coolant supply, 1 - With coolant supply

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW 2MT MM (CBN) (174) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

Spare Parts

Designation							
S25S SVQCR/L-16	SR 16-236 P	T-15/5					
S32T SVQCR/L-16	SR 16-236 P	T-15/5	TVC 3-1P	SR TC-3P	HW 4.0	TVC 3-04675(a)*	
A40U SVQCR/L-22	SR 14-536	T-20/5	TVC 22T330	SR TC-3	HW 2.5		PL 40

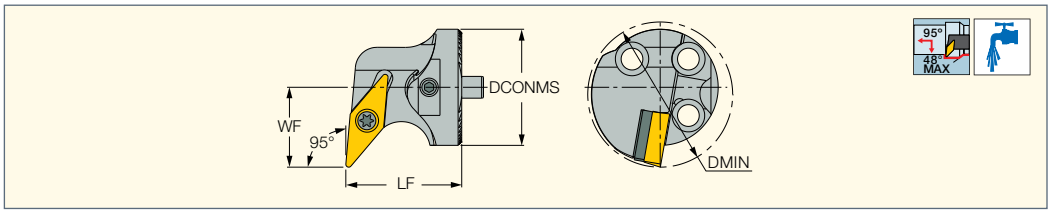
* Optional, to be ordered separately

(a) Rhombic seat for inserts with radius 1.2, should be ordered separately

WHISPERLINE

AVC-SVLCR/L

Interchangeable Boring
Heads Carrying 35° Rhombic
Inserts with 7° Clearance



Designation	WF	DCONMS	DMIN	LF	CSP(2)	MIID(3)
AVC-D32-SVLCR/L-16T	22.00	32.00	40.00	32.00	1	VCGT 332-F3M
AVC-D40-SVLCR/L-16T (1)	27.00	40.00	50.00	32.00	1	VCGT 332-F3M

• For positive "V" insert geometry with radius 1.2mm please use set: TVC 3-76 * 3312824

(1) DMIN of 50mm shank is DMIN of requested head + 10mm • DMIN of 60mm shanks is DMIN of requested head + 20mm

(2) 0 - Without coolant supply, 1 - With coolant supply

(3) Master insert identification

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW 2MT MM (CBN) (174) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

Spare Parts

Designation					
AVC-SVLCR/L	SR 16-236 P*	T-15/5*	SR TC-3P*	TVC 3-1P*	TVC 3-04675(a)*

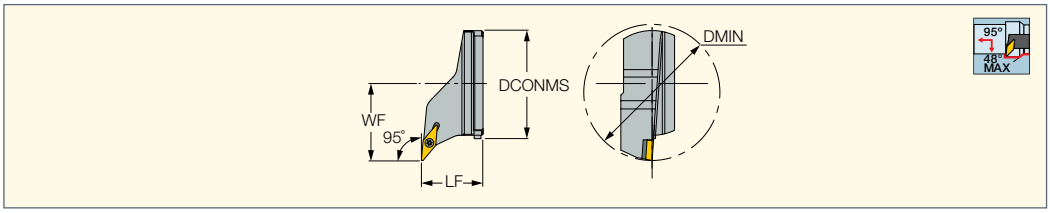
* Optional, to be ordered separately

(a) Rhombic seat for inserts with radius 1.2, should be ordered separately

WHISPERLINE

AVC-SVLCR/L-VH

Interchangeable Boring
Heads Carrying 35° Rhombic
Inserts with 7° Clearance



Designation	WF	DCONMS	DMIN	LF	MIID(1)
AVC-D80-SVLCR/L-16T-VH	57.00	77.00	100.00	45.00	VCGT 160404

(1) Master insert identification

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW 2MT MM (CBN) (174) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

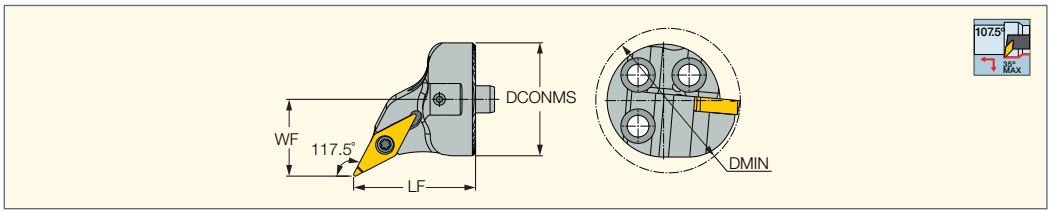
Spare Parts

Designation				
AVC-SVLCR/L-VH	TVC 3-1P	SR 16-236 P	SR TC-3P	T-15/5

WHISPERLINE

AVC-SVPCR/L

Interchangeable Boring Heads Carrying 35° Rhombic Inserts with 7° Clearance and 117.5 Approach Angle



Designation	WF	DCONMS	DMIN	LF	CSP(1)	MIID(2)							
AVC-D20-SVPCR/L-11	14.00	20.00	25.00	23.00	0	VCGT 221-F3P	FT39 D6-5X8	T-8/5	SR 14-560				
AVC-D32-SVPCR/L-16T	22.00	32.00	40.00	32.00	1	VCGT 332-F3M	FT39 D6-5X8	T-15/5	SR 16-236 P	TVC 3-1P	SR TC-3P	HW 4.0	SR M4X4 DIN913 TL360
AVC-D40-SVPCR/L-16T	27.00	40.00	50.00	32.00	1	VCGT 332-F3M							

(1) 0 - Without coolant supply, 1 - With coolant supply

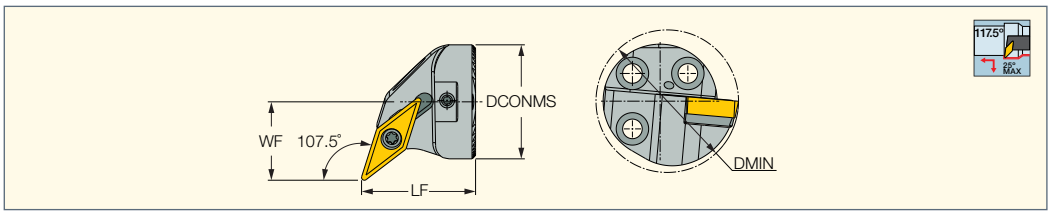
(2) Master insert identification

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW 2MT MM (CBN) (174) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

WHISPERLINE

AVC-SVQCR/L

Interchangeable Boring Heads Carrying 35° Rhombic Inserts with 7° Clearance and 107.5 Approach Angle



Designation	WF	DCONMS	DMIN	LF	CSP(1)	MIID(2)							
AVC-D25-SVQCR/L-11	17.00	25.00	32.00	30.00	1	VCGT 221-F3P	FT39 D6-5X8	SR 14-560	T-8/5				SR M2.5X2.5 DIN913 TL360
AVC-D32-SVQCR/L-16	22.00	32.00	40.00	32.00	1	VCGT 332-F3M	FT39 D6-5X8	SR 16-236 P	T-15/5	TVC 3-1P	SR TC-3P	HW 4.0	SR M4X4 DIN913 TL360
AVC-D40-SVQCR/L-16	27.00	40.00	50.00	40.00	1	VCGT 332-F3M	FT39 D6-5X8	SR 16-236 P	T-15/5	TVC 3-1P	SR TC-3P	HW 4.0	SR M4X4 DIN913 TL360

(1) 0 - Without coolant supply, 1 - With coolant supply

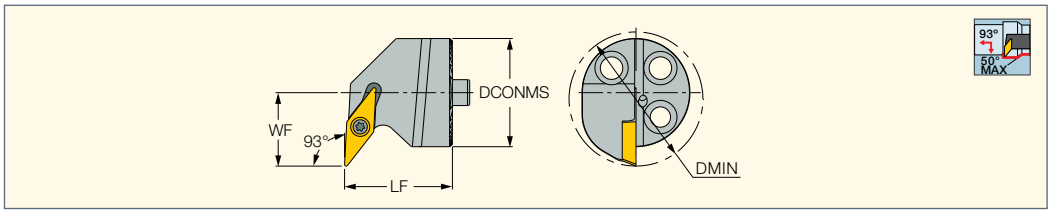
(2) Master insert identification

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW 2MT (CBN) (173) • VCGW 2MT MM (CBN) (174) • VCGW MT (CBN) (173) • VCGW MT (PCD) (221)

WHISPERLINE

AVC-SVUCR/L

Interchangeable Boring Heads Carrying 35° Rhombic Inserts with 7° Clearance



Designation	WF	DCONMS	DMIN	LF	CSP(1)	MIID(2)		
AVC-D20-SVUCR/L-11	16.00	20.00	27.00	20.00	0	VCGT 221-F3P	SR 14-560*	T-8/5*
AVC-D25-SVUCR/L-11	17.00	25.00	32.00	25.00	1	VCGT 221-F3P	SR 14-560*	T-8/5*

(1) 0 - Without coolant supply, 1 - With coolant supply

(2) Master insert identification

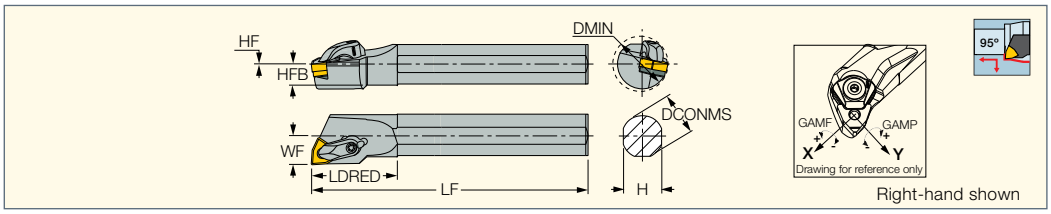
* Optional, to be ordered separately

For inserts, see pages: VCGT (PCD) (219) • VCGT MD/RD (PCD) (220) • VCGW (CBN) (172) • VCGW (PCD) (220) • VCGW MT (PCD) (221)

ISOTURN

S-DWLNR/L

R-Clamp Boring Bars Carrying Negative Trigon Inserts



Designation	DCONMS	LF	LDRED	H	HFB	HF	WF	DMIN	Insert
S25T DWLNR/L-08	25.00	300.00	50.0	23.0	12.3	0.8	17.00	32.00	WNGA 0804
S32U DWLNR/L-08	32.00	350.00	55.0	29.0	15.8	1.3	22.00	40.00	WNGA 0804
S40V DWLNR/L-08	40.00	400.00	55.0	36.0	19.8	1.8	27.00	60.00	WNGA 0804

For inserts, see pages: WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66)

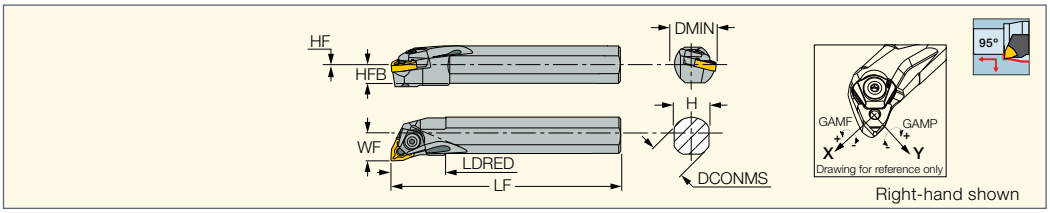
Spare Parts

Designation					
S-DWLNR/L	TWN 423	SP 4	LCGR-4	SR 10400270-25.5	T-15/5

ISOTURN

A/S-MWLNR/L-W

Top Wedge Lock Boring Bars Carrying Double-Sided Trigon Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	DMIN	HF	CSP[2]	Insert
A20Q MWLNR/L-06W	20.00	180.00	28.0	18.0	9.2	13.00	25.00	0.2	1	WNGA 06T3
A20 MWLNR/L-06W-AD [1]	20.00	100.00	28.0	18.0	9.0	13.00	25.00	0.0	1	WNGA 06T3
A25R MWLNR/L-06W	25.00	200.00	34.0	23.0	11.7	17.00	32.00	0.2	1	WNGA 06T3
A32S MWLNR/L-06W	32.00	250.00	28.0	29.0	14.7	19.00	36.00	0.2	1	WNGA 06T3
S20S MWLNR/L-06W	20.00	250.00	28.0	18.0	9.2	13.00	25.00	0.2	0	WNGA 06T3
S25T MWLNR/L-06W	25.00	300.00	28.0	23.0	11.7	17.00	32.00	0.2	0	WNGA 06T3
S32U MWLNL-06W	32.00	350.00	40.0	29.0	14.7	19.00	36.00	0.2	0	WNGA 06T3
S32U MWLNR-06W	32.00	350.00	28.0	29.0	14.7	19.00	36.00	0.2	0	WNGA 06T3
A25R MWLNR/L-08W	25.00	200.00	40.0	23.0	11.7	17.00	32.00	0.2	1	WNGA 0804
A25 MWLNR-08W-AD [1]	25.00	120.00	35.0	23.0	11.7	17.00	32.00	0.2	1	WNGA 0804
A32S MWLNR/L-08W	32.00	250.00	45.0	29.0	14.7	22.00	40.00	0.2	1	WNGA 0804
A40T MWLNR/L-08W	40.00	300.00	50.0	36.0	18.2	27.00	50.00	0.2	1	WNGA 0804
S25T MWLNR/L-08W	25.00	300.00	35.0	23.0	11.7	17.00	32.00	0.2	0	WNGA 0804
S32U MWLNR/L-08W	32.00	350.00	45.0	28.0	14.7	22.00	40.00	0.7	0	WNGA 0804
S40V MWLNR/L-08W	40.00	400.00	50.0	36.0	18.2	27.00	50.00	0.2	0	WNGA 0804
S50V MWLNR/L-13W	50.00	400.00	63.0	47.0	23.5	35.00	63.00	0.0	0	WNGA 1306

[1] AD - short tool for adapter holders

[2] 0 - Without coolant supply, 1 - With coolant supply

For inserts, see pages: WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66)

Spare Parts

Designation										
A20 MWLNR/L-06W-AD			ZNW 3WI	LC 250 SET 1					HW 2.5	PL 20
A20Q MWLNR/L-06W			ZNW 3WI	LC 250 SET 1					HW 2.5	PL 20
A25R MWLNR/L-06W	IWSN 322W	IWSN 3-2W[a]*	ZNW 3W	LC 250 SET 1					HW 2.5	PL 25
A32S MWLNR/L-06W	IWSN 322W	IWSN 3-2W[a]*	ZNW 3W	LC 250 SET 1					HW 2.5	PL 32
S20S MWLNR/L-06W			ZNW 3WI	LC 250 SET 1					HW 2.5	
S25T MWLNR/L-06W	IWSN 322W	IWSN 3-2W[a]*	ZNW 3W	LC 250 SET 1					HW 2.5	
S32U MWLNR/L-06W	IWSN 322W	IWSN 3-2W[a]*	ZNW 3W	LC 250 SET 1					HW 2.5	
A25R MWLNR/L-08W	TWN 423		ZNW-4WI	LC 252 SET 2					HW 3.0	PL 25
A25 MWLNR-08W-AD	TWN 423		ZNW-4WI	LC 252 SET 2					HW 3.0	PL 25
A32S MWLNR/L-08W	TWN 423		ZNW-4WI	LC 252 SET 1					HW 3.0	PL 32
A40T MWLNR/L-08W	IWSN 433	IWSN 433M[b]*	ZNW 4W	LC 252 SET 1					HW 3.0	PL 40
S25T MWLNR/L-08W	TWN 423		ZNW-4WI	LC 252 SET 2					HW 3.0	
S32U MWLNR/L-08W	TWN 423		ZNW-4WI	LC 252 SET 1					HW 3.0	
S40V MWLNR/L-08W	IWSN 433	IWSN 433M[b]*	ZNW 4W	LC 252 SET 1					HW 3.0	
S50V MWLNR/L-13W	IWSN 635		ZNW 6W		LC 253	SPR 17-362	WA M8	SR 17-362	HW 4P	

* Optional, to be ordered separately

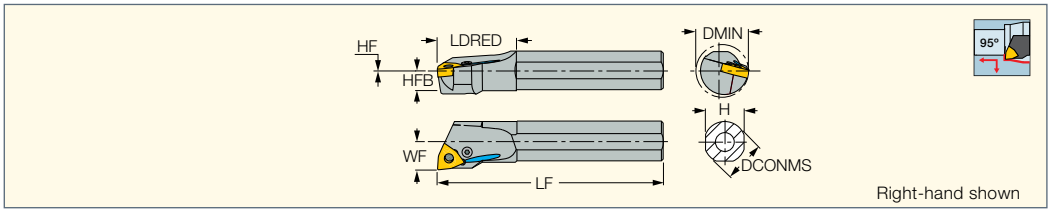
[a] Use IWSN 3-2W optional seat for WNGA 0604.. inserts

[b] Use IWSN 433M optional seat for WNGA 0804..-TNM inserts

ISOTURN

A/S-PWLNR/L

Lever Lock Boring Bars Carrying Double-Sided Trigon Inserts



Designation	DCONMS	LF	LDRED	H	HFB	WF	DMIN	HF	CSP[1]	Insert
A16M PWLNR/L-06	16.00	150.00	27.0	15.0	8.0	11.00	20.00	0.5	1	WNGA 06T3
A20Q PWLNR/L-06	20.00	180.00	36.0	18.0	9.2	13.00	25.00	0.2	1	WNGA 06T3
A25R PWLNR/L-06	25.00	200.00	35.0	23.0	11.7	17.00	32.00	0.2	1	WNGA 06T3
S16Q PWLNR/L-06	16.00	180.00	27.0	15.0	8.0	11.00	20.00	0.5	0	WNGA 06T3
S20R PWLNR/L-06	20.00	200.00	36.0	18.0	9.0	13.00	27.00	0.0	0	WNGA 06T3
S25S PWLNR/L-06	25.00	250.00	40.4	23.0	11.5	17.00	32.00	0.0	0	WNGA 06T3
S32T PWLNR-06	32.00	300.00	50.0	29.0	14.5	19.00	39.00	0.0	0	WNGA 06T3
A25R PWLNR/L-08	25.00	200.00	47.0	23.0	11.5	17.00	32.00	0.5	1	WNGA 0804
A32S PWLNR/L-08	32.00	250.00	50.0	28.0	14.7	22.00	39.00	0.7	1	WNGA 0804
S25S PWLNR/L-08	25.00	250.00	47.0	23.0	11.5	17.00	32.00	0.0	0	WNGA 0804
S32T PWLNR/L-08	32.00	300.00	50.0	29.0	14.5	22.00	39.00	0.0	0	WNGA 0804
S40U PWLNR/L-08	40.00	350.00	59.0	36.0	18.0	27.00	49.00	0.0	0	WNGA 0804

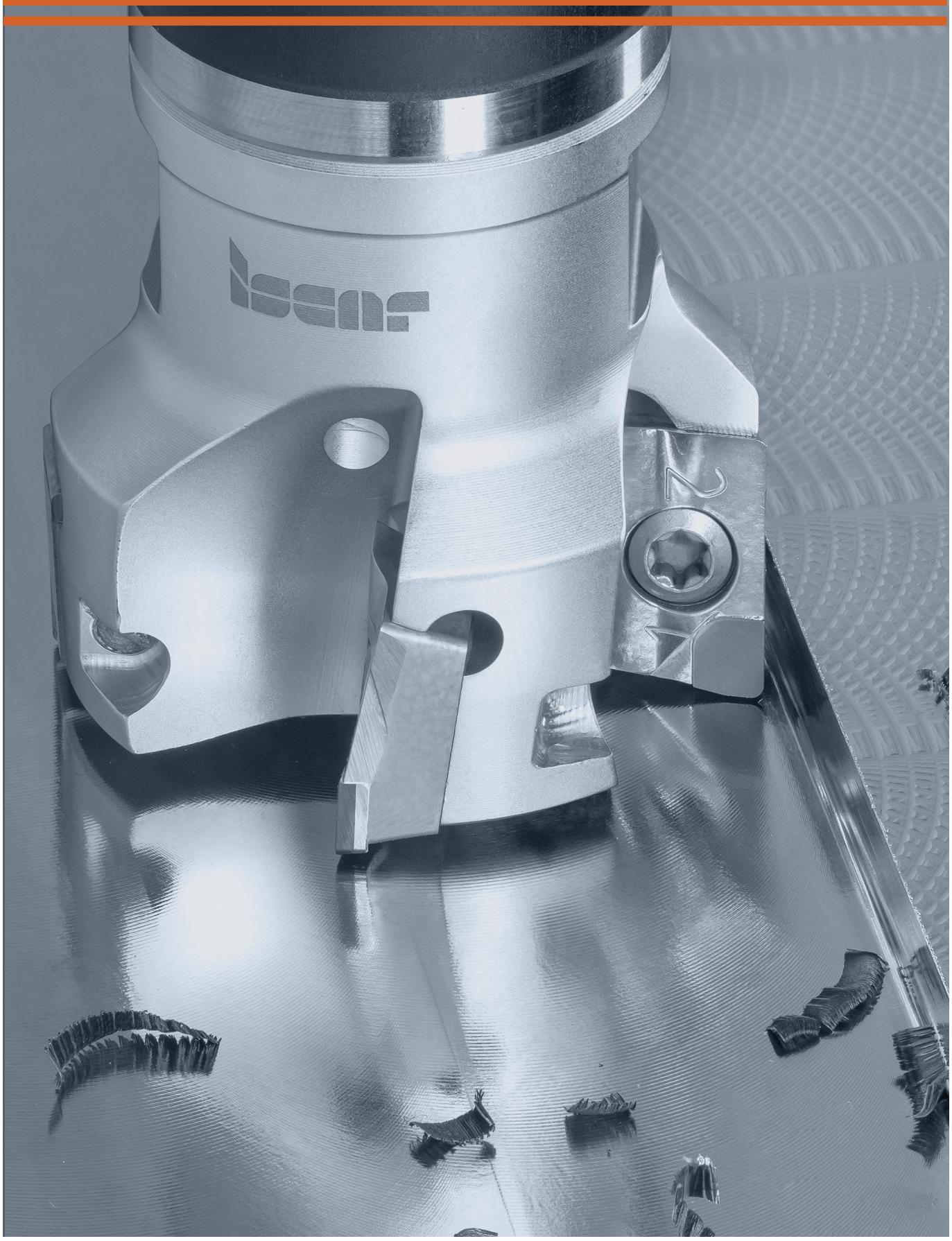
[1] 0 - Without coolant supply, 1 - With coolant supply

For inserts, see pages: WNGA (CBN) (176) • WNGA (PCD) (222) • WNGA (CER) (66)

Spare Parts

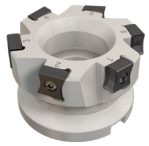
Designation							
A16M PWLNR/L-06				LR 3S	SR 117-2009	PL 16	HW 2.0/5
A20Q PWLNR/L-06	TWN 322	SP 3	PN 3-4	LR 3W	SR 117-2014	PL 20	HW 2.5/5
A25R PWLNR/L-06	TWN 322	SP 3	PN 3-4	LR 3	SR 117-2014	PL 25	HW 2.5/5
S16Q PWLNR/L-06				LR 3S	SR 117-2009		HW 2.0/5
S20R PWLNR/L-06	TWN 322	SP 3	PN 3-4	LR 3W	SR 117-2014		HW 2.5/5
S25S PWLNR/L-06	TWN 322	SP 3	PN 3-4	LR 3	SR 117-2014		HW 2.5/5
S32T PWLNR-06	TWN 322	SP 3	PN 3-4	LR 3	SR 117-2014		HW 2.5/5
A25R PWLNR/L-08				LR 4M	SR 117-2011	PL 25	HW 2.5/5
A32S PWLNR/L-08	TWN 423	SP 4	PN 3-4	LR 4	SR 117-2010	PL 32	HW 3.0
S25S PWLNR/L-08				LR 4M	SR 117-2011		HW 2.5/5
S32T PWLNR/L-08	TWN 423	SP 4	PN 3-4	LR 4	SR 117-2010		HW 3.0
S40U PWLNR/L-08	TWN 423	SP 4	PN 3-4	LR 4	SR 117-2010		HW 3.0

TOOLS FOR MILLING CBN & PCD



Tools for Milling CBN & PCD - Index

F90LN-N11 305



F90LN-N15 306

HM90 E90A-10 307

HM90 E90A-MM-10-JHP 310

HM90 E90A-M-10 311

HM90 F90AP-10 312

HM90 F90AP-AMT 313

HM90 F90AP-10-JHP 313

F90AD-SFR 314

HM90 E90AD-15 315

HM90 E90AD-M-15 316

HM90 E90AD-M-15-JHP 316

HM90 E90AD-MM-15-JHP 317

HM90 F90A-15 318

HM90 F90A-15-JHP 319

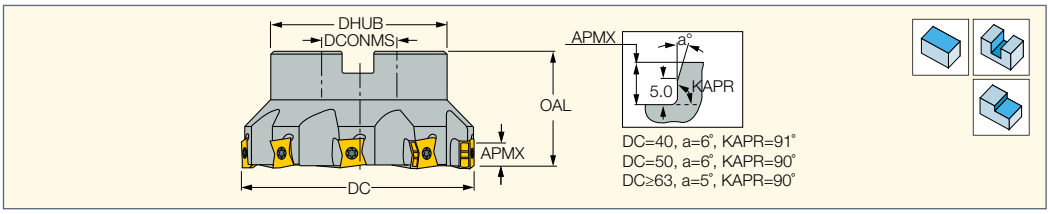
SSB 320

SSB-LN15-R/L 320

TANGMILL TANGENTIAL LINE

F90LN-N11

90° Face Mills Carrying LN..1106... Tangentially Clamped Inserts



Designation	DC	CICT(3)	APMX	OAL	DHUB	DCONMS	Arbor	kg
F90LN D040-04-16-R/L-N11	40.00	4	10.00	40.00	38.40	16.00	A	0.22
F90LN D040-06-16-L-N11 (1)	40.00	6	10.00	40.00	38.40	16.00	A	0.04
F90LN D040-06-16-R-N11 (1)	40.00	6	10.00	40.00	38.40	16.00	A	0.21
F90LN D050-05-22-R/L-N11	50.00	5	10.00	40.00	47.00	22.00	A	0.32
F90LN D050-07-22-L-N11 (1)	50.00	7	10.00	40.00	47.00	22.00	A	0.32
F90LN D050-07-22-R-N11 (1)	50.00	7	10.00	40.00	47.00	22.00	A	0.33
F90LN D063-06-22-R/L-N11	63.00	6	10.00	40.00	59.20	22.00	B	0.47
F90LN D063-09-22-R/L-N11 (1)	63.00	9	10.00	40.00	59.20	22.00	B	0.50
F90LN D080-08-27-R/L-N11 (2)	80.00	8	10.00	50.00	70.00	27.00	B	0.98
F90LN D080-11-27-R/L-N11 (2)	80.00	11	10.00	50.00	70.00	27.00	B	1.02
F90LN D100-09-32-L-N11 (2)	100.00	9	10.00	50.00	77.00	32.00	B	1.40
F90LN D100-09-32-R-N11 (2)	100.00	9	10.00	50.00	77.00	32.00	B	1.41
F90LN D100-14-32-R-N11 (2)	100.00	14	10.00	50.00	77.00	32.00	B	1.48
F90LN D125-10-40-L-N11 (2)	125.00	10	10.00	63.00	95.00	40.00	B	2.73
F90LN D125-10-40-R-N11 (2)	125.00	10	10.00	63.00	95.00	40.00	B	2.67
F90LN D125-18-40-R-N11 (2)	125.00	18	10.00	63.00	95.00	40.00	B	2.88

• For user guide, see pages 329-330,333-336

(1) Fine pitch

(2) For internal coolant through the holder, use a matching coolant set (should be ordered separately)

(3) Number of inserts (or edges for solid tool)

For inserts, see pages: • LNAR 1106 (PCD) (226) • LNAR 1106PN-R-S-W (PCD) (226) • LNAW-11 (CBN) (179)

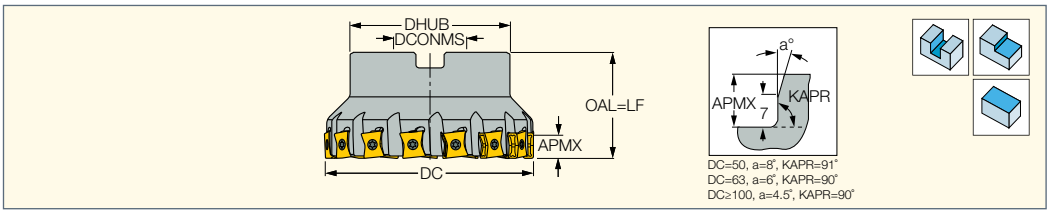
Spare Parts

Designation				
F90LN D040-04-16-R/L-N11	SR 34-550	SW6-SD	BLD T10/S7	SR M8X30DIN912
F90LN D040-06-16-R/L-N11	SR 34-550	SW6-SD	BLD T10/S7	SR M8X30DIN912
F90LN D050-05-22-R/L-N11	SR 34-550	SW6-SD	BLD T10/S7	SR M10X25 DIN912
F90LN D050-07-22-R/L-N11	SR 34-550	SW6-SD	BLD T10/S7	SR M10X25 DIN912
F90LN D063-06-22-R/L-N11	SR 34-550	SW6-SD	BLD T10/S7	
F90LN D063-09-22-R/L-N11	SR 34-550	SW6-SD	BLD T10/S7	
F90LN D080-08-27-R/L-N11	SR 34-550	SW6-SD	BLD T10/S7	
F90LN D080-11-27-R/L-N11	SR 34-550	SW6-SD	BLD T10/S7	
F90LN D100-09-32-R/L-N11	SR 34-550	SW6-SD	BLD T10/S7	
F90LN D100-14-32-R-N11	SR 34-550	SW6-SD	BLD T10/S7	
F90LN D125-10-40-R/L-N11	SR 34-550	SW6-SD	BLD T10/S7	
F90LN D125-18-40-R-N11	SR 34-550	SW6-SD	BLD T10/S7	

TANGMILL TANGENTIAL LINE

F90LN-N15

90° Face Mills Carrying LN..1506... Tangentially Clamped Inserts



Designation	DC	CICT(2)	APMX	OAL	DHUB	DCONMS	Arbor	kg
F90LN D050-05-22-R/L-N15	50.00	5	14.00	40.00	47.00	22.00	A	0.33
F90LN D063-05-22-R/L-N15	63.00	5	14.00	40.00	59.20	22.00	B	0.48
F90LN D063-08-22-R/L-N15	63.00	8	14.00	40.00	59.20	22.00	B	0.50
F90LN D080-07-27-L-N15 (1)	80.00	7	14.00	50.00	70.00	27.00	B	1.01
F90LN D080-07-27-R-N15 (1)	80.00	7	14.00	50.00	70.00	27.00	B	1.02
F90LN D080-10-27-L-N15 (1)	80.00	10	14.00	50.00	70.00	27.00	B	1.05
F90LN D080-10-27-R-N15 (1)	80.00	10	14.00	50.00	70.00	27.00	B	1.06
F90LN D100-08-32-L-N15 (1)	100.00	8	14.00	50.00	78.00	32.00	B	0.50
F90LN D100-08-32-R-N15 (1)	100.00	8	14.00	50.00	78.00	32.00	B	1.52
F90LN D100-12-32-L-N15 (1)	100.00	12	14.00	50.00	78.00	32.00	B	1.59
F90LN D100-12-32-R-N15 (1)	100.00	12	14.00	50.00	78.00	32.00	B	1.60
F90LN D125-09-40-R/L-N15 (1)	125.00	9	14.00	63.00	95.00	40.00	B	2.95
F90LN D125-15-40-L-N15 (1)	125.00	15	14.00	63.00	95.00	40.00	B	3.06
F90LN D125-15-40-R-N15 (1)	125.00	15	14.00	63.00	95.00	40.00	B	3.07
F90LN D160-10-40-L-N15	160.00	10	14.00	63.00	120.00	40.00	C	4.30
F90LN D160-10-40-R-N15	160.00	10	14.00	63.00	120.00	40.00	C	4.29
F90LN D160-20-40-L-N15	160.00	20	14.00	63.00	120.00	40.00	C	4.48
F90LN D160-20-40-R-N15	160.00	20	14.00	63.00	120.00	40.00	C	4.50
F90LN D200-12-60-L-N15	200.00	12	14.00	63.00	135.00	60.00	C	6.67
F90LN D200-12-60-R-N15	200.00	12	14.00	63.00	135.00	60.00	C	6.64
F90LN D250-15-60-R-N15	250.00	15	14.00	63.00	150.00	60.00	C	10.39
F90LN D250-30-60-R-N15	250.00	30	14.00	63.00	150.00	60.00	C	10.83

• Left-hand cutters are designated by a red groove • For user guide, see pages 329-330,333-336

(1) For internal coolant through the holder, use a matching coolant set (should be ordered separately)

(2) Number of inserts (or edges for solid tool)

For inserts, see pages: • LNAR 1506 PN-R-S (PCD) (226) • LNAW-15 (CBN) (180)

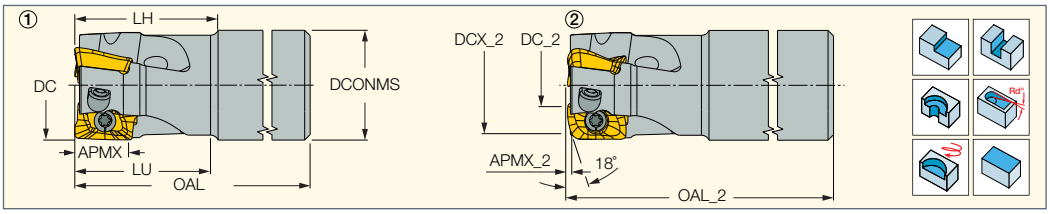
Spare Parts

Designation				
F90LN D050-05-22-L-N15	SR 34-535	SW6-T	BLD T15/M7	SR M10X25 DIN912
F90LN D050-05-22-R-N15	SR 34-535	SW6-T-SH	BLD T15/M7	SR M10X25 DIN912
F90LN D063-05-22-R/L-N15	SR 34-535	SW6-T-SH	BLD T15/M7	
F90LN D063-08-22-R/L-N15	SR 34-535	SW6-T-SH	BLD T15/M7	
F90LN D080-07-27-R/L-N15	SR 34-535	SW6-T-SH	BLD T15/M7	
F90LN D080-10-27-R/L-N15	SR 34-535	SW6-T-SH	BLD T15/M7	
F90LN D100-08-32-R/L-N15	SR 34-535	SW6-T-SH	BLD T15/M7	
F90LN D100-12-32-R/L-N15	SR 34-535	SW6-T-SH	BLD T15/M7	
F90LN D125-09-40-R/L-N15	SR 34-535	SW6-T-SH	BLD T15/M7	
F90LN D125-15-40-L-N15	SR 34-535	SW6-T	BLD T15/M7	
F90LN D125-15-40-R-N15	SR 34-535	SW6-T-SH	BLD T15/M7	
F90LN D160-10-40-R/L-N15	SR 34-535	SW6-T-SH	BLD T15/M7	
F90LN D160-20-40-R/L-N15	SR 34-535	SW6-T-SH	BLD T15/M7	
F90LN D200-12-60-R/L-N15	SR 34-535	SW6-T-SH	BLD T15/M7	
F90LN D250-15-60-R-N15	SR 34-535	SW6-T-SH	BLD T15/M7	
F90LN D250-30-60-R-N15	SR 34-535	SW6-T	BLD T15/M7	

HELI2000

HM90 E90A-10

Endmills Carrying
HM90 AP.. 1003... Inserts



Designation	DC	DCX_2	DC_2	DCONMS	APMX	APMX_2	CICT(1)	OAL	OAL_2	LH	LU	RMPX°(2)	RMPX°_2	MDN	MDX	Shank(3)	CSP(4)	RPMX(5)	MIID(6)	MIID_2(7)	Kg
HM90 E90A-D10-1-C10	10.00	10.10	1.00	10.00	9.80	1.00	1	80.00	79.63	20.0	13.8	5.0	5.0	11.10	19.20	C	0	132843	HM90 APKT 1003 PDR	-	0.04
HM90 E90A-D10-1-C10-C	10.00	10.10	1.00	10.00	9.80	1.00	1	80.00	79.63	20.0	13.8	5.0	5.0	11.10	19.20	C	1	131850	HM90 APKT 1003 PDR	-	0.04
HM90 E90A-D10-1-C16-LB	10.00	10.10	1.00	16.00	9.80	1.00	1	160.00	159.63	30.0	13.8	5.0	5.0	11.10	19.20	C	0	132843	HM90 APKT 1003 PDR	-	0.22
HM90 E90A-D10-1-W16	10.00	-	-	16.00	9.80	-	1	80.00	-	20.0	10.6	5.0	-	-	-	W	0	132843	HM90 APKT 1003 PDR	-	0.10
HM90 E90A-D12-1-C16	12.00	12.10	3.00	16.00	9.80	1.00	1	80.00	79.63	20.0	14.0	32.0	32.0	15.10	23.20	C	0	92536	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.11
HM90 E90A-D12-1-C16-LB	12.00	12.10	3.00	16.00	9.80	1.00	1	160.00	59.63	30.0	16.0	32.0	32.0	15.10	23.20	C	0	92536	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.23
HM90 E90A-D12-1-W16	12.00	12.10	3.00	16.00	9.80	1.00	1	80.00	79.63	20.0	14.0	32.0	32.0	15.10	23.20	W	0	92536	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.11
HM90 E90A-D12-1-W16-C	12.00	12.10	3.00	16.00	9.80	1.00	1	80.00	79.63	20.0	14.0	32.0	32.0	15.10	23.20	W	1	92536	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.10
HM90 E90A-D12-1-C16-C	12.00	-	-	16.00	9.80	-	1	80.00	-	20.0	14.0	32.0	-	-	-	C	1	92536	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.10
HM90 E90A-D14-1-C16	14.00	14.10	5.00	16.00	9.80	1.00	1	80.00	79.63	23.0	18.4	7.0	7.0	19.10	27.20	C	0	75930	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.11
HM90 E90A-D14-1-W16	14.00	14.10	5.00	16.00	9.80	1.00	1	80.00	79.63	23.0	18.4	7.0	7.0	19.10	27.20	W	0	75930	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.11
HM90 E90A-D16-2-C15-B	16.00	16.10	7.00	15.00	9.80	1.00	2	150.00	149.63	25.0	24.4	15.0	15.0	23.10	31.20	C	0	66712	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.19
HM90 E90A-D16-2-C15-B-C	16.00	16.10	7.00	15.00	9.80	1.00	2	150.00	149.63	25.0	24.4	15.0	15.0	23.10	31.20	C	1	66712	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.17
HM90 E90A-D16-2-C16	16.00	16.10	7.00	16.00	9.80	1.00	2	90.00	89.63	26.0	25.2	15.0	15.0	23.10	31.20	C	0	66712	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.12
HM90 E90A-D16-2-C16-B	16.00	16.10	7.00	16.00	9.80	1.00	2	150.00	149.63	40.0	38.2	15.0	15.0	23.10	31.20	C	0	66712	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.22
HM90 E90A-D16-2-C16-B-C	16.00	16.10	7.00	16.00	9.80	1.00	2	150.00	149.63	40.0	38.2	15.0	15.0	23.10	31.20	C	1	66712	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.20
HM90 E90A-D16-2-C16-C	16.00	16.10	7.00	16.00	9.80	1.00	2	90.00	89.63	26.0	25.2	15.0	15.0	23.10	31.20	C	1	66712	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.11
HM90 E90A-D16-2-C16-LB	16.00	16.10	7.00	16.00	9.80	1.00	2	180.00	179.63	40.0	38.1	15.0	15.0	23.10	31.20	C	0	66712	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.26
HM90 E90A-D16-2-W16	16.00	16.10	7.00	16.00	9.80	1.00	2	85.00	84.63	26.0	25.2	15.0	15.0	23.10	31.20	W	0	66712	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.12
HM90 E90A-D16-2-W16-C	16.00	16.10	7.00	16.00	9.80	1.00	2	85.00	84.63	26.0	25.2	15.0	15.0	23.10	31.20	W	1	66712	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.11
HM90 E90A-D17-2-C16	17.00	17.10	8.00	16.00	9.80	1.00	2	90.00	89.63	28.0	27.0	15.0	15.0	25.10	33.20	C	0	63393	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.13
HM90 E90A-D17-2-C16-L170	17.00	17.10	8.00	16.00	9.80	1.00	2	170.00	169.63	27.0	-	4.5	15.0	25.10	33.20	C	0	63393	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.25
HM90 E90A-D18-2-C16	18.00	18.10	9.00	16.00	9.80	1.00	2	90.00	89.63	26.0	-	7.5	7.5	27.10	35.20	C	0	60361	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.13
HM90 E90A-D18-2-C16-C	18.00	18.10	9.00	16.00	9.80	1.00	2	90.00	89.63	26.0	-	7.5	7.5	27.10	35.20	C	1	60361	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.12
HM90 E90A-D18-2-W20	18.00	18.10	9.00	20.00	9.80	1.00	2	90.00	89.63	30.0	26.4	7.5	7.5	27.10	35.20	W	0	60361	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.18
HM90 E90A-D18-2-W20-C	18.00	18.10	9.00	20.00	9.80	1.00	2	90.00	89.63	30.0	26.4	7.5	7.5	27.10	35.20	W	1	60361	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.17
HM90 E90A-D19-2-C20	19.00	19.10	10.00	20.00	9.80	1.00	2	90.00	89.63	26.0	25.0	7.5	7.5	29.10	37.20	C	0	57727	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.19
HM90 E90A-D20-2-C19-B	20.00	20.10	11.00	19.00	9.80	1.00	2	160.00	159.63	25.0	-	7.5	7.5	31.10	39.20	C	0	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.33
HM90 E90A-D20-2-C19-B-C	20.00	20.10	11.00	19.00	9.80	1.00	2	160.00	159.63	25.0	-	7.5	7.5	31.10	39.20	C	1	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.30
HM90 E90A-D20-2-C20	20.00	20.10	11.00	20.00	9.80	1.00	2	110.00	109.63	26.0	25.3	7.5	7.5	31.10	39.20	C	0	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.24
HM90 E90A-D20-2-C20-B	20.00	20.10	11.00	20.00	9.80	1.00	2	160.00	159.63	40.0	38.0	7.5	7.5	31.10	39.20	C	0	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.36
HM90 E90A-D20-2-C20-B-C	20.00	20.10	11.00	20.00	9.80	1.00	2	160.00	159.63	40.0	38.0	7.5	7.5	31.10	39.20	C	1	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.33
HM90 E90A-D20-2-C20-C	20.00	20.10	11.00	20.00	9.80	1.00	2	110.00	109.63	26.0	25.3	7.5	7.5	31.10	39.20	C	1	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.22
HM90 E90A-D20-2-C20-LB	20.00	20.10	11.00	20.00	9.80	1.00	2	200.00	199.63	40.0	38.0	7.5	7.5	31.10	39.20	C	0	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.46
HM90 E90A-D20-2-C20-XL	20.00	20.10	11.00	20.00	9.80	1.00	2	130.00	129.63	60.0	59.0	7.5	7.5	31.10	39.20	C	0	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.27
HM90 E90A-D20-2-W20	20.00	20.10	11.00	20.00	9.80	1.00	2	90.00	89.63	26.1	25.0	7.5	7.5	31.10	39.20	W	0	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.19
HM90 E90A-D20-2-W20-XL	20.00	20.10	11.00	20.00	9.80	1.00	2	130.00	129.63	60.0	59.0	7.5	7.5	31.10	39.20	W	0	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.27
HM90 E90A-D20-3-C20	20.00	20.10	11.00	20.00	9.80	1.00	3	110.00	109.63	26.1	25.0	7.5	7.5	31.10	39.20	C	0	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.24
HM90 E90A-D20-3-C20-C	20.00	20.10	11.00	20.00	9.80	1.00	3	110.00	109.63	26.1	25.0	7.5	7.5	31.10	39.20	C	1	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.22
HM90 E90A-D20-3-W16	20.00	20.10	11.00	16.00	9.80	1.00	3	85.00	84.63	26.1	-	7.5	7.5	31.10	39.20	W	0	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.13
HM90 E90A-D20-3-W16-C	20.00	20.10	11.00	16.00	9.80	1.00	3	85.00	84.63	26.1	-	7.5	7.5	31.10	39.20	W	1	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.12
HM90 E90A-D20-3-W20	20.00	20.10	11.00	20.00	9.80	1.00	3	90.00	89.63	26.1	25.0	7.5	7.5	31.10	39.20	W	0	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.19
HM90 E90A-D20-3-W20-C	20.00	20.10	11.00	20.00	9.80	1.00	3	90.00	89.63	26.1	25.0	7.5	7.5	31.10	39.20	W	1	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.18
HM90 E90A-D20-2-W20-C	20.00	-	-	20.00	9.80	-	2	90.00	-	26.1	25.0	7.5	-	-	-	W	1	55578	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.18
HM90 E90A-D21-2-C20-L270	21.00	21.10	12.00	20.00	9.80	1.00	2	270.00	269.63	26.0	-	2.8	2.8	33.10	41.20	C	0	53729	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.64
HM90 E90A-D21-3-C20	21.00	21.10	12.00	20.00	9.80	1.00	3	115.00	114.63	26.0	25.0	7.5	2.8	33.10	41.20	C	0	53729	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.26
HM90 E90A-D22-3-C20	22.00	22.10	13.00	20.00	9.80	1.00	3	115.00	114.63	26.0	-	7.5	7.5	35.10	43.20	C	0	51846	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.26
HM90 E90A-D22-3-C20-C	22.00	22.10	13.00	20.00	9.80	1.00	3	115.00	114.63	26.0	-	7.5	7.5	35.10	43.20	C	1	51846	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.25
HM90 E90A-D22-3-W25	22.00	22.10	13.00	25.00	9.80	1.00	3	95.00	94.63	26.0	21.0	7.5	7.5	35.10	43.20	W	0	51846	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.31
HM90 E90A-D22-3-W25-C	22.00	22.10	13.00	25.00	9.80	1.00	3	95.00	94.63	26.0	21.0	7.5	7.5	35.10	43.20	W	1	51846	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.29
HM90 E90A-D25-3-C24-B	25.00	25.10	16.00	24.00	9.80	1.00	3	200.00	199.63	25.0	-	2.5	2.5	41.10	49.20	C	0	47512	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.67
HM90 E90A-D25-3-C24-B-C	25.00	25.10	16.00	24.00	9.80	1.00	3	200.00	199.63	25.0	24.0	2.5	2.5	41.10	49.20	C	1	47512	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.64
HM90 E90A-D25-3-C25	25.00	25.10	16.00	25.00	9.80	1.00	3	120.00	119.63	26.1	25.0	2.5	2.5	41.10	49.20	C	0	47512	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.42
HM90 E90A-D25-3-C25-B	25.00	25.10	16.00	25.00	9.80	1.00	3	200.00	199.63	40.0	37.0	2.5	2.5	41.10	49.20	C	0	47512	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.72

• 1- with standard square insert • 2- with FF (fast feed) insert • For user guide, see pages 329-330,333-336

(1) Number of inserts (or edges for solid tool)
(2) Maximum ramping angle
(3) C-Cylindrical, W-Weldon
(4) 0 - Without coolant supply, 1 - With coolant supply
(5) Maximum RPM
(6) Master insert identification
(7) Master insert identification 2

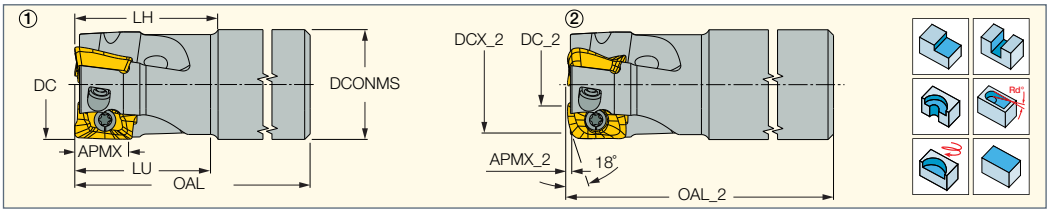
For inserts, see pages: • APKW 100304 PDR (PCD) (225)

Continued

HELI2000

HM90 E90A-10

Endmills Carrying
HM90 AP.. 1003... Inserts



Designation	DC	DCX_2	DC_2	DCONMS	APMX	APMX_2	CICT(1)	OAL	OAL_2	LH	LU	RMPX°(2)	RMPX°_2	MDN	MDX	Shank(3)	CSP(4)	RPMX(5)	MIID(6)	MIID_2(7)	Kg
HM90 E90A-D25-3-C25-B-C	25.00	25.10	16.00	25.00	9.80	1.00	3	200.00	199.63	40.0	37.0	2.5	2.5	41.10	49.20	C	1	47512	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.68
HM90 E90A-D25-3-C25-C	25.00	25.10	16.00	25.00	9.80	1.00	3	120.00	119.63	26.1	25.0	2.5	2.5	41.10	49.20	C	1	47512	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.39
HM90 E90A-D25-3-W25	25.00	25.10	16.00	25.00	9.80	1.00	3	95.00	94.63	26.1	25.0	2.5	2.5	41.10	49.20	W	0	47512	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.32
HM90 E90A-D25-3-W25-C	25.00	25.10	16.00	25.00	9.80	1.00	3	95.00	94.63	26.1	25.0	2.5	2.5	41.10	49.20	W	1	47512	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.30
HM90 E90A-D25-3-W25-XL	25.00	25.10	16.00	25.00	9.80	1.00	3	140.00	139.63	80.0	79.0	2.5	2.5	41.10	49.20	W	0	47512	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.47
HM90 E90A-D25-4-C25	25.00	25.10	16.00	25.00	9.80	1.00	4	120.00	119.63	26.0	25.0	2.5	2.5	41.10	49.20	C	0	47512	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.42
HM90 E90A-D25-4-C25-C	25.00	25.10	16.00	25.00	9.80	1.00	4	120.00	120.00	26.0	25.0	2.5	2.5	41.10	49.20	C	1	47512	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.39
HM90 E90A-D25-4-W25	25.00	25.10	16.00	25.00	9.80	1.00	4	95.00	94.63	26.0	25.0	2.5	2.5	41.10	49.20	W	0	47512	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.31
HM90 E90A-D25-4-W25-C	25.00	25.10	16.00	25.00	9.80	1.00	4	95.00	94.63	26.0	25.0	2.5	2.5	41.10	49.20	W	1	47512	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.30
HM90 E90A-D25-2-C25	25.00	-	-	25.00	9.80	-	2	120.00	120.00	26.1	25.0	2.5	-	-	-	C	0	47512	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.42
HM90 E90A-D25-2-W25	25.00	-	-	25.00	9.80	-	2	95.00	95.00	26.1	25.0	2.5	-	-	-	W	0	47512	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.32
HM90 E90A-D28-4-C25	28.00	28.10	19.00	25.00	9.80	1.00	4	120.00	119.63	26.0	-	2.0	2.0	47.10	55.20	C	0	44005	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.44
HM90 E90A-D28-4-C25-C	28.00	28.10	19.00	25.00	9.80	1.00	4	120.00	119.63	26.0	-	2.0	2.0	47.10	55.20	C	1	44005	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.41
HM90 E90A-D28-4-W25	28.00	28.10	19.00	25.00	9.80	1.00	4	95.00	94.63	26.0	-	2.0	2.0	47.10	55.20	W	0	44005	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.33
HM90 E90A-D30-4-C32	30.00	30.10	21.00	32.00	9.80	1.00	4	130.00	129.63	40.0	35.4	2.0	2.0	51.10	59.20	C	0	36782	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.72
HM90 E90A-D30-4-W25	30.00	30.10	21.00	25.00	9.80	1.00	4	95.00	94.63	30.0	-	2.0	2.0	51.10	59.20	W	0	36782	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.35
HM90 E90A-D30-4-W25-C	30.00	30.10	21.00	25.00	9.80	1.00	4	95.00	94.63	30.0	-	2.0	2.0	51.10	59.20	W	1	36782	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.33
HM90 E90A-D32-3-C32	32.00	32.10	23.00	32.00	9.80	1.00	3	130.00	129.63	30.0	28.5	3.0	3.0	55.10	63.20	C	0	35614	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.76
HM90 E90A-D32-3-W32	32.00	32.10	23.00	32.00	9.80	1.00	3	110.00	109.63	30.0	28.5	3.0	3.0	55.10	63.20	W	0	35614	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.63
HM90 E90A-D32-4-C32	32.00	32.10	23.00	32.00	9.80	1.00	4	130.00	129.63	30.0	28.5	3.0	3.0	55.10	63.20	C	0	35614	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.75
HM90 E90A-D32-4-C32-B	32.00	32.10	23.00	32.00	9.80	1.00	4	200.00	199.63	40.0	37.2	3.0	3.0	55.10	63.20	C	0	35614	HM90 APKT 1003 PDR	APKT 1003R8T-FF	1.18
HM90 E90A-D32-4-C32-LB	32.00	32.10	23.00	32.00	9.80	1.00	4	250.00	249.63	40.0	37.2	3.0	3.0	55.10	63.20	C	0	35614	HM90 APKT 1003 PDR	APKT 1003R8T-FF	1.50
HM90 E90A-D32-4-W25	32.00	32.10	23.00	25.00	9.80	1.00	4	95.00	94.63	30.0	-	3.0	3.0	55.10	63.20	W	0	35614	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.37
HM90 E90A-D32-4-W32-XL	32.00	32.10	23.00	32.00	9.80	1.00	4	160.00	159.63	100.0	28.5	3.0	3.0	55.10	63.20	W	0	35614	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.87
HM90 E90A-D32-5-C32	32.00	32.10	23.00	32.00	9.80	1.00	5	130.00	129.63	30.0	28.5	3.0	3.0	55.10	63.20	C	0	35614	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.75
HM90 E90A-D32-5-C32-C	32.00	32.10	23.00	32.00	9.80	1.00	5	130.00	129.63	30.0	28.5	3.0	3.0	55.10	63.20	C	1	35614	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.72
HM90 E90A-D32-5-W25	32.00	32.10	23.00	25.00	9.80	1.00	5	95.00	94.63	30.0	-	3.0	3.0	55.10	63.20	W	0	35614	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.37
HM90 E90A-D32-5-W25-C	32.00	32.10	23.00	25.00	9.80	1.00	5	95.00	94.63	30.0	-	3.0	3.0	55.10	63.20	W	1	35614	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.35
HM90 E90A-D32-5-W32-C	32.00	32.10	23.00	32.00	9.80	1.00	5	110.00	109.63	30.0	28.5	3.0	3.0	55.10	63.20	W	1	35614	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.60
HM90 E90A-D40-5-C32	40.00	40.10	31.00	32.00	9.80	1.00	5	130.00	129.63	30.0	-	2.7	2.7	71.10	79.20	C	0	31855	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.83
HM90 E90A-D40-5-W32-C	40.00	40.10	31.00	32.00	9.80	1.00	5	110.00	109.63	30.0	-	2.7	2.7	71.10	79.20	W	1	31855	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.68
HM90 E90A-D50-7-C32	50.00	-	-	32.00	9.80	-	7	130.00	130.00	41.6	-	2.7	-	-	-	C	0	28492	HM90 APKT 1003 PDR	APKT 1003R8T-FF	0.94

• 1- with standard square insert • 2- with FF (fast feed) insert • For user guide, see pages 329-330,333-336

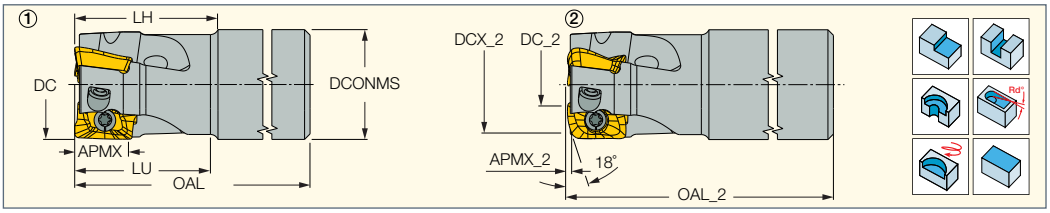
(1) Number of inserts (or edges for solid tool)
(2) Maximum ramping angle
(3) C-Cylindrical, W-Weldon
(4) 0 - Without coolant supply, 1 - With coolant supply
(5) Maximum RPM
(6) Master insert identification
(7) Master insert identification 2

For inserts, see pages: • APKW 100304 PDR (PCD) (225)

HELI2000

HM90 E90A-10

Endmills Carrying
HM90 AP.. 1003... Inserts



Spare Parts

Designation				
HM90 E90A-D10-1-C10	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D10-1-C10-C	SR 34-505/HG	T-8/53		
HM90 E90A-D10-1-C16-LB	SR 34-505/HG	T-8/53		
HM90 E90A-D10-1-W16	SR 34-505/HG	T-8/53		
HM90 E90A-D12-1-C16	SR 34-505/HG	T-8/53		
HM90 E90A-D12-1-C16-LB	SR 34-505/HG	T-8/53		
HM90 E90A-D12-1-W16	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D12-1-W16-C	SR 34-505/HG	T-8/53		
HM90 E90A-D12-1-C16-C	SR 34-505/HG	T-8/53		
HM90 E90A-D14-1-C16	SR 34-505/HG	T-8/53		
HM90 E90A-D14-1-W16	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D16-2-C15-B	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D16-2-C15-B-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D16-2-C16	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D16-2-C16-B	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D16-2-C16-B-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D16-2-C16-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D16-2-C16-LB	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D16-2-W16	SR 34-505/HG	T-8/53		
HM90 E90A-D16-2-W16-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D17-2-C16	SR 34-505/HG	T-8/53		
HM90 E90A-D17-2-C16-L170	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D18-2-C16	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D18-2-C16-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D18-2-W20	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D18-2-W20-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D19-2-C20	SR 34-505/HG	T-8/53		
HM90 E90A-D20-2-C19-B	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D20-2-C19-B-C	SR 34-505/HG	T-8/53		
HM90 E90A-D20-2-C20	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D20-2-C20-B	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D20-2-C20-B-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D20-2-C20-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D20-2-C20-LB	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D20-2-C20-XL	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D20-2-W20	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D20-2-W20-XL	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D20-3-C20	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D20-3-C20-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D20-3-W16	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D20-3-W16-C	SR 34-505/HG	T-8/53		
HM90 E90A-D20-3-W20	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D20-3-W20-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D20-2-W20-C	SR 34-505/HG	T-8/53		
HM90 E90A-D21-2-C20-L270	SR 34-505/HG	T-8/53		
HM90 E90A-D21-3-C20	SR 34-505/HG	T-8/53		
HM90 E90A-D22-3-C20	SR 34-505/HG	T-8/53		
HM90 E90A-D22-3-C20-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D22-3-W25	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D22-3-W25-C	SR 34-505/HG	T-8/53		
HM90 E90A-D25-3-C24-B	SR 34-505/HG	T-8/53		
HM90 E90A-D25-3-C24-B-C	SR 34-505/HG	T-8/53	BLD T08/M7	SW4-SD
HM90 E90A-D25-3-C25	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D25-3-C25-B	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D25-3-C25-B-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D25-3-C25-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D25-3-W25	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D25-3-W25-C	SR 34-505/HG	T-8/53	BLD T08/M7	SW4-SD
HM90 E90A-D25-3-W25-XL	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D25-4-C25	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D25-4-C25-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D25-4-W25	SR 34-505/HG	T-8/53		

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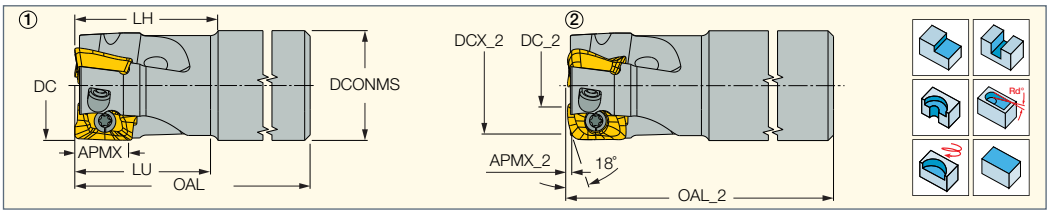
HELI2000

HM90 E90A-10

Endmills Carrying
HM90 AP.. 1003... Inserts



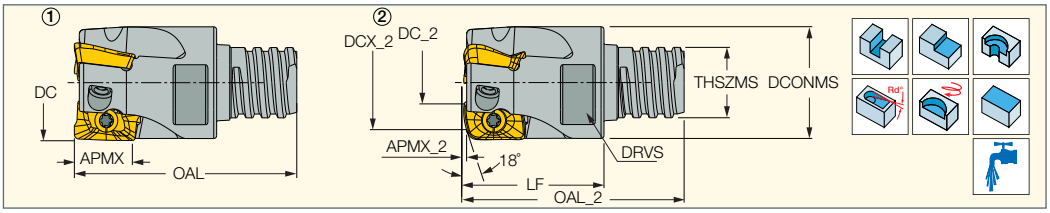
Spare Parts

Designation				
HM90 E90A-D25-4-W25-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D25-2-C25	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D25-2-W25	SR 34-505/HG	T-8/53		
HM90 E90A-D28-4-C25	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D28-4-C25-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D28-4-W25	SR 34-505/HG	T-8/53		
HM90 E90A-D30-4-C32	SR 34-505/HG	T-8/53		
HM90 E90A-D30-4-W25	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D30-4-W25-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D32-3-C32	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D32-3-W32	SR 34-505/HG	T-8/53		
HM90 E90A-D32-4-C32	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D32-4-C32-B	SR 34-505/HG	T-8/53		
HM90 E90A-D32-4-C32-LB	SR 34-505/HG	T-8/53		
HM90 E90A-D32-4-W25	SR 34-505/HG	T-8/53		
HM90 E90A-D32-4-W32-XL	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D32-5-C32	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D32-5-C32-C	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D32-5-W25	SR 34-505/HG		BLD T08/M7	SW4-SD
HM90 E90A-D32-5-W25-C	SR 34-505/HG	T-8/53		
HM90 E90A-D32-5-W32-C	SR 34-505/HG	T-8/53		
HM90 E90A-D40-5-C32	SR 34-505/HG	T-8/53		
HM90 E90A-D40-5-W32-C	SR 34-505/HG	T-8/53		
HM90 E90A-D50-7-C32	SR 34-505/HG		BLD T08/M7	SW4-SD

HELI2000 JET LINE
MULTI-MASTER

HM90 E90A-MM-10-JHP

90° JHP Endmills with a
MULTI-MASTER Threaded
Adaptation Carrying HELI2000
and HELIMILL Inserts



Designation	DC	DC_2	DCX_2	CICT(1)	APMX	APMX_2	OAL	OAL_2	RMPX°(2)	RMPX°_2
HM90 E90A D16-2-MMT10-JHP	16.00	7.00	16.10	2	9.80	1.00	34.80	35.17	15.0	15.0
HM90 E90A D20-3-MMT12-JHP	20.00	11.00	20.10	3	9.80	1.00	38.50	38.87	7.5	7.5
HM90 E90A D25-4-MMT15-JHP	25.00	16.00	25.10	4	9.80	1.00	47.00	47.37	7.5	7.5
HM90 E90A D32-5-MMT21-JHP	32.00	23.00	32.10	5	9.80	1.00	57.95	58.32	3.0	3.0

Designation	MDN	MDX	LF	DCONMS	THSZMS	RPMX(3)	DRVS(4)	TQ_3(5)	kg	MIID(6)	MIID_2(7)
HM90 E90A D16-2-MMT10-JHP	23.10	31.20	23.40	15.60	T10	66710	13.0	28	0.10	APKT 1003PDR-HM	APKT 1003R8T-FF
HM90 E90A D20-3-MMT12-JHP	31.10	39.20	25.50	19.70	T12	55575	16.0	28	0.15	APKT 1003PDR-HM	APKT 1003R8T-FF
HM90 E90A D25-4-MMT15-JHP	41.10	49.20	30.00	24.70	T15	47510	20.0	40	0.05	APKT 1003PDR-HM	APKT 1003R8T-FF
HM90 E90A D32-5-MMT21-JHP	55.10	63.20	34.85	30.10	T21	35610	24.0	110	0.20	APKT 1003PDR-HM	APKT 1003R8T-FF

- 1- with standard square insert • 2- with FF (fast feed) insert • For user guide, see pages 329-330,333-336
- Do not apply lubricant to the MULTI-MASTER threaded connection

(1) Number of inserts (or edges for solid tool)
(2) Maximum ramping angle
(3) The maximum cutting speed (RPM) for the cutting head assembled on the shank should be the lower parameter (RPMX) of either the cutting head or the shank
(4) Torque key size
(5) Tool tightening torque Nxm (lbfxin)
(6) Master insert identification
(7) Master insert identification 2

For inserts, see pages: • APKW 100304 PDR (PCD) (225)

Spare Parts

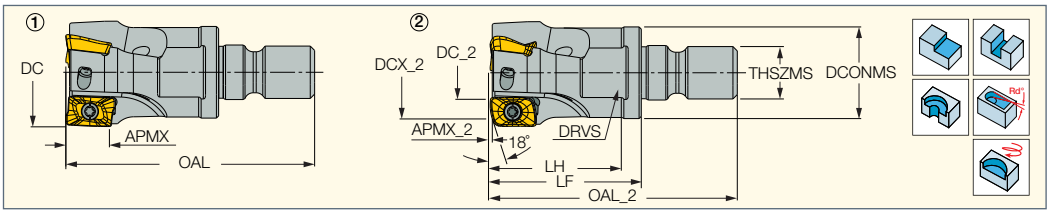
Designation				
HM90 E90A-MM-10-JHP	SR 34-505/HG	SR 34-505/HG(a)	BLD T08/M7	SW4-SD

(a) Recommended tightening torque for this item: 1.2 Nxm

HELI2000

HM90 E90A-M-10

90° Endmills with a FLEXFIT Threaded Adaptation Carrying HM90 AP.. 1003... Inserts



Designation	DC	DC_2	DCX_2	CICT(1)	DCONMS	THSZMS	LH	LF	OAL	OAL_2	APMX	APMX_2	RMPX°(2)
HM90 E90A-D16-2-M08	16.00	7.00	16.10	2	14.75	M08	24.0	30.00	47.50	47.13	9.80	1.00	15.0
HM90 E90A-D20-3-M10	20.00	11.00	20.10	3	18.00	M10	30.0	30.00	50.00	49.63	9.80	1.00	7.5
HM90 E90A-D20-3-M12	20.00	11.00	20.10	3	21.00	M12	24.0	30.00	52.00	51.63	9.80	1.00	7.5
HM90 E90A-D25-3-M12	25.00	16.00	25.10	3	21.00	M12	35.0	35.00	57.00	56.63	9.80	1.00	2.5
HM90 E90A-D25-4-M12	25.00	16.00	25.10	4	21.00	M12	35.0	35.00	57.00	56.63	9.80	1.00	2.5
HM90 E90A-D32-4-M16	32.00	23.00	32.10	4	29.00	M16	35.0	35.00	60.00	59.63	9.80	1.00	3.0

Designation	RMPX°_2	MDN	MDX	CSP(3)	DRVS(4)	TQ_3(5)	RPMX(6)	MIID(7)	MIID_2(8)	kg
HM90 E90A-D16-2-M08	15.0	23.10	31.20	0	9.6	20	66712	APKT 1003PDR-HM	APKT 1003R8T-FF	0.03
HM90 E90A-D20-3-M10	7.5	31.10	39.20	1	15.1	29	55578	APKT 1003PDR-HM	APKT 1003R8T-FF	0.05
HM90 E90A-D20-3-M12	7.5	31.10	39.20	1	17.1	33	55578	APKT 1003PDR-HM	APKT 1003R8T-FF	0.06
HM90 E90A-D25-3-M12	2.5	41.10	49.20	1	17.1	33	47512	APKT 1003PDR-HM	APKT 1003R8T-FF	0.08
HM90 E90A-D25-4-M12	2.5	41.10	49.20	1	17.1	33	47512	APKT 1003PDR-HM	APKT 1003R8T-FF	0.08
HM90 E90A-D32-4-M16	3.0	55.10	63.20	1	25.1	40	35614	APKT 1003PDR-HM	APKT 1003R8T-FF	0.16

- 1- with standard square insert • 2- with FF (fast feed) insert • For user guide see pages 329-330,333-336
- When mounting items with FLEXFIT threaded adaptation to their holders, the mating surfaces and threaded areas must be thoroughly cleaned.

Apply appropriate tightening torque to eliminate a gap between the mating faces. Estimated torque values are specified in the TQ_3 parameter

(1) Number of inserts (or edges for solid tool)
(2) Maximum ramping angle
(3) 0 - Without coolant supply, 1 - With coolant supply
(4) Torque key size
(5) Tool tightening torque Nxm (lbfxin)
(6) Maximum RPM
(7) Master insert identification
(8) Master insert identification 2

For inserts, see pages: • APKW 100304 PDR (PCD) (225)

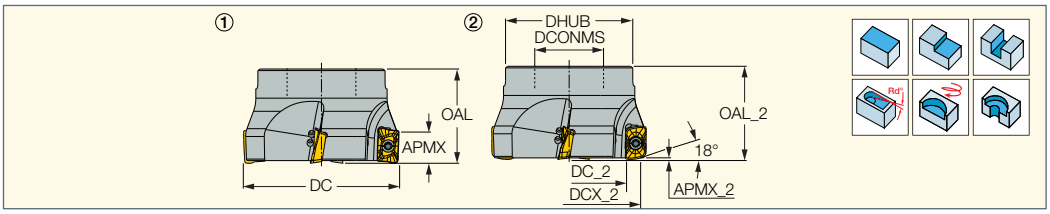
Spare Parts

Designation			
HM90 E90A-M-10	SR 34-505/HG	SW4-SD	BLD T08/M7

HELI2000

HM90 F90AP-10

90° Face Mills Carrying HM90 APKT 1003... Inserts



Designation	DC	DC_2	DCX_2	CICT(2)	APMX	APMX_2	OAL	OAL_2	MDN	MDX	DHUB
HM90 F90AP D32-3-16	32.00	23.00	32.10	3	9.80	1.00	35.00	34.63	55.10	63.20	30.40
HM90 F90AP D32-5-16	32.00	23.00	32.10	5	9.80	1.00	35.00	34.63	55.10	63.20	30.40
HM90 F90AP D40-5-22	40.00	31.00	40.10	5	9.80	1.00	40.00	39.63	71.10	79.20	38.40
HM90 F90AP D40-6-22	40.00	31.00	40.10	6	9.80	1.00	40.00	39.63	71.10	79.20	38.40
HM90 F90AP D50-6-22	50.00	41.00	50.10	6	9.80	1.00	40.00	39.63	91.10	99.20	48.40
HM90 F90AP D50-7-22	50.00	41.00	50.10	7	9.80	1.00	40.00	39.63	91.10	99.20	48.40
HM90 F90AP D63-7-22 (1)	63.00	54.00	63.10	7	9.80	1.00	40.00	39.63	117.10	125.20	59.00
HM90 F90AP D63-9-22	63.00	54.00	63.10	9	9.80	1.00	40.00	39.63	117.10	125.20	59.00
HM90 F90AP D80-8-27 (1)	80.00	71.00	80.10	8	9.80	1.00	50.00	49.63	151.10	159.20	70.00
HM90 F90AP D100-9-32 (1)	100.00	91.00	100.10	9	9.80	1.00	50.00	49.63	191.10	199.20	78.00

Designation	MIID(3)	MIID_2(4)	RPMX(5)	DCONMS	RMPX°(6)	RMPX°_2	Arbor	kg
HM90 F90AP D32-3-16	APKT 1003PDR-HM	APKT 1003R8T-FF	35355	16.00	2.2	2.2	A	0.10
HM90 F90AP D32-5-16	APKT 1003PDR-HM	APKT 1003R8T-FF	35355	16.00	2.2	2.2	A	0.10
HM90 F90AP D40-5-22	APKT 1003PDR-HM	APKT 1003R8T-FF	31623	22.00	1.9	1.9	A	0.19
HM90 F90AP D40-6-22	APKT 1003PDR-HM	APKT 1003R8T-FF	31623	22.00	1.9	1.9	A	0.18
HM90 F90AP D50-6-22	APKT 1003PDR-HM	APKT 1003R8T-FF	28284	22.00	1.4	1.4	A	0.34
HM90 F90AP D50-7-22	APKT 1003PDR-HM	APKT 1003R8T-FF	28284	22.00	1.4	1.4	A	0.35
HM90 F90AP D63-7-22 (1)	APKT 1003PDR-HM	APKT 1003R8T-FF	25198	22.00	1.0	1.0	B	0.52
HM90 F90AP D63-9-22	APKT 1003PDR-HM	APKT 1003R8T-FF	25198	22.00	1.0	1.0	B	0.52
HM90 F90AP D80-8-27 (1)	APKT 1003PDR-HM	APKT 1003R8T-FF	22361	27.00	0.9	0.9	B	0.94
HM90 F90AP D100-9-32 (1)	APKT 1003PDR-HM	APKT 1003R8T-FF	20100	32.00	0.7	0.7	B	1.51

• 1- with standard square insert • 2- with FF (fast feed) insert • For user guide, see pages 329-330,333-336

(1) For internal coolant through the holder, use a matching coolant set (should be ordered separately)

(2) Number of inserts (or edges for solid tool)

(3) Master insert identification

(4) Master insert identification 2

(5) Maximum RPM

(6) Maximum ramping angle

For inserts, see pages: • APKW 100304 PDR (PCD) (225)

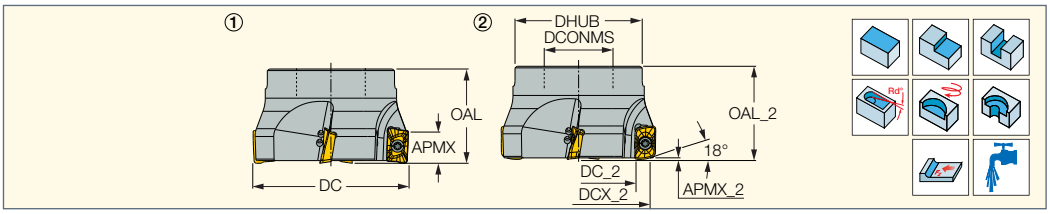
Spare Parts

Designation				
HM90 F90AP D32-3-16	SR 34-505/HG	SW4-SD	BLD T08/M7	SR M8X20DIN912
HM90 F90AP D32-5-16	SR 34-505/HG	SW4-SD	BLD T08/M7	SR M8X20DIN912
HM90 F90AP D40-5-22	SR 34-505/HG	SW4-SD	BLD T08/M7	SR M10X25 DIN912
HM90 F90AP D40-6-22	SR 34-505/HG	SW4-SD	BLD T08/M7	SR M10X25 DIN912
HM90 F90AP D50-6-22	SR 34-505/HG	SW4-SD	BLD T08/M7	SR M10X25 DIN912
HM90 F90AP D50-7-22	SR 34-505/HG	SW4-SD	BLD T08/M7	SR M10X25 DIN912
HM90 F90AP D63-7-22	SR 34-505/HG	SW4-SD	BLD T08/M7	
HM90 F90AP D63-9-22	SR 34-505/HG	SW4-SD	BLD T08/M7	
HM90 F90AP D80-8-27	SR 34-505/HG	SW4-SD	BLD T08/M7	
HM90 F90AP D100-9-32	SR 34-505/HG	SW4-SD	BLD T08/M7	

HELI2000

HM90 F90AP-AMT

90° Light Weight Face Cutters Carrying HM90 AP...T 1003 inserts



Designation	DC	DC_2	DCX_2	CICT(1)	APMX	APMX_2	OAL	OAL_2	DHUB	DCONMS	RMPX°(2)
HM90 F90AP D50-4-22-AMT	50.00	41.00	50.10	4	9.80	1.00	30.00	29.63	42.00	22.00	1.4
HM90 F90AP D63-6-22-AMT	63.00	54.00	63.10	6	9.80	1.00	31.00	30.63	48.00	22.00	1.0

Designation	RMPX°_2	MDN	MDX	MIID(3)	MIID_2(4)	Arbor	kg
HM90 F90AP D50-4-22-AMT	1.4	91.10	99.20	HM90 APCT 100302R-PDR	APKT 1003R8T-FF	A	0.13
HM90 F90AP D63-6-22-AMT	1.0	117.10	125.20	HM90 APCT 100302R-PDR	APKT 1003R8T-FF	A	0.20

• 1- with standard square insert • 2- with FF (fast feed) insert • For user guide, see pages 329-330,333-336

(1) Number of inserts (or edges for solid tool)

(2) Maximum ramping angle

(3) Master insert identification

(4) Master insert identification 2

For inserts, see pages: • APKW 100304 PDR (PCD) (225)

Spare Parts

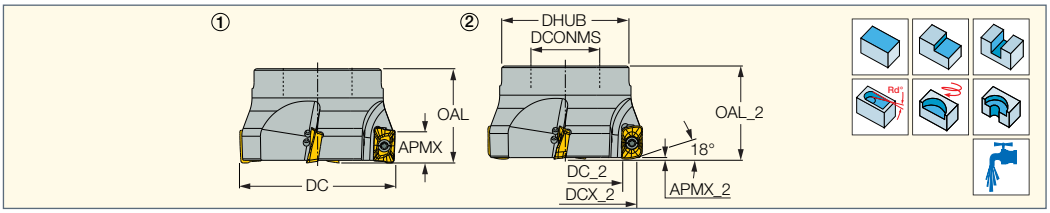
Designation			
HM90 F90AP-AMT	SR 34-505/HG(a)	SW4-SD	BLD T08/M7

(a) Recommended tightening torque: 1.2 Nxm

HELI2000 JET LINE

HM90 F90AP-10-JHP

90° JHP Face Mills Carrying HELI2000 and HELIMILL Inserts



Designation	DC	DC_2	DCX_2	CICT(1)	APMX	APMX_2	OAL	OAL_2	DHUB	DCONMS
HM90 F90AP D032-5-16-JHP	32.00	23.00	32.10	5	9.80	1.00	45.00	44.63	30.40	16.00
HM90 F90AP D040-6-16-JHP	40.00	31.00	40.10	6	9.80	1.00	40.00	39.63	38.40	16.00
HM90 F90AP D040-6-22-JHP	40.00	31.00	40.10	6	9.80	1.00	40.00	39.63	38.00	22.00
HM90 F90AP D050-7-22-JHP	50.00	41.00	50.10	7	9.80	1.00	50.00	49.63	48.00	22.00

Designation	MDN	MDX	RPMX(2)	MIID(3)	MIID_2(4)	RMPX°(5)	RMPX°_2	Arbor	kg
HM90 F90AP D032-5-16-JHP	55.10	63.20	35300	APKT 1003PDR-HM	APKT 1003R8T-FF	2.2	2.2	A	0.17
HM90 F90AP D040-6-16-JHP	71.10	79.20	31600	APKT 1003PDR-HM	APKT 1003R8T-FF	1.9	1.9	A	0.29
HM90 F90AP D040-6-22-JHP	71.10	79.20	31600	APKT 1003PDR-HM	APKT 1003R8T-FF	1.9	1.9	A	0.27
HM90 F90AP D050-7-22-JHP	91.10	99.20	28200	APKT 1003PDR-HM	APKT 1003R8T-FF	1.4	1.4	A	0.49

• 1- with standard square insert • 2- with FF (fast feed) insert • Use adaptation only with face coolant outlets

• For user guide, see pages 329-330,333-336

(1) Number of inserts (or edges for solid tool)

(2) Maximum RPM

(3) Master insert identification

(4) Master insert identification 2

(5) Maximum ramping angle

For inserts, see pages: • APKW 100304 PDR (PCD) (225)

Spare Parts

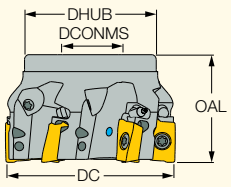
Designation				
HM90 F90AP D032-5-16-JHP	SR 34-505/HG(a)	SR PS 118-0416	BLD T08/M7	SW4-SD
HM90 F90AP D040-6-16-JHP	SR 34-505/HG	SR M8X25DIN912	BLD T08/M7	SW4-SD
HM90 F90AP D040-6-22-JHP	SR 34-505/HG(a)	SR PS 118-0273	BLD T08/M7	SW4-SD
HM90 F90AP D050-7-22-JHP	SR 34-505/HG(a)	SR PS 118-0271C	BLD T08/M7	SW4-SD

(a) Recommended tightening torque for this item: 1.2 Nxm

HELI2000

F90AD-SFR

Adjustable Face Mills (used mainly for PCD/CBN inserts)

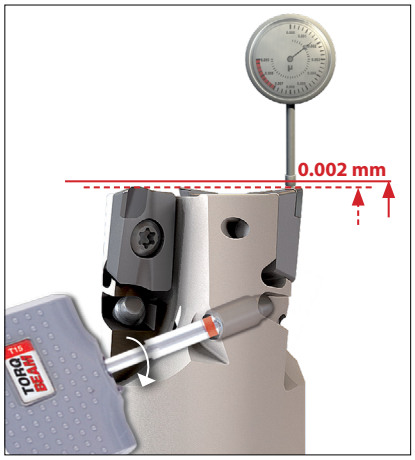


Designation	DC	CICT(1)	OAL	DHUB	DCONMS	Arbor	RPMX(2)	kg
F90AD D050-04-22-SFR	50.00	4	40.00	49.00	22.00	A	23000	0.31
F90AD D063-04-22-SFR	63.00	4	40.00	50.00	22.00	A	20600	0.43
F90AD D063-06-22-SFR	63.00	6	40.00	50.00	22.00	A	20600	0.49
F90AD D080-06-27-SFR	80.00	6	50.00	60.00	27.00	B	18200	0.89

- These tools may also be used for regular HELI2000 AD.. 1505... inserts, for applications that require precise frontal edge adjustment
- For user guide, see page 329-330,333-336

(1) Number of inserts (or edges for solid tool)
(2) Maximum RPM

For inserts, see pages: ADKW (CBN) (179) • ADKW (PCD) (225)



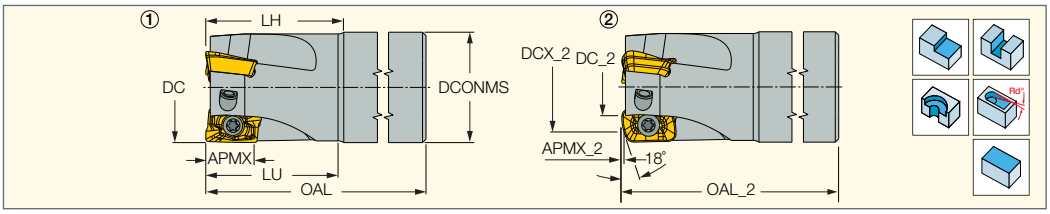
Spare Parts

Designation					
F90AD D050-04-22-SFR	SR 14-544/S	SR 11800782	BLD T15/S7	SW6-T-SH	SR M10X20DIN912
F90AD D063-04-22-SFR	SR 14-544/S	SR 11800782	BLD T15/S7	SW6-T-SH	SR M10X20DIN912
F90AD D063-06-22-SFR	SR 14-544/S	SR 11800782	BLD T15/S7	SW6-T-SH	SR M10X20DIN912
F90AD D080-06-27-SFR	SR 14-544/S	SR 11800782	BLD T15/S7	SW6-T-SH	

HELI2000

HM90 E90AD-15

90° Endmills Carrying HM90
ADKT-1505... Inserts



Designation	DC	DCX_2	DC_2	DCONMS	APMX	APMX_2	CICT(1)	OAL	OAL_2	LH	LU	RMPX°(2)	RMPX°_2
HM90 E90AD-D20-1-C20	20.00	20.50	7.26	20.00	14.30	1.50	1	110.00	109.74	35.0	34.0	3.0	3.0
HM90 E90AD-D25-2-C24-B	25.00	25.50	12.26	24.00	14.30	1.50	2	200.00	199.74	30.0	-	11.5	11.5
HM90 E90AD-D25-2-C25	25.00	25.50	12.26	25.00	14.30	1.50	2	110.00	109.74	35.0	34.0	11.5	11.5
HM90 E90AD-D25-2-C25-B	25.00	25.50	12.26	25.00	14.30	1.50	2	200.00	199.74	50.0	49.0	11.5	11.5
HM90 E90AD-D25-2-C25-C	25.00	25.50	12.26	25.00	14.30	1.50	2	110.00	109.74	35.0	34.0	11.5	11.5
HM90 E90AD-D25-2-C25-XL	25.00	25.50	12.26	25.00	14.30	1.50	2	150.00	149.74	35.0	34.0	11.5	11.5
HM90 E90AD-D25-2-W25	25.00	25.50	12.26	25.00	14.30	1.50	2	100.00	99.74	35.0	34.0	11.5	11.5
HM90 E90AD-D25-2-W25-C	25.00	25.50	12.26	25.00	14.30	1.50	2	100.00	109.74	35.0	34.0	11.5	11.5
HM90 E90AD-D25-2-W25-XL	25.00	25.50	12.26	25.00	14.30	1.50	2	150.00	149.74	70.0	69.0	11.5	11.5
HM90 E90AD-D32-2-C32	32.00	32.50	19.26	32.00	14.30	1.50	2	120.00	119.74	40.0	38.0	5.3	5.3
HM90 E90AD-D32-3-C31-B	32.00	32.50	19.26	31.00	14.30	1.50	3	250.00	249.74	30.0	-	5.3	5.3
HM90 E90AD-D32-3-C32	32.00	32.50	19.26	32.00	14.30	1.50	3	120.00	119.74	40.0	38.0	5.3	5.3
HM90 E90AD-D32-3-C32-B	32.00	32.50	19.26	32.00	14.30	1.50	3	250.00	249.74	50.0	48.0	5.3	5.3
HM90 E90AD-D32-3-C32-C	32.00	32.50	19.26	32.00	14.30	1.50	3	120.00	119.74	40.0	38.0	5.3	5.3
HM90 E90AD-D32-3-C32-XL	32.00	32.50	19.26	32.00	14.30	1.50	3	160.00	159.74	40.0	38.0	5.3	5.3
HM90 E90AD-D32-3-W32	32.00	32.50	19.26	32.00	14.30	1.50	3	110.00	109.74	40.0	38.3	5.3	5.3
HM90 E90AD-D32-3-W32-C	32.00	32.50	19.26	32.00	14.30	1.50	3	110.00	109.74	40.0	38.3	5.3	5.3
HM90 E90AD-D32-3-W32-XL	32.00	32.50	19.26	32.00	14.30	1.50	3	160.00	159.74	40.0	38.3	5.3	5.3
HM90 E90AD-D40-3-C40-B	40.00	40.50	27.26	40.00	14.30	1.50	3	250.00	249.74	50.0	48.0	4.0	4.0
HM90 E90AD-D40-3-W40-XL	40.00	40.50	27.26	40.00	14.30	1.50	3	200.00	199.74	80.0	78.0	4.0	4.0
HM90 E90AD-D40-4-C32	40.00	40.50	27.26	32.00	14.30	1.50	4	130.00	129.74	40.0	-	4.0	4.0
HM90 E90AD-D40-4-W32	40.00	40.50	27.26	32.00	14.30	1.50	4	115.00	114.74	40.0	-	4.0	4.0
HM90 E90AD-D40-4-W32-C	40.00	40.50	13.26	32.00	14.30	1.50	4	115.00	114.74	40.0	-	4.0	11.5

Designation	MDN	MDX	Shank(3)	RPMX(4)	CSP(5)	MIID_2(6)	kg			
HM90 E90AD-D20-1-C20	27.76	40.00	C	51586	0	ADCT 1505R8T-FF	0.24	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-C24-B	37.76	50.00	C	41967	0	ADCT 1505R8T-FF	0.67	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-C25	37.76	50.00	C	41967	0	ADCT 1505R8T-FF	0.37	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-C25-B	37.76	50.00	C	41967	0	ADCT 1505R8T-FF	0.71	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-C25-C	37.76	50.00	C	41967	1	ADCT 1505R8T-FF	0.34	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-C25-XL	37.76	50.00	C	41967	0	ADCT 1505R8T-FF	0.53	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-W25	37.76	50.00	W	41967	0	ADCT 1505R8T-FF	0.33	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-W25-C	37.76	50.00	W	41967	1	ADCT 1505R8T-FF	0.30	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D25-2-W25-XL	37.76	50.00	W	41967	0	ADCT 1505R8T-FF	0.51	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D32-2-C32	51.76	64.00	C	28924	0	ADCT 1505R8T-FF	0.68	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D32-3-C31-B	51.76	64.00	C	28924	0	ADCT 1505R8T-FF	1.41	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D32-3-C32	51.76	64.00	C	28924	0	ADCT 1505R8T-FF	0.67	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D32-3-C32-B	51.76	64.00	C	28924	0	ADCT 1505R8T-FF	1.48	SR 14-544/S	SW6-T-SH	BLD T15/M7
HM90 E90AD-D32-3-C32-C	51.76	64.00	C	28924	1	ADCT 1505R8T-FF	0.63	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D32-3-C32-XL	51.76	64.00	C	28924	0	ADCT 1505R8T-FF	0.92	SR 14-544/S	SW6-T-SH	BLD T15/M7
HM90 E90AD-D32-3-W32	51.76	64.00	W	28924	0	ADCT 1505R8T-FF	0.59	SR 14-544/S	SW6-T-SH	BLD T15/M7
HM90 E90AD-D32-3-W32-C	51.76	64.00	W	28924	1	ADCT 1505R8T-FF	0.56	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D32-3-W32-XL	51.76	64.00	W	28924	0	ADCT 1505R8T-FF	0.91	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D40-3-C40-B	67.76	80.00	C	25870	0	ADCT 1505R8T-FF	2.34	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D40-3-W40-XL	67.76	80.00	W	25870	0	ADCT 1505R8T-FF	1.81	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D40-4-C32	67.76	80.00	C	25870	0	ADCT 1505R8T-FF	0.82	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D40-4-W32	67.76	80.00	W	25870	0	ADCT 1505R8T-FF	0.73	SR 14-544/S	SW6-SD	BLD T15/M7
HM90 E90AD-D40-4-W32-C	39.76	52.00	W	25870	1	ADCT 1505R8T-FF	0.69	SR 14-544/S	SW6-SD	BLD T15/M7

• 1- with standard square insert • 2- with FF (fast feed) insert • For user guide, see pages 329-330,333-336

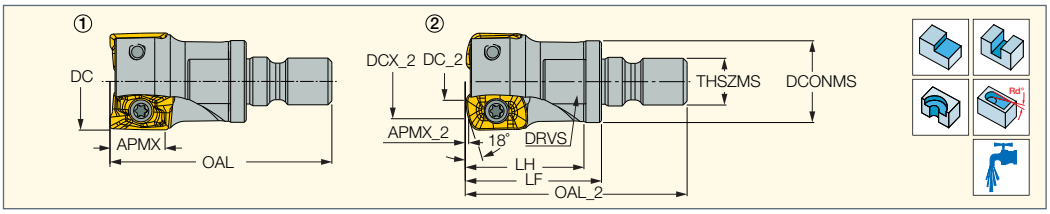
(1) Number of inserts (or edges for solid tool)
(2) Maximum ramping angle
(3) C-Cylindrical, W-Weldon
(4) Maximum RPM
(5) 0 - Without coolant supply, 1 - With coolant supply
(6) Master insert identification 2

For inserts, see pages: • ADKW (CBN) (179) • ADKW (PCD) (225)

HELI2000

HM90 E90AD-M-15

90° Endmills with a FLEXFIT Threaded Adaptation Carrying HM90 ADKT-1505... Inserts



Designation	DC	DC_2	DCX_2	CICT(1)	APMX	APMX_2	DCONMS	THSZMS	LH	LF	OAL	OAL_2	RMPX°(2)
HM90 E90AD-D25-2-M12	25.00	12.26	25.50	2	14.30	1.50	21.00	M12	30.8	35.00	57.00	56.74	11.5
HM90 E90AD-D32-3-M16	32.00	19.26	32.50	3	14.30	1.50	29.00	M16	40.0	40.00	65.00	64.74	5.3
HM90 E90AD-D40-4-M16	40.00	27.26	40.50	4	14.30	1.50	29.00	M16	40.0	40.00	65.00	64.74	4.0

Designation	RMPX°_2	MDN	MDX	MIID(3)	MIID_2(4)	RPMX(5)	DRVS(6)	TQ_3(7)	kg			
HM90 E90AD-D25-2-M12	11.5	37.76	50.00	ADKT 1505PDTR	ADCT 1505R8T-FF	41967	17.1	33	0.08	SR 14-544/S	SW6-T-SH	BLD T15/M7
HM90 E90AD-D32-3-M16	5.3	51.76	64.00	ADKT 1505PDTR	ADCT 1505R8T-FF	28924	25.1	40	0.16	SR 14-544/S	SW6-T-SH	BLD T15/M7
HM90 E90AD-D40-4-M16	4.0	67.76	80.00	ADKT 1505PDTR	ADCT 1505R8T-FF	25870	25.1	40	0.21	SR 14-544/S	SW6-SD	BLD T15/M7

- 1- with standard square insert • 2- with FF (fast feed) insert • For user guide see pages 329-330,333-336
- When mounting items with FLEXFIT threaded adaptation to their holders, the mating surfaces and threaded areas must be thoroughly cleaned.

Apply appropriate tightening torque to eliminate a gap between the mating faces. Estimated torque values are specified in the TQ_3 parameter

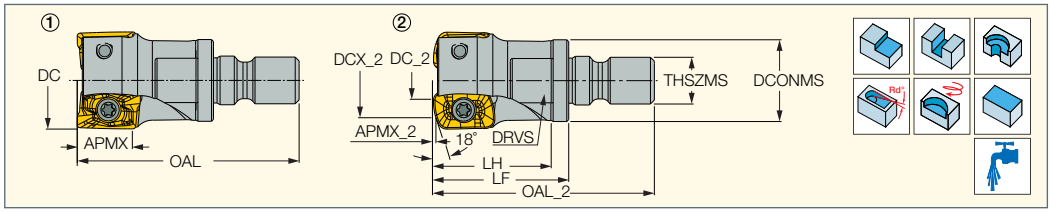
(1) Number of inserts (or edges for solid tool)
(2) Maximum ramping angle
(3) Master insert identification
(4) Master insert identification 2
(5) Maximum RPM
(6) Torque key size
(7) Tool tightening torque Nxm (lbfxin)

For inserts, see pages: • ADKW (CBN) (179) • ADKW (PCD) (225)

HELI2000 JET LINE

HM90 E90AD-M-15-JHP

90° JHP Endmills With a FLEXFIT Threaded Adaptation Carrying HELI2000 and HELIMILL Inserts



Designation	DC	DC_2	DCX_2	CICT(1)	APMX	APMX_2	OAL	OAL_2	RMPX°(2)	RMPX°_2	LF	THSZMS
HM90 E90AD D32-3-M16-JHP	32.00	19.26	32.50	3	14.30	1.50	65.00	64.74	5.3	5.3	40.00	M16

Designation	MDN	MDX	RPMX(3)	DRVS(4)	DCONMS	TQ_3(5)	MIID(6)	MIID_2(7)	kg
HM90 E90AD D32-3-M16-JHP	51.76	64.00	28924	25.0	30.50	40	ADKT 1505PDTR	ADCT 1505R8T-FF	0.17

- 1- with standard square insert • 2- with FF (fast feed) insert • For user guide see pages 329-330,333-336
- When mounting items with FLEXFIT threaded adaptation to their holders, the mating surfaces and threaded areas must be thoroughly cleaned.

Apply appropriate tightening torque to eliminate a gap between the mating faces. Estimated torque values are specified in the TQ_3 parameter

(1) Number of inserts (or edges for solid tool)
(2) Maximum ramping angle
(3) Maximum RPM
(4) Torque key size
(5) Tool tightening torque Nxm (lbfxin)
(6) Master insert identification
(7) Master insert identification 2

For inserts, see pages: • ADKW (CBN) (179) • ADKW (PCD) (225)

Spare Parts

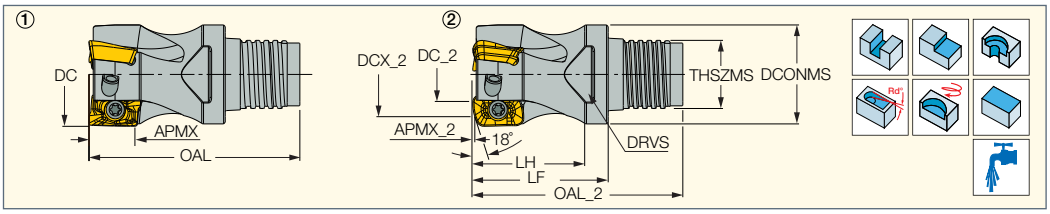
Designation				
HM90 E90AD-M-15-JHP	SR 14-544/S	SR 14-544/S(a)	BLD T15/M7	SW6-T-SH

(a) Recommended tightening torque for this item: 4.8 Nxm

HELI2000 JET LINE

HM90 E90AD-MM-15-JHP

90° JHP Endmills with a MULTI-MASTER Threaded Adaptation Carrying HELI2000 and HELIMILL Inserts



Designation	DC	DC_2	DCX_2	CICT(1)	APMX	APMX_2	OAL	OAL_2	DCONMS	RMPX°(2)	RMPX°_2	LF
HM90 E90AD D25-2-MMT15JHP	25.00	12.26	25.00	2	14.30	1.50	56.30	56.04	24.00	11.5	11.5	39.30
HM90 E90AD D32-3-MMT21JHP	32.00	19.26	32.50	3	14.30	1.50	63.00	62.74	30.50	5.3	5.3	39.90

Designation	RPMX(3)	THSZMS	MDN	MDX	TQ_3(4)	DRVS(5)	MIID(6)	MIID_2(7)	kg
HM90 E90AD D25-2-MMT15JHP	41967	T15	37.76	50.00	40	20.0	ADKT 1505PDTR	ADKT 1505R8T-FF	0.10
HM90 E90AD D32-3-MMT21JHP	28924	T21	51.76	64.00	40	24.0	ADKT 1505PDTR	ADKT 1505R8T-FF	0.26

- 1- with standard square insert • 2- with FF (fast feed) insert • Do not apply lubricant to the MULTI-MASTER threaded connection
- For user guide see pages 329-330,333-336

(1) Number of inserts (or edges for solid tool)
(2) Maximum ramping angle
(3) The maximum cutting speed (RPM) for the cutting head assembled on the shank should be the lower parameter (RPMX) of either the cutting head or the shank
(4) Tool tightening torque Nxm (lbfxin)
(5) Torque key size
(6) Master insert identification
(7) Master insert identification 2

For inserts, see pages: • ADKW (CBN) (179) • ADKW (PCD) (225)

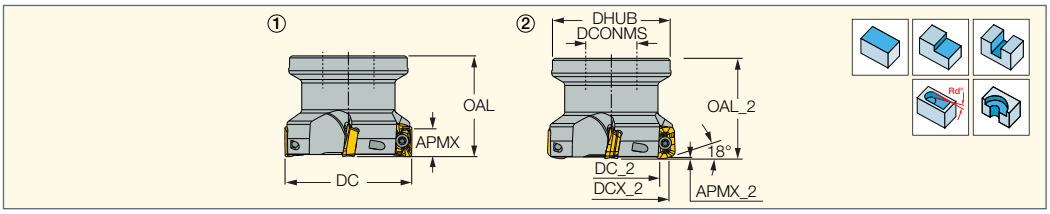
Spare Parts

Designation			
HM90 E90AD-MM-15-JHP	SR 14-544/S	BLD T15/M7	SW6-T-SH

HELI2000

HM90 F90A-15

90° Face Mills Carrying HM90
ADKT 1505... Inserts



Designation	DC	DC_2	DCX_2	APMX	APMX_2	OAL	OAL_2	DHUB	DCONMS	RMPX°(2)	RMPX°_2	Arbor
HM90 F90A D 40-3-16	40.00	27.30	40.50	14.30	1.50	40.00	39.74	38.60	16.00	4.0	4.0	A
HM90 F90A D 40-4-16	40.00	27.30	40.50	14.30	1.50	40.00	39.74	38.60	16.00	4.0	4.0	A
HM90 F90A D 50-3-22	50.00	37.30	50.50	14.30	1.50	40.00	39.74	48.00	22.00	2.6	2.6	A
HM90 F90A D 50-5-22	50.00	37.30	50.50	14.30	1.50	40.00	39.74	48.00	22.00	2.6	2.6	A
HM90 F90A D 63-4-22	63.00	50.30	63.50	14.30	1.50	40.00	39.74	59.20	22.00	2.0	2.0	A
HM90 F90A D 63-6-22	63.00	50.30	63.50	14.30	1.50	40.00	39.74	59.20	22.00	2.0	2.0	A
HM90 F90A D 80-5-27 (1)	80.00	67.30	80.50	14.30	1.50	50.00	49.74	70.00	27.00	0.8	0.8	B
HM90 F90A D 80-7-27 (1)	80.00	67.30	80.50	14.30	1.50	50.00	49.74	70.00	27.00	0.8	0.8	B
HM90 F90A D100-6-32 (1)	100.00	87.30	100.50	14.30	1.50	50.00	49.74	78.00	32.00	0.7	0.7	B
HM90 F90A D100-8-32 (1)	100.00	87.30	100.50	14.30	1.50	50.00	49.74	78.00	32.00	0.7	0.7	B
HM90 F90A D125-9-40 (1)	125.00	112.30	125.50	14.30	1.50	63.00	62.74	90.00	40.00	0.5	0.5	B

Designation	MDN	MDX	RPMX(3)	MIID(4)	MIID_2(5)	kg
HM90 F90A D 40-3-16	67.80	80.00	25870	ADKT 1505PDTR	ADKT 1505R8T-FF	0.20
HM90 F90A D 40-4-16	67.80	80.00	25870	ADKT 1505PDTR	ADKT 1505R8T-FF	0.19
HM90 F90A D 50-3-22	87.80	100.00	23139	ADKT 1505PDTR	ADKT 1505R8T-FF	0.32
HM90 F90A D 50-5-22	87.80	100.00	23139	ADKT 1505PDTR	ADKT 1505R8T-FF	0.30
HM90 F90A D 63-4-22	113.80	126.00	20614	ADKT 1505PDTR	ADKT 1505R8T-FF	0.55
HM90 F90A D 63-6-22	113.80	126.00	20614	ADKT 1505PDTR	ADKT 1505R8T-FF	0.52
HM90 F90A D 80-5-27 (1)	147.80	160.00	18293	ADKT 1505PDTR	ADKT 1505R8T-FF	0.91
HM90 F90A D 80-7-27 (1)	147.80	160.00	19293	ADKT 1505PDTR	ADKT 1505R8T-FF	0.88
HM90 F90A D100-6-32 (1)	187.80	200.00	16362	ADKT 1505PDTR	ADKT 1505R8T-FF	1.54
HM90 F90A D100-8-32 (1)	187.80	200.00	16362	ADKT 1505PDTR	ADKT 1505R8T-FF	1.49
HM90 F90A D125-9-40 (1)	237.80	250.00	14635	ADKT 1505PDTR	ADKT 1505R8T-FF	2.95

• 1- with standard square insert • 2- with FF (fast feed) insert • For user guide, see pages 329-330,333-336

(1) For internal coolant through the holder, use a matching coolant set (should be ordered separately)

(2) Maximum ramping angle

(3) Maximum RPM

(4) Master insert identification

(5) Master insert identification 2

For inserts, see pages: • ADKW (CBN) (179) • ADKW (PCD) (225)

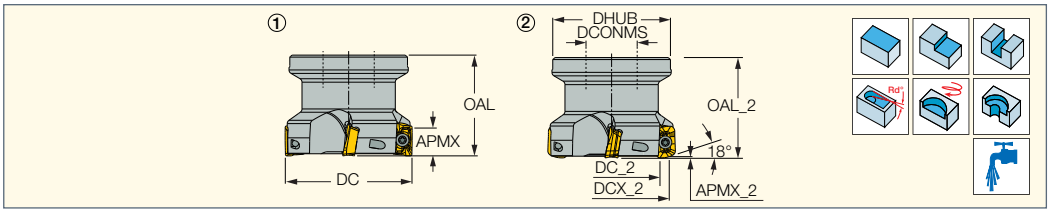
Spare Parts

Designation				
HM90 F90A D 40-3-16	SR 14-544/S	BLD T15/M7	SW6-T-SH	SR M8X25DIN912
HM90 F90A D 40-4-16	SR 14-544/S	BLD T15/M7	SW6-T-SH	SR M8X25DIN912
HM90 F90A D 50-3-22	SR 14-544/S	BLD T15/M7	SW6-T-SH	SR M10X25 DIN912
HM90 F90A D 50-5-22	SR 14-544/S	BLD T15/M7	SW6-T-SH	SR M10X25 DIN912
HM90 F90A D 63-4-22	SR 14-544	BLD T15/M7	SW6-T-SH	SR M10X25 DIN912
HM90 F90A D 63-6-22	SR 14-544	BLD T15/M7	SW6-T-SH	SR M10X25 DIN912
HM90 F90A D 80-5-27	SR 14-544	BLD T15/M7	SW6-T-SH	
HM90 F90A D 80-7-27	SR 14-544	BLD T15/M7	SW6-T-SH	
HM90 F90A D100-6-32	SR 14-544	BLD T15/M7	SW6-T-SH	
HM90 F90A D100-8-32	SR 14-544	BLD T15/M7	SW6-T-SH	
HM90 F90A D125-9-40	SR 14-544	BLD T15/M7	SW6-T-SH	

HELI2000 JET LINE

HM90 F90A-15-JHP

90° JHP Face Mills Carrying
HELI2000 and HELIMILL Inserts



Designation	DC	DC_2	DCX_2	CICT(1)	APMX	APMX_2	OAL	OAL_2	DHUB	DCONMS
HM90 F90A D050-5-22-JHP	50.00	37.30	50.50	5	14.30	1.50	50.00	39.74	48.00	22.00
HM90 F90A D063-6-22-JHP	63.00	50.30	63.50	6	14.30	1.50	50.00	49.74	48.00	22.00

Designation	RPMX(2)	MDN	MDX	MIID(3)	MIID_2(4)	RMPX°(5)	RMPX°_2	Arbor	kg
HM90 F90A D050-5-22-JHP	23100	87.80	100.00	ADKT 1505PDTR	ADKT 1505R8T-FF	2.6	2.6	A	0.50
HM90 F90A D063-6-22-JHP	20600	113.80	126.00	ADKT 1505PDTR	ADKT 1505R8T-FF	2.0	2.0	A	0.76

- 1- with standard square insert • 2- with FF (fast feed) insert • Use adaptation only with face coolant outlets
- For user guide, see pages 329-330,333-336

(1) Number of inserts (or edges for solid tool)
(2) Maximum RPM
(3) Master insert identification
(4) Master insert identification 2
(5) Maximum ramping angle

For inserts, see pages: • ADKW (CBN) (179) • ADKW (PCD) (225)

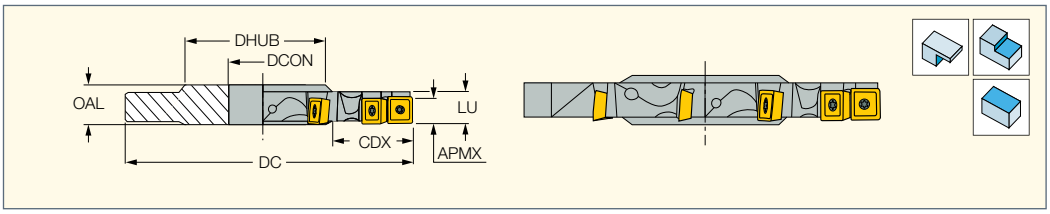
Spare Parts

Designation				
HM90 F90A D050-5-22-JHP	SR 14-544/S(a)	SR PS 118-0273	BLD T15/M7	SW6-T-SH
HM90 F90A D063-6-22-JHP	SR 14-544(a)	SR PS 118-0273	BLD T15/M7	SW6-T-SH

(a) Recommended tightening torque for this item: 4.8 Nxm

ISCARMILL

SSB
Single-Side Cutting, Disk
Type Slotting Cutters



Designation	APMX	DC	CICT(1)	CDX(2)	DHUB	DCONMS	LU	OAL		
SSB D100-12-32-R/L10	9.00	100.00	9	26.00	47.00	32.00	12.00	16.00	SR 14-544/S	T-15/51
SSB D125-12-40-R/L10	9.00	125.00	11	35.00	55.00	40.00	12.00	16.00	SR 14-544/S	T-15/51
SSB D160-16-40-R/L10	9.00	160.00	13	52.00	55.00	40.00	16.00	20.00	SR 14-544/S	T-15/51

(1) Number of inserts (or edges for solid tool)
(2) Cutting depth maximum

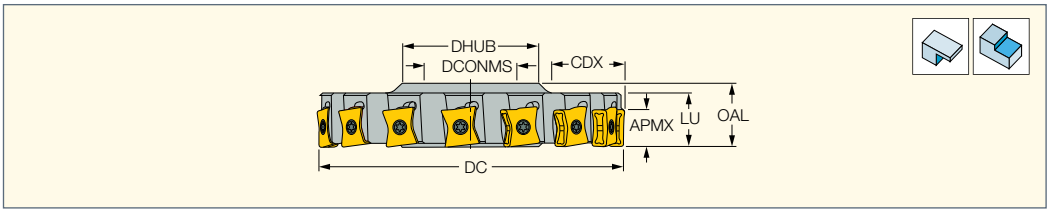
For inserts, see pages: • SPGW (CBN) (159) • SPGW (PCD) (208)

Tool Diameter						Width of Cutter										Type of Insert
80	100	125	160	200	250	8	10	12	14	16	17.5	18	20	22	24	25	
	●	●						✓									QPMT 1004 XPMT 1004 SPMT 1004(1) (1)For R.H. tools only
			●							✓							
●	●	●	●											✓			LNKX 1506 LNMT 1506 LNHT 1506...HT
				●											✓		

● Without seat

TANGMILL TANGENTIAL LINE

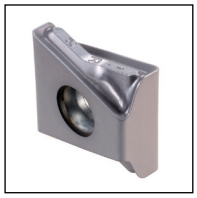
SSB-LN15-R/L
Single-Side Cutting, Disk
Type Slotting Cutters



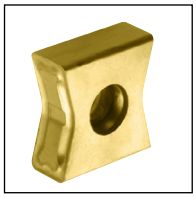
Designation	DC	CICT(1)	CDX(2)	APMX	DHUB	DCONMS	LU	OAL	kg			
SSB D080-22-27-LN15-L	80.00	10	18.00	14.00	42.00	27.00	22.00	24.00	0.56	SR 34-535	BLD T15/M7	SW6-T-SH
SSB D080-22-27-LN15-R	80.00	10	18.00	14.00	42.00	27.00	22.00	24.00	0.57			
SSB D100-22-32-LN15-L	100.00	12	26.00	14.00	48.00	32.00	22.00	26.00	0.95	SR 34-535	BLD T15/M7	SW6-T-SH
SSB D100-22-32-LN15-R	100.00	12	26.00	14.00	48.00	32.00	22.00	26.00	0.96			
SSB D125-22-40-LN15-L	125.00	15	35.00	14.00	56.00	40.00	22.00	26.00	1.51	SR 34-535	BLD T15/M7	SW6-T-SH
SSB D125-22-40-LN15-R	125.00	15	35.00	14.00	56.00	40.00	22.00	26.00	1.53			
SSB D160-22-40-LN15-L	160.00	20	52.00	14.00	56.00	40.00	22.00	26.00	2.64	SR 34-535	BLD T15/M7	SW6-T-SH
SSB D160-22-40-LN15-R	160.00	20	52.00	14.00	56.00	40.00	22.00	26.00	2.66			
SSB D200-24-50-LN15-L	200.00	25	65.00	14.00	70.00	50.00	24.00	28.00	4.66	SR 34-535	BLD T15/M7	SW6-T-SH
SSB D200-24-50-LN15-R	200.00	25	65.00	14.00	70.00	50.00	24.00	28.00	4.67			

• Note: Left-hand cutters are designated by a yellow groove
(1) Number of inserts (or edges for solid tool)
(2) Cutting depth maximum

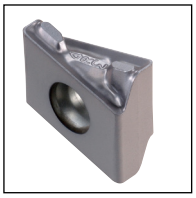
For inserts, see pages: • LNAW-15 (CBN) (180)



LNMT 1506PTNT-HT
R.H./L.H.



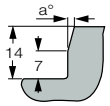
LNKX 1506...
LNMT 1506...
R.H./L.H.



LNMT 1506PN-R-HT
R.H. only

Gang-Mill Assembly
SDN and left-hand SSB cutters feature two keyways. It is recommended to assemble gang-mills with alternating keyway position. This practice reduces vibration.

90° lead angle cutter
For DC=80 lead angle cutter a=6°
For DC≥100 lead angle cutter a=4.5°



USER GUIDE

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Grade Comparison Chart

Bidemics / Ceramics

	ISCAR	Greenleaf	Kennametal	Kyocera	Sandvik	Ceramtec	Ssangyong	Sumiotomo	TaeguTec	Tungaloy	Widia	Walter	Ceratizit	Valenite	Hertel	Newcomer	Romay
Cast Iron	IN18	GEM19	KY1310 KY1615	KA30	CC6190 CC650		SZ200 SZ300		AB120 AW20		CW2015		CTN3105 CTS3105		AC5	NP5200	CC10
	IN6 IN10	GEM7	KY1310 KY1320 KY1615 KY3400	A65 A66N PT600M	CC620 CC650 CC6050	SN60 SN80 SH2	SD200 ST100 ST300 ST500 SD200 TA300 TC300	NB90S	AB30	LX11 LX21 CX710	CW2015 CW5025	WSN10	CTN3105 CTM3110 CTI3105 CTN3110 CTS3105	Q32	HT610CA MC2	NP5000	CC20 CC30
	IS26 IS45 IS45C	CSN100 CSN200 GSN100 HSN100 HSN200	KY3000 KY3400 KY3500 KYK25 KYK35 KY4400 KYK10 KY1320	CS7050 KS500 KS6000 KS6050	CC1690 CC6090 CC6190	SL506 SL508 SL550C SL554C SL654 SL808 SL854C	SN26 SN300 SN400 SN500 SN600 SN700 SN800	NS260 NS260C SN2000K SN2100K	AS10 AS500 SC10 AW20 AB30 AB20	CX710 FX105	CW5025	WSN10	CTM3110 CTN3110	VPQ130 VPQ135			CC510 CC513 CC514 CC514SC CC515 CC516 CC516SC
Heat Resistant Alloy	IS05 IS10																
	IW10	WG300 WG600 WG700	KY1525 KY4300		CC670		SW400 SW500 SW700 SW800	WX1500 WX120	TC430		CW3020						CC60
	IS14 IS15 IS45 IS55	XSYTIN-1	KY1540 KY2100 KYS25 KYS30 KYSP30 KYSM10	CF1 KS6030 KS6040	CC6060 CC650 CC6065		SN800 SN900	WX2500 WX2000	AS20	TW43 TS200 TS300							CC5477
Hardened Material	IN10 IN16 IN16C IN20	GEN7	KY1615 KY4400	A65 A66N KT66 PT600M	CC6050 CC650 CC6190		ST500 TM300 TC100 TC300	NB90S NB150H	AW120 AB30 AB20 AB2010	LX11	CW2015		CTS3105	Q35 VPZ205 VPZ215	HT610CA		CC30SC
	IW10	WG300 WG600 WG700	KY4300 KYS25		CC670		SW400 SW500 SW700 SW800				CW2015		CTS3105				

* Please note that details displayed above depict their respective owner's publications, as made publicly available by each at the time of producing this table. Sources for such publications are documented.

Bidemics / CBN

	ISCAR	Kennametal	Kyocera	Mitsubishi	Sandvik	Seco	Ceramtec	Widia	Walter	Ceratizit	Ssangyong	Sumiotomo	TaeguTec	Tungaloy	Dijet	Hitachi
Cast Iron	BI30H BI30HC BI30K BI30KC	KB1345 KB1630 KB5630 KB9610 KB9640 KB1340	KBN60M KBN65B KBN900	BC5030 MB710 MB730 MB5015 MBS140	CB7525 CB7925	CBN200 CBN300 CBN400C CBN500 CBN600	WBN100 WBN105 WBN115 WBN120 WBN750	WBH10C WBK40U WBK45U	WCB50 WCB80	TA100 TA120 TA201 CTL3215	SBN1000 SBN1600	BN500 BN600 BN700 BNS800	KB90 KB90A TB650 TB670 TB730	BX470 BX480 BX850 BX870 BX90S BX910 BX930 BX950 BXC90	JBN330 JBN795	BH200 BH250
Heat Resistant Alloy	IS02															
	BI05S BI15S	KB1340 KB1630 KB5630	KBN65B KBN65M	MB730	CB7050	CBN170 CBN200		WBK45U	WCB80	TA201		BN7500	KB90 TB730	BX470 BX480		
Hardened Material	BI05H BI05HC BI15H BI15HC BI25H BI25HC BI30H BI30HC	KB1340 KB1610 KB1625 KB5610 KB5625 KB5630 KB9610 KB9640	KBN05M KBN10C KBN10M KBN25C KBN25M KBN30M KBN35N KBN510 KBN525 KBN900	BC8110 BC8020 B8120 MB810 MB8025 MBC010 MBC020 MB825 MB835	CB20 CB50 CB7015 CB7025 CB7525	CBN10 CBN050C CBN100 CBN150 CBN160P CBN170 CBN200 CBN300P CBN350	WBN500 WBN550 WBN600 WBN650	WBH10C WBH10P WBH10U WBH25P WBH40C	WCB30 WCB50 WCB80	CTL3215 TA100 TA201	SBN1000 SBN2000 SBN4000	BN250 BN300 BN350 BN1000 BN2000 BNC80 BNC100 BNC150 BNC160 BNC200 BNC300 BNC2010 BNC2020 BNX10 BNX20 BNX25 BNX300	KB50 TB610 TB650 TB670	BXM10 BXA10 BX330 BX530 BXM20 BXA20 BX360 BX380	JBN245 JBN300 JBN330	BH200 BH250

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Sources for such publications are documented.

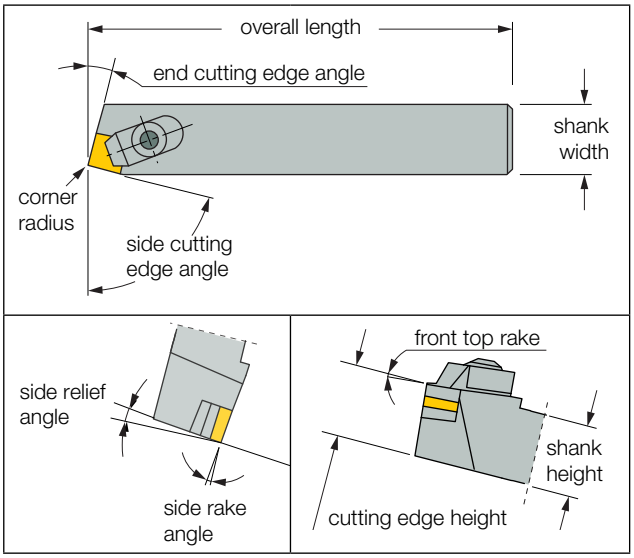
PCD

	ISCAR	Kennametal	Kyocera	Mitsubishi	Sandvik	Seco	Ssangyong	Sumiotomo	Widia	Walter	Ceratizit	TaeguTec	Tungaloy	Dijet	Ingersoll
Non-Ferrous Material	ID4 ID5 ID8	KD1400 KD1405 KD1425 KD1410 KD1415 KD1425	KPD001 KPD010 KPD230	MD205 MD220 MD230	CD10 CD1810	PD10 PD20 PD30	SPD1000 SPD2000 SPD3000	DA10 DA90 DA150 DA200 DA1000 DA2200	WDN25U	WCD10	CTD4110 CTD4125 CTD4205	KP100 KP300 KP500	DX110 DX120 DX140 DX160 DX180	JDA10 JDA30 JDA40 JDA715 JDA735 JDA745	IN90D

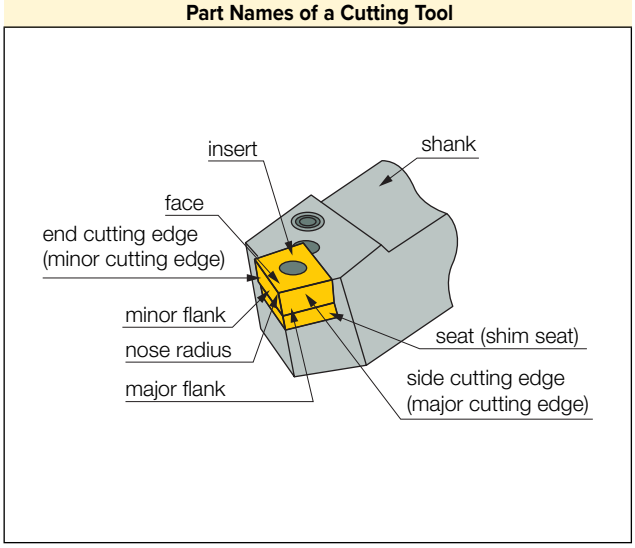
* Please note that details displayed above depict their respective owner's publications, as made publicly available by each at the time of producing this table.
Sources for such publications are documented.

Turning Tools Terminology

Toolholder Part Names



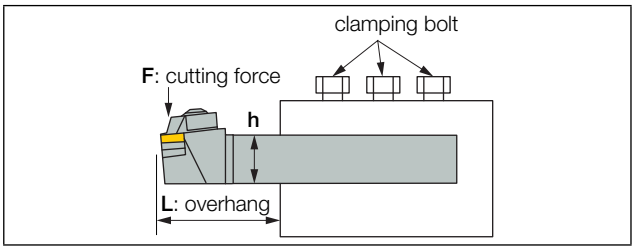
Part Names of a Cutting Tool



Holder Rigidity

Toolholder Deflection

$$\delta = \frac{4 \times F \times L^3}{E \times b \times h^3} = \frac{4 \times K_c \times f \times L^3}{E \times b \times h^3}$$

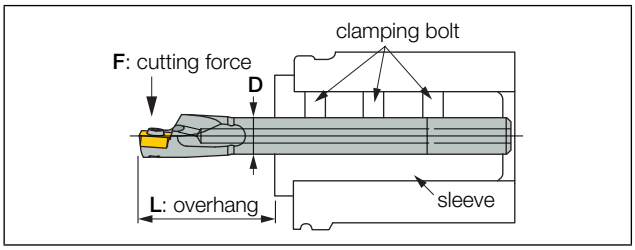


Symbol	Term	Unit
δ	deflection amount	mm
b	shank width	mm
h	shank height	mm
E	young's modulus	N / mm²
a_p	depth of cut	mm
f	feed	mm/rev
K_c	specific cutting force	N / mm²
L	overhang	mm
F	cutting force	N

(F = $K_c \times a_p \times f$)

Boring Bar Deflection

$$\delta = \frac{64 \times F \times L^3}{3 \times E \times \pi \times D^4} = \frac{64 \times K_c \times f \times L^3}{3 \times E \times \pi \times D^4}$$



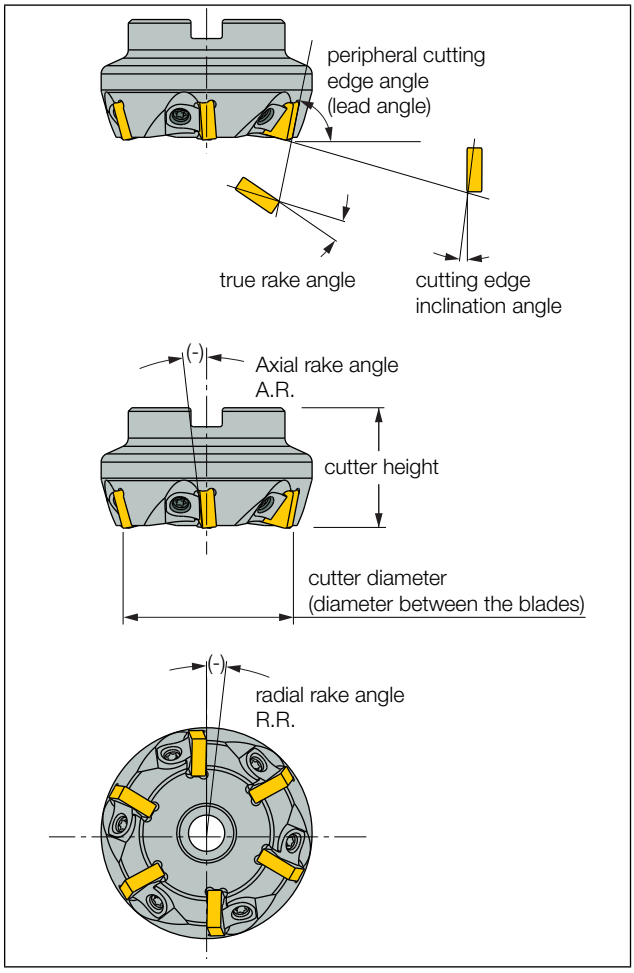
Symbol	Term	Unit
δ	deflection amount	mm
D	shank width	mm
E	young's modulus	N / mm²
a_p	depth of cut	mm
f	feed	mm/rev
K_c	specific cutting force	N / mm²
L	overhang	mm
F	cutting force	N
π	Pi (3.14)	

(F = $K_c \times a_p \times f$)

An important factor in improving the rigidity of a toolholder is to ensure the overhang of the tool shank is as short as possible.

Milling Cutters Terminology

Milling Cutter Terminology

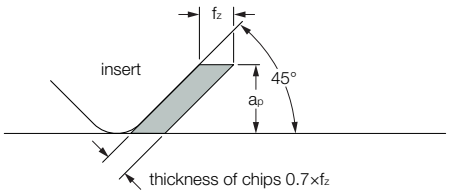


Functions of Each Cutting Edge Angle

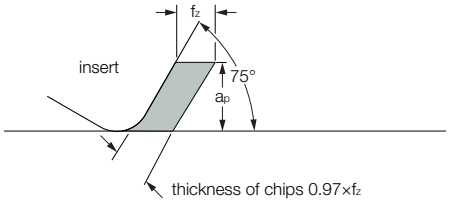
Name	Function	Effects
radial rake angle: R.R.	controls the direction of chip evacuation and cutting force	negative (–): excels in chip control performance
axial rake angle: A.R.	controls the direction of chip evacuation and cutting force	positive (+): excels in cutting performance and bue resistance
lead angle	controls the thickness and evacuation direction of chips	larger lead angles decrease the thickness of chips and relieves cutting load
true rake angle	actual rake angle	larger angles excel in cutting performance and bue resistance, but lower the cutting edge strength smaller angles increase the cutting edge strength but lower the bue resistance
cutting edge tilt angle	controls the direction of chip evacuation	larger angles excel in chip control performance and relieve cutting load, but lower the strength of the insert corner

Functions of Each Angle

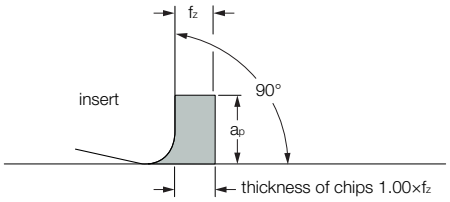
Lead Angle: Relationship of This Angle and Chip Thickness



lead angle: 45 degrees

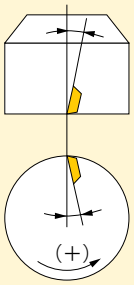
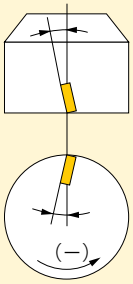
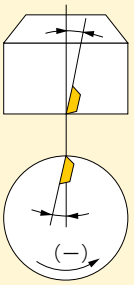


lead angle: 75 degrees



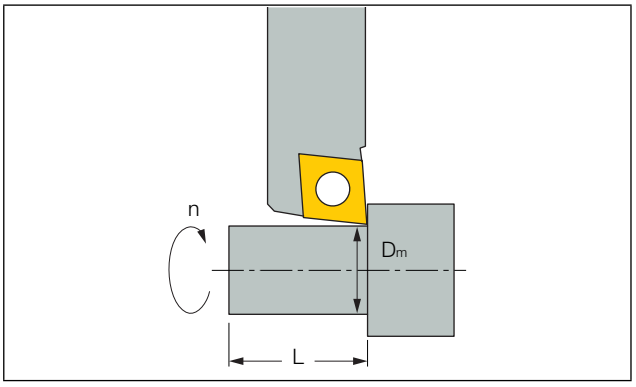
lead angle: 90 degrees

Rake Angle: Combinations and Characteristics

Combinations of the Angles for Basic Cutting Edge Shapes		(+) Axial rake angle: positive	(–) Axial rake angle: negative	(+) Axial rake angle: positive
		 Radial rake angle: positive	 Radial rake angle: negative	 Radial rake angle: negative
		Double-Positive Cutting Edge Shape (DP Edge Shape)	**Double-Negative Cutting Edge Shape (DN Edge Shape)**	**Negative-Positive Cutting Edge Shape (NP Edge Shape)**
Radial Rake Angle (R.R.)		positive (+)	negative (–)	negative (–)
Axial Rake Angle (A.R.)		positive (+)	negative (–)	positive (+)
Insert Specification		positive (single side used)	negative (both sides used)	positive (single side used)
Work Material	**Steel**	●		●
	Cast Iron		●	●
	Aluminum Alloy	●		

Calculation Formula for Turning

Calculating the Cutting Speed



Rotation Speed

$$V_c \text{ (m / min)} = \frac{\pi \times D_m \times n}{1000}$$

Calculating the Revolution Speed from the Cutting Speed

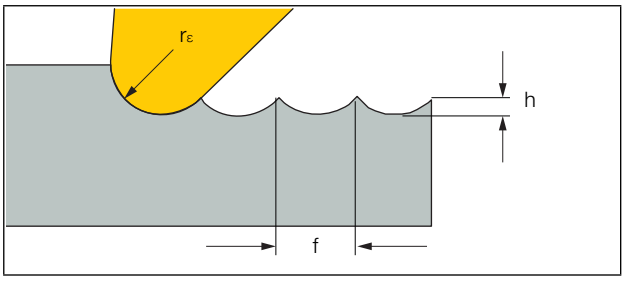
$$n \text{ (min}^{-1}\text{)} = \frac{1000\ V_c}{\pi \times D_m}$$

Vc - cutting speed (m / min)
Dm - machining diameter (mm)
n - spindle speed (min^{-1})
π - Pi (3.14)

Example: Obtaining a cutting speed for machining a Workpiece of 200 mm diameter at the spindle speed of 1,000 min^{-1}:

$$V_c = \frac{\pi \times 200 \times 1000}{1000} = 628 \text{ (m / min)}$$

Calculating the Theoretical Surface Roughness



$$h \text{ (µm)} = \frac{f_2}{8r_\varepsilon} \times 1000$$

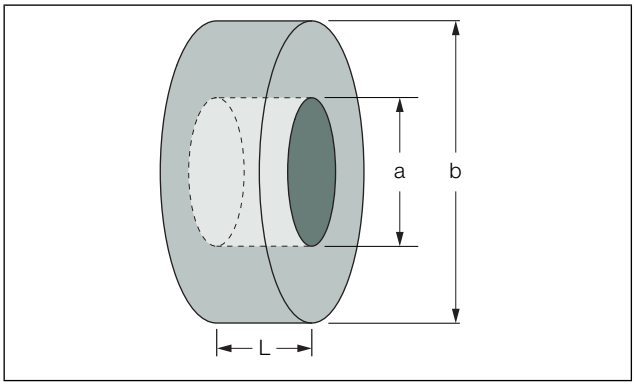
h - theoretical surface roughness (µm)
f - feed (mm/rev)
rε - corner radius (mm)

Example: Obtaining the theoretical surface roughness when machining with an insert having 0.8 corner radius at a feed rate of 0.1 mm/rev:

$$h = \frac{0.1^2}{8 \times 0.8} \times 1000 = 1.56 \text{ (µm)}$$

Guidelines for Actually Finished Surface Roughness
Steel type work: Theoretical surface roughness × 1.5 to 3
Cast iron type work: Theoretical surface roughness × 3 to 5

Calculating the Cutting Time



Calculating the Cutting Time for OD (ID) Machining

$$T \text{ (min)} = \frac{L}{f \times n}$$

T - cutting time (min)
L - cutting length (mm)
f - feed (mm/rev)
n - spindle speed (min^{-1})

Calculating the Cutting Time for Facing

$$T \text{ (min)} = \frac{\pi \times (a^2 - b^2)}{4000 \times V_c \times f}$$

T - cutting time (min)
Vc - cutting speed (m/min)
f - feed (mm/rev)
π - Pi (3.14)

Example: Obtaining a cutting time for machining of work to be cut 100 mm long at the spindle speed of 1,000 min^{-1} and at a feed rate of 0.1 mm/rev:

$$T = \frac{100}{0.1 \times 1000} = 1 \text{ (min)}$$

Calculating the Metal Removal Rate

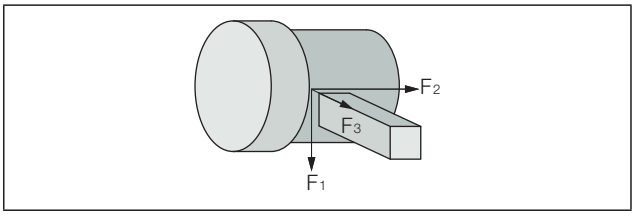
$$Q = V_c \times f \times a_p$$

Q - metal removal rate (cm^3 / min)
Vc - cutting speed (m / min)
ap - feed (mm/rev)
f - depth of cut (mm)

Example: Obtaining the volume of chips evacuated per minute for machining at a cutting speed of 700 m / min, feed of 0.4 mm/rev, and a depth of cut of 2 mm

$$Q = 700 \times 0.4 \times 2 = 560 \text{ (cm}^3\text{ / min)}$$

Calculating the Cutting Force



F_1 - principal cutting force
F_2 - feed force
F_3 - thrust force

$$F_{(N)} = K_c \times a_p \times f$$

F - cutting force (N)
K_c - specific cutting force (N / mm^2)*
a_p - depth of cut (mm)
f - feed (mm/rev)

* See the table below.

Example: Calculating the cutting force for gray cast iron cut at the feed rate of 0.2 mm/rev and with a depth of cut of 3 mm:

$$F = 1800 \times 3 \times 0.2 = 1080(N)$$

Calculating the Power Required

$$P_{c\ (kW)} = \frac{V_c \times f \times a_p \times K_c}{60 \times 10^3 \times \eta}$$

P_c - required power (kW)
V_c - cutting speed (m / min)
f - feed (mm/rev)
a_p - depth of cut (mm)
K_c - specific cutting force (n / mm^2) *
η - mechanical efficiency

* See the table below.

Example: Calculating the cutting power for the machining of gray cast iron at a cutting speed of 700 m / min, feed rate of 0.4 mm/rev, and with a depth of cut of 2 mm (with 0.8 set as the mechanical efficiency)

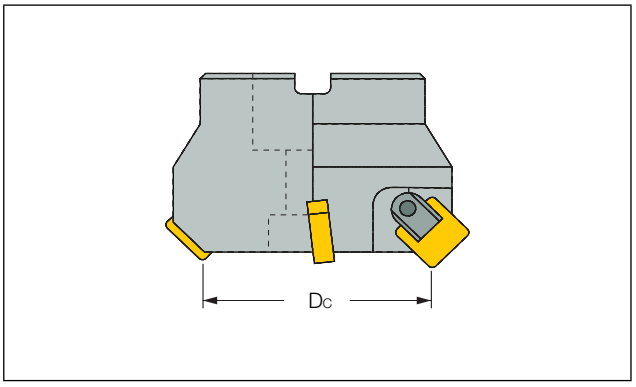
$$P_c = \frac{700 \times 0.4 \times 2 \times 1400}{60 \times 10^3 \times 0.8} = 16.33\ (kW)$$

Specific Cutting Force

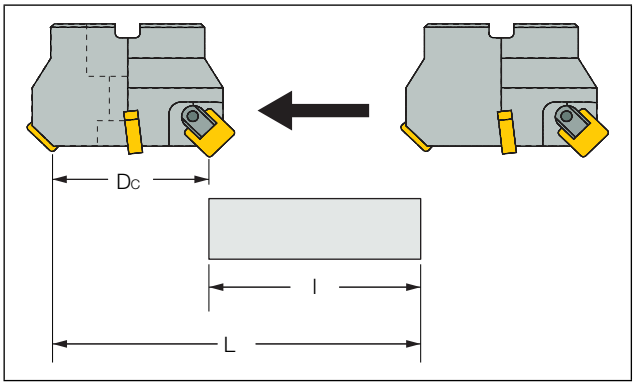
Workpiece Material	Tensile Strength, MPa, Hardness, HB	Specific Cutting Force (N / mm^2) "K_c" to Cutting Feed Rate (mm/rev)				
		0.1 mm/rev	0.2 mm/rev	0.3 mm/rev	0.4 mm/rev	0.6 mm/rev
Soft Steel	**520**	**3,610**	**3,100**	**2,720**	**2,500**	**2,280**
Medium-Hardness Steel	620	3,080	2,700	2,570	2,450	2,300
Hard Steel	720	4,500	3,600	6,250	2,950	2,640
Tool Steel	670	3,040	2,800	2,630	2,500	2,400
	770	3,150	2,850	2,620	2,450	2,340
Cr-Mo Steel	600	3,610	3,200	2,880	2,700	2,500
	730	4,500	3,900	3,400	3,150	2,850
Alloy Steel	900	3,070	2,650	2,350	2,200	1,980
	HB350	3,310	2,900	2,580	2,400	2,200
Gray Cast Iron	HB200	2,110	1,800	1,600	1,400	1,330

Calculation Formula for Milling

Calculating the Cutting Speed



Calculating the Cutting Time



Calculating the Cutting Speed from the Rotation Speed

$$V_{c\ (m\ /\ min)} = \frac{\pi \times D_m \times n}{1000}$$

Calculating the Revolution Speed from the Cutting Speed

$$n_{(min^{-1})} = \frac{1000\ V_c}{\pi \times D_m}$$

V_c - cutting speed (m / min)
Dm - machining diameter (mm)
n - spindle speed (min^{-1})
π - Pi (3.14)

Example: Obtaining a cutting speed for machining a Workpiece of 200 mm diameter at the spindle speed of 1,000 min^{-1}:

$$V_c = \frac{\pi \times 200 \times 1000}{1000} = 628\ (m\ /\ min)$$

Calculating the Feed Speed (Feed Rate)

$$f_{z\ (mm\ /\ t)} = \frac{V_f}{z \times n}$$

$$V_{f\ (mm\ /\ min)} = f_z \times z \times n$$

f_z - feed per tooth (mm / t)
V_f - table feed (mm / min)
z - number of tooth
n - spindle speed (min^{-1})

Example: Obtaining the feed rate for milling with a 10-teeth cutter at the 0.2 mm / t and the revolution speed of 1,000 min^{-1}

$$V_{f\ (mm\ /\ min)} = 0.2 \times 10 \times 1000 = 2000\ (mm\ /\ min)$$

Calculating the Cutting Time for OD (ID) Machining

$$T_{(min)} = \frac{L}{V_f}$$

T - cutting time (min)
L - total length of tool travel ($l + D_c$)
V_f - Feed speed (mm / min)

Example: Obtaining the machining time for milling 200 mm on a workpiece fed at the rate of 1000 (mm / min)

$$T_{(min)} = \frac{200}{1000}$$

Calculating the Cutting Power

$$P_{c\ (kW)} = \frac{a_e \times a_p \times V_f \times K_c}{60 \times 10^6 \times \eta}$$

P_c - cutting power (kW)
a_e - cutting width (mm)
a_p - depth of cut (mm)
V_f - feed rate (mm / min)
K_c - specific cutting force (N / mm^2) *
η - mechanical efficiency (0.7~0.8)

* See the table below.

Example: Calculating the power required to machine gray cast iron for a length of 150 mm, at a feed rate of 1,100 mm / min, and with a depth of cut of 3 mm (with 0.8 set as the mechanical efficiency and 0.2 mm as the feed par tooth / blade)

$$P_c = \frac{150 \times 3 \times 1100 \times 1400}{60 \times 10^6 \times 0.8} = 14.44\ (kW)$$

Specific Cutting Force

Work Material	Tensile Strength or Hardness	Specific Cutting Force (N / mm^2) K_c to Cutting Feed (mm/rev)				
		0.1 mm / t	0.2 mm / t	0.3 mm / t	0.4 mm / t	0.6 mm / t
Soft Steel	520	2,200	1,950	1,820	1,700	1,580
Medium-Hardness Steel	620	1,980	1,800	1,730	1,600	1,570
Hard Steel	720	2,520	2,200	2,040	1,850	1,740
Tool Steel	670	1,980	1,800	1,730	1,700	1,600
	770	2,030	2,030	1,800	1,750	1,700
Cr-Mo Steel	600	2,180	2,000	1,860	1,800	1,670
	730	2,540	2,250	2,140	2,000	1,800
Alloy Steel	900	2,000	1,800	1,680	1,600	1,500
	HB350	2,100	1,900	1,760	1,700	1,530
Gray Cast Iron	HB200	1,750	1,400	1,240	1,050	970
Aluminum Alloy	160	580	480	400	350	320

Calculating the Metal Removal Rate

$$Q_{(cm^3 / min)} = a_e \times a_p \times v_f$$

Q - volume of evacuated chips (cm^3 / min)
a_e - cutting length (mm)
a_p - depth of cut (mm)
v_f - feed rate (mm / min)

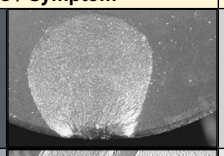
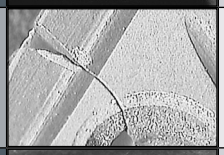
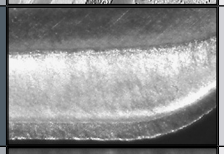
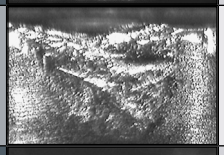
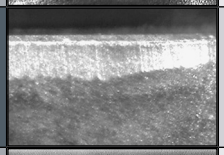
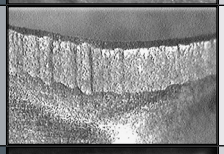
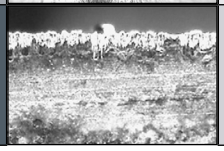
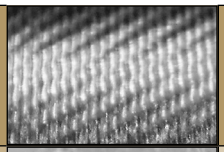
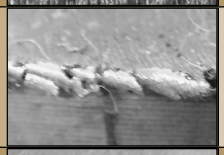
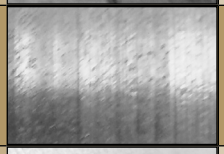
Example: Obtaining the volume of chips evacuated per minute for machining at a cutting speed of 700 m / min, feed rate of 0.4 mm/rev, and with a 2 mm depth of cut

$$Q = 150 \times 3 \times 1100 = 495\ (cm^3 / min)$$

Troubleshooting for Turning

Type of Problem		Possible Cause	Corrective Measures	Material / Grade Selection				Cutting Conditions					Tool Shape							Machine / Installation		
				Change to a Harder Material / Grade	Change to a Tougher Material / Grade	Change to a Material / Grade More Resistant to Thermal Shock	Change to a Material / Grade More Resistant to Deposition	Cutting Speed ↓ Decrease	Feed Rate ↑ Increase	Depth of Cut ↑ Increase	Coolant: Use Non-Water-Soluble Type	Coolant: Review Dry or Wet Operation	Review the Type of Chipbreaker	Rake Angle ↓ Decrease / ↑ Increase	Nose Radius of the Insert ↑ Increase	Side Cutting Edge Angle ↑ Increase	Cutting Edge Strength, Honing ↑ Increase	Improve the Accuracy of Insert	Improve the Rigidity of the Holder	Improve the Installation Accuracy of the Cutting Tool	Review the Overhang of the Cutting Tool	Prevent Vibration of the Machine, Improve the Machine Rigidity
Short Tool Life	Excessive Insert Wear	unsuitable tool material / grade		●																		
		unsuitable cutting edge shape											●	↗	↗	↗	↘					
		improper cutting conditions						↘	↗			wet										
	Fracture / Chipping of the Cutting Edge	unsuitable tool material / grade			●																	
		improper cutting conditions							↘	↘												
		insufficient cutting edge strength											●		↗		↗					
		thermal shock				●		↘	↘	↘	●	dry										
		built-up edge					●	↗	↗		●	wet										
		insufficient toughness																	●	●	●	●
Poor Dimensional Accuracy	Variation in Dimensions During Cutting	improper accuracy of insert																	●			
		clearance / relief of the work / tool											●	↗	↘	↘	↘		●	●	●	●
	Need for Offsetting During Cutting	increased flank wear		●											↗							
		built-up edge					●	↗														
		improper cutting conditions						↘	↗													
Poor Surface Finish	Poor Surface Roughness	deposition						↗			●	wet										
		unsuitable cutting edge shape											●		↗							
		chatter						↘	↘	↘									●	●	●	●
Heat	Deterioration in Tool Life / Accuracy Due to Excessive Heat Generation	improper cutting conditions						↘	↘	↘												
		unsuitable cutting edge shape											●	↗			↘					
Burring, Chipping, Scuffing	Burring	boundary wear		●																		
		improper cutting conditions						↘	↑↓			wet										
		unsuitable cutting edge shape											●	↗	↘	↘	↘					
	Chipping	improper cutting conditions							↘	↘												
		unsuitable cutting edge shape											●	↗	↗	↗	↘					
		vibration																	●	●	●	●
	Scuffing	unsuitable tool material / grade					●															
		improper cutting conditions						↗			●	wet										
		unsuitable cutting edge shape											●	↗			↘					
		vibration																	●	●	●	●
Chip Control	Elongated Chips	improper cutting conditions						↘	↗	↗		wet										
		chipbreaker's effective chip control range											●									
		unsuitable cutting edge shape													↘	↘						

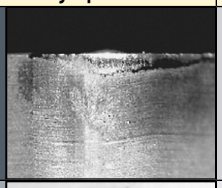
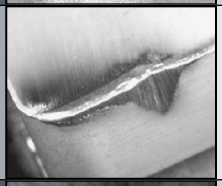
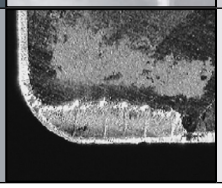
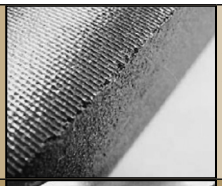
Troubleshooting Turning Case Studies

	Case / Symptom		Possible Causes	Corrective Measures
Insert	Flaking		• due to compressive forces being applied to the cutting edge from elastic deformation in the area being cut • occurs when deposited / adhered material is peeled off	• use a coated grade • choose a material / grade highly resistant to fracture • decrease the cutting speed
	Clamping Crack		• the insert was clamped under improper seating conditions	• clean the clamping areas and install the insert in the recommended way • tighten to the specified torque
	Creater Wear		• high temperature causes chemical reactions between the insert material and chips	• use a coated grade / higher wear resistance grade • decrease both the cutting speed and feed rate • widen the rake angle
	Fracture		• depth of cut might be too big • feed rate is too high • chips have become trapped • chatter resulting in vibration • insufficient edge strength	• enlarge the honed edge • make the nose radius larger • narrow the rake angle to secure the cutting edge strength • decrease D.O.C
	Flank Wear		• the grade is too soft • cutting speed is too high • relief angle is too small	• use a coated grade • choose a grade highly resistant to wear • decrease the cutting speed
	Plastic Deformation		• high cutting force and excessive heat is applied to the cutting edge	• choose a material / grade highly resistant to wear • decrease both the cutting speed and feed rate • make the nose radius larger • use coolant
	Notching Wear		• the workpiece surface is too hard • boundary area has been oxidized • burrs, caused by chips in the sheared form, have been cut	• widen the side cutting edge angle • make the nose radius larger so that cutting is performed within the radius • use a round insert
	Deposition		• the deposition is caused to the face by a chemical reaction of the workpiece material due to heat generation	• increase the cutting speed • widen the relief angle • hone the face with a mirror-like-surface finish • change to a grade with less affinity to the workpiece material
	Built-Up Edge		• this occurs because the cutting temperature is lower than the recrystallization temperature of the workpiece material	• increase the cutting speed • use coolant with excellent lubrication performance • change to a grade with less affinity to the workpiece material
Workpiece	Chatter Mark		• the cutting force is too great • the rigidity of the workpiece and cutting tool is insufficient	• decrease the feed rate • use a smaller edge preparation • ensure tool overhang is minimized • change the cutting edge angle of the holder
	Burring		• the feed rate is incorrect • the shape of insert is not suitable	• decrease the feed rate • use a smaller edge preparation
	Gouging		• vibration of the cutting edge due to deposition / built-up edge	• increase the cutting speed • use cutting oil excellent in lubrication performance • change to a grade with less affinity to the workpiece material
	Chipping		• the feed rate is too high • an unsuitable insert was selected	• decrease the feed rate • use a smaller edge preparation • change to a grade highly resistant to boundary wear • change the cutting edge angle of the holder

Troubleshooting Guidelines for Milling

Type of Problem	Possible Cause	Corrective Measures	Material / Grade Selection				Cutting Conditions							Tool Shape							
			Change to a Harder Material / Grade	Change to a Tougher Material / Grad	Change to a Material / Grade More Resistant to Thermal Shock	Change to a Material / Grade More Resistant to Deposition	Cutting Speed ↘ Decrease	Feed Rate ↗ Increase	Depth of Cut	Review Cutter Diameter and Cutting Width	Review Tool Path	Coolant: Wet	Coolant: Dry	Relief Angle of Insert ↘ Decrease	Nose Radius of Cutting Edge ↗ Increase	Cutting Edge Strength, Honing	Number of Teeth / Blades	Enlarge the Chip Pocket	Check the Wiper Shape	Improve Accuracy of Cutting Edge Run-Out	Improve Rigidity of Tool
Damaged Or Broken Cutting Edge of the Insert	Increased Flank Wear	improper cutting conditions					↘					●									
		unsuitable cutting edge shape	●											↗		↘			●		
	Increased Wear on Face	improper cutting conditions					↘	↘	↘			●									
		unsuitable cutting edge shape	●											↗	↗	↘					
	Fracture / Chipping on Cutting Edge	improper cutting conditions						↘	↘		●										
		unsuitable cutting edge shape		●										↘	↗	↗			●	●	●
	Thermal Shock	improper cutting conditions					↘	↘	↘				●								
		unsuitable cutting edge shape			●									↗		↘					
	Built-Up Edge	improper cutting conditions					↗	↗				●									
		unsuitable cutting edge shape				●								↗		↘					
Machining Accuracy	Poor Surface Finish	improper cutting conditions					↘	↘	↘			●									
		unsuitable cutting edge shape	●			●									↘	↘			●	●	
	Burring	improper cutting conditions						↕	↘	●	●										
		unsuitable cutting edge shape												↗	↘	↘			●		
	Chipping	improper cutting conditions						↘	↘		●										
		unsuitable cutting edge shape												↗	↗	↘	↗		●		
	Poor Flatness and Parallelism	improper cutting conditions						↘	↘			●		↗	↘	↘	↘		●	●	●
Others	Increased Chatter / Vibration	improper cutting conditions					↘	↘	↘	●	●			↗	↘	↘	↘				
	Poor Chip Evacuation	improper cutting conditions					↗	↘		●		●	●								
		unsuitable tool / blade edge shape												↗			↘	●			

Troubleshooting Milling Case Studies

	Case / Symptom		Possible Causes	Corrective Measures
Insert	VB Wear		• cutting speed is too high • feed rate is too low • the shape of the insert is not suitable • the material / grade of the insert is not suitable	• decrease the cutting speed • increase the feed rate • make the nose radius larger • change to a grade highly resistant to boundary wear
	Notching Wear		• the material / grade of the inserts is not suitable • the shape of the cutter is not suitable • the shape of insert is not suitable	• change to a grade highly resistant to boundary wear • widen the rake angle • change the insert shape to a different one
	Chipping / Fracture		• the cutting speed is incorrect • the shape of the cutter is not suitable • the shape of insert is not suitable	• decrease the feed rate and depth of cut in order to reduce the cutting force • use a smaller edge preparation • prepare the cutting edge to give it a round honing • change to a grade highly resistant to fracture
	Thermal Crack		• the cutting conditions are incorrect • the material / grade of insert is not suitable	• decrease the cutting speed • change to dry cutting from wet cutting • use a material / grade highly resistant to thermal shock
Workpiece	Chipping		• the feed rate is too high • an unsuitable insert is selected • the shape of the cutter is not suitable	• decrease the feed rate • use a smaller edge preparation • change to a grade highly resistant to boundary wear • set the lead angle at 45 degrees
	Burring		• the feed rate is incorrect • the shape of insert is not suitable • the shape of the cutter is not suitable	• adjust the feed rate • use a smaller edge preparation • make the lead angle narrower

ISO 13399 Compliance

ISO 13399 Property Symbols	Content
ADJLX	adjustment limit maximum
ADJRG	adjustment range
ALF	clearance angle radial
ALP	clearance angle axial
AN	clearance angle major
ANN	clearance angle minor
APMX	depth of cut maximum
AS	clearance angle wiper edge
ASP	adjusting screw protrusion
AZ	plunge depth maximum
B	shank width
BBD	balanced by design
BCH	corner chamfer length
BD	body diameter
BDX	body diameter maximum
BHCC	bolt hole circle count
BHTA	body half taper angle
BMC	body material code
BS	wiper edge length
BSR	wiper edge radius
CASC	cartridge size code
CB	chipbreaker face count
CBP	chipbreaker property
CBDP	connection bore depth
CBMD	chipbreaker manufacturers designation
CCMS	connection code machine side
CCWS	connection code workpiece side
CCP	chamfer corner property
CDI	insert cutting diameter
CDX	cutting depth maximum
CEATC	tool cutting edge angle type code
CECC	cutting edge condition code
CEDC	cutting edge count
CF	spot chamfer
CHW	corner chamfer width
CICT	cutting item count
CNC	corner count
CND	coolant entry diameter
CNSC	coolant entry style code
CNT	coolant entry thread size
CP	coolant pressure
CRE	spot radius
CRKS	connection retention knob thread size
CSP	coolant supply property
CTP	coating property
CTX	cutting point translation x-direction
CTY	cutting point translation y-direction
CUTDIA	workpiece parting diameter maximum
CUB	connection unit basis
CW	cutting width
CWX	cutting width maximum
CXD	coolant exit diameter
CXSC	coolant exit style code
CZC	connection size code

ISO 13399 Property Symbols	Content
D1	fixing hole diameter
DAH	diameter access hole
DAXN	axial groove outside diameter minimum
DAXX	axial groove outside diameter maximum
DBC	diameter bolt circle
DC	cutting diameter
DCB	connection bore diameter
DCBN	connection bore diameter minimum
DCBX	connection bore diameter maximum
DCC	design configuration style code
DCCB	counterbore diameter connection bore
DCIN	cutting diameter internal
DCINN	cutting diameter internal minimum
DCINX	cutting diameter internal maximum
DCSC	cutting diameter size code
DCN	cutting diameter minimum
DCON	connection diameter
DCONMS	connection diameter machine side
DCONWS	connection diameter workpiece side
DCSFMS	contact surface diameter machine side
DCX	cutting diameter maximum
DF	flange diameter
DHUB	hub diameter
DMIN	minimum bore diameter
DMM	shank diameter
DN	neck diameter
DRVA	drive angle
EPSR	insert included angle
FHA	flute helix angle
FHCSA	fixing hole countersunk angle
FHCSD	fixing hole countersunk diameter
FLGT	flange thickness
FMT	form type
FXHLP	fixing hole property
GAMF	rake angle radial
GAMN	rake angle normal
GAMO	rake angle orthogonal
GAMP	rake angle axial
GAN	insert rake angle
H	shank height
HA	thread height theoretical
HAND	hand
HBH	head bottom offset height
HBKL	head back offset length
HBKW	head back offset width
HBL	head bottom offset length
HC	thread height actual
HF	functional height
HHUB	hub height
HTB	body height
IC	inscribed circle diameter
IFS	insert mounting style code
IIC	insert interface code
INSL	insert length

ISO 13399 Property Symbols	Content
KAPR	tool cutting edge angle
KCH	corner chamfer angle
KRINS	cutting edge angle major
KWL	keyway length
KWW	keyway width
KYP	keyway property
L	cutting edge length
LAMS	inclination angle
LB	body length
LBB	chipbreaker width
LBX	body length maximum
LCCB	counterbore depth connection bore
LCF	length chip flute
LDRED	reduced body diameter length
LE	cutting edge effective length
LF	functional length
LFA	a dimension on lf
LH	head length
LPR	protruding length
LS	shank length
LSC	clamping length
LSCN	clamping length minimum
LSCX	clamping length maximum
LTA	lta length (length from mcs to crp)
LU	usable length
LUX	usable length maximum
M	m-dimension
MHA	mounting hole angle
MHD	mounting hole distance
MHH	mounting hole height
MIID	master insert identification
MTP	clamping type code
NCE	cutting end count
NOF	flute count
NOI	insert index count
NT	tooth count
OAH	overall height
OAL	overall length
OAW	overall width
PDPT	profile depth insert
PDX	profile distance ex
PDY	profile distance ey
PFS	profile style code
PL	point length
PNA	profile included angle
PSIR	tool lead angle
PSIRL	cutting edge angle major left hand
PSIRR	cutting edge angle major right hand
RAL	relief angle left hand
RAR	relief angle right hand
RCP	rounded corner property
RE	corner radius
SX	shank cross section shape code

ISO 13399 Property Symbols	Content
TC	tolerance class insert
TCE	tipped cutting edge code
TCTR	thread tolerance class
TD	thread diameter
THFT	thread form type
THL	threading length
THLGTH	thread length
THSC	tool holder shape code
THUB	hub thickness
TP	thread pitch
TPI	threads per inch
TPIN	threads per inch minimum
TPIX	threads per inch maximum
TPN	thread pitch minimum
TPT	thread profile type
TPX	thread pitch maximum
TQ	torque
TSYC	tool style code
TTP	thread type
ULDR	usable length diameter ratio
UST	unit system
W1	insert width
WEP	wiper edge property
WF	functional width

List of Reference Symbols Complying with ISO13399

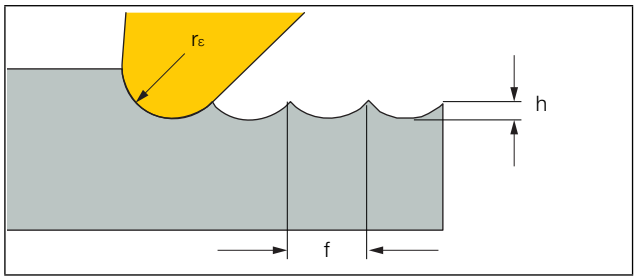
ISO13399 Property Symbols	Content
CIP	coordinate system in process
CRP	cutting reference point
CSW	coordinate system workpiece side
MCS	mounting coordinate system
PCS	primary coordinate system

Surface Roughness Standards

			JIS B0601 (2001) ISO 4287 (1997) / ISO 1302 (2002)	JIS B0601 (1994) JIS B0031 (1982)	JIS B0601(1982) JIS B0031(1982)	JIS B0601(1970) JIS B0031(1970)	JIS B0601(1970)
Cross- Section Curve			no filter, digital signal	no filter, digital signal	no filter, analog signal	no filter, analog signal	no filter, analog signal
	evaluation length		shape length	—	one standard length	one standard length	one standard length
	maximum height		Pt	—	Rmax	Rmax (S indication)	Hmax (S)
	10-point average roughness		—	—	Rz	Rz (Z indication)	—
Roughness Curve			phase correction, band λs – λc	phase correction, short wavelength λc	2RC, short wavelength cut-offλc	2RC, short wavelength cut-offλc	—
	evaluation length		determine individually for each standard length λc.	average for ℓn, calculated for each standard length λc	one measured length ≥ 3λc	one measured length ≥ 3λc	—
	maximum height		maximum height Rz	maximum height Ry	—	—	—
	set standard length based on height parameters Rz, Rmax, and Ry.	0.25 mm	0.1~0.5 µm	0.1~0.5 µm	0.8 µm or less	0.8 µm or less	select from 0.3,1,3,5 and 10 mm
		0.8 mm	0.5~10 µm	0.5~10 µm	0.8~6.3 µm	0.8~6.3 µm	select from 0.3,1,3,5 and 10 mm
		2.5 mm	10~50 µm	10~50 µm	6.3~25 µm	6.3~25 µm	select from 0.3,1,3,5 and 10 mm
	dimension indicated in drawing		U 0.008-2.5 / Rz L 1.5 L -2.5 / Rz 0.7	Ry = 1.6~0.8 λc 0.25	Rmax = 1.6 Rmax 0.8	Surface symbol or triangle symbol: 1.6S / 0.8S, 0.25 Upper limit, 0.25 Lower limit	triangle symbol: 0.8S or less ▽▽▽▽; 1.5S~6S ▽▽▽; 12S~25S ▽▽; 35S or higher ▽
	10-point average roughness		RzJIS	Rz	—	—	—
	center line average roughness		Ra75	Ra75	Ra	Ra (“a” indication)	—
	arithmetic average roughness		arithmetic average roughness Ra	arithmetic average roughness Ra	—	—	—
	set standard length based on height parameters Rz, Rmax, and Ry.	0.25 mm	0.1~0.5 µm	0.1~0.5 µm	—	—	—
		0.8 mm	0.5~10 µm	0.5~10 µm	Ra shall be 12.5 µm or less.	λc shall be 0.8 mm.	—
		2.5 mm	10~50 µm	10~50 µm	12.5~100 µm	—	—
	dimension indicated in drawing		U“2RC”-0.8 / Ra75 3.1 L“2RC”-0.8 / Ra75 1.5	1.6~3.2	3.2 1.6	surface symbol or triangle symbol: 0.2 Ra or less ▽▽▽▽; 0.4 Ra~1.6 Ra ▽▽▽; 3.2 Ra~6.3 Ra ▽▽; 12.5 Ra to 25 Ra or more ▽	—

Theoretical Surface Roughness

The theoretical surface roughness for lathe machining is the minimum value which can be obtained under the set machining conditions, and can be expressed by the following formula.



$$h\ (\mu m) = \frac{f_2}{8r_\varepsilon} \times 1000$$

h - theoretical surface roughness (µm)
f - feed (mm/rev)
r_ε - nose radius (mm)

Actual Surface Roughness

- When machining steel: Theoretical surface roughness x 1.5–3
- When machining cast iron: Theoretical surface roughness x 3–5

Surface Finish Improvement Measures

- Increase the nose radius
- Use a wiper insert
- Adjust the cutting speed and / or feed
- Change the material and / or shape of the insert

Relationship with Triangle Symbols

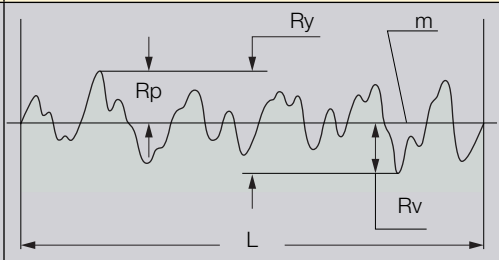
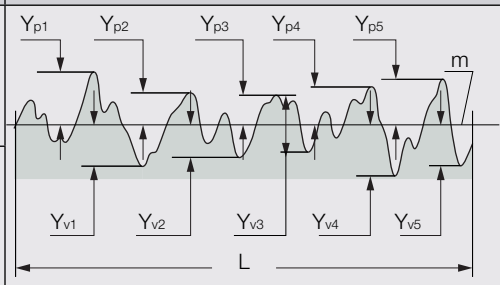
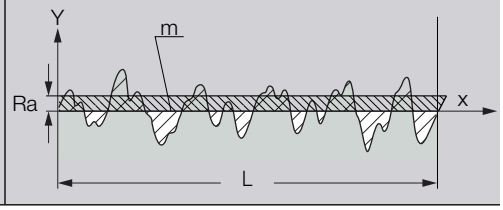
Arithmetic Average Roughness Ra(µm)	Maximum Height Rz(µm)	10-Point Average Roughness RzJIS (µm)	Triangle Symbol (1)
0.025	0.1	0.1	▽▽▽▽
0.05	0.2	0.2	
0.1	0.4	0.4	
0.2	0.8	0.8	
0.4	1.6	1.6	▽▽▽
0.8	3.2	3.2	
1.6	6.3	6.3	
3.2	12.5	12.5	▽▽
6.3	25	25	
12.5	50	50	▽
25	100	100	

(1) The finishing symbols (triangle symbol ▽ and symbol ~) are no longer used in JIS pursuant to the 1994 revision.

Examples of Reading

1 When Ra = 1.6 µm ➜ 1.6 µm Ra
2 When Rz = 6.3 µm ➜ 6.3 µm Rz
3 When RzJIS = 6.3 µm ➜ 6.3 µm RzJIS

Obtaining the Surface Roughness

Type	New Symbol JIS B0601: '01	Old Symbol JIS B0601:'94	Calculation	Obtaining Method (example)
Max. Height (Peak)	Rz	Ry	the addition of the max. value for the depth rv and the max. height rp on the roughness curve for the reference length: $R_z = R_p + R_v$	
Average Roughness of 10 Points	RzJIS	Rz	the addition of the average of the maximum to fifth highest values and the average of the deepest to the fifth deepest values on the roughness curve for the reference length: $R_{zJIS} = \frac{(Y_{p1}+Y_{p2}+Y_{p3}+Y_{p4}+Y_{p5})+(Y_{v1}+Y_{v2}+Y_{v3}+Y_{v4}+Y_{v5})}{5}$	
Arithmetic Average of Roughness	Ra	Ra	the average of absolute values on the roughness curve f (x) for the reference length: $R_a = \frac{1}{L}\int_0^L \{f(x)\}$	

Hardness Comparison Chart

Vickers Hardness (HV)	Rockwell hardness			Brinell hardness, 10 mm balls, 3000 kgf load	Shore hardness (HS)	Tensile strength Kgf / mm² [N / m2] Approximate value MPa[1]
	Scale A Load: 60 kgf brale indenter (HRA)	Scale C Load: 150 kgf brale indenter (HRC)	Scale B Load: 100 kgf Diameter 1 / 16′ brale indenter (HRB)	Tungsten carbide ball		
2200	(95.1)	–	–	–	–	
2100	(94.6)	–	–	–	–	
2000	94.2	–	–	–	–	
1900	93.7	(80.5)	–	–	–	
1800	93.2	(79.2)	–	–	–	
1700	92.7	(77.9)	–	–	–	
1600	91.8	(76.6)	–	–	–	
1500	91.0	(75.3)	–	–	–	
1450	90.4	(74.6)	–	–	–	
1400	90.0	74.0	–	–	–	
1350	89.6	73.4	–	–	–	
1300	89.1	72.7	–	–	–	
1250	88.6	72.1	–	–	–	
1200	88.1	71.5	–	–	–	
1150	87.6	70.9	–	–	–	
1100	87.1	70.3	–	–	–	
1050	86.6	69.6	–	–	–	
1000	86.2	68.9	–	–	–	
940	85.6	68.0	–	–	97	
920	85.3	67.5	–	–	96	
900	85.0	67.0	–	–	95	
880	84.7	66.4	–	(767)	93	
860	84.4	65.9	–	(757)	92	
840	84.1	65.3	–	(745)	91	
820	83.8	64.7	–	(733)	90	
800	83.4	64.0	–	(722)	88	
780	83.0	63.3	–	(710)	87	
760	82.6	62.5	–	(698)	86	
740	82.2	61.8	–	(684)	84	
720	81.8	61.0	–	(670)	83	
700	81.3	60.1	–	(656)	81	
690	81.1	59.7	–	(647)	–	
680	80.8	59.2	–	(638)	80	
670	80.6	58.8	–	630	–	
660	80.3	58.3	–	620	79	
650	80.0	57.8	–	611	–	
640	79.8	57.3	–	601	77	
630	79.5	56.8	–	591	–	
620	79.2	56.3	–	582	75	
610	78.9	55.7	–	573	–	
600	78.6	55.2	–	564	74	
590	78.4	54.7	–	554	–	
580	78.0	54.1	–	545	72	
570	77.8	53.6	–	535	–	
560	77.4	53.0	–	525	71	
550	77.0	52.3	–	517	–	
540	76.7	51.7	–	507	69	
530	76.4	51.1	–	497	–	
520	76.1	50.5	–	488	67	
510	75.7	49.8	–	479	–	
500	75.3	49.1	–	471	66	
490	74.9	48.4	–	460	–	

[1] 1 MPa = 1 N / mm²

[2] This table is an excerpt from the JIS Iron and Steel Handbook

[3] Values in parentheses in the above table are not usually used

Vickers Hardness (HV)	Rockwell hardness			Brinell hardness, 10 mm balls, 3000 kgf load	Shore hardness (HS)	Tensile strength Kgf / mm² [N / m2] Approximate value MPa[1]
	Scale A Load: 60 kgf brale indenter (HRA)	Scale C Load: 150 kgf brale indenter (HRC)	Scale B Load: 100 kgf Diameter 1 / 16′ brale indenter (HRB)	Tungsten carbide ball		
480	74.5	47.7	–	452	64	
470	74.1	46.9	–	442	–	
460	73.6	46.1	–	433	62	
450	73.3	45.3	–	425	–	
440	72.8	44.5	–	415	59	
430	72.3	43.6	–	405	–	
420	71.8	42.7	–	397	57	
410	71.4	41.8	–	388	–	
400	70.8	40.8	–	379	55	
390	70.3	39.8	–	369	–	
380	69.8	38.8	(110.0)	360	52	
370	69.2	37.7	–	350	–	
360	68.7	36.6	(109.0)	341	50	
350	68.1	35.5	–	331	–	
340	67.6	34.4	(108.0)	322	47	
330	67.0	33.3	–	313	–	
320	66.4	32.2	(107.0)	303	45	
310	65.8	31.0	–	294	–	
300	65.2	29.8	(105.5)	284	42	
295	64.8	29.2	–	280	–	
290	64.5	28.5	104.5	275	41	
285	64.2	27.8	–	270	–	
280	63.8	27.0	103.5	265	40	
275	63.5	26.4	–	261	–	
270	63.1	25.6	102.0	256	38	
265	62.7	24.8	–	252	–	
260	62.4	24.0	101.0	247	37	825
255	62.0	23.1	–	243	–	805
250	61.6	22.2	99.5	238	36	795
245	61.2	21.3	–	233	–	780
240	60.7	20.3	98.1	228	34	765
230	–	18.0	96.7	219	33	730
220	–	15.7	95.0	209	32	695
210	–	13.4	93.4	200	30	670
200	–	(11.0)	91.5	190	29	635
190	–	(8.5)	89.5	181	28	605
180		(6.0)	87.1	171	26	580
170		(3.0)	85.0	162	25	545
160		(0.0)	81.7	152	24	515
150			78.7	143	22	490
140			75.0	133	21	455
130			71.2	124	20	425
120			66.7	114		390
110			52.3	105		–
100			56.2	95		–
95			52.0	90		–
90			48.0	86		–
85			41.0	81		–

[1] 1 MPa = 1 N / mm²

[2] This table is an excerpt from the JIS Iron and Steel Handbook

[3] Values in parentheses in the above table are not usually used

Ni-Based Heat Resistant Super Alloys (HRSA)

Material Specifications Cross-Reference List - Aerospace Material Designation

Commercial designation	Hardness Brinell HB		Nominal composition Approximate Content in %											USA			UK	France	Germany	
	Ann.	Aged	Ni	Cr	Co	Fe	Mo	C	Mn	Si	Al	Ti	Others	SAE	AMS	UNS	BS	AFNOR	Werkst.-Nr	DIN1706
Astroloy	—	—	56.9	15.0	15.0	—	5.25	0.06	—	—	4.0	3.5	0.05	—	—	—	—	—	—	—
AerMet 100			11.1	3.1	13.4	70.0	1.20	0.23				0.05								
GMR 235	—	—	63.3	15.5	—	10.0	5.2	0.15	0.25	0.6	3.0	2.0	0.06	—	—	—	—	—	—	—
GMR 235D	—	—	63.0	15.5	—	4.5	5.0	0.15	0.1	0.3	3.5	2.5	0.05	—	—	—	—	—	—	NiCr16MoAl
Hastelloy B	140	—	64.3	0.6	1.25	5.5	28.0	0.1	0.8	0.7	—	—	—	5396A	5396	N10001	—	ND37FeV	2.48	S-NiMo30
Hastelloy B-3			65.0	1.5	3.00	1.5	28.5	0.01	3.0	0.1	0.5		1.0							
Hastelloy C	200	—	54.1	16.0	1.25	5.75	17.0	0.07	0.8	0.7	—	—	4.0	5388C	5388	N10002	—	—	2.460	NiCr17Mo17FeW
Hastelloy C-22			56.0	22.0	2.50	3.00			0.5	0.1			3.8							
Hastelloy C22HS			74.0	22.0	1.00	2.00							0.0							
Hastelloy C-276			57.0	16.0	2.50	5.00	16.0	0.01	1.0	0.1			1.0							
Hastelloy N	—	—	72.2	7.0	0.25	3.0	16.5	0.06	0.4	0.25	0.5	—	0.21	5771	5607	N10003	—	—	—	—
Hastelloy W	—	—	62.7	5.0	1.25	5.5	24.5	0.06	0.5	0.5	—	—	—	—	5786	N10004	—	—	—	—
Hastelloy X	160	—	47.1	22.0	1.5	18.5	9.0	0.1	0.6	0.6	—	—	0.6	5390A	5390	N06002	—	NC22FeD	2.460	—
Hastelloy R235	—	—	61.0	15.0	2.5	10.0	5.5	0.15	0.25	0.6	3.0	2.0	—	—	—	—	—	—	—	—
Haynes 25			10.0	20.0	51.0	3.0	1.0	0.10	1.50	0.4			15.0							
Haynes 75	—	—	73.7	20.0	—	5.0	—	0.12	—	—	0.25	0.4	0.5	—	—	—	—	—	—	—
Haynes 80A	—	—	70.9	20.0	2.0	3.0	—	0.1	—	—	1.5	2.5	—	—	—	—	—	—	—	—
Haynes 188			22.0	22.0	39.0	3.0		0.1	1.25	0.35			1.0							
Haynes 263	—	25	51.4	20.0	20.0	—	6.0	0.06	—	—	1.0	1.5	—	—	5872	—	—	—	—	—
Haynes 600	—	—	75.9	16.0	—	8.0	—	0.08	—	—	—	—	—	—	—	—	—	—	—	—
Haynes 625	—	—	61.4	21.0	—	5.0	9.0	0.1	—	—	—	—	3.5	—	—	—	—	—	—	—
Haynes 718	—	43	53.5	18.0	—	19.0	3.0	0.08	—	—	0.5	0.9	5.0	—	5596 / 5597	—	—	—	—	—
Haynes X-750	—	37	74.9	16.0	—	7.0	—	0.08	—	—	0.8	0.25	1.0	—	5542 / 5593	—	—	NC15TNbA	—	—
IN-100	—	—	61.6	10.0	15.0	—	3.0	0.18	1.2	0.5	5.5	4.75	—	—	5397	N13100	—	—	LW2.4674	NiCo15Cr10MoAlTi
Incoloy A-286			25.5	15.0		56.5						2.10								
Incoloy 800			35.0	23.0		39.5		0.10			0.6	0.60	1.8							
Incoloy 804	—	—	41.0	29.5	—	26.0	—	0.1	1.0	0.75	0.25	0.6	0.5	—	—	—	—	—	—	—
Incoloy 825	180	—	42.0	21.0	—	30.0	3.0	0.04	—	—	—	1.0	2.0	—	—	N08825	3072-76	NC21FeDU	2.486	NiCr21Mo
Incoloy 901	180	300	44.3	12.5	—	34.0	6.0	0.05	0.24	0.12	0.15	2.7	0.15	—	5660	N09901	—	ZSNCDT42	LW2.4662	NiFe35Cr14MoTi
Incoloy 903	—	380	39.0	—	15.0	41.0	—	0.02	—	—	0.7	1.4	3.0	—	—	—	—	—	—	—
Incoloy 909			38.0		13.0	42.0	1.25			0.4	0.0	1.5	4.7							
Incoloy MA956				20.0		74.0					4.5	0.5	0.5							
Inconel 600	170	—	75.0	15.5	—	8.0	—	0.05	—	—	—	—	—	5540	5580	N06600	3072-76	NC15Fe	2.482	NiCr15Fe
Inconel 601	150	—	60.0	23.0	—	14.0	—	0.05	—	—	1.4	—	—	—	5715	N06601	—	—	2.485	NiCr23Fe
Inconel 604	180	—	74.4	15.8	—	7.2	—	0.04	0.2	0.2	—	—	0.1	—	—	—	—	—	—	—
Inconel 617			52.0	22.0	12.5	1.5	9.5				1.2				5887-89					
Inconel 625	180	—	61.0	21.5	—	2.5	9.0	0.04	0.5	0.5	0.4	0.4	3.6	—	5666	N06625	—	NC22FeDNB	2.486	NiCr22Mo9Nb
Inconel 625CLF			61.0	21.5		2.5	9.0						3.6		5879					
Inconel 700	—	350	46.0	15.0	23.5	0.7	3.75	0.12	0.1	0.3	3.0	2.2	—	—	—	—	—	NK27CADT	—	NiCo29Cr15MoAlTi
Inconel 702	—	—	79.6	15.6	—	0.35	—	0.04	0.05	0.2	3.0	0.7	—	—	5550	N07702	—	—	—	—
Inconel 706	—	—	42.0	16.0	—	40.0	—	0.03	0.2	0.3	0.4	1.75	—	—	5702	N09707	—	—	—	—
Inconel 713	—	—	75.0	12.5	—	—	4.2	0.12	—	—	6.1	0.8	—	—	5391	—	3146-3	NC12AD	LW2.4670	S-NiCr13Al6MoNb
Inconel 718	180	380	52.5	19.0	—	19.0	3.0	0.04	0.35	0.35	0.9	0.9	0.1	5383	5589	N07713	HR8	NC19FeNB	LW24668	NiCr19Fe19NbMo
Inconel 718SPF			54.0	18.0		18.5	3.0					1.0	5.0		5596G					
Inconel 722	—	380	74.8	15.0	—	6.5	—	0.04	0.55	0.2	0.6	2.4	—	—	5541	N07722	—	NC16FeTi	—	NiCr16FeTi
Inconel 751	—	—	70.0	15.5	—	7.0	—	0.1	1.0	0.5	1.5	2.6	0.5	—	—	N07751	—	—	—	—
Inconel 781	—	—	70.0	16.0	—	8.0	—	0.07	2.25	0.15	0.1	3.0	0.2	—	—	—	—	—	—	—
Inconel 783			30.0	3.5	26.5	27.0		0.03	0.05		6.0	0.4								
Inconel HX			47.0	22.0	1.5	18.0	9.0						0.6		5536					
Inconel MA754			77.5	20.0		1.0					0.3	0.5	0.6							
Inconel X-750	—	390	73.0	15.5	—	7.0	—	0.04	0.35	0.35	0.7	2.5	—	5542G	5582	N07750	—	NC16FeTNb	2.467	NiCr16FeTi
Invar 36			36.0	0.25	0.5	62.0		0.15	0.60	0.40			1.00							

Commercial designation	Hardness Brinell HB		Nominal composition Approximate Content in %											USA			UK	France	Germany	
	Ann.	Aged	Ni	Cr	Co	Fe	Mo	C	Mn	Si	Al	Ti	Others	SAE	AMS	UNS	BS	AFNOR	Werkst.-Nr	DIN1706
Invar 42			41.0			56.0		0.50	0.40				1.00							
Jessop G39	130	—	67.5	19.5	—	5.0	3.0	0.5	—	—	—	—	4.5	—	—	—	—	—	—	NiCr20MoW
Jessop G64	220	—	60.7	11.0	—	2.0	3.0	0.15	—	—	6.0	—	4.0	—	—	—	—	—	—	NiCr11AlWNb
Jessop G81	—	300	79.3	20.0	13.0	—	—	0.05	—	—	1.3	2.3	—	—	—	—	—	—	—	NiCr20Co18Ti
Jethete M-152			2.5	16.8			1.8	0.12	0.7	0.18			0.6							
Jethete M-252	—	320	55.3	20.0	10.0	—	10.0	0.15	0.5	0.5	1.0	2.6	—	—	5551	N07252	—	—	2.492	S-NiCr19Co
MAR-M 200	—	—	69.4	9.0	10.0	—	—	0.15	—	—	5.0	2.0	13.5	—	—	—	—	—	—	NiW13Co10Cr9AlTi
MAR-M 246	—	270	59.5	9.0	10.0	0.2	2.5	0.15	—	—	5.5	1.5	11.5	—	—	—	—	—	2.468	NiCo10W10Cr9AlTi
MAR-M 421	—	—	62.3	15.5	10.0	—	1.7	0.15	—	—	4.3	1.75	5.3	—	—	—	—	—	—	NiCR16Co10WAlTi
MAR-M 432	—	—	52.3	15.5	20.0	—	—	0.15	—	—	2.8	4.3	5.0	—	—	—	—	—	—	NiCo20Cr16WAlTi
Monel 400	110	—	65.0	—	—	1.5	—	0.12	1.0	—	—	—	32.0	4544	4574	N04400	3072-76	NU30	2.436	NiCu30Fe
Monel 405			63.0			2.5		0.30	2.0	0.5			34.0							
Monel K-500	120	290	64.0	—	—	1.0	—	0.13	0.8	—	2.8	0.6	30.0	4676	—	N05500	3072-76	—	2.438	NiCu30Al
Monel R-405	110	—	66.0	—	—	1.2	—	0.15	1.0	—	—	—	31.06	4674	7234	N04405	—	—	—	—
Multimet N155			21.0	22.5	21		3.5	0.16	2.0	1.0			4.50							
Nickel 200			99.0			0.4		0.15	0.35	0.35			0.26							
Nickel 201			99.0			0.4		0.02	0.35	0.35			0.26							
Nimocast 80	—	—	69.9	20.0	2.0	5.0	—	0.1	—	—	1.0	2.0	—	—	—	—	3146	—	—	—
Nimocast 90	—	—	52.9	20.0	18.0	5.0	—	0.1	—	—	1.5	2.5	—	—	—	—	—	—	—	—
Nimocast 713	—	—	72.6	13.4	—	—	4.5	0.12	—	—	6.2	1.0	2.3	—	—	—	—	—	—	—
Nimocast 842	—	—	57.7	22.0	10.0	—	10.0	0.3	—	—	—	—	—	5391A	—	—	HC203	NC13AD	2.467	S-NiCr13Al6MoNb
Nimocast PD16	—	—	43.8	16.5	—	34.0	3.3	0.06	—	—	1.2	1.2	—	—	5397	—	HC204	NK15CAT	LW2.4674	—
Nimocast PE10	—	—	56.4	20.0	—	—	6.0	—	—	—	—	—	9.0	—	—	—	—	—	—	NiFe33Cr17Mo
Nimocast PK24	—	—	61.1	9.5	15.0	—	3.0	0.17	—	—	5.5	4.7	1.0	—	—	—	3146	—	—	—
Nimonic 75	170	—	75.0	19.5	—	4.0	—	0.12	—	—	—	0.4	—	—	—	—	HR5,203-4	NC20T	2.463	NiCr20Ti
Nimonic 80A	—	350	75.0	19.5	—	—	—	0.08	—	—	1.4	2.4	—	—	—	N07080	Hr401,601	NC20TA	2.463	NiCr20TiAk
Nimonic 86			65.0	25.0			10.0													
Nimonic 90	—	346	59.0	19.5	16.5	—	—	0.08	—	—	1.5	2.5	—	—	—	N07090	Hr2,202	Nc20ATV	2.463	NiCr20Co18Ti
Nimonic 95	—	—	49.9	19.5	—	5.0	—	0.11	—	1.0	2.0	3.5	—	—	—	—	—	—	—	—
Nimonic 101			48.0	24.2	19.7		1.5				1.4	3.0								
Nimonic 105	—	320	53.0	15.0	20.0	—	5.0	0.12	—	—	4.7	1.2	—	—	—	—	HR3	NCKD20ATV	2.463	NiCo20C15MoAlTi
Nimonic 115	—	350	59.0	14.2	13.2	—	4.0	0.16	—	—	5.0	4.0	—	—	—	—	HR4	NCK15ATD	2.464	NiCo15Cr15MoAlTi
Nimonic 242	—	—	58.0	21.5	10.0	—	10.5	—	—	—	—	—	—	—	—	—	—	—	—	—
Nimonic 263 / C263	—	275	51.5	20.2	20.0	—	6.0	0.06	—	—	0.5	2.0	—	—	—	—	HR10	NCK20D	2.465	NiCr15Co19MoTi
Nimonic 901	—	350	44.0	12.5	—	35.0	5.7	0.04	—	—	0.3	2.9	—	5660C	5661A	—	—	ZSNCDT42	2.466	NiCr15MoTi
Nimonic PE11			39.0	18.0		34.0	5.2				0.8	2.3								
Nimonic PE13	—	—	49.0	21.8	1.5	18.5	9.0	0.1	0.5	0.5	—	—	0.6	5536E	5754E	—	HR6,204	NC22FeD	2.467	NiCr22Fe18Mo
Nimonic PE16	—	250	43.5	16.5	—	34.0	3.3	0.06	—	—	1.2	1.2	—	—	—	—	HR207	NW11AC	—	NiFe33Cr17Mo
Nimonic PK25	—	—	49.9	19.0	19.5	—	4.0	0.08	0.8	0.8	2.9	2.9	—	5751A	5753	—	—	NKOD20ATU	2.467	NiCr18CoMo
Nimonic PK31	—	—	53.8	20.0	14.0	—	4.5	—	—	—	0.4	2.3	5.0	—	—	—	—	—	—	—
Nimonic PK33	—	350	55.9	18.0	14.0	0.5	7.0	0.05	0.25	0.25	2.1	2.2	—	—	—	—	—	NC19KDUV	—	NiCr20Co16MoTi
R-235	—	—	63.3	15.0	1.2	10.0	5.5	0.12	0.1	0.3	2.0	2.5	—	—	—	—	—	—	—	—
Refractaloy 26	—	—	38.0	19.0	20.0	16.0	3.2	0.03	0.8	1.0	0.2	2.75	—	—	—	—	—	Z6NKCDT38	—	—
Rene 41	—	—	53.1	19.0	11.0	1.8	10.0	0.09	0.3	0.3	1.5	3.1	—	—	5399	N07041	—	NC19KDT	2.497	NiCr19Co11MoTi
Rene 63	—	—	54.4	14.0	15.0	0.5	6.0	0.05	0.1	0.2	3.8	2.5	3.5	—	—	—	—	—	—	—
Rene 77	—	—	57.6	15.0	15.0	0.4	4.2	0.17	0.1	0.1	4.3	3.3	—	—	—	—	—	—	—	—
Rene 80	—	—	61.0	14.0	9.5	—	4.0	0.15	—	—	—	4.0	8.0	—	—	—	—	—	—	—
Rene 95	—	—	64.5	14.0	8.0	—	3.5	0.15	—	—	—	2.5	3.5	—	—	—	—	NC14K8	—	—
Rene 100	—	—	60.6	10.0	15.0	—	3.0	0.18	—	—	5.5	4.7	—	—	—	—	—	—	—	NiCo15Cr10MoAlTi
Rene 125	—	—	60.0	8.9	10.0	—	2.0	0.1	—	—	4.7	2.5	7.0	—	—	—	—	—	—	—
TRW 1800	—	—	70.0	13.0	—	—	—	0.1	—	—	6.0	0.06	10.5	—	—	—	—	—	—	—
TRW V1 A	—	—	70.5	6.0	7.5	—	2.0	0.13	—	—	5.4	1.0	6.3	—	—	—	—	—	—	NiTa9Co8W6CrAl
Udimar 250			18.0		8.0	68.0	5.0				0.1	0.4			6512					
Udimar 300			18.5		9.0	66.0	5.0				0.1	0.7								
Udimet 500	—	—	51.7	19.0	19.0	—	4.0	0.1	0.1	0.1	3.0	3.0	—	—	5751	N07500	—	NCK19DAT	2.498	NiCr18Co18MoTi

Commercial designation	Hardness Brinell HB		Nominal composition Approximate Content in %										USA			UK	France	Germany	
	Ann.	Aged	Ni	Cr	Co	Fe	Mo	C	Mn	Si	Al	Ti	Others	SAE	AMS	UNS	BS	AFNOR	Werkst.-Nr	DIN1706
Udimet 520			56.0	19.0	12.0		6.0				2.0	3.0	1.0							
Udimet 630	—	—	51.0	17.0	—	17.5	3.0	0.04	—	—	0.6	1.1	4.1	—	—	—	—	—	2.467	NiCr19NbMo
Udimel 700	—	—	54.6	15.0	17.5	—	—	0.1	—	—	4.4	3.4	—	—	—	—	—	NCKD20AT	2.464	NiCo15CrMoAlTi
Udimet 710	—	—	55.0	18.0	15.0	0.5	1.5	0.07	—	—	2.5	5.0	1.5	—	—	—	—	NC18TDA	—	—
Udimet 718	180	380	52.5	18.0	—	18.0	3.0	0.05	—	—	0.6	0.1	5.2	5383	5589	N07718	HR8	NC19FeN	LW2.4668	NiCr19Fe19NbMo
Udimet 720			56.0	16.0	14.7		3.0				2.5	5.0	1.3							
Udimet alloy D-979			45.0	15.0		27.0	4.0				1.0	3.0	4.0							
Udimet L-605			10.0	20.5	50.0	3.0			1.5				15.0		5759					
Udimet alloy R41			55.0	19.0	11.0		10.0				1.5	3.1								
Waspaloy	—	HRC35-42	56.9	19.8	13.5	0.8	4.45	0.07	0.1	0.1	1.4	3.0	—	—	5544	N07001	—	NC20K14	LW2.4668	NiCr19Fe19NbMo

Co-Based Heat Resistant Alloys

Material Specifications Cross-Reference List - Aerospace Material Designation

Commercial designation	Hardness Brinell HB		Nominal Composition Approximate content in %											USA		UK	France	Germany		Others
	Ann.	Aged	Ni	Cr	Co	Fe	Mo	C	Mn	Si	Al	Ti	Others	SAE	AMS	BS	AFNOR	Werkst.-Nr	DIN1706	
Air Resist 13	—	—	1.0	—	79.6	2.5	—	11.0	—	—	3.5	—	4.12	—	—	—	—	—	—	—
Air Resist 213	—	—	—	19.0	65.8	—	—	4.7	—	—	3.5	—	6.68	—	—	—	—	—	—	—
Altemp S 816	—	—	20.0	20.0	47.6	—	4.0	4.0	—	—	—	—	0.4	—	(5534)	—	—	LW2.4989	CoCr20Ni20W	—
FSX 414	—	—	10.0	29.0	52.8	1.0	—	7.0	—	—	—	—	0.25	—	—	—	—	—	—	—
Haynes 25*	—	—	10.0	20.0	49.0	3.0	—	15.0	1.5	0.5	—	—	0.1	5537C	5759	—	KC20WN	LW2.4964	CoCr20W15Ni	—
Haynes 36	—	—	10.0	18.5	52.8	2.0	—	14.5	1.2	0.6	—	—	0.4	—	—	—	—	—	CoCr19W14NiB	—
Haynes 151	—	—	—	20.0	65.6	—	—	12.8	0.5	0.5	—	0.15	0.47	—	—	—	—	—	CoCr20W13	—
Haynes 188*	—	—	22.0	22.0	38.0	2.5	—	14.0	1.0	0.4	—	—	0.1	—	5772	—	KC22WN	—	CoCr22W14Ni	—
HS 6*	—	—	2.5	28.0	60.5	3.0	—	5.0	—	—	—	—	1.0	—	5373	—	—	—	—	R30006
HS 21*	—	—	3.0	27.0	62.6	2.0	5.0	—	0.6	0.6	—	—	0.25	—	5385	3531	—	—	CoCr29Mo	R30021
HS 25	—	—	10.0	20.0	48.4	3.0	—	15.0	1.5	2.0	—	—	0.1		5759	—	KC20WN	LW2.4964	CoCr20W15Ni	—
HS 30	—	—	16.0	24.0	51.4	1.0	6.0	—	0.6	0.6	—	—	0.4	5380	—	—	—	—	CoCr25NiW	R30030
HS 31	—	—	10.0	25.0	53.8	1.5	—	8.0	0.6	0.8	—	—	0.4	5382	—	3146	—	LW2.4670	CoCr25NiW	R30031
HS 36	—	—	10.0	18.0	53.1	2.0	—	15.0	1.5	—	—	—	0.4	—	—	—	—	—	CoCr19W14NiB	—
Inconel 783			28.5	3.0	34.0	26.0					5.4	0.1	3.0		5940					
J 1570*	—	—	28.0	19.0	39.0	2.0	—	7.0	—	—	—	—	—	—	—	—	—	—	—	—
J 1650	—	—	27.0	19.0	38.0	—	—	12.0	—	—	—	—	0.2	—	—	—	—	—	—	—
Jessop 832	—	—	12.0	19.0	44.0	17.0	2.0	—	0.8	0.3	—	—	3.5	—	—	—	—	—	CoCr19Fe16NiMoVNb	—
Jessop 834	—	—	12.0	19.0	42.0	20.0	2.0	—	—	—	—	—	6.5	—	—	—	—	—	CoCr19Fe20NiMoVNb	—
Jessop 865	—	—	10.5	25.5	53.0	2.0	—	7.5	0.6	0.6	—	—	0.45	—	—	—	—	—	CoCr25Niw	—
Jessop 875	—	—	—	21.0	66.0	—	—	11.0	—	—	—	—	2.45	—	—	—	—	—	CoCr21W11Nb	—
Jessop 887	—	—	10.0	20.0	50.0	3.0	—	15.0	0.5	1.5	—	—	0.1	—	—	—	—	—	CoCr20W15Ni	—
Jessop X-40			10.5	25.5	53.0	1.5	—	7.5	0.75	0.75	—	—	0.5	—	5382	3156-2	—	LW2.4670	CoCr25NiW	—
Jessop X-45			10.5	25.5	54.7	2.0	—	7.0	—	—	—	—	0.25	—	—	—	—	—	—	—
Jessop X-50			20.5	25.5	40.3	4.0	—	12.0	—	—	—	—	0.75	—	—	—	—	—	—	—
Jessop X-63			10.0	25.0	57.6	1.0	6.0	—	—	—	—	—	0.45	—	—	—	—	—	—	—
Jetalloy 209	—	—	10.0	20.0	52.0	1.0	—	15.0	—	—	—	2.0	0.02	—	—	—	—	—	—	—
L-251	—	—	10.0	19.0	56.0	1.0	—	14.0	—	—	—	—	0.4	—	—	—	—	—	—	—
L-605	—	—	10.0	20.0	51.0	1.6	—	15.0	1.5	0.6	—	—	0.1	—	5759	—	—	2.496	CoCr20W15Ni	R30605
M 203	—	—	25.0	20.0	38.0	1.6	—	12.0	0.8	1.0	0.7	2.0	1.67	—	—	—	—	—	—	—
M 204	—	—	25.0	18.0	42.0	1.6	—	12.0	—	—	—	—	1.27	—	—	—	—	—	—	—
M 205	—	—	25.0	18.0	40.0	1.6	—	12.0	—	—	2.7	—	1.67	—	—	—	—	—	—	—
ME16				15.0	23.0	2.0	5				5.0		22.25							
MP35N			37.0	21.0	29.2	1.0	10.5		0.15	0.15		1.0	0.04		5844					
MAR-M 302	—	—	—	21.5	57.0	0.75	—	10.0	0.1	0.2	—	—	10.0	—	—	—	—	—	CoCrW10TaZrB	—
MAR-M 322	—	—	—	21.5	60.0	0.75	—	9.0	0.1	0.1	—	0.75	7.7	—	—	—	—	—	CoCr22W9TaZrNb	—
MAR-M 509	—	—	10.0	23.0	55.0	—	—	7.0	0.05	0.05	—	0.2	4.6	—	—	3146-3	—	—	CoCr24Ni10WTaZrB	—
MAR-M 905	—	—	20.0	20.0	55.0	—	—	—	—	—	—	0.5	7.65	—	—	—	—	—	—	—
MAR-M 918	—	—	20.0	20.0	52.0	0.4	—	—	0.1	0.1	—	0.5	7.65	—	—	—	—	—	CoCr20Ni20Ta	—
NF3				14.3	22.4		3.9				4.8	4.6	17.90							
Refractaloy 70	—	—	20.0	21.0	46.0	0.5	8.0	4.0	—	—	—	—	0.08	—	—	—	—	—	—	—
STELLITE 6				26.0	72.0			5.0												
UDIMET 188			22.0	22.0	38.0	3.0		14.0	1.25											
V-36	—	—	20.0	25.0	43.2	2.4	4.0	2.0	0.6	0.5	—	—	2.29	—	—	—	—	—	CoCr25NiMoWNb	—
WI-52			0.5	21.0	62.6	2.0	—	11.0	0.25	0.25	—	—	2.45	—	—	—	—	—	CoCr12MoW	—

ISCAR Material Groups

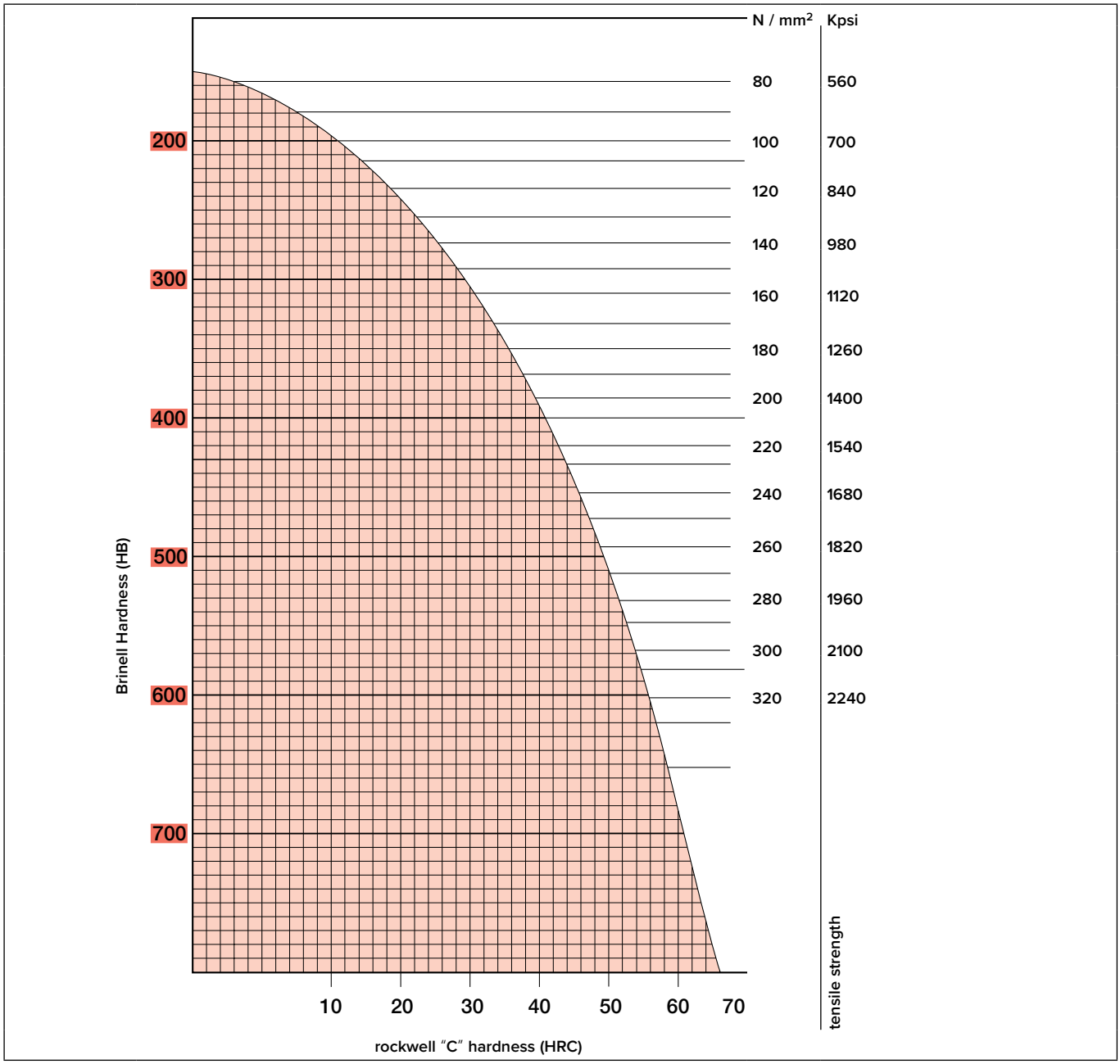
Based on ISO 513 and VDI 3323 standards

ISO	Material		Condition	Tensile Strength [N / mm²]	Kc1(1) [N / mm²]	mc(2)	Hardness HB	Material Group No.
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	1350	0.21	125	1
		≥0.25% C	annealed	650	1525	0.22	190	2
		<0.55% C	quenched and tempered	850	1675	0.24	250	3
		≥0.55% C	annealed	750	1675	0.24	220	4
			quenched and tempered	1000	1900	0.24	300	5
	low alloy and cast steel (less than 5% of alloying elements)		annealed	600	1775	0.24	200	6
			quenched and tempered	930	1675	0.24	275	7
				1000	1725	0.24	300	8
				1200	1800	0.24	350	9
	high alloyed steel, cast steel and tool steel		annealed	680	2450	0.23	200	10
			quenched and tempered	1100	2500	0.23	325	11
	stainless steel and cast steel		ferritic / martensitic	680	1875	0.21	200	12
			martensitic	820	1875	0.21	240	13
M	stainless steel and cast steel		austenitic, duplex	600	2150	0.20	180	14
K	gray cast iron (GG)		ferritic / pearlitic		1150	0.20	180	15
			pearlitic / martensitic		1350	0.28	260	16
	nodular cast iron (GGG)		ferritic		1225	0.25	160	17
			pearlitic		1350	0.28	250	18
	malleable cast iron		ferritic		1225	0.25	130	19
			pearlitic		1420	0.3	230	20
N	aluminum-wrought alloys		not hardenable		700	0.25	60	21
			hardenable		800	0.25	100	22
	aluminum-cast alloys	≤12% Si	not hardenable		700	0.25	75	23
			hardenable		700	0.28	90	24
		>12% Si	high temperature		750	0.25	130	25
	copper alloys	>1% Pb	free cutting		700	0.27	110	26
			brass		700	0.27	90	27
			electrolytic copper		700	0.27	100	28
	non metallic		duroplastics, fiber plastics		200	0.20	70 Shore D	29
			hard rubber		200	0.20	55 Shore D	30
S	high temperature alloys	Fe based	annealed		2600	0.24	200	31
			hardened		3100	0.24	280	32
		Ni or Co based	annealed		3300	0.24	250	33
			hardened		3300	0.24	350	34
			cast		3300	0.24	320	35
	titanium alloys		pure	400	1160	0.24	190	36
			alpha+beta alloys, hardened	1050	1245	0.24	310	37
H	hardened steel		hardened		4600	0.25	55 HRC	38
			hardened		4700	0.25	60 HRC	39
	chilled cast iron		cast		4600	0.27	400	40
	cast iron		hardened		4500	0.27	55 HRC	41

- steel
- stainless steel
- cast iron
- non-ferrous metals
- superalloys and titanium
- hard materials

(1) Specific cutting force for 1 mm² chip section
(2) Chip thickness factor

Hardness Conversion Table



Material Cross Reference Chart

According to VDI 3323 Standard

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	1020; G10200; K02301; K02595; K02596; K02597; K02598; K02599; K02702; K0300	1.0044	S275JR; St 44-2; Fe 430 B	EN 43 B; Fe 430 B FN; 43 / 25 HR; 43 / 25HS; 43 B; HFW4; HFS4; ERW 3	E 28-2	1411; 1412	Fe 430 B FN; Fe 430 B	AE 275 B; Fe 430 B FN	SN 400 B; SN 400 C; SN 490 B; SN 490 C; SS 400; STK 400; STKM 19 C; STKR 400; 19 C; SS 41; STK 41	St4ps; St4sp	S275JR
1		1.0050	E295; St 50-2; Fe 490-2; ST 50-2 G (E295+CR)	Fe 490-2 FN; 50 B	A 50-2	1550; 2172	Fe 490	A 490-2; Fe 490-2 FN	SS 490; SS 50	St5ps; St5sp	
1	K02404; K02702	1.0045	S355JR; Fe 510 B	50 B; 4360-50 B	E 36-2		Fe 510 B FN	AE 355 B	SN 400 B; SN 400 C; SN 490 B; SN 490 C; SS 490; SS 50		S355JR
1	K02702	1.0143	S275J0; St 44-3 U; Fe 430 C	43C; 4360-43C	E 28-3	1414-01	Fe 430 C FN	AE 275 D			S275J0
1		1.0130	P265S; SPH 265	164-400B LT 20	SPH 265; A 42 AP			SPH 265			P265S
1	A 619	1.0333	DC03G1; USt 3; USt 13	2 CR; 3 CR	E		FeP 02	AP 02	SPCD		DC03G1
1	K02601; K03000; A 573 Gr. 70; A 611 Gr.D	1.0144	S275J2G3 (S275J2); St 44-3 (Fe 430 D 1)	Fe 430 D1 FF; 4360-43 C; 4360-43 D	E 28-3; E 28-4	1411; 1412; 1414	Fe 430 B; Fe 430 C (FN); Fe 430 D (FF)	AE 275 D; Fe 430 D1 FF	SM 400 A; SM 400 B; SM 400 C; SS 400; STK 400; STKR 400; SM 41 A; SM 41 B; SM 41 C	St4kp; St4ps; St4sp	
1	1008; G10080; A 621	1.0330	DC01; DC 01; St 2; St 12	CR 4; CS 4	C; TC	1142	FeP 01; FeP 00	AP 11; FeP 01; AP 00	SPCC; CR 1		DC01 (FeP 05)
1	1015; G10150; K02401	1.0037	S235JR (Fe 360 B); St 37-2	Fe 360 B; 4360-40 B; ERW 3; CEW 3; 37 / 23 HR; 37 / 23 HS; 37 / 23 CR; 37 / 23 CS	E 24-2	1311	Fe 360 B; 1449 37 / 23 HR	AE 235 B; Fe 360 B	STKM 12 A; STKM 12 AC		
1		1.0035	S185 (Fe 310-0); St 33	Fe 310-0; 15 HR; 15 HS; 1449 15 HR; 1449 15 HS	A 33	1300	Fe 320	Fe 310-0; A 310-0	SGP; SS 330; SS 34	St0	S185
1	K02502	1.0034	E195; RSt 34-2	CEW 2; 34 / 20 HR; 34 / 20 HS; 34 / 20 CR; 1449 34 / 20CS	A 34-2 NE		Fe 330 BFN			St2ps; St2sp	E195
1		1.0334	DD12G1; UStW 23		2 C		FeP 12	AP 12	SPHD	10kp	

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	1006; G10060	1.0335	DD13; StW 24	1 CR; 1 CS; 1 HR; 2 HR; 2 HS; 2 CR; 2 CS	3 C		FeP 13	AP13	SPHE	08kp	DD13
1	A 620	1.0338	DC04; St 4; St 14	CR 1; CR 2	ES	1147	FeP 04	AP 04; FeP 04	SPCE; HR 4	08JuA	DC04 (FeP 04)
1	K01700; K02001; K02200; K02201; K02203; K02503; K02601; K02801	1.0345	P235GH; HI; H I	141-360; 151-360; 154-360; 161-360; 164-360	A 37 CP	1330; 1331	FeE 235; Fe 360 1 KW; Fe 360 1 KG; Fe 360 2 KW; Fe 360 2 KG	A 37 Grado RA II; A 37 Grado RC I	SGV 410; SGV 450; SGV 480; SPV 235; SPV 450; SPV 490; SGV 42; SGV 46; SGV 49; SPV 24; SPV 46; SPV 50		P235GH
1	1010; G10100	1.0301	C10; C 10	040 A 10; 045 M 10; En 2 A; En 2 A / 1; En 2 B; En 32 A; 10 CS	C10RR; XC 10; C 10; AF 34 C 10		1 C 10; C 10	F.151; F.151.A	S 10C	10	C10
1		1.0149	S275JOH; St 44-3 U; RoSt 44-2	43 C; 4360-43C	E 28-3	1412-04	Fe 430 C	Fe 430 C; AE 275 C			S275JOH
1		1.0226	DX51D; St 02 Z	Z2	GC	1151 10	FeP 02 G	FeP 02 G	SGC C		
1	A 1011 (SS Grade 36 (230) Type 2); A1011 (SS Grade 36 (250) Type 1)	1.0114	S235JO; St 37-3 U; Fe 360 C	40 C; 4360-40C	E 24-3		Fe 360 C FN	AE 235 C	SS 330; SS 34		S235JO
1	A572-60	1.8900	S380N; StE 380	4360 55 E		2145	FeE 390 KG		S 25 C		S380N
1	A 572 Gr. 65	1.0060	E335; St 60-2 (Fe 590-2 B)	En 55 C; Fe 590-2-FN; 55 E; 4360-55 E	A 60-2	1650	Fe 590; Fe 60-2	A 590; Fe 590-2 FN	SM 570; SM 58	St6ps; St6sp	E335
1		1.0028	S250G1T; USt 34-2		A 34-2		Fe 330; Fe 330 B FU		SS 330; SS 34		
1	K01700; K02200; K02801	1.0112	P235S; SPH 235	164-360B LT20; 1501-164-360B LT20	A 37 AP; SPH 235		Fe 360 C	AE 235 C			P235S
1		1.0722	10SPb20; 10 SPb 20		10 PbF 2		CF 10 SPb 20	10 SPb 20; F.2122			10SPb20
1	1108; 1109; 1111; B1111; B 1111; G11080; G11090	1.0721	10S20; 10 S 20		10 F 2		CF 10 S 20	10 S 20; F. 2121			10S20
1	12L13; 12L14; 12 L 13; 12 L 14; G12134; G12144	1.0718	11SMnPb30; 9 SMnPb 28	230 M 07 Pb; En 1A Pb	S 250 Pb	1914	CF 9 SMnPb 28	F.210.C; F.210.M; 11 SMnPb 28; F.2112	SUM 22 L; SUM 23 L; SUM 24 L		11SMnPb30

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	1213; 1215; G12130; G12150	1.0715	11SMn30; 9 SMn 28	230 M 07; En 1 A	S 250	1912	CF 9 S 22	F.210.A; F.210.L; 11 SMn 28; F.2111	SUM 22		11SMn30
1	1020; 1023; G10200; G10230	1.1151	C22E; Ck 22	055 M 15; 070 M 20; En 3 A; En 3 C; En 2	XC 25; XC 18; 2 C 22	1450	C 20; C 25	F.1120; C 25 K	S 20 C; S 20 CK; S 22 C	20	C22E
1	A 1008 (HSLAS-F Grade 80 [550]); A 1011 (HLAS-F Grade 80 [550])	1.0986	S500MC; QStE 500 TM	60F55 HR; 60F55 HS; 60F55 CS	E 560 D; S 560 MC		FeE 560 TM				S500MC
1	A 1008 (HSLAS-F Grade 70 [480]); A 1008 (HSLAS Grade 70 [480] Class 1)	1.0984	S500MC; QStE 500 TM		E 490 D; S 490 MC	2662	FeE 490 TM				S500MC
1	A 1008 (HSLAS Grade 65 [450] Class 1); A 1008 (HSLAS Grade 65 [450] Class 2)	1.0982	S460MC; QStE 460 TM	1501-50F45; 50F45 HR; 50F45 HS; 50F45 CS							S460MC
1	A 1008 (HSLAS Grade 50 [340] Class 1); A 1008 (HSLAS Grade 50 [340] Class 2)	1.0976	S355MC; QStE 360 TM	46F40 HR; 46F40 HS; 46F40 CS	E 355 D	2642	FeE 355 TM				S355MC
1	A 1008 (HSLAS Grade 50 [340]); A 1008 (HSLAS Grade45 [310] Class 2); A 1011 (HSLAS-F Grade 50 [340])	1.0972	S315MC; QStE 300 TM	1501-40F30; 43F35 HR; 43F35 HS; 43F35 CS	E 315 D						
1	K01600; K02007; K02700; K02701; K02803; K02900; K03009; K03300; K11803; K12000; K12001; K12037	1.0562	P355N; StE 355	225-490A	FeE 355 KG N; E 355 R / FP; A 510 AP	2106	FeE 355; FeE 355 KG; FeE 355 KW	AE 355 KG; AE 355 DD	SM 490 A; SM 490 B; SM 490 C; SM 490 YA; SM 490YB STK 490 YB; STK 490; STK 500; SM 50 A; SM 50 B	15GF	P355N
1	1024; K03011; K03014; K12037; K12709	1.0570	S355J2G3 (S355J2); St 52-3 N (Fe 510 D1)			2132; 2134	fE 510	AE 355 D; Fe 510 D1 FF	SM 490 A; SM 490 B; SM 490 C; SM 490 YA; SM 490 YB; SM 520 B; SM 520 C; STK 490; STK 500; STKM 16 C	17GS; 17G1S	S355J2G3

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	K01600; K02302; K02700; K02701; K02803; K03301; K11803; K12037; K12609; A 299 (A); A 299 (B)	1.0566	P355NL1; TStE 355	225-490 A	A 510 FP	2107	Fe E 355 KT		SLA 365; STK 490; STK 500; SLA 37; STK 50; STK 51		P355NL1
1	K01600; K02007; K02701; K02803; K117803; K12001; K12037; K12609	1.0565	P355NH; WStE 355	225 / 490; 225-490 A; 500 Nb	A 510 AP	2106	FeE 355-2; FeE 355 KW				P355NH
1	K12037	1.0549	S355 NLH; TStE 355	50 EE		2135	Fe 510 D	FeE 355 KTM			S355 NLH
1	K12000	1.0553	S355JO; St 52-3 U; Fe 510 C	50 C; 4360-50C	E 36-3		Fe 510 C FN	AE 355 C	SCC 3		S355JO
1	A 252 (1); A 252 (2); A 252 (3)	1.0547	S355JOH; St 52-3 U	50 C; 4360-50C	TSE 355-3; E 36-3		Fe 510 C	AE 355 C; Fe 510 C			S355JOH
1	K02502	1.0036	S235JRG1; S235JR; Fe 360 B; USt 37-2	Fe 360 B FU; Fe 360 B FN		1311; 1312	Fe 360 B; Fe 360 C; Fe 360 D	AE 235 B; Fe 360 B		16D; St3Kp	
1	1020; 1022; 1023; G10200; G10220; G10230	1.0402	C22	055 M 15; 070 M 20; En 3 A; En 3 B; En 3 C; En 2; 22 HS; 22 CS	AF 42 C 20; XC 25; 1 C 22	1450	C 20; C 21	F.112; 1 C 22	S 20 C; S 22 C	20	C22; 2C / 2D
1	K01701; K02505; K02704; K02801	1.0425	P265GH; H II	151-400; 154-400; 161-400; 164-400	A 42 CP; A 42 AP	1431; 1430; 1432	Fe 410 1 KW; Fe 410 1 KG; Fe 410 1 KT; Fe 410 2 KW; Fe 410 2 KG	A 42 Grado RC I; A 42 Grado RC II; F.6306; F.6307	SG 295; SGV 410; SGV 450; SGV 480; SPV 315; SPV 355; SG 30; SGV 42; SGV 46; SGV 49; SPV 32; SPV 36	16K; 20K	P265GH
1	A27 65-35	1.0443	HX300PD; H300PD; H 300 PD		E 23-45 M	1305					HX300PD
1	K12000; K12037	1.0546	S355NL; TStE 355	50 EE; 4360-50EE	E 355 FP	2135; 2135-01	FeE 355 KT	AE 355 Grado KT			
1	K12709	1.0545	S355N; StE 355	50 E; 4360-50E	E 355 R	2134	FeE 355 KG	AE 355 Grado KG	SM 490 A; SM 490 B; SM 490 C; SM 490 YA; SM 490 YB; SM 50 A; SM 50 B; SM 50 C; SM 50 YA; SM 50 YB		S355N
1	K02705; K02305; K12709	1.0539	S355NH; StE 335 N	S355NH	S355NH; TSE 355-4	2134-04	Fe 510 B	Fe 355 KGN			S355NH

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	1213; 1215; G12130; G12150	1.0715	11SMn30; 9 SMn 28	230 M 07; 220 M 07	S 250	1912	CF 9 S 22	F.210.A; F.210.L; 11 SMn 28; F.2111	SUM 22		11SMn30
1		1.0722	10SPb20; 10 SPb 20		10 PbF 2		CF 10 SPb 20	10 SPb 20; F.2122			10SPb20
1	1215; G12150; A 29 (1215); A 108 (1215); A 510 (1215); A 510 (1215); A 519 (1215); A 521 (1215)	1.0736	11SMn37; 9 SMn 36		S 300		CF 9 Mn 36	12 SMn 35; F.2113	SUM 25		11SMn37
1	12L14; 12 L 14; G12144	1.0737	11SMnPb37; 9 SMnPb 36		S 300 Pb	1926	CF 9 SMnPb 36	12 SMnPb 35; F.2114			11SMnPb37
1	1010; G10100	1.1121	C10E; Ck 10	040 A 10; 045 M 10; En 2 A; En 2 A / 1; En 2 B; En 32 A	C10RR; XC 10	1265	2 C 10; 2 C 15; 1 C 10; C 10	C 10 k; F.1510	S 09 CK; S 10 C	08; 10	C10E
1	1015; 1017; G10150; G10170	1.1141	C15E; Ck 15	080 A 15; 080 M 15; En 32 C	XC 12; XC 15; XC 18	1370	1 C 15; C 15	C 16 k; F.1511; F.1110; C 15 k	S 15 C; S 15 CK	15	C15E
1	1020; G10200; K02301; K02595; K02596; K02597; K02598; K02599; K02702; K03000	1.0044	S275JR; St 44-2; Fe 430 B	En 43 B; Fe 430 B; 43 / 25 HR; 43 / 25 HS; 43 B; HFW 4; HFS 4; ERW 3; CEW 4; SAW 4	E 28 A; NFA 35-501 E 28	1411; 1412	Fe 430 B FN	AE 275 B; Fe 430 B FN	SN 400 B; SN 400 C; SN 490 B; SN 490 C; SS 400; STK 400; STKM 19 C; STKR 400; 19 C; SS 41; STK 41	St4ps; St4sp	S275JR
1		1.0250	S320GD; StE 320-3 Z		S 320 GD				SGC 440; SZAC 440; SZAH 440; SGLH 440		S320GD
1		1.0453	P265NL; P 265 NL								P265NL
1		1.0338	DC04; St 4; St 14	CR 1; CS 2	ES	1147	FeP 04	AP 04; FeP 04	SPCE; HR 4	08JuA	DC04
1											
1	K02001; K02601; K02701	1.0116	S235J2G3 (S235J2); St 37-3 N; Fe 360 D 1	Fe 360 D1 FF; 37 / 23 CR; 37 / 23 CS; 37 / 23 HR; 37 / 23 HS; 40 D; HFW 4; HFS 4	E 24-3; E 24-4; E 24-U	1312; 1313	Fe 360 C; D; Fe 360 C FN; Fe 360 D FF; Fe 37-2		SS 330; SS 34	16D; St3sp	S235J2G3
1	1015; 1017; G10150; G10170	1.0401	C15; C 15	080 A 15; 080 M 15; En32 C; 17 CS; 17 HS	C18RR; XC 18; C 18; AF 37 C 12	1350	1 C 15; C15; C16	F.111	S 15 C		C15
1		1.0347	DC03; RRSt; RRSt 13	CR2; CR3; CS3; 1449 3 CR; 1449 2 CR	E	1146	FeP 02; FeP 03	AP 02; AP02; FeP03	SPCD; CR 3	08Ju	DC03

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	K01500; K01702; K02401; K02502; K03000; A570.36	1.0038	S235JR; S235JRG2; RSt 37-2; Fe 360 B	Fe 360 B FU; 37 / 23 CR; 37 / 23 CS; 37 / 23 HR; 37 / 23 HS; HFW 3; HFS 3; 40 B	E 24-2 NE	1312	Fe 360 B FN	AE 235 B FN; AE 235 B FU; Fe 360 B FN; Fe 360 B FU	SS 330; SS 34	St3ps; St3sp	S235JR
1	J03001	1.0446	GE240; GS-45	A 1					230-450; 230-450 W	25L-3	GE240
2	1035; G10350	1.0501	C35G; C 35 G	080 M 30; En 5; 080 M 36	C 35; AF 55; 1 C 35; XC 38	1572; 1550	C 35; 1 C 35	F.113	S 35 C; S 35 CM		C35G
2	1035; G10350	1.1183	C35G; C 35 G; Cf 35	080 A 35	XC 38 TS	1572	C 36; C 38	F.1130; C 35 k	S 35 C; S 35 CM	35	C35G
2	1039; G10390	1.1157	40Mn4; 40 Mn 4		35 M 5					40G	
2	1040; G10400	1.0511	C40; C 40	En 8; 080 M 40	AF 60; C 40; 1 C 40		C 40; 1 C 40	F.114.A			C40
2	1045; 1045 H; 1042; G10450; H10450; G10420	1.1191	C45E; Ck 45	080 H 46; 080 M 46	C45RR; XC 45; XC 48 H-1	1672	C 45	F.1140; F.1142; C 45 k; C48 k	S 45 C; S 45 CM; S 48 C	45	C45E
2	1025; G10250	1.1158	C25E; Ck 25	070 M 26	2 C 25; XC 25		C 25	F.1120; C 25 k	S 25 C; S 28 C	25	C25E
2	1043; 1045; G10430; G10450	1.0503	C45; C 45	080 M 46	C 45; AF 65; C 45; 1 C 45	1650	C 45; 1 C 45	F.114	S 45 C; S 45 CM	45	C45
2	1050; 1055; G10500; G10550	1.1213	C53G; C53E; Cf 53		XC 48 TS		C 53		S 50 C; S 50 CM	50	
2	1140; G11400	1.0726	35S20; 35 S 20	212 M 36	35 MF 4	1957		F.210.G; 35 MnS 6; F.2131			35S20; 8M
2	1139; 1146; G11390; G11460	1.0727	46S20; 45 S 20		45 MF 4						46S20
2	K12000	1.0553	S355J0; St 52-3 U; Fe 510-C	50 C	E 36-3		Fe 510 C FN	AE 355 C	SCC 3		S355J0
2		1.0551	S355JRC								S355JRC
2	K02700; K02803; K03103; K03300; K12437	1.0473	P355GH; 19 Mn 6		A 52 CP	2101; 2102	Fe E 355-2	A 52 RC I, RA II	SGV 410; SGV 450; SGV 480		P355GH
2		1.0416	C18D; GS-38		20-400 M	1306					C18D
2	K12447	1.0577	S355J2; S355J2G4; Fe 510 D2		A 52 FP	2107		A 52 RB II; AE 355 D			
2	1049; 1050; G10490; G10500	1.1206	C50E; Ck 50	080 M 50	XC 50; 2 C 50	1674	C 50			50	C50E
2	1330; 1527; G13300; G15270	1.1170	28Mn6	150 M 19; En 14 A; En 14 B	20 M 5		C 28 Mn		SCMn 1	30G	28Mn6

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
2	1034; 1035; 1038; G10340; G10350; G10380; C 1034	1.1181	C35E; Ck 35	080 M 30; En 5; 080 M 36	XC35RR; XC32; XC 35; XC 38 H 2; XC 38 H 1; 2 C 35	1572	C 35	F.1130; C 35 k	S 35 C; S 35 CM; S 38 C	35	C35E
2		1.1180	C35R; Cm 35	080 A 35	XC 38 H 1 u; Cm 35		C 35	F.1135; C 35 k-1			C35R
2	1030; G10300	1.1178	C30E; Ck 30	080 M 30; En 5	XC 32		C 30	2 C 30	S 30 C; S 30 CM		C30E
2	1049; 1050; G10490; G10500	1.0540	C50	En 43 A; 080 M 50	C50	1674	C 50	1 C 50	S 50 C		C50
2	1536; G15360	1.1166	34Mn5					TO.B	SMn 433 H; SMn 433 HRCH; SMn 433 RCH; SMn 1 H		
2	1025; G10250	1.0406	C25	070 M 26	1 C 25		C 25; 1 C 25				
2		1.0723	15S22; 15 S 20	210 A 15; 210 M 15		1922		F.210F; F.210.F	SUM 32		
2		1.1730	C45U; C45W; C 45 U; C 45 U								C45U
3	1045; 1049; G10450; G10490	1.1201	C45R; Cm 45	080 M 46	3 C 45; XC 42 H 1; XC 48 H 1 u	1660	C 45	F.1145; F.1147; C 45 k-1; C 48 k-1	S 45 C; S 45 CM	45	C45R
3	1040; G10400	1.1186	C40E; Ck 40	080 M 40; En 8	2 C 40; XC 42 H 1		C 40		S 40 C	40	C40E
3	1074; 1075; G10740; G10750	1.0614	C76D; C 76 D; D 75-2		XC 75		3 CD 75			75	C76D
3	1095; G10950	1.0618	C92D; C 92 D; D 95-2	95 HS; 95 CS	XC 90		3 CD 95				C92D
3	1086; G10860	1.0616	C86D; C 86 D; D 85-2	80 HS; 80 CS	XC 80		C 85; 3 CD 85				C86D
3		1.1165	G28Mn6; GS-30 Mn 5	A 5; A 6				30 Mn 5; AM 30 Mn 5; F.120.D; F.8211; F.8311	SCMn 2	27ChGSNMDTL; 30GSL	G28Mn6
3	K01700; K02001; K02200; K02201; A 516 Gr.70; A 515 Gr. 70; A 414 Gr.F; A 414 Gr.G	1.0481	P295GH; 17Mn4; 17 Mn 4	224-469 B	A 48 CP; A 48 AP	2102	Fe 295	A 47 RC I; RA II	SG 365; SGV 410; SGV 450; SGV 480; SPV 315; SG 37; SGV 42; SGV 46; SGV 49; SPV 32	14G2	P295GH
3	1043; 1045; G10430; G10450	1.0503	C45; C 45	080 M 46	C 45; AF 65; C 45; 1 C 45	1650	C 45; 1 C 45	F.114	S 45 C; S 45 CM		C45

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
3	1335; 1335 H; 1541; 1541 H; G13350; G15410; H13350; H15410	1.1167	36Mn5; 36 Mn 5	150 M 36	40 M 5; 35 Mn 5	2120		F. 1203-36 Mn 6; F. 8212-36 Mn 5	SMn 438; SMn 438H; SCMn 3	35G2; 35GL	36Mn5
3	1045; 1045 H; 1042; G10450; H10450; G10420	1.1191	C45E; Ck 45	089 H 46; 080 M 46	C45RR; XC 45; XC 48 H 1	1672	C 45	F.1140; F.1142; C 45 k; C 48 k	S 45 C; S 45 CM; S 48 C	45	C45E
3		1.1303	38MnVS6; 38 MnVS 6								38MnVS6
4	1055; G10550	1.0535	C55	070 M 55; En 9	C54; 1 C 55; AF 70; C 55	1655	C 55; 1 C 55	F.115	S 55 C; S 55 C-CSP; S 55 CM	55	C55
4	1055; G10550	1.1203	C55E; Ck 55	070 M 55; En 9	C50RR; XC 54; XC 50; 2 C 55; XC 55 H 1	1655	C 55	F.1150; C 55 K	S 55 C; S 55 C-CSP; S 55 CM	55	C55E
4	1060; G10600	1.0601	C60	060 A 62; En 43 D	C60; 1 C 60		C 60; 1 C 60		S 58 C; S 60-C-CSP; S 60 CM; S 65 C-CSP; S 65 CM	60; 60G	C60; 43D
4	1070; G10700	1.1231	C67S; Ck 67	060 A 67; 080 A 67; En 43 E	C68RR; XC 68	1770	C 67		S 70 C-CSP; S 70 CM	65GA; 68GA	C67S
4	1074; 1075; 1078; G10700; G10750; G10780	1.1248	C75S; Ck 75	060 A 78; 80	C75RR; XC 75	1774	C 75		S 75 CM	75A	C75S
4	1095; G10950	1.1274	C100S; Ck 101	95	C100RR; XC 100	1870	C 100		SK 95 -CSP		C100S
4	W112; W1; T72301	1.1563	C125U; C 125 W		Y2 120; C120E3U		C 120 KU	F.5123; C 120	SK 120; SK 120 M; SK 2; SK 2 M; TC 120	U12-1	C125U
4	1086; G10860	1.1269	C80S; Ck 85; C 85 E		C90RR; XC 90		C 85		SK 85-CP	85A	C80S
4	1055; G10550	1.1209	C55R; Cm 55	070 M 55; En 9	3 C 55; XC 55 H 1		C 55	F.1155; C 55 k-1			C55R
4	1074; 1075; G10740; G10750	1.0605	C75	060 A 78	C 75		C 75			75	
4	1070; G10700	1.0603	C67	060 A 67; 080 A 67; En 43 E; 1449 70 HS	C68; XC 65		C 67		S 70 C-CSP; S 70 CM		C67
4		1.1219	C56E2; Cf 54						C56E2; S55C		C56E2
5	1055; G10550	1.1220	C56D2; C 56 D 2		C 56 D 2						C56D2
5		1.1217	C90S; C 90 S	CS95	C90RR; XC 90; XC90; C90E2U				SK 95		C90S

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
5	1060; 1064; G10600; G10640	1.1221	C60E; Ck 60	060 A 62; 070 M 60; En 43 D	C60RR; XC 60; X 65; 2 C 60	1678	C 60		S 58 C; S 60 C-CSP; S 60 CM; C 65 C-CSP; C 60 CM	60GA	C60E
5	1055; G10550	1.1203	C55E; Ck 55	070 M 55; En 9	C50RR; XC 54; XC 50; XC 55 H 1; 2 C 55	1655	C 55	F.1150; C 55 k	S 55 C; S 55 C-CSP; S 55 CM	55	C55E
6	9260; G92600	1.5028	65Si7; 65 Si 7		60 S 7				50 P 7; SUP 6; SUP 6 M; SUP 7; SWOSM	60S2G	
6	9260 H; H92600; 9260; G92600	1.5027	60Si7	251 A 60; 251 H 60	60 S 7		60 Si 7	F.144.B; F.1441		60S2	
6	9255; G92550	1.5026	56Si7; 56 Si 7; 55Si7; 55 Si 7	251 A 58; En 45 A	55 S 7	2085; 2090	55 Si 7	F.144; F.144.A; 56 Si 7; F.1440		55S2; 60S2	565Si7; 55Si7
6	9255; G22550	1.5025	51Si7; 51 S 7		50S7; 51 Si 7		48 Si 7; 50 Si 7	F.145.B			51Si7
6		1.5024	46Si7		45 S 7; Y 46 S 7; 46 SI 7			F.1451			46Si7
6	G50986; ASTM Grade E50100; ASTM Grade G15116; SAE E50100	1.3501	100Cr2; 100 Cr 2	GCr6; B00040; GCr4	100C2					SchCh4	
6	K21390; K21590; ASTM A 182 F22	1.7380	10CrMo9-10; 10 CrMo 9 10	622; 622-490; 622 / 515; 622 / 690	12 CD 9-10; 10 CD 9.10	2218	12 CrMo 9 10	TU.H	SCMQ4E; SCMV 4; SFVA F 22.A; SFVA F 22.B; SFVCM F22B; STBA 24; STFA 24; STPA 24	12Ch8	10CrMo9-10
6	O2; T31502	1.2842	90MnCrV8; 90 MnCrV 8	BO 2; BO2	90 MnV 8; 90 MV 8		90 MnVCr 8 KU	90 MnCrV 8; F.5229			90MnCrV8
6		1.2550	60WCrV7; 60 WCrV 7	BS1; BS 1	55 WC 20	2710	55 WCrV 8 KU; 58 WCr 9 KU	60 WCrSiV 8; F.5242			60WCrV7
6		1.2241	51CrMnV4; 51 CrV 4; 50 CrV 4								
6	L2; T61202	1.2210	115CrV3; 115 CrV 3		100 C 3		107 CrV 3 KU	F.520.L; F.5125			115CrV3
6		1.2419	105WCr6; 105 WCr 6	105WC 13	105 WCr 5; 105 WC 13	2140	107 WCr 5 KU	F.5233; 105 WCr 5	SKS 2; SKS 2 M; SKS 3; SKS 31	ChW1G; ChWG	105WCr6
6	4820; 5120; 5120H; G48200; G51200; H51200	1.7147	20MnCr5; 20 MnCr 5	150 M 19	20 MC 5	2172	20 MnCr 5; Fe52	F.150.D	SMnC 420 H; SMnC 420 RCH; SMnC 21 H	18ChG	20MnCr5
6	9255; G92550	1.0904	55Si7; 55 Si 7	250A53	55 S 7	2085	55 Si 8	56 Si 7			
6	9254; G92550	1.0904	55Si7; 55 Si 7	250 A 53	55 S 7	2090					
6	9262; G95620	1.0961	HDT 450 F; S340 MGC		60 SC 6		60 SiCr 8	60 SiCr 8; F.1442		60S2; 55S2; 50ChFA	

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
6	4135; 4137; 4135H; 4137H; G41350; G41370; H41350; H41370	1.7220	34CrMo4; GS34 CrMo 4; G34 CrMo 4	708 A 30	34 CD 4; 34CrMo4RR; 35 CD 4;	2234	34 CrMo 4 KB; 35 CrMo 4	35 CrMo 4 DF; F.125.A; F.125.B; F.1254; F.1250	SCM 435 H; SCM 435 HRCH; SCM 435 M; SCM 435 RCH; SCM 435TK; SCM 3 H; STKS 3	35ChM; AS38ChGM	34CrMo4
6		1.5120	38MnSi4; 38 MnSi 4								
6	L3; T61203	1.2067	102Cr6; 102 Cr 6; 100Cr6	BL 3; BL3	100Cr6RR; 100 C 6; 100Cr6; Y 100 C 6		102 Cr 6 KU	F.5230; 100 Cr 6	SUJ 2	Ch	102Cr6
6	L1	1.2108	90CrSi5; 90 CrSi 5			2092	105 WCr 5				90CrSi5
6	P20; T51620	1.2330	35CrMo4; 35 CrMo 4	708 A 37	34 CD 4	2234	35 CrMo 4				35CrMo4
6	O1; T31501	1.2510	100MnCrW4; 100 MnCrW 4	BO1; BO0; BO 1; BO 0	90MnWCrV5; 90 MWCV 5; 8 MO 8	2140	95 MnWCr 5 KU; 10 WCr 6	F.522.A; F.5220; 95 MnCrW5; 105 WCr 5	SKS 31		100MnCrW4
6	S1; T41901	1.2542	45WCrV7; 45 WCrV 7	BS1; BS 1	45 WCrV 8; 45 WCrV 20	2710	45 WCrV 8 KU	F.524; F.5241; 45 WCrSi 8		5ChW25F	45WCrV7
6	L6; T61206	1.2713	55NiCrMoV6; 56NiCrMoV6; 55 NiCrMoV 6; 56 NiCrMoV 6	BH 224; BH 225	55 NCDV 7			F.520.S	SKT 4	5ChNM	55NiCrMoV6
6		1.2721	50NiCr13		55 NCV 6	2550		F.528			
6	E52100; G52986	1.3505	100Cr6; 100 Cr 6	2 S.135; 535 A 99	100Cr6RR; 100 C 6; 100Cr6	2258	100 Cr 6	F.131; 100 Cr 6; F.1310	SUJ 2; SUJ 4	SchCh 15	100Cr6
6	K11820; K12020; K12320; A204 Grade A; A182 Grade F1	1.5415	16Mo3; 15 Mo 3	1503-243 B	15 D 3	2912; 16Mo3	16 Mo 3 KG; 16 Mo 3 KW; 16 Mo 5 KG; 16 Mo 5 KW	F. 2601; 16 Mo 3	STBA 12; STFA 12; STPA 12		
6	4422; G44220; J12522	1.5419	G20Mo5; 20Mo4; GS-22 Mo 4	245; B 1; B1					SCPH 11		G20Mo5
6	A 350-LF 5; K13050; K21703; K22103	1.5622	14Ni6; 14 Ni 6		16 N 6		14 Ni 6 KG; 14 Ni 6 KT	F.2641; 15 Ni 6			14Ni6
6	3415	1.5732	14NiCr10; 14 NiCr 10		14 NC 11		16 NiCr 11	15 NiCr 11	SNC 415; SNC 415 H; SNC 415 M	12ChN3A	14NiCr10
6	3310; 3310 RH; 3312; 3316; 9315; E 3310; E 3316; E9315; G33106	1.5752	15NiCr13; 14NiCr14; 15 NiCr 13; 14NiCr14	655 M 13; 655 H 13; En 36 A	10 NC 12; 12 NC 15; 14 NC 12; 16 NC 12; 16 NCD 13			15 NiCr 11; F.1540	SNC 815 H; SNC 815 HRCH; SNC 815 RCH; SNC 22 H		15NiCr13
6		1.7262	15CrMo5; 15 CrMo 5		12 CD 4			12 CrMo 4; F.150.J; F155; F.1551	SCM 415 H; SCM 415 HRCH; SCM 415 M; SCM 415 RCH; SCM 415 TK; SCM 21 H		15CrMo5
6		1.6587	17CrNiMo6; 17 CrNiMo 6	820A16	18 NCD 6			14 NiCrMo 13			

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
6	9310; 9310H; 9310 RH; E 9310 H; G93106; H93100; H93106	1.6657	14NiCrMo13-4; 14 NiCrMo 13 4	832 H 13; 832 M 13; S.157; En 36 C	16 NCD 13		15 NiCrMo 13; 16 NiCrMo 12	14 NiCrMo 13; 14 NiCrMo 13-1; F.1560; F.1569			
6	5015; G50150	1.7015	15Cr3; 15 Cr 3	523 M 15	12 C 3; 15Cr2RR; 15 C 2				SCr 415; SCr 415 H; SCr 415 HRCH; SCr 415 RCH; SCr 21 H	15Ch	15Cr3
6	5132; 5132 H; G51320; H51320	1.7033	34Cr4; 34 Cr 4	530 A 32; 530 H 32; 530 M 32	32 C 4		34 Cr 4; 34 Cr KB	35 Cr 4; F.8221	SCr 430; SCr 430 H; SCr 430 HRCH; SCr 430 RCH; SCr 2 H	35Ch	34Cr4
6	5140; 5140 H; 5140 RH; G51400; H51400	1.7035	41Cr4; 41 Cr 4	530 A 40; 530 M 40; 530 H 40; En 18	42 C 4		41 Cr 4; 41 Cr 4 KB	41 Cr 4 DF; F.1211; F.1202	SCr 440; SCr 440 H	40Ch	41Cr4
6	5140; G51400	1.7045	42Cr4; 42 Cr 4	530 A 40	42 C 4 TS	2245	41 Cr 4	42 Cr 4	SCr 440		
6	5115; 5117; G51150; G51170	1.7131	16MnCr5; 16 MnCr 5	527 M 17; 590 H 17; 590 M 17	16MnCr5RR; 16 MC 5	2173	16 MnCr 5	F.1516		18ChG	16MnCrS5
6		1.7139	16MnCrS5; 16 MnCrS 5		BGH 7139; BOHLER E 411; VW 4221; OPEL QS1916; PROCONS 7139; E411; SES	2127					16MnCrS5
6	5155; 5155 H; 5150; G51550; H51550; G51600	1.7176	55Cr3; 55 Cr 3	525 A 58; 525 A 60; En 48	55 C 3; 55Cr3	2253	55 Cr 3	F.1431	SUP 9; SUP 9 A; SUP 9 M	50ChGA	55Cr3
6	4142; G41420	1.7223	41CrMo4; 41 CrMo 4		MOC 2; V320		41 CrMo 4	42 CrMo 4	SNB 22-1	40ChFA	
6	4140; 4140 H; 4140 RH; 4142; 4142 H; 4145; G41400; H41400; G41420; H41420; K14248; K14047	1.7225; 1.7227	42CrMo4; 42CrMo4V; 42 CrMo 4; 42 CrMo 4 V	708 M 40; 709 M 40; En 19; En 19 A	42 CD 4; 40 CD 4; 42CrMo4RR	2244; 42CrMo4	42 CrMo 4; 38 CrMo 4 KB; 41 CrMo 4	TO.D; TU.L	SCM 440 H; SCM 440 HRCH; SCM 440 M; SCM 440 RCH; SCM 440 TK; SNB 7 Class 2; SCM 4 H; SNB 22-1	40ChFA	42CrMo4
6	4147; 4147 H; 4150; 4150 H; 8650; 8650 H; G41470; G41500; G86500; H41470; H41500; H86500	1.7228	50CrMo4; 50 CrMo 4	708 M 40; 708 A 47		2512	653 M 31		SCM 445 H; SCM 445 HRCH; SCM 445 RCH; SCM 5 H		50CrMo4

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
6	8620; G86200	1.7321	20MoCr4; 20 MoCr 4			2625				BGH 7321; E320; SIQUAL 7321	20MoCr4
6	K11547; K11562; K11564; K11757; K11789; K12052; ASTM A182 F12	1.7335	13CrMo4-5; 13 CrMo4 4	620; 620-440; 620-470; 620-540; 621	15 CD 4-05	2216	14 CrMo 3; 14CrMo4 5	TU.E; TU.F; F.2631; 14 CrMo 4 5	SCMV 2; SFVA 12; STBA 22; STFA 22; STPA 20; STPA 22	12ChM; 15ChM	13CrMo4-5
6	K21390; K21590; ASTM A182 F22	1.7380	10CrMo9-10; 10 CrMo 9 10; GS-12CrMo9-10; GS-12 CrMo 9 10; G 12 CrMo9-12	622; 622-490; 622 / 515; 622 / 690; 1502-622	12 CD 9-10; 10 CD 9.10	2218	12 CrMo 9; 12 CrMo 10	TU.H	SCMQ 4 E; SCMV 4; SFVA F 22 A; SFVA F 22 B; SFVCM F 22 B; STBA 24; STFA 24; STPA 24	12Ch8	10CrMo9-10
6		1.7715	14MoV6-3; 14 MoV 6 3	1503-660-440				13 MoCrV 6			
6	E71400; K24065; K24728; A355 Class A	1.8509	41CrAlMo7-10; 41CrAlMo7; 41 CrAlMo 7	905 M 39; En 41 B	40 CAD 6.12	2940	41 CrAlMo 7	F.174; 41 CrAlMo 7; F1740	SACM 645; SACM 1	38Ch2MJuA	41B
6		1.6566	17NiCrMo6-4								17NiCrMo6-4
6	P20+S	1.2312	40CrMnMoS8-6		40 CMD 8 S						
6		1.7149	20MnCrS5; 20 MnCrS 5								20MnCrS5
6	P20+Ni	1.2738	40CrMnNiMo8-6-4; 40 CrMnNiMo 8 6 4		40 CMND 8					40Ch2GNM	40CrMnNiMo8-6-4
6		1.2311	40CrMnMo7; 40 CrMnMo 7		40 CMD 8		35 CrMo 8 KU	F.5302			40CrMnMo7
6		1.7238	49CrMo4; 49 CrMo 4								
6	4150; G41500	1.7701	52CrMoV4; 51CrMoV4; 51 CrMoV 4		51 CDV 4; 51CrMoV4		51 CrMoV 4				51CrMoV4
6		1.7337	16CrMo4-4; 16 CrMo 4 4				A 18 CrMo 45 KW		SCM 415 M; SCM 415; STBA 22; SFVA F12		
6		1.7242	16CrMo4; 16 CrMo 4		15 CD 3.5		18 CrMo 4	F.1550; 18 CrMo 4	SCM 418 H; SCM 418 HRCH; SCM 418 RCH; SCM 418 TK		16CrMo4
6	4419; 4419 H; 4520; G44190; H44190; G45200; K11522; K11820; K12020; K12023; K12320; K12821	1.5423	16Mo5				16 Mo 5 KG; 16 Mo 5 KW	TU.D; F.2602	SB 450 M; SB 480 M; SB 46 M SB 49 M		
6										30ChGSA	
6	HY-80; HY 80; HY80; K31820; MIL-S-21952										
6				605 M 36; En 16; En 16T							

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
7	4130; 4130 H; 4130 RH; G41300; H41300	1.7218	25CrMo4; 25 CrMo 4; GS-25 CrMo 4; G 25 CrMo 4	708 A 25	25 CD 4	2225	25 CrMo 4; 25 CrMo KB	F.222; F.1256	SCM 420 TK; SCM 430 M; SCM 430 RCH; SCM 430 TK; STKS 1	20ChM; 30ChM	25CrMo4
7		1.8070	21CrMoV5-11; 21 CrMoV 5 11				35 NiCr 9				
7		1.7755	GS-35 CrMoV 10 4; G35 CrMoV 10-4								
7		1.7733	24CrMoV5-5		20 CDV 6		21 CrMoV 5 11				
7	4340; 4340 H; 9850; G43400; G98500; H43400; K23028	1.6565	40NiCrMo6; 40 NiCrMo 6	817 M 40; En 24				F.1275; 40 NiCrMo 7	SNB 24-1; SNB 24-2; SNB 24-3; SNB 24-4; SNB 24-5; SNCM 439 RCH	40Ch2N2MA	40NiCrMo6
7	8640; 8640 H; 8740; 8740 H; 8742; G86400; G87400; G87420; H86400; H87400; K11640	1.6546	40NiCrMo2-2; 40 NiCrMo 2 2		40 NCD 2; 40 NCD TS		40 NiCrMo 2; 40 NiCrMo 2 KB	40 NiCrMo 2 DF; F.1205; F.1204; TO.E	SNCM 240; SNCM 240 RCH	38ChGNM	
7	8617; 8617 H; 8620; 8620 H; 8620 RH; 8617; G86170; G86200; H86170; H86200; K12147	1.6523	20NiCrMo2-2; 21NiCrMo2; 21 NiCrMo 2	805 H 20; 805 M 20; 806 M 20; En 362	20 NCD 2	2506	20 NiCrMo 2	20 NiCrMo 2; 20 NiCrMo 3-1; F.1522; F.1534	SNCM 220; SNCM 220 H; SNCM 220 HRCH; SNCM 220 M; SNCM 220 RCH; SNCM 21 H	20ChGNM	20NiCrMo2-2
7		1.5755	31NiCr14; 31 NiCr 14	653 M 31	18 NC 13						
7	3135	1.5710	36NiCr6; 36 NiCr 6	640 A 35	35 NC 6				SNC 236		36NiCr6
7	4340; G43400; 4337; G43370	1.6582	34CrNiMo6; 34 CrNiMo 6	816 M 6; 817 M 40	34 CrNiMo 8; 35 NCD 6	2541	35 NiCrMo 6 KB	F.1272		38Ch2N2MA	34CrNiMo6
7		1.8519	31CrMoV9; 31 CrMoV 9							30Ch3MF	31CrMoV9
7	8630	1.6545	30NiCrMo2-2; 30 NiCrMo 2 2		30 NCD 2		30 NiCrMo 2 KB				
7	4340; G43400	1.6580	30CrNiMo8	823 M 30	30 CND 8; 30 NCD 8			30 CrNi Mo 8	SNCM 431		
7	K01907	1.5217	20MnV6; 20 MnV 6 N	55 C; GR 55; Grade 55	20MV6; TS E 455 4; TU E 455 4						20MnV6; S460
7	300M; 4340M; K44220	1.6928	41SiNiCrMoV7-6	S 155							
8		1.8523	40CrMoV13-9; 39CrMoV13-9; 39 CrMoV 13 9	897 M 39			36 CrMoV 12				40CrMoV13-9
8		1.8515	31CrMo12; 31 CrMo 12	722 M 24	30 CD 12	2240	32 CrMo 12	F.1712; F.124.A			31CrMo12; 40B
8		1.8161	58CrV4; 58 CrV 4								

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
8		1.7361	32CrMo12; 32 CrMo 12	722 M 24	30 CD 12	2240	30 CrMo 12	F.124.A			32CrMo12
8	9840; G98400	1.6511	36CrNiMo4; 36 CrNiMo 4	817 M 37; 816 M 40	40 NCD 3; 35 NCD 5		39 NiCrMo 4; 39 NiCrMo 4 KB	F.128; F.1280; 35 NiCrMo 4	SUP 10	40ChGNM; 40ChN2MA	36CrNiMo4
8	6145; 6150; 6150 H; G61500; H61500	1.8159	51CrV4; 50CrV4; 50 CrV 4	735 A 50; 735 A 51; 735 H 51; 735 M 50; En 47	50CrV4RR; 50 CV 4; 51 CV 4	2230	50 CrV 4	F.143; F.143.A; 51 CrV 4; F.1430	SUP 10; SUP 10-CSP; SUP 10 M	50ChFA; 50ChGFA	51CrV4
8	3435	1.5736	36NiCr10; 36 NiCr 10		30 NC 11				SNC 631; SNC 631 H; SNC 631 M		
8	A128 Grade A; J91109; J91129; J91139; J91149	1.3401; 1.3403	X120Mn12; X 120 Mn 12; G-X120 Mn 12	BW 10	Z 120 M 12	2183	GX 120 Mn 12	F.240.A; F.240.A1; AM-X 120 Mn 12; F.8251	SCMnH 1; SCMnH 11	110G13L	
8	4142; G41420	1.2332	47CrMo4	708 M 40	42 CD 4	2244	42 CrMo 4	42 CrMo 4	SCM; SCM 440		47CrMo4
8	4140 H; 4140 RH; 4140 HT		42CrMo4+QT								
8											
8											
8		1.8705	21MnCr6-5								
8											
9		1.6659	31NiCrMo13-4	830 M 31		2534		F.270			
9		1.5864	35NiCr18								
9											
9											
9											
9		1.8715	17MnCr5-3								17MnCr5-3
10	K71340; K81340	1.5662	X8Ni9	1501-509; 1501-510; 502-650; 509-690	9 Ni; Z 8 N 09		X 10 Ni 9; X 12 Ni 09	F.2645; XBNi 09	SL9N520; SL9N590; STBL 690; STPL 690; SL9N53; SL9N60; STBL 70; STPL 70		X8Ni9
10	2515; A2515; 2517; E2517; K41583	1.5680	X12Ni5; 12Ni19;		Z 18 N 5; Z 10 N 05; 5 Ni				SL5N590; SL5N60		X12Ni5
10	D4; T30404; D6; T30406	1.2436	X210CrW12; X 210 CrW 12	BD6	Z 200 CD 12; Z 210 CW 12-01; X210CrW12-1	2312	X 215 CrW 12 1 KU	F.5213; X210 CrW 12	SKD 2		X210CrW12
10	H13; T20813	1.2344	X40CrMoV5-1; X40 CrMoV 5 1	BH 13	X 40 CrMoV 5; Z 40 CDV 5	2242	X 40 CrMoV 5 1 1 KU	F.5318; X 40 CrMoSiV 5	SKD 61	4Ch5MF1S	X40CrMoV5-1
10	A2; T30102	1.2363	X100CrMoV5; X100CrMoV5-1; X 100 CrMoV 5 1	BA 2	X 100 CrMoV 5; Z 100 CDW 5	2260	X 100 CrMoV 5 1 KU	F.536; F.5227; X 100 CrMoV 5	SKD 12		X100CrMoV5
10	H21; T20821	1.2581	X30WCrV9-3; X30WCrV9 3	BH 21	Z 30 WCV 9		X 30 WCrV 9 3 KU	F.5323; X 30 WCrV 9	SKD 5	3Ch2W8F	X30WCrV9-3; X30WCrV9 3
10		1.2601	X165CrMoV12; X 165 CrMoV 12			2310	X165CrMoW 12KU				X165CrMoV12
10		1.2316	X36CrMo17; X38CrMo16								X38CrMo16

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
10	M2; T11302	1.3343	HS6-5-2; HS 6-5-2; S 6-5-2	BM 2; BM2	Z 85 WDCV 06-05-04-02; 6-5-2; HS6-5-2	2722		F.550.A; F.5604	SKH 51	R6M5	HS6-5-2
10	H11; T20811	1.2343	X37CrMoV5-1; X38CrMoV5-1	BH 11	Z 38 CDV 5; X38CrMoV		X 37 CrMoV 5 1 KU	F.520.G; F.5137; X 37 CrMoSiV 5	SKD 6	4Ch5MFS	X37CrMoV5-1
10	H12; T20812	1.2606; 1.2605	X37CrMoW5-1; X 37 CrMoW 5 1; X35CrWMoV5; X 35 CrWMoV 5	BH 12	Z 35 CWDV 5; X35CrWMoV5		X 35 CrMoW 05 KU	F.537	SKD 62	5ChNM	X37CrMoW5-1; X35CrWMoV5
10	D2; T30402	1.2379	X153CrMoV12; X155CrVMo12-1; X155 CrVMo 12 1	BD 2	X 160 CrMoV 12; Z 160 CDV 12	2310	X 155 CrVMo 12 1 KU	F.520.A	SKD 10; SKD 11		X153CrMoV12
10		1.2085	X33CrS16; X 33 CrS 16		Z 35 V CD 17.S						X33CrS16
10		1.2162	21MnCr5; 21 MnCr 5		20 MC 5						21MnCr5
10		1.2767	X45NiCrMo4; 45NiCrMo16; X 45 NiCrMo 4		45 NCD 16		40 NiCrMoV 8 KU				X45NiCrMo4
10		1.2764	X19NiCrMo4; X 19 NiCrMo 4; GX19NiCrMo4								X19NiCrMo4
10	D3; T30403	1.2080	X210Cr12; X 210 Cr 12	BD 3	X200Cr12; Z 200 C 12		X 205 Cr 12 KU	F.521; F.5212; X 210 Cr 12	SKD 1	Ch12	X210Cr12
10		1.2367	X38CrMoV5-3; X 38 CrMoV 5 3								X38CrMoV5-3
10		1.6957	27NiCrMoV15-6; 26NiCrMoV14-5; 26 NiCrMoV 14 5								
10	501; 502; S50100; S50200; K41545	1.7362	X12CrMo5; X 11 CrMo 5; 12CrMo19-5; 12 CrMo 19 5					F.240.B; TU.J	SCMV 6; SFVA F 5 A; SFVA F 5 B; SFVA F 5 C; SFVA 5 D; SNB 5 Class 1; STBA 29; STFA 25; STPA 25		X12CrMo5
11	M33; T11333; M34; T11334	1.3249	HS2-9-2-8; S 2-9-2-8	BM 34				2-9-2-8; F.5611			
11	M41; T11341	1.3246	HS7-4-2-5; S 7-4-2-5		Z 110 WKCDV 07-05-04-04-02			F.5615; HS 7-4-2-5			HS7-4-2-5
11	M42; T11342	1.3247	HS2-10-1-8; S 2-10-1-8	BM 42	Z 110 DKCWV 09-08-04-02-01; 2-9-1-8; HS2-9-1-8	2716	HS 2-9-1-8	F.5617; HS 2-10-1-8	SKH 59		HS2-10-1-8
11		1.3207	HS10-4-3-10; S 10-4-3-10	BT 42	Z 130 WKCDV 10-10-04-04-03; 10-4-3-10; HS10-4-3-10		HS 10-4-3-10	F.550.B; F.5553; HS 10-4-3-10	SKH 57	R12F3K10M3-SCh	HS10-4-3-10
11	T15; T12015	1.3202	HS12-1-4-5; S 12-1-4-5	BT 15	HS12-1-4-5		HS 12-1-5-5	F.5563; HS 12-1-5-5		R13F4K5	
11		1.3243	HS6-5-2-5; S 6-5-2-5	BM 35	6-5-2-5; 6-5-2-5 HC; HS6-5-2-5; HS6-5-2-5HC; Z 85 WDKCV 06-05-05-04-02; Z 90 WDKCV 06-05-05-04-02	2723	HS 6-5-2-5	F.550.C; F.5613; HS 6-5-2-5	SKH 55	R6M5K5	HS6-5-2-5

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
11	M7; T11307	1.3348	HS2-9-2; S 2-9-2		Z 100 DCWV 09-04-02-02; 2-9-2; HS2-9-2	2782	HS 2 9 2	F.5607; HS 2-9-2	SKH 58		HS2-9-2
11	T4; T12004	1.3255	HS18-1-2-5; S 18-1-2-5	BT 4	Z 80 WKCV 19-05-04-01; HS 18-1-1-5		HS 18-1-1-5	F.5530; HS 18-1-1-5	SKH 3		HS18-1-2-5
11	T1; T12001	1.3355	HS18-0-1; S 18-0-1	BT 1	18-0-1; HS 18-0-1; Z 80 WCV 18-04-01	2750	HS 18-0-1	F.5520; HS 18-0-1	SKH 2	R18	HS18-0-1
11											
11											
11											
11											
11											
11											
11			X10NiMoCrV6								
12	430 F; S43020	1.4104	X12CrMoS17; X 12 CrMoS 17		Z 13 CF 17	2383	X 10 CrS 17	F.3413	SUS 430 F		X12CrMoS17
12	S31500	1.4417	GX2CrNiMoN25-7-3			2376					GX2CrNiMoN 25-7-3
12		1.4742	X10CrAlSi18; X10CrAl18		Z 12 CAS 18			F.3113; X 10 CrAl 18	SUS 21	15Ch18SJu	X10CrAlSi18
12		1.4724	X10CrAlSi13; X10CrAl13; X 10 CrAl 13				X 10 CrAl 12	F.3152; X 10 CrAl 13		10Ch13SJu	X10CrAlSi13
12	434; S43400	1.4113	X6CrMo17-1; X 6 CrMo 17 1	434 S 17	Z 8 CD 17-01	2325		F.3116	SUS 434		X6CrMo17-1
12	HNV-6; HNV6; S65006	1.4747	X80CrNiSi20; X 80 CrNiSi 20	443 S 65	Z 80 CSN 20-02		X 80 CrSiNi 20	F.320B	SUH 4		
12	446; S44600	1.4762	X10CrAlSi25; X10CrAl24; X 10 CrAl 24		Z 10 CAS 24	2322		F.3154	SUH 446		X10CrAlSi25
12	EV 8; S63008	1.4871	X53CrMnNiN21-9; X 53 CrMnNiN 21 9	349 S 52	Z 52 CMN 21-9 Az		X 53 CrMnNiN 21 9	F.3217	SUH 35, SUH 36	55Ch20G9AN4	X53CrMnNiN21-9
12		1.4001	X7Cr14; X 7 Cr 14; G-X 7 Cr 13		Z 8 C 13 FF				SUS 4105		X7Cr14
12	440 B; S44003	1.4112	X90CrMoV18		X 89 CrMoV 18-1			SUS 440B			X90CrMoV18
12	410 S; 403; S41008; S40300	1.4000	X6Cr13; X 6 Cr 13	403 S 17	Z 8 C 12	2301	X 6 Cr 13	F.3110	SUS 403; SUS 403 FB; SUS 410 S	08Ch13	X6Cr13
12	410; S41000; S41001; CA-15	1.4006	X12Cr13; GX12Cr13; X 12 Cr 13; X 10 Cr 13	410 S 21; ANC 1 grade A; En 56 A	Z 10 C 13; Z 13 C 13	2302	X 12 Cr 13 KG; X 12 Cr 13 KW	F.3401	SUS 410; SUS 410 FB; SUS 410 TB; SUS 410 TKA; SUS 410 TKC; SUS F 410-A; SUS F 410-B; SUS F 410-C	12Ch13; 15Ch13L	X13Cr13
12	405; S40500	1.4002	X6CrAl13; X 6 CrAl 13	405 S 17	Z 8 CA 12		X 6 CrAl 13	F.3111	SUS 405; SUS 405 TB; SUS 405 TP		X6CrAl13
12	416; S41600	1.4005	X12CrS13; X 12 CrS 13	416 S 21; En 56 AM	Z 11 CF 13	2380	X12 CrS 13	F.3411	SUS 416		X12CrS13
12		1.4015	X8Cr17								
12	430; S43000	1.4016	X6Cr17; X 6 Cr 17	430 S 17; 430 S 15; 430 S 18	Z 8 C 17	2320	X 8 Cr 17	F.310.D; F.3113	SUS 430; SUS 430 TB; SUS 430 TKA; SUS 430 TKC; SUS 430 TP	12Ch17	X6Cr17

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
12		1.4027	GX20Cr14	ANC 1 grade B; ANC 1 grade C; 420 C 24; 420 C 29	Z 20 C 13 M				SCS 2	20Ch13L	
12	420 F; S42020	1.4028	X30Cr13; X 30 Cr 13	420 S 37; 420 S 45; En 56 C; En 56 D	Z 33 C 13 CI; Z 33 C 13; Z 30 C 13	2304	X 30 Cr 13	F.3403	SUS 420 F; SUS 420 J 2; SUS 420 J 2-CSP; SUS 420 J 2 FB; SUS 420 J 2 TKA	30Ch13	X30Cr13
12		1.4086	GX120Cr29; G-X 120 Cr 29	452 C 11							
12		1.4340	GX40CrNi27-4; G-X 40 CrNi 27 4								
12		1.4720	X20CrMo13; X 20 CrMo 13								
12	439; 430 Ti; S43035; S43036; XM 8	1.4510	X3CrTi17; X 6 CrTi 17		Z 4 CT 17		X 6 CrTi 17	F.3115; X 5 CrTi 17	SUS 430 LX; SUS 430 LXTB; SUS XM8TB	08Ch17T	X3CrTi17
12	446-1	1.4749	X18CrN28		Z 12 C 25						X18CrN28
12		1.4511	X3CrNb17; X 6 CrNb 17		Z 4 CNb 17		X 6 CrNb 17	F.3122; X 5 CrNb 17	SUS 430 LX; SUS 430 LXTB		X3CrNb17
12	409; S40900	1.4512	X2CrTi12; X 6 CrTi 12	LW 19; 409 S 19	Z 3 CT 12		X 6 CrTi 12	F.3121	SUH 409 L; SUS 409 LTB; SUS 409 TB		X2CrTi12
12		1.4418	X4CrNiMo16-5-1; X 4 CrNiMo 16 5		Z 6 CND 16-04-01	2387					X4CrNiMo16-5-1
12	420; S42000	1.4021	X20Cr13; X 20 Cr 13	420 S 37; 420 S 29; En 56 C	Z 20 C 13 CI; Z 20 C 13	2303	X 20 Cr 13	F.310.J; F.3402	SUS 420 J 1; SUS 420 J 1 FB; SUS 420 J 1 TKA	20Ch13	X20Cr13
13	420; S42000; S42080	1.4031	X39Cr13; X 38 Cr 13		Z 40 C 14 CI; Z 40 C 14	2304	X 40 Cr 14	F.3404; X40 Cr 13	SUS 420 J 2	40Ch13	X39Cr13
13		1.4922	X20CrMoV11-1; X20CrMoV12-1; X 20 CrMoV 12 1	BS 762		2317	X 20 CrMoNi 12 01				X20CrMoV11-1; X20CrMoV12-1
13		1.4923	X22CrMoV12-1; X21CrMoNiV12-1; X 22 CrMoV 12 1								X22CrMoV12-1; X21CrMoNiV12-1
13	420; S42000	1.4021	X20Cr13; X 20 Cr 13	420 S 37; 420 S 29; En 56 C	Z 20 C 13 CI; Z 20 C 13	2303	X 20 Cr 13	F.310.J; F.3402; X 20 Cr 13	SUS 420 J 1; SUS 420 J 1 FB; SUS 420 J 1 TKA	20Ch13	X20Cr13
13	420; S42000	1.4034	X46Cr13; X 46 Cr 13		Z 44 C 14 CI; Z 44 C 14; Z 38 C 13 M		X 40 Cr 14	F.3405; X 40 Cr 13		40Ch13	X46Cr13
13	431; S43100	1.4057	X17CrNi16-2; X 20 CrNi 17 2; X 22 CrNi 17	431 S 29; En 57	Z 15 CN 16.02 CI; Z 15 CN 16-02	2321	X16 CrNi 16	F.313; F.3427; X 19 CrNi 17 2	SUS 431; SUS 431 FB	14Ch17N2; 20Ch17N2	X17CrNi16-2
13	CA 6-NM; S41500; J91540	1.4313	X3CrNiMo13-4; X 4 CrNi 13 4		Z 6 CN 13-04; Z 6 CN 13-4; Z 4 CND 13.4 M	2384					X3CrNiMo13-4
13		1.4122	X39CrMo17-1; X 35 CrMo 17				X 39 CrMo 17-1				X39CrMo17-1
13	422; S42200	1.4935	X20CrMoWV12-1; X 20 CrMoWV 12 1								X20CrMoWV12-1
13	HNV 3; S65007	1.4718	X45CrSi9-3; X 45 CrS 9 3; G-X 45 CrNi 9 3	401 S 45; En 52	Z 45 CS 9		X 45 CrSi 8	F.322; F.3220	SUH 1	40Ch9S2; 4Ch9S2	X45CrSi9-3

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
13		1.2083; 1.2083 ESR	X40Cr14; X 42 Cr 13		X40Cr14; Z 40 C 14	2314	X 41 Cr 13 KU	F.5263; X 40 Cr 13	SUS 420 J 2		X40Cr14
13	CA 6-NM; J91540	1.4317	GX4CrNi13-4; G-X 5 CrNi 13 4	425 C 11; 425 C 12	Z 4 CND 13 4 M		GX 6 CrNi 13 04		SCS 6; SCS 6X		GX4CrNi13-4
13	S13800; XM-13	1.4534	X3CrNiMoAl 13-8-2; X 3 CrNiMoAl 13 8 2	FE-PM1503							X3CrNiMoAl 13-8-2
14	15-5PH; 15-5 PH; XM-12; S15500; J92110	1.4545; 1.4545.9	X5CrNiCuNb15-5		Z 7 CNU 15-05						X5CrNiCu15-3
14	329; S31260; S32900	1.4460	X3CrNiMo27-5-2; X 4 CrNiMo 27 5 2		Z 3 CND 25-07 Az; Z 5 CND 27-05 Az	2324		F.3552; F.3309; X 8 CrNiMo 27-05; X 8 CrNiMo 26 6	SUS 329 J 1; SUS 329 J 1 FB; SUS 329 J 1 TB; SUS 329 J 1 TP	10Ch26N5M	X3CrNiMo27-5-2
14	321; S32100	1.4541	X6CrNiTi18-10	321 S 31; LW 18; LW 24; LWCF 18; LWCF 24; 321 S 12; 321 S 50; 321 S 51; 321 S 50-490; 1010; 1115	Z 6 CNT 18-10	2337	X 6 CrNiTi 18 11; X 6 CrNiTi 18 11 KG; X 6 CrNiTi 18 11 KW; X 6 CrNiTi 18 11 KT	F.332; F.3523; X 6 CrNiTi 18 10	SUS 321	06Ch18N10T; 08Ch18N10T; 09Ch18N10T; 12Ch18N10T	X6CrNiTi18-10
14		1.4425	X2CrNiMo18-13-3								
14	316; 316H; 316 H; S31600; S31609	1.4401	X5CrNiMo17-12-2; X 5 CrNiMo 18 10	316 S 31; 316 S 33; 316 S 17; 316 S 19; 316 S 40; 316 S 41; 845	Z 6 CND 17-11; Z 6 CND 17-11-02-FF; Z 7 CND 17-11-02; Z 7 CND 17-12-02	2347	X 5 CrNiMo 17 12; X 5 CrNiMo 17 12 KG; X 5 CrNiMo 17 12 KW	F.310.A; F.3534; X 5 CrNiMo 17 12 2	SUS 316; SUS 316 A; SUS 316 FB; SUS 316 HFB; SUS 316 HTB; SUS 316 HTP; SUS 316 TB; SUS 316 TBS	08Ch16N11M3	X5CrNiMo17-12-2
14		1.4821	X20CrNiSi25-4		Z20CNS25.04						X20CrNiSi25-4
14	J92701	1.4312	GX10CrNi18-8	ANC 3 grade A; ANC 3 A; 302 C 25	Z 10 CN 18.9 M				SCS 12; SCS 13A	10Ch18N9L	
14	J92605; J93005	1.4823	GX40CrNiSi27-4; G-X 40 CrNiSi 27 4						SCH 11 X		GX40CrNiSi27-4
14		1.4585	GX7CrNiMoCuNb18-18; G-X 7 CrNiMoCuNb 18 18				X 6 CrNiMoTi 17 12				
14	347; J92640; J82710	1.4552	GX5CrNiNb19-11; G-X 5 CrNiNb 18 9	347 C 17; 821 grade Nb	Z 4 CNNb 19.10 M; Z 6 CNNb 18.10 M			AM-X 7 CrNiNb 20 10; F.8413	SCS 21; SCS 21 X		GX5CrNiNb19-11
14		1.4500	GX7NiCrMoCuNb25-20; G-X 7 NiCrMoCuNb 25-20		23 NCDU 25.20 M						
14	304; S30400	1.4301	X5CrNi18-10; X 5 CrNi 18 9	304 S 15; 304 S 31; LW 13; LW 15; LW 21; LWCF 13; LWCF 15; 302 S 17; 304 S 16; 304 S 17; 304 S 40	Z 4 CN 19-10 FF; Z 5 CN 17-08; Z 6 CN 18-09; Z 7 CN 18-09	2333; 2332	X 5 CrNi 18 10; X 5 CrNi 18 10 KG; X 5 CrNi 18 10 KW; X 5 CrNi 18 10 KT	F.3504; X 5 CrNi 18 10	SUS 304; SUS 304 A; SUS 304-CSP; SUS 304 FB; SUS 304 TB; SUS 304 TBS; SUS 304 TKA; SUS 304 TKC	08Ch18N10	X5CrNi18-10

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
14	304L; 304 L; S30403; J92500; J92600	1.4306; 1.4309	X2CrNi19-11; GXCrNi19-11	304 S 11; LW 20; LWCF 20; S.536; T.74; 304 C 12; 305 S 11	Z 1 CN 18-12; Z 2 CN 18-10; Z 3 CN 19.10 M; Z 3 CN 18-10; Z 3 CN 19-11; Z 3 CN 19-11 FF	2352	X 3 CrNi 18 11; X 2 CrNi 18 11; GX 2 CrNi 19 10	F.310.G; F.3503; X 2 CrNi 19 10; AM-X 2 CrNi 19 10; F.8412	SCS19	03Ch18N11	X2CrNi19-11; GXCrNi19-11
14	304H; 304 H; CF-8; J92590; J92600; J92650; J92710	1.4308	GX5CrNi19-10; G-X 6 CrNi 18 9	304 C 15	Z 6 CN 18.10 M; Z 6 CN 19.9 M			AM-X 7 CrNi 20 10; F.8411	SCS 13; SCS 13 A; SCS 13 X	07Ch18N9L	GX5CrNi19-10; 58E
14	J92701	1.4312	GX10CrNi18-8; G-X 10 CrNi 18 8	ANC 3 grade A; ANC 3 A; 3025 S 25	Z 10 CND 18.9 M				SCS 12	10Ch18N9L	GX10CrNi18-8
14	S32304	1.4362	X2CrNiN23-4; X 2 CrNiN 23 4		Z 3 CN 23-04 Az	2327					X2CrNiN23-4
14	201; S20100	1.4372	X12CrMnNiN17-7-5		Z 12 CMN 17-07 Az				SUS 201		X12CrMnNiN 17-7-5
14	316; S31600	1.4436	X3CrNiMo17-13-3; X 5 CrNiMo 17 13 3	316 S 31; 316 S 33; LW 23; LWCF 23; 316 S 19; 316 S 40; 316 S 41; 1.4436	Z 6 CND 18-12-03; Z6 CND 18-13; Z 7 CND 18-12-03	2343	X 5 CrNiMo 17 13; X 8 CrNiMo 17 13	F.3538; X 5 CrNiMo 17 13 3	SUS 316; SUS 316 A; SUS 316 FB; SUS 316 TB; SUS 316 TBS; SUS 316 TKA; SUS 316 TKC; SUS 316 TP		X3CrNiMo17-13-3
14	316L; 316 L; S31603; J92700; J92800	1.4404	X2CrNiMo17-12-2; X2CrNiMo17-13-2; X 2 CrNiMo 17 12 2; X 2 CrNiMo 17 13 2	316 S 11; 316 S 13; 316 S 14; 316 S 30; S.161; S.537; T.75	Z 2 CND 17-12; Z 3 CND 17-11-02; Z 3 CND 17-12-02; Z 3 CND 17-12-02 FF; Z 3 CND 18-12-03	2348	X 2 CrNiMo 17 12	F.310.K; F.3533; F.3537	SUS 316 L; SUS 316 LFB; SUS 316 LTBS; SUS 316 LTP; SUS 316 F 316 L		X2CrNiMo17-13-2
14	316LN; 316 LN; S31653	1.4406	X2CrNiMoN17-11-2; X2CrNiMoN17-12-2; X 2 CrNiMoN 17 12 2	316 S 61; 316 S 63	Z 2 CND 17-11 Az		X 2 CrNiMoN 17 12	F.3542; X 2 CrNiMoN 17 12 2	SUS 316 LN; SUS F 316 LN		X2CrNiMoN 17-11-2
14	CF-8M; J92900	1.4408	GX5CrNiMo 19-11-2; G-X 6 CrNiMo 18 10	ANC 4 grade B; ANC 4 B; 316 C 16; 845 grade B				AM-X 7 CrNiMo 20 10; F.8414	SCS 14; SCS 14 A; SCS 14 X	07Ch18N10G2S2M2L	GX5CrNiMo 19-11-2
14	S32750	1.4410	X2CrNiMoN25-7-4; X 10 CrNiMo 18 9		Z 5 CND 25-06 Az	2328					X2CrNiMoN 25-7-4
14	316LN; 316 LN; S31563	1.4429	X2CrNiMoN17-13-3; X 2 CrNiMoN 17 13 3	316 S 63; 1.4429	Z 3 CND 17-12 Az	2375	X 2 CrNiMoN 17 13	F.3543; X 2 CrNiMoN 17 13 3	SUS 316 LN; SUS F 316 LN		X2CrNiMoN 17-13-3
14	316L; 316 L; S31603; J92800	1.4435	X2CrNiMo18-4-3; X 2 CrNiMo18 14 3	316 S 13; 316 S 11; 316 S 14; 316 S 31; LW 22; LWCF 22; 845 B	Z 3 CND 17-12-03; Z 3 CND 18-14-03	2353	X 2 CrNiMoN 17 13; X 2 CrNiMoN 17 13 KG; X 2 CrNiMoN 17 13 KW	F.3533-X2 CrNiMo 17 13 2	SUS 316 L; SUS 316 LFB; SUS 316 LTBS; SUS 316 LTP; SUS F 316 L	O3Ch17N14M3	X2CrNiMo18-4-3
14	S31726	1.4439	X2CrNiMoN17-13-5; X 2 CrNiMoN 17 13 5		Z 3 CND 18-14-05 Az			F.3544; X 2 CrNiMoN 17 13 5			X2CrNiMoN 17-13-5
14	317; S31700	1.4449	X3CrNiMo18-12-3	317 S 16			X 5 CrNiMo 18 15		SUS 317; SUS 317 TB; SUS 317 TP; SUS F 317		X3CrNiMo18-12-3

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
14	329; S31260; S32900	1.4460	X3CrNiMoN27-5-2; X 4 CrNiMoN 27 5 2		Z 5 CND 27-05 Az; Z 3 CND 25-07 Az	2324		F.3552; F.3309; X 8 CrNiMo 27-05; X 8 CrNiMo 26 6	SUS 329 J 1; SUS 329 J 1 FB; SUS 329 J 1 TB; SUS 329 J 1 TP	10Ch26N5M	X3CrNiMoN27-5-2
14	S31803; S31260; S32900	1.4462	X2CrNiMoN22-5-3; X 2 CrNiMoN 22 5 3	318 S 13; 1.4462	Z 2 CND 24-08 Az; Z 3 CND 25-06-03 Az; Z 3 CND 25 -05 Az	2377			SUS 329 J 3 L; SUS 329 J 3 LTB; SUS 329 J 3 LTP		X2CrNiMoN22-5-3
14	631; 17-7PH; 17-7 PH; S17700	1.4568; 1.4564; 1.4504	X7CrNiAl17-7; X 7 CrNiAl 17 7	301 S 81	Z 9 CNA 17-07; Z 8 CNA 17-07	2388		X 2 CrNiMo 17 12	SUS 631; SUS 631 J 1; SUS 631-CSP	09Ch17N7Ju1	X7CrNiAl17-7
14	443; 444; S44300; S44400	1.4521	X2CrMoTi18-2; X 2 CrMoTi 18 2		Z 3 CDT 18-02; Z 3 CDT 18-2	2326		F.3123; X 2 CrMoTiNb 18 2	SUS 444; SUS 444 TB; SUS 444 TP		X2CrMoTi18-2
14	904L; 904 L; N08904	1.4539	X1NiCrMoCu25-20-5; X 1 NiCrMoCuN 25 20 5	904 S 13	Z 2 NCDU 25-20	2562					X1NiCrMoCu 25-20-5
14	630; 17-4PH; 17-4 PH; S17400	1.4542	X5CrNiCuNb16-4; X 5 CrNiChNb 17 4		Z 7 CNU 15-05; Z 7 CNU 16-04; Z 7 CNU 17-04				SUS 630; SUS 630 FB; SUS F 630		X5CrNiCuNb16-4
14	S31254	1.4547	X1CrNiMoN20-18-7			2378					X1CrNiMoN 20-18-7
14	631; 17-7PH; 17-7 PH; S17700	1.4568	X7CrNiAl17-7; X 7 CrNiAl 17 7	301 S 81	Z 9 CNA 17-07; Z 8 CNA 17-07	2388		X 2 CrNiMo 17 12	SUS 631; SUS 631 J 1; SUS 631-CSP	09Ch17N7Ju1	X7CrNiAl17-7
14	316 Ti; S31635	1.4571	X6CrNiMoTi17-12-2; X 6 CrNiMoTi 17 12 2	320 S 31; 320 S 18	Z 6 CNDT 17-12	2350	X 6 CrNiMoTi 17 12; X 6 CrNiMoTi 17 12 KG; X 6 CrNiMoTi 17 12 KW	F.310.B; F.3535; X 6 CrNiMoTi 17 12 2	SUS 316 Ti; SUS 316 TiTB; SUS 316 TiTP	08Ch16N11M3T; 08Ch17N13M2T; 10Ch17N13M2T	X6CrNiMoTi 17-12-2
14	309S; 309 S; 309; S30908; S30900	1.4833	X12CrNi23-13; X 7 CrNi 23 14	309 S 24	Z 15 CN 23-13; Z 15 CN 24-13		X 6 CrNi 23 14		SUS 309 S; SUS 309 S TB; SUS 309 S TP		X12CrNi23-13
14	S30415	1.4891	X4CrNiSiN18-10; X 4 CrNiSiN 18 10			2372					X4CrNiSiN 18-10
14	S30815	1.4893	X9CrNiSiNCe21-11-2; X 8 CrNiSiN 21 11			2368					X9CrNiSiNCe 21-11-2
14	304H; 304 H; S30409; S30480	1.4948	X6CrNi18-10; X6CrNi18-11; X 6 CrNi 18 11;	304 S 50; 304 S 51; 801 grade A	Z 5 CN 18-09				SUS 302		X6CrNi18-10
14		1.4581	GX5CrNiMoNb19-11-2; G X 5 CrNiMoNb 18 10	ANC 4 grade C; ANC 4 C; 318 C 17; 845 grade Nb	Z 4 CNDNb 18.12 M		GX 6 CrNiMoNb 20 11		SCS 22		GX5CrNiMoNb 19-11-2
14	303; S30300	1.4305	X8CrNiS18-9; X 10 CrNiS 18 9	303 S 31	Z 8 CNF 18-09	2346	X 10 CrNiS 18 09	F.310.C; F.3508; X 10 CrNiS 18-09	SUS 303	30Ch18N11	X8CrNiS18-9; 58M

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
14	304L; 304 L; S30403	1.4306	X2CrNi19-11; X 2 CrNi 19 11	304 S 11; LW14; LW 20; LWCF 14; LWCF 20; S.536; T.74; 304 C 12; 304 S 11	Z 1 CN 18-12; Z 3 CN 18-10; Z 3 CN 19-11; Z 3 CN 19-11 FF	2352	X 2 CrNi 18 11; X 3 CrNi 18 11	F.310.G; F.3503; X 2 CrNi 18 10	SUS 304 L; SUS 304 LFP; SUS 304 LTB; SUS 304 LTBS; SUS 304 LTP; SUS F 304 L	03Ch18N11	X2CrNi19-11
14	301; J 230; S30100; S30200	1.4310	X10CrNi18-8; X 12 CrNi 17 7	301 S 21; 301 S 22	Z 11 CN 17-08; Z 11 CN 18-08; Z 12 18-09	2331	X 12 CrNi 17 07	F.3517; X 2 CrNiN 18 10	SUS 301; SUS 301-CSP; SUS 302; SUS 302 FB	12Ch18N9	X10CrNi18-8
14	304LN; 304 LN; S30453	1.4311	X2CrNiN18-10; X 2 CrNiN 18 10	304 S 61	Z 3 CN 18-10 Az; Z 3 CN 18-07 Az	2371	X 2 CrNiN 18 11	F.3541; X 2 CrNiN 18 10	SUS 304 LN; SUS F 304 LN		X2CrNiN18-10
14	304B1; 304B2; 304B3; 304 B1; 304 B2; 304 B3; S30461; S30462; S30463	1.4350	X5CrNi18-9	304 S 31	Z 6 CN 18.09	2332; 2333	X 5 CrNi 18 10	F.3551			58E
14	317L; 317 L; S31703	1.4438	X2CrNiMo18-15-4; X2 CrNiMo 18 16 4	317 S 12	Z 2 CND 19-15-04; Z 3 CND 19-15-04	2367	X 2 CrNiMo 18 16	F.3539; X2 CrNiMo 18 16 4	SUS 317 L; SUS 317 LFB; SUS 317 LTB; SUS 317 LTP; SUS F 317 L; SUS Y 317 L		X2CrNiMo18-15-4
14	321H; 321 H; S32109	1.4878	X12CrNiTi18-10; X 12 CrNiTi 18-9	321 S 31	Z 6 CNT 18-10	2337	X 6 CrNiTi 18.11	F.3553	SUS 321; SUS 321 HFB; SUS 321 HTB; SUS 321 HTP; SUS 321 TKA; SUS 321 TP; SUS F 321; SUS Y 321		X12CrNiTi18-10; 58B
14	347; 348; S34700; S34800	1.4550	X6CrNiNb18-10; X 6 CrNiNb 18 10	347 S 31; ANC 3 grade B; ANC 3 B; 347 S 20; 347 S 40; 347 S 50; 347 S 51	Z 6 CNNb 18-10	2338	X 6 CrNiNb 18 11; X 6 CrNiNb 18 11 KG; X 6 CrNiNb 18 11 KW; X 6 CrNiNb 18 11 KT	F.3524; X 6 CrNiNb 18 10	SUS 347; SUS 347 FB; SUS 347 HTB; SUS 347 TB; SUS 347 TKA; SUS 347 TP; SUS F 347	08Ch18N12B	X6CrNiNb18-10; 58F;
14	318; S31803	1.4583	X10CrNiMoNb18-12; X 10CrNiMoNb 18 12		Z 6 CNDNb 18-12		X 6 CrNiMoNb 20 11				
14	310H; 310 H; 310S; 310 S; S31008; S31009	1.4845	X8CrNi25-21; X 12 CrNi 25 21	310 S 16; 310 S 24; 310 S 25; 310 S 31	Z 8 CN 25-20; Z 12 CN 25-20; Z 12 CN 26-21	2361	X 6 CrNi 25 20 (X 6 CrNi 25 20)	F.331	SUS 310 S; SUS 310 FB; SUS 310 STG; SUS 310 STP; SUS310 TB; SYS Y 310 S	10Ch23N18; 20Ch23N18	X12CrNi25-21
14		1.4465; 1.4466	X1CrNiMoN25-22-2; X 2 CrNiMoN 25 22 7								X1CrNiMoN 25-22-2
14	309; S30900	1.4828	X15CrNiSi20-12; X 15 CrNiSi 20 12	309 S 24	Z 9 CN 24-13; Z 17 CNS 20-12		X 16 CrNi 23 14	F.3312; X 15 CrNiSi 20-12	SUH 309; SUS 309 TB; SUS 309 TP	20Ch20N14S2	58C; X15CrNiSi20-12
14	HK; J94203; J94204; J94224	1.4848	GX40CrNiSi25-20; G-X 40 CrNiSi 25 20	310 C 40; 310 C 45			G X 40 CrNi 26 20	AM-X 40 CrNi 25 20; F.8452	SCH 21; SCH 22; SCH 22 X		GX40CrNiSi25-20
14	HK 30; J93503; J94003; J94013; HH	1.4837; 1.4848+Nb	GX40CrNiSi25-12; G-X 40 CrNiSi 25 12	309 C 30			G X 35 CrNi 25 12		SCH 13; SCH 13 A; SCH 13 X; SCH 17; SCS 17	40Ch24N12SL	GX40CrNiSi25-12

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
14	310; 314; S3100; S31400; S31500	1.4841	X15CrNiSi25-21; X 15 CrNiSi 25 20	314 S 25	Z 15 CNS 25-20		X 16 CrNiSi 25 20	F.3310; X 15 CrNiSi 25-20	SUH 310; SUS 310 TB; SUS Y 310	20Ch25N20S2	X15CrNiSi25-21
14		1.4849	GX40NiCrSiNb38-19; G-X 40 NiCrSi 38 18								GX40NiCrSiNb 38-19
14	S32760; SA351 / 995; 25Cr-7Ni-Mo-N	1.4501	X2CrNiMoCuWN25-7-4	1.4501	Z 3 CNDU 25-06 Az						X2CrNiMoCuWN 25-7-4
14	348; S34800	1.4546	X5CrNiNb18-10	2 S.130; 2 S.143; 3 S.144; 3 S.145; S.525; S.527							
14		1.4544; 1.4544.9		S.524; S.526; 2 S 129	Z 10 CNT 18-11; 9160 / C 63; 9160C201		X 6 CrNiTi 18 11			08Ch18N12T	FE-PA 13
14		1.6900	X12CrNi18-9; X 12 CrNi 18 9								
14		1.4829	X12CrNi22-12; X 12 CrNi 22 12								
14		1.4882	X50CrMnNiNbN21-9		Z 50 CMNNb 21.09						X50CrMnNiNbN 21-9
14	316N; 316 N; J92804	1.4409	GX2CrNiMo19-11-2; G-X 2 CrNiMo 19 11 2		Z 3 CND 19.10 M		GX2 CrNiMo 19 11	AM-X 2 CrNiMo 19 11; F.8415	SCS 16 A; SCS 16 AX SCS 16 AXN		GX2CrNiMo 19-11-2
14	304L; 304 L J92500; J92620	1.4309	GX2CrNi19-11	304 C 12	Z 3 CN 19.10 M		GX 2 CrNi 19 10	AM-X 2 CrNi 19 10; F.8412	SCS 19; SCS 19 A		GX2CrNi19-11
15	A48 25 B; Class 25; No 25 B	0.6015	EN-GJL-150; GG 15; EN-JL 1020	Grade 150	Ft 15 D; R 15 D	01 15-00	G 14; G 15	FG 15	FC 15; FC 150	SCh 15	EN-GJL-150; EN-JL 1020
15	A48-30 B; Class 30, No.30 B	0.6020	EN-GJL-200; GG 20; EN-JL 1030	Grade 220	Ft 20 D	01 20-00	G 20; Gh 190	FG 20	FC 20; FC 200	SCh 20	EN-GJL-200; EN-JL 1030
15	A48-20 B; Class 20; No 20 B	0.6010	EN-GJL-100; GG 10; EN-JL 1010		Ft 10 D	01 10-00	G 10	FG 10	FC 10; FC 100	SCh10	EN-GJL-100; EN-JL 1010
16	A48-45 B; Class 45; No 45 B	0.6030	EN-GJL-300; GG 30; EN-JL 1050	Grade 300	Ft 30 D	01 30-00	G 30	FG 30	FC 30; FC 300	SCh 30	EN-GJL-300; EN-JL 1050
16	A48-50 B; Class 50; No 50 B	0.6035	EN-GJL-350; GG 35; EN-JL 1060	Grade 350	Ft 35 D	01 35-00	G 35	FG 35	FC 35; FC350	SCh 35	EN-GJL-350; GG 35; EN-JL 1060
16	A48-60 B; Class 60; No 60 B	0.6040	EN-JLZ; GG 40	Grade 400	Ft 40 D	01 40-00				SCh 40	EN-JLZ
16	A48-40 B; Class 40; No 40 B	0.6025	EN-GJL-250; GG 25; EN-JL 140	Grade260	Ft 25 D	01 25-00	G 25	FG 25	FC 25	SCh 25	EN-GJL-250; EN-JL 140
17		0.7033	EN-GJS-350-22-LT; GGG 35.3	350 / 22 L 40	FGS 370- / 17	0717-15	GS 370-17	FNG 38-17	FCD 350-22L	VCh42-12	EN-GJS-350-22-LT
17	60-40-18; A536 60-40-18	0.7043	EN-GJS-400-18; EN-GJS-400-18-LT; GGG-40.3; EN-GJS-400-18A-LT	370 / 7; SNG 370 / 17	FGS 370-17	0717-15	GSO 400-12			VCh 42-2	EN-GJS-400-18; EN-GJS-400-18-LT; EN-GJS-400-18A-LT
17	60-40-18; A536 60-40-18	0.7040	EN-GJS-400-15; EN-JS 1030; GGG-40	420 / 12; SNG 420 / 12	FCS 400-12	0717-02	GS 400-12	FGE 38-17	FCD 40	VCh 42-12	EN-GJS-400-15; EN-JS 1030

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
17	65-45-12; A536 65-45-12	5.3107	EN-GJS-450-10	450 / 10; SNG 450 / 10	FGS 450-10		GS 400-12	FGE 42-12	FCD450	VCh 45	EN-GJS-450-10
18	65-45-12; A536 65-45-12	0.7050	EN-GJS-500-7; EN-GJS-500-7A; EN-JS 1050; GGG-50	500 / 7	FGS 500-7	0727-02	GS 500 / 7	FGE 50-7	FCD 50; FCD 500; FCD 500-7	VCh 50-2	EN-GJS-500-7; EN-GJS-500-7A; EN-JS 1050
18	80-55-06; A536 80-55-06	0.7060	EN-GJS-600-3; EN-GJS-600-3A; EN-JS 1060; GGG-60	600 / 3	FGS 600-3	0732-03	GS 600 / 3	FGE 60-2	FCD 60; FCD 600; FCD 600-3		
18		0.7652	GGG-NiMn 13 7	S-NiMn 13 7	S-NM 13 7	07 32-03	GGG 60	GGG 60			
18	100-70-03; A536 100-70-03	0.7070	EN-GJS-700-2; EN-JS 1070; GGG-70	700 / 2; SNG700 / 2	FGS 700-2	0737-01	GS 700-2	FGE 70-2	FCD 70; FCD 700; FCD 700-2	VCh 70-2	EN-GJS-700-2; EN-JS 1070
18	A439 Type D-2	0.7660	GGG-NiCr 20 2	S-NiCr 20 2	S-NC 20-2						
18	A439 Type D-2 B	0.7661	GGG-NiCr 20 3	S-NiCr 20 3	S-NC 20 3						
19	A47-32510; A47 Class 32510; A47 Grade 32510; 32510	0.8135	EN-GJMB-350-10; EN-JM 1130; GTS-35-10; GTS-35	B 340 / 12; 310 B340 / 12	MN 35-10; A32-702 MN 350-10	0810	B 35-10	GTS 35; 36114 Type A	FCMB 340; G5703 FCMB 340	KCh 35-10	EN-GJMB-350-10; EN-JM 1130
19	A47-35018, A47 Class 35018; A47 Grade 35018				MN 380-18; A32-702 MN 380-18					KCh 37-12	
19	A47-22010; A47 Class 22010; A47 Grade 22010; UNS F22200			B 32-10; 6681 B 32-10					FCMB 310	KCh 33-8	
20	A220-50005; A220 Class 50005; A220 Grade 50005	0.8155	EN-GJMB-550-4; EN-JM1160; GTS-55-04	P 55-04; P 510 / 4	MP 60-3; A32-703 MP 60-3; Mn 550-4	0856-00	P 55-04	Type C; 36116 Type C	FCMP 540	KCh 55-4; KCh60-3	EN-GJMB-550-4; EN-JM1160
20	A220-70003; A220 Class 70003; A220 Grade 70003	0.8165	EN-GJMB-650-2; EN-JM1180; GTS-65-02	P 65-02; 6681 P 65-02; P 570 / 3	Mn 650-3	0862-030	GMN 65		FCMP 590	KCh 63-3	EN-GJMB-650-2; EN-JM1180
20	A220-70003; A220 Class 70003; A220 Grade 70003	0.8170	EN-GJMB-700-2; EN-JM1190; GTS-70-02	P 70-2; 6681 P 70-2; P 690 / 2	MP 70-2; A 32-703 MP 70-2; Mn 700-2	0862-03	P 70-2; GMN 70	36116 Type A	FCMP 690	KCh 70-2	EN-GJMB-700-2; EN-JM1190
20	A220-45006; A220 Class 45006; A220 Grade 45006 A220-45008; A220 Class 45008; A220 Grade 45008	0.8145	EN-GJMD-450-6; EN-JM1140; GTS-45-06; GTS-45	P 45-06; 6681 P 45-06	MP 50-5; A32-703 MP 50-5	0854-00	P 45-06	Type E; 36116 Type E		KCh 45-7	EN-GJMD-450-6; EN-JM1140
20	A220-80002; A220 Class 80002; A220 Grade 80002			P 70-2	MN 700-2	854			FCMP 70; FCMP 700	KCh 80-1.5	

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
20	A220-90001; A220 Class 90001; A220 Grade 90001										
20	A220-60004; A220 Class 60004; A220 Grade 60004										
20	A220-40010; A220 Class 40010; A220 Grade 40010					0852-00					
20		0.8040	EN-GJMW-400-5; GTW-40-05	W 40-05	MB 400-5		W 40-05	36113 Type A	FCMW 370		EN-GJMW-400-5; EN-JM1030
20		0.8035	EN-GJMW-350-4; GTW-35-04	W 35-04	MB 35-7		W 35-04	36113 Type B	FCMW 330		EN-GJMW-350-4; EN-JM1010
21	AA5005; AA5006; A95005; A95006; 5005; 5005A; 5006	3.3315	AlMg1; AlMg1C	N41	A G0-6	144106	L3350		A5005	1510; AMg1	AlMg1C; 5005A
21	AA1050; A91050; 1050; 1050A	3.0255	Al99,5; Al99.5	1B	A5	14407	9001 / 2	L-3051		AD0	Al99.5; Al99,5; 1050A
21	AA1200; A91200 ; 1200; 1200A	3.0205	Al99,0; Al99.0; Al99	1C	A4	144010	Al99.0	L-3001	A1200	A0	Al99.0; AL99,0; 1200
22	AA2017; A92017; 2017; 2017A	3.1325; 3.1124	AlCu2,5Si(A); AlCu2.5Si(A); AlCuMg1		A-U4G			L-3120		V65	AlCu2,5Si(A); AlCu2.,5Si(A); 2017A
22		3.2315	AlMgSi1	H30	A-SGM0.7	144312	9006 / 4	L-3453		AD35	AlSiMgMn; 6082
22		3.4345	AlZnMgCuO,5; AlZnMgCuO.5								AlZnMgCu0.5; AlZnMgCu0,5; 7022
22		3.1655	AlCu6BiPb; AlCuBiPb	FC1	A-U5PbBi	144355	9002 / 5	L-3192	A2011		AlCu6BiPb; 2011
22	AA7075; A97075; 7075	3.4365; 3.4364	AlZn5,5MgCu; AlZn5.5MgCu; AlZnMgCu1,5; AlZnMgCu1.5	7075; L95; L96	A-Z5GU		9007 / 2	L-3710	A7075	B95	AlZn5.5MgCu; AlZn5,.5MgCu; AW-7075; 7075
22	AA2024; A92024; 2024	3.1355; 3.1354	AlCuMg2	2024; 2L97	A-U4G1		9002 / 4; 3583	L-3140	A2024	D16	AlCu4Mg1; 2024
22		3.4335	AlZn4,5Mg1; AlZn4.5Mg1	H17	A-Z5G	144425	9007 / 1	L-3741			AlZn4.5Mg1; AlZn4,5Mg1; 7020
22	AA6061; A96061; 6061	3.3211; 3.3214	AlMg1SiCu	H20	A-GSUC		9006 / 2	L-3420	A6061	AD33	EN AW-6061; EN AW-AlMg1SiCu; AlMg1SiCu
23		3.3261	G-AlMg5Si; GK-AlMg5Si; AlMg5Si; VDS 245	LM5		144163				AL13	EN AC-51400; EN AC-AlMg5Si; G-AlMg5Si; AlMg5Si
23		3.2982	GD-AlSi12(Cu); G-AlSi12(Cu); AlSi12(Cu); VDS 231 D		A-S12U		3048				EN AC-47100; EN AC-AlSi12C; G-AlSi12Cu; AlSi12Cu; AlSi12Cu1(Fe)

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
23	520.0; AA 520.0; A05200				A-G10S		3056	L-2310	AC7B	A18	
23	222.0; AA 222.0; A02220			LM12			3041	L-2110			
23	518.0; AA 518.0; A05180	3.3292	G-AlMg9; GD-AlMg9; AlMg9; VDS 349								EN AC-51200; EN AC-AlMg9; G-AlMg9; AlMg9
23	203.0; AA 203.0; A02030	3.1754	G-AlCu5Ni1,5; G-AlCu5Ni1.5		AU5NKZr						
23	ER4047; A94047	3.2585	SG-AlSi12	4047A; NG2		144262					SG-AlSi12; EL-AlSi12
23	712.0; AA 712.0; A07120		G-AlZn10Si8Mg; GK-AlZn10Si8Mg; AlZn10Si8Mg; VDS 108		A-Z5GF		3602				EN AC-71100; EN AC-AlZn10Si8Mg; G-AlZn10Si8Mg; AlZn10Si8Mg
23	514.0; 514.1; AA 514.0; AA 514.1; A05140; A05141	3.3561	G-AlMg5; GK-AlMg5; AlMg5; EN AC-51300; VDS 244		A-G6		3058	L-2331		AL28; AMg5Mz;	EN AC-51300; EN AC-AlMg5; G-AlMg5; AlMg5
23	B413.0; AA B413.0; A24130; B213.0; AA 213.0; A22130	3.2581; 3,2582	G-AlSi12; GK-AlSi12; GD-AlSi12; AlSi12	LM6	A-S13	144261	4514	L-2520	AC3		EN AC-44200; EN AC-AlSi12; G-AlSi12; GD-AlSi12; AlSi12
23		3.2211	G-AlSi11; GK-AlSi11; AlSi11								EN AC-44000; EN AC-AlSi11; G-AlSi11
23	A444.0; AA A444.0; A14440									AK7	
23		3.3541	G-AlMg3; GK-AlMg3; GF-AlMg3; AlMg3; VDC 244	H20	A-G3T	144224	3059	L-2341	ADC6		EN AC-51100; EN AC-AlMg3; G-AlMg3; AlMg3
24	515.0; AA 515.0; A05150	3.3241	G-AlMg3Si; GK-AlMg3Si; GF-AlMg3Si; AlMg3Si; AlMg3Si1								G-AlMg3Si1; AlMg3Si
24		3.2373	G-AlSi9Mg; GK-AlSi9Mg; AlSi9Mg		A-S9G		3051		AC4A	AK9	G-AlSi9Mg; AlSi9Mg
24	A356.0; AA A356.0; A13560; A356.2; AA A356.2; A13562	3.2371	G-AlSi7Mg; GK-AlSi7Mg; GF-AlSi7Mg; AlSi7Mg	2L99	A-S7G03			L-2651	AC4CH	AL9	G-AlSi7Mg; AlSi7Mg
24	204.0; AA 204.0; A02040	3.1371	G-AlCu4TiMg; GK-AlCu4TiMg; GF-AlCu4TiMg; AlCu4TiMg		AU5GT			L-2140	AC1B		EN AC-21000; EN AC-AlCu4TiMg; G-AlCu4TiMg
24	A333.0; AA A333.0; A13330	3.2161	G-AlSi8Cu3; GK-AlSi8Cu3			144163				AL13	EN AC-AlSi8Cu3; EN AC-AlSi8Cu3; G-AlSi8Cu3
24	380.0; AA 380.0; A03800	3.2163	G-AlSi9Cu3; GD-AlSi9Cu3; AlSi9Cu3; VDS 226	LM24	A-S9U3	144252	3610	L-2630	AC4B	AK8M3; AK8	EN AC-46200; EN AC-AlSi8Cu3; G-AlSi9Cu3; AlSi8Cu3

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
24	365.0; AA 365.0; A03650		G-AlSi10MnMg								EN AC-43500; EN AC-AlSi10MnMg; G-AlSi10MnMg
24	319.0; AA 319.0; A03190	3.2151	G-AlSi6Cu4; GK-AlSi6Cu4; AlSi6Cu4; VDS 225	LM21	A-S5UZ	144230	7369 / 4	L-2620	AC2B	AK5M	EN AC-45000; EN AC-AlSi6Cu4; G-AlSi6Cu4; AlSi6Cu4
24		3.2383	G-AlSi10MgCu; GK-AlSi10MgCu; G-AlSi10Mg(Cu); GK-AlSi10Mg(Cu); AlSi10MgCu; AlSi10Mg(Cu)		A-S10UG						
24		3.2381; 3.2385	G-AlSi10Mg; GK-AlSi10Mg; GD-AlSi10Mg; AlSi10Mg; VDS 239		A-S10G	144253					EN AC-43000; EN AC-AlSi10Mg; G-AlSi10Mg; AlSi10Mg
24		3.1841	G-AlCu4Ti; AlCu4Ti							AL19	EN AC-21100; EN AC-AlCu4Ti; G-AlCu4Ti; AlCu4Ti
25	390.0; AA 390.0; A03900		G-AlSi17Cu4Mg	LM30		4282					EN AB-48100; EN AC-48100; G-AlSi17Cu4Mg; AlSi17Cu4Mg
25	393.0; AA 393.0; A03930		G-AlSi20CuMgNi; AlSi20CuMgNi	LM29						AK21M2N2	
25			G-AlSi18Cu1MgNi; AlSi18Cu1MgNi	LM28							
26	C36000	2.0375	CuZn36Pb3	CZ124	CuZn36Pb3		12167		C3600; C3601; C3602		CuZn36Pb3; CW603N
26	C83810	2.1098	CuSn3Zn8Pb5-C; G-CuSn2ZnPb	LG1							CuSn3Zn8Pb5-C
26	C83600	2.1096; 2.1096.01	CuSn5Zn5Pb5-C; G-CuSn5ZnPb; Rg 5	LG2	CuPb5Sn5Zn5; UE5; U-E 5 Pb 5 Z 5	5204-15			H5111; H2203	BrO5Ts5S5	CuSn5Zn5Pb5-C
26	C93200	2.1090	CuSn7Zn4Pb7-C; G-CuSn7ZnPb; GC-CuSn7ZnPb; GZ-CuSn7ZnPb; Rg 7	GC 493K	CuSn7Pb6Zn4; UE7; U-E 7 Z 5 Pb 4						CuSn7Zn4Pb7-C
26	C93800	2.1182	CuSn7Pb15-C; G-CuPb15Sn; GC-CuPb15Sn; GZ-CuPb15Sn	LB1	U-Pb15E8; U-Pb 15 E8			C-3300			CuSn7Pb15-C; CC496K
26	C93700	2.1176	CuSn10Pb10-C; G-CuPb10Sn; GC-CuPb10Sn; GZ-CuPb10Sn	LB2	U-Pb10						CuSn10Pb10-C
27	C22000	2.0230	CuZn10; Ms90	CZ101	U-Z10; CuZn10		P-CuZn10; P-OT90		C2200	L90	CuZn10; CW501L
27	C86200; SAE 430A	2.0596	CuZn34Mn3Al2Fe1-C; G-CuZn34Al2; GK-CuZn34Al2; GZ-CuZn34Al2	HTB 1	U-Z36N3; CuZn19Al6Y20				HBSC4; H5102 / class 3; H5102 / class 4	LTs23A; LTs23A6Zh3MTs2	CuZn34Mn3Al2 Fe1-C; CC764S
27	C27200	2.0335	CuZn36; Ms64	CZ108	U-Z36; CuZn 36		C 2700			L63	CuZn36; CW507L
27	C27400	2.0321	CuZn37; Ms63	CZ108			P-CuZn37; P-OT63		C2720	L63	CuZn37; CW508L
27	C86400	2.0592	CuZn35Mn2Al1Fe1-C; G-CuZn35Al1; GK-CuZn35Al1; GZ-CuZn35Al1; G-Ms60	HTB 1					HBSC1; CAC301		CuZn35Mn2Al1 Fe1-C; CC765S

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
27	C46400	2.0530	CuZn38Sn1As; CuZn38Sn1	CZ112			P-CuZn39Sn1		C4640	LO60-1	CuZn38Sn1As; CW717R
27	C23000; 85Cu-15Zn	2.0240	CuZn15 ; CuZn 15	CZ102	U-Z15; CuZn15	5112-02; 5112-04; 5112-05			C2300		CuZn15; CW502L
27	C24000; 80Cu-20Zn	2.0250	CuZn20; CuZn 20; Ms80	CZ103	CuZn20	5114-02; 5114-04; 5114-05			C2400		CuZn20; CW503L
27	C26000; CA260	2.0265	CuZn30; CuZn 30	CZ106	CuZn30				C2600		CuZn30; CW505L
28	C63000	2.0966	CuAl10Ni5Fe4; CuAl 10 Ni 5 Fe 4	CA 104	U-A10N; CuAl9Ni5Fe3		P-CuAl10Ni5Fe5		C6301	BrAD; BrAZhN10-4-4; N10-4-4	CuAl10Ni5Fe4; CW307G
28	C90700	2.1050	CuSn10-C; G-CuSn 10; SnBz10	CT1	CuSn8						CuSn10-C; CC480K
28	C90800; C91700	2.1052; 2.1052.01; 2.1052.04; 2.1052.03	CuSn12-C; G-CuSn12; GZ-CuSn12; SnBz12, Gbz12	PB2	UE12P				CAC502C; PBC2C		CuSn12-C; CC483K
28	C95800; C95810	2.0975	G-CuAl10Fe5Ni5-C; G-CuAl 10 Ni; NiAlBz-F60		CuAl10Fe5Ni5 Y70				CAC703C		CC333G
28	C11000	2.0060	Cu-ETP; E-Cu57; E Cu 57	C101	Cu-B		Cu-DHP	C11020	C1100	M1	Cu-ETP; E-Cu57; CW004A
28	C81500	2.1292	G-CuCrF 35	CC1-FF	U-Cr0.8Zr						
28	C10300	2.0070	Cu-HCP; Cu-PHC; SE-Cu						C103	LS60-2	Cu-HCP; CW020A; Cu-PHC; CW021A
28	C10100; C10200	2.0040	Cu-OF; OF-Cu	C103; C110	Ci-c1; Cu-c2			C-1120	C1011; C1020	M0b	Cu-OF; CW008A
28	C86550	2.0590	G-CuZn40Fe; G-SoMsF30								G-CuZn40Fe
28	C18100; C18150	2.1293	CuCr1Zr; CuCrZr	CC102	U-C1Z; U-Cr0.8Zr						CuCr1Zr; CW106C
28	C11000; C12200	2.0090	Cu-DHP; E-Cu58; E Cu 58 SF-Cu	C106	Cu-B				C1100; C1220	M1f	Cu-DHP; E-Cu58; CW024A
28	C95500	2.0971	CuAl9Ni3Fe2		UA9					BrA10Zh4N4L	
28	C61000	2.0920	CuAl8; Cu Al 8		CuAl8					BrA7	CuAl8
29											
29											
30											
30											
31	330; N08330	1.4864	X12NiCrSi35-16; X12NiCrSi36-16; X12 NiCrSi 36 16	NA 17; INCOLOY alloy DS	Z 20 NCS 33-16; Z 12 NCS 37-18; Z 12 NCS 35-16			F.3313	SUH 330		
31	N08002; N08004; N08005; N08030	1.4865	GX40NiCrSi38-19 GX40NiCrSi38-18; G-X40 NiCrSi38 18	330 C 11; 330 C 40; 331 C 40			GX 50 NiCr 39 19		SCH 15; SCH 16		GX40NiCrSi38-18
31		1.4558	X2NiCrAlTi32-20; X2 NiCrAlTi 32 20	NA 15					NCF 800		X2NiCrAlTi32-20
31	N08031	1.4562	X1NiCrMoCu32-28-7; X1 NiCrMoCu 32 28 7								X1NiCrMoCu 32-28-7
31		1.4958	X5NiCrAlTi31-20; X5 NiCrAlTi 31 20	NA 15					NCF 800 H; NCF 718		X5NiCrAlTi31-20

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
31	N08811	1.4959	X8NiCrAlTi32-21; X8 NiCrAlTi 32 21	NA 15; NA 15 H	Z 8 NC 33-21; Z 10 NC 32-21						X8NiCrAlTi32-21
31	N08028	1.4563	X1NiCrMoCu31-27-4; X1 NiCrMoCu 31 27 4		Z 2 NCDU 31-27; Z 1 NCDU 31-27-03	2584				EK77; ChN30MDB	X1NiCrMoCu 31-27-4
31	B 163; N08800; N08810; N08332; N08811	1.4876	X10NiCrAlTi32-21; X10NiCrAlTi32-20; X10 NiCrAlTi 32 20	NA 15; NA 15 H	Z 10 NC 32-21; Z 8 NC 33-21			F.3314; F.3545	NCF 800; NCF 800 TB; NCF 800 TP		X10NiCrAlTi32-21
32	S590; J 467	1.4977	X40CoCrNi20-20; X40 CoCrNi 20 20		Z 42 CNKDWNb						
32	660; S66286	1.4980	X6NiCrTiMoVB25-15-2; X5NiCrTi26-15 X6 NiCrTiMoVB 25 15 2; X5 NiCrTi 26 15	HR 51; HR 52	Z 3 NCT 25; Z 6 NCTDV 25.15 B						X6NiCrTiMoVB 25-15-2; X5NiCrTi26-15
32		1.4943; 1.4944	X4NiCrTi25-15; X5NiCrTi26-15	HR 51	Z 6 NCTDV 25-15 B	2570					X4NiCrTi25-15; X5NiCrTi26-15
32	661; R30155	1.4971	X12CrCoNi21-20; X12 CrCoNi 21 20								X12CrCoNi21-20
32	Haynes 556; R30556										
33	Incoloy 825; N08825;	2.4858	NiCr21Mo	NA 16	NC 21 Fe DU					ChN38VT	
33	Hastelloy C-4; N06455	2.4610	NiMo16Cr16Ti								
33	Nimonic 75; N06075; AMS 5715	2.4630; 2.4951	NiCr20Ti	HR 5; HR 203-4	NC 20 T						
33	Inconel 625; N06625; AMS 5666	2.4856	NiCr22Mo9Nb	NA 21	NC 22 FeDNb						
33	Inconel 690; N06690	2.4642	NiC29Fe		NC 30 Fe						
33	Monel 400; N04400	2.4360; 2.4361	NiCu30Fe	NA 13	NU 30						
33	Hastelloy X; N06002; 5390A; AMS 5754; AMS 5536	2.4603; 2.4665	NiCr30FeMo; NiCr22Fe18Mo; NiCr21Fe18Mo9	HR 6	NC 22 FeD						
33	Inconel 617; N06617; AMS 5887	2.4663a	NiCr23Co12Mo		NC 14 K 9 T 5 DWA						
33	Nimonic 90; N07090; AMS 5829	2.4632; 2.4969	NiCr20Co18Ti; NiCr 20 Co 18 Ti	HR 2; HR202; HR 402; HR 501; HR 502; HR 503	Z 8 NCDT 42						NiCr20Co18Ti
33	Haynes 214; NO7214	2.4646	NiCr16Al								
33	Rene 41; N07041; AMS 5712; AMS 5713	2.4973	NiCr19Co11MoTi; NiCr 19 CoMo		NC 19 KDT						
33	Hastelloy B2; N10665	2.4617; 2.4616; 2.4615	NiMo28; EL-NiM29; SG(UP)-NiMo27						YNiMo-7		NiMo28
33	Udimet L-605; R30605	2.4964	CoCr20W15Ni								
33	Monel R-405; N04405	2.4360; 2.4361	NiCu30Fe	NA 13	NU 30						

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
33	Inconel 600; N06600; AMS 5665	2.4816	NiCr15Fe8; NiCr 15 Fe	NA 14	NC 16 FeT					ChN78T	NiCr15Fe8
33	Inconel 601; N06601	2.4851	NiCr23Fe15A; NiCr 23 Fe		N C 23 FeA					ChN60Yu	NiCr23Fe15A
33	Nimonic 263; N07263; AMS 5872; AMS 5886	2.4650	NiCo20Cr20MoTi; NiCo 20 Cr 20 MoTi MoTi	HR 10; HR 206; HR 404	NCK 20 D						NiCo20Cr20MoTi
34	Haynes 188; Jetalloy 209; R30188; AMS 5772	2.4964	CoCr22W14Ni		KC22WN						
34	Monel K-500; N05500	2.4375	NiCu30Al3Ti; NiCu 30 Al	NA 18	NU 30 AT						NiCu30Al3Ti
34	Inconel 718; N07718; AMS 5596; AMS 5589	2.4668	NiCr19Nb5Mo3; NiCr 19 NbMo; NiCr19Fe19Nb5Mo3	HR 8	NC 19 Fe Nb						NiCr19Nb5Mo3
34		2.4955	NiFe25Cr20NbTi; NiFe 25 Cr 20 NbTi		NiFe25Cr20NbTi						NiFe25Cr20NbTi
34	Incoloy 925; N09925	2.4670									
34	Nimonic 901; N09901; AMS 5660; AMS 5661	2.4662	NiFe35Cr14MoTi; NiCr13Mo6Ti3; NiCr 13 Mo 6 Ti 3		Z8 NCDT 42						
34	Udimet 500; N07500; ALSi 684	2.4983	NiCr18Co18MoAlTi		NCK 19 DAT						NiCr18Co18MoAlTi
34	Nimonic 80A; N07080	2.4631; 2.4952	NiCr20TiAl; NiCr 20 TiAl	HR 401; HR 601	NC 20 TA				NCF 80 A	ChN77TYuR; ChN56VMTYu	NiCr20TiAl
34	Jetalloy 209; AMS 5772		CoCr22W14Ni		KC 22 WN						
34	Altemp S-816	2.4989	CoCr20Ni20W							Altemp S-816	
34	MAR-M 246	2.4675	NiCr23Mo16Cu; NiCr 23 Mo 16 Cu								NiCr23Mo16Cu
34	Inconel 722; N07722; AMS 5411										
34	Waspaloy; N07001; ALSi 685; AMS 5704; AMS 5706; AMS 5708; AMS 5544	2.4654	NiCr20Co13Mo4Ti3AL; NiCr 19 Co 14 Mo 4 Ti		NC 20 K 14						NiCr20Co 13Mo4Ti3AL
34	Rene 80				NC14 K9 T5 DWA						
35	5388C; N30002; CW-12MW;	2.4883	G-NiM16CrW								
35	N7M; N-7M; N30007	2.4685	G-NiMo28		ND 30 M						
35	N12MV; N-12MV; N30012	2.4882; 9.4810; 2.4810 / 9.4810	G-NiMo30								
35	Nimocast PK24; N13100; AMS 5397	2.4674	G-NiCo15Cr10AlTiMo	HC 204	NK 15 CAT						

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
35	Jethete M-252; N07252; AMS 5551	2.4916	G-NiCr19Co; G-NICR 19 Co								
35	Nimocast 713; N07713; AMS 5391; Inconel 713LC	2.4670	G-NiCr13Al6MoNb	HC 203	NC 13 AD						
35	M-35-1; N214135	2.4365; 2.4365 / 9.4365	G-NiCu40Nb						NiCuC		
36	Titanium Grade 1; R50250; ASTM GR. 1	3.7024; 3.7025	Ti 1; Ti 99.8	TA1	T-35		Ti1-Type 1	Ti-PO1	Class 2; Gr-1	VT1-00	Ti 99.8
36	Titanium Grade 2; R50400; AMS 4902; AMS 4941; AST M Gr. 2	3.7034; 3.7035; 3.7036	Ti 2; Ti 99.7	TA2; TA3; TA4; TA5	T-40		Ti1-Type 2	Ti-PO2	Class 2; Gr-2	VT1-0	Ti 99.7
36	Titanium Grade 3; R50500; ASTM Gr. 3	3.7055; 3.7056	Ti 3; Ti 99.6	DTD 5023, DTD 5273	T-50		Ti1-Type 3		Class 3; Gr-3		Ti 99.6
36	Titanium Grade 4; R50700; ASTM Gr. 4	3.7064; 3.7065; 3.7066	Ti 4; Ti 99.5	TA7; TA8; TA9	T-60		Ti1-Type 4		Class 4; Gr-4		Ti 99.5
36	Titanium Grade 7; R52400; Ti-0.15Pd	3.7235					Ti2Pd-Type 7		Class 13; Gr-13		
37	Titanium Grade 5; R56400; Ti-6Al-4V	3.7165; 3.7164	Ti6Al4V	TA10; TA11; TA12; TA13; TA 28; TA56; Ti-Al-V	TA6V; T-A 6 V; Ti-P.63		TiAl6V4-Type 5	Ti-P63	Class 6 0; Gr 6 0; SAT-64	VT6	Ti6Al4V
37	Titanium Grade 6Al-2Sn-4Zr-2Mo; R54620; 6Al-2Sn-4Zr-2Mo	3.7145; 3.7144	TiAl6Sn2Zr4Mo2							VT25	TiAl6Sn2Zr4Mo2
37		3.7175; 3.7174	TiAl6V6Sn2								
37	Titanium Grade 9; R56320; Ti-3Al-2.5V	3.7195; 3.7194	Ti6Al2.5V				TiAl3V2.5-Type 9		Class 6 1; Gr 6 1	PT-3V	Ti6Al2.5V
37		3.7124	TiCu2	TA 21; TA22; TA23; TA24	T-U2			Ti-P11			
37		3.7185; 3.7184	Ti4Al4Mo2Sn; TiAl4Mo4Sn4Si0.5	TA45; TA46; TA47; TA48; TA49; TA50; TA57	T-A4DE			Ti-P68			
37	Titanium Grade 6; R54520; Ti-5Al-2.5Sn	3.7115.1; 3.7115	TiAl5Sn2.5; TiAl 5 Sn 22	TA14; TA17	T-A5E; Ti-P.65				SAT-525	VT5-1	TiAl5Sn2.5
37	R56410; Ti-10V-2Fe-3Al										

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
37	Titanium grade 23; R56401; Ti-6Al-4V-ELI		Ti6Al4V ELI	TA11			TiAl6V4ELI-Type 5.1		Class 6 1; Gr 6 1		
37										VST 5553	Ti5Al5V5Mo3Cr; Ti-5Al-5V-5Mo-3Cr
37	Ti-4Al-3Mo-1V				T-A4D3V					VT14	
37										VT22	
38		1.2762	75CrMoNiW6-7; 75 CrMoNiW 6 7								75CrMoNiW6-7
38	W1; T72301	1.1625	C80W2; C 80 W2	BW 18				F.520.U; F.5107; C 80	SK 75; SK 85; SK 85 M; SK 5; SK 5 M; SK 6	U8-1	C80W2
38	W110; T72301	1.1545	C105U; C 105 W 1; C 105 U		C 105 E 2 U; Y1 105; C105E2U	1880	C 100 KU	F.515; F.516	SK 105; SK 3; TC 105	U10A-1; U10A-2; U11-1	C105U
38		1.6746	32NiCrMo14-5; 32 NiCrMo 14-5	832 M 31	35 NCD 14			F.1262-32 NiCrMo 12			32NiCrMo14-5
38	W210; T72302	1.2833	100V1; 100 V 1	BW 2	C 105 E 2 UV 1; Y1 105 V; 100 V 2		102 V 2 KU		SKS 43		100V1
38	6145; 6150; 6150 H; G61500; H61500	1.8159	51CrV4; 50CrV4; 50 CrV 4	735 A 50; 735 A 51; 735 H 51; 735 M 50; En 47	50CrV4RR; 50 CV 4; 51 CV 4	2230	50 CrV 4	F.143; F.143.A; 51 CrV 4; F.1430	SUP 10; SUP 10-CSP; SUP 10 M	50ChFA; 50ChGFA	51CrV4
38	P20; T51620	1.2330	35CrMo4; 35 CrMo 4	708 A 37	34 CD 4	2234	35 CrMo 4				35CrMo4
38											
38											
38											
38											
38		1.8721	26MnCr6-3								26MnCr6-3
38											
38											
38											
38		1.2083; 1.2083 ESR	X40Cr14; X 42 Cr 13		X40Cr14; Z 40 C 14	2314	X 41 Cr 13 KU	F.5263; X 40 Cr 13	SUS 420 J 2		X40Cr14
38	300M; 4340M; K44220	1.6928	41SiNiCrMoV7-6								S 155
38										30ChGSA	
39	A2; T30102	1.2363	X100CrMoV5; X100CrMoV5-1; X 100 CrMoV 5 1	BA 2	X 100 CrMoV 5; Z 100 CDW 5	2260	X 100 CrMoV 5 1 KU	F.536; F.5227; X 100 CrMoV 5	SKD 12		X100CrMoV5
39	D2; T30402	1.2379	X153CrMoV12; X155CrVMo12-1; X155 CrVMo 12 1	BD 2	X 160 CrMoV 12; Z 160 CDV 12	2310	X 155 CrVMo 12 1 KU	F.520.A	SKD 10; SKD 11		X153CrMoV12
39	D3; T30403	1.2080	X210Cr12; X 210 Cr 12	BD 3	X200Cr12; Z 200 C 12		X 205 Cr 12 KU	F.521; F.5212; X 210 Cr 12	SKD 1	Ch12	X210Cr12
39	L3; T61203	1.2067	102Cr6; 102 Cr 6; 100 Cr 6	BL 3; BL3	100Cr6RR; 100 C 6; 100Cr6; Y 100 C 6		102 Cr 6 KU	F.5230; 100 Cr 6	SUJ 2	Ch	102Cr6
39	M1; H41; T11301; T20841	1.3346	HS2-9-1; S 2-9-1	BM 1	HS 2-8-1; Z 85 DCWV 08-04-02-01						HS2-9-1

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	ALSi / SAE / UNS / ASTM / AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
39	T1; T12001	1.3355	HS18-0-1; S 18-0-1	BT 1	18-0-1; HS 18-0-1; Z 80 WCV 18-04-01	2750	HS 18-0-1	F.5520; HS 18-0-1	SKH 2	R18	HS18-0-1
39	O2; T31502	1.2842	90MnCrV8; 90 MnCrV 8	BO 2; BO2	90 MnV 8; 90 MV 8		90 MoVCr 8 KU	90 MnCrV 8; F.5229			90MnCrV8
39	H13; T20813	1.2344	X40CrMoV5-1; X40 CrMoV 5 1	BH 13	X 40 CrMoV 5; Z 40 CDV 5	2242	X 40 CrMoV 5 1 1 KU	F.5318; X 40 CrMoSiV 5	SKD 61	4Ch5MF1S	X40CrMoV5-1
39											
39											
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39											
39											
39	440C; S44004; S44025	1.4125	X105CrMo17; X105 CrMo 17		Z 100 CD 17 Cl; Z 100 CD 17				SUS 440 C	95Ch18; 110Ch18M-SChD	X105CrMo17
40	A 532 III A 25% Cr	0.9650	G-X 260 Cr 27	Grade 3 D		0466-00				ChWG	
40	Ni-Hard 4	0.9630	G-X 300 CrNiSi 9 5 2								
40	Ni-Hard 1	0.9625	G-X 330 NiCr 4 2	Grade 2 B		0513-00					
40	A 532 III A 25% Cr	0.9655	G-X 300 CrMo 27 1	Grade 3 E						20Ch25N20S2	
40	Ni-Hard 2	0.9620	G-X 260 NiCr 4 2	Grade 2 A		0512-00					
41	A532 IID20%CrMo-LC	0.9645; 5.5609	G-X 260 CrMoNi 20 2 1	Grade 3C							EN-GJN-HV600(XCr23)
41	A532 IIC15%CrMo-HC	0.9635; 0.9640	G-X 300 CrMo 15 3; G-X 300 CrMoNi 15 2 1	Grade 3A; Grade 3B							EN-GJN-HV600(XCr14)

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