Member IMC Group

NTK CUTTING TOOLS

CUTTING TOOLS

2025

General Catalog

Safety instructions for using ultra hard cutting tools

1. Instructions for using ultra hard cutting tools

As required by the laws concerning Product Liability enforced on July 1, 1996, we place warning or caution labels on the packages of applicable NTK products. However, each tool body itself bears no detailed safety instructions. Therefore, you are requested to read and understand fully the “Safety instructions for the use of carbide cutting tools” before putting any ultra hard tool materials into use. In addition, we request that all relevant staff and operators fully understand these safety instructions prior to use.

2. Basic characteristics of ultra hard tool materials

2-1. Meaning and classifications of terms used in this catalog

Ultra hard tool materials: The collective name for materials used as cutting tools, including carbides, ceramics, CBN and diamond (PCD) sintered materials.
Carbide: Tool materials where the main component is WC (Tungsten Carbide)
Ultra hard materials: The collective name for materials used as ultra hard tools. Also used as a convenient way of referring to carbides under a narrower definition.
Ultra hard tools: The collective name for tools using ultra hard tool materials.

2-2. Physical properties

Appearance: Varies depending on the material. Example: gray, black or gold
Odor: Odorless
Hardness: Cemented carbide: HV500 up to 3,000 kg/mm^2
Specific gravity: Carbide: 9 up to 19

2-3. Composition / Ingredients

Carbide, nitride, carbo-nitride, or oxidized materials of W, Ti, Al, Ta, B or the like; some contain metallic components such as Co, Ni, Cr and/or Mo.

3. Precautions for handling ultra hard tool materials

- One of the properties specific to these materials is high hardness, another is brittleness. Therefore, shock loads or impacts, or excessive clamping of these materials may result in breakage or other damage.
- As the specific gravity (density) of these materials is very high, a large component made up of these materials or such products in large quantity should be handled with care.
- Ultra hard materials are different in their thermal expansion ratio from metals. These products are prone to thermal shock and subsequent breakage when subjected to a sudden increase or decrease in temperature.
- As cutting oil, lubricant and general moisture may corrode ultra hard materials and affect their strength, pay extra attention to storing them in good conditions.

4. Precautions machining ultra hard tools

- The strength of ultra hard tools may be significantly lowered depending on the surface condition. Always use diamond grinding wheels for finish machining.
- Dust is produced when ultra hard tools are ground. Install appropriate ventilation/disposal equipment and wear protective gear such as masks, as inhalation of such dust may be hazardous to health. If such dust contacts your skin or comes into contact with your eyes, flush well with flowing water.
- After the grinding of ultra hard tools or brazed tools, the waste coolant contains components of heavy metals. Be sure to dispose of such waste liquid properly.
- After re-grinding ultra hard tools, check that they are free of cracks or damage before use.
- When ultra hard material or products made of ultra hard material is marked with lasers or an electric pen, cracking may occur to the marked area. Do not mark in areas where stress is applied during use.
- Processing ultra hard material by electric discharge may cause residual cracks on the surface, resulting in lower strength. Thus, remove any cracks completely by grinding as required.
- Be careful when brazing ultra hard material. If the temperature is lower or higher than the melting point of the brazing material, the insert may not be permanently fixed.

Metalcutting Safety

Applicable Products	Possible Risks	Safety Measures
General Cutting Tools	Contact with a sharp cutting edge with bare hands may result in injury.	Use protective gear such as protective gloves when taking the tool out of packaging and installing into the machine.
	Misuse or using under inappropriate conditions may cause the cutting tool to break and/or shatter into pieces, resulting in personal injury.	Use protective equipment, machine guarding and/or protective glasses. Use within the range of recommended conditions. Please refer to the instruction manual and catalogue.
	Sudden increase in cutting resistance due to impact load or excessive wear may cause the cutting tool to break and/or shatter into pieces, resulting in personal injury.	Use protective gear such as protective gloves when taking the tool out of packaging and installing into the machine.
	High-temperature chips may be produced and long chips may be ejected, resulting in injury and/or burns.	Use protective equipment, machine guarding and/or protective glasses. Before removing chips, always stop the machine. Wear protective gloves and use proper equipment for chip removal.
	The tool and material/work being cut can become very hot. Touching them immediately after use may cause burns.	Use protective gear such as protective gloves.
	Sparks, heat generation due to breakage and/or chips during cutting may cause fire.	Do not use the machine and tools in locations where there are risks of ignition or explosion. When using water-insoluble cutting oil, fire prevention measures must be implemented.
	Out of balance machine set ups when run at a high speed, may cause insert breakage due to excess vibration or chatter, resulting in injury.	Use protective equipment, machine guarding and/or protective glasses. Perform a trial-run beforehand to make sure the setup is stable, free of chatter, vibration and abnormal noise.
	Touching burrs and flashes on machined work may result in personal injury.	Use adequate hand protection.
Throw-Away Type Tools (With indexable insert)	Inappropriately clamped inserts and/or components may become detached from the machine during cutting, resulting in injury.	Before installing the insert, clean the seating surface and clamping components so that they are free of debris. Use the wrench supplied to install the insert and check that the insert and components are securely clamped. Do not use any inserts or components other than the items specified.
	Excessively tightening with a device such as a pipe extension may cause the insert and/or components to break or detach due to over clamping.	Do not use tightening devices such as pipe extensions to obtain further torque. Always use the supplied wrench.
	At high speeds inserts and/or components may lose clamping pressure due to the loosening effect of centrifugal force. This is very dangerous. Always ensure secure clamping systems and check regularly.	Use within the range the recommended conditions. Please refer to the instruction manual and catalogue.
Cutters and Rotational Tools	As cutters have sharp cutting edges, contact with bare hands may result in injury.	Use protective equipment such as protective gloves.
	Imbalance or eccentric rotation may cause the tool to break due to vibration or chatter, resulting in potential injury.	Use at a rotational speed within the recommended conditions. To prevent eccentric rotation and vibration due to worn bearings, regularly check the machine rotor/ rotating parts for the accuracy and balance and adjust as required.
Drills	Extra care should be taken when through hole drilling as chips may be ejected at high speed as the drill breaks through the workpiece.	Use protective equipment such as machine guards and/or protective glasses. Additional guarding around the chuck and drill may be advisable.
	Drill tips of a very small diameter are usually pointed and extremely sharp. Extra care and safety precautions should be taken when handling to avoid puncture wounds.	Always use precautions and secure safe handling methods. Wear protective gloves and glasses.
Brazed Inserts / Tools	Inserts may break or become, detached due to incorrect brazing.	Use protective equipment such as machine guards and/or protective glasses. Additional guarding around the chuck and drill may be advisable.
Others	It is not advisable to use repeatedly brazed inserts as the braze may progressively weaken.	Do not use repeatedly brazed inserts as the strength of such inserts is lowered.
	Use only for the original and intended purpose. Using outside recommended parameters is very dangerous, causing damages to machines and/or tools.	Always use and operate as specified, observing the required safety rules and conditions.

Guidelines for Catalog

- This catalog lists products as of December 2025.
- Please note that specifications of the products listed in this catalog may be changed without notice due to continuous research & development and product improvements.
- This catalog contains the major features and relevant information on all of our products. Please contact our sales representatives or dealers if more detailed information is needed.
- Stock Status Symbols

● : Standard stock
★ : Standard stock (specific)
◎ : Semi-standard inventory (delivery: approx. 3 weeks)
● : New standard stock
★ : New standard stock (Specified)
■ : While stock lasts (discontinued item)
Ⓜ : Mirror finish
💧 : Coolant through
Blank: Special order

Standard

1) Holder Type	Package quantity	Notes
Turning holder	1 pc / case	
Drill	1 pc / case	
Milling cutter	1 pc / case	
2) Spare parts	**Package quantity**	**Notes**
Screw	10 pc / case	Clamp screw, Clamp bolt, Double screw, Button screw, Set screw, Shim screw, Balancing screw, Positioning clamp screw, Ball screw fixture, Screw part
Spring	10 pc / case	Spring
Seat	10 pc / case	Shim seat
Clamp	10 pc / case	
Snap ring	10 pc / case	
Spring pin	10 pc / case	
Clamp pin	5 pc / case	
Washer	10 pc / case	
Blade	1 pc / case	
Joint	1 pc / case	
Coupling	1 pc / case	
Coolant hose	1 pc / case	
Wrench	5 pc / case	Torque-wrench: 1 pc / case
Handle, Bit, Driver	1 pc / case	
Clamp, Wedge, Cartridge, Thrust Plate, Clamping bolt: for cutter	1 pc / case	
Clamp screw: for cutter	4 pc / case	
3) Insert Type	**Package quantity**	**Notes**
All others	10 pc / case	
BIDEMICS(Brazed)	1 pc / case	JP2,120
Insert for cut-off	5 pc / case	CTPW series
STICK DUO SHAPER DUO	1 pc / case	
Endmill	1 pc / case	S-MILL

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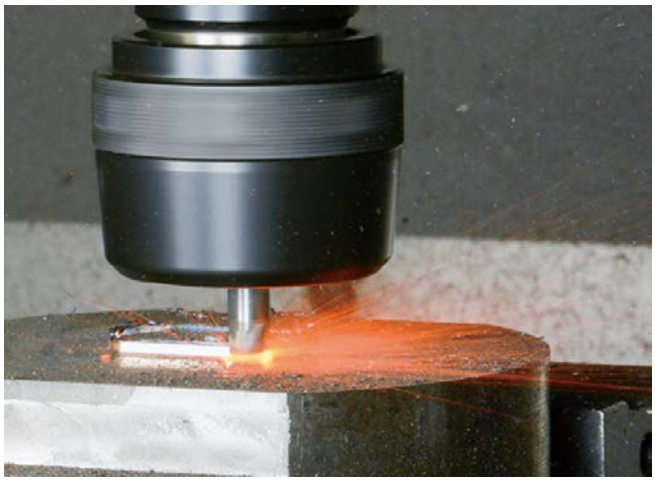
NTK CUTTING TOOLS

Cutting tools play an integral part in any manufacturing process. NTK offers a wide range of tooling products and inserts from Ceramics, CBNs, PCDs, Carbides to new materials like BIDEMICS.

1. Advanced Cutting Tools A1
2. Swiss Tooling O1

MEMO



Unique Product Information

NTK CeramiX NTK450 ..... A02

BIDEMICS NTK120 ..... A04

General Turning: Multi Clamp Toolholders A06

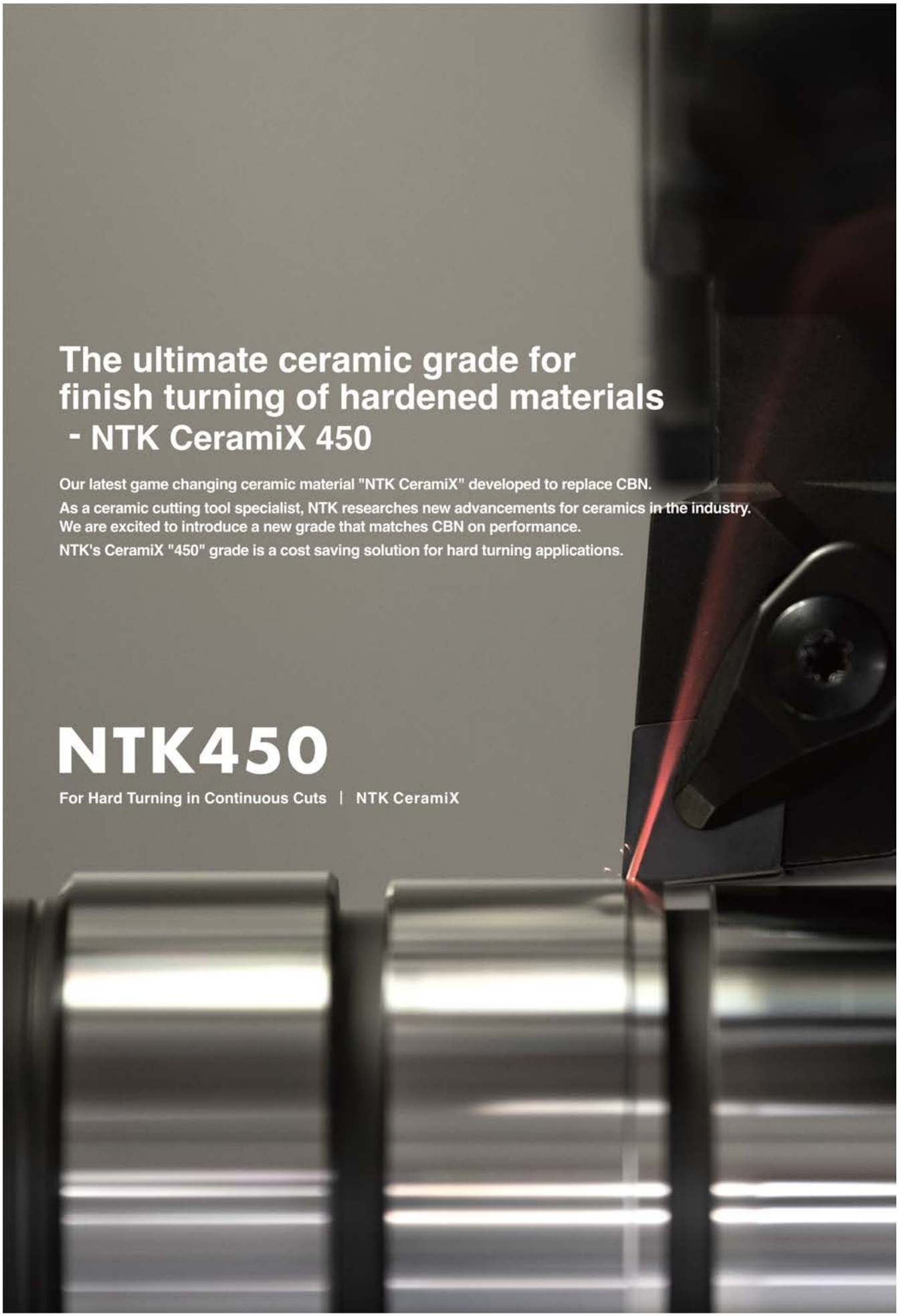
Grooving/Side Turning: GROOVE DUO A07

Face Grooving: GROOVE DUO BLADE A08

Endmill: CERAMATIC RCE series A11

Milling cutter: JRF series A13

Milling cutter: JWNXM series A18



The ultimate ceramic grade for finish turning of hardened materials - NTK CeramiX 450

Our latest game changing ceramic material "NTK CeramiX" developed to replace CBN.
As a ceramic cutting tool specialist, NTK researches new advancements for ceramics in the industry.
We are excited to introduce a new grade that matches CBN on performance.
NTK's CeramiX "450" grade is a cost saving solution for hard turning applications.

NTK450

For Hard Turning in Continuous Cuts | NTK CeramiX

NTK CeramiX 450

New cost saving option for hard turning applications
Significant tooling cost reduction compared to CBN

Key points

- New TiAlN coating offers excellent wear resistance for hard turning.
- The best option when a balance of tool cost and performance is essential, like small production runs.

Price and Performance Comparison

Application area

Continuous hard turning cuts Hardness range: 55 to 65 HRC

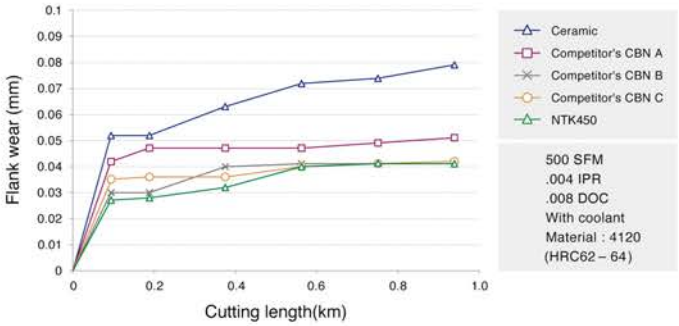
Recommended Cutting Conditions

Grade	Material	Application	Process	Cutting Speed (SFM)	Feed (IPR)	DOC (inch)	Without coolant	With coolant
NTK450	Hardened materials (55 to 65 HRC)	Turning	Finishing	330-660	.003-.006	.004-.020	●	●
				The same conditions as current CBN				

Material characteristic

Grade	Coating	Density (g/cm³)	Bending Strength (MPa)	Hardness (Hv)	Fracture Toughness (Mpa · √m)	Structure
NTK450	TiAlN Specialized for NTK450	7.5	1200	2290	5.7	
Conventional Ceramic	TiN	4.6	1100	2060	4.3	

Wear comparison vs. CBN

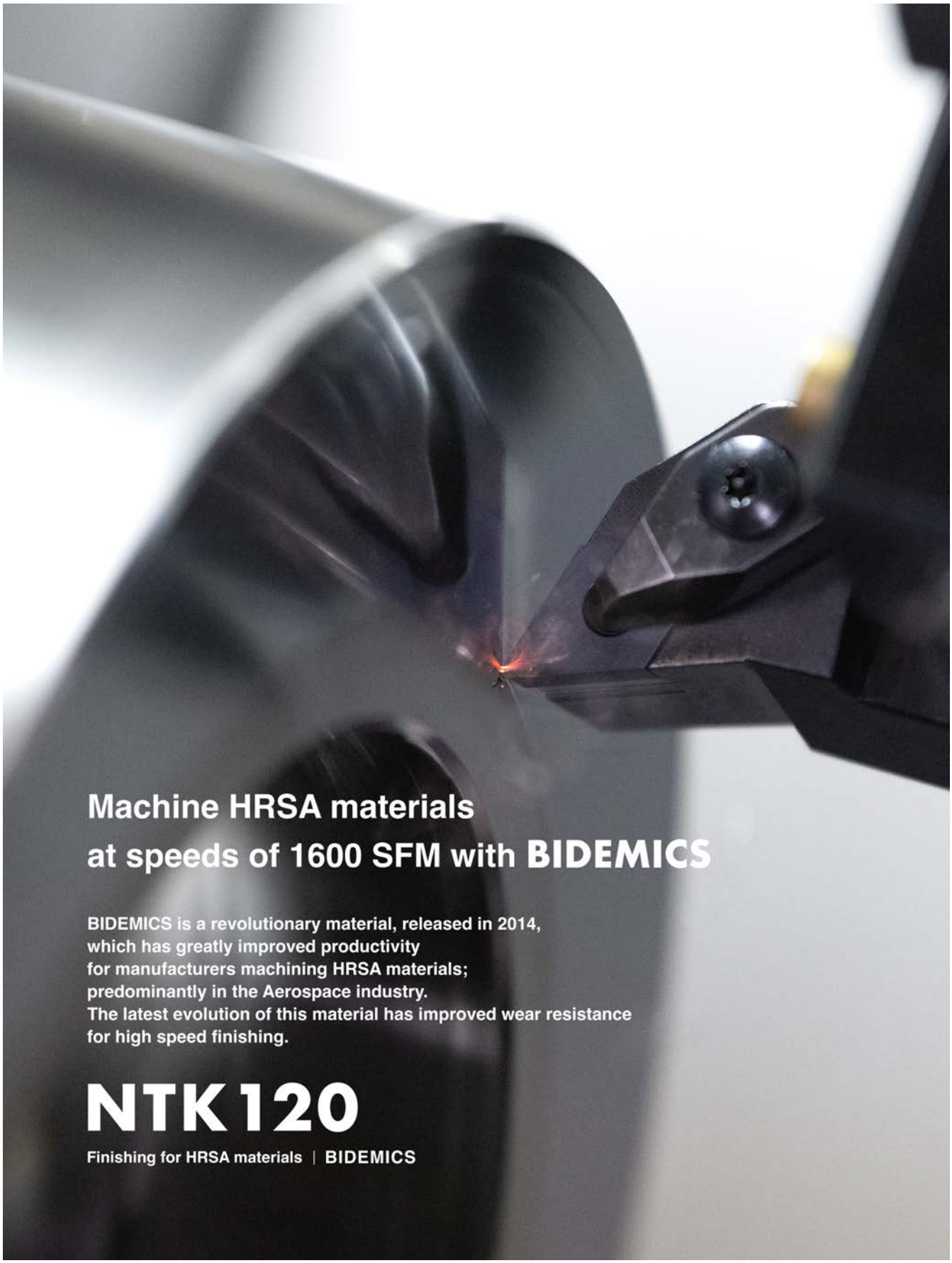


Insert Item List

Geometry	Item number (Unit : 1pc/case ※)	Item number (Unit : 10pcs/case ※)	Corner R (Inch)	Grade NTK450	Dimensions (Inch) IC	Thickness	Edge preparation
	CNGA 431X03	CNGA 431X03 -10	.016	●	1/2	3/16	.004×15° + Honed edge
	432X03	432X03 -10	.031	●			
	433X03	433X03 -10	.047	●			
	DNGA 431X03	DNGA 431X03 -10	.016	●			
	432X03	432X03 -10	.031	●			
	433X03	433X03 -10	.047	●			
	TNGA 331X03	TNGA 331X03 -10	.016	●	3/8		
	332X03	332X03 -10	.031	●			
	333X03	333X03 -10	.047	●			
	VNGA 331X03	VNGA 331X03 -10	.016	●			
	332X03	332X03 -10	.031	●			
	333X03	333X03 -10	.047	●			

※ Please order with Item Number that corresponds to desired package quantity.

lineup → D6 - D31

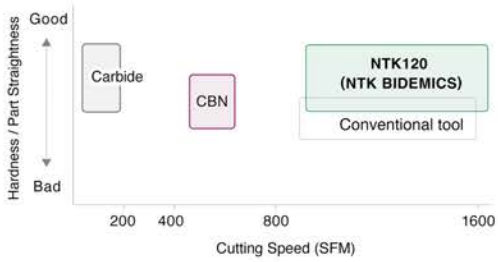

Machine HRSA materials
at speeds of 1600 SFM with BIDEMICS
BIDEMICS is a revolutionary material, released in 2014,
which has greatly improved productivity
for manufacturers machining HRSA materials;
predominantly in the Aerospace industry.
The latest evolution of this material has improved wear resistance
for high speed finishing.
NTK120
Finishing for HRSA materials | BIDEMICS

BIDEMICS NTK120

Industry changing - Super high speed finishing of HRSA materials.

Up to 15 times faster speeds vs. carbide and CBN

Cutting Speed and Wear Resistance Comparison



Key Points

- Wear resistance provides performance and consistency of machined part straightness
- Offers finishing speeds of 1600 SFM

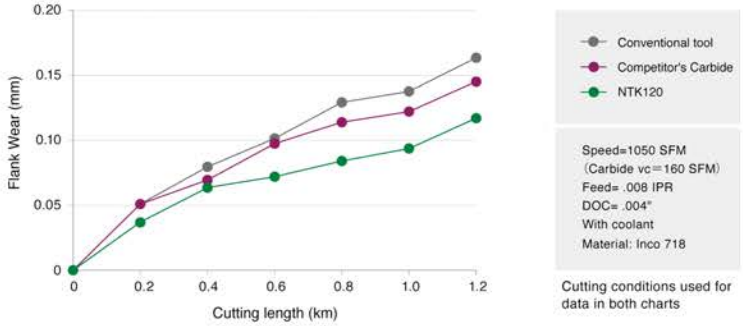
Application Area

Continuous cuts when finishing HRSA materials

Recommended Cutting Conditions

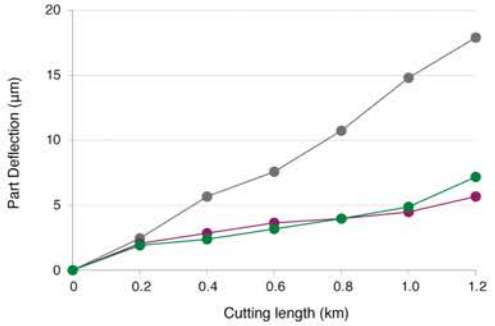
Grade	Material	Application	Process	Cutting Speed (SFM)	Feed (IPR)	DOC (inch)	With coolant
NTK120	Heat Resistant Super Alloys	Turning	Finishing	700 -1200	.004 -.008	.010 - .015	●

Wear Resistance



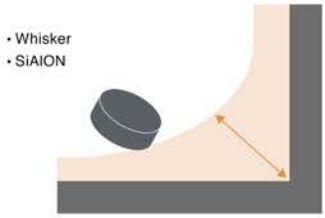
Cutting conditions used for data in both charts

Part Straightness vs. Cut Length



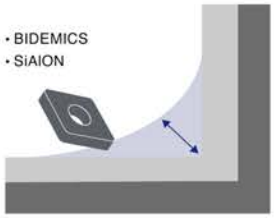
Recommended Machining Passes at a Corner

1. Roughing pass



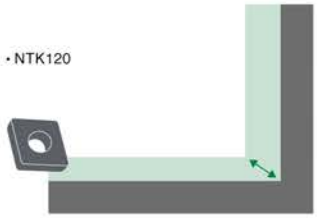
Use a strong geometry insert like a round, RNG45, for heavy material removal

2. Semi-finishing pass



SiAlON grades are best to remove extra material at the corner

3. Finishing pass



NTK120 - Machine with a consistent DOC to provide stable tool life

Insert Item List

Geometry	Item number	Corner R	Grade	Dimensions (inch)		
			NTK120	IC	Thickness	Edge preparation
	CNGA 431BQE02	.016	●	1/2	3/16	Honed edge .0016
	432BQE02	.031	●			
	433BQE02	.047	●			
	DNGA 431BQE02	.016	●			
	432BQE02	.031	●			
	433BQE02	.047	●			
	VNGA 331BQE02	.016	●	3/8		
	332BQE02	.031	●			

lineup → D6 - D31

General Turning

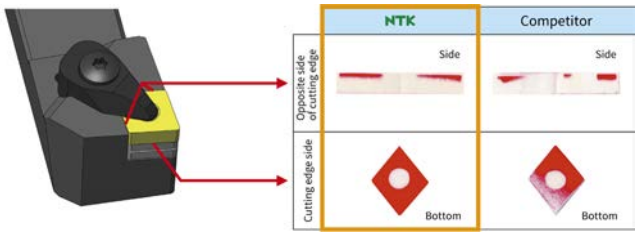
Multi Clamp Toolholders

Turning holder ideal for ceramic tools

The newly designed clamping system ensures rigidity and insert crack prevention during clamping, to achieve stable machining with ceramic tools.

Features①

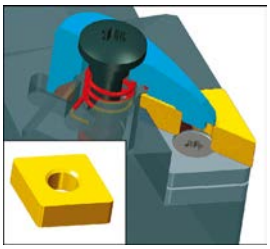
Ceramic inserts may chip or become unstable due to forces and impacts that occur during machining. NTK holders use a strong multi-clamp system that evenly distributes forces on ceramic insert for a rigid set up.



Features②

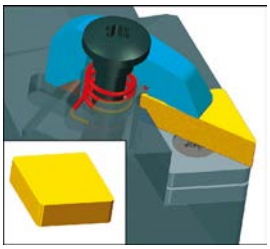
Three types of inserts can be utilized in a holder by simply changing the clamp.

Double-clamp type



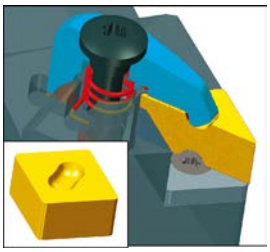
The insert can be firmly clamped.

Clamp-on type



Not ideal for machining applications that apply cutting forces from multiple directions. The insert is clamped firmly and is suitable for ceramic tools.

Dimple-clamp type



Combines the double-clamp and clamp-on styles. It is effective for suppressing insert edge chipping.

lineup → E5,E8,E14-16,E23-24,E34-35,E38,E45

For grooving | Swiss CNC lathes / Conventional CNC lathes

GROOVE DUO

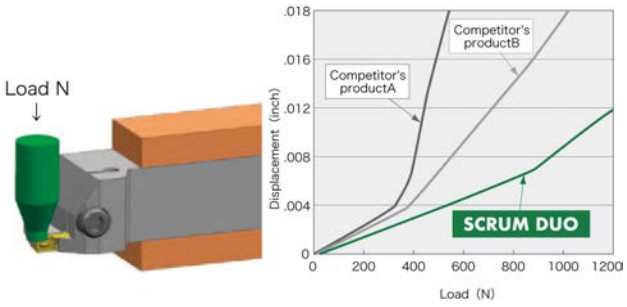
Exceptionally rigid design to ensure stable grooving

Prevents the insert from shifting during machining and achieves a good machined surface

Performance

- Applicable groove width: .118-.236 of an inch
- Highly rigid holder achieves a .138 inch depth of cut during side turning operation

Tool pressure comparison when grooving



Two chipbreaker styles - select the best fit for your grooving application

GW chipbreaker: A versatile design with edge sharpness and chip control. Multi-functional for grooving and side turning.
GV chipbreaker: Features superior sharpness with high rake face. Ideal for applications requiring low tool pressure.

GW chipbreaker

GV chipbreaker

Grooving

[Cutting conditions] Material: SCM415 Groove width: .0197 inch 500 SFM .004 IPR .275 DOC; No step feed; with coolant.
[Tools] Insert: DM4 GWPG500N04F-GW Holder: GTWPR2525M-5F10

Side turning

[Cutting conditions] Material: SCM415 Groove width: .0197 inch 500 SFM .004 IPR .039 DOC; No step feed; with coolant.
[Tools] Insert: DM4 GWPG500N04F-GW Holder: GTWPR2525M-5F10

lineup → F12-14,T33-35

For face grooving

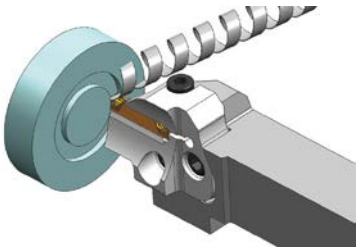
GROOVE DUO BLADE

Strongest rigidity in a modular style system

Unique S-shaped chipbreaker designed specifically for face grooving. The blade lineup supports a wide range of machining applications.

Groove widths range from .118 to .236 inch and a minimum machining diameter of 1.142 inch.

Chip Comparison Grooving

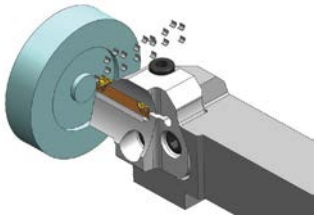


Good chip control and good machined surfaces with or without step feed

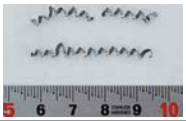
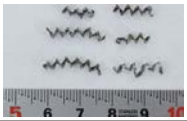
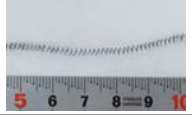
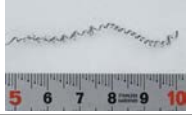
	GT chipbreaker	Competitor's	
Chip			Tangled chips during deep grooving
Grooved face			Scratches inside bottom

Material: 4130, 450SFM, .004IPR, 2"diameter, .040depth,
No step feed with coolant
Insert: DM4 GWPFM500N04-GT Holder: GBWPFR-5T15-050120

Chip Comparison Side Turning



Excellent chip control and shiny groove bottom surface during side turning

		IPR		
		.002	.004	.008
DOC(inch)	.118			
	.039			
	.008			

Material: 4130, 450SFM with coolant
Insert: DM4 GWPFM500N04-GT Holder: GBWPFR-5T15-050120

lineup → F15-22,F29-47

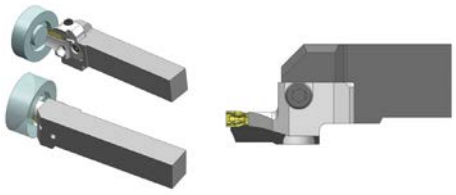
Blade and toolholder body combinations for modular system

Blade types can be easily combined with straight and L-shaped holders

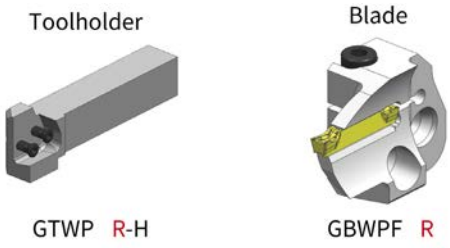
GTWP-H

Holder for blades (straight type: 0°)

Right-hand



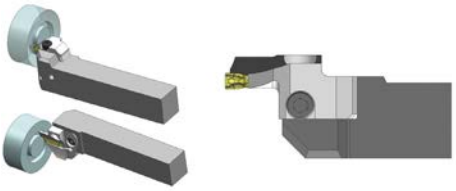
Clockwise rotation (M4 command)



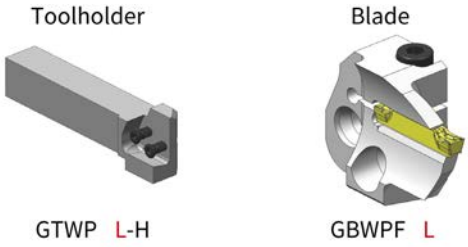
* Right-hand toolholder takes Right-hand blade.

Please use the right-hand blade for the right-hand holder body.

Left-hand



Counter clockwise rotation (M3 command)



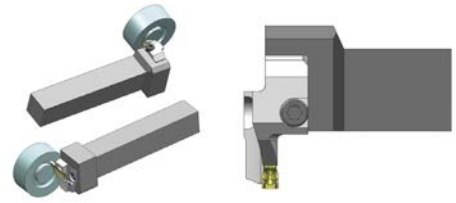
* Left-hand toolholder takes Left-hand blade.

Please use a left-handed blade for a left-handed holder body.

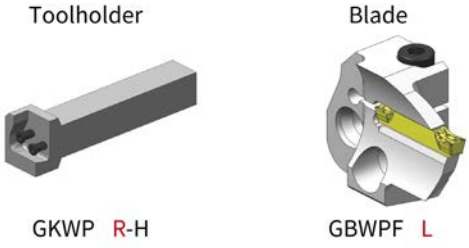
GKWP-H

Holder for blades (L-shaped type 90°)

Right-hand



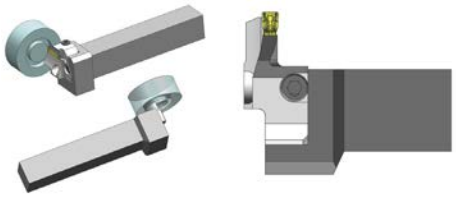
Counter clockwise rotation (M3 command)



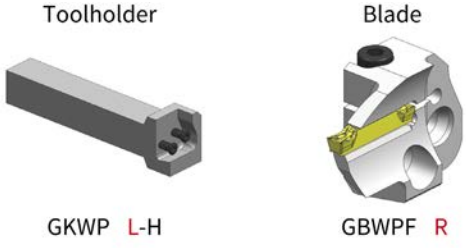
* Right-hand toolholder takes Left-hand blade.

Please use the left-hand blade for the right-hand holder body.

Left-hand



Clockwise rotation (M4 command)

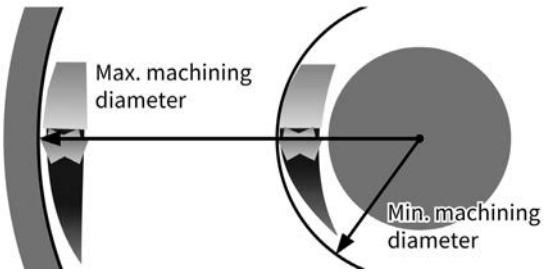


* Left-hand toolholder takes Right-hand blade.

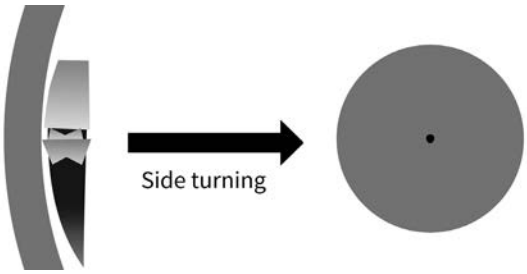
Please use the right-hand blade for the left-hand holder body.

Notes on use

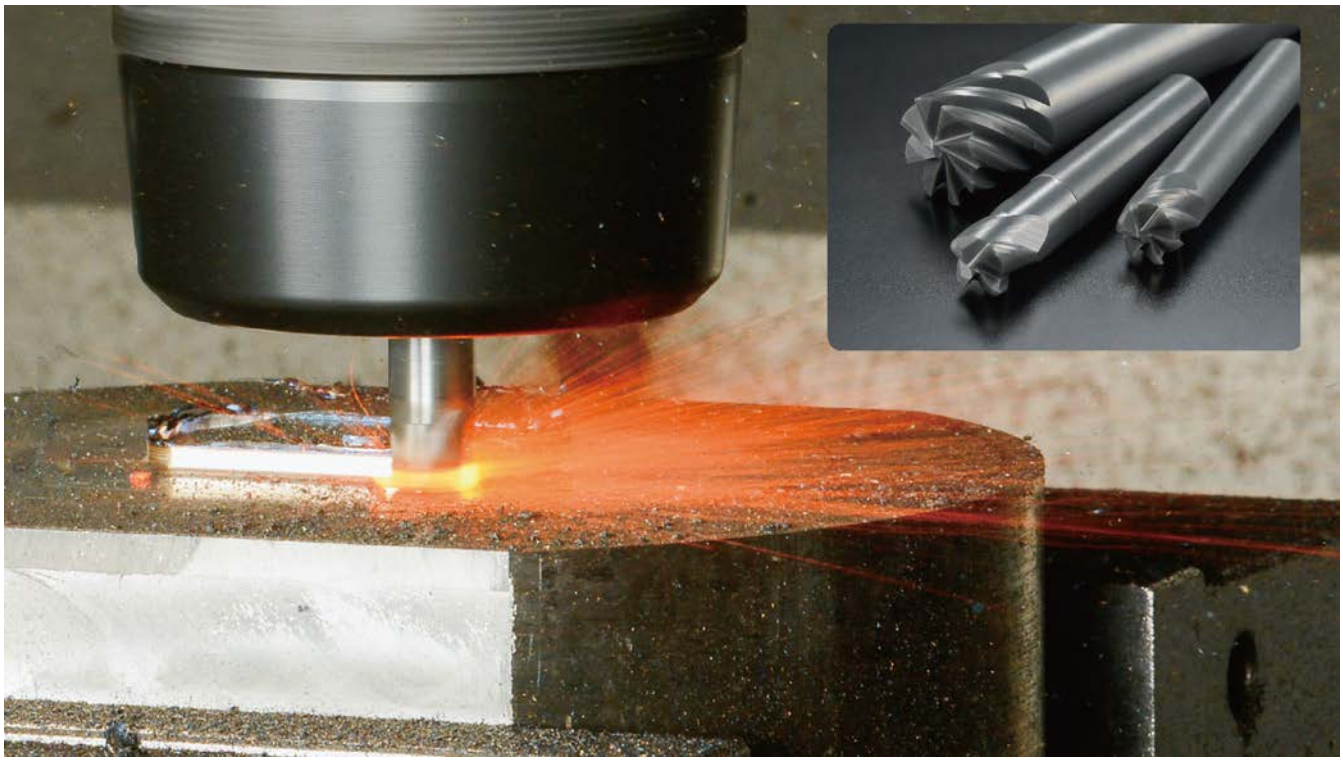
Select the end-face blade so that the outermost diameter of the first end-face groove to be machined is within the range of the minimum and maximum machining diameters.



To widen the groove, select a blade with the outermost diameter of the end face groove and machine from the outer edge toward the center.



lineup → F15-22,F29-47



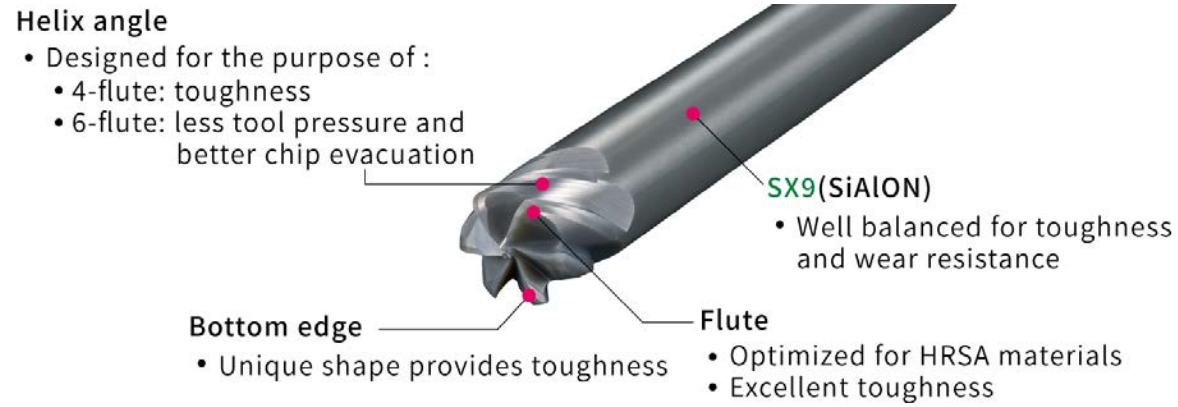
For heat-resistant alloys | Sharp edged ceramic end mills

CERAMATIC RCE type

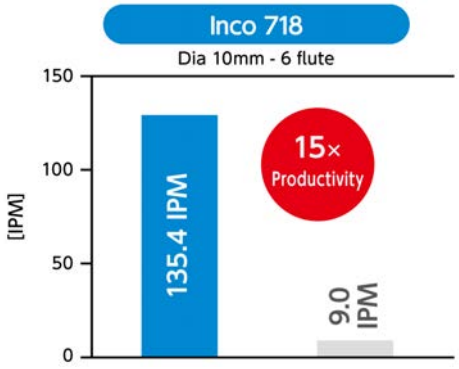
High-speed machining with ceramic

High-speed machining of heat-resistant alloys is achieved using the SiAlON ceramic grade "SX9" which has excellent wear resistance and toughness. 10 times more efficient machining than carbide end mills.

Features



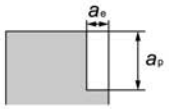
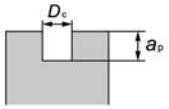
Performance



	SX9	Carbides
SFM	1970	130
IPT	.0012	←
DOC	.118	←

lineup → H4

Recommended cutting condition (Heat resistant alloy)

Application	Grade	ϕD_c	Flute	Cutting Speed (SFM) 500 2000 3500	Feed (IPT)	Depth of cut (a_p —inch)	Width of cut (a_e —inch)	Coolant
Face Milling	SX9	3/8"	4/6/8		.0012	.056	—	DRY
		1/2"				.075		
		5/8"				.094		
		3/4"				.113		
		8mm				.047		
		10mm				.059		
		12mm				.071		
		16mm				.094		
		20mm				.118		
Side Milling 	SX9	3/8"	4/6/8		.0012	.187	.037	DRY
		1/2"				.250	.050	
		5/8"				.313	.063	
		3/4"				.375	.075	
		8mm				.157	.031	
		10mm				.197	.039	
		12mm				.236	.047	
		16mm				.315	.063	
		20mm				.394	.079	
Slotting 	SX9	3/8"	4		.0012	.094	—	DRY
		1/2"				.125		
		5/8"				.156		
		8mm				.079		
		10mm				.098		
		12mm				.118		
		16mm				.157		
	SX9	3/8"	6		.0012	.056	—	DRY
		1/2"				.075		
		5/8"				.094		
		8mm				.047		
		10mm				.059		
		12mm				.071		
		16mm				.094		
		3/4"	8		.0012	.113	—	
		16mm				.118		

Notes on Heat-Resistant Alloy Machining

- Toolpaths in which the cutting edge leaves the workpiece during machining are likely to cause defects due to rapid cooling of the cutting edge. Use a toolpath that allows for continuous cutting as much as possible.
- Continue machining without removing the BUE (built up edge) on the cutting edge.
- Cutting speed should be 980 SFM or more.
- Maximum ramping angle of 1.5° is recommended. When ramping, please machine at 50% of the feed rate.
- Since work hardening occurs due to high-speed machining, leave a machining allowance of .012 inch or more for finish machining.
- Recommended arbor: 1st-Hydro chuck; 2nd-Mechanical milling chuck.

Introducing a New Paradigm in Ceramic-Embedded Cutters

NTK Achieves Industry-First Triple-Blade Configuration with Ceramic Negative Inserts for ϕ.630″ Cutters
By utilizing double-sided, high-strength negative inserts and the high efficiency of three blades, NTK contributes to cost-effective tooling, stable machining processes, and enhanced productivity.

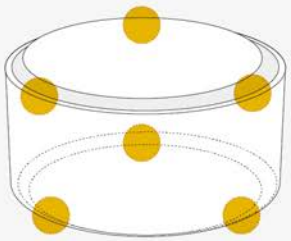
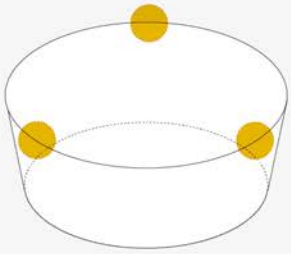
Enhancing Machining Efficiency Further with Increased Insert Count

JRF Cutter (Negative insert)	Conventional (Positive insert)

High-Efficiency Machining with 3,4 and 5 insert design at ϕ.630″ - Supports Maximum Table Feed of 283 ipm

Economical with Double-Sided Negative Inserts

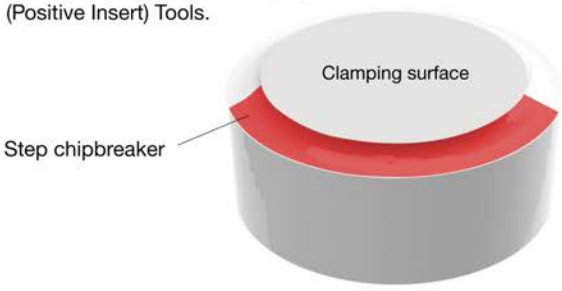
● Usable Corner

JRF Cutter (Negative insert)	Conventional (Positive insert)
	

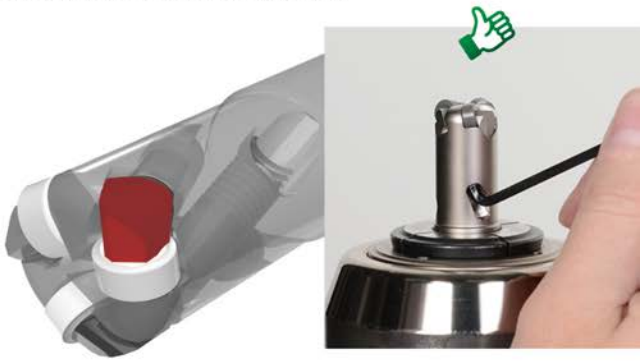
lineup → I6 - 8

Extended Lifespan Chipbreaker

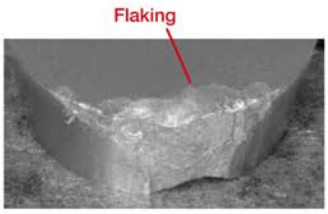
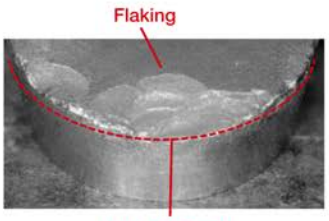
Our Step Chipbreaker: Reduces Flaking by Lowering the Cutting Edge from the Clamping Surface of Conventional (Positive Insert) Tools.



Prevent Insert Movement During Machining with Increased Clamping Force



Insert Damage Suppression with Chipbreaker-Equipped Negative Inserts and Increased Clamping Force!

	JRF Cutter (Negative insert)	Competitor (Positive insert)	
Number of teeth	3 (Φ.630″)	2 (Φ.630″)	
Table feed (ipm)	88	59	
Edge Damage		 Flaking Insert breakage	 Flaking Insert rotating

Workpiece Material	Waspaloy (Combustion Casing)	Feed per tooth (ipt)	.0030″
Cutting Speed (sfm)	1640 (10,000rpm)	D.O.C.(inch)	.0197

Recommended Machining Parameters

Grade	Workpiece Material	Machining process	Cutting conditions			DRY	WET
			Cutting Speed (sfm)	Feed (ipt)	D.O.C. (inch)		
SX3 SX9	HRSA	Milling	1300 - **2300** – 3280	.0032 - **.0039** - .0047	- **.0394**	●	×

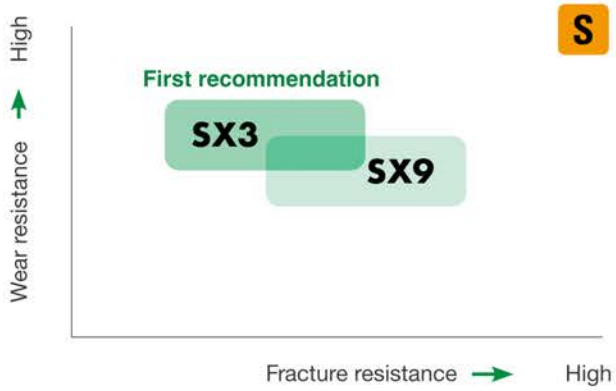
Material-Specific Characteristics

SX3

The First Recommended Material for Machining Heat-Resistant Alloys with Ceramics: Balancing Wear Resistance and Fracture Resistance.

SX9

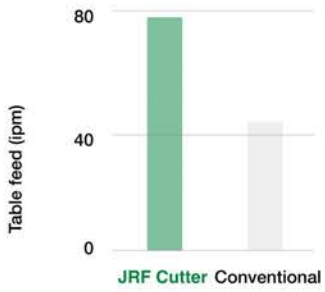
Ceramic Material Prioritizing Fracture Resistance



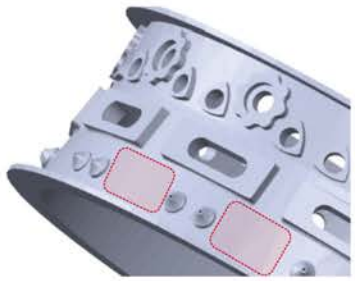
Case study

Waspaloy (Combustion Casing)

		Conventional
Grade	SX9 Negative insert	SX9 Positive insert
Number of teeth	5 (Φ1.250″)	3 (Φ1.250″)
Speed (sfm)	2624 (8,000rpm)	2624 (8,000rpm)
Feed per tooth (ipt)	.0020	.0020
Table feed (ipm)	78	47
D.O.C. (inch)	.0394	.0394
Tool life	2 pass	1 pass
Number of usable corners	8	5



1.7 Times Efficiency

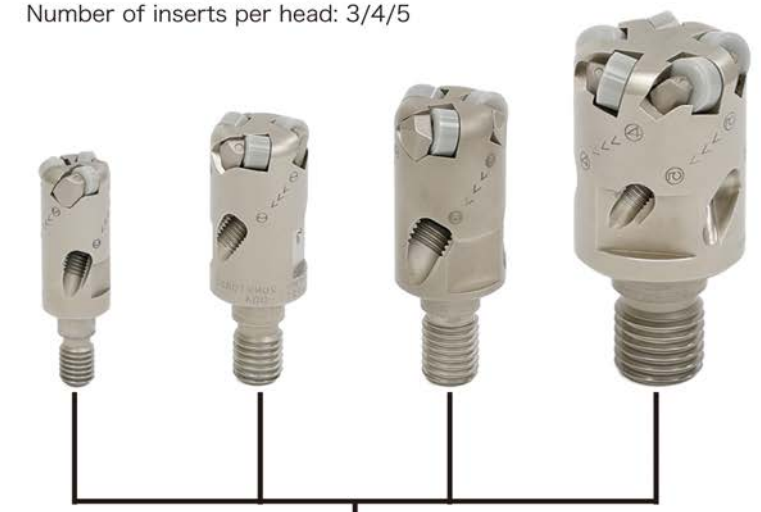


32% Reduction in Tooling Costs

Insert Price ÷ Number of Corners (tool life) x Number of inserts

Introducing a New Era of High-Efficiency Machining:
The Fusion of NTK's JRF Modular cutter and Tungaloy's TUNG-FLEX arbor and modular shank

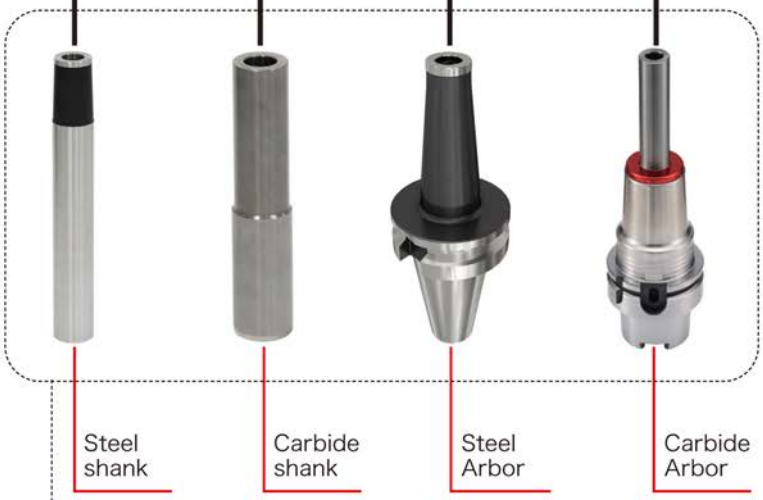
Head Diameter: ϕ16/ϕ20/ϕ25/ϕ32
Number of inserts per head: 3/4/5



NTK CUTTING TOOLS

Features

- Higher number of inserts for even higher efficiency
- Negative inserts with higher cutting edge strength for more stable machining
- Economical negative insert that can be used on both sides



TUNGFLEX
TUNGALOY

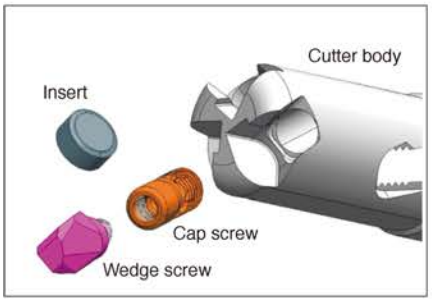
Tungaloy

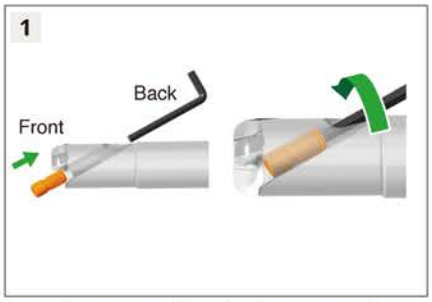
Features

Various types of modular heads can be combined with different shanks and holders for multiple application needs.

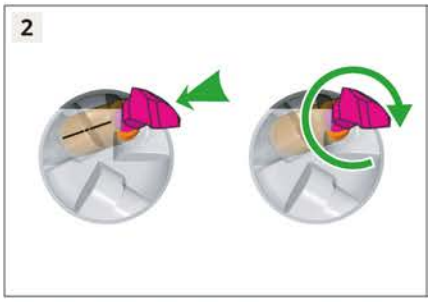
- Steel / Carbide shank series
- Arbors – BT, HSK type

JRF cutter parts installation manual

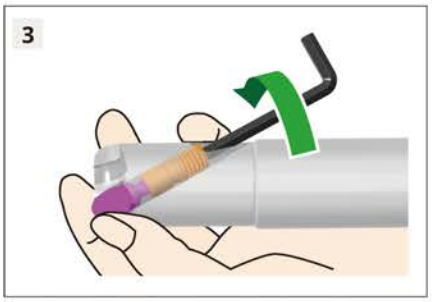




Insert the cap screw from the front, insert a hex wrench from the back side, and rotate it 360 degrees (1 turn).

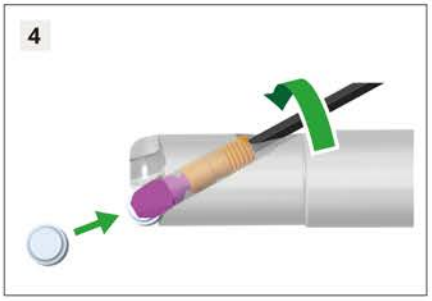


Insert the wedge screw into the cap screw and rotate it 360 degrees (1 turn) by hand.



Hold the wedge screw and tighten the cap screw with the hex wrench until it stops, then loosen it 360 degrees (1 turn) *.

*Loosen 360° for insert space



First, insert the insert.
Then, insert the torque wrench from the back side and tighten to the specified torque value.

Video explanation

Shank type Designation	Modular type Designation	Recommended tightening torque※	Cap screw	Wedge screw
JRFMH016E160R03	JRFMH016MM08R03	2N·m	HCS3P050	HWS3P050
JRFIH0625E0625R03				
JRFMH020E200R03	JRFMH020MM10R03			
JRFIH075E075R03				
JRFMH025E250R04	JRFMH025MM12R04			
JRFIH100E100R04				
JRFMH032E320R05	JRFMH032MM16R05			
JRFIH125E125R05				
JRFMH025E250R03	JRFMH025MM12R03	4N·m	HCS5P080	HWS5P080
JRFIH100E100R03				
JRFMH032E320R03	JRFMH032MM16R03			
JRFIH125E125R03				
JRFMH032E320R04	JRFMH032MM16R04			
JRFIH125E125R04				

※If the recommended cutting conditions or tightening torque are exceeded, the insert, cutter body, cap screw, or wedge screw may be damaged. Please ensure machining is performed within the specified recommended range.

Milling tools for machining gray cast iron and ductile cast iron | Ceramic inserts

JWNXM series Cutter

Ultra-high speed machining exceeding 3,200 SFM

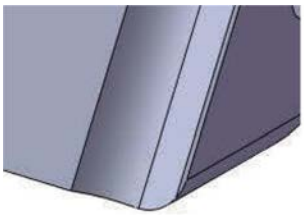
Low-resistance cutters and inserts reduce edge chipping of workpiece.
Multiple machining passes → One machining pass reduces machining time and extends tool life (up to .217 inch depth of cut)
Ideal for cutting cast iron with scale.

Features. 1

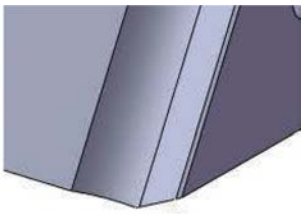
Unique 6-corner cutting edge reduces tooling costs. Excellent cutting performance with chipbreaker.

Features. 2

Two types of edge features: an edge radius for high feed rate and a C-chamfer shape for excellent cutting performance.



【Radius type】

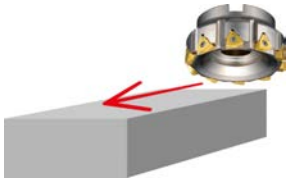


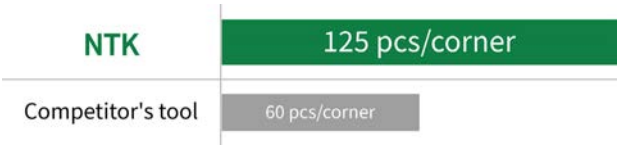
【Chamfered type】

Case study transmission case

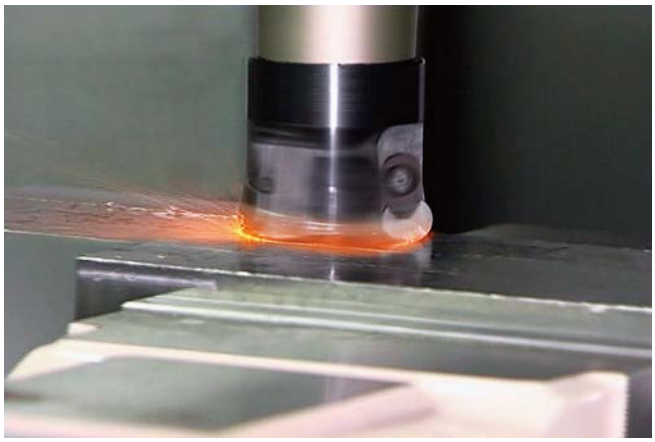
The competitor's inserts were replaced after 60 parts because insert wear caused an increase of cutting forces that loosened clamping and shifted the workpiece, but the JWNXM series cutter has low cutting resistance, so no clamping shift due to wear progresses is observed, and the life is doubled compared to the current tool.

Work material	FC230
Cutting speed	1640 SFM
Feed	.005 IPT
DOC	.039 inch
Coolant	DRY





lineup → I13



Solution

Heat-resistant alloy machining B02

Cast iron / ductile cast iron machining B14

Hardened material machining B18

Mill roll machining B20

V-pulley machining B22

Copper machining B24

Plastics machining B26

Additive manufacturing machining B28

BIDEMICS - Game Changer

- 1600 SFM **Speed** Capability
- Double tool life at whisker's speed range

JX1

■Features
- **Up to 1600 SFM speed capability**
- Much longer tool life at Whisker ceramics' speed range
- Superior surface finish vs. Whisker ceramics

■Work Materials
- Inco 718
- 718 Plus
- Powdered metal
- Inco 625
- Rene

➡C11

JP2/120

■Features
- 10 to 15x speed capability vs. carbide
- Better wear resistance and notching resistance than CBNs
- Superior surface finish to Carbide or CBN

■Work Materials
- Inco 718
- 718 Plus
- Powdered metal
- Inco 625
- Rene

➡C12

SX7

■Features
- Can run at same cutting condition as whisker ceramics
- Best grade for high-speed milling

■Work Materials
- Inco 718
- Inco 625
- Waspaloy
- Udimet 720

➡C26

SX3

■Features
- Excellent wear resistance and toughness. Wide range of HRSA machining applications: Roughing with scale - semi finishing turning.
- Able to machine even the newest generation of HRSA work materials (like Rene) as well as most common HRSA materials; such as Inconel 718.

■Work Materials
- Inco 718
- 718 Plus
- Powdered metal
- Inco 625
- Rene

➡C24

SiAlON - Workhorse

- Durable for scale to semi-finish machining

Whisker - Versatile Player

● Productivity and reliability

JX3

■Features
- Added toughness in BIDEMICS
- Same speed capability as JX1

■Work Materials
- Inco 718
- 718 Plus
- Powdered metal
- Inco 625
- Rene

➡C11

WA1/533

■Features
- Better flank wear resistance compared to SiAlON ceramics
- Better notching resistance compared to competitor's whisker ceramics

■Work Materials
- Inco 718
- Inco 625

➡C28

SX5

■Features
- Best grade for scale and interruptions
- Best grade for machining high-cobalt alloys

■Work Materials
- Waspaloy
- Udimet 720
- 718 Plus
- Rene 41

※ Production by order.

➡C25

SX9

■Features
- Extreme toughness makes higher feed and heavier DOC machining possible
- Best grade for machining Inco 718 with scale

➡C27

■Work Materials
- Inco 718
- Inco 706
- Inco 713
- Rene

Heat-resistant alloy machining

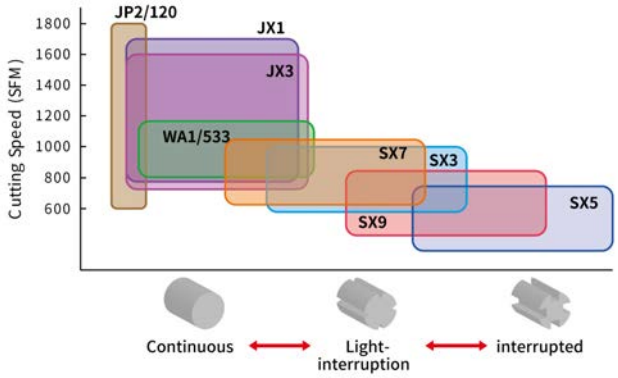
Insert grades

Category	Grade	Attributes	Applications						
			Scale	No scale	Profiling	Finishing	Grooving	Milling	End milling
BIDEMICS	JX1	Special grade with higher speed and longer tool life potential		●	●	○	●		
BIDEMICS	JP2/120	Special grade for finish turning				●			
BIDEMICS	JX3	Added toughness in BIDEMICS		●	●	○	●		
Whisker	WA1/533	General versatile grade for turning		○	○		○		
SiAlON	SX3	Best balance of toughness and hardness	○	●	●		●	●	
SiAlON	SX5	Best grade for Waspaloy with scale	●				○		
SiAlON	SX7	Versatile grade for turning and milling	○	○	○		●	●	
SiAlON	SX9	Best grade for scale of Inco718	●	○	○			○	●

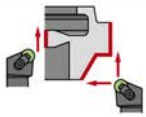
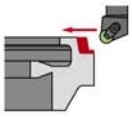
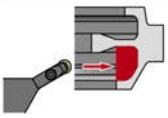
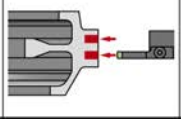
● 1st Choice ○ 2nd Choice

Grade Map

Grade Map



Application

	Rough with scale	Rough&semi-finish	Profiling	Grooving	Milling	End milling
						

Cutting conditions

Application	Grade	Work material	Cutting speed	Feed	Depth of cut	Coolant
			600 800 1000 1200 1400 1600	.004 .008 .012 .016 .020	.020 .040 .060 .080 .100	
Rough with Scale	SX5	Waspaloy	650 (600-800) SFM	.012 (.008-.014) IPR	.080 (.040-.200)"	WET
	SX9	Inco718	650 (600-800) SFM	.012 (.008-.014) IPR	.080 (.040-.200)"	
	SX3	Overall	800 (600-900) SFM	.008 (.004-.009) IPR	.080 (.040-.200)"	
Rough no Scale	JX1 JX3	Overall	700-1300 (600-1600) SFM	.008 (.005-.011) IPR	.070 (.040-.100)"	WET
	SX9 SX3 SX7	Overall	700 (600-900) SFM	.009 (.006-.012) IPR	.080 (.040-.100)"	
	WA1/533	Overall	800 (600-1000) SFM	.008 (.005-.010) IPR	.070 (.040-.100)"	
Profiling & Semi-Finish	JX1 JX3	Overall	700-1500 (600-1600) SFM	.008 (.004-.010) IPR	.060 (.040-.080)"	WET
	SX3 SX7	Overall	800 (600-900) SFM	.008 (.005-.010) IPR	.060 (.040-.080)"	
	WA1/533	Overall	800 (600-1100) SFM	.008 (.004-.010) IPR	.060 (.040-.080)"	
Finishing	JP2/120	Overall	700-1600 (600-1700) SFM	.004 (.002-.007) IPR	.010 (.005-.030)"	WET
Grooving	JX1 JX3	Overall	1200 (600-1600) SFM	.003 (.002-.004) IPR	When using SX7/SX3/SX5, increase feed rates 100% vs. Whisker Ceramics	WET
	SX5	Waspaloy	700 (600-800) SFM	.006 (.003-.007) IPR		
	SX3 SX7	Overall	750 (600-900) SFM	.0045 (.003-.006) IPR		
	WA1/533	Overall	800 (600-1100) SFM	.003 (.002-.004) IPR		

Application	Grade	Work material	Cutting speed	Feed	Depth of cut	Coolant
			1500 2000 2500 3000 3500 4000	.002 .003 .004 .005 .006	.020 .040 .060 .080 .100	
Milling	SX3 SX7	Overall	2700 (2000-4000) SFM	.004 (.003-.005) IPT	.070 (.040-.100)"	DRY
	SX9	Overall	2500 (1500-3500) SFM	.005 (.004-.006) IPT	.080 (.040-.100)"	
End milling	SX9	Overall	2000 (980-3300) SFM	.0008-.0013 IPT		DRY

Heat-resistant alloy machining

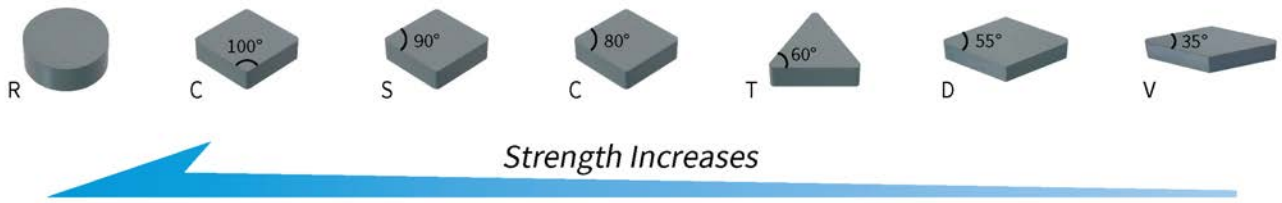
Key Points in Machining

The key to successful heat-resistant alloy machining is the use of "BIDEMICS" and "ceramics".

- BIDEMICS and ceramic materials improve productivity in machining heat-resistant alloys.
- BIDEMICS has excellent VB wear resistance and SiAlON ceramics has 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 more stable machining.

Selection of insert shape with toughness

Select inserts with higher strength cutting edges if at all possible.

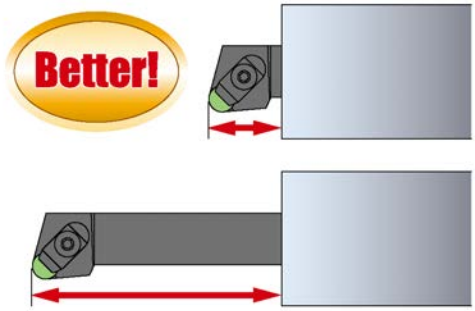


Selection of corner R with superior strength

The larger the insert's corner radius, the stronger the insert's cutting edge and the longer its life. However, please note that the larger the corner radius, the higher the cutting resistance. In general, RNG45 inserts are used for rough machining and CNGN43 inserts are used for finish machining of heat resistant alloys.

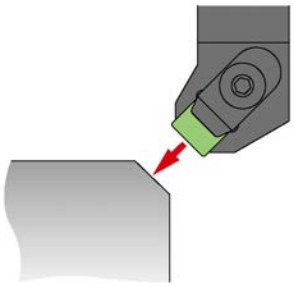
Minimize the amount of overhang

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 ceramics in turning.
However, DRY machining may be more effective in case of strong interrupted machining.
When using SiAlON ceramics (SX3, SX7, SX9) in milling, be sure to use DRY machining.

Cutting Edge Treatment

Sharp edge preparation is typically required when machining heat-resistant alloys.
Using a slight T-land or honed edge is also effective to reduce notching, flaking, and built up edge.

Troubleshooting

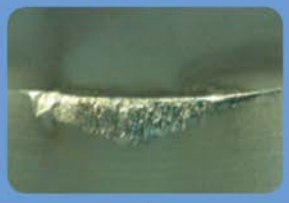
Insert Breakage

- Cutting Condition ➡ B8
- Programming at Scale ➡ B9
- Insert Grade ➡ Choose tougher grade
- Insert Shape ➡ B11
- Edge Preparation ➡ B11

Notching

- Cutting Condition ➡ B8
- Depth of Cut ➡ B9
- Lead Angle ➡ B9
- Programming ➡ B10
- Insert Grade ➡ Choose SiAlON ceramic

Flank Wear



- Cutting Condition ➡ B8
- Insert Grade ➡ Choose harder grade

Flaking

- Cutting Condition ➡ B8
- Programming ➡ B10
- Edge Preparation ➡ B11

Heat

- Cutting Condition ➡ B8
- Insert Shape ➡ B11
- Edge Preparation ➡ B11

Chatter

- Cutting Condition ➡ B8
- Others ➡ B11

- Grooving information ➡ B12

Heat-resistant alloy machining

Troubleshooting

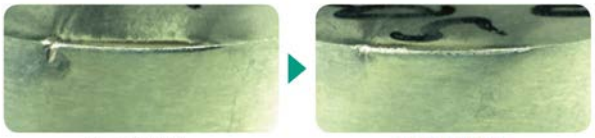
Adjustment of cutting conditions

	Cutting speed (SFM)		Feed rate (IPR)		Grade attribute		
	SiAlON	BIDEMICS	SiAlON	BIDEMICS	BIDEMICS	SiAlON	Whisker
Notching		↗ 「a」	↗ 「b」		1st Choice	1st Choice	
Flank wear	↘ 「c」		↗ 「d」		1st Choice	2nd Choice SX3 SX7	1st Choice
Breakage			↘	↘	2nd Choice	1st Choice	
Heat	↘	↘	↘	↘	—	—	—
Chatter	↗	↗	↘	↘	—	—	—

1st Choice 2nd Choice

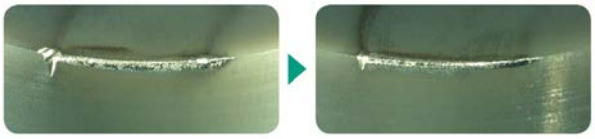
Result

「a」 BIDEMICS : Increase cutting speed



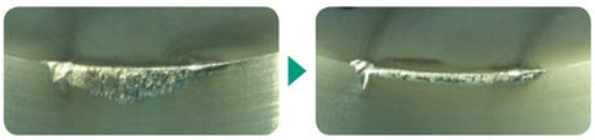
500 SFM 1800 SFM

「b」 SX7 • SX3 • SX9 • SX5 : Increase feed rate



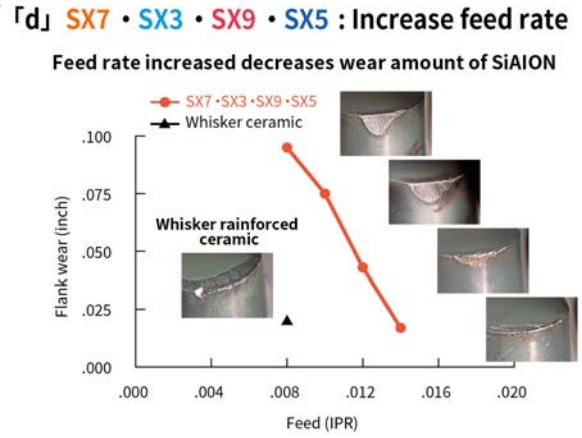
.008 IPR .016 IPR

「c」 SX7 • SX3 • SX9 • SX5 : Decrease cutting speed



1300 SFM 500 SFM

「d」 SX7 • SX3 • SX9 • SX5 : Increase feed rate



Cutting condition
Work material : Inco718
Insert shape : RNG45
Cutting Speed : 800 SFM
Depth of Cut : .080"
WET

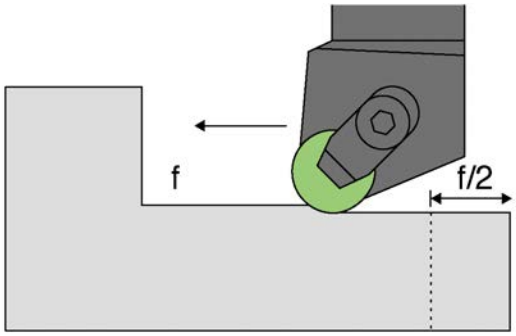
When using the SX7 & SX3 & SX9 & SX5, increased feed is necessary to increase the wear resistance of the tool. By increasing the feed rate and taking advantage of the high tool material strength of the SX7 & SX3 & SX9 & SX5, the number of times the tool and workpiece material rub against each other can be reduced, thereby reducing wear. In addition, higher feed rates shorten cycle time, increasing 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.

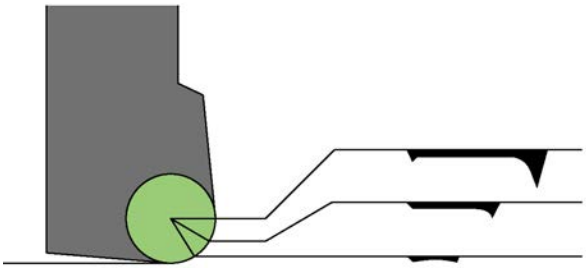
Understanding the hardness of the work material is the key to a successful cutting process. Many machining operators do not know the hardness of their work material. This causes them to spend a lot of time finding the optimum cutting conditions for test machining. The higher the hardness of the work material, the lower the cutting speed should be. Also, where there is scale on the workpiece surface, the cutting speed and feed rate must be reduced by 25%. By changing the machining program in this way, 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 edge wear, increases. In order to reduce edge wear and extend tool life, it is necessary to control the depth of cut.

The table below shows the maximum depth of cut for round 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

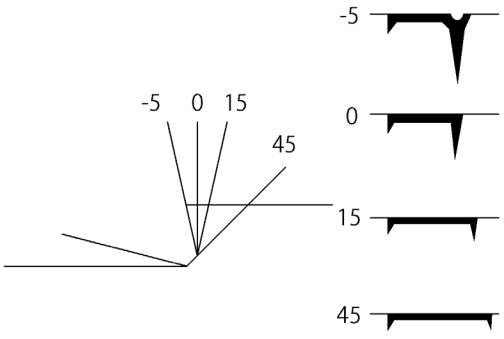
IC size of RN insert	Max. depth of cut	*Corner R size	Max. depth of cut
1/4	.060...Less	1/32	.008...Less
3/8	.090...Less	3/64	.012...Less
1/2	.125...Less	1/16	.016...Less
1	.250...Less	3/32	.024...Less

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

Lead angle

In the machining of heat-resistant alloys, the larger the lead angle, the less wear is likely to occur. Also, the larger the lead angle, the cutting force is distributed over a wider area of the insert, which reduces notch 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 SX9 inserts, which have excellent chip resistance, higher feed rates reduce wear and machining time.

Effect of lead angle on wear pattern



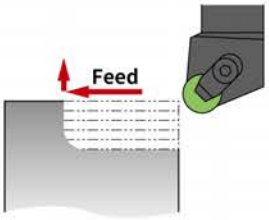
Troubleshooting

Troubleshooting (continued)

Programming

Rough

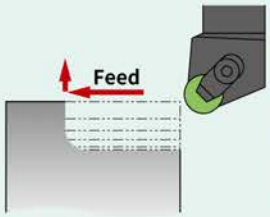
Same Depth of Cut



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

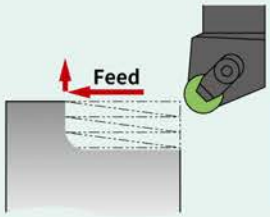
change to

Varying Depth of Cut



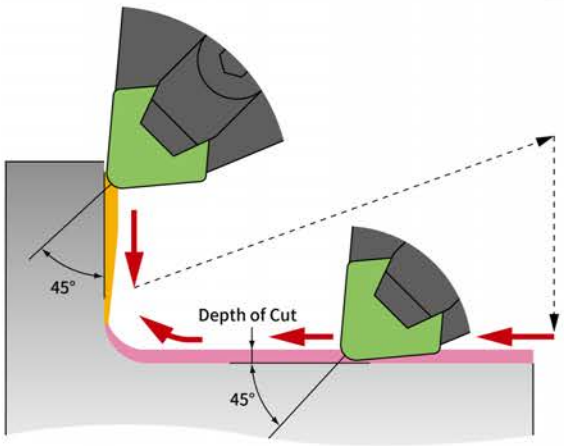
Note) Another programming change that may help to reduce notching is by varying the depth of cut. Again, the same principle applies, notching takes place at various points on the cutting edge rather than concentrated at one point.

Ramping



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

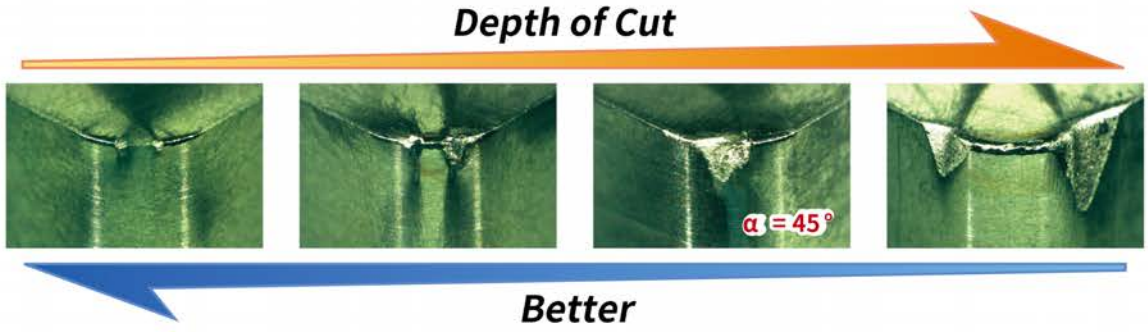
Finish



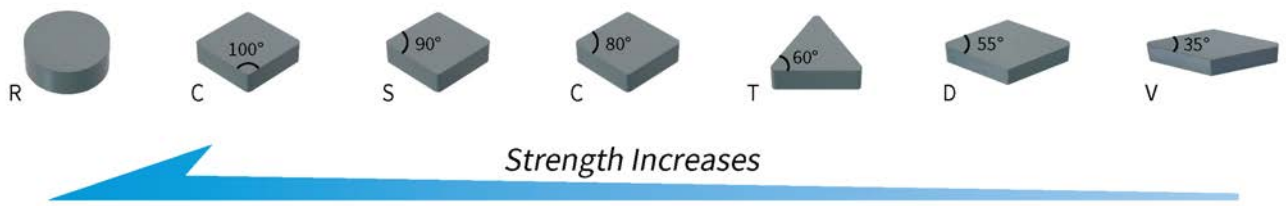
• α= 45°

Insert radius	DOC
1/64"	.005"
1/32"	.009"
3/64"	.014"
1/16"	.018"
3/32"	.028"
1/8"	.037"

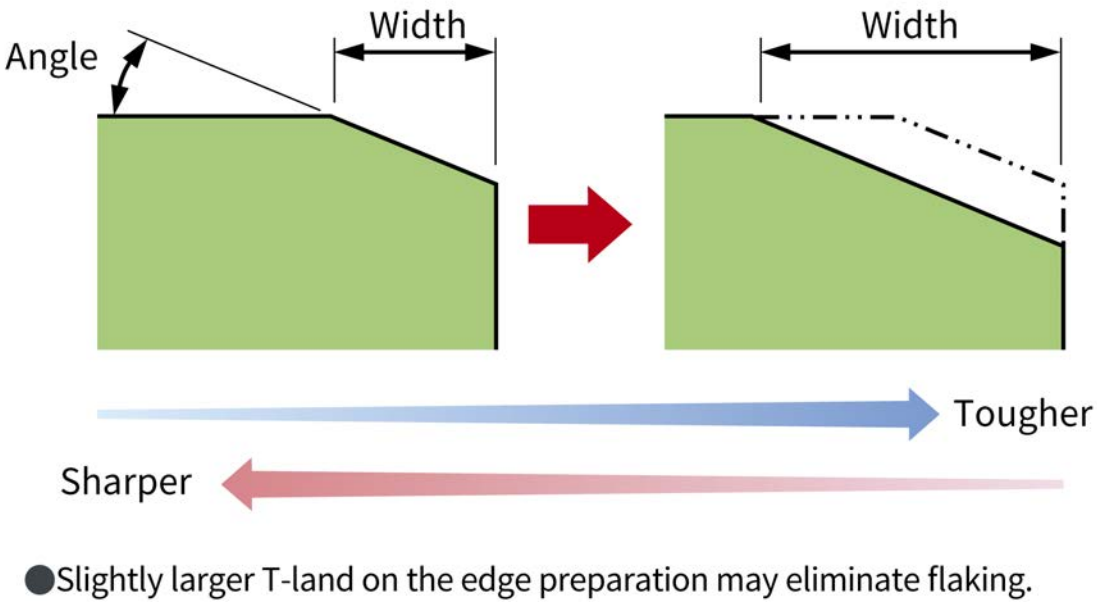
Note) The correct procedure is to take more material off during the previous roughing application.
Then remove the amount of stock suitable for the nose radius of the insert by staying
below the 45° mark of the corner radius.
This will minimize notching and allow a cut from both directions.



Insert shape



Edge treatment



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

Prevention of chattering

When machining nickel-based heat-resistant alloys, chattering often occurs due to increased cutting resistance. Chatter is especially 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.

Heat-resistant alloy machining

Key points for grooving

BIDEMICS and ceramic inserts enable high-speed, high-efficiency grooving. NTK offers a wide range of materials, including whisker ceramics, BIDEMICS, and SiAlON materials, which contribute to further productivity improvement and stable machining.

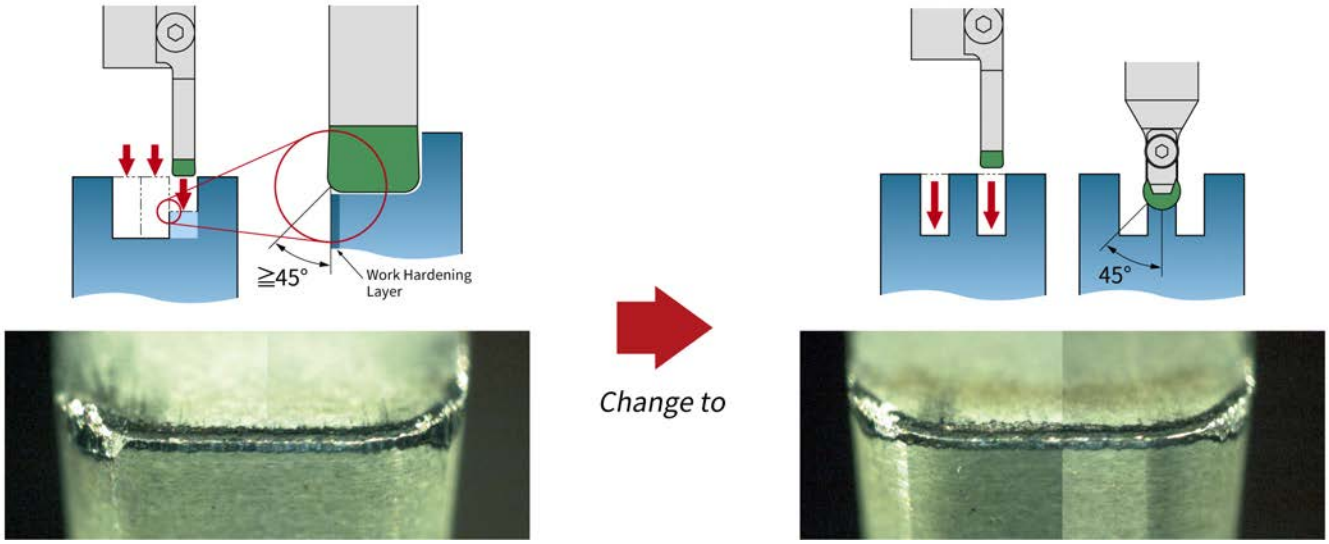
	JX1 JX3	SX3 SX7	SX5	WA1
Speed	●	○	○	○
Feed		●	●	
Versatility	○	○		●
Toughness		○	●	
	Can run at up to 1500 SFM. Double the speed of whisker	Double the feed of whisker	Best for Scale and interruption	Versatile grade

● : 1st choice ○ : 2nd choice

Application	Grade	Work material	Cutting speed (600 800 1000 1200 1400 1600)	Feed (.004 .008 .012 .016 .020)	Depth of cut (.020 .040 .060 .080 .100)	Coolant
Grooving	JX1 JX3	Overall	1200 (600-1600) SFM	.003 (.002-.004) IPR	When using SX7/SX3/SX5, increase feed rates 100% vs. Whisker Ceramics	WET
	SX5	Waspaloy	700 (600-800) SFM	.006 (.003-.007) IPR		
	SX3 SX7	Overall	750 (600-900) SFM	.0045 (.003-.006) IPR		
	WA1	Overall	800 (600-1100) SFM	.003 (.002-.004) IPR		

When applying JX1/JX3, increase speed to over 1000 SFM
When applying SX3/SX7/SX5, increase feed rates 100% vs. Whisker Ceramics

Application



When grooving in multiple passes:
When grooving a final pass, the cutting edge contacts the work-hardened area.
This causes chipping of the corner radius and border wear.

The grooving is performed on both sides, leaving the center machining point.
Finally, grooving is performed with a strong insert shape such as RCGX type.

MEMO

SX6 Silicon Nitride Ceramic ➡C19

Features

- 1st choice for roughing gray cast iron
- Applicable for wet cutting
- Excellent thermal shock resistance makes high speed milling possible

	SX6
Notching	◎
Flank Wear	
Toughness	○
Heat Shock	◎

Recommended Applications

- Gray cast iron — Rough — Turning and milling

Recommended Cutting Conditions

Work material	Purpose	Grade	Cutting speed (SFM)	Feed (IPR / IPT)	Depth of cut (inch)	DRY	WET
Gray cast iron	Turning	SX6	1800–3500	.012–.024	.020–.140	●	●
	Milling	SX6	1500–4200	.003–.010	.020–.140	●	○

HC1, HW2 Alumina Oxide Ceramic ➡C16 • 17

Features

- 1st choice for finishing gray cast iron with no coolant
- Excellent wear resistance makes high speed finishing possible

Recommended Applications

- Gray cast iron — Finish — Turning
- Chilled liners — Rough / Finish — Turning（HW2）

Recommended Cutting Conditions

Work material	Purpose	Grade	Cutting speed (SFM)	Feed (IPR)	Depth of cut (inch)	DRY	WET
Gray cast iron	Turning	HC1	1200–2100	.004–.016	.020–.080	●	
		HW2	1200–2100	.004–.016	.020–.080	●	
Chilled liners	Turning	HW2	800–1200	.004–.012	.020–.080	●	

SP9 CVD Coated Silicon Aluminum Oxynitride ceramics ➡C20

SP9
◎
◎

Features

- Extremely tough – Tough enough to rough cast iron with T0420 (.004" X20) edge preparation
- Small edge preparation – Low tool pressure for stable precision machining
- SP9' s toughness makes higher feed rates possible
- Dramatically reduced flank wear due to CVD coating

Recommended Applications

- Gray cast iron — Rough — Turning and milling
- Ductile cast iron — Rough — Turning and milling

Recommended Cutting Conditions

Work material	Purpose	Grade	Cutting speed (SFM)	Feed (IPR / IPT)	Depth of cut (inch)	DRY	WET
Gray cast iron	Turning	SP9	1200–2700	.012–.024	–.140	●	○
	Milling		1200–2500	.003–.010	–.240	●	○
Ductile cast iron	Turning	SP9	800–2000	.012–.024	–.140	○	●
	Milling		2100–3000	.002–.010	–.240	●	○

HC2, HC6 TiC Ceramic ➡C21 • C18 WA1/533 Whisker Reinforced Ceramic ➡C28

Features

- All grades make high speed finishing of cast iron possible
- Applicable for wet cutting conditions
- HC6 – Optimized for finishing ductile cast iron

Recommended Applications

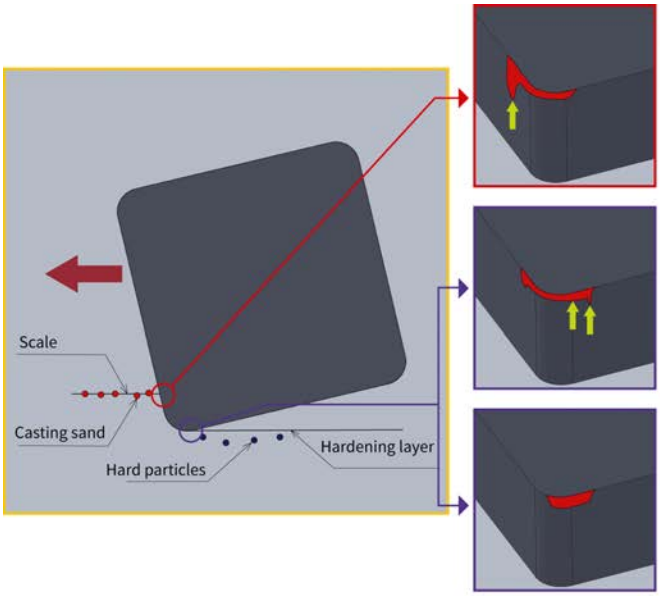
- Gray cast iron — Finish — Turning (HC2 • HC6 • 533)
- Ductile cast iron — Finish — Turning (HC6)

Recommended Cutting Conditions

Work material	Purpose	Grade	Cutting speed (SFM)	Feed (IPR)	Depth of cut (inch)	DRY	WET
Gray cast iron	Turning	HC2/HC6	1200–2100	.004–.016	–.060	●	●
		WA1/533	1200–2100	.004–.016	–.120	●	●
Ductile cast iron	Turning	HC6	600–1500	.004–.012	–.040	○	●

Cast iron / ductile cast iron machining

Recommended grade from cutting edge damage



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

Roughing **SX6**

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

Roughing **SP9** *DRY machining

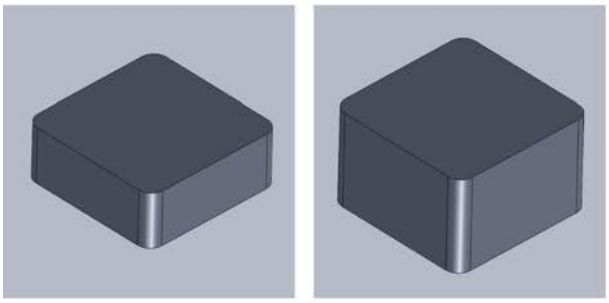
Finishing **HC2 HC6** *HC6 WET machining recommended

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

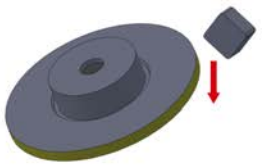
Finishing **HC1 HW2** *DRY machining

Effect of insert thickness

When machining with high cutting loads, such as roughing, a thicker insert effectively.

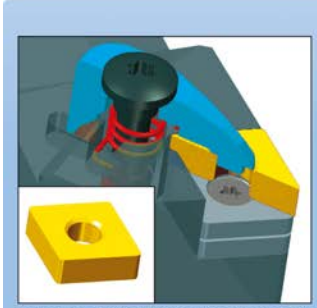


Brake disc	
Work material	: FC250
Cutting speed(SFM)	: 1804
Feed(IPR)	: .018"
Depth of cut(inch)	: .098"
Coolant	: DRY
SNG45 type	100 pcs/corner stable
SNG43 type	50-70 pcs/corner unstable

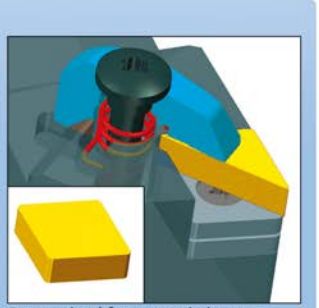


Recommended clamping type when using ceramic inserts

To maximize the performance of ceramic inserts, clamping rigidity of the inserts is important.
Select the clamping method best suited for your machining method.

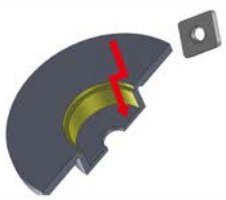


Capable of clamping inserts tightly. Supports cutting loads from any direction.



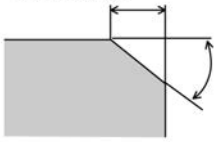
Best suited for ceramic inserts. Not suitable where cutting loads are applied from multiple directions.

Brake disc	
Work material	: FC250
Cutting speed(SFM)	: 2460
Feed(IPR)	: .014"
Depth of cut(inch)	: .079"
Coolant	: DRY
NTK double clamping type	100 pcs/corner
Lever lock type	45 pcs/corner



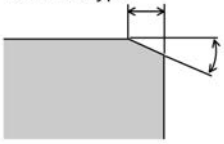
Use of different edge treatments

<Tougher type>



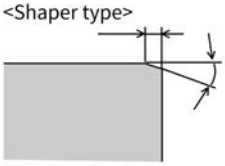
Width: Bigger
Angle: Bigger
Ex. width .012" × angle 35°

<Balance type>



Width: Medium
Angle: Medium
Ex. width .008" × angle 20°

<Shaper type>



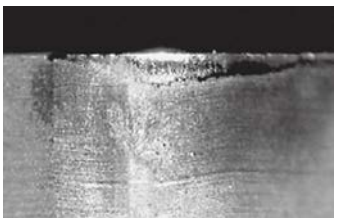
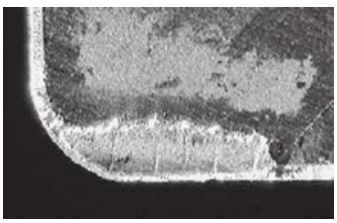
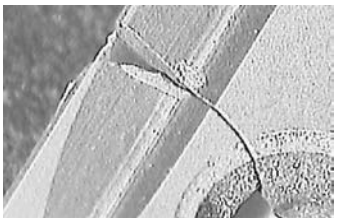
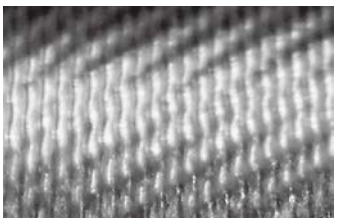
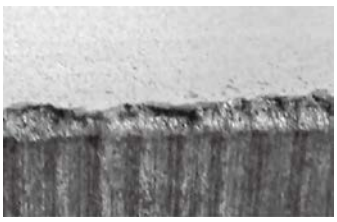
Width: Smaller
Angle: Smaller
Ex. width .004" × angle 15°

Case1.
Excessive notch wear or chipping in the early stages of machining.
→Tougher type is recommended.

Case2.
Unstable machining dimensions and excessive VB wear
→Sharper type is recommended.

Case3.
Micro chipping occured.
→Add round honing on the cutting edge is recommended.

Troubleshooting

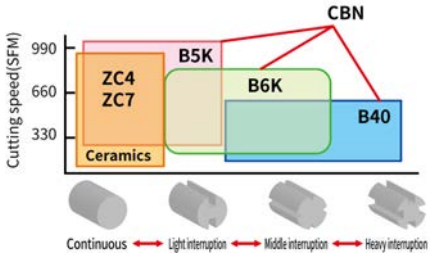
	Case study		Cause	Measure
Insert	VB wear		• Cutting speed too high • Feed rate too low • Insert shape incorrect • Incorrect insert grade	• Reduce cutting speed • Increase feed rate • Increase corner radius • Change to a grade with superior wear resistance
	Notch wear		• Incorrect insert grade • Cutter 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

Hardened material machining

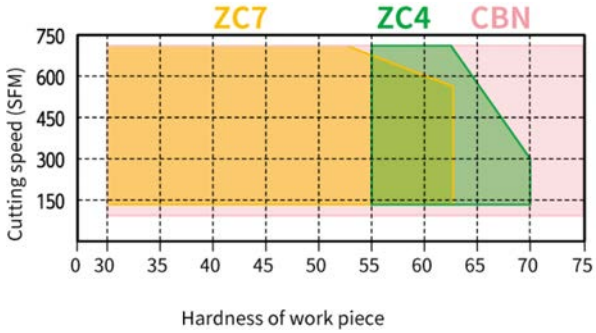
Features

- ZC7 and HC4 ceramic materials have high wear resistance in machining of hardened materials.
- ZC7 is suitable for a wide range of machining applications from carburized hardened steel to induction hardened steel.
- ZC4 offers high cutting performance in workpiece hardness in the HRc 55-70 range.
- Wiper inserts and inserts with breakers (AG) are available to improve machining efficiency.

Application Map

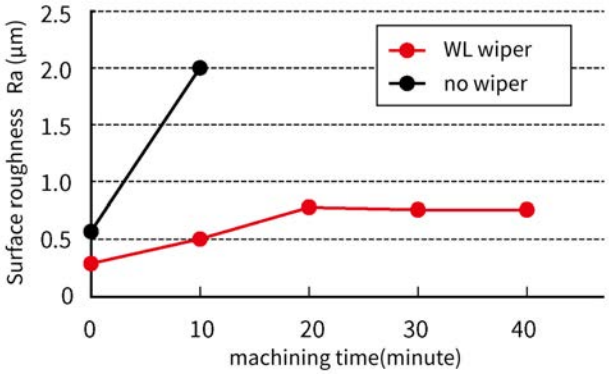


Recommended Speed Range



Effect of Wiper Flat on Cutting Edge

CNGA433WL 320SFM .004IPR .020DOC



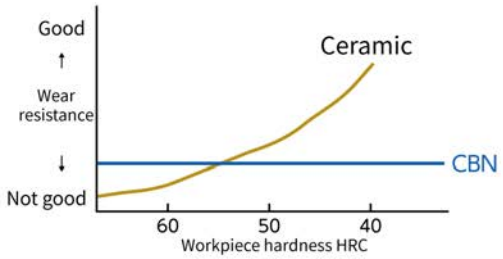
Recommended depth of cut and feed

Corner R	Depth of cut(inch)	Feed(IPR)
.016	~.007	.001 ~ .003
.032	~.015	.003 ~ .004
.047	~.020	.004 ~ .005
.063	~.030	.005 ~ .006
1/4 (Round Insert)	~.080	.006 ~ .010

※for 30RMS finish

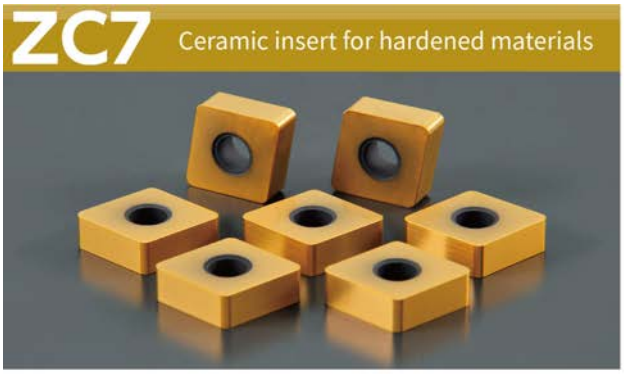
Advantages of Ceramic Inserts

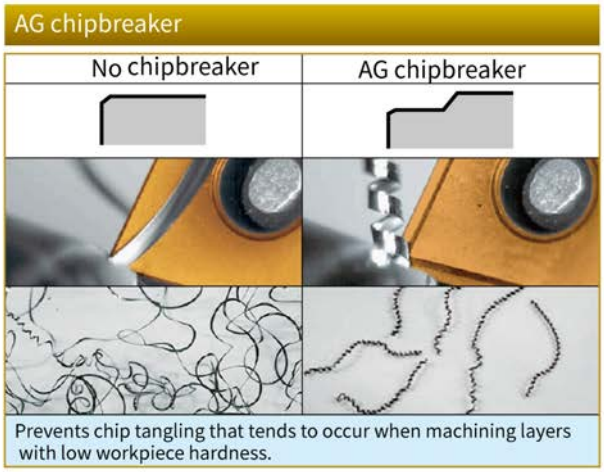
Lower workpiece hardness makes CBN tools wear out easier.



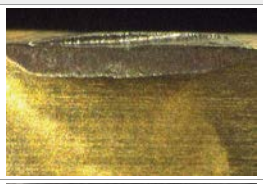
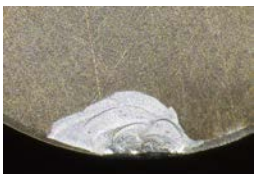
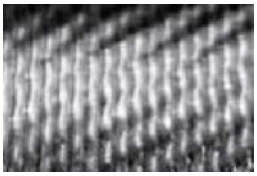
Ceramic has superior wear resistance to CBN in machining workpieces with hardnesses of HRC55 or less.

Key points for using different edge treatments





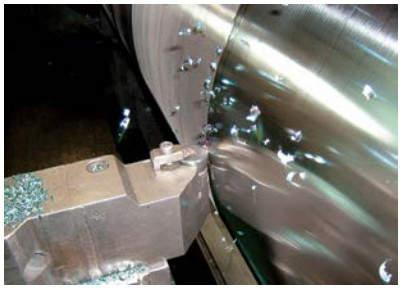
Troubleshooting

	Case		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 piece	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

Features

- In addition to the "HC2" ceramic material, which can be used for various types of mill roll machining, NTK offers the "HC5" and "HC7" ceramic materials, which improve machining efficiency even further.
- "533" has excellent wear resistance and is best suited for rough machining of carbide and high-hardness mill rolls.
- "ZC7" is applicable for a wide range of applications including carburized and induction hardened steels.
- "ZC4" has the best performance in hardened mill roll machining in the Shore hardness range of 74 to 97.



Recommended cutting conditions

Mill roll	Insert grade		Cutting speed (SFM)				Feed (IPR)	Depth of cut (inch)	DRY	WET
				Shore hardness Scale Hs						
				55-65	65-72	72-				
Steel	Ceramic	**HC7**	450-600	100%	80%	60%	.004-.012	.025-.075	●	
	Ceramic	**HC5**	450-600	100%	80%	60%	.004-.012	.025-.075	●	
	Ceramic	**HC2**	350-450	100%	80%	60%	.004-.012	.025-.075	●	
Chilled cast iron	Ceramic	**HC7**	450-600	100%	80%	60%	.004-.012	.025-.075	●	
	Ceramic	**HC5**	450-600	100%	80%	60%	.004-.012	.025-.075	●	
	Ceramic	**HC2**	350-450	100%	80%	60%	.004-.012	.025-.075	●	
Ductile cast iron	Ceramic	**HC7**	300-600	100%	80%	60%	.004-.012	.025-.075	●	
	Ceramic	**HC5**	300-600	100%	80%	60%	.004-.012	.025-.075	●	
	Ceramic	**HC2**	250-450				.004-.012	.025-.075	●	
Carbide	Whisker	**533**	150-500				.004-.012	.010-.080	●	
CPM	Ceramic	**ZC4**	400-500				.004-.012	.025-.075	●	
	Ceramic	**HC5**	400-500				.004-.012	.025-.075	●	
	Ceramic	**HC7**	400-500				.004-.012	.025-.075	●	
Hardness Hs46-86 (continuous machining)	Ceramic	**ZC7**	130-700	Finish	Finish	Finish	.003-.008	.005-.030	●	●
Hardness Hs74-97 (continuous machining)	Ceramic	**ZC4**	130-700	Finish	Finish	Finish	.003-.008	.005-.030	●	●

Recommended cutting speed

WL Wiper Recommended Feed Rates

Corner R	Depth of cut (inch)	Feed (IPR)	
		30 micro	60 micro
1/64	-.007	.002-.003	.003-.004
1/32	-.015	.003-.004	.004-.005
3/64	-.020	.004-.005	.005-.0065
1/16	-.030	.004-.0055	.006-.0075
1/4	-.080	.007-.010	.010-.014

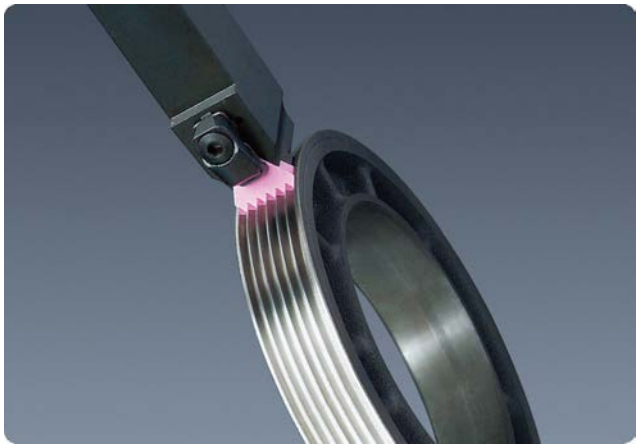
Key Points of Mill roll machining

- 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 with 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 Hs67.
- HSS and CPM rolls typically have a hardness of Hs100 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 • ERWtube mills • Turks heads • Hot & Cold rolls • Work reducing rolls	Preferred in abrasive operations. High wear capabilities.

V-pulley machining

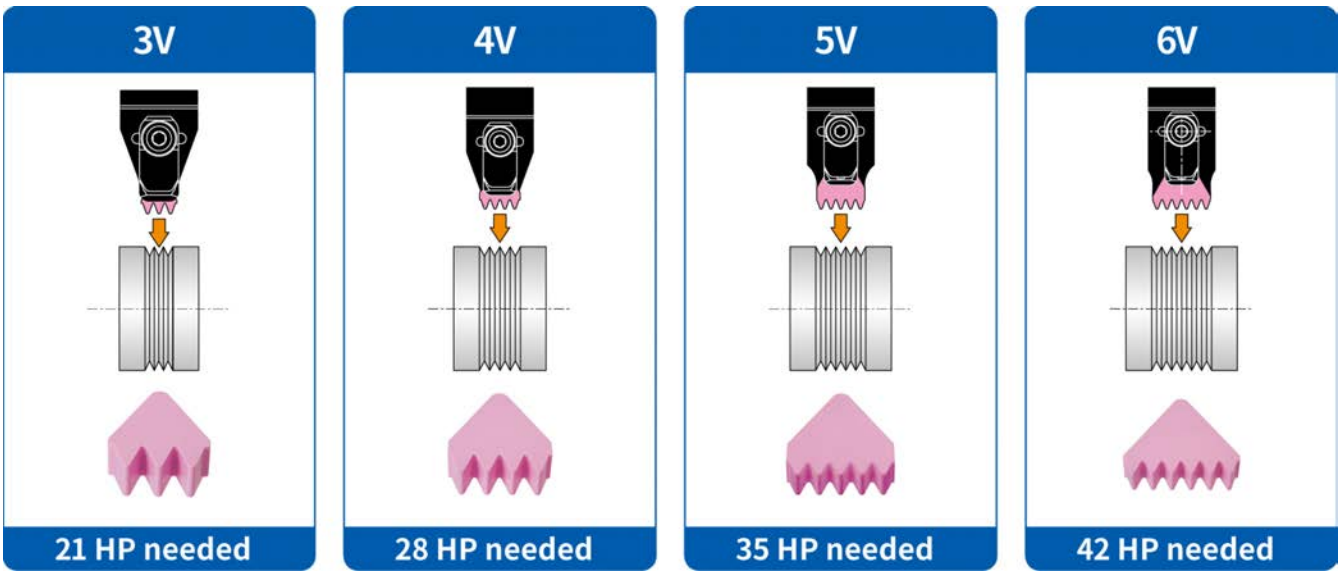


Features

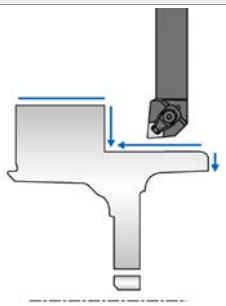
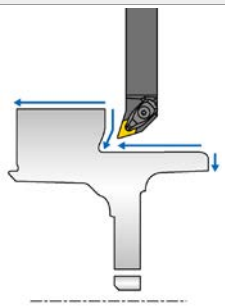
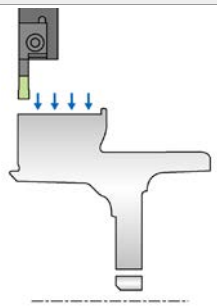
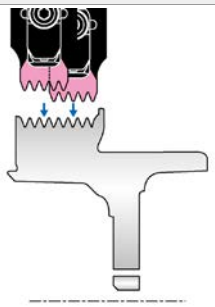
- **High-speed machining of poly-V pulleys**
- **Up to 6 grooves can be machined in a single pass**
- **High-precision inserts can be produced by profile machining**

Recommended Cutting Conditions

Material	Insert grade	Cutting speed (SFM)	Feed (IPR)	DRY	WET
Gray cast iron	**HW2**	1000-2000	.002-.006	●	



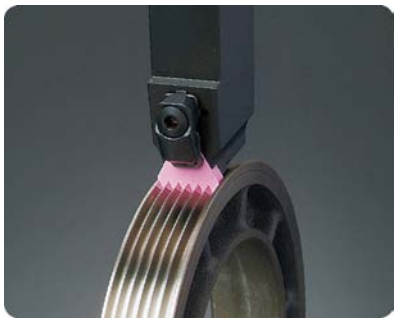
High-speed machining of poly V with NTK ceramic inserts

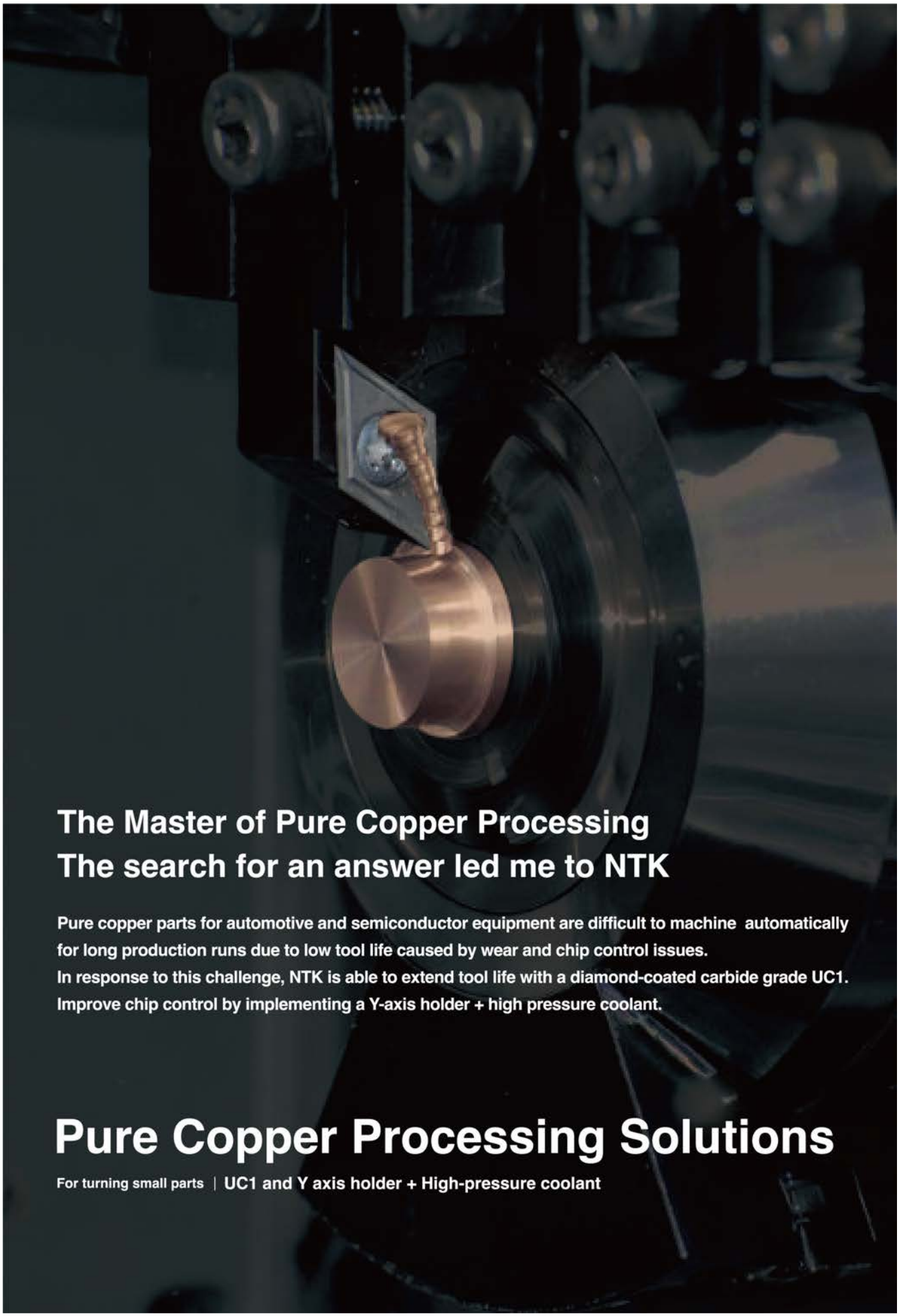
	Process #1	Process #2	Process #3	Process #4
	OD and Profile Roughing	OD and Profile Finishing	Plunge Grooving	Poly-V Grooving
Tooling				
Insert	CNGX453 T0820 SX6	DNGA432T0525 HC6 DNGA432 T0420 SP9	VDB 250 B031 T0220 WA1	HW2 PTM 53 K50504 HW2*
Cutting speed (SFM)	2000-2800	1500-2000(HC6) 1800-2400 (SP9)	1000-1400	1200-1500 (1400 SFM recommend)
Feed (IPR)	.018-.024	.012-.018 (HC6) .018-.024 (SP9)	.008-.010	.002-006
Depth of cut (inch)	.080-.120	Process dependent (.020)	-	-
Coolant	DRY (WET)	DRY (WET)	DRY (WET)	DRY
Pcs / corner	-300 pcs	-300 pcs	-300 pcs	-300 pcs

*Check the machine required power.

	3V	4V	5V	6V
Required HP	21HP	28HP	35HP	42HP

NTK's Ceramic Inserts ensure higher productivity and stable tool life for Damper-Pulley machining.





The Master of Pure Copper Processing
The search for an answer led me to NTK

Pure copper parts for automotive and semiconductor equipment are difficult to machine automatically for long production runs due to low tool life caused by wear and chip control issues.
In response to this challenge, NTK is able to extend tool life with a diamond-coated carbide grade UC1.
Improve chip control by implementing a Y-axis holder + high pressure coolant.

Pure Copper Processing Solutions

For turning small parts | UC1 and Y axis holder + High-pressure coolant

NTK's Work Changing Concept

Diamond-coated carbide : Longer tool life with UC1
Improved chip control with Y-axis tool holder + high-pressure coolant

Performance

- **High purity, high hardness diamond coating, and excellent adhesion performance enable long-term stable machining.**
- **Improved chip control by applying Y-axis direction machining with high-pressure coolant.**

Applications

Pure copper (C1020/C1100) machined using Sliding head automatic lathes or CNC-lathes.

〔 Machining Property of C1100 Tough Pitch Copper 〕

Diamond-coated carbide: UC1 with excellent wear resistance & welding resistance is recommended because tooling tends to wear and the machined surface deteriorates due to welding, resulting in short tool life.

A good machined surface can be obtained by applying the appropriate cutting condition (low cutting depth/low feed) which reduces the chip thickness.

Case Study

Battery connector : C1100 ϕ.394 -.787 in.

		Competitor
Tool	UC1 DCMT32.508 FNAM3	PVD super coat DCGT32.508 molded chipbreaker
Speed (SFM)	180 - 360	
Feed (IPR)	.0012	
DOC (inch)	.008	
Coolant	WET	
Tool life		**50 pcs.**

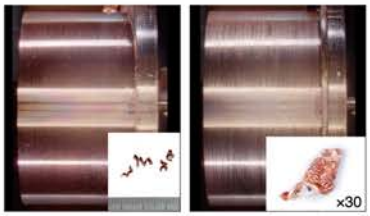
Electrode part : C1100 ϕ.472 in.

		Competitor
Tool	UC1 DCMT32.504 FNAM3	PVD super coat DCGT32.504 molded chipbreaker
Speed (SFM)	262	
Feed (IPR)	.002	
DOC (inch)	.040	
Coolant	WET	
Tool life		**100 pcs.**

Machined Surface Comparison

Part material : C1100 v_c = 260 SFM a_p = .040 WET
Tool : DCMT32.508FNAM3 UC1

f = .0008 IPR | *f* = .002 IPR



If the cutting conditions cause the chips to become thick (high cutting depth or high feed) then the machined surface will deteriorate due to chip clogging.

Cutting conditions

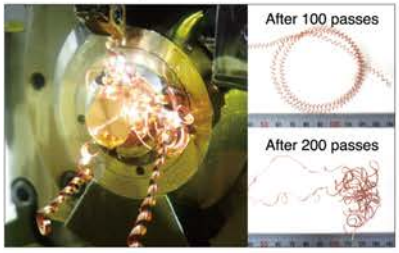
Grade	Material	Operation	Machining	Speed (SFM)	Feed (IPR)	DOC (inch)	WET
UC1	Tough pitch copper C1100	Turning	Rough - Finish	160 - 500	.0008 - .002	.008 - .080	●

Using the cutting conditions shown, chips can be segmented and controlled with AM3 chipbreaker.
When machining at large depths of cut and high feed rate, select CL or ZP chipbreakers to suppress chip clogging.

〔 Machining Properties of C1020 Oxygen-free Copper 〕

Stable chip generation may be difficult with a chip breaker alone, it is recommended to add a Y-axis holder + high pressure coolant

Example of Chip Issues

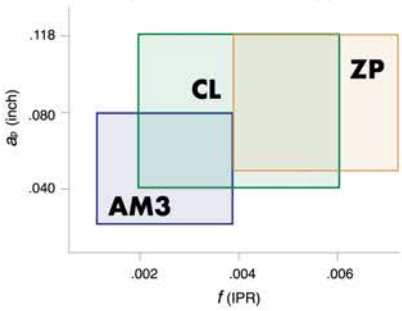


Even if good chip control is obtained at initial stage of machining, sudden chip entanglement can occur leading to tool wear.

Y-axis holder + high-pressure coolant

Chip tangling can be suppressed by Y-axis machining with high-pressure coolant.

Chip breaker machining range



Cutting Conditions

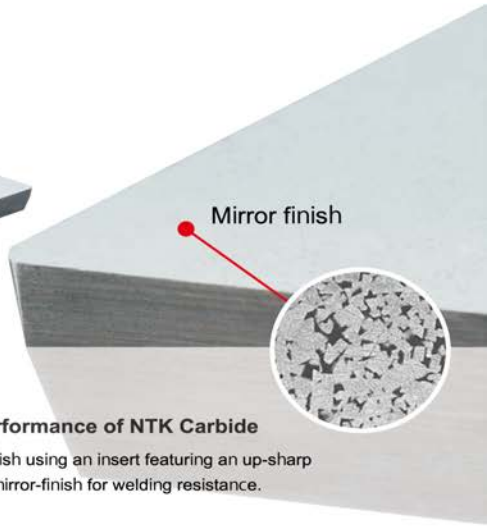
Grade	Material	Operation	Machining	Speed (SFM)	Feed (IPR)	DOC (inch)	WET
UC1 TM4	Oxygen-free copper C1020	Turning	Rough - Finish	160 - 500	.0008 - .008	.020 - .118	●

Refer to content above to select cutting conditions and chip breaker to obtain good chip control.
If you want longer tool life than PVD Carbide: TM4, use Diamond-Coated Carbide: UC1.

New Machining Process for Chip Control
The issue is solved by applying Y-axis tooling to machine Plastics
<PEEK/PTFE> used in medical equipment, implants,
semiconductor equipment components, etc.
Solution for Machining Plastics
For turning small parts | Y-axis holder + KM1 Insert

Solution for Machining Plastics
The Realization of Stable Machining

Improved chip control with a Y-axis holder
High quality surface finish with KM1



| Performance

- **Applying Y-axis machining eliminates chip control issues.**
- **Mirror-finish polished fine grain cemented carbide ensures an excellent surface finish**

| Application Area

Automatic lathe (Gang type) machining plastic materials (PEEK/PTFE, etc.)

| Machining Performance of NTK Carbide

Excellent surface finish using an insert featuring an up-sharp edge and polished mirror-finish for welding resistance.

| Recommended Cutting Conditions

Grade	Material	Operation	Machining	Cutting speed (SFM)	Feed (IPR)	DOC (inch)	DRY	AIR
KM1	Plastic (PEEK,PTFE,etc.)	Turning	Roughing - Finishing	164 - 490	.002 -.004	.020 - .118	●	●

| Chip Control Performance

Material : PEEK(ϕ.3937″) Cutting conditions : 267 SFM .002 IPR .039 DOC

Machining approach	Standard machining		Y-axis machining	
Chipbreaker	Yes	No	Yes	No
Machining image				

| Case Study

Medical implant : PEEK

	NTK	Competitor
Tool	KM1 VCGW2208H No chipbreaker	Carbide VCGT11T302 Molded chipbreaker
Cutting speed (SFM)	328	
Feed (IPR)	.0023	
DOC (inch)	.010	
Coolant	AIR	DRY
Tool life	**80 pcs.**	**40 pcs.**

Automotive component : PEEK (with glass fiber)

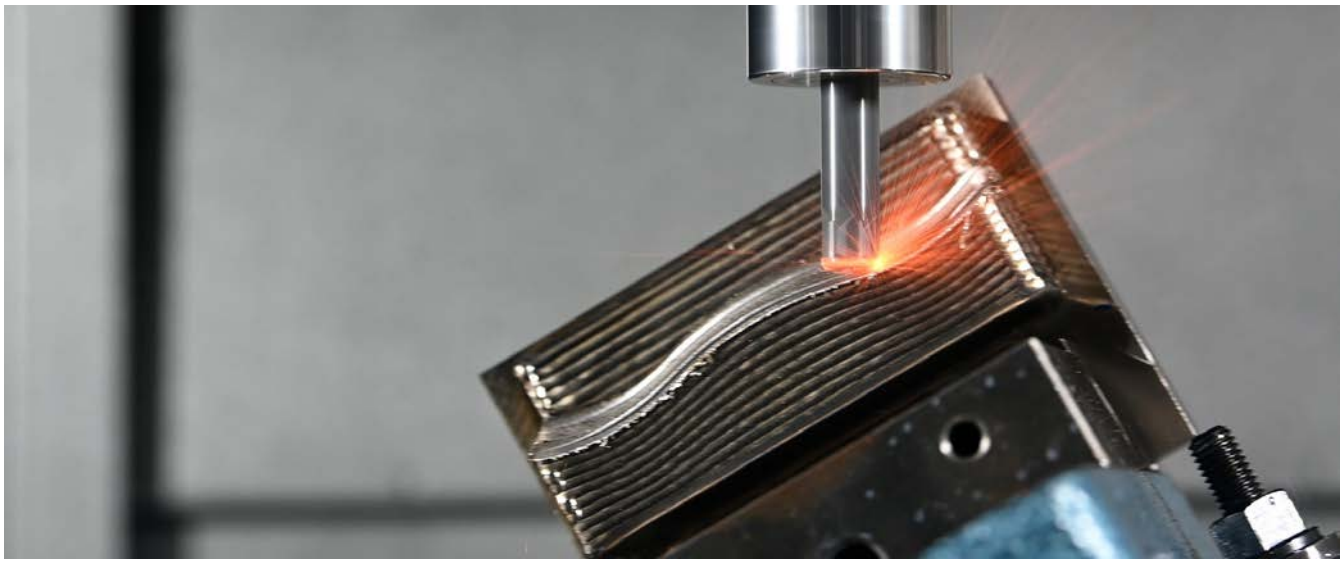
	NTK	Competitor
Tool	KM1 DCGT11T302H No chipbreaker	PVD Carbide VNMG160408 Molded chipbreaker
Cutting speed (SFM)	394	131
Feed (IPR)	.003	.002
DOC (inch)	.010	
Coolant	AIR	DRY
Tool life	**3 pcs.**	**1 pc.**

| Tool Lineup

Application types : Front turning (ISO) / Back turning / Grooving / Cut-off / Threading / Boring

Standard holder	Metric: 7 , 8 , 10 , 12 , 16 , 20mm * Coolant through available from 10mm Inch: 3/8 , 1/2 , 5/8 , 3/4inch * Coolant through available from 3/8inch
Y-axis coolant through holder	Metric: 12 , 16 Inch: 3/8 , 1/2 , 5/8
Boring bar	Minimum machining diameter: Standard holder - from ϕ.039″ * Coolant through holder - from ϕ.0866″ available

* For details, please refer to the NTK General Catalog or Swiss Tooling Catalog.



Additive manufacturing workpieces for rough machining | SiAlON ceramics

Additive manufacturing machining

Achieving speedy rough cutting of metal additive manufacturing workpieces (nickel-based alloys)
Capable of high-speed machining about 10 times faster than carbide tools.

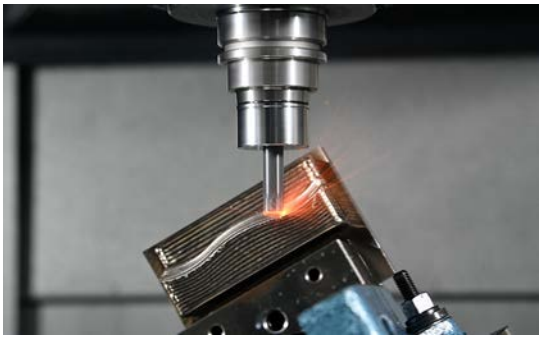
Performance

- Highly efficient machining of additionally built nickel-based alloys
- Ceramic grade with excellent toughness
- High-speed and stable machining
- Lineup of milling and end milling tools

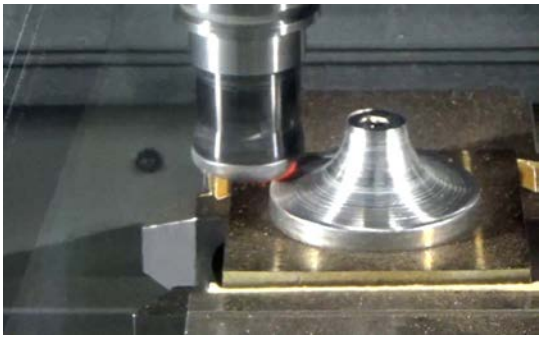
Applications

- Workpiece built up by Nickel-based alloys
- Milling/End milling for rough machining

End milling



Helical milling



Tool Materials/Selection Guide

Application Range of NTK Insert Grades C02

Insert grade recommendation by work material type C03

Recommended Cutting Conditions C04

ANSI / ISO Insert Nomenclature C06

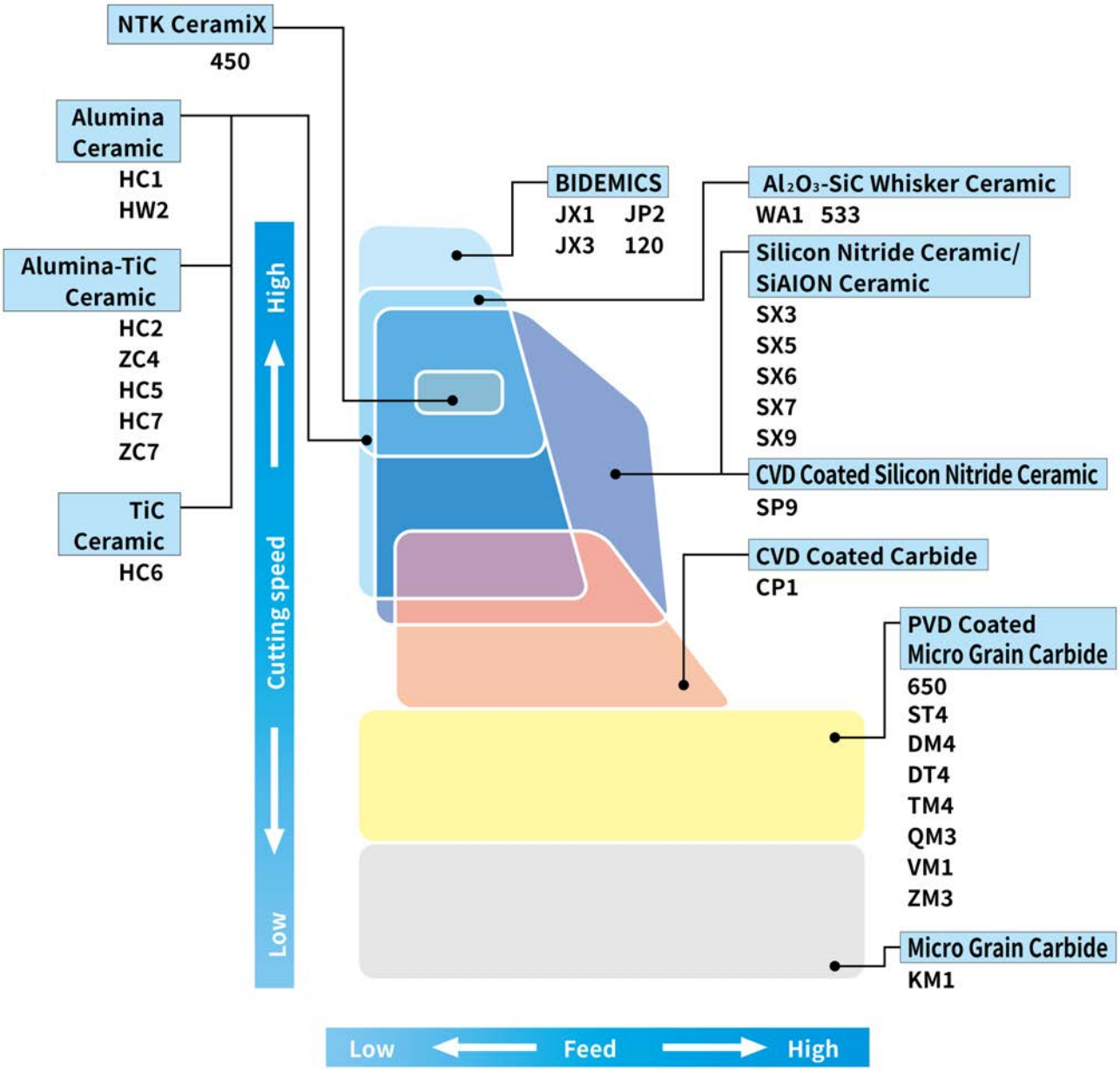
BIDEMICS C10

Ceramics / NTK CeramiX C13

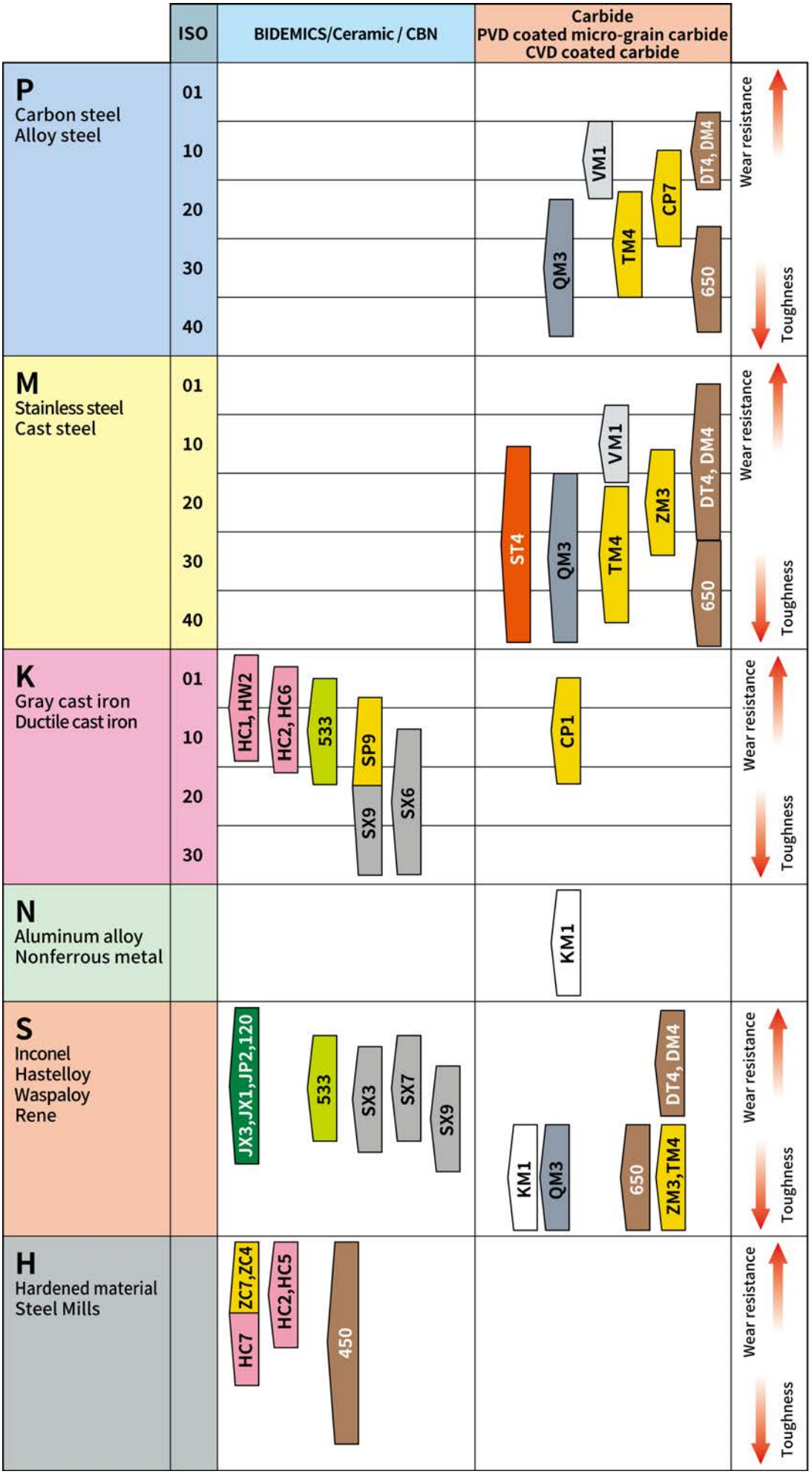
Carbides C29

Chipbreakers C42

Application Range of NTK Insert Grades



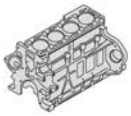
Insert grade recommendation by work material type

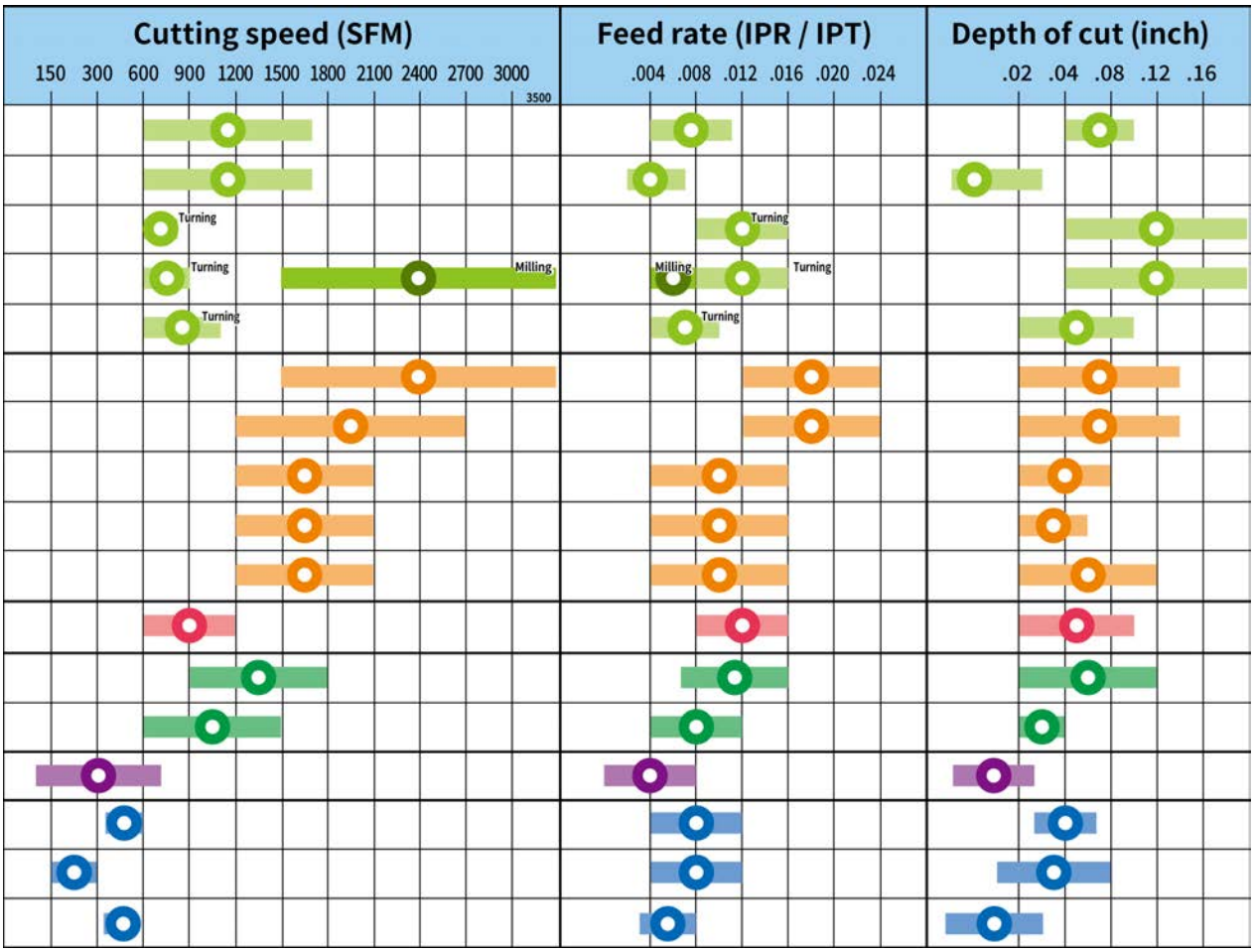


Recommended Cutting Conditions

BIDEMICS, Ceramics, CBN, NTK CeramiX

●First Choice ○Second Choice

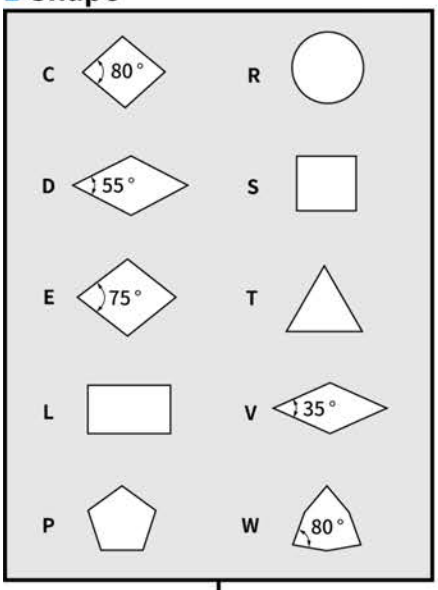
Work material	Tool Grade		Application						Coolant	
			Roughing	Semi-finishing	Finishing	Continuous	Light interruption	Interruption	Dry	Wet
Heat-resistant alloy * Based on Using .500" IC Insert except JP2	BIDEMICS	JX1 / JX3	○	○	○	○	○			●
	BIDEMICS	JP2 / 120		○	○	○	○			●
	Ceramic	SX5	○			○	○	○		● (Turning)
	Ceramic	SX3 / SX7 / SX9	○	○		○	○	○	● (Milling)	● (Turning)
	Ceramic	533/WA1	○	○		○	○		○	●
Gray cast iron 	Ceramic	SX6	○	○		○	○	○	●	●
	Ceramic	SP9	○	○	○	○	○	○	●	○
	Ceramic	HC1 / HW2			○	○	○		●	
	Ceramic	HC2 / HC6			○	○	○		●	●
	Ceramic	533/WA1			○	○	○		●	●
Chilled Liners	Ceramic	HW2	○	○	○	○			●	
Ductile cast iron	Ceramic	SP9	○	○	○	○	○	○	○	●
	Ceramic	HC6			○	○	○		○	●
Hardened material	Ceramic	450/HC4/ZC7			○	○	○		●	●
Rolls * Based on Using .500" IC Insert	Ceramic	HC5 / HC7	○	○	○	○	○	○	●	
Steel, Cast iron, Ductile iron / Carbide	Ceramic	533/WA1	○	○	○	○	○	○	●	
CPM	Ceramic	HC5 / ZC4 / HC7	○	○	○	○	○	○	●	


Cutting speed (SFM)
150 300 600 900 1200 1500 1800 2100 2400 2700 3000
3500
Turning
Turning
Milling
Turning
Feed rate (IPR / IPT)
.004 .008 .012 .016 .020 .024
Turning
Milling
Turning
Turning
Depth of cut (inch)
.02 .04 .08 .12 .16

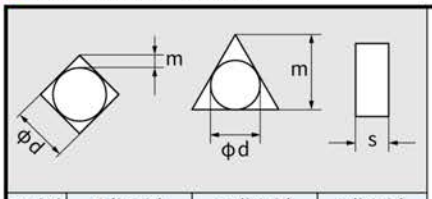
ANSI / ISO Insert Nomenclature

BIDEMICS / Ceramics

1 Shape



3 Tolerance Class



Symbol	d (inch)	m (inch)	s (inch)
A	±.0010	±.0002	±.0010
F	±.0050	±.0002	±.0010
C	±.0010	±.0005	±.0010
H	±.0050	±.0005	±.0010
E	±.0010	±.0010	±.0010
G	±.0010	±.0010	±.0050
J	±.0020	±.0020	±.0050
K	±.002 ~±.005	±.0005	±.0010
L	±.002 ~±.005	±.0010	±.0010
M	±.002 ~±.005	±.003 ~±.007	±.0050
N	±.002 ~±.005	±.003 ~±.007	±.0010
U	±.003 ~±.010	±.005 ~±.015	±.0050

C S T — M tolerance

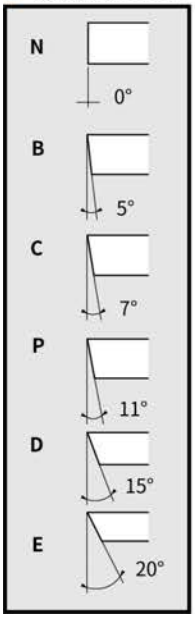
Inscribed Circle	d (inch)	m (inch)
1/4"	±.002	±.003
3/8"	±.002	±.003
1/2"	±.003	±.005
5/8"	±.004	±.006
3/4"	±.004	±.006
1"	±.005	±.007

D K — M tolerance

Inscribed Circle	d (inch)	m (inch)
1/4"	±.002	±.004
3/8"	±.002	±.004
1/2"	±.003	±.006
5/8"	±.004	±.006
3/4"	±.004	±.007

	1	2	3	4
Inch	S	N	G	A
Metric	S	N	G	A

2 Clearances



4 Type

Type	Symbol	Type	Symbol
	N (E)	70°–90°	H
	F		
	R	70°–90°	B
	A		
	G	40°–60°	T
	M	40°–60°	W
Special design	X		

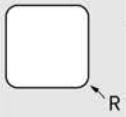
6 Thickness

Thickness S(inch)	Inch	Metric
3/32"	1.5	02
1/8"	2	03
5/32"	2.5	T3
3/16"	3	04
1/4"	4	06
5/16"	5	07
3/8"	6	09
1/2"	8	12

5 Symbol for Insert Size

Inch		Metric					
Inscribed Circle		C	D	R	S	T	V	W
1/4"	2	06	07	06	11	11	04
3/8"	3	09	11	09	16	16	06
1/2"	4	12	15	12	22	22	08
5/8"	5	16	19	15	27	27	10
3/4"	6	19	23	19	33	33	13
1"	8	25	31	25	44	44	17

7 Corner Radius

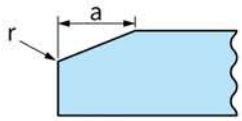
Corner Radius		Inch	Metric
	1/64"	1	04
	1/32"	2	08
	3/64"	3	12
	1/16"	4	16
	5/64"	5	20
	3/32"	6	24
	1/8"	8	32

4	3	3	T	04	20
5	6	7	8	9	10
12	04	12	T	010	20

8 Edge Condition

Sharp	FNX08
Honed	E
Chamfered	T
Chamfered and Honed	Z
	S
	U
Double Chamfered	K
Double Chamfered and Honed	J
	P
	Q

9 Negative Land Width



Symbol	Description		a (inch)	r (inch)
	inch	metric		
E	01	002	–	.001
	02	004	–	.002
T	02	005	.002	–
	03	008	.003	–
	04	010	.004	–
	05	012	.005	–
	06	015	.006	–
	08	020	.008	–
Z	04	010	.004	.001
	08	020	.008	.001
S	04	010	.004	.002
	08	020	.008	.002
U	16	040	.016	.003
K	28	070	.028	–
J	60	150	.060	.001
P	71	180	.071	.002
Q	95	240	.095	.003

Note: K, J, P & Q show its primary land width

10 Negative Land Angle

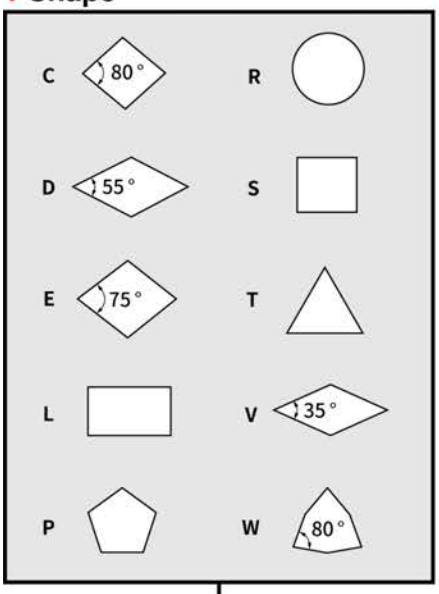
Description	b
10	10°
15	15°
20	20°
25	25°
30	30°

Note: K, J, P & Q show its primary land angle

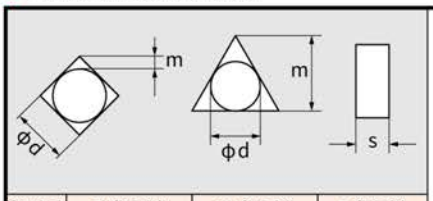
ANSI / ISO Insert Nomenclature

Carbide

1 Shape



3 Tolerance Class



Symbol	d (inch)	m (inch)	s (inch)
A	±.0010	±.0002	±.0010
F	±.0050	±.0002	±.0010
C	±.0010	±.0005	±.0010
H	±.0050	±.0005	±.0010
E	±.0010	±.0010	±.0010
G	±.0010	±.0010	±.0050
J	±.0020	±.0020	±.0050
K	±.002 ~ ±.005	±.0005	±.0010
L	±.002 ~ ±.005	±.0010	±.0010
M	±.002 ~ ±.005	±.003 ~ ±.007	±.0050
N	±.002 ~ ±.005	±.003 ~ ±.007	±.0010
U	±.003 ~ ±.010	±.005 ~ ±.015	±.0050

C S T

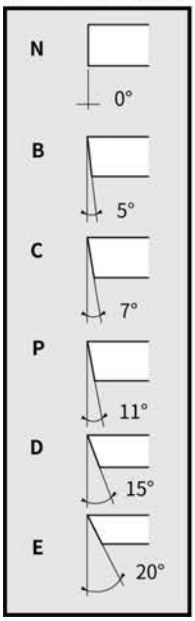
Inscribed Circle	M tolerance d (inch)	M tolerance m (inch)
1/4	±.002	±.003
3/8	±.002	±.003
1/2	±.003	±.005
5/8	±.004	±.006
3/4	±.004	±.006
1	±.005	±.007

D K

Inscribed Circle	M tolerance d (inch)	M tolerance m (inch)
1/4	±.002	±.004
3/8	±.002	±.004
1/2	±.003	±.006
5/8	±.004	±.006
3/4	±.004	±.007

	1	2	3	4
Inch	C	C	G	T
Metric	C	C	G	T

2 Clearances



4 Type

Type	Symbol	Type	Symbol
	N (E)	70°–90°	H
	F		
	R	70°–90°	B
	A		
	G	40°–60°	T
	M	40°–60°	W
Special design	X		

6 Thickness

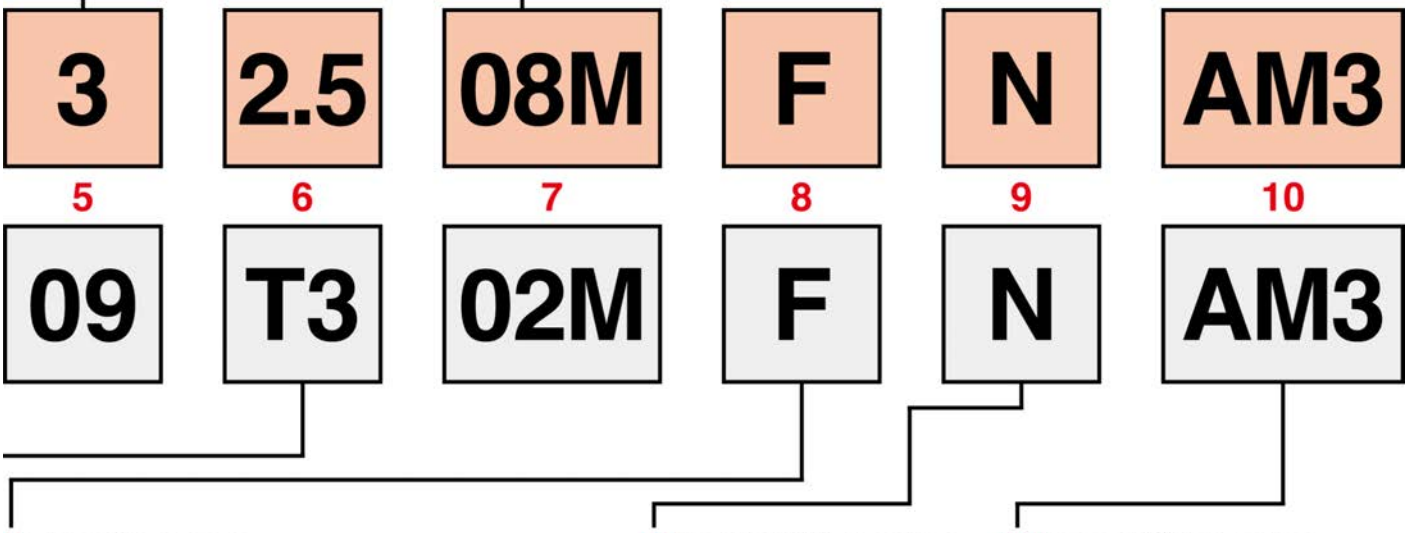
Thickness S(inch)	Inch	Metric
3/32	1.5	02
1/8	2	03
5/32	2.5	T3
3/16	3	04
1/4	4	06
5/16	5	07
3/8	6	09
1/2	8	12

5 Cutting Edge Length

Inch		Metric						
Inscribed Circle		C	D	R	S	T	V	W
1/4	2	06	07	06		11	11	04
3/8	3	09	11	09		16	16	06
1/2	4	12	15	12		22	22	08
5/8	5	16	19	15		27	27	10
3/4	6	19	23	19		33	33	13
1	8	25	31	25		44	44	17

7 Nose Radius

Corner Radius	Inch	Metric
.001	01	00
.003	04M	01M
.004	04	01
.007	08M	02M
.008	08	02
.015	1M	04M
.016 (1/64)	1	04
.031 (1/32)	2	08



8 Edge Sharpness

F	Up-sharp edge (without any edge preparation)
(Blank)	Non up-sharp edge

9 Hand of Chipbreaker

N	Neutral*
R	Right-hand
L	Left-hand

* Omitted when edge is not "up-sharp"

10 Type of Chipbreaker

See page P20 to P23 for chipbreaker information

11 Wiper insert

"-WP" after chipbreaker

BIDEMICS

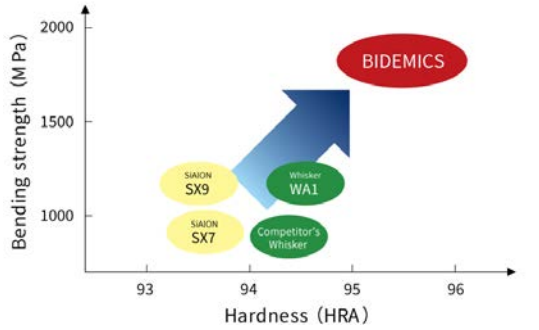
Heat-resistant alloys, which are mainly used in the aircraft industry, have low thermal conductivity, high temperature strength, high work hardening, and high adhesion to tool materials, making them extremely difficult to cut, and improving production efficiency has been a key issue.
BIDEMICS is a new category of material that combines various materials to achieve high strength and high hardness. It enables highly efficient machining that exceeds the performance of conventional carbide and ceramics.

Insert grade, applications, and features

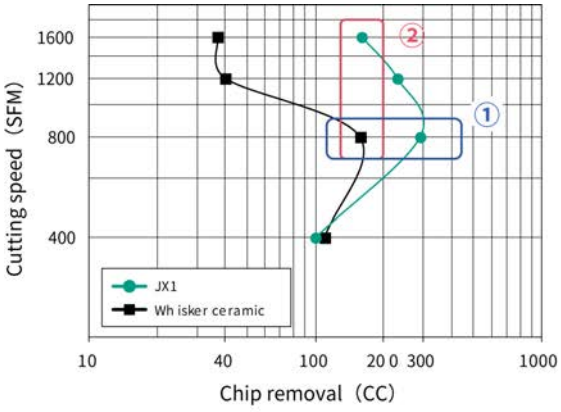
Work material	Grade	Application
S Heat resistant alloy	JX1	Semi-finishing/rough machining of heat-resistant alloys (no scale) Cutting speed up to 1600 SFM. Longer life and better machined surface compared to ceramic grades
	JX3	Semi-finishing/rough machining of heat-resistant alloys (no scale) Cutting speed up to 1600 SFM. Longer life and better machined surface compared to ceramic grades
	120	Finish machining of heat-resistant alloys Cutting speed up to 1700 SFM. Longer life and better machined surface compared to carbide tools
	JP2	Finish machining of heat-resistant alloys Cutting speed up to 1700 SFM. Longer life and better machined surface compared to carbide tools

Physical properties

Grade	Hardness HRA	Bending Strength MPa	Thermal Conductivity W/m・K
JX1	95.5	1,800	40
WA1	94.5	1,200	35



Machining productivity comparison between JX1 and Whisker Ceramics



①Longer tool life

JX1/JX3's combination of High Hardness,Superior Thermal Conductivity and Improved Strength compared to Whisker ceramics results in significantly longer tool life when applied at typical Whisker ceramic speeds, feeds, and depth of cut.

②Higher Speeds, More Productivity

JX1/JX3's superior physical properties compared to Whisker ceramic enable you to increase speeds; potentially as much as 2X Whisker ceramic speeds; increasing productivity and potentially offsetting the need for additional equipment to meet increasing demands.

Chips break easily at higher cutting speeds vs the typically continuous chips of HRSA materials. The result is more efficient chip removal.

Recommended Cutting Conditions

Grade	Work material	Application	Process	Cutting speed (SFM)	Feed (IPR)	Depth of cut (inch)	Coolant
JX1	Heat-resistant alloys	Turning	Rough (no scale)	600-**1600**	.006-.012	.040-.100	WET
JX3			Semi-finishing	600-**1600**	.004-.010	.020-.080	WET
120	Heat-resistant alloys	Turning	Finishing	180-**1700**	.002-.008	.004-.030	WET
JP2			Finishing	180-**1700**	.004-.010	.010-.040	WET

Heat-resistant alloys for rough to semi-finishing | BIDEMICS

JX1 / JX3

Ultra-high speed machining of heat-resistant alloys at 1600 SFM
Longer life & higher quality machined surface compared to whisker ceramics
Applicable to new materials for aircraft parts

Performance

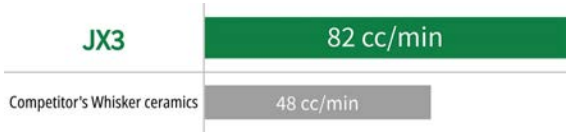
Significantly longer life than whisker ceramics
Twice the cutting speed is possible. Good machined surfaces are achieved.
Suitable for machining heat-resistant alloys made of powder alloys

Application

Heat-resistant alloys
Turning / Grooving / Profiling
Rough to semi-finishing with no-scale

Case study Turbine disk

Work material	Inconel 718
Cutting speed	Competitor: 690 SFM NTK: 1150 SFM
Feed	.006 IPR
Depth of cut	.060 inch
Coolant	WET



Heat-resistant alloys for finishing | BIDEMICS

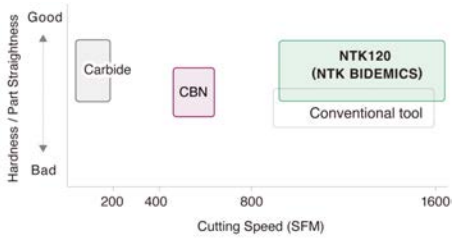
NTK120 / JP2

For high-speed finishing

Ultra-high-speed finishing of heat-resistant alloy.
15 times faster than carbide and 3 times faster than CBN.

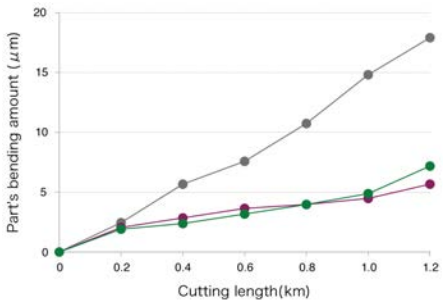
Performance

Excellent wear-resistance with BIDEMICS and part straightness is achieved during finishing operations. Capable of machining heat-resistant alloys at a cutting speed of 1700 SFM.



Part's Straightness Performance

[cutting conditions] material: Inconel 718
1050 SFM (Carbide 160 SFM)
f=.008 IPR DOC=.004" WET

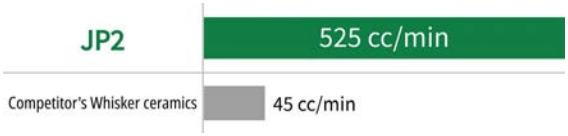


Application

Heat resistant alloys
Finishing

Case study Turbine disk (finishing)

Work material	Inconel 718
Cutting speed	Competitor: 70 SFM NTK: 800 SFM
Feed	.003 IPR
Depth of cut	.010 inch
Coolant	WET



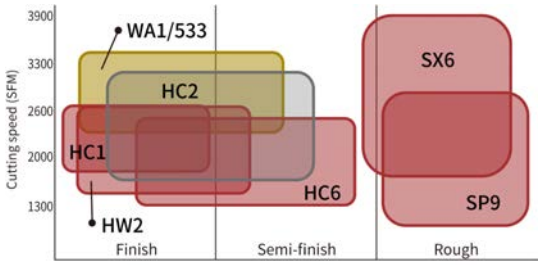
Ceramics / NTK CeramiX

NTK ceramic inserts provide highly efficient machining with excellent high-temperature hardness, heat resistance, and chemical stability.
NTK offers various types and geometries of silicon nitride, alumina, and whisker ceramic inserts to meet the needs of each application and support highly effective high-speed cutting.

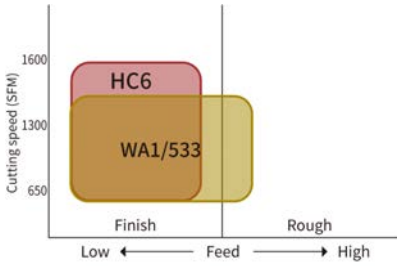
Insert grade, applications, and features

Work material	Grade	Structure	Color	Application	Hardness HRA	Toughness MPa	Thermal conductivity W/m.K
K Cast iron	**HC1**	Al_2O_3	White	Rough - Finishing of gray cast iron	94	700	17
	HW2	Al_2O_3	Pink	finishing of gray cast iron Reinforced toughness	94	750	19
	HC6	TiC+Al_2O_3	Black	finishing of ductile cast iron finishing of gray cast iron with coolant	94	800	29
	SX6	Si_3N_4	Gray	Turning/milling of gray cast iron Reinforced VB wear resistance	93.5	1,200	29
	SP9	SiAlON	Yellow	Turning of Ductile iron Roughing of gray cast iron High-precision machining by low-resistance edge treatment + CVD coating	93.5	1,200	15
H Hardened material	**450**	TiAlN coating	Black	Continuous finishing of hardened material (HRC 55-65)	95.5	1200	31
	HC2/HC5	Al_2O_3+TiC	Black	Semi-finishing of hardened materials and gray cast iron	94.5	800	21
	HC4/ZC4	Al_2O_3+TiC	Black / Gold	Finishing of hardened materials (e.g. removal of carburized layers)	95.5	1,000	25
	HC7/ZC7	Al_2O_3+TiC	Black / Gold	Finishing of hardened materials (e.g. removal of carburized layers)	95	1,100	23
S Heat resistant alloy	**SX3**	SiAlON	Gray	Turning/Milling of heat-resistant alloys Excellent balance between wear and chipping resistance	93	1,100	12
	SX5	SiAlON	Gray	Rough turning of heat-resistant alloy (Waspaloy)	92.5	1100	18
	SX7	SiAlON	Gray	Turning/Milling of heat-resistant alloys Good wear resistance	93	900	11
	SX9	SiAlON	Gray	Rough turning/milling of heat-resistant alloys and gray cast iron Excellent chipping resistance	93.5	1,200	15
	WA1 / 533	Al_2O_3+SiC	Light green	Turning of heat-resistant alloys/gray cast iron Excellent chipping resistance	94.5	1,200	35

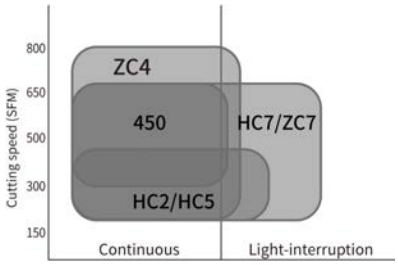
For gray cast iron



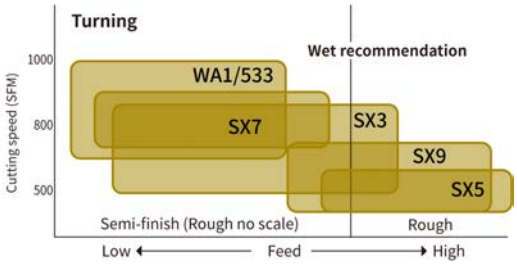
For ductile cast iron

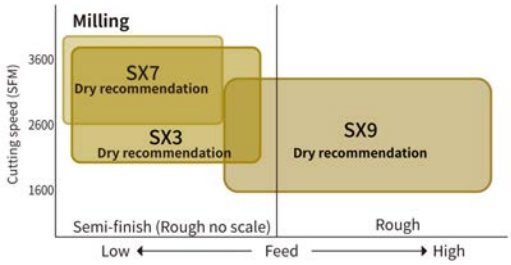


For hardened materials



For heat-resistant alloys





For continuous machining of hardened materials | NTK CeramiX

NTK450

NTK CeramiX, a new material that maximizes the performance of ceramics, is born
Establishing an intermediate position between CBN and ceramics
Higher economic efficiency enables insert cost reduction

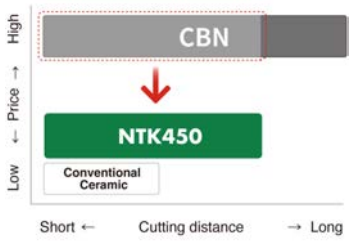
Performance

- Higher wear resistance with newly developed coating and dense, homogenized base material structure
- Ideal for small-lot production or single-part production when balancing tooling cost and performance

Application

Hardened materials
Continuous machining HRC55-65

Insert cost and cutting distance

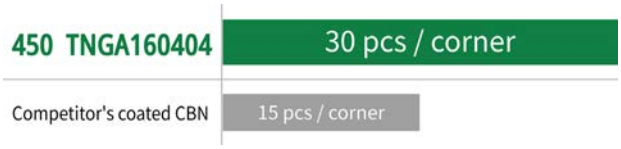


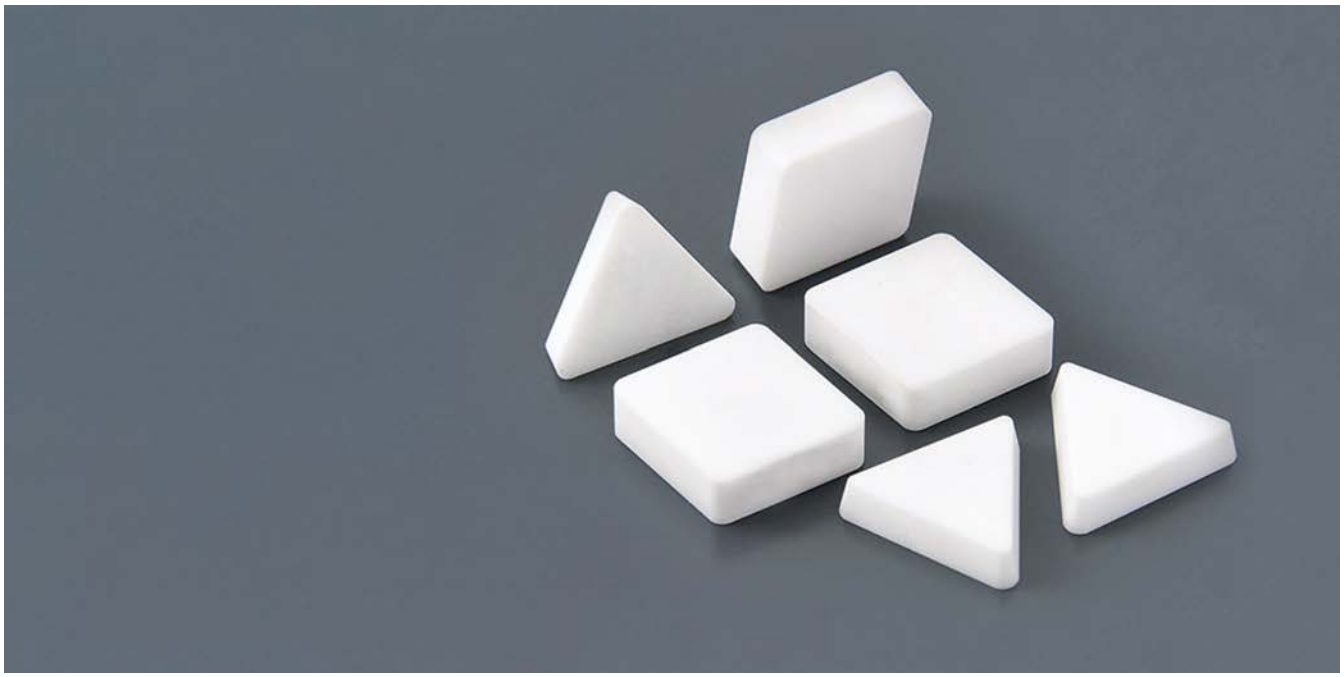
Case study Industrial robot parts machining

NTK CeramiX "450" achieves twice the machining capability of competitor CBN.
In addition, annual tooling costs have been reduced by approximately 70%.

Work material	4130 (HRC 58-62)
Cutting speed	660 SFM
Feed	.002 IPR
Depth of cut	.004 inch
Coolant	WET

Machining dia. : ø2.36 inches





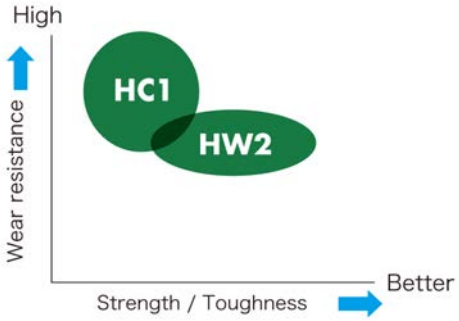
Gray cast iron continuous finishing | Alumina ceramics

HC1

First recommended grade for finishing ordinary gray cast iron
High-speed machining at 2300 SFM

Performance

- Dedicated grade for high-speed finishing
- Excellent wear resistance
- Highly heat resistant due to high-purity alumina components, ideal for high-speed and high-temperature machining



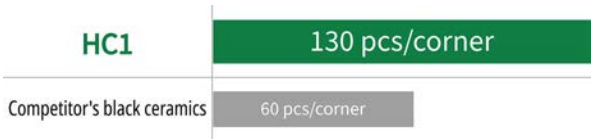
Application

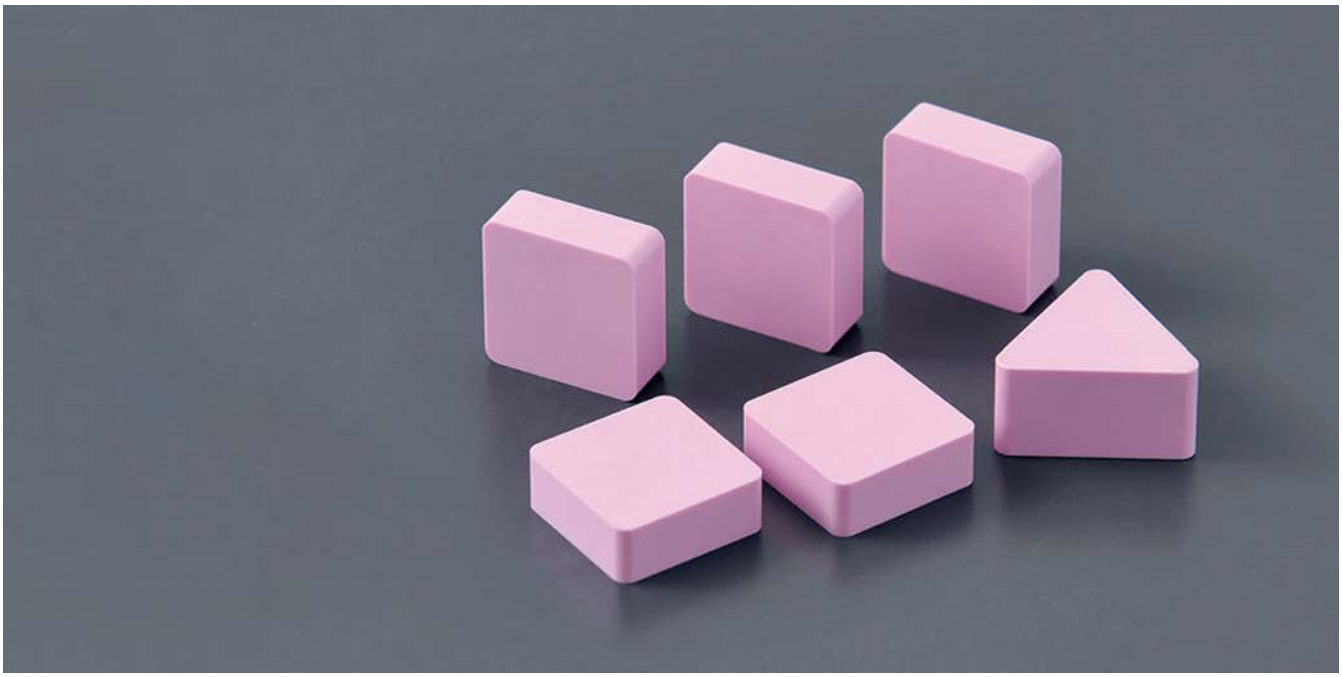
Gray cast iron turning
Finishing

Case study disc brake

HC1 has twice the tool life compared to other competitors' black ceramics.

Work material	FC250
Cutting speed	2100 SFM
Feed	.012 IPR
Depth of cut	.020 inch
Coolant	DRY





Gray cast iron continuous finishing | Alumina ceramics

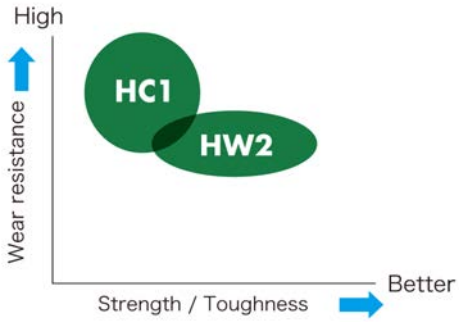
HW2

Stable high-speed finish machining is achieved by alumina particles with excellent high-temperature hardness and strength.

High-speed machining at 2300 SFM

Performance

- High-speed finishing
- High-strength and high-toughness grade using high-purity alumina with zirconia added



Application

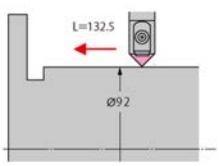
Gray cast iron

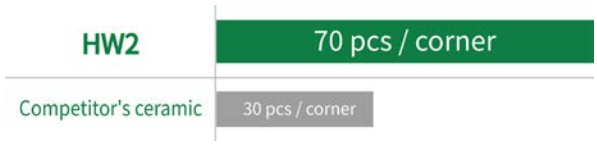
Finishing light interrupted to continuous turning

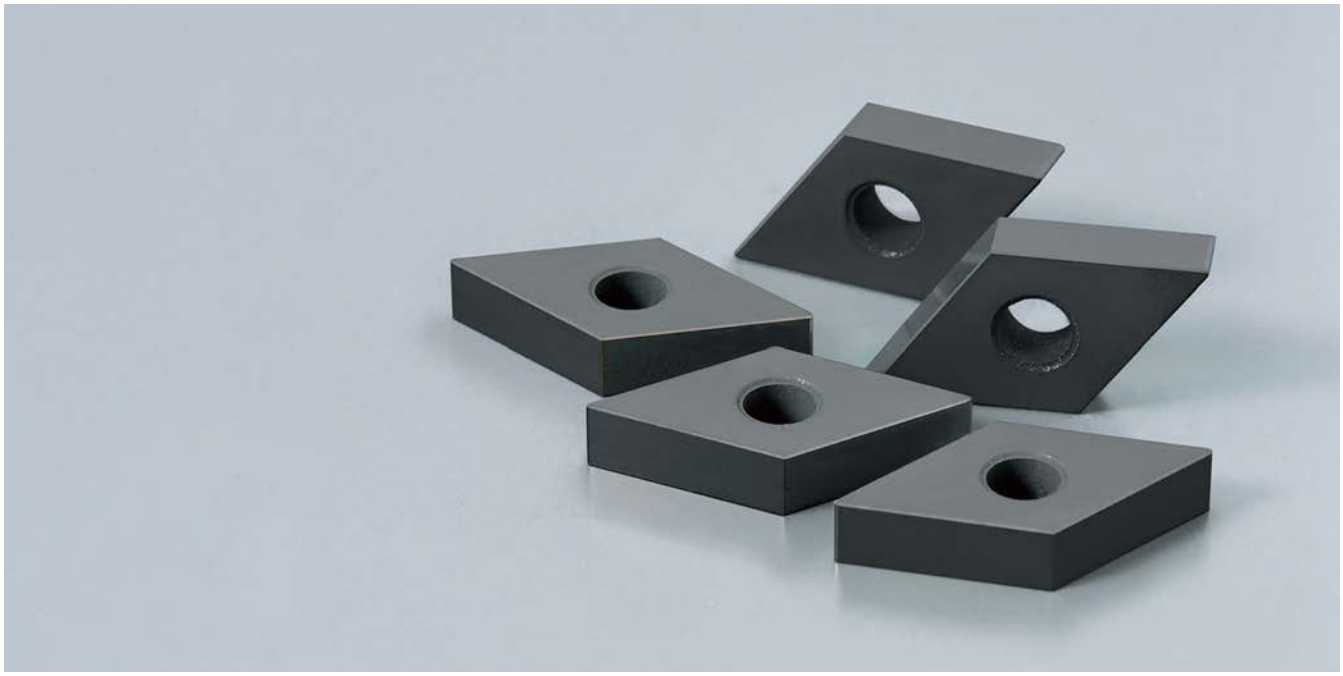
Case study Cylinder liner machining

HW2 has twice the amount of tool life than the competitor's grade, as well as a higher quality machined surface.

Work material	Chilled iron
Cutting speed	2000 SFM
Feed	.013 IPR
Depth of cut	.118 inch
Coolant	DRY







Ductile cast iron finishing | TiC based ceramic + alumina

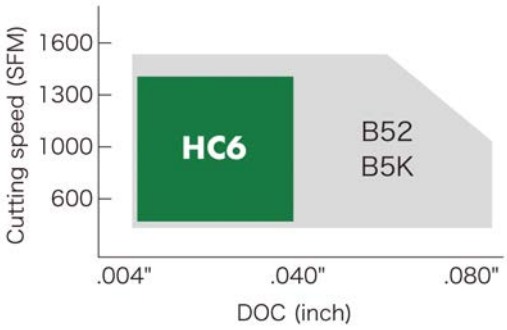
HC6

Ceramic grade specifically designed for ductile iron machining

Ideal for high-speed finishing at 1300 SFM

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



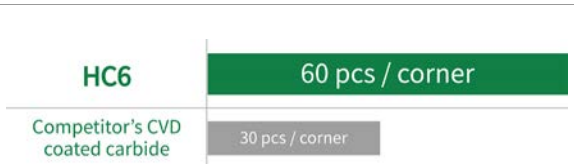
Application

Ductile cast iron
Finish turning

Case study Differential case machining

HC6 achieved double the tool life compared to competitor's CVD coated carbide.

Work material	Ductile cast iron
Cutting speed	900 SFM
Feed	.008 IPR
Depth of cut	.020 inch
Coolant	WET



Gray Cast iron with scale machining, excellent wear resistance | Silicon nitride ceramic

SX6

Machining gray cast iron at ~3900 SFM

Outstanding notch wear resistance and thermal shock resistance

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

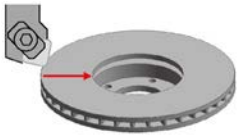
Application

Gray cast iron with scale
Turning / Milling

Case study brake disc

SX6 has a 1.5 times longer tool life than other competitors' silicon nitride.

Work material	FC150 with scale
Cutting speed	2400 SFM
Feed	.02 IPR
Depth of cut	.079~.118 inch
Coolant	WET



Ductile & Gray cast iron roughing with scale to finishing | Coated Silicon nitride ceramics

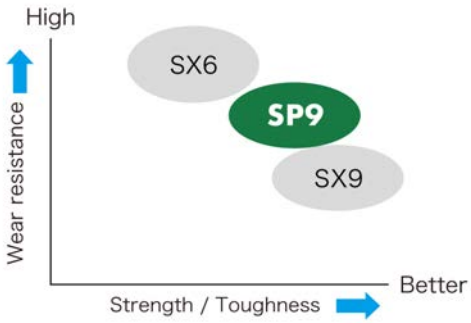
SP9

Excellent chipping resistance and wear resistance due to combination of high toughness and CVD coating

CVD coating enables longer tool life even in the low-speed range at 980 SFM

Performance

- Combination of high-toughness and CVD coating provides both excellent chipping resistance and wear resistance
- Minimum cutting edge treatment reduces cutting resistance
- Also capable of performing finishing operations



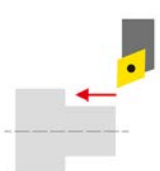
Application

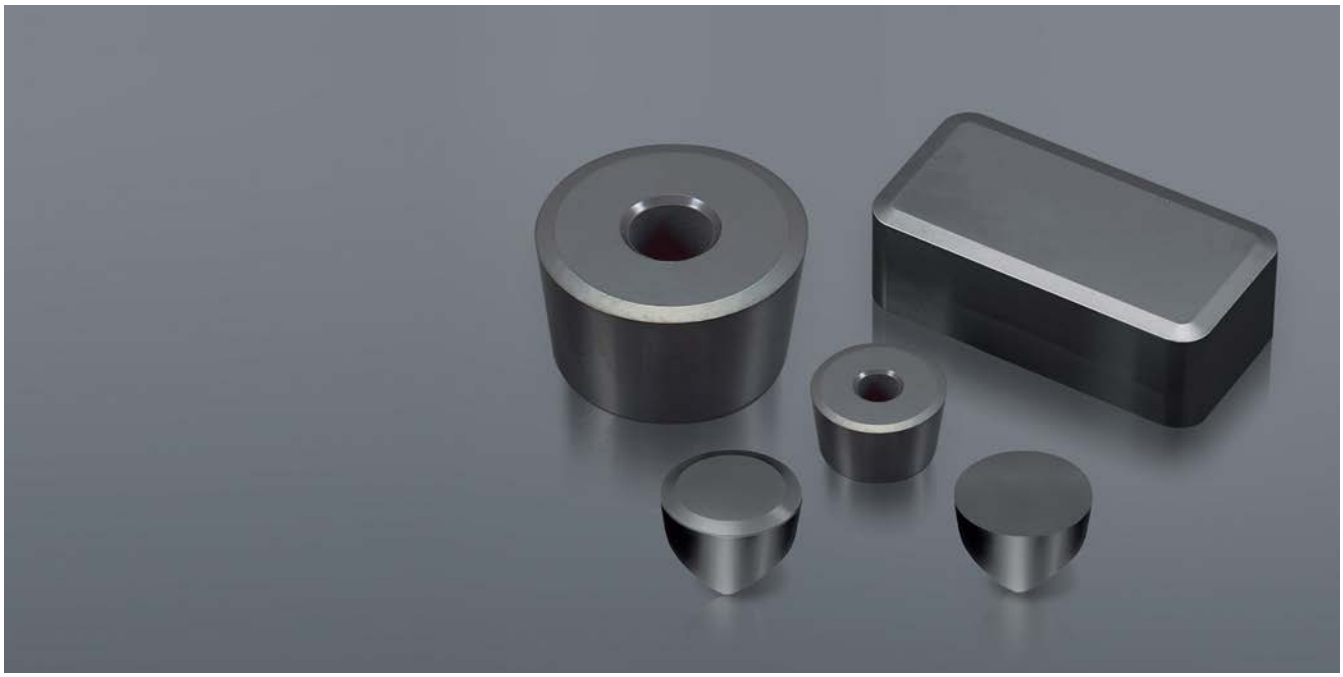
Ductile cast iron / Gray cast iron
Turning / Milling roughing with scale to finishing

Case study Differential case machining

SP9 can machine faster than other competitors' CVD coated carbide, and the C/T reduced to 1/2.

Work material	Ductile cast iron with scale
Cutting speed	1500 SFM (SP9) 660 SFM (CVD coated carbide)
Feed	.014 IPR
Depth of cut	.059 inch
Coolant	DRY





Gray cast iron and hardened material continuous machining | Alumina TiC based ceramics

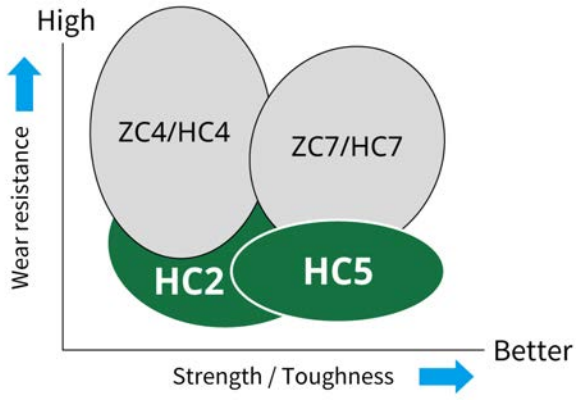
HC2 / HC5

All-purpose grade for machining gray cast iron and hardened materials

Well balanced grades between wear resistance and chipping resistance

Performance

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



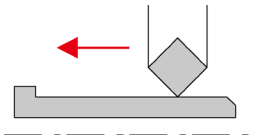
Application

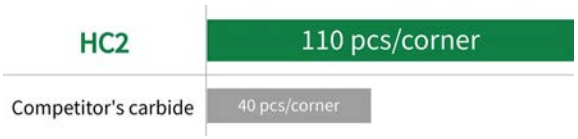
Gray cast iron / Semi to finishing with continuous machining
Hardened materials / Finishing
Hardened and cast iron mill rolls / Semi to finishing

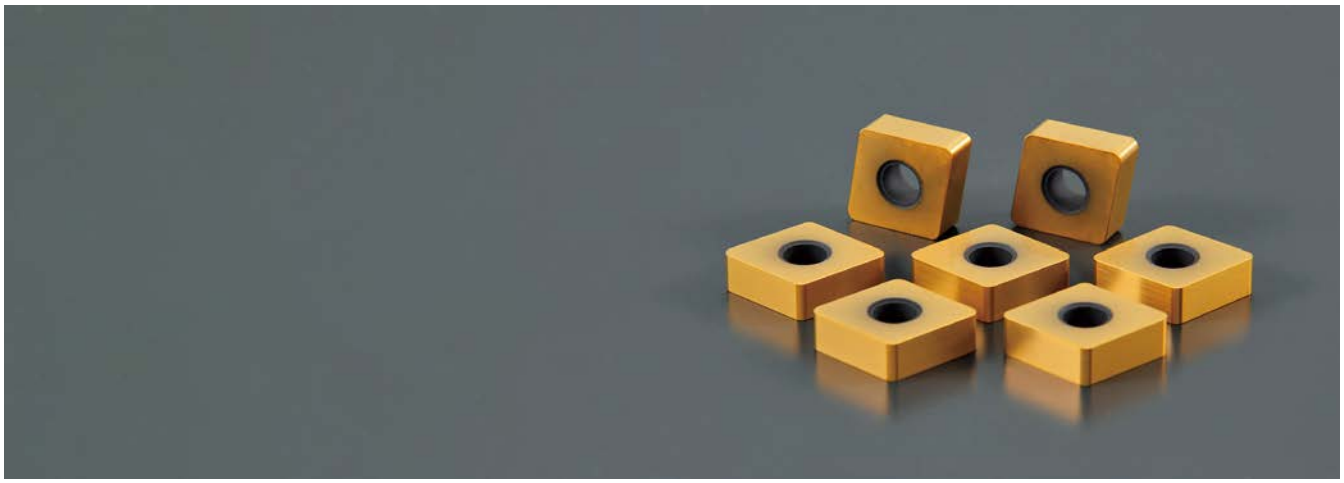
Case study cylinder liner machining

HC2 achieves 1.3 times higher machining efficiency and nearly three times longer tool life than the competitor's carbide.

Work material	Gray cast iron
Cutting speed	2000 SFM (HC2) 1300 SFM (competitor's carbide)
Feed	.020 IPR
Depth of cut	.028 inch
Coolant	DRY







Hardened material continuous machining | Alumina TiC based ceramics

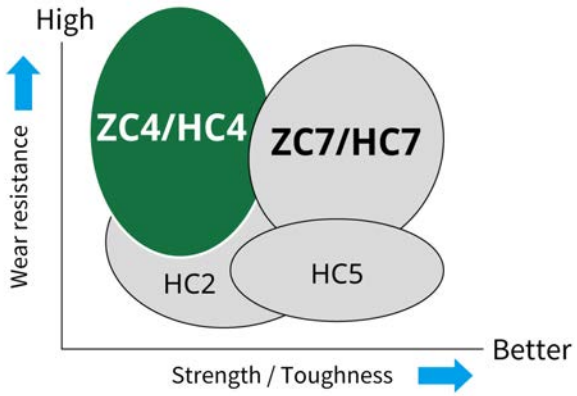
HC4/ZC4

Ceramic 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 combination of high toughness material and CVD coating
- Significant tool cost reductions are achieved by replacing CBN
- Inserts with a wiper flat are available to further improve machining efficiency



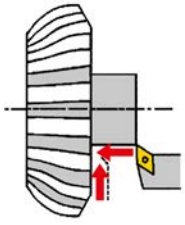
Application

Continuous machining of hardened materials HRC 55-70

Case study Gear machining

ZC4 has superior wear resistance and twice the tool life extension compared to competitors' tool.

Work material	Carburized and hardened steel (HRC 63)
Cutting speed	400 SFM
Feed	.004 IPR
Depth of cut	.006 inch
Coolant	DRY



Hardened material machining | Alumina TiC based ceramics

ZC7 / HC7

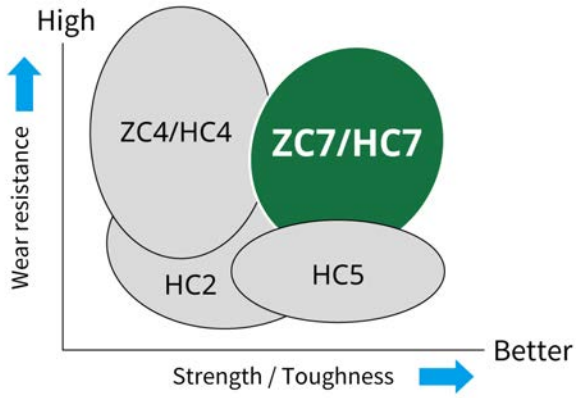
Suitable for work materials with a wide range of hardness

Reduces insert cost by replacing CBN

Suitable for hardened materials with hardness of HRC 30-62

Performance

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



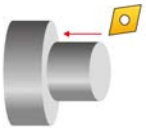
Application

Continuous machining of hardened materials HRC 30-62

Case study Tool parts machining

ZC7 can machine the same number of pieces as CBN and has a stable tool life. Significant cost reductions are achieved.

Work material	SCr42H
Cutting speed	400 SFM
Feed	.006 IPR
Depth of cut	.016 inch
Coolant	WET



Heat-resistant alloy roughing to semi-finish machining | SiAlON ceramics

SX3

Covers wide range of machining:Roughing with scale to semi-finishing

Ceramic grade combining toughness and wear resistance

High speed and stable machining in turning and milling

Performance

- Excellent wear and chipping resistance. Versatile ceramic 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 alloys

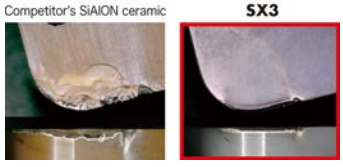
Turning / Profiling / Milling

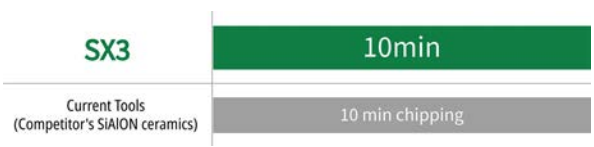
Roughing with scale to semi-finishing

Case study Rene130 with scale machining

In scale machining, SX3 was in good condition with no defects, whereas the competitor's SiAlON resulted in defects.

Work material	Rene130
Cutting speed	380 SFM
Feed	.006 IPR
Depth of cut	-
Coolant	WET





Heat-resistant alloy roughing with scale | SiAlON ceramics

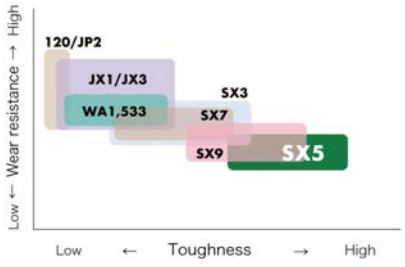
SX5

First recommendation for machining through scale

Excellent notch wear resistance ideal for machining scale

Performance

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



Application

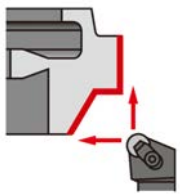
Heat resistant alloys

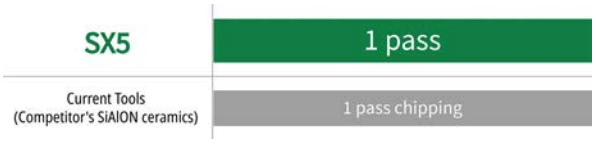
Turning / grooving through scale

Case study Aircraft part (Roughing with scale)

SX5 insert had more stable performance and no edge chipping compared to the competitor's SiAlON grade.

Work material	Inconel718
Cutting speed	670 SFM
Feed	.008 IPR
Depth of cut	.098 inch
Coolant	WET





Heat-resistant alloy roughing (no scale) to semi-finish machining | SiAlON ceramic

SX7

Better notch resistance than whisker ceramics

Improved boundary wear resistance to prevent cutting edge wear and breakage

Performance

- Better notching resistance compared to whisker ceramics
  No need to program ramping to shift wear on insert
- Better flank wear resistance compared to other SiAlONs.
- Ideal for semi-finishing Inconels and Waspaloy

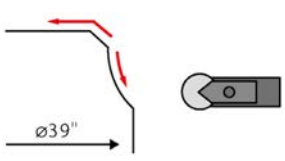
Application

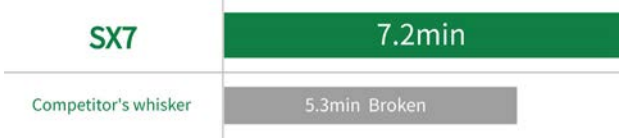
Roughing with no scale to semi-finishing heat resistant alloys
Turning / Grooving / Milling

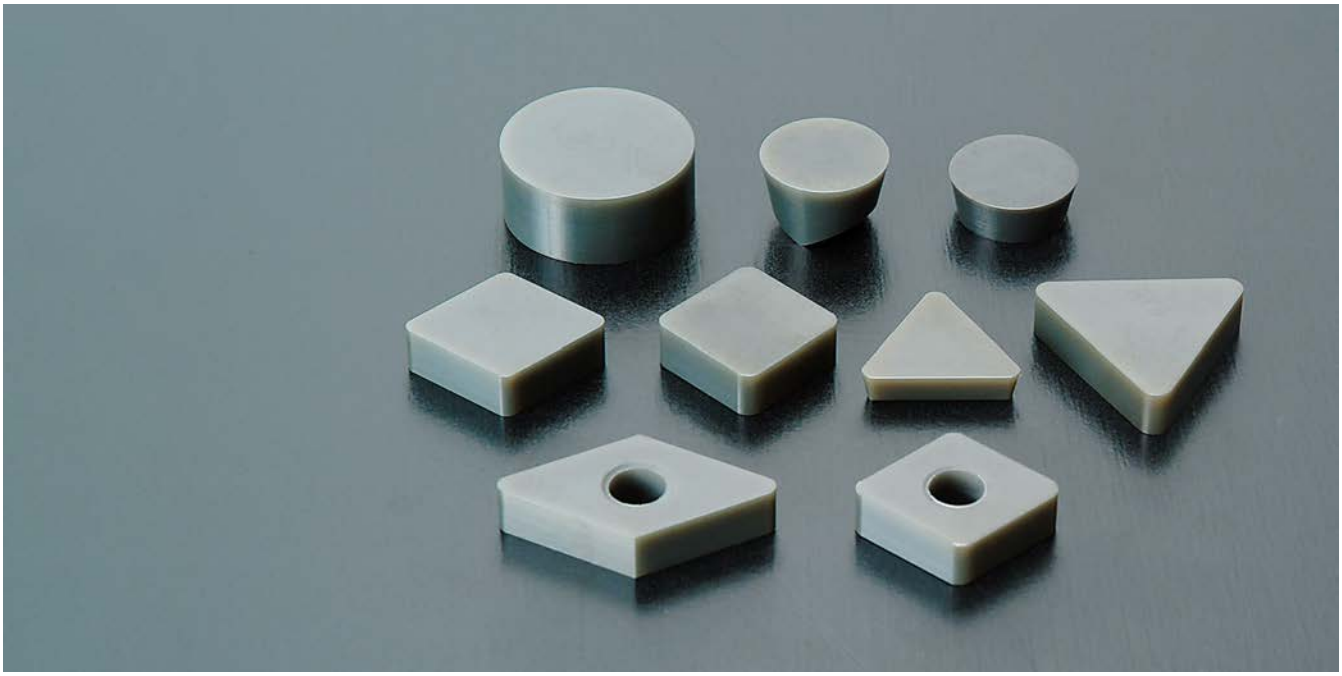
Case study Turbine case (semi-finishing)

SX7 insert achieved more stable machining due to its excellent notching resistance compared to the competitor's whisker insert.

Work material	Waspaloy
Cutting speed	800 SFM
Feed	.012 IPR
Depth of cut	Varied depth of cut
Coolant	WET







Heat-resistant alloy roughing (scale) to semi-finish machining | SiAlON ceramic

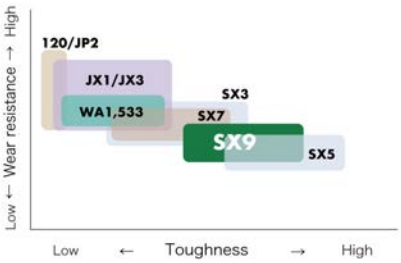
SX9

SiAlON ceramic grade material with improved chipping resistance

Best grade for roughing heat resistant alloys like Inconel 718 with scale

Performance

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



Application

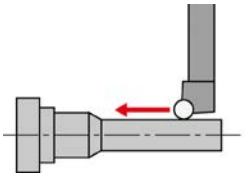
Heat resistant alloys

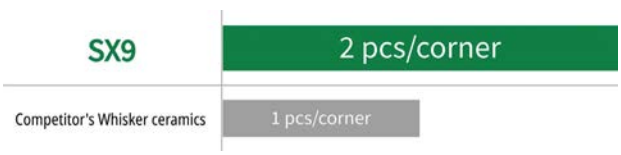
Turning / Milling / End milling : roughing operations

Case study Aircraft part (with scale)

SX9 is a significant cost advantage and achieved double the tool life compared to competitor's whisker insert.

Work material	Inconel718
Cutting speed	600 SFM
Feed	.008 IPR
Depth of cut	~ .024 inch
Coolant	WET





Heat-resistant alloy roughing (no scale) to semi-finish machining | Whisker ceramic

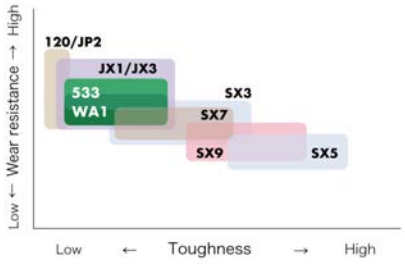
NTK533 / WA1

High speed and efficient machining of heat resistant alloys

SiC fibers in the material provide strength, flank wear resistance and thermal shock resistance

Performance

- Alumina ceramic 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



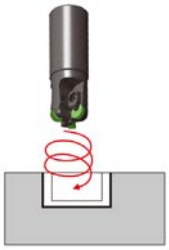
Application

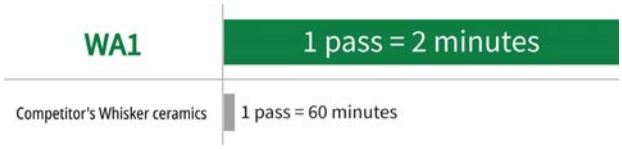
Roughing (no scale) to semi-finishing heat resistant alloys
Turning / Grooving / Milling

Case study Gas turbine case

WA1 significantly reduced cycle time compared to the competitor's carbide end mill.

Work material	Inconel718
Cutting speed	2700 SFM
Feed	.004 IPR
Depth of cut	.080 inch
Coolant	DRY



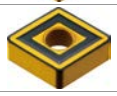


Micro-grain Carbide and PVD/CVD-coated Carbide

Excellence in precision machining and machining of hard-to-cut materials

These material grades use WC micro-grain carbide, the hard base material is a micro size 1um granulated substrate. Furthermore, the substrate is coated using a PVD method with TiN, TiCN, and/ or TiAlN. The process results in a tougher and harder carbide with ultra sharp cutting edges. The variety of grades are suitable for machining difficult-to cut materials and demanding high precision small part applications. This selection of micro-grain carbide grades exhibit excellent wear resistance and thermal crack resistance.

Features

Work material	Grade		Coating		Application	Physical properties*					
						Density g/cm³	Hardness HRA	Bending strength Mpa	Young's modulus GPa	Thermal expansion coefficient ×10⁻⁶/K	Thermal conductivity W/m.K
S Heat resistant alloy	650		thick PVD	HiPIMS	Best performance on small diameter Ni-based alloy workpieces. (Approx. dia. 0.787")	14.4	91.0	3000	580	5.8	63
M Stainless steel	ST4		thick PVD	CrAlN	Best grade for 304 SS	14.4	91.0	3000	580	5.8	63
	DT4		thin PVD	TiAlN	Excellent oxidation resistance for Swiss-type lathes	14.4	91.0	3000	580	5.8	63
	TM4		thin PVD	TiN-TiCN	Best combination of wear resistance, toughness and adhesion resistance for Swiss-type lathes	14.4	91.0	3000	580	5.8	63
	ZM3		thick PVD	TiN	Best adhesion resistance enables high accuracy machining	14.4	91.0	3000	580	5.8	63
	DM4		thick PVD	TiAlN	Best oxidation resistance for high temperature machining	14.4	91.0	3000	580	5.8	63
P Steel	QM3		thick PVD	TiCN	Best wear resistance enables stable machining	14.4	91.0	3000	580	5.8	63
	VM1		thin PVD	TiCN	Best edge sharpness and good wear resistance	14.8	92.0	2500	640	5.7	84
	CP7		thick CVD	Al_2O_3-TiCN	Roughing to semi-finishing of steel	13.8	90.1	2200	580	-	-
K Cast iron	CP1		thick CVD	Al_2O_3-TiCN	For cast iron and ductile cast iron	14.9	92.0	2400	640	-	-
N Non-ferrous material	KM1		uncoated	-	Best for non-ferrous materials; features a polished mirror finish surface	14.8	92.0	2500	640	5.7	84
M P N	AC3		thin PVD	TiAlN-TiAlCrN	Developed for solid carbide endmills	14.2	91.0	3000	560	6.1	49

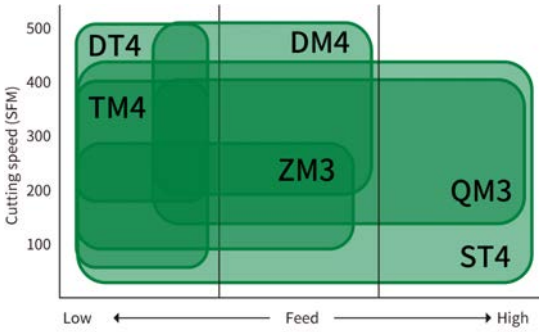
※The values of the base material are indicated.

Coating specifications

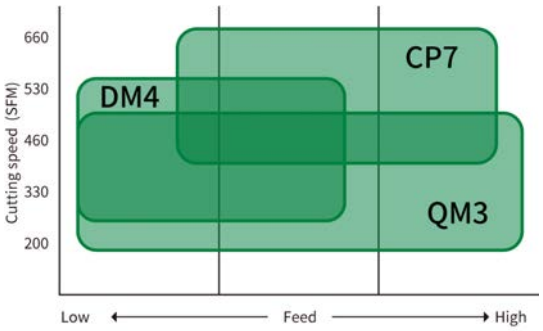
	650	ST4	QM3	DM4	DT4	TM4	VM1	ZM3
Thickness	Thick	Thick	Thick	Thick	Thin	Thin	Thin	Thick
Wear resistance		○	◎	○	○	○	○	
Heat resistance	◎	○		◎	◎			○
Adhesion Resistance		◎				○		◎
Edge Sharpness					○	○	◎	
Composition	HiPIMS	CrAlN	TiCN	TiAlN	TiAlN	TiN-TiCN	TiCN	TiN

◎1st choice ○2nd choice

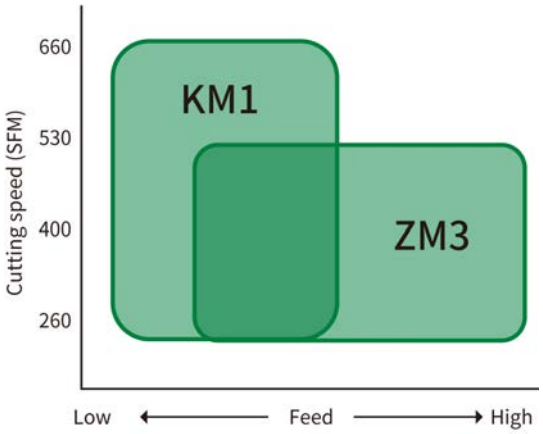
Stainless steel



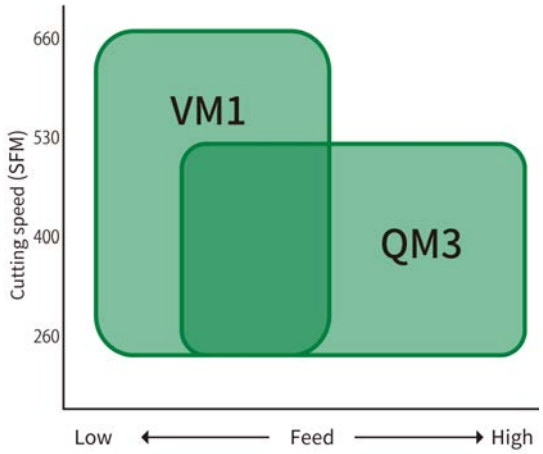
Carbon and alloy steel



Aluminum and brass



Free-cutting steel



Ni-based alloy machining | PVD coated carbide

NTK650

For more stable machining of small-diameter Ni-based components

Common challenges : Edge damage and wear from welding

Discover stable machining with NTK's Innovative Material, 650

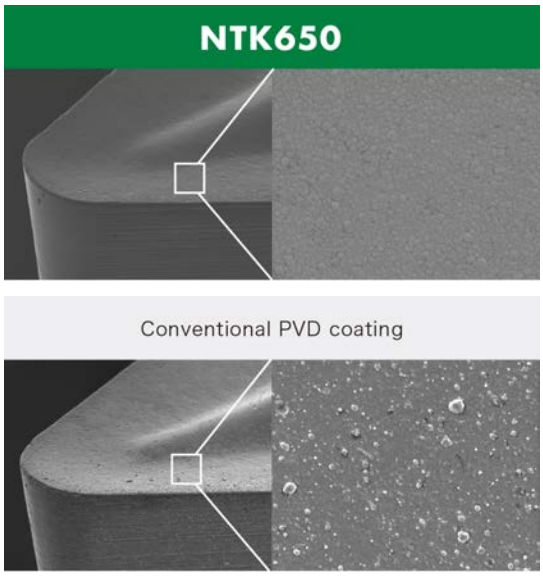
Features

- **Adoption of new HiPIMS coating. Improvement of surface-smoothness and suppression of imperfections in coating**
  Improves welding performance, which is critical to providing stable machining of Ni-based alloys
- **TiAlN system with excellent hardness and heat resistance achieves long life**
  Excellent wear resistance even in difficult-to-machine material processing with high cutting edge temperature

Application

Small diameter Ni-based alloy workpieces. (Approx. dia. 0.787")

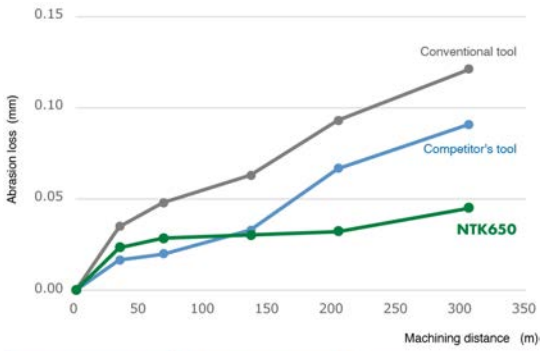
New HiPIMS PVD grade



Performance

Cutting conditions

Material: Inconel 718 164 SFM .002 IPR .039" DOC WET, DCGT 32.508M



Ideal for stainless steel machining | PVD coated carbide

ST4

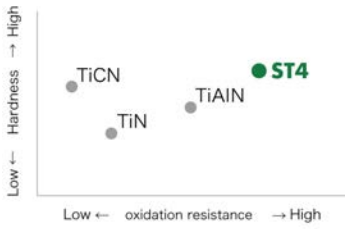
Stable and consistent performance machining tough materials like 304 SS

Solution for stainless steel machining issues like reduced tool life, inconsistency of part dimensions, and poor chip control.

Performance

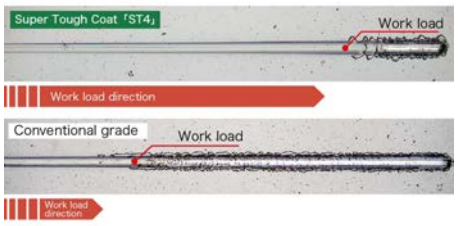
Unique coating with a high aluminum composition dramatically improves hardness and oxidation resistance.
Extended tool life is achieved by suppressing wear due to increased cutting temperatures.

Coating wear and oxidation chart



Coating layer adhesion strength

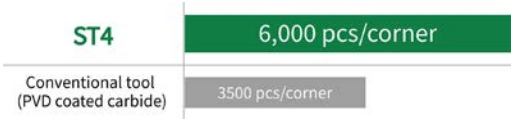
Significantly improved insert surface smoothness and coating adhesion.
Prevents adhesion to the cutting edge, which tends to occur in stainless steel machining, leading to stabilization of dimensional accuracy and machined surfaces.



Case study

ST4 has approximately 1.7 times longer tool life than competitor's tools.

Work material	SUS316L
Cutting speed	200 SFM
Feed	End face .0004 IPR External .0012 IPR
Depth of cut	.012 - .079 inch
Coolant	WET



General-purpose machining with excellent adhesion resistance | PVD coated carbide

ZM3

Excellent adhesion resistance and dimensional stability, ideal for high-precision machining of small-diameter workpieces

Achieves stable machining with its resistance to built up edge

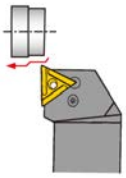
Performance

- Stable machining dimensions due to high adhesion of the coating
- Smooth TiN coating provides outstanding adhesion resistance

Case study

ZM3 offers outstanding adhesion resistance and dimensional stability with a tool life that is 40 times longer than that of competitor's tools.

Work material	S10C
Cutting speed	330 SFM
Feed	.005 IPR
Depth of cut	.012 ~ .016 inch
Coolant	WET



General purpose machining with excellent wear resistance | PVD coated carbide

TM4

Versatile grade for all types of work materials

Easy-to-use grade with excellent sharpness and adhesion resistance

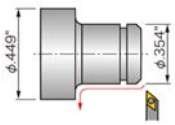
Performance

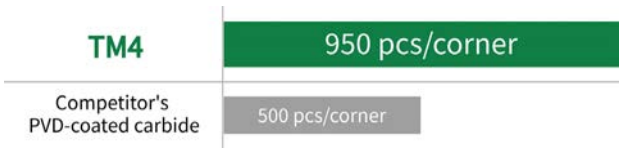
- Excellent workpiece dimensional stability and tool life due to multilayer coating
- A smooth hard coating with excellent adhesion resistance

Case study automotive parts

TM4 achieved 1.9 times longer tool life than the competitor's product. Its superior wear resistance ensured long stable machining.

Work material	304SS
Cutting speed	270 SFM
Feed	.0008 IPR
Depth of cut	~.047 inch
Coolant	WET





Machining difficult-to-cut materials | PVD-coated carbide

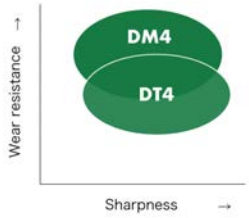
DT4 / DM4

Ideal for machining difficult-to-cut materials such as titanium and heat-resistant alloys

Stable machining even under conditions where cutting heat tends to concentrate on the cutting edge

Performance

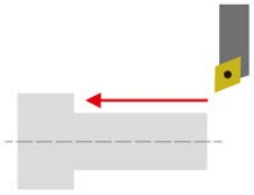
- Thick TiAlN coating reduces cutting tool damage due to heat generated during machining.
- DT4 has a thin coating layer. A sharp cutting edge ideal for machining small diameter parts.
- DM4 has a thick coating layer. A combination of heat resistance and wear resistance makes it ideal for high load machining such as parting and grooving.

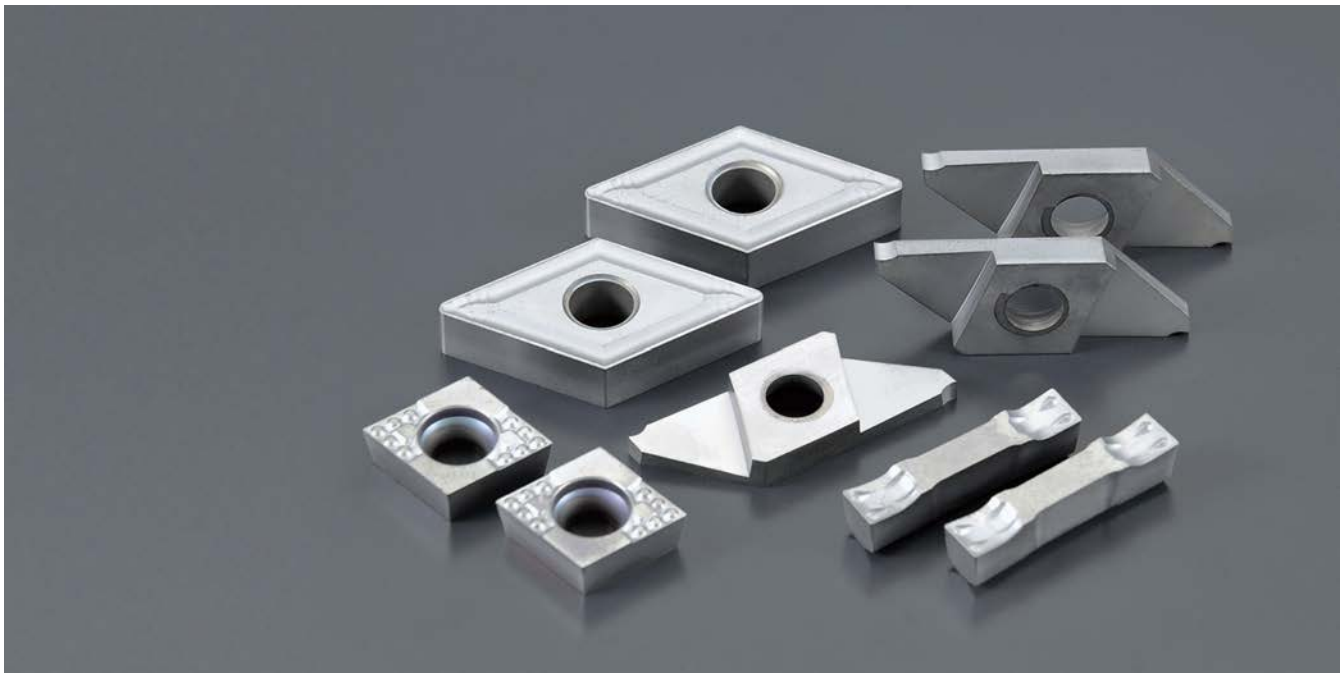


Case study medical screw

DM4 achieved approximately 1.6 times longer tool life than the competitor's product.

Work material	Titanium alloy
Cutting speed	200 SFM
Feed	.0008 IPR
Depth of cut	.002 inch
Coolant	WET





Carbon and alloy steel machining | PVD coated carbide

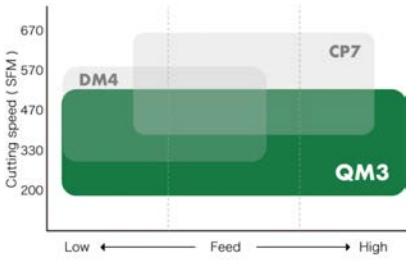
QM3

Longer tool life and stable machining of carbon and alloy steels such as S45C and SCM materials
Excellent wear resistance ensures stable machining and extended tool life

Performance

- Combination of tough carbide material and TiCN coating provides excellent chipping resistance.
- Excellent wear resistance, especially in the low speed range.
- Stable machining even in heavy interruptions.

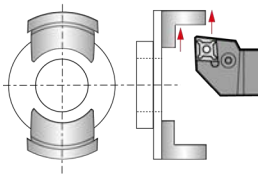
Application area

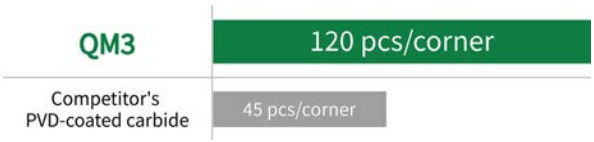


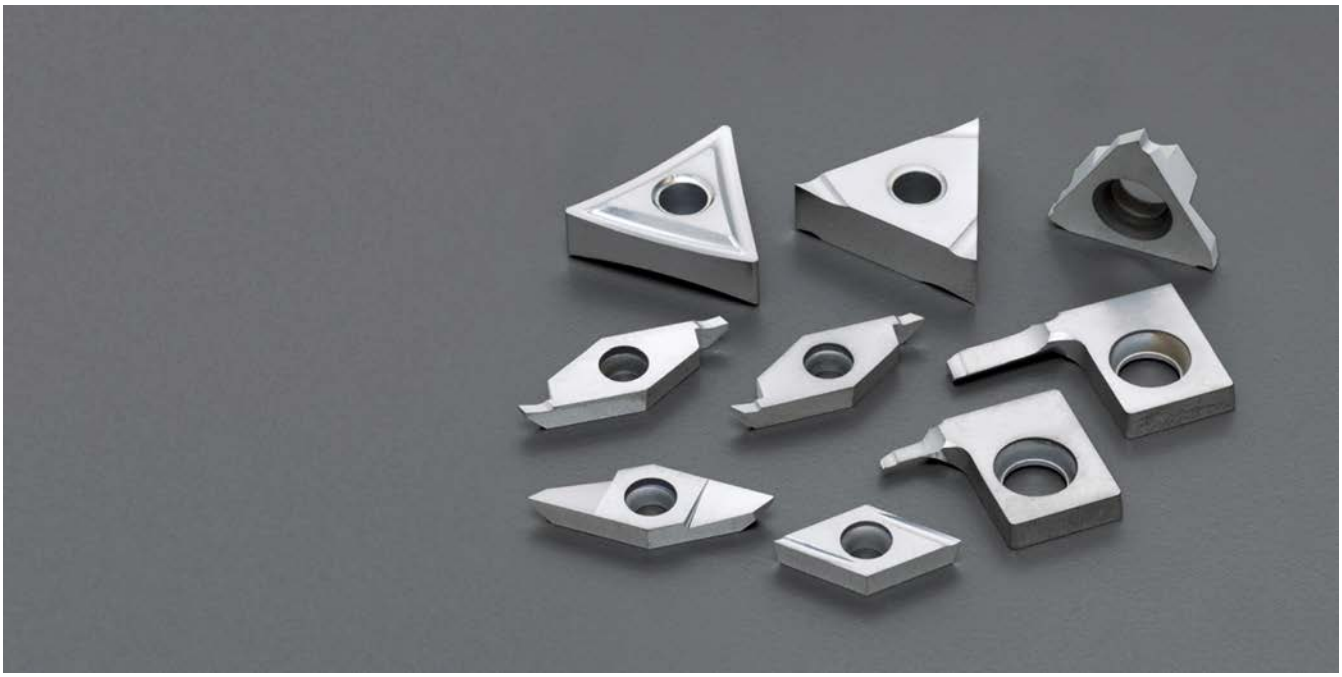
Case study

The combination of QM3 and Z5 chipbreaker extends the tool life by more than 2.5 times, while the competitor's tool experienced unstable tool life.

Work material	S50C
Cutting speed	520 SFM
Feed	.013 IPR
Depth of cut	.059 inch
Coolant	WET







Free-cutting steel machining | PVD-coated carbide

VM1

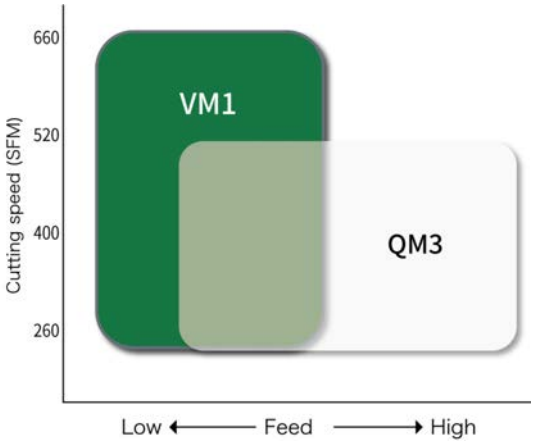
Ideal for machining free-cutting steel (SUM)

Long-tool life machining is achieved by reducing the built up edge on the cutting edge.

Performance

- Thin-layer TiCN coating provides both outstanding sharpness and wear resistance.
- Achieves long tool life and high-precision machining even at high speeds.

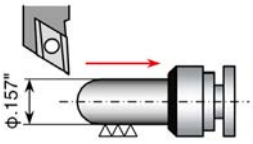
Application area

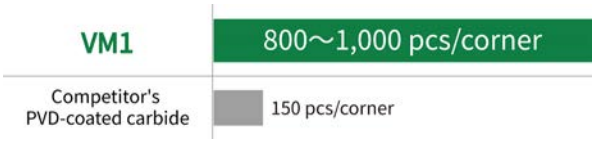


Case study

VM1 is stable in both dimensions and surface finish and has 5 times longer tool life than the competitor's product.

Work material	SUM24L
Cutting speed	460 SFM
Feed	.001 IPR
Depth of cut	.004 inch
Coolant	WET





High-speed machining of carbon and alloy steel | CVD coated carbide

CP7

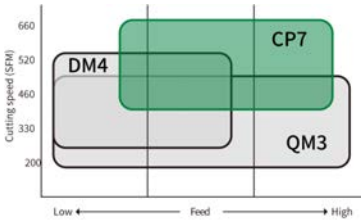
Ideal for high-speed machining of alloy steel and carbon steel

CVD multilayer coating for outstanding performance machining steel

Performance

The CVD multi-layer coating and high strength base material provides excellent wear resistance and toughness that can be used in a wide range of applications.

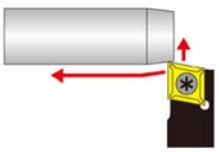
Application area

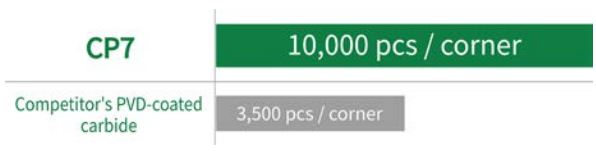


Case study

Achieves approximately 3 times the tool life of the competitor's coated carbide.
Wide range of applications are possible.

Work material	SUJ2
Cutting speed	300 SFM
Feed	.006 IPR
Depth of cut	.020 inch
Coolant	WET





Grey cast iron and ductile cast iron with scale machining | CVD coated carbide

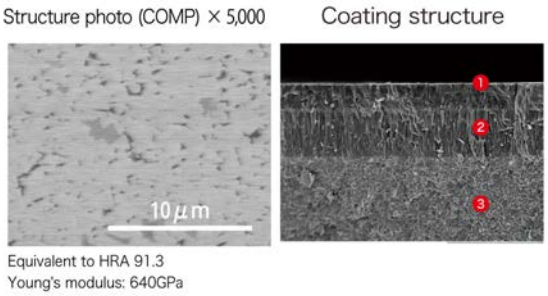
CP1

Achieves high efficiency and stable machining even under conditions where cutting speed cannot be increased

Outstanding wear resistance at 1000 SFM

Performance

- Specializing in scale machining of grey and ductile cast iron.
- Excellent wear resistance and stable machining are achieved with a thick TiCN layer and an Al_2O_3 layer in the coating.
- Unique smooth rake face surface provides superior adhesion resistance.



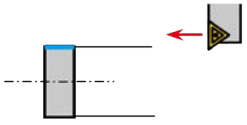
Equivalent to HRA 91.3
Young's modulus: 640GPa

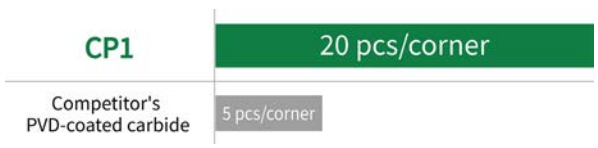
① A very smooth layer of fine grain Al2O3
② Fine column shaped grain TiCN layer
③ Ultra - hard carbide base material

Case study

CP1 achieves higher machining efficiency than competitor's tools.

Work material	FCD450
Cutting speed	660 SFM
Feed	.005 IPR
Depth of cut	.039 inch
Coolant	WET





Non-ferrous metal machining, cost effective | Uncoated carbide

KM1

Ideal for machining non-ferrous metals such as aluminum, brass, and resin

Excellent machined surfaces are achieved by reducing the occurrence of built up edge

Outstanding sharpness solves the problem of a rough machined surface

Performance

- Uncoated fine-grained carbide with excellent sharpness.
- Mirror polished surface reduces built up edge.
- Stable machining dimensions and excellent surface finishes.

KM1 comparison chart

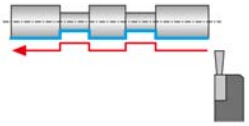
Up sharp edges and mirror finish

Case study

The competitor's product machined 3 roughing passes and a finishing pass. The chips often scratched the workpiece. The cycle time was more than 3 minutes.

KM1 machined in a single pass, reducing the cycle time to 1 minute and 50 seconds.

Work material	A5056
Cutting speed	300~570 SFM
Feed	.0015 IPR
Depth of cut	.020~.200 inch
Coolant	WET



End mill tools | PVD coated carbide

AC3

Developed for solid carbide end milling

Ideal for end milling of small-diameter workpieces that are prone to chattering, or applications that have problems with burrs forming

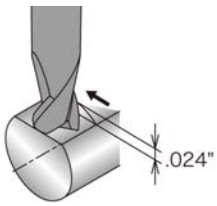
Performance

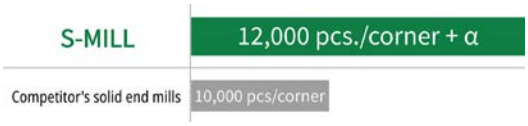
- TiAlN-TiAlCrN coated + fine grain carbide
- Grade with both excellent sharpness and wear resistance required for end milling on CNC type automatic lathes

Case study

The current tool created a poor machined surface when it reached the end of its tool life. The S-Mill achieved good surface finish and an extended tool life.

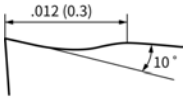
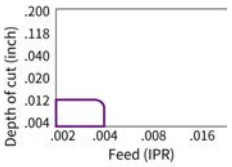
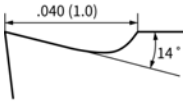
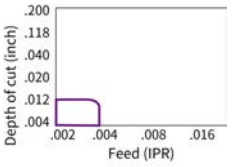
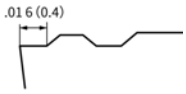
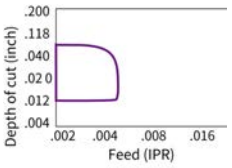
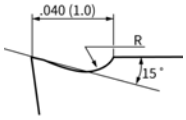
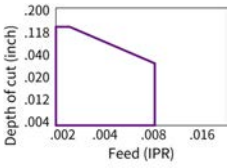
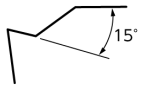
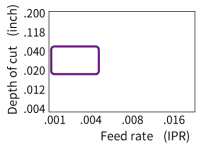
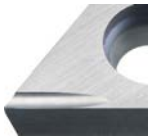
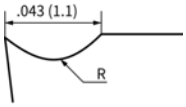
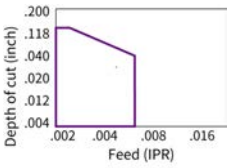
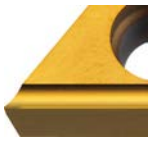
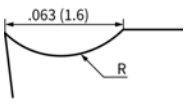
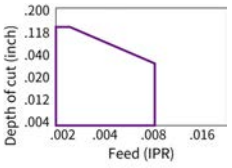
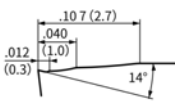
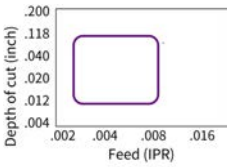
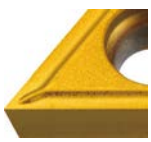
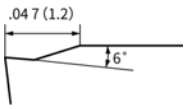
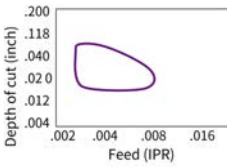
Work material	SUS416F
Cutting speed	3,200 rpm
Feed	5.5 IPM
Depth of cut	.024 inch
Coolant	WET



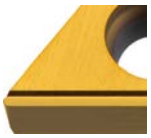
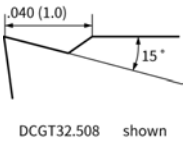
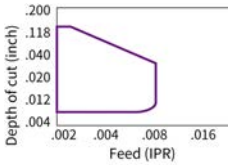
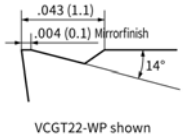
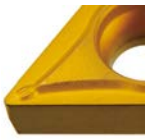
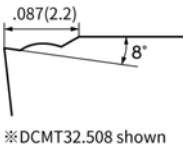
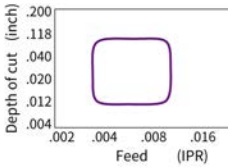
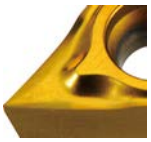
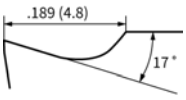
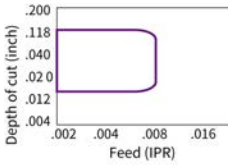
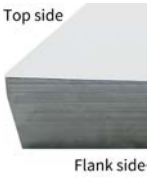
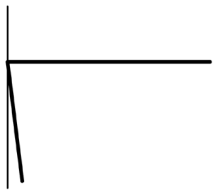


Chipbreaker for turning

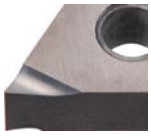
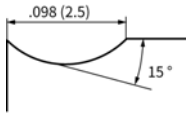
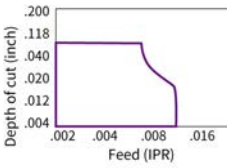
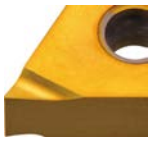
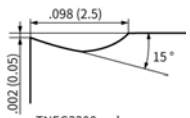
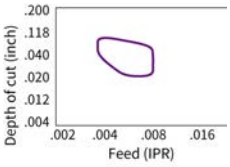
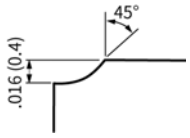
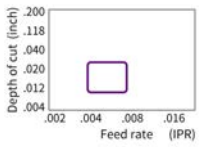
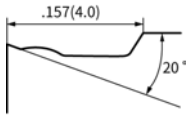
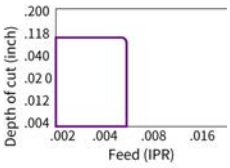
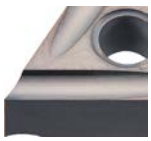
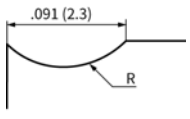
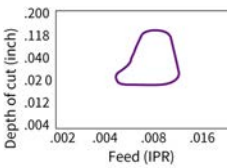
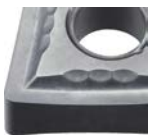
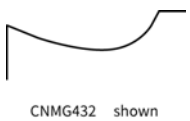
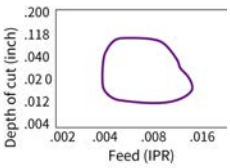
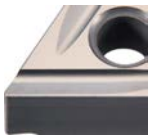
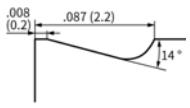
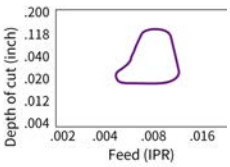
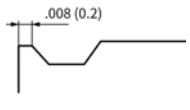
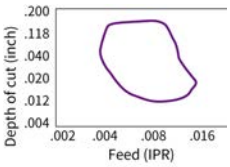
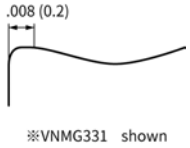
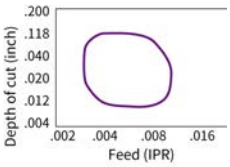
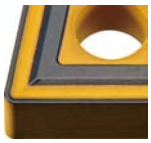
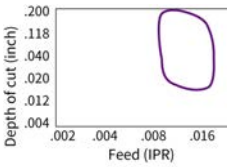
Positive inserts - Chipbreaker Overview

Application	Type	Chipbreaker design		Features	Applicable range
Finishing	**AMX**		 DCGT32.508M shown	• Designed for very light depth of cut	
	KHG		 DCET32.508 shown	• Excellent chip control on finishing cuts • For super high-precision machining • Precision tolerance in corner radius: ±.0004"	
	AZ7		 DCGT32.508M shown	• Excellent chip control at light feed and light depth of cut	
	AT		 DCGT32.508 shown	• Excellent adhesion resistance with dimensional stability • Best for small diameter parts and for machining low carbon steels	
Light cut	**TMV**			• Chipbreaker for Vibration Cutting • Reliably long tool life and stable chip evacuation during vibration cutting	
	UHG		 DCET32.504M shown	• Excellent chip control on finishing cuts • Precision tolerance in corner radius: ±.0004"	
	U **U1**		 DCGT32.508 shown	• Sharp cutting edge prevents materials from work hardening [chipbreaker width] U →.043" U1→.063"	
	YL		 DCGT11T302MYL	• Great combination of sharpness and toughness • Excellent chip control	
	AM3		 DCGT32.508 shown	• All purpose chipbreaker • Sharp edge with toughness	

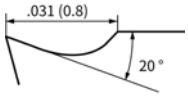
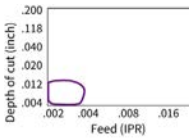
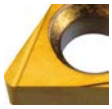
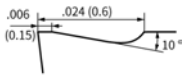
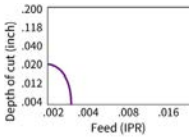
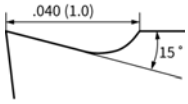
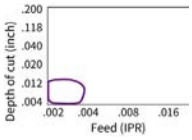
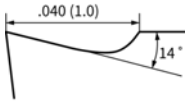
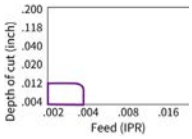
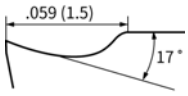
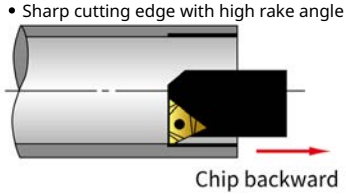
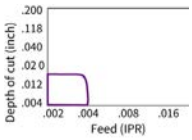
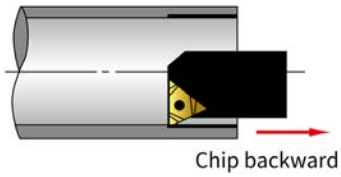
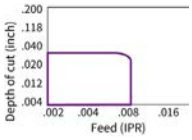
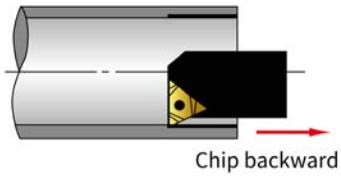
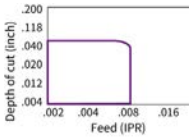
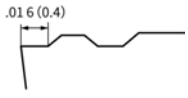
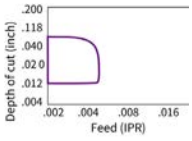
Positive inserts - Chipbreaker Overview

Application	Type	Chipbreaker design		Features	Applicable range
Middle Cut	**S**		 DCGT32.508 shown	• Standard ground chipbreaker with wide cutting condition coverage • Sharp cutting edge with excellent chip control	
	SX		 VCGT22-WP shown		
	AZ8		 ※DCMT32.508 shown	• Superior cutting quality and versatile breaker with CVD coating	
	CL		 DCGT32.508M shown	• Sharpest molded chipbreaker • Excellent chip control • Less tool pressure	
Non-ferrous	**V** **P** **H**			• Very up-sharp edge with mirror finish • V: Mirror finish on Top and Flank side with R0 nose radius • P: Mirror finish on Top and Flank side • H: Mirror finish on Top side	–

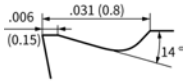
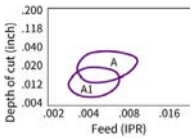
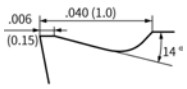
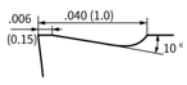
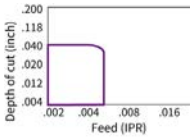
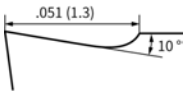
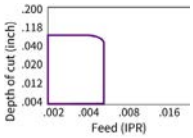
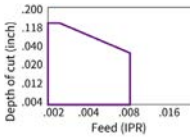
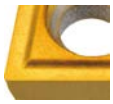
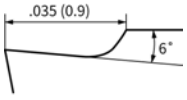
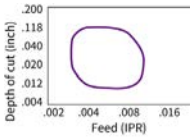
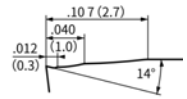
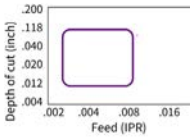
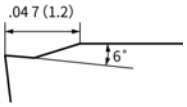
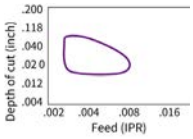
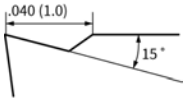
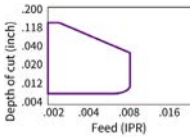
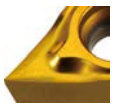
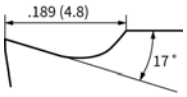
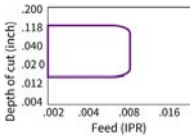
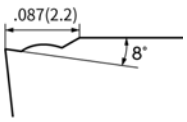
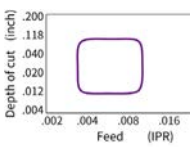
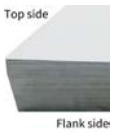
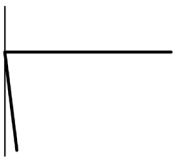
Negative inserts - Chipbreaker Overview

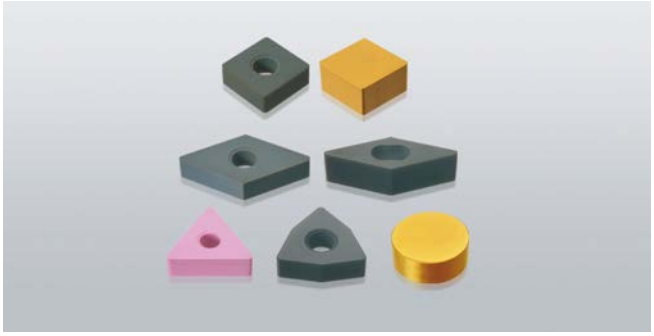
Application	Type	Chipbreaker design	Features	Applicable range
Finishing	**DA**	 	• Excellent chip control and sharp cutting edge	
	D1	 	• Excellent chip control and sharp cutting edge	
	AG		• Resolve chip entanglement, which is likely to occur during machining of low-hardness layer	
Light cut	**UL**		• Negative insert with a positive insert's chipbreaker • Reduced burr • Improved microfinish formation • Superb advantage in cost formation corner over positive inserts	
Middle Cut	**U2**	 	• Reduces burrs and work hardening due to high rake design	
	ZP	 	• Double-positive rake and sharp cutting edge • Low tool pressure even at heavy depth of cut	
	C	 	• General-purpose chipbreaker with excellent toughness and chip control	
Rough Cut	**Z5**		• Very tough insert • Designed for machining through heavy interruption	
	AM1		• Tough chipbreaker for roughing with exceptional stability	
	G		• Tough chipbreaker for roughing with exceptional stability	

ID turning positive inserts - Chipbreaker Overview

Application	Type	Chipbreaker design		Features	Applicable range
Internal Finishing	**A2**		 ERGP52Y shown	• Control chips at light feed and light depth of cut • Sharp cutting edge due to large rake angle	
	B1		 TCGP5208 shown	• Stable cutting thanks to sharp and tough cutting edge	
	K		 TPGHP7308 shown	• Superb chip control on finishing applications • Sharp cutting edge with the high rake angle	
	KHG		 DCET32.508 shown	• For super high-precision machining • Precision tolerance in corner radius: ±.0004"	
	FG		 TPGH221 shown	• Evacuates chips BACKWARD at light depth of cut • Sharp cutting edge with high rake angle 	
	F05		TPGP5208 shown	• Evacuates chips BACKWARD • Excellent choice for blind hole machining 	
	F1		TPGP2208 shown	• Evacuates chips BACKWARD • Excellent choice for blind hole machining 	
	AZ7		 DCGT32.508M shown	• Excellent chip control at light feed and light depth of cut	

ID turning positive inserts - Chipbreaker Overview

Application	Type	Chipbreaker design		Features	Applicable range
Internal Light cut	**A1**		 CPGP8308 shown	• Tough cutting edge and good chip control • General-purpose ID chipbreaker	
	A		 CPGP0308 shown	• Tough cutting edge and good chip control • General-purpose ID chipbreaker	
	B2		 TPGP7308 shown	• Stable cutting thanks to sharp and tough cutting edge	
	B3		 TPGP6308 shown	• Stable cutting thanks to sharp and tough cutting edge	
	U **U1**		DCGT32.508 shown	• Sharp cutting edge prevents materials from work hardening [chipbreaker width] U →.043" U1→.063"	
	AM5		 CPGH21.508 shown	• Provides both good cutting performance and chip control	
	YL		 DCGT11T302MYL	• Great combination of sharpness and toughness • Covers extremely wide range • Excellent chip control	
Internal Middle Cut	**AM3**		 DCGT32.508 shown	• All purpose chipbreaker • Sharp edge with toughness	
	S		 DCGT32.508 shown	• Standard ground chipbreaker with wide cutting condition coverage	
	CL		 DCGT32.508M shown	• Sharpest molded chipbreaker • Less tool pressure	
	AZ8		 ※DCMT32.508 shown	• CVD coated chip breaker with excellent sharpness and high versatility.	
Non-ferrous	**V** **P** **H**			• Very up-sharp edge with mirror finish • V: Mirror finish on Top and Flank side with R0 nose radius • P: Mirror finish on Top and Flank side • H: Mirror finish on Top side	-



Turning Insert

ANSI / ISO Insert Nomenclature D02

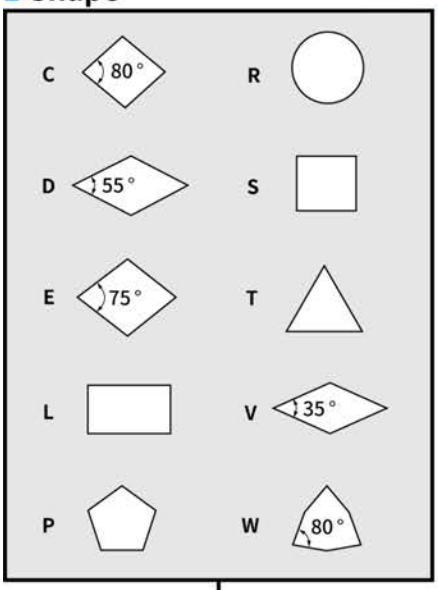
BIDEMICS / Ceramics / NTK CeramiX D06

Carbide D32

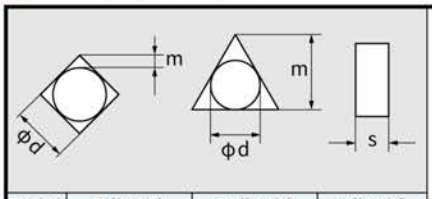
ANSI / ISO Insert Nomenclature

BIDEMICS / Ceramics

1 Shape



3 Tolerance Class



Symbol	d (inch)	m (inch)	s (inch)
A	±.0010	±.0002	±.0010
F	±.0050	±.0002	±.0010
C	±.0010	±.0005	±.0010
H	±.0050	±.0005	±.0010
E	±.0010	±.0010	±.0010
G	±.0010	±.0010	±.0050
J	±.0020	±.0020	±.0050
K	±.002 ~±.005	±.0005	±.0010
L	±.002 ~±.005	±.0010	±.0010
M	±.002 ~±.005	±.003 ~±.007	±.0050
N	±.002 ~±.005	±.003 ~±.007	±.0010
U	±.003 ~±.010	±.005 ~±.015	±.0050

C S T

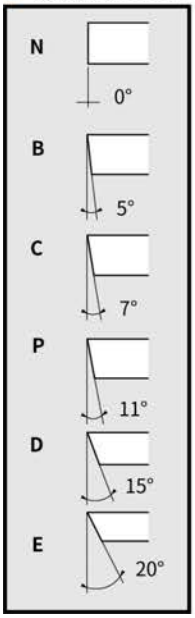
Inscribed Circle	M tolerance d (inch)	M tolerance m (inch)
1/4"	±.002	±.003
3/8"	±.002	±.003
1/2"	±.003	±.005
5/8"	±.004	±.006
3/4"	±.004	±.006
1"	±.005	±.007

D K

Inscribed Circle	M tolerance d (inch)	M tolerance m (inch)
1/4"	±.002	±.004
3/8"	±.002	±.004
1/2"	±.003	±.006
5/8"	±.004	±.006
3/4"	±.004	±.007

	1	2	3	4
Inch	S	N	G	A
Metric	S	N	G	A

2 Clearances



4 Type

Type	Symbol	Type	Symbol
	N (E)	70°–90°	H
	F		
	R	70°–90°	B
	A		
	G	40°–60°	T
	M	40°–60°	W
Special design	X		

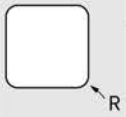
6 Thickness

Thickness S(inch)	Inch	Metric
3/32"	1.5	02
1/8"	2	03
5/32"	2.5	T3
3/16"	3	04
1/4"	4	06
5/16"	5	07
3/8"	6	09
1/2"	8	12

5 Symbol for Insert Size

Inch		Metric					
Inscribed Circle		C	D	R	S	T	V	W
1/4"	2	06	07	06	11	11	04
3/8"	3	09	11	09	16	16	06
1/2"	4	12	15	12	22	22	08
5/8"	5	16	19	15	27	27	10
3/4"	6	19	23	19	33	33	13
1"	8	25	31	25	44	44	17

7 Corner Radius



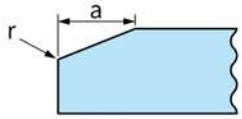
Corner Radius	Inch	Metric
1/64"	1	04
1/32"	2	08
3/64"	3	12
1/16"	4	16
5/64"	5	20
3/32"	6	24
1/8"	8	32

4	3	3	T	04	20
5	6	7	8	9	10
12	04	12	T	010	20

8 Edge Condition

Sharp	FNX08
Honed	E
Chamfered	T
Chamfered and Honed	Z
	S
	U
Double Chamfered	K
Double Chamfered and Honed	J
	P
	Q

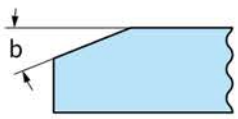
9 Negative Land Width



Symbol	Description		a (inch)	r (inch)
	inch	metric		
E	01	002	–	.001
	02	004	–	.002
T	02	005	.002	–
	03	008	.003	–
	04	010	.004	–
	05	012	.005	–
	06	015	.006	–
	08	020	.008	–
Z	04	010	.004	.001
	08	020	.008	.001
S	04	010	.004	.002
	08	020	.008	.002
U	16	040	.016	.003
K	28	070	.028	–
J	60	150	.060	.001
P	71	180	.071	.002
Q	95	240	.095	.003

Note: K, J, P & Q show its primary land width

10 Negative Land Angle



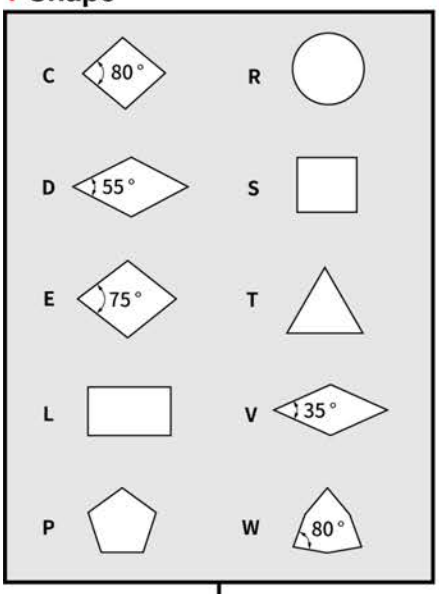
Description	b
10	10°
15	15°
20	20°
25	25°
30	30°

Note: K, J, P & Q show its primary land angle

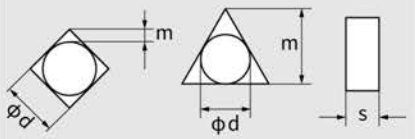
ANSI / ISO Insert Nomenclature

Carbide

1 Shape



3 Tolerance Class



Symbol	d (inch)	m (inch)	s (inch)
A	±.0010	±.0002	±.0010
F	±.0050	±.0002	±.0010
C	±.0010	±.0005	±.0010
H	±.0050	±.0005	±.0010
E	±.0010	±.0010	±.0010
G	±.0010	±.0010	±.0050
J	±.0020	±.0020	±.0050
K	±.002 ~ ±.005	±.0005	±.0010
L	±.002 ~ ±.005	±.0010	±.0010
M	±.002 ~ ±.005	±.003 ~ ±.007	±.0050
N	±.002 ~ ±.005	±.003 ~ ±.007	±.0010
U	±.003 ~ ±.010	±.005 ~ ±.015	±.0050

C S T

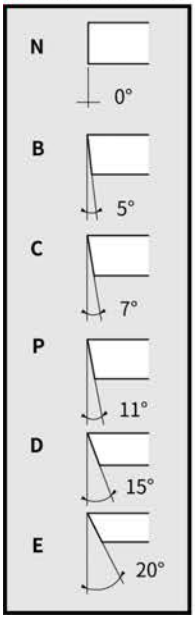
Inscribed Circle	M tolerance d (inch)	M tolerance m (inch)
1/4	±.002	±.003
3/8	±.002	±.003
1/2	±.003	±.005
5/8	±.004	±.006
3/4	±.004	±.006
1	±.005	±.007

D K

Inscribed Circle	M tolerance d (inch)	M tolerance m (inch)
1/4	±.002	±.004
3/8	±.002	±.004
1/2	±.003	±.006
5/8	±.004	±.006
3/4	±.004	±.007

	1	2	3	4
Inch	C	C	G	T
Metric	C	C	G	T

2 Clearances



4 Type

Type	Symbol	Type	Symbol
	N (E)	70°–90°	H
	F		
	R	70°–90°	B
	A		
	G	40°–60°	T
	M	40°–60°	W
Special design	X		

6 Thickness

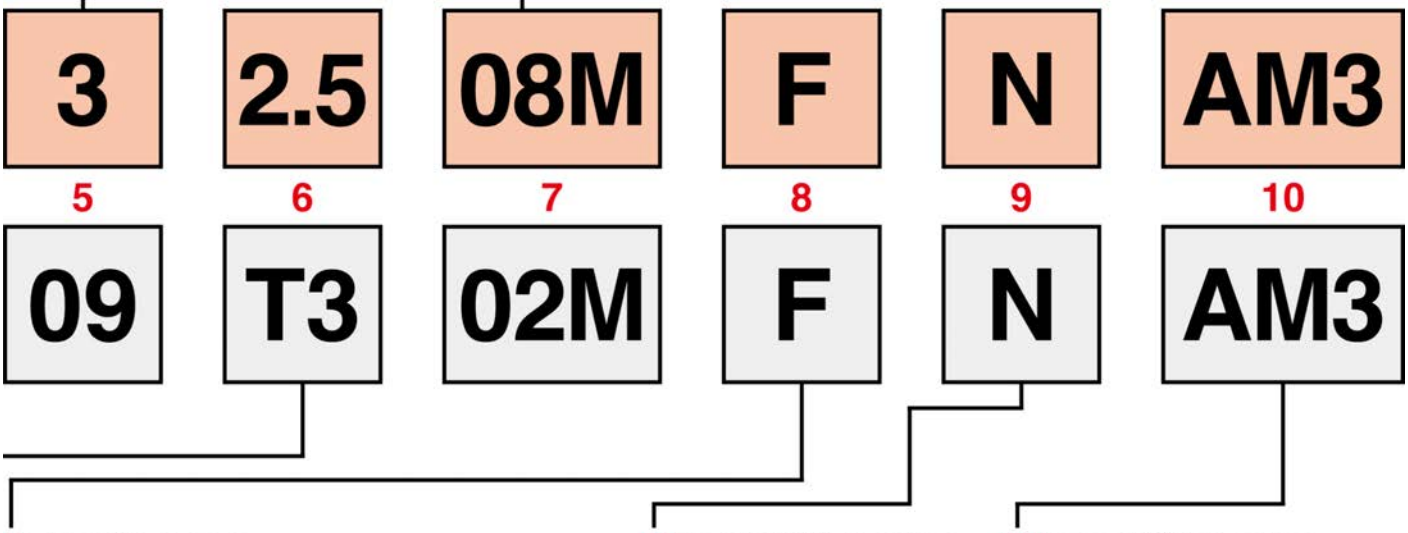
Thickness S(inch)	Inch	Metric
3/32	1.5	02
1/8	2	03
5/32	2.5	T3
3/16	3	04
1/4	4	06
5/16	5	07
3/8	6	09
1/2	8	12

5 Cutting Edge Length

Inch		Metric						
Inscribed Circle		C	D	R	S	T	V	W
1/4	2	06	07	06	11	11	04	
3/8	3	09	11	09	16	16	06	
1/2	4	12	15	12	22	22	08	
5/8	5	16	19	15	27	27	10	
3/4	6	19	23	19	33	33	13	
1	8	25	31	25	44	44	17	

7 Nose Radius

Corner Radius	Inch	Metric
.001	01	00
.003	04M	01M
.004	04	01
.007	08M	02M
.008	08	02
.015	1M	04M
.016 (1/64)	1	04
.031 (1/32)	2	08



8 Edge Sharpness

F	Up-sharp edge (without any edge preparation)
(Blank)	Non up-sharp edge

9 Hand of Chipbreaker

N	Neutral*
R	Right-hand
L	Left-hand

* Omitted when edge is not "up-sharp"

10 Type of Chipbreaker

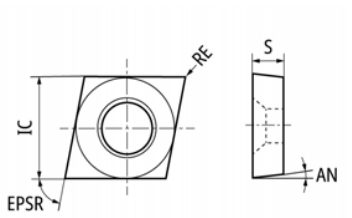
See page P20 to P23 for chipbreaker information

11 Wiper insert

"-WP" after chipbreaker

BIDEMICS / Ceramics / NTK CeramiX

CCGW

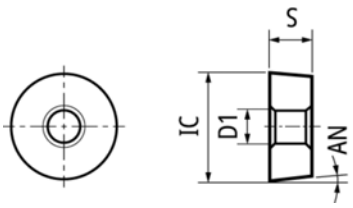


Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	AN °	RE inch	BIDEMICS PVD 120	BIDEMICS PVD JP2	JX1	JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	HW2	HC2	PVD ZC4	HC5	HC6	HC7	PVD ZC7	Silicon Nitride Ceramics SX3	SX5	SX7	SX9	SX6	CVD SP9	Whisker Ceramics WA1	533
	CCGW 21.51 T0225	CCGW 060204 T00525	80	1/4	3/32	7	.016								●	●												
	CCGW 21.51 T0420	CCGW 060204 T01020	80	1/4	3/32	7	.016								●													
	CCGW 21.52 T0225	CCGW 060208 T00525	80	1/4	3/32	7	.031								●	●												
	CCGW 21.52 T0420	CCGW 060208 T01020	80	1/4	3/32	7	.031								●													
	CCGW 32.51 T0420	CCGW 09T304 T01020	80	3/8	5/32	7	.016								●													
	CCGW 32.51 T0425	CCGW 09T304 T01025	80	3/8	5/32	7	.016								●	●												
	CCGW 32.52 T0420	CCGW 09T308 T01020	80	3/8	5/32	7	.031								●													
	CCGW 32.52 T0425	CCGW 09T308 T01025	80	3/8	5/32	7	.031								●	●												
	CCGW 32.53 T0420	CCGW 09T312 T01020	80	3/8	5/32	7	.047																		●			
	CCGW 431 T0420	CCGW 120404 T01020	80	1/2	3/16	7	.016																		●			
	CCGW 432 T0420	CCGW 120408 T01020	80	1/2	3/16	7	.031																		●	●		

For more information on the holders, please reference page Q14-21,V33.

CDH

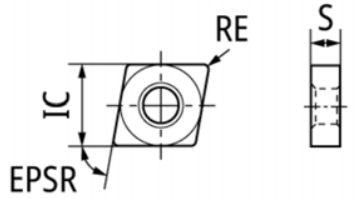


Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

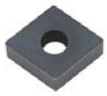
Shape	Item Number (Inch)	Item Number (Metric)	IC inch	S inch	AN °	D1 inch	BIDEMICS PVD 120	BIDEMICS PVD JP2	JX1	JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	HW2	HC2	PVD ZC4	HC5	HC6	HC7	PVD ZC7	Silicon Nitride Ceramics SX3	SX5	SX7	SX9	SX6	CVD SP9	Whisker Ceramics WA1	533
	CDH 22 P2810	CDH 1207 P07010	1/2	5/16	6	.125								●		●		●									
	CDH 33 P6010	CDH 1909 P15010	3/4	3/8	6	.250								●		●		●									
	CDH 33 P6010C	CDH 1909 P15010C	3/4	3/8	6	.250										●		●									
	CDH 33 P6015	CDH 1909 P15015	3/4	3/8	6	.250								●													
	CDH 33 KQ6010	CDH 1909 KQ15010	3/4	3/8	6	.250								●													
	CDH 33 Q6010B	CDH 1909 Q15010B	3/4	3/8	6	.250										●		●									
	CDH 42 P8015	CDH 2512 P20015	1.000	1/2	6	.266								●		●		●									
	CDH 42 P12010	CDH 2512 P30010G	1.000	1/2	6	.266								●		●											
	CDH 43 P6010	CDH 2519 P15015	1.000	3/4	6	.266								●													
	CDH 515 P7110B	CDH 3209 P18010B	1-1/4	3/8	6	.391								●				●									
	CDH 515 P7110	CDH 3209 P18010	1-1/4	3/8	6	.391								●													
	CDH 515 P8015	CDH 3209 P20015	1-1/4	3/8	6	.391								●		●		●									
	CDH 515 KQ7110	CDH 3209 KQ18010	1-1/4	3/8	6	.391								●		●											
	CDH 53 P8015	CDH 3219 P20015	1-1/4	3/4	6	.391								●		●		●									
	CDH 53 KQ9515	CDH 3219 KQ24015	1-1/4	3/4	6	.391								●		●											

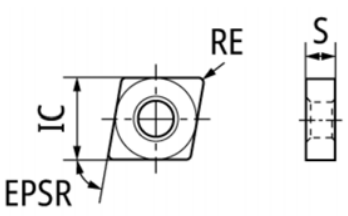
For more information on the holders, please reference page E52.

CNGA



Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	CNGA 431 BQ E02	CNGA 120404 BQ E004	80	1/2	3/16	.016	●	●																			
	CNGA 431 BQ T0220	CNGA 120404 BQ T00520	80	1/2	3/16	.016		●																			
	CNGA 431 S0825	CNGA 120404 S02025	80	1/2	3/16	.016													●								
	CNGA 431 T0220	CNGA 120404 T00520	80	1/2	3/16	.016																				●	
	CNGA 431 T0425	CNGA 120404 T01025	80	1/2	3/16	.016								●					●								
	CNGA 431 T0525	CNGA 120404 T01225	80	1/2	3/16	.016									●		●										
	CNGA 431 X0415	CNGA 120404 X01015	80	1/2	3/16	.016					●																
	CNGA 431 X0415 -10	CNGA 120404 X01015 -10	80	1/2	3/16	.016					●																
	CNGA 431 Z0825	CNGA 120404 Z02025	80	1/2	3/16	.016									●												
	CNGA 432 BQ E02	CNGA 120408 BQ E004	80	1/2	3/16	.031	●	●																			
	CNGA 432 BQ T0220	CNGA 120408 BQ T00520	80	1/2	3/16	.031		●																			
	CNGA 432 E02	CNGA 120408 E004	80	1/2	3/16	.031														●			●				●
	CNGA 432 S0825	CNGA 120408 S02025	80	1/2	3/16	.031													●								
	CNGA 432 T0220	CNGA 120408 T00520	80	1/2	3/16	.031														●	●		●			●	
	CNGA 432 T0420	CNGA 120408 T01020	80	1/2	3/16	.031						●	●	●			●						●		●	●	
	CNGA 432 T0425	CNGA 120408 T01025	80	1/2	3/16	.031								●			●		●								
	CNGA 432 T0525	CNGA 120408 T01225	80	1/2	3/16	.031						●		●	●	●	●										
	CNGA 432 T0820	CNGA 120408 T02020	80	1/2	3/16	.031								●										●			
	CNGA 432 T0825	CNGA 120408 T02025	80	1/2	3/16	.031																	●				
	CNGA 432 X0415	CNGA 120408 X01015	80	1/2	3/16	.031					●																
	CNGA 432 X0415 -10	CNGA 120408 X01015 -10	80	1/2	3/16	.031					●																
	CNGA 433 BQ E02	CNGA 120412 BQ E004	80	1/2	3/16	.047	●	●																			
	CNGA 433 BQ T0220	CNGA 120412 BQ T00520	80	1/2	3/16	.047		●																			
	CNGA 433 E02	CNGA 120412 E004	80	1/2	3/16	.047														●			●				●
	CNGA 433 S0825	CNGA 120412 S02025	80	1/2	3/16	.047													●								
	CNGA 433 T0220	CNGA 120412 T00520	80	1/2	3/16	.047														●	●		●			●	
	CNGA 433 T0320	CNGA 120412 T00820	80	1/2	3/16	.047																●					
	CNGA 433 T0420	CNGA 120412 T01020	80	1/2	3/16	.047						●	●	●			●						●		●	●	
	CNGA 433 T0425	CNGA 120412 T01025	80	1/2	3/16	.047						●		●			●		●								
	CNGA 433 T0820	CNGA 120412 T02020	80	1/2	3/16	.047								●										●			
	CNGA 433 T0825	CNGA 120412 T02025	80	1/2	3/16	.047											●						●				
	CNGA 433 X0415	CNGA 120412 X01015	80	1/2	3/16	.047					●																
	CNGA 433 X0415 -10	CNGA 120412 X01015 -10	80	1/2	3/16	.047					●																
	CNGA 433 Z0825	CNGA 120412 Z02025	80	1/2	3/16	.047									●												
	CNGA 434 E02	CNGA 120416 E004	80	1/2	3/16	.063														●			●				●
	CNGA 434 T0220	CNGA 120416 T00520	80	1/2	3/16	.063														●	●		●			●	
	CNGA 434 T0420	CNGA 120416 T01020	80	1/2	3/16	.063						●	●	●			●						●		●	●	●
	CNGA 434 T0525	CNGA 120416 T01225	80	1/2	3/16	.063								●		●											
	CNGA 434 T0820	CNGA 120416 T02020	80	1/2	3/16	.063																		●			
	CNGA 434 T0825	CNGA 120416 T02025	80	1/2	3/16	.063																	●				
	CNGA 452 S1235	CNGA 120708 S03035	80	1/2	5/16	.031													●								
	CNGA 453 T0825	CNGA 120712 T02025	80	1/2	5/16	.047						●													●		
	CNGA 542 T0825	CNGA 160608 T02025	80	5/8	1/4	.031								●													
	CNGA 543 T0220	CNGA 160612 T00520	80	5/8	1/4	.047															●					●	
	CNGA 543 T0420	CNGA 160612 T01020	80	5/8	1/4	.047																			●		
	CNGA 543 T0820	CNGA 160612 T02020	80	5/8	1/4	.047																		●			
	CNGA 543 T0825	CNGA 160612 T02025	80	5/8	1/4	.047								●		●											
	CNGA 543 Z0825	CNGA 160612 Z02025	80	5/8	1/4	.047									●											●	
	CNGA 544 T0220	CNGA 160616 T00520	80	5/8	1/4	.063															●					●	
	CNGA 544 T0820	CNGA 160616 T02020	80	5/8	1/4	.063																					
	CNGA 544 T0825	CNGA 160616 T02025	80	5/8	1/4	.063								●													
	CNGA 544 Z0825	CNGA 160616 Z02025	80	5/8	1/4	.063									●												
	CNGA 643 T0220	CNGA 190612 T00520	80	3/4	1/4	.047															●					●	
	CNGA 643 T0420	CNGA 190612 T01020	80	3/4	1/4	.047																			●	●	
	CNGA 643 T0820	CNGA 190612 T02020	80	3/4	1/4	.047																		●			
	CNGA 643 T0825	CNGA 190612 T02025	80	3/4	1/4	.047								●	●	●											
	CNGA 643 Z0620	CNGA 190612 Z01520	80	3/4	1/4	.047																				●	

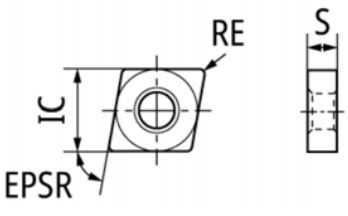


	Steel																								
	Stainless Steel																								
	Cast Iron						●	●	●		●	●								●	●	○	○		
	Non-Ferrous Material																								
	Heat Resistant Alloy	●	●	●	●													●	●	●	●			●	●
	Hardened Material					●			○	●	○		●	●											
	Others (non-metallic)																								

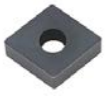
Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	CNGA 644 T0220	CNGA 190616 T00520	80	3/4	1/4	.063															●					●	
	CNGA 644 T0825	CNGA 190616 T02025	80	3/4	1/4	.063								●													
	CNGA 644 P6015	CNGA 190616 P15015	80	3/4	1/4	.063																					

For more information on the holders, please reference page E5-9,G6,Q65.

CNGA-WL with wiper for higher feed



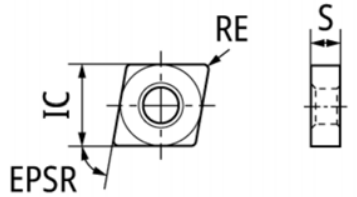
	Steel																								
	Stainless Steel																								
	Cast Iron						●	●	●		●	●								●	●	○	○		
	Non-Ferrous Material																								
	Heat Resistant Alloy	●	●	●	●													●	●	●	●			●	●
	Hardened Material					●			○	●	○		●	●											
	Others (non-metallic)																								

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	CNGA 431 WL T0425	CNGA 120404 WL T01025	80	1/2	3/16	.016									●				●								
	CNGA 432 WL T0425	CNGA 120408 WL T01025	80	1/2	3/16	.031													●								
	CNGA 433 WL T0425	CNGA 120412 WL T01025	80	1/2	3/16	.047									●				●								

For more information on the holders, please reference page E5-9,G6,Q65.

Wiper Width: R.014": .014", R.031": .026", R.047": .033"
Applicable holders: 95° cutting edge angle (C31, CCLN), 75° cutting edge angle (CCBN).

CNGG-AG with chipbreaker

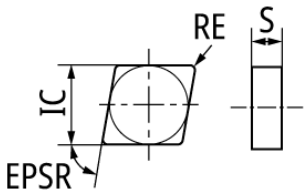


Steel																									
Stainless Steel																									
Cast Iron						●	●	●		●	●							●	●	○	○				
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●		
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

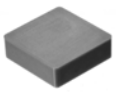
Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics							Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD							CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	CNGG 431 Z0430 AG	CNGG 120404 Z01030 AG	80	1/2	3/16	.016													●								
	CNGG 432 Z0430 AG	CNGG 120408 Z01030 AG	80	1/2	3/16	.031													●								
	CNGG 433 Z0430 AG	CNGG 120412 Z01030 AG	80	1/2	3/16	.047													●								

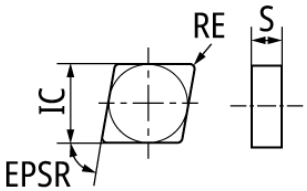
For more information on the holders, please reference page E5-9,G6,Q65.

CNGN



Steel																									
Stainless Steel																									
Cast Iron						●	●	●		●	●							●	●	○	○				
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●		
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics							Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD							CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	CNGN 431 S0825	CNGN 120404 S02025	80	1/2	3/16	.016													●								
	CNGN 431 T0425	CNGN 120404 T01025	80	1/2	3/16	.016								●			●		●								
	CNGN 431 T0525	CNGN 120404 T01225	80	1/2	3/16	.016								●													
	CNGN 432 E02	CNGN 120408 E004	80	1/2	3/16	.031				●										●			●				●
	CNGN 432 S0825	CNGN 120408 S02025	80	1/2	3/16	.031													●								
	CNGN 432 T0220	CNGN 120408 T00520	80	1/2	3/16	.031				●										●	●		●			●	●
	CNGN 432 T0320	CNGN 120408 T00820	80	1/2	3/16	.031																					●
	CNGN 432 T0420	CNGN 120408 T01020	80	1/2	3/16	.031						●	●	●			●						●		●	●	●
	CNGN 432 T0425	CNGN 120408 T01025	80	1/2	3/16	.031								●			●		●								
	CNGN 432 T0525	CNGN 120408 T01225	80	1/2	3/16	.031								●	●												
	CNGN 432 T0820	CNGN 120408 T02020	80	1/2	3/16	.031																		●			
	CNGN 432 T0825	CNGN 120408 T02025	80	1/2	3/16	.031						●											●			●	●
	CNGN 432 Z0825	CNGN 120408 Z02025	80	1/2	3/16	.031																					
	CNGN 433 E02	CNGN 120412 E004	80	1/2	3/16	.047				●										●			●				●
	CNGN 433 S0825	CNGN 120412 S02025	80	1/2	3/16	.047													●								
	CNGN 433 T0220	CNGN 120412 T00520	80	1/2	3/16	.047				●										●	●		●			●	●
	CNGN 433 T0320	CNGN 120412 T00820	80	1/2	3/16	.047			●																		●
	CNGN 433 T0420	CNGN 120412 T01020	80	1/2	3/16	.047						●	●	●			●						●		●	●	●
	CNGN 433 T0425	CNGN 120412 T01025	80	1/2	3/16	.047						●	●	●			●		●							●	●
	CNGN 433 T0525	CNGN 120412 T01225	80	1/2	3/16	.047								●	●												
	CNGN 433 T0820	CNGN 120412 T02020	80	1/2	3/16	.047																		●			
	CNGN 433 T0825	CNGN 120412 T02025	80	1/2	3/16	.047						●											●			●	●
	CNGN 433 Z0825	CNGN 120412 Z02025	80	1/2	3/16	.047																					
	CNGN 434 E02	CNGN 120416 E004	80	1/2	3/16	.063				●										●			●				●
	CNGN 434 T0220	CNGN 120416 T00520	80	1/2	3/16	.063				●										●	●		●			●	●
	CNGN 434 T0420	CNGN 120416 T01020	80	1/2	3/16	.063						●	●	●			●						●		●		●
	CNGN 434 T0820	CNGN 120416 T02020	80	1/2	3/16	.063																		●			
	CNGN 434 T0825	CNGN 120416 T02025	80	1/2	3/16	.063																	●				
	CNGN 435 T0425	CNGN 120420 T01025	80	1/2	3/16	.079											●										
	CNGN 452 E02	CNGN 120708 E004	80	1/2	5/16	.031				●										●			●				●
	CNGN 452 T0220	CNGN 120708 T00520	80	1/2	5/16	.031				●										●			●			●	●
	CNGN 452 T0825	CNGN 120708 T02025	80	1/2	5/16	.031								●													
	CNGN 453 E02	CNGN 120712 E004	80	1/2	5/16	.047				●										●			●				●
	CNGN 453 T0220	CNGN 120712 T00520	80	1/2	5/16	.047				●										●	●					●	●

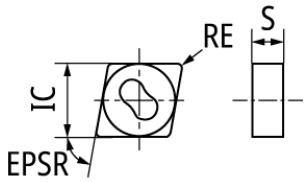


Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ○ ●
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

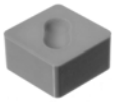
Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	RE inch	BIDEMICS PVD 120	BIDEMICS PVD JP2	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics HC2	Alumina Ceramics PVD ZC4	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics PVD ZC7	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics CVD SP9	Whisker Ceramics WA1	Whisker Ceramics 533
	CNGN 453 T0825	CNGN 120712 T02025	80	1/2	5/16	.047								●													
	CNGN 454 E02	CNGN 120716 E004	80	1/2	5/16	.063				●										●			●				●
	CNGN 454 T0220	CNGN 120716 T00520	80	1/2	5/16	.063				●										●			●			●	●
	CNGN 454 T0825	CNGN 120716 T02025	80	1/2	5/16	.063								●													
	CNGN 552 T0825	CNGN 160708 T02025	80	5/8	5/16	.031								●													
	CNGN 554 T0220	CNGN 160716 T00520	80	5/8	5/16	.063																				●	●
	CNGN 643 T0825	CNGN 190612 T02025	80	3/4	1/4	.047								●													
	CNGN 644 T0825	CNGN 190616 T02025	80	3/4	1/4	.063								●													
	CNGN 646 T0220	CNGN 190624 T00520	80	3/4	1/4	.094																				●	
	CNGN 648 T0825	CNGN 190632 T02025	80	3/4	1/4	.126								●													
	CNGN 656 T0220	CNGN 190724 T00520	80	3/4	5/16	.094															●						

For more information on the holders, please reference page E5-9,G6.

CNGX

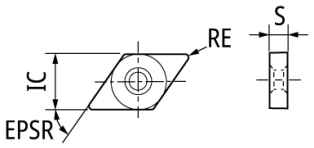


Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ○ ●
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

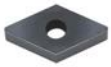
Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	RE inch	BIDEMICS PVD 120	BIDEMICS PVD JP2	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics HC2	Alumina Ceramics PVD ZC4	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics PVD ZC7	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics CVD SP9	Whisker Ceramics WA1	Whisker Ceramics 533
	CNGX 432 T0320	CNGX 120408 T00820	80	1/2	3/16	.031																●					
	CNGX 432 T0420	CNGX 120408 T01020	80	1/2	3/16	.031																	●		●		
	CNGX 432 T0820	CNGX 120408 T02020	80	1/2	3/16	.031																		●			
	CNGX 433 T0220	CNGX 120412 T00520	80	1/2	3/16	.047																●					
	CNGX 433 T0320	CNGX 120412 T00820	80	1/2	3/16	.047																●					
	CNGX 433 T0420	CNGX 120412 T01020	80	1/2	3/16	.047																	●		●		
	CNGX 433 T0820	CNGX 120412 T02020	80	1/2	3/16	.047																		●			
	CNGX 434 T0420	CNGX 120416 T01020	80	1/2	3/16	.063																	●		●		
	CNGX 452 T0220	CNGX 120708 T00520	80	1/2	5/16	.031																	●				
	CNGX 452 T0320	CNGX 120708 T00820	80	1/2	5/16	.031																●					
	CNGX 452 T0420	CNGX 120708 T01020	80	1/2	5/16	.031																	●		●		
	CNGX 452 T0820	CNGX 120708 T02020	80	1/2	5/16	.031																		●	●		
	CNGX 453 S0830	CNGX 120712 S02030	80	1/2	5/16	.047													●								
	CNGX 453 T0220	CNGX 120712 T00520	80	1/2	5/16	.047																	●				
	CNGX 453 T0320	CNGX 120712 T00820	80	1/2	5/16	.047																●					
	CNGX 453 T0420	CNGX 120712 T01020	80	1/2	5/16	.047																●	●		●		
	CNGX 453 T0820	CNGX 120712 T02020	80	1/2	5/16	.047																	●	●	●		
	CNGX 453 T0825	CNGX 120712 T02025	80	1/2	5/16	.047																			●		
	CNGX 454 S0830	CNGX 120716 S02030	80	1/2	5/16	.063													●								
	CNGX 454 T0420	CNGX 120716 T01020	80	1/2	5/16	.063																	●		●		
	CNGX 454 T0820	CNGX 120716 T02020	80	1/2	5/16	.063																		●	●		
	CNGX 454 T0825	CNGX 120716 T02025	80	1/2	5/16	.063																			●		

For more information on the holders, please reference page E5-6,G6.

DNGA

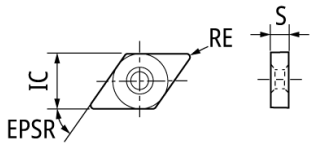


Steel																									
Stainless Steel																									
Cast Iron						●	●	●		●	●									●	●	○	○		
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●		
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics							Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD							CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	DNGA 331 T0820	DNGA 110404 T02020	55	3/8	3/16	.016								●													
	DNGA 431 BQ E02	DNGA 150404 BQ E004	55	1/2	3/16	.016	●	●																			
	DNGA 431 BQ T0220	DNGA 150404 BQ T00520	55	1/2	3/16	.016		●																			
	DNGA 431 S0825	DNGA 150404 S02025	55	1/2	3/16	.016													●								
	DNGA 431 T0220	DNGA 150404 T00520	55	1/2	3/16	.016																				●	
	DNGA 431 T0425	DNGA 150404 T01025	55	1/2	3/16	.016								●			●		●								
	DNGA 431 T0525	DNGA 150404 T01225	55	1/2	3/16	.016									●												
	DNGA 431 X0415	DNGA 150404 X01015	55	1/2	3/16	.016					●																
	DNGA 431 X0415 -10	DNGA 150404 X01015 -10	55	1/2	3/16	.016					●																
	DNGA 431 Z0825	DNGA 150404 Z02025	55	1/2	3/16	.016								●	●												
	DNGA 432 BQ E02	DNGA 150408 BQ E004	55	1/2	3/16	.031	●	●																			
	DNGA 432 BQ T0220	DNGA 150408 BQ T00520	55	1/2	3/16	.031		●																			
	DNGA 432 E02	DNGA 150408 E004	55	1/2	3/16	.031														●			●				●
	DNGA 432 S0825	DNGA 150408 S02025	55	1/2	3/16	.031								●					●								
	DNGA 432 T0220	DNGA 150408 T00520	55	1/2	3/16	.031														●	●		●			●	
	DNGA 432 T0320	DNGA 150408 T00820	55	1/2	3/16	.031																●					
	DNGA 432 T0420	DNGA 150408 T01020	55	1/2	3/16	.031						●	●	●			●						●		●	●	●
	DNGA 432 T0425	DNGA 150408 T01025	55	1/2	3/16	.031								●			●		●								
	DNGA 432 T0525	DNGA 150408 T01225	55	1/2	3/16	.031								●	●		●										
	DNGA 432 T0820	DNGA 150408 T02020	55	1/2	3/16	.031								●										●			
	DNGA 432 T0825	DNGA 150408 T02025	55	1/2	3/16	.031						●											●				
	DNGA 432 X0415	DNGA 150408 X01015	55	1/2	3/16	.031					●																
	DNGA 432 X0415 -10	DNGA 150408 X01015 -10	55	1/2	3/16	.031					●																
	DNGA 432 Z0820	DNGA 150408 Z02020	55	1/2	3/16	.031																				●	
	DNGA 432 Z0825	DNGA 150408 Z02025	55	1/2	3/16	.031									●												
	DNGA 433 BQ E02	DNGA 150412 BQ E004	55	1/2	3/16	.047	●	●																			
	DNGA 433 BQ T0220	DNGA 150412 BQ T00520	55	1/2	3/16	.047		●																			
	DNGA 433 E02	DNGA 150412 E004	55	1/2	3/16	.047														●			●				●
	DNGA 433 S0825	DNGA 150412 S02025	55	1/2	3/16	.047													●								
	DNGA 433 T0220	DNGA 150412 T00520	55	1/2	3/16	.047														●	●		●			●	●
	DNGA 433 T0320	DNGA 150412 T00820	55	1/2	3/16	.047																●					
	DNGA 433 T0420	DNGA 150412 T01020	55	1/2	3/16	.047						●	●	●			●						●		●	●	
	DNGA 433 T0425	DNGA 150412 T01025	55	1/2	3/16	.047							●						●								
	DNGA 433 T0525	DNGA 150412 T01225	55	1/2	3/16	.047								●			●										
	DNGA 433 T0820	DNGA 150412 T02020	55	1/2	3/16	.047								●										●			
	DNGA 433 T0825	DNGA 150412 T02025	55	1/2	3/16	.047						●											●				
	DNGA 433 X0415	DNGA 150412 X01015	55	1/2	3/16	.047					●																
	DNGA 433 X0415 -10	DNGA 150412 X01015 -10	55	1/2	3/16	.047					●																
	DNGA 433 Z0825	DNGA 150412 Z02025	55	1/2	3/16	.047									●												
	DNGA 434 E02	DNGA 150416 E004	55	1/2	3/16	.063														●			●				●
	DNGA 434 S0820	DNGA 150416 S02020	55	1/2	3/16	.063								●													
	DNGA 434 T0220	DNGA 150416 T00520	55	1/2	3/16	.063														●			●			●	●
	DNGA 434 T0420	DNGA 150416 T01020	55	1/2	3/16	.063																				●	
	DNGA 434 T0525	DNGA 150416 T01225	55	1/2	3/16	.063									●												
	DNGA 436 T0420	DNGA 150424 T01020	55	1/2	3/16	.094																				●	●
	DNGA 442 T0825	DNGA 150608 T02025	55	1/2	1/4	.031								●													
	DNGA 542 T0820	DNGA 190608 T02020	55	5/8	1/4	.031								●													
	DNGA 543 T0820	DNGA 190612 T02020	55	5/8	1/4	.047								●													
	DNGA 543 T0825	DNGA 190612 T02025	55	5/8	1/4	.047										●											
	DNGA 544 T0825	DNGA 190616 T02025	55	5/8	1/4	.063								●													

For more information on the holders, please reference page E14-16,G11,Q67.

DNGG-AG with chipbreaker

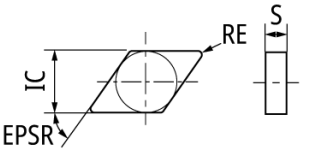


Steel																									
Stainless Steel																									
Cast Iron							●	●	●		●	●									●	●	○	○	
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●													●	●	●	●			●	●	
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	DNGG 431 Z0430 AG	DNGG 150404 Z01030 AG	55	1/2	3/16	.016													●								
	DNGG 432 Z0430 AG	DNGG 150408 Z01030 AG	55	1/2	3/16	.031													●								
	DNGG 433 Z0430 AG	DNGG 150412 Z01030 AG	55	1/2	3/16	.047													●								

For more information on the holders, please reference page E14-16,G11.

DNGN

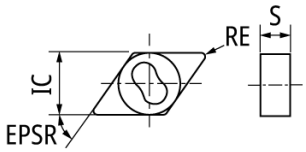


Steel																									
Stainless Steel																									
Cast Iron							●	●	●		●	●									●	●	○	○	
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●													●	●	●	●			●	●	
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	DNGN 431 T0425	DNGN 150404 T01025	55	1/2	3/16	.016								●													
	DNGN 432 S0825	DNGN 150408 S02025	55	1/2	3/16	.031													●								
	DNGN 432 T0220	DNGN 150408 T00520	55	1/2	3/16	.031																				●	
	DNGN 432 T0420	DNGN 150408 T01020	55	1/2	3/16	.031						●	●	●			●						●		●	●	
	DNGN 432 T0425	DNGN 150408 T01025	55	1/2	3/16	.031											●		●								
	DNGN 432 T0525	DNGN 150408 T01225	55	1/2	3/16	.031								●													
	DNGN 432 T0820	DNGN 150408 T02020	55	1/2	3/16	.031																					
	DNGN 432 Z0825	DNGN 150408 Z02025	55	1/2	3/16	.031																					
	DNGN 433 T0220	DNGN 150412 T00520	55	1/2	3/16	.047																				●	●
	DNGN 433 T0420	DNGN 150412 T01020	55	1/2	3/16	.047						●	●	●			●						●		●	●	
	DNGN 433 T0625	DNGN 150412 T01525	55	1/2	3/16	.047								●													
	DNGN 433 T0820	DNGN 150412 T02020	55	1/2	3/16	.047																					
	DNGN 433 T0825	DNGN 150412 T02025	55	1/2	3/16	.047																				●	●
	DNGN 434 T0220	DNGN 150416 T00520	55	1/2	3/16	.063																				●	
	DNGN 434 T0420	DNGN 150416 T01020	55	1/2	3/16	.063																				●	
	DNGN 434 T0425	DNGN 150416 T01025	55	1/2	3/16	.063								●													
	DNGN 452 E02	DNGN 150708 E004	55	1/2	5/16	.031				●										●			●				●
	DNGN 452 T0220	DNGN 150708 T00520	55	1/2	5/16	.031				●										●			●				●
	DNGN 453 E02	DNGN 150712 E004	55	1/2	5/16	.047				●										●			●				●
	DNGN 453 T0220	DNGN 150712 T00520	55	1/2	5/16	.047				●										●			●				●
	DNGN 453 T0825	DNGN 150712 T02025	55	1/2	5/16	.047								●												●	●
	DNGN 454 E02	DNGN 150716 E004	55	1/2	5/16	.063				●										●			●				●
	DNGN 454 T0220	DNGN 150716 T00520	55	1/2	5/16	.063				●										●			●				●
	DNGN 454 T0825	DNGN 150716 T02025	55	1/2	5/16	.063								●													
	DNGN 543 T0825	DNGN 190612 T02025	55	5/8	1/4	.047								●													

For more information on the holders, please reference page E14-16,G11.

DNGX

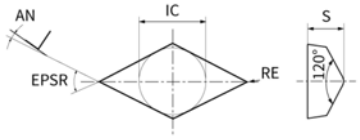


Steel	
Stainless Steel	
Cast Iron	● ● ● ○ ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	DNGX 353 T0825	DNGX 110712 T02025	55	3/8	5/16	.047							●														
	DNGX 452 T0420	DNGX 150708 T01020	55	1/2	5/16	.031																	●		●		
	DNGX 452 T0220	DNGX 150708 T00520	55	1/2	5/16	.031																	●				
	DNGX 452 T0820	DNGX 150708 T02020	55	1/2	5/16	.031																		●			
	DNGX 453 T0420	DNGX 150712 T01020	55	1/2	5/16	.047																	●		●		
	DNGX 454 T0420	DNGX 150716 T01020	55	1/2	5/16	.063																	●		●		
	DNGX 454 T0825	DNGX 150716 T02025	55	1/2	5/16	.063																			●		

For more information on the holders, please reference page E14-16,G11.

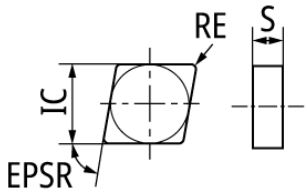
DPGN-V



Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

Shape	Item Number		EPSR	IC	S	AN	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
								PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	°	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	DPGN 443 E02 -V	DPGN 150612 E004 -V	55	1/2	1/4	11	.047				●										●							

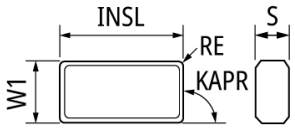
ENGN



Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	ENGN 452 T0825	ENGN 130708 T02025	75	1/2	5/16	.031								●													
	ENGN 453 T0825	ENGN 130712 T02025	75	1/2	5/16	.047								●													

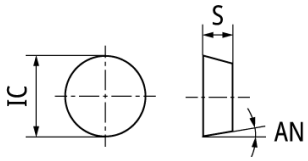
LNM



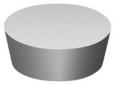
	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
	PVD	PVD			PVD				PVD				PVD							CVD		
	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
Steel																					
Stainless Steel																					
Cast Iron						●	●	●		●	●							●	●	○	○
Non-Ferrous Material																					
Heat Resistant Alloy	●	●	●	●										●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●								
Others (non-metallic)																					

Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	S inch	RE inch	INSL inch	W1 inch
	LNJ 6688 P6015	LNJ 6688 P15015	90	1/2	.126	1-1/2	3/4
	LNJ 6688 P8015B	LNJ 6688 P20015B	90	1/2	.126	1-1/2	3/4
	LNM 6688 P6015	LNM 6688 P15015	90	1/2	.126	1-1/2	3/4
	LNM 6688 PNX8	LNM 6688 PNX8	90	1/2	.126	1-1/2	3/4
	LNM 6688 S6015	LNM 6688 S15015	90	1/2	.126	1-1/2	3/4
	LNM 6688 SNX6	LNM 6688 SNX6	90	1/2	.126	1-1/2	3/4

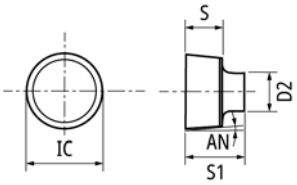
RBGN



	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
	PVD	PVD			PVD				PVD				PVD							CVD		
	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
Steel																					
Stainless Steel																					
Cast Iron						●	●	●		●	●							●	●	○	○
Non-Ferrous Material																					
Heat Resistant Alloy	●	●	●	●										●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●								
Others (non-metallic)																					

Shape	Item Number (Inch)	Item Number (Metric)	IC inch	S inch	AN °
	RBGN 330 P2820	RBGN 090400 P07020	3/8	3/16	5
	RBGN 440 P2820	RBGN 120600 P07020	1/2	1/4	5

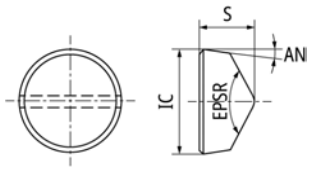
RBGX



Steel																														
Stainless Steel																														
Cast Iron							●	●	●		●	●											●	●	○	○				
Non-Ferrous Material																														
Heat Resistant Alloy	●	●	●	●															●	●	●	●			●	●				
Hardened Material					●				○	●	○		●	●																
Others (non-metallic)																														

Shape	Item Number		IC	S	AN	D2	S1	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics							Whisker Ceramics	
								PVD	PVD			PVD				PVD				PVD							CVD		
	(Inch)	(Metric)	inch	inch	°	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	RBGX 160S P6015	RBGX 16S P15015	.630	.315	5	.315	.512								●													
	RBGX 160S S6015	RBGX 16S S15015	.630	.315	5	.315	.512																				●	●
	RBGX 200 P8015	RBGX 20 P20015	.787	.394	5	.394	.591								●		●		●									●
	RBGX 200S P8015	RBGX 20S P20015	.787	.394	5	.394	.591								●													
	RBGX 260 P8015	RBGX 26 P20015	1.024	.394	5	.551	.591								●		●		●									●
	RBGX 260S P8015	RBGX 26S P20015	1.024	.394	5	.551	.591								●													
	RBGX 260S S8015	RBGX 26S S20015	1.024	.394	5	.551	.591																				●	●
	RBGX 320 P8015	RBGX 32 P20015	1.260	.472	5	.630	.787								●		●											●

RCGX

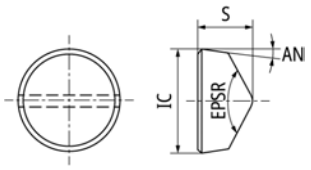


Steel																														
Stainless Steel																														
Cast Iron													●	●	●		●	●									●	●	○	○
Non-Ferrous Material																														
Heat Resistant Alloy	●	●	●	●																	●	●	●	●			●	●		
Hardened Material					●										○	●	○		●	●										
Others (non-metallic)																														

Shape	Item Number		EPSR	IC	S	AN	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics							Whisker Ceramics	
							PVD	PVD			PVD					PVD				PVD							CVD		
	(Inch)	(Metric)	°	inch	inch	°	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	RCGX 230 E02	RCGX 060400 E004	120	1/4	3/16	7			●	●										●	●	●	●				●
	RCGX 230 T0220	RCGX 060400 T00520	120	1/4	3/16	7				●										●	●		●			●	●
	RCGX 230 T0320	RCGX 060400 T00820	120	1/4	3/16	7			●	●												●					
	RCGX 230 T0420	RCGX 060400 T01020	120	1/4	3/16	7			●	●										●	●	●	●				●
	RCGX 230 T0425	RCGX 060400 T01025	120	1/4	3/16	7								●		●		●									●
	RCGX 230 T0820	RCGX 060400 T02020	120	1/4	3/16	7												●									
	RCGX 230 P2815	RCGX 060400 P07015	120	1/4	3/16	7										●		●									●
	RCGX 240 E02	RCGX 060600 E004	120	1/4	1/4	7			●	●										●	●	●	●				●
	RCGX 240 T0220	RCGX 060600 T00520	120	1/4	1/4	7				●										●						●	
	RCGX 240 T0420	RCGX 060600 T01020	120	1/4	1/4	7			●	●										●	●	●	●			●	●
	RCGX 240 T0425	RCGX 060600 T01025	120	1/4	1/4	7								●		●		●									●
	RCGX 240 P2815	RCGX 060600 P07015	120	1/4	1/4	7										●		●									
	RCGX 250 T0220	RCGX 060700 T00520	120	1/4	5/16	7														●	●		●			●	●
	RCGX 350 E02	RCGX 090700 E004	120	3/8	5/16	7			●	●										●	●	●	●				●
	RCGX 350 K7915	RCGX 090700 K20015	120	3/8	5/16	7													●								
	RCGX 350 P2815	RCGX 090700 P07015	120	3/8	5/16	7								●												●	●
	RCGX 350 T0220	RCGX 090700 T00520	120	3/8	5/16	7				●										●	●		●			●	●
	RCGX 350 T0225	RCGX 090700 T00525	120	3/8	5/16	7																	●			●	●
	RCGX 350 T0320	RCGX 090700 T00820	120	3/8	5/16	7			●	●												●				●	●
	RCGX 350 T0420	RCGX 090700 T01020	120	3/8	5/16	7			●	●										●	●	●	●			●	●
	RCGX 350 T0425	RCGX 090700 T01025	120	3/8	5/16	7								●		●		●									●
	RCGX 450 E02	RCGX 120700 E004	120	1/2	5/16	7			●	●										●	●	●	●				●
	RCGX 450 K7915	RCGX 120700 K20015	120	1/2	5/16	7													●								
	RCGX 450 T0220	RCGX 120700 T00520	120	1/2	5/16	7				●										●	●		●			●	●
	RCGX 450 T0225	RCGX 120700 T00525	120	1/2	5/16	7																	●				
	RCGX 450 T0320	RCGX 120700 T00820	120	1/2	5/16	7			●	●												●				●	●
	RCGX 450 T0420	RCGX 120700 T01020	120	1/2	5/16	7			●	●										●	●		●			●	●
	RCGX 450 T0425	RCGX 120700 T01025	120	1/2	5/16	7								●		●		●									●
	RCGX 450 P6015	RCGX 120700 P15015	120	1/2	5/16	7								●												●	
	RCGX 450 P8015	RCGX 120700 P20015	120	1/2	5/16	7								●		●		●									●
	RCGX 450 Z0620	RCGX 120700 Z01520	120	1/2	5/16	7																				●	●
	RCGX 450 Z0820	RCGX 120700 Z02020	120	1/2	5/16	7																				●	●
	RCGX 660 P8015	RCGX 191000 P20015	120	3/4	.394	7								●		●		●									
	RCGX 87.60 P8015	RCGX 251200 P20015	120	1.000	.472	7										●											

For more information on the holders, please reference page E53-59.

RCGX10

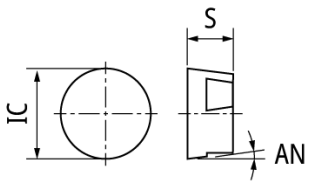


Steel																							
Stainless Steel																							
Cast Iron						●	●	●		●	●							●	●	○	○		
Non-Ferrous Material																							
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●										
Others (non-metallic)																							

Shape	Item Number		EPSR	IC	S	AN	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	°	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	RCGX 101 P2010	RCGX 101 P05010	120	3/16	.240	7								●													
	RCGX 102 P4815	RCGX 102 P12015	120	1/4	.309	7								●		●		●									
	RCGX 102 T0225	RCGX 102 T00525	120	1/4	.309	7																	●				
	RCGX 102 T0820	RCGX 102 T02020	120	1/4	.309	7								●													
	RCGX 103 P4815	RCGX 103 P12015	120	3/8	.309	7								●		●		●									
	RCGX 103 P8015	RCGX 103 P20015	120	3/8	.309	7										●		●									
	RCGX 103 T0820	RCGX 103 T02020	120	3/8	.309	7								●													
	RCGX 103 T0825	RCGX 103 T02025	120	3/8	.309	7									●												
	RCGX 103 T1625	RCGX 103 T04025	120	3/8	.309	7									●												
	RCGX 104 P6015	RCGX 104 P15015	120	1/2	5/16	7								●		●		●									
	RCGX 104 P8015	RCGX 104 P20015	120	1/2	5/16	7										●		●									
	RCGX 104 T0820	RCGX 104 T02020	120	1/2	5/16	7								●													
	RCGX 104 T1625	RCGX 104 T04025	120	1/2	5/16	7									●												
	RCGX 105 P4815	RCGX 105 P12015	120	5/8	.388	7								●		●											
	RCGX 105 P8015	RCGX 105 P20015	120	5/8	.388	7										●		●									
	RCGX 106 P4815	RCGX 106 P12015	120	3/4	.388	7								●													
	RCGX 106 P8015	RCGX 106 P20015	120	3/4	.388	7								●		●		●									
	RCGX 108 P8015	RCGX 108 P20015	120	1.000	.461	7								●													

For more information on the holders, please reference page E53-59.

RCGY

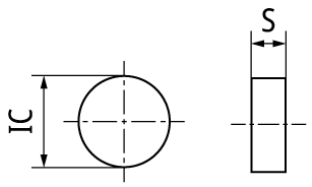


Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

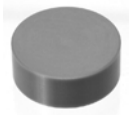
Shape	Item Number		IC	S	AN	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
						PVD	PVD			PVD				PVD				PVD							CVD		
	(Inch)	(Metric)	inch	inch	°	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	RCGY 34 T0225	RCGY 090603 T00525	3/8	1/4	7																				●	●
	RCGY 44 T0225	RCGY 120603 T00525	1/2	1/4	7																				●	●

For more information on the holders, please reference page E62.

RNGN

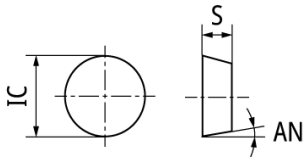


Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

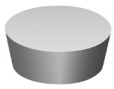
Shape	Item Number (Inch)	Item Number (Metric)	IC	S	BIDEMICS PVD 120	BIDEMICS PVD JP2	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics HC2	Alumina Ceramics PVD ZC4	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics PVD ZC7	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics CVD SP9	Whisker Ceramics WA1	Whisker Ceramics 533
	RNGN 320 T0220	RNGN 090300 T00520	3/8	1/8																				●	
	RNGN 320 T0425	RNGN 090300 T01025	3/8	1/8								●													
	RNGN 320 T0525	RNGN 090300 T01225	3/8	1/8									●												
	RNGN 330 T0320	RNGN 090400 T00820	3/8	3/16																●					
	RNGN 420 T0425	RNGN 120300 T01025	1/2	1/8								●													
	RNGN 430 E01	RNGN 120400 E002	1/2	3/16																	●				
	RNGN 430 E02	RNGN 120400 E004	1/2	3/16			●	●										●	●	●	●				●
	RNGN 430 S0425	RNGN 120400 S01025	1/2	3/16													●								●
	RNGN 430 S0825	RNGN 120400 S02025	1/2	3/16													●								
	RNGN 430 T0220	RNGN 120400 T00520	1/2	3/16				●										●	●		●			●	●
	RNGN 430 T0225	RNGN 120400 T00525	1/2	3/16																	●			●	●
	RNGN 430 T0320	RNGN 120400 T00820	1/2	3/16																●					●
	RNGN 430 T0420	RNGN 120400 T01020	1/2	3/16			●	●								●		●	●	●	●			●	●
	RNGN 430 T0425	RNGN 120400 T01025	1/2	3/16								●			●		●								●
	RNGN 430 T0525	RNGN 120400 T01225	1/2	3/16								●	●	●											
	RNGN 430 T0820	RNGN 120400 T02020	1/2	3/16																		●			
	RNGN 430 T0825	RNGN 120400 T02025	1/2	3/16																	●				
	RNGN 430 T2820	RNGN 120400 T07020	1/2	3/16								●													
	RNGN 430 Z0825	RNGN 120400 Z02025	1/2	3/16									●			●									
	RNGN 450 E01	RNGN 120700 E002	1/2	5/16																	●			●	
	RNGN 450 E02	RNGN 120700 E004	1/2	5/16			●	●										●	●	●	●				●
	RNGN 450 E03	RNGN 120700 E007	1/2	5/16								●													
	RNGN 450 K7915	RNGN 120700 K20015	1/2	5/16												●									
	RNGN 450 P2810	RNGN 120700 P07010	1/2	5/16								●													
	RNGN 450 S0425	RNGN 120700 S01025	1/2	5/16													●								●
	RNGN 450 S0825	RNGN 120700 S02025	1/2	5/16													●								
	RNGN 450 T0220	RNGN 120700 T00520	1/2	5/16				●										●	●		●			●	●
	RNGN 450 T0225	RNGN 120700 T00525	1/2	5/16																	●			●	●
	RNGN 450 T0320	RNGN 120700 T00820	1/2	5/16			●	●												●					●
	RNGN 450 T0420	RNGN 120700 T01020	1/2	5/16			●	●								●		●	●		●		●	●	●
	RNGN 450 T0425	RNGN 120700 T01025	1/2	5/16													●								●
	RNGN 450 T0525	RNGN 120700 T01225	1/2	5/16									●												
	RNGN 450 T0820	RNGN 120700 T02020	1/2	5/16																		●		●	
	RNGN 450 T0825	RNGN 120700 T02025	1/2	5/16								●					●								
	RNGN 450 Z0620	RNGN 120700 Z01520	1/2	5/16																				●	●
	RNGN 450 Z0825	RNGN 120700 Z02025	1/2	5/16									●			●									
	RNGN 450 P8015	RNGN 120700 P20015	1/2	5/16								●		●		●									●
	RNGN 550 T0220	RNGN 150700 T00520	5/8	5/16														●	●		●			●	
	RNGN 550 T0225	RNGN 150700 T00525	5/8	5/16																	●			●	●
	RNGN 550 T0320	RNGN 150700 T00820	5/8	5/16																●					●
	RNGN 550 P8015	RNGN 150700 P20015	5/8	5/16								●		●		●									
	RNGN 640 P6010	RNGN 190600 P15010	3/4	1/4								●													
	RNGN 640 T0825	RNGN 190600 T02025	3/4	1/4								●													
	RNGN 650 E02	RNGN 190700 E004	3/4	5/16														●	●		●				
	RNGN 650 K8015	RNGN 190700 K20015	3/4	5/16																				●	●
	RNGN 650 T0220	RNGN 190700 T00520	3/4	5/16														●	●		●			●	
	RNGN 650 T0225	RNGN 190700 T00525	3/4	5/16																	●				
	RNGN 650 T0320	RNGN 190700 T00820	3/4	5/16																●					●
	RNGN 650 T0420	RNGN 190700 T01020	3/4	5/16																	●			●	●
	RNGN 650 P8015	RNGN 190700 P20015	3/4	5/16								●		●		●									
	RNGN 850 E02	RNGN 250700 E004	1.000	5/16														●	●		●				
	RNGN 850 S6015	RNGN 250700 S15015	1.000	5/16															●						
	RNGN 850 T0220	RNGN 250700 T00520	1.000	5/16														●	●		●			●	●
	RNGN 850 T0320	RNGN 250700 T00820	1.000	5/16																					●
	RNGN 850 P8015	RNGN 250700 P20015	1.000	5/16										●										●	
	RNGN 860 T0220	RNGN 250900 T00520	1.000	3/8														●	●						

For more information on the holders, please reference page E48-50,G3,I11.

RPGN

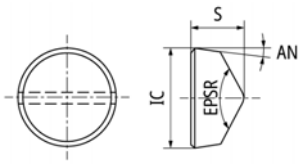


Steel																							
Stainless Steel																							
Cast Iron						●	●	●		●	●								●	●	○	○	
Non-Ferrous Material																							
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●										
Others (non-metallic)																							

Shape	Item Number		IC	S	AN	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
						PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	inch	inch	°	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	RPGN 21.50 E02	RPGN 060200 E004	1/4	3/32	11														●		●					
	RPGN 21.50 T0220	RPGN 060200 T00520	1/4	3/32	11														●	●	●	●			●	●
	RPGN 21.50 T0320	RPGN 060200 T00820	1/4	3/32	11																●					
	RPGN 21.50 T0420	RPGN 060200 T01020	1/4	3/32	11																				●	
	RPGN 320 E02	RPGN 090300 E004	3/8	1/8	11														●		●	●				
	RPGN 320 T0220	RPGN 090300 T00520	3/8	1/8	11														●		●	●			●	●
	RPGN 320 T0320	RPGN 090300 T00820	3/8	1/8	11																●					
	RPGN 320 T0420	RPGN 090300 T01020	3/8	1/8	11																				●	
	RPGN 320 T0425	RPGN 090300 T01025	3/8	1/8	11								●													
	RPGN 420 T0525	RPGN 120300 T01025	1/2	1/8	11									●												
	RPGN 430 E01	RPGN 120400 E002	1/2	3/16	11																●					
	RPGN 430 E02	RPGN 120400 E004	1/2	3/16	11														●		●	●				
	RPGN 430 EA01X	RPGN 120400 EM02X	1/2	3/16	11																	●				
	RPGN 430 T0220	RPGN 120400 T00520	1/2	3/16	11														●	●	●	●			●	●
	RPGN 430 T0225	RPGN 120400 T00525	1/2	3/16	11																	●				
	RPGN 430 T0320	RPGN 120400 T00820	1/2	3/16	11																●					
	RPGN 430 T0420	RPGN 120400 T01020	1/2	3/16	11												●		●	●	●	●			●	●
	RPGN 430 Z0620	RPGN 120400 Z01520	1/2	3/16	11																				●	
	RPGN 430 Z0825	RPGN 120400 Z02025	1/2	3/16	11												●									
	RPGN 650 T0220	RPGN 190700 T00520	3/4	5/16	11															●						

For more information on the holders, please reference page G5,I9.

RPGX

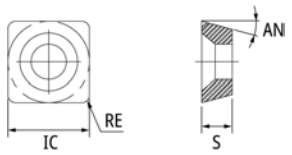


Steel																							
Stainless Steel																							
Cast Iron						●	●	●		●	●								●	●	○	○	
Non-Ferrous Material																							
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●										
Others (non-metallic)																							

Shape	Item Number		EPSR	IC	S	AN	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	°	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	RPGX 230 E02	RPGX 060400 E004	120	1/4	3/16	11			●	●										●	●	●	●				●
	RPGX 230 T0220	RPGX 060400 T00520	120	1/4	3/16	11				●										●	●					●	●
	RPGX 230 T0420	RPGX 060400 T01020	120	1/4	3/16	11			●	●										●	●	●	●				●
	RPGX 240 E02	RPGX 060600 E004	120	1/4	1/4	11			●	●										●	●		●				●
	RPGX 240 T0220	RPGX 060600 T00520	120	1/4	1/4	11				●										●							
	RPGX 240 T0420	RPGX 060600 T01020	120	1/4	1/4	11			●	●										●	●	●	●				●
	RPGX 250 T0220	RPGX 060700 T00520	120	1/4	5/16	11														●							
	RPGX 350 E02	RPGX 090700 E004	120	3/8	5/16	11			●	●										●	●	●	●				●
	RPGX 350 T0220	RPGX 090700 T00520	120	3/8	5/16	11				●										●	●		●			●	●
	RPGX 350 T0320	RPGX 090700 T00820	120	3/8	5/16	11			●	●												●					●
	RPGX 350 T0420	RPGX 090700 T01020	120	3/8	5/16	11			●	●										●	●	●	●			●	●
	RPGX 350 T0225	RPGX 090800 T00525	120	3/8	.309	11																	●				
	RPGX 450 E02	RPGX 120700 E004	120	1/2	5/16	11			●	●										●	●	●	●				●
	RPGX 450 T0220	RPGX 120700 T00520	120	1/2	5/16	11				●										●	●		●			●	●
	RPGX 450 T0225	RPGX 120700 T00525	120	1/2	5/16	11																	●				
	RPGX 450 T0320	RPGX 120700 T00820	120	1/2	5/16	11			●	●												●					●
	RPGX 450 T0420	RPGX 120700 T01020	120	1/2	5/16	11			●	●										●	●	●	●			●	●

For more information on the holders, please reference page E53-59.

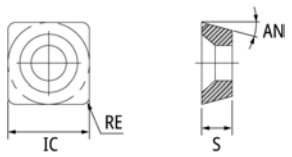
SCGW



Steel																														
Stainless Steel																														
Cast Iron							●	●	●		●	●													●	●	○	○		
Non-Ferrous Material																														
Heat Resistant Alloy	●	●	●	●															●	●	●	●					●	●		
Hardened Material					●			○	●	○			●	●																
Others (non-metallic)																														

Shape	Item Number		EPSR	IC	S	AN	RE	D1	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
									PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	°	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	SCGW 32.52 T0420	SCGW 09T308 T01020	90	3/8	5/32	7	.031	–																		●			
	SCGW 431 T0420	SCGW 120404 T01020	90	1/2	3/16	7	.016	–																		●			
	SCGW 432 T0420	SCGW 120408 T01020	90	1/2	3/16	7	.031	–																		●			

SDCW

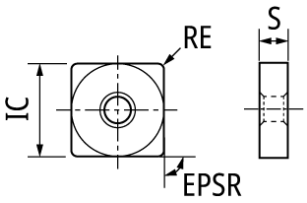


Steel																														
Stainless Steel																														
Cast Iron							●	●	●		●	●													●	●	○	○		
Non-Ferrous Material																														
Heat Resistant Alloy	●	●	●	●															●	●	●	●					●	●		
Hardened Material					●			○	●	○			●	●																
Others (non-metallic)																														

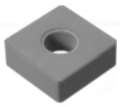
Shape	Item Number		EPSR	IC	S	AN	RE	D1	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
									PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	°	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	SDCW 432 T0420	SDCW 120408 T01020	90	1/2	3/16	15	.031	.217																		●	●		
	SDCW 433 T0420	SDCW 120412 T01020	90	1/2	3/16	15	.047	.217																		●			
	SDCW 434 T0420	SDCW 120416 T01020	90	1/2	3/16	15	.063	.217																		●			

For more information on the holders, please reference page I27,I29,I31.

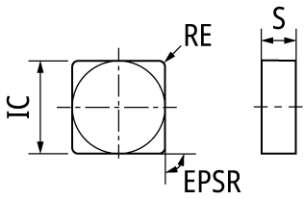
SNGA



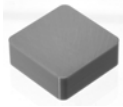
Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ● ● ●
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	SNGA 431 T0425	SNGA 120404 T01025	90	1/2	3/16	.016													●								
	SNGA 431 S0825	SNGA 120404 S02025	90	1/2	3/16	.016													●								
	SNGA 432 E02	SNGA 120408 E004	90	1/2	3/16	.031														●			●				
	SNGA 432 S0825	SNGA 120408 S02025	90	1/2	3/16	.031													●								
	SNGA 432 T0420	SNGA 120408 T01020	90	1/2	3/16	.031						●	●	●			●						●		●		
	SNGA 432 T0425	SNGA 120408 T01025	90	1/2	3/16	.031													●								
	SNGA 432 T0820	SNGA 120408 T02020	90	1/2	3/16	.031																		●			
	SNGA 432 Z0825	SNGA 120408 Z02025	90	1/2	3/16	.031									●												
	SNGA 433 E02	SNGA 120412 E004	90	1/2	3/16	.047														●			●				
	SNGA 433 S0825	SNGA 120412 S02025	90	1/2	3/16	.047													●								
	SNGA 433 T0220	SNGA 120412 T00520	90	1/2	3/16	.047																	●			●	
	SNGA 433 T0420	SNGA 120412 T01020	90	1/2	3/16	.047						●	●	●			●				●		●		●	●	
	SNGA 433 T0425	SNGA 120412 T01025	90	1/2	3/16	.047													●								
	SNGA 433 T0525	SNGA 120412 T01225	90	1/2	3/16	.047								●	●		●										
	SNGA 433 T0820	SNGA 120412 T02020	90	1/2	3/16	.047																		●			
	SNGA 433 Z0825	SNGA 120412 Z02025	90	1/2	3/16	.047									●												
	SNGA 434 E02	SNGA 120416 E004	90	1/2	3/16	.063														●			●				
	SNGA 434 T0420	SNGA 120416 T01020	90	1/2	3/16	.063						●	●	●			●						●		●		
	SNGA 434 T0525	SNGA 120416 T01225	90	1/2	3/16	.063											●										
	SNGA 434 T0820	SNGA 120416 T02020	90	1/2	3/16	.063																		●			
	SNGA 543 T0220	SNGA 150612 T00520	90	5/8	1/4	.047															●					●	
	SNGA 543 T0225	SNGA 150612 T00525	90	5/8	1/4	.047																	●				
	SNGA 544 T0220	SNGA 150616 T00520	90	5/8	1/4	.063															●						
	SNGA 544 T0820	SNGA 150616 T02020	90	5/8	1/4	.063															●						
	SNGA 644 T0825	SNGA 190616 T02025	90	3/4	1/4	.063								●													

For more information on the holders, please reference page E21-30,G16.



Steel																									
Stainless Steel																									
Cast Iron						●	●	●		●	●								●	●	○	○			
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●													●	●	●	●			●	●	
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	SNGN 322 T0425	SNGN 090308 T01025	90	3/8	1/8	.031								●			●										
	SNGN 322 T0525	SNGN 090308 T01225	90	3/8	1/8	.031								●													
	SNGN 324 T0425	SNGN 090316 T01025	90	3/8	1/8	.063						●		●													
	SNGN 324 T0525	SNGN 090316 T01225	90	3/8	1/8	.063								●													
	SNGN 332 T0425	SNGN 090408 T01025	90	3/8	3/16	.031								●													
	SNGN 431 S0825	SNGN 120404 S02025	90	1/2	3/16	.016													●								
	SNGN 431 T0425	SNGN 120404 T01025	90	1/2	3/16	.016								●					●								
	SNGN 432 E02	SNGN 120408 E004	90	1/2	3/16	.031														●			●				
	SNGN 432 S0825	SNGN 120408 S02025	90	1/2	3/16	.031													●								
	SNGN 432 T0220	SNGN 120408 T00520	90	1/2	3/16	.031															●		●	●		●	●
	SNGN 432 T0320	SNGN 120408 T00820	90	1/2	3/16	.031																					●
	SNGN 432 T0420	SNGN 120408 T01020	90	1/2	3/16	.031						●	●	●			●								●	●	●
	SNGN 432 T0425	SNGN 120408 T01025	90	1/2	3/16	.031						●		●			●		●							●	●
	SNGN 432 T0525	SNGN 120408 T01225	90	1/2	3/16	.031						●		●	●												
	SNGN 432 T0820	SNGN 120408 T02020	90	1/2	3/16	.031																		●			
	SNGN 432 T0825	SNGN 120408 T02025	90	1/2	3/16	.031																	●				
	SNGN 433 E02	SNGN 120412 E004	90	1/2	3/16	.047														●			●				
	SNGN 433 S0825	SNGN 120412 S02025	90	1/2	3/16	.047													●								
	SNGN 433 T0220	SNGN 120412 T00520	90	1/2	3/16	.047															●		●			●	●
	SNGN 433 T0320	SNGN 120412 T00820	90	1/2	3/16	.047																					●
	SNGN 433 T0420	SNGN 120412 T01020	90	1/2	3/16	.047						●	●	●			●							●	●	●	●
	SNGN 433 T0425	SNGN 120412 T01025	90	1/2	3/16	.047						●		●			●		●							●	●
	SNGN 433 T0525	SNGN 120412 T01225	90	1/2	3/16	.047								●	●												
	SNGN 433 T0820	SNGN 120412 T02020	90	1/2	3/16	.047																		●	●		
	SNGN 433 T0825	SNGN 120412 T02025	90	1/2	3/16	.047																	●				
	SNGN 433 Z0825	SNGN 120412 Z02025	90	1/2	3/16	.047									●												
	SNGN 434 E02	SNGN 120416 E004	90	1/2	3/16	.063														●			●				
	SNGN 434 S0825	SNGN 120416 S02025	90	1/2	3/16	.063													●								
	SNGN 434 T0220	SNGN 120416 T00520	90	1/2	3/16	.063															●		●			●	●
	SNGN 434 T0420	SNGN 120416 T01020	90	1/2	3/16	.063						●	●	●			●						●	●	●	●	●
	SNGN 434 T0425	SNGN 120416 T01025	90	1/2	3/16	.063						●		●			●		●							●	●
	SNGN 434 T0525	SNGN 120416 T01225	90	1/2	3/16	.063								●	●												
	SNGN 434 T0820	SNGN 120416 T02020	90	1/2	3/16	.063																		●			
	SNGN 434 T0825	SNGN 120416 T02025	90	1/2	3/16	.063																	●				
	SNGN 435 T0420	SNGN 120420 T01020	90	1/2	3/16	.079																			●		
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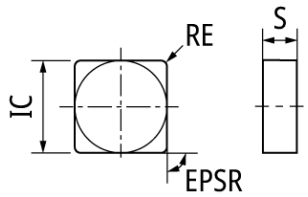
	SNGN 435 T0820	SNGN 120420 T02020	90	1/2	3/16	.079																		●			
	SNGN 435 T0825	SNGN 120420 T02025	90	1/2	3/16	.079						●														●	●
	SNGN 436 T0425	SNGN 120424 T01025	90	1/2	3/16	.094								●													
	SNGN 436 T0820	SNGN 120424 T02020	90	1/2	3/16	.094																		●			
	SNGN 438 S0825	SNGN 120432 S02025	90	1/2	3/16	.126								●													
	SNGN 438 T0525	SNGN 120432 T01225	90	1/2	3/16	.126								●													
	SNGN 452 T0220	SNGN 120708 T00520	90	1/2	5/16	.031																				●	
	SNGN 452 T0825	SNGN 120708 T02025	90	1/2	5/16	.031						●		●													
	SNGN 453 S0825	SNGN 120712 S02025	90	1/2	5/16	.047								●													
	SNGN 453 T0220	SNGN 120712 T00520	90	1/2	5/16	.047															●					●	
	SNGN 453 T0825	SNGN 120712 T02025	90	1/2	5/16	.047								●													
	SNGN 454 T0220	SNGN 120716 T00520	90	1/2	5/16	.063															●					●	
	SNGN 454 T0825	SNGN 120716 T02025	90	1/2	5/16	.063							●	●													
	SNGN 554 E02	SNGN 150716 E004	90	5/8	5/16	.063														●			●				
	SNGN 554 T0420	SNGN 150716 T01020	90	5/8	5/16	.063														●			●	●		●	
	SNGN 554 T0820	SNGN 150716 T02020	90	5/8	5/16	.063																	●	●	●	●	
	SNGN 554 T0825	SNGN 150716 T02025	90	5/8	5/16	.063																				●	●
	SNGN 632 T0820	SNGN 190408 T02020	90	3/4	3/16	.031								●													
	SNGN 634 T0820	SNGN 190416 T02020	90	3/4	3/16	.063								●													
	SNGN 643 T0820	SNGN 190612 T02020	90	3/4	1/4	.047								●													
	SNGN 644 T0120	SNGN 190616 T00320	90	3/4	1/4	.063															●						
	SNGN 644 T0220	SNGN 190616 T00520	90	3/4	1/4	.063														●	●		●			●	
	SNGN 644 T0225	SNGN 190616 T00525	90	3/4	1/4	.063																	●				

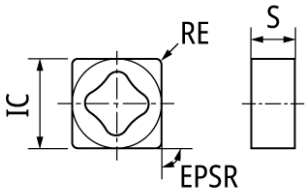


Steel																									
Stainless Steel																									
Cast Iron						●	●	●		●	●								●	●	○	○			
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●		
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

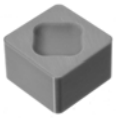
Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	SNGN 644 T0320	SNGN 190616 T00820	90	3/4	1/4	.063																●					
	SNGN 644 T0420	SNGN 190616 T01020	90	3/4	1/4	.063															●		●				
	SNGN 644 T0825	SNGN 190616 T02025	90	3/4	1/4	.063								●													
	SNGN 644 Z0620	SNGN 190616 Z01520	90	3/4	1/4	.063																				●	
	SNGN 653 T0825	SNGN 190712 T02025	90	3/4	5/16	.047								●													
	SNGN 654 E02	SNGN 190716 E004	90	3/4	5/16	.063														●			●				
	SNGN 654 T0420	SNGN 190716 T01020	90	3/4	5/16	.063														●			●				
	SNGN 654 T0825	SNGN 190716 T02025	90	3/4	5/16	.063								●													
	SNGN 656 E02	SNGN 190724 E004	90	3/4	5/16	.094														●			●				
	SNGN 656 T0120	SNGN 190724 T00320	90	3/4	5/16	.094															●						
	SNGN 656 T0225	SNGN 190724 T00525	90	3/4	5/16	.094																	●				
	SNGN 656 T0320	SNGN 190724 T00820	90	3/4	5/16	.094																●					
	SNGN 656 T0420	SNGN 190724 T01020	90	3/4	5/16	.094														●			●			●	
	SNGN 866 E02	SNGN 250924 E004	90	1.000	3/8	.094														●			●				
	SNGN 866 T0420	SNGN 250924 T01020	90	1.000	3/8	.094														●			●				

For more information on the holders, please reference page E21-30,G16,I14,I17,I20.

SNGX

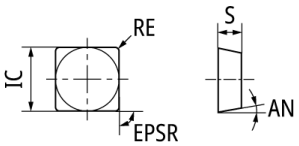


Steel																									
Stainless Steel																									
Cast Iron						●	●	●		●	●								●	●	○	○			
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●		
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	SNGX 452 T0220	SNGX 120708 T00520	90	1/2	5/16	.031																	●				
	SNGX 452 T0320	SNGX 120708 T00820	90	1/2	5/16	.031																●					
	SNGX 453 T0220	SNGX 120712 T00520	90	1/2	5/16	.047														●			●				
	SNGX 453 T0320	SNGX 120712 T00820	90	1/2	5/16	.047																●					
	SNGX 453 T0420	SNGX 120712 T01020	90	1/2	5/16	.047																	●		●		
	SNGX 453 T0820	SNGX 120712 T02020	90	1/2	5/16	.047																		●	●		
	SNGX 453 T0825	SNGX 120712 T02025	90	1/2	5/16	.047																			●		
	SNGX 454 T0420	SNGX 120716 T01020	90	1/2	5/16	.063																	●		●		
	SNGX 454 T0820	SNGX 120716 T02020	90	1/2	5/16	.063																		●	●		
	SNGX 454 T0825	SNGX 120716 T02025	90	1/2	5/16	.063																			●		
	SNGX 552 T0320	SNGX 150708 T00820	90	5/8	5/16	.031																●					
	SNGX 553 T0220	SNGX 150712 T00520	90	5/8	5/16	.047															●		●				
	SNGX 553 T0320	SNGX 150712 T00820	90	5/8	5/16	.047																●					
	SNGX 554 T0320	SNGX 150716 T00820	90	5/8	5/16	.063																●					

For more information on the holders, please reference page E21-24,G16.

SPGN

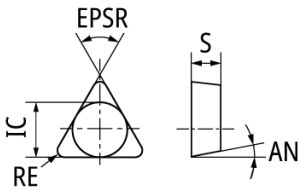


	Steel	Stainless Steel	Cast Iron	Non-Ferrous Material	Heat Resistant Alloy	Hardened Material	Others (non-metallic)
BIDEMICS PVD 120					●		
BIDEMICS PVD JP2					●		
BIDEMICS JX1					●		
BIDEMICS JX3					●		
NTK CeramiX PVD 450						●	
Alumina Ceramics HC1			●				
Alumina Ceramics HW2			●				
Alumina Ceramics HC2			●			○	
Alumina Ceramics PVD ZC4						●	
Alumina Ceramics HC5			●			○	
Alumina Ceramics HC6			●				
Alumina Ceramics HC7						●	
Alumina Ceramics PVD ZC7						●	
Silicon Nitride Ceramics SX3					●		
Silicon Nitride Ceramics SX5					●		
Silicon Nitride Ceramics SX7					●		
Silicon Nitride Ceramics SX9					●		
Silicon Nitride Ceramics SX6			●				
Silicon Nitride Ceramics CVD SP9			●				
Whisker Ceramics WA1			○		●		
Whisker Ceramics 533			○		●		

Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	AN °	RE inch
	SPGN 322 T0420	SPGN 090308 T01020	90	3/8	1/8	11	.031
	SPGN 322 T0425	SPGN 090308 T01025	90	3/8	1/8	11	.031
	SPGN 324 S0820	SPGN 090316 S02020	90	3/8	1/8	11	.063
	SPGN 422 T0420	SPGN 120308 T01020	90	1/2	1/8	11	.031
	SPGN 422 T0425	SPGN 120308 T01025	90	1/2	1/8	11	.031
	SPGN 422 T0525	SPGN 120308 T01225	90	1/2	1/8	11	.031
	SPGN 423 T0420	SPGN 120312 T01020	90	1/2	1/8	11	.047
	SPGN 424 T0420	SPGN 120316 T01020	90	1/2	1/8	11	.063
	SPGN 432 T0420	SPGN 120408 T01020	90	1/2	3/16	11	.031
	SPGN 432 T0425	SPGN 120408 T01025	90	1/2	3/16	11	.031
	SPGN 433 T0420	SPGN 120412 T01020	90	1/2	3/16	11	.047
	SPGN 433 T0425	SPGN 120412 T01025	90	1/2	3/16	11	.047
	SPGN 434 T0420	SPGN 120416 T01020	90	1/2	3/16	11	.063
	SPGN 434 T0425	SPGN 120416 T01025	90	1/2	3/16	11	.063
	SPGN 434 T0820	SPGN 120416 T02020	90	1/2	3/16	11	.063
	SPGN 634 T0420	SPGN 190416 T01020	90	1/2	3/16	11	.063

Shape	BIDEMICS PVD 120	BIDEMICS PVD JP2	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics HC2	Alumina Ceramics PVD ZC4	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics PVD ZC7	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics CVD SP9	Whisker Ceramics WA1	Whisker Ceramics 533
							●	●													
								●													
								●													
							●	●													
								●			●										
									●												
							●	●													
							●	●													
																		●			
								●													
																		●	●		
								●													
																		●	●		
											●										
																		●			
																		●			

TBGE

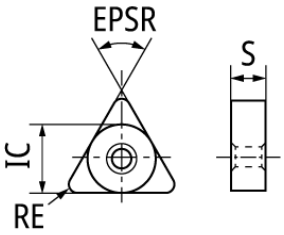


	Steel	Stainless Steel	Cast Iron	Non-Ferrous Material	Heat Resistant Alloy	Hardened Material	Others (non-metallic)
BIDEMICS PVD 120					●		
BIDEMICS PVD JP2					●		
BIDEMICS JX1					●		
BIDEMICS JX3					●		
NTK CeramiX PVD 450						●	
Alumina Ceramics HC1			●				
Alumina Ceramics HW2			●				
Alumina Ceramics HC2			●			○	
Alumina Ceramics PVD ZC4						●	
Alumina Ceramics HC5			●			○	
Alumina Ceramics HC6			●				
Alumina Ceramics HC7						●	
Alumina Ceramics PVD ZC7						●	
Silicon Nitride Ceramics SX3					●		
Silicon Nitride Ceramics SX5					●		
Silicon Nitride Ceramics SX7					●		
Silicon Nitride Ceramics SX9					●		
Silicon Nitride Ceramics SX6			●				
Silicon Nitride Ceramics CVD SP9			●				
Whisker Ceramics WA1			○		●		
Whisker Ceramics 533			○		●		

Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	AN °	RE inch
	TBGE 521 T0225	TBGN 060104 T00525	60	5/32	1/16	5	.016
	TBGE 522 T0225	TBGN 060108 T00525	60	5/32	1/16	5	.031

Shape	BIDEMICS PVD 120	BIDEMICS PVD JP2	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics HC2	Alumina Ceramics PVD ZC4	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics PVD ZC7	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics CVD SP9	Whisker Ceramics WA1	Whisker Ceramics 533
								●													
								●													

TNGA

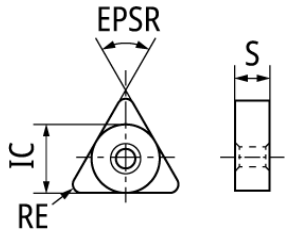


Steel																									
Stainless Steel																									
Cast Iron						●	●	●		●	●								●	●	○	○			
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●		
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	TNGA 321 T0425	TNGA 160304 T01025	60	3/8	1/8	.016								●													
	TNGA 322 T0525	TNGA 160308 T01225	60	3/8	3/16	.031								●													
	TNGA 331 S0825	TNGA 160404 S02025	60	3/8	3/16	.016													●								
	TNGA 331 T0425	TNGA 160404 T01025	60	3/8	3/16	.016								●					●								
	TNGA 331 X0415	TNGA 160404 X01015	60	3/8	3/16	.016					●																
	TNGA 331 X0415 -10	TNGA 160404 X01015 -10	60	3/8	3/16	.016					●																
	TNGA 331 Z0825	TNGA 160404 Z02025	60	3/8	3/16	.016									●												
	TNGA 332 S0825	TNGA 160408 S02025	60	3/8	3/16	.031													●								
	TNGA 332 T0420	TNGA 160408 T01020	60	3/8	3/16	.031						●	●	●			●						●		●		
	TNGA 332 T0425	TNGA 160408 T01025	60	3/8	3/16	.031								●			●		●						●		
	TNGA 332 T0525	TNGA 160408 T01225	60	3/8	3/16	.031								●	●	●	●										
	TNGA 332 T0820	TNGA 160408 T02020	60	3/8	3/16	.031																		●			
	TNGA 332 T0825	TNGA 160408 T02025	60	3/8	3/16	.031																	●				
	TNGA 332 X0415	TNGA 160408 X01015	60	3/8	3/16	.031					●																
	TNGA 332 X0415 -10	TNGA 160408 X01015 -10	60	3/8	3/16	.031					●																
	TNGA 332 Z0825	TNGA 160408 Z02025	60	3/8	3/16	.031									●												
	TNGA 333 S0825	TNGA 160412 S02025	60	3/8	3/16	.047													●								
	TNGA 333 T0420	TNGA 160412 T01020	60	3/8	3/16	.047						●	●	●			●						●		●		
	TNGA 333 T0425	TNGA 160412 T01025	60	3/8	3/16	.047								●			●		●						●		
	TNGA 333 T0525	TNGA 160412 T01225	60	3/8	3/16	.047											●										
	TNGA 333 T0820	TNGA 160412 T02020	60	3/8	3/16	.047																		●			
	TNGA 333 T0825	TNGA 160412 T02025	60	3/8	3/16	.047																	●				
	TNGA 333 X0415	TNGA 160412 X01015	60	3/8	3/16	.047					●																
	TNGA 333 X0415 -10	TNGA 160412 X01015 -10	60	3/8	3/16	.047					●																
	TNGA 333 Z0825	TNGA 160412 Z02025	60	3/8	3/16	.047									●												
	TNGA 334 T0420	TNGA 160416 T01020	60	3/8	3/16	.063						●	●	●			●						●		●		
	TNGA 334 T0820	TNGA 160416 T02020	60	3/8	3/16	.063																		●			
	TNGA 334 T0825	TNGA 160416 T02025	60	3/8	3/16	.063																	●				
	TNGA 431 T0425	TNGA 220404 T01025	60	1/2	3/16	.016								●													
	TNGA 432 S0825	TNGA 220408 S02025	60	1/2	3/16	.031													●								
	TNGA 432 T0220	TNGA 220408 T00520	60	1/2	3/16	.031																				●	
	TNGA 432 T0525	TNGA 220408 T01225	60	1/2	3/16	.031									●												
	TNGA 432 T0825	TNGA 220408 T02025	60	1/2	3/16	.031								●		●											
	TNGA 433 T0825	TNGA 220412 T02025	60	1/2	3/16	.047								●													
	TNGA 433 Z0825	TNGA 220412 Z02025	60	1/2	3/16	.047									●												
	TNGA 434 T0525	TNGA 220416 T01225	60	1/2	3/16	.063									●												
	TNGA 434 T0825	TNGA 220416 T02025	60	1/2	3/16	.063								●													

For more information on the holders, please reference page E38-41,Q59-63.

TNGG-AG with chipbreaker

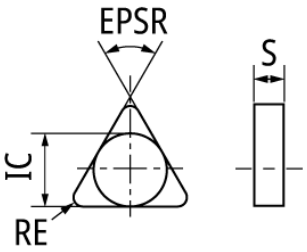


	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
Steel																					
Stainless Steel																					
Cast Iron						●	●	●		●	●							●	●	○	○
Non-Ferrous Material																					
Heat Resistant Alloy	●	●	●	●										●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●								
Others (non-metallic)																					

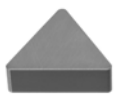
Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	RE inch	BIDEMICS PVD 120	BIDEMICS PVD JP2	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics PVD HC2	Alumina Ceramics PVD ZC4	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics PVD ZC7	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics CVD SP9	Whisker Ceramics WA1	Whisker Ceramics 533
	TNGG 332 Z0430 AG	TNGG 160408 Z01030 AG	60	3/8	3/16	.031													●								
	TNGG 333 Z0430 AG	TNGG 160412 Z01030 AG	60	3/8	3/16	.047													●								

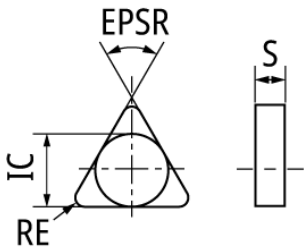
For more information on the holders, please reference page E38-41,Q59-63.

TNGN



	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
Steel																					
Stainless Steel																					
Cast Iron						●	●	●		●	●							●	●	○	○
Non-Ferrous Material																					
Heat Resistant Alloy	●	●	●	●										●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●								
Others (non-metallic)																					

Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	RE inch	BIDEMICS PVD 120	BIDEMICS PVD JP2	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics PVD HC2	Alumina Ceramics PVD ZC4	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics PVD ZC7	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics CVD SP9	Whisker Ceramics WA1	Whisker Ceramics 533
	TNGN 221 T0225	TNGN 110304 T00525	60	1/4	1/8	.016								●													
	TNGN 222 T0225	TNGN 110308 T00525	60	1/4	1/8	.031								●			●										
	TNGN 321 T0425	TNGN 160304 T01025	60	3/8	1/8	.016								●													
	TNGN 322 T0425	TNGN 160308 T01025	60	3/8	1/8	.031								●			●										
	TNGN 322 T0525	TNGN 160308 T01225	60	3/8	1/8	.031									●												
	TNGN 322 T0825	TNGN 160308 T02025	60	3/8	1/8	.031								●													
	TNGN 331 S0825	TNGN 160404 S02025	60	3/8	3/16	.016													●								
	TNGN 331 T0425	TNGN 160404 T01025	60	3/8	3/16	.016								●					●								
	TNGN 332 S0825	TNGN 160408 S02025	60	3/8	3/16	.031													●								
	TNGN 332 T0320	TNGN 160408 T00820	60	3/8	3/16	.031																					●
	TNGN 332 T0420	TNGN 160408 T01020	60	3/8	3/16	.031						●	●	●			●								●	●	●
	TNGN 332 T0425	TNGN 160408 T01025	60	3/8	3/16	.031						●		●			●		●							●	●
	TNGN 332 T0525	TNGN 160408 T01225	60	3/8	3/16	.031								●	●												
	TNGN 332 T0820	TNGN 160408 T02020	60	3/8	3/16	.031																		●			
	TNGN 332 T0825	TNGN 160408 T02025	60	3/8	3/16	.031																	●				
	TNGN 332 Z0825	TNGN 160408 Z02025	60	3/8	3/16	.031																					
	TNGN 333 S0825	TNGN 160412 S02025	60	3/8	3/16	.047													●								
	TNGN 333 T0320	TNGN 160412 T00820	60	3/8	3/16	.047																					●
	TNGN 333 T0420	TNGN 160412 T01020	60	3/8	3/16	.047						●	●	●			●							●	●	●	●
	TNGN 333 T0425	TNGN 160412 T01025	60	3/8	3/16	.047						●		●			●		●							●	●
	TNGN 333 T0525	TNGN 160412 T01225	60	3/8	3/16	.047									●												
	TNGN 333 T0820	TNGN 160412 T02020	60	3/8	3/16	.047								●										●			
	TNGN 333 T0825	TNGN 160412 T02025	60	3/8	3/16	.047																	●				
	TNGN 333 Z0825	TNGN 160412 Z02025	60	3/8	3/16	.047																					
	TNGN 334 T0420	TNGN 160416 T01020	60	3/8	3/16	.063						●	●	●			●							●		●	●
	TNGN 334 T0425	TNGN 160416 T01025	60	3/8	3/16	.063						●	●	●													
	TNGN 334 T0525	TNGN 160416 T01225	60	3/8	3/16	.063								●													
	TNGN 334 T0820	TNGN 160416 T02020	60	3/8	3/16	.063																		●			
	TNGN 334 T0825	TNGN 160416 T02025	60	3/8	3/16	.063																	●				
	TNGN 335 T0425	TNGN 160420 T01025	60	3/8	3/16	.079						●		●													
	TNGN 335 T0820	TNGN 160420 T02020	60	3/8	3/16	.079																		●			

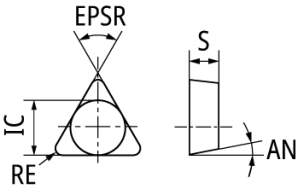


Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	TNGN 352 T0825	TNGN 160708 T02025	60	3/8	5/16	.031								●													
	TNGN 353 T0825	TNGN 160712 T02025	60	3/8	5/16	.047								●													
	TNGN 431 T0425	TNGN 220404 T01025	60	1/2	3/16	.016								●													
	TNGN 432 T0220	TNGN 220408 T00520	60	1/2	3/16	.031															●		●			●	
	TNGN 432 T0420	TNGN 220408 T01020	60	1/2	3/16	.031																	●			●	
	TNGN 432 T0425	TNGN 220408 T01025	60	1/2	3/16	.031											●										
	TNGN 432 T0525	TNGN 220408 T01225	60	1/2	3/16	.031								●													
	TNGN 432 T0820	TNGN 220408 T02020	60	1/2	3/16	.031																		●			
	TNGN 432 Z0825	TNGN 220408 Z02025	60	1/2	3/16	.031									●												
	TNGN 433 T0220	TNGN 220412 T00520	60	1/2	3/16	.047															●					●	
	TNGN 433 T0630	TNGN 220412 T01530	60	1/2	3/16	.047								●													
	TNGN 433 Z0820	TNGN 220412 Z02020	60	1/2	3/16	.047								●													
	TNGN 433 Z0825	TNGN 220412 Z02025	60	1/2	3/16	.047									●				●								
	TNGN 434 T0220	TNGN 220416 T00520	60	1/2	3/16	.063															●					●	●
	TNGN 434 T0625	TNGN 220416 T01525	60	1/2	3/16	.063								●													
	TNGN 452 T0220	TNGN 220708 T00520	60	1/2	5/16	.031															●						
	TNGN 452 T0825	TNGN 220708 T02025	60	1/2	5/16	.031								●													
	TNGN 453 T0220	TNGN 220712 T00520	60	1/2	5/16	.047															●					●	
	TNGN 454 T0220	TNGN 220716 T00520	60	1/2	5/16	.063																				●	●
	TNGN 544 T0120	TNGN 270616 T00320	60	5/8	1/4	.063															●						
	TNGN 544 T0220	TNGN 270616 T00520	60	5/8	1/4	.063																				●	
	TNGN 544 T0825	TNGN 270616 T02025	60	5/8	1/4	.063								●													

For more information on the holders, please reference page E38-41.

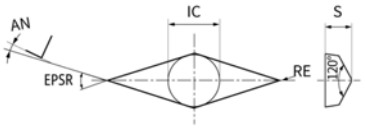
TPGN



Steel																									
Stainless Steel																									
Cast Iron						●	●	●		●	●								●	●	○	○			
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●													●	●	●	●			●	●	
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	AN °	RE inch	BIDEMICS PVD 120	BIDEMICS PVD JP2	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics HC2	Alumina Ceramics PVD ZC4	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics PVD ZC7	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics CVD SP9	Whisker Ceramics WA1	Whisker Ceramics 533
	TPGNE 521 T0225	TPGN 060104 T00525	60	5/32	1/16	11	.016								●													
	TPGNE 731 T0225	TPGN 090204 T00525	60	7/32	3/32	11	.016								●													
	TPGNE 732 T0225	TPGN 090208 T00525	60	7/32	3/32	11	.031								●													
	TPGN 221 T0225	TPGN 110304 T00525	60	1/4	1/8	11	.016								●													
	TPGN 221 T0420	TPGN 110304 T01020	60	1/4	1/8	11	.016							●	●													
	TPGN 221 T0425	TPGN 110304 T01025	60	1/4	1/8	11	.016													●								
	TPGN 221 T0525	TPGN 110304 T01225	60	1/4	1/8	11	.016									●												
	TPGN 222 T0225	TPGN 110308 T00525	60	1/4	1/8	11	.031								●			●										
	TPGN 222 T0420	TPGN 110308 T01020	60	1/4	1/8	11	.031							●	●			●										
	TPGN 222 T0425	TPGN 110308 T01025	60	1/4	1/8	11	.031													●								
	TPGN 222 T0525	TPGN 110308 T01225	60	1/4	1/8	11	.031									●												
	TPGN 222 T0825	TPGN 110308 T02025	60	1/4	1/8	11	.031								●													
	TPGN 223 T0225	TPGN 110312 T00525	60	1/4	1/8	11	.047											●										
	TPGN 223 T0820	TPGN 110312 T02020	60	1/4	1/8	11	.047								●													
	TPGN 3208 T0425	TPGN 160302 T01025	60	3/8	1/8	11	.008								●													
	TPGN 321 T0420	TPGN 160304 T01020	60	3/8	1/8	11	.016							●	●													
	TPGN 321 T0425	TPGN 160304 T01025	60	3/8	1/8	11	.016								●					●								
	TPGN 321 T0525	TPGN 160304 T01225	60	3/8	1/8	11	.016									●												
	TPGN 322 T0220	TPGN 160308 T00520	60	3/8	1/8	11	.031														●						●	
	TPGN 322 T0420	TPGN 160308 T01020	60	3/8	1/8	11	.031							●	●			●										
	TPGN 322 T0425	TPGN 160308 T01025	60	3/8	1/8	11	.031								●			●		●								
	TPGN 322 T0525	TPGN 160308 T01225	60	3/8	1/8	11	.031								●	●												
	TPGN 323 T0220	TPGN 160312 T00520	60	3/8	1/8	11	.047														●						●	
	TPGN 323 T0420	TPGN 160312 T01020	60	3/8	1/8	11	.047							●	●													
	TPGN 323 T0425	TPGN 160312 T01025	60	3/8	1/8	11	.047							●	●													
	TPGN 323 T0525	TPGN 160312 T01225	60	3/8	1/8	11	.047									●												
	TPGN 324 T0425	TPGN 160316 T01025	60	3/8	1/8	11	.063								●													
	TPGN 431 T0425	TPGN 220404 T01025	60	1/2	3/16	11	.016								●													
	TPGN 432 T0425	TPGN 220408 T01025	60	1/2	3/16	11	.031								●			●										
	TPGN 432 T0525	TPGN 220408 T01225	60	1/2	3/16	11	.031									●												
	TPGN 434 T0425	TPGN 220416 T01025	60	1/2	3/16	11	.063								●													

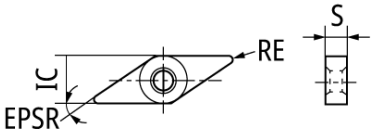
VCGN-V



Steel																									
Stainless Steel																									
Cast Iron						●	●	●		●	●								●	●	○	○			
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●													●	●	●	●			●	●	
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	AN °	RE inch	BIDEMICS PVD 120	BIDEMICS PVD JP2	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics HC2	Alumina Ceramics PVD ZC4	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics PVD ZC7	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics CVD SP9	Whisker Ceramics WA1	Whisker Ceramics 533
	VCGN 2.533 E02 -V	VCGN 130412 E004 -V	35	5/16	.187	7	.047				●										●							

VNGA

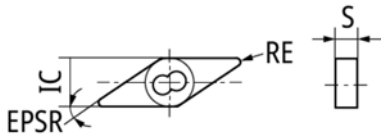


Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

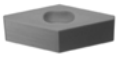
Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	VNGA 331 BQ E02	VNGA 160404 BQ E004	35	3/8	3/16	.016	●	●																			
	VNGA 331 BQ T0220	VNGA 160404 BQ T00520	35	3/8	3/16	.016		●																			
	VNGA 331 S0825	VNGA 160404 S02025	35	3/8	3/16	.016													●								
	VNGA 331 T0220	VNGA 160404 T00520	35	3/8	3/16	.016															●						
	VNGA 331 T0225	VNGA 160404 T00525	35	3/8	3/16	.016															●						
	VNGA 331 T0420	VNGA 160404 T01020	35	3/8	3/16	.016						●	●	●			●							●			
	VNGA 331 T0425	VNGA 160404 T01025	35	3/8	3/16	.016								●			●		●								
	VNGA 331 T0525	VNGA 160404 T01225	35	3/8	3/16	.016									●		●										
	VNGA 331 X0415	VNGA 160404 X01015	35	3/8	3/16	.016					●																
	VNGA 331 X0415 -10	VNGA 160404 X01015 -10	35	3/8	3/16	.016					●																
	VNGA 331 Z0825	VNGA 160404 Z02025	35	3/8	3/16	.016									●												
	VNGA 332 BQ E02	VNGA 160408 BQ E004	35	3/8	3/16	.031	●	●																			
	VNGA 332 BQ T0220	VNGA 160408 BQ T00520	35	3/8	3/16	.031		●																			
	VNGA 332 S0825	VNGA 160408 S02025	35	3/8	3/16	.031													●								
	VNGA 332 T0220	VNGA 160408 T00520	35	3/8	3/16	.031															●					●	
	VNGA 332 T0320	VNGA 160408 T00820	35	3/8	3/16	.031																●					
	VNGA 332 T0420	VNGA 160408 T01020	35	3/8	3/16	.031						●	●	●			●						●	●	●		
	VNGA 332 T0425	VNGA 160408 T01025	35	3/8	3/16	.031								●			●		●					●			
	VNGA 332 T0525	VNGA 160408 T01225	35	3/8	3/16	.031									●		●										
	VNGA 332 X0415	VNGA 160408 X01015	35	3/8	3/16	.031					●																
	VNGA 332 X0415 -10	VNGA 160408 X01015 -10	35	3/8	3/16	.031					●																
	VNGA 332 Z0825	VNGA 160408 Z02025	35	3/8	3/16	.031									●												
	VNGA 333 BQ E02	VNGA 160412 BQ E004	35	3/8	3/16	.047		●																			
	VNGA 333 BQ T0220	VNGA 160412 BQ T00520	35	3/8	3/16	.047		●																			
	VNGA 333 S0825	VNGA 160412 S02025	35	3/8	3/16	.047													●								
	VNGA 333 T0320	VNGA 160412 T00820	35	3/8	3/16	.047																●					
	VNGA 333 T0420	VNGA 160412 T01020	35	3/8	3/16	.047						●	●	●			●						●	●	●		
	VNGA 333 T0425	VNGA 160412 T01025	35	3/8	3/16	.047								●	●	●			●					●			
	VNGA 333 X0415	VNGA 160412 X01015	35	3/8	3/16	.047					●																
	VNGA 333 X0415 -10	VNGA 160412 X01015 -10	35	3/8	3/16	.047					●																
	VNGA 333 Z0825	VNGA 160412 Z02025	35	3/8	3/16	.047									●												
	VNGA 431 T0425	VNGA 220404 T01025	35	1/2	3/16	.016								●													
	VNGA 432 T0425	VNGA 220408 T01025	35	1/2	3/16	.031								●													
	VNGA 433 T0425	VNGA 220412 T01025	35	1/2	3/16	.047										●											
	VNGA 436 T0420	VNGA 220424 T01020	35	1/2	3/16	.094																				●	

For more information on the holders, please reference page E34-35.

VNGX

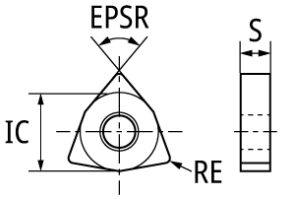


Steel																									
Stainless Steel																									
Cast Iron							●	●	●		●	●									●	●	○	○	
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●												●	●	●	●				●	●	
Hardened Material					●			○	●	○			●	●											
Others (non-metallic)																									

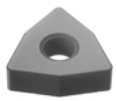
Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	VNGX 352 T0820	VNGX 160708 T02020	35	3/8	5/16	.031																		●			
	VNGX 353 T0820	VNGX 160712 T02020	35	3/8	5/16	.047																		●			

For more information on the holders, please reference page E34-35.

WNGA

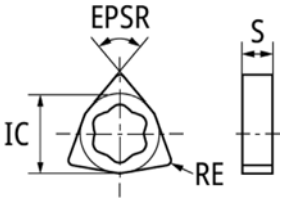


Steel																									
Stainless Steel																									
Cast Iron							●	●	●		●	●									●	●	○	○	
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●												●	●	●	●				●	●	
Hardened Material					●			○	●	○			●	●											
Others (non-metallic)																									

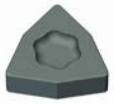
Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	WNGA 331 T0525	WNGA 060404 T01225	80	3/8	3/16	.016									●												
	WNGA 332 T0525	WNGA 060408 T01225	80	3/8	3/16	.031									●												
	WNGA 333 T0525	WNGA 060412 T01225	80	3/8	3/16	.047									●												
	WNGA 431 S0825	WNGA 080404 S02025	80	1/2	3/16	.016													●								
	WNGA 431 T0220	WNGA 080404 T00520	80	1/2	3/16	.016																				●	
	WNGA 431 Z0825	WNGA 080404 Z02025	80	1/2	3/16	.016									●												
	WNGA 432 E02	WNGA 080408 E004	80	1/2	3/16	.031														●			●				
	WNGA 432 S0825	WNGA 080408 S02025	80	1/2	3/16	.031													●								
	WNGA 432 T0220	WNGA 080408 T00520	80	1/2	3/16	.031														●	●		●			●	
	WNGA 432 T0420	WNGA 080408 T01020	80	1/2	3/16	.031																	●		●		●
	WNGA 432 T0525	WNGA 080408 T01225	80	1/2	3/16	.031									●		●										
	WNGA 432 T0820	WNGA 080408 T02020	80	1/2	3/16	.031								●										●			
	WNGA 432 Z0825	WNGA 080408 Z02025	80	1/2	3/16	.031									●												
	WNGA 433 E02	WNGA 080412 E004	80	1/2	3/16	.047														●			●				
	WNGA 433 S0825	WNGA 080412 S02025	80	1/2	3/16	.047													●								
	WNGA 433 T0220	WNGA 080412 T00520	80	1/2	3/16	.047														●	●		●			●	
	WNGA 433 T0420	WNGA 080412 T01020	80	1/2	3/16	.047																	●		●		●
	WNGA 433 T0525	WNGA 080412 T01225	80	1/2	3/16	.047											●										
	WNGA 433 T0820	WNGA 080412 T02020	80	1/2	3/16	.047								●										●			
	WNGA 434 E02	WNGA 080416 E004	80	1/2	3/16	.063														●			●				
	WNGA 434 T0220	WNGA 080416 T00520	80	1/2	3/16	.063														●			●				
	WNGA 434 T0420	WNGA 080416 T01020	80	1/2	3/16	.063																	●		●		
	WNGA 434 T0820	WNGA 080416 T02020	80	1/2	3/16	.063																		●			

For more information on the holders, please reference page E45,G20.

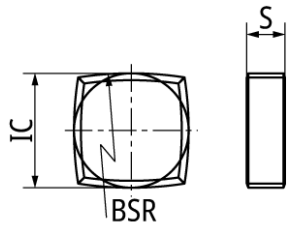
WNGX



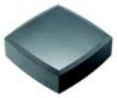
Steel																											
Stainless Steel																											
Cast Iron						●	●	●		●	●										●	●	○	○			
Non-Ferrous Material																											
Heat Resistant Alloy	●	●	●	●														●	●	●	●			●	●		
Hardened Material					●			○	●	○		●	●														
Others (non-metallic)																											

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	WNGX 453 T0820	WNGX 080712 T02020	80	1/2	5/16	.047																		●			

ZT1130

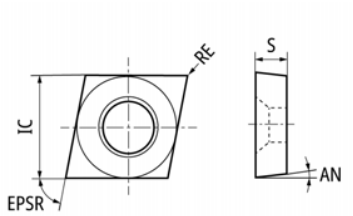


Steel																											
Stainless Steel																											
Cast Iron						●	●	●		●	●										●	●	○	○			
Non-Ferrous Material																											
Heat Resistant Alloy	●	●	●	●														●	●	●	●			●	●		
Hardened Material					●			○	●	○		●	●														
Others (non-metallic)																											

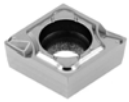
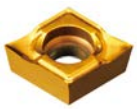
Shape	Item Number		IC	S	BSR	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
						PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(Metric)	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	ZT 1130 P9120	ZT 1130 P23020	1-1/2	1/2	4-1/2								●		●		●									

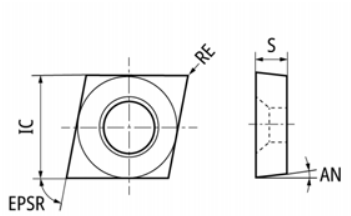
Carbide

CC..



Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	AN	RE	Carbide										
								PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	CCGT 32.504M R TMV	CCGT 09T301M R TMV	80	3/8	5/32	7	.003	●	●	●			●					
	CCGT 32.508M R TMV	CCGT 09T302M R TMV	80	3/8	5/32	7	.007	●	●	●			●					
	CCGT 32.51M R TMV	CCGT 09T304M R TMV	80	3/8	5/32	7	.015	●	●	●			●					
	CCGT 32.501 YL	CCGT 09T300 YL	80	3/8	5/32	7	.001				●		●					
	CCGT 32.504M YL	CCGT 09T301M YL	80	3/8	5/32	7	.003	●	●	●	●	●	●					
	CCGT 32.508M YL	CCGT 09T302M YL	80	3/8	5/32	7	.007	●	●	●	●	●	●					
	CCGT 32.51M YL	CCGT 09T304M YL	80	3/8	5/32	7	.015	●	●	●	●	●	●					
	CCGT 32.52M YL	CCGT 09T308M YL	80	3/8	5/32	7	.031		●	●	●	●	●					
	CCGT 21.504M CL	CCGT 060201M CL	80	1/4	3/32	7	.003		●	●	●	●	●					
	CCGT 21.508M CL	CCGT 060202M CL	80	1/4	3/32	7	.007		●	●	●	●	●					
	CCGT 32.501 CL	CCGT 09T300 CL	80	3/8	5/32	7	.001				●		●					
	CCGT 32.504M CL	CCGT 09T301M CL	80	3/8	5/32	7	.003	●	●	●	●	●	●					
	CCGT 32.508M CL	CCGT 09T302M CL	80	3/8	5/32	7	.007	●	●	●	●	●	●					
	CCGT 32.51M CL	CCGT 09T304M CL	80	3/8	5/32	7	.015	●	●	●	●	●	●					
	CCGT 21.501 FN AM3	CCGT 060200 FN AM3	80	1/4	3/32	7	.001				●	●	●	●				
	CCGT 21.504M FN AM3	CCGT 060201M FN AM3	80	1/4	3/32	7	.003		●		●	●	●					
	CCGT 21.508 FN AM3	CCGT 060202 FN AM3	80	1/4	3/32	7	.008							●	●			
	CCGT 21.508M FN AM3	CCGT 060202M FN AM3	80	1/4	3/32	7	.007		●		●	●	●					
	CCGT 21.51 FN AM3	CCGT 060204 FN AM3	80	1/4	3/32	7	.016								●			
	CCGT 21.51M FN AM3	CCGT 060204M FN AM3	80	1/4	3/32	7	.015		●		●	●	●					
	CCGT 32.501 FN AM3	CCGT 09T300 FN AM3	80	3/8	5/32	7	.001				●	●	●	●				
	CCGT 32.504M FN AM3	CCGT 09T301M FN AM3	80	3/8	5/32	7	.003	●	●		●	●	●	●	●			
	CCGT 32.508 FN AM3	CCGT 09T302 FN AM3	80	3/8	5/32	7	.008					●		●				
	CCGT 32.508M FN AM3	CCGT 09T302M FN AM3	80	3/8	5/32	7	.007	●	●		●	●	●	●	●			
	CCGT 32.51 FN AM3	CCGT 09T304 FN AM3	80	3/8	5/32	7	.016					●		●				
	CCGT 32.51M FN AM3	CCGT 09T304M FN AM3	80	3/8	5/32	7	.015	●	●		●	●	●	●	●			
	CCMT 21.508 FN AM3	CCMT 060202 FN AM3	80	1/4	3/32	7	.008			●								
	CCMT 21.51 FN AM3	CCMT 060204 FN AM3	80	1/4	3/32	7	.016			●								
	CCMT 32.508 FN AM3	CCMT 09T302 FN AM3	80	3/8	5/32	7	.008			●								
	CCMT 32.51 FN AM3	CCMT 09T304 FN AM3	80	3/8	5/32	7	.016			●								
	CCMT 32.52 FN AM3	CCMT 09T308 FN AM3	80	3/8	5/32	7	.031			●								
	CCGT 21.501 AZ7	CCGT 060200 AZ7	80	1/4	3/32	7	.001					●						
	CCGT 21.504M AZ7	CCGT 060201M AZ7	80	1/4	3/32	7	.003					●						
	CCGT 21.508M AZ7	CCGT 060202M AZ7	80	1/4	3/32	7	.007					●						
	CCGT 32.501 AZ7	CCGT 09T300 AZ7	80	3/8	5/32	7	.001				●	●	●		●			
	CCGT 32.504M AZ7	CCGT 09T301M AZ7	80	3/8	5/32	7	.003				●	●	●		●			
	CCGT 32.508M AZ7	CCGT 09T302M AZ7	80	3/8	5/32	7	.007				●	●	●		●			
	CCGT 32.51M AZ7	CCGT 09T304M AZ7	80	3/8	5/32	7	.015				●	●	●		●			
	CCMT 21.508 E01 AZ8	CCMT 060202 E002 AZ8	80	1/4	3/32	7	.008										●	
	CCMT 21.51 E02 AZ8	CCMT 060204 E004 AZ8	80	1/4	3/32	7	.016										●	
	CCMT 21.52 E02 AZ8	CCMT 060208 E004 AZ8	80	1/4	3/32	7	.031										●	
	CCMT 32.508 E01 AZ8	CCMT 09T302 E002 AZ8	80	3/8	5/32	7	.008										●	
	CCMT 32.51 E02 AZ8	CCMT 09T304 E004 AZ8	80	3/8	5/32	7	.016										●	
	CCMT 32.52 E02 AZ8	CCMT 09T308 E004 AZ8	80	3/8	5/32	7	.031										●	
	CCGT 21.501 R S	CCGT 060200 R S	80	1/4	3/32	7	.001				●	●		●	●			
	CCGT 21.501 L S	CCGT 060200 L S	80	1/4	3/32	7	.001							●	●			
	CCGT 21.504M R S	CCGT 060201M R S	80	1/4	3/32	7	.003				●	●						
	CCGT 21.504 R S	CCGT 060201 R S	80	1/4	3/32	7	.004							●	●			
	CCGT 21.504 L S	CCGT 060201 L S	80	1/4	3/32	7	.004							●	●			
	CCGT 21.508M R S	CCGT 060202M R S	80	1/4	3/32	7	.007				●	●						
	CCGT 21.508 R S	CCGT 060202 R S	80	1/4	3/32	7	.008							●	●			
	CCGT 21.508 L S	CCGT 060202 L S	80	1/4	3/32	7	.008							●	●			
	CCGT 21.51 R S	CCGT 060204 R S	80	1/4	3/32	7	.016					●						
	CCGT 32.501 R S	CCGT 09T300 R S	80	3/8	5/32	7	.001				●	●	●	●	●			
	CCGT 32.501 L S	CCGT 09T300 L S	80	3/8	5/32	7	.001							●				



Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number (Inch)	Item Number (Metric)	EPSR	IC	S	AN	RE	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM11	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
			°	inch	inch	°	inch											
	CCGT 32.504M R S	CCGT 09T301M R S	80	3/8	5/32	7	.003				●	●	●					
	CCGT 32.504 R S	CCGT 09T301 R S	80	3/8	5/32	7	.004					●		●	●			
	CCGT 32.504 L S	CCGT 09T301 L S	80	3/8	5/32	7	.004							●	●			
	CCGT 32.508M R S	CCGT 09T302M R S	80	3/8	5/32	7	.007				●	●	●					
	CCGT 32.508 R S	CCGT 09T302 R S	80	3/8	5/32	7	.008					●		●	●			
	CCGT 32.508 L S	CCGT 09T302 L S	80	3/8	5/32	7	.008							●				
	CCGT 32.51M R S	CCGT 09T304M R S	80	3/8	5/32	7	.015				●	●	●					
	CCGT 32.51 R S	CCGT 09T304 R S	80	3/8	5/32	7	.016					●						
	CCGT 21.501 R U	CCGT 060200 R U	80	1/4	3/32	7	.001				●				●			
	CCGT 21.504 R U	CCGT 060201 R U	80	1/4	3/32	7	.004				●				●			
	CCGT 21.504 L U	CCGT 060201 L U	80	1/4	3/32	7	.004								●			
	CCGT 21.508 R U	CCGT 060202 R U	80	1/4	3/32	7	.008				●				●			
	CCGT 21.508 L U	CCGT 060202 L U	80	1/4	3/32	7	.008								●			
	CCGT 32.501 R U1	CCGT 09T300 R U1	80	3/8	5/32	7	.001				●		●		●			
	CCGT 32.501 L U1	CCGT 09T300 L U1	80	3/8	5/32	7	.001								●			
	CCGT 32.504 R U1	CCGT 09T301 R U1	80	3/8	5/32	7	.004				●		●		●			
	CCGT 32.504 L U1	CCGT 09T301 L U1	80	3/8	5/32	7	.004								●			
	CCGT 32.508 R U1	CCGT 09T302 R U1	80	3/8	5/32	7	.008				●		●		●			
	CCGT 32.508 L U1	CCGT 09T302 L U1	80	3/8	5/32	7	.008								●			
	CCGT 32.51 R U1	CCGT 09T304 R U1	80	3/8	5/32	7	.016				●		●		●			
	CCGT 32.51 L U1	CCGT 09T304 L U1	80	3/8	5/32	7	.016								●			
	CCET 21.502 R KHG	CCET 0602005 R KHG	80	1/4	3/32	7	.002							●				
	CCET 21.502 L KHG	CCET 0602005 L KHG	80	1/4	3/32	7	.002							●				
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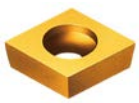
	CCET 21.507 L KHG	CCET 0602018 L KHG	80	1/4	3/32	7	.007							●				
	CCET 21.508 R KHG	CCET 060202 R KHG	80	1/4	3/32	7	.008							●				
	CCET 21.508 L KHG	CCET 060202 L KHG	80	1/4	3/32	7	.008							●				
	CCET 32.502 R KHG	CCET 09T3005 R KHG	80	3/8	5/32	7	.002						●	●				
	CCET 32.502 L KHG	CCET 09T3005 L KHG	80	3/8	5/32	7	.002							●				
	CCET 32.503 R KHG	CCET 09T3008 R KHG	80	3/8	5/32	7	.003						●	●				
	CCET 32.503 L KHG	CCET 09T3008 L KHG	80	3/8	5/32	7	.003							●				
	CCET 32.507 R KHG	CCET 09T3018 R KHG	80	3/8	5/32	7	.007						●	●				
	CCET 32.507 L KHG	CCET 09T3018 L KHG	80	3/8	5/32	7	.007							●				
	CCET 32.508 R KHG	CCET 09T302 R KHG	80	3/8	5/32	7	.008						●	●				
	CCET 32.508 L KHG	CCET 09T302 L KHG	80	3/8	5/32	7	.008							●				
	CCGT 21.504 FR F1	CCGT 060201 FR F1	80	1/4	3/32	7	.004		●			●	●					
	CCGT 21.508 FR F1	CCGT 060202 FR F1	80	1/4	3/32	7	.008		●			●	●					
	CCGT 21.51 FR F1	CCGT 060204 FR F1	80	1/4	3/32	7	.016		●			●	●					
	CCGT 32.508 FR F1	CCGT 09T302 FR F1	80	3/8	3/32	7	.008		●			●	●					
	CCGT 32.51 FR F1	CCGT 09T304 FR F1	80	3/8	3/32	7	.016		●			●	●					
	CCGW 21.501 FN	CCGW 060200 FN	80	1/4	3/32	7	.001								●			
	CCGW 21.501 H Ⓜ	CCGW 060200 H Ⓜ	80	1/4	3/32	7	.001											●
	CCGW 21.504 FN	CCGW 060201 FN	80	1/4	3/32	7	.004								●			
	CCGW 21.504 H Ⓜ	CCGW 060201 H Ⓜ	80	1/4	3/32	7	.004											●
	CCGW 21.508 H Ⓜ	CCGW 060202 H Ⓜ	80	1/4	3/32	7	.008											●
	CCGW 32.500 V Ⓜ	CCGW 09T30 V Ⓜ	80	3/8	5/32	7	.000							●				
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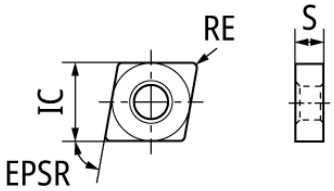
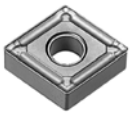
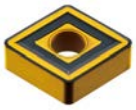
	CCGW 32.501 H Ⓜ	CCGW 09T300 H Ⓜ	80	3/8	5/32	7	.001											●
	CCGW 32.504 FN	CCGW 09T301 FN	80	3/8	5/32	7	.004								●			
	CCGW 32.504 H Ⓜ	CCGW 09T301 H Ⓜ	80	3/8	5/32	7	.004											●
	CCGW 32.504 P Ⓜ	CCGW 09T301 P Ⓜ	80	3/8	5/32	7	.004							●				
	CCGW 32.508 H Ⓜ	CCGW 09T302 H Ⓜ	80	3/8	5/32	7	.008											●
	CCGW 32.508M P	CCGW 09T302M P	80	3/8	5/32	7	.007				●							
	CCGW 32.508 P Ⓜ	CCGW 09T302 P Ⓜ	80	3/8	5/32	7	.008							●				

For more information on the holders, please reference page Q14-21,V33.

CN.G

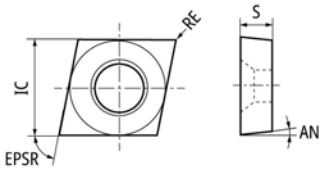


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number (Inch)	Item Number (Metric)	EPSR	IC	S	RE	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
			°	inch	inch	inch											
	CNGG 431 FN UL	CNGG 120404 FN UL	80	1/2	3/16	.016			●		●	●					
	CNGG 432 FN UL	CNGG 120408 FN UL	80	1/2	3/16	.031			●		●	●					
	CNGG 431 FN ZP	CNGG 120404 FN ZP	80	1/2	3/16	.016			●		●			●			
	CNGG 432 FN ZP	CNGG 120408 FN ZP	80	1/2	3/16	.031			●		●			●			
	CNMG 432 T0225 Z5	CNMG 120408 T00525 Z5	80	1/2	3/16	.031			●		●						
	CNMG 432 G	CNMG 120408 G	80	1/2	3/16	.031									●		
	CNMG 433 G	CNMG 120412 G	80	1/2	3/16	.047									●		
	CNMG 434 G	CNMG 120416 G	80	1/2	3/16	.063									●		

For more information on the holders, please reference page E5-9,G6,Q65.

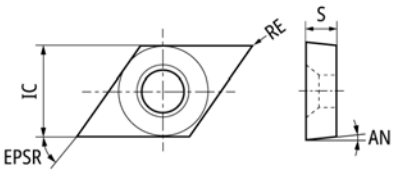
CP..



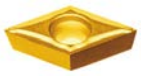
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

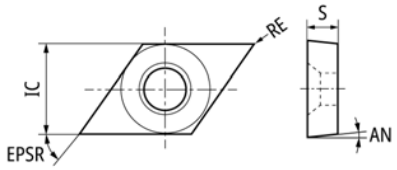
Shape	Item Number (Inch)	Item Number (Metric)	EPSR	IC	S	AN	RE	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
			°	inch	inch	°	inch											
	CPGH 21.508 FN AM5	CPGH 060202 FN AM5	80	1/4	3/32	11	.008						●		●			
	CPGP 0308 FN AM5	CPGH 080202 FN AM5	80	1/4	3/32	11	.008						●		●			
	CPGM 3208 FN AM5	CPGM 090302 FN AM5	80	3/8	1/8	11	.008						●		●			
	CPGM 321 FN AM5	CPGM 090304 FN AM5	80	3/8	1/8	11	.016						●		●			
	CPGM 322 FN AM5	CPGM 090308 FN AM5	80	3/8	1/8	11	.031						●		●			
	CPGP 6204 FR F1	CPGH 040101 FR F1	80	3/16	1/16	11	.004		●			●	●					
	CPGP 6208 FR F1	CPGH 040102 FR F1	80	3/16	1/16	11	.008		●			●	●					
	CPGP 621 FR F1	CPGH 040104 FR F1	80	3/16	1/16	11	.016		●			●	●					
	CPGH 21.508 FR F1	CPGH 060202 FR F1	80	1/4	3/32	11	.008		●			●	●					
	CPGH 21.51 FR F1	CPGH 060204 FR F1	80	1/4	3/32	11	.016		●			●	●					
	CPGP 6204 L S	CPGH 040101 L S	80	3/16	1/16	11	.004					●	●					
	CPGP 6208 L S	CPGH 040102 L S	80	3/16	1/16	11	.008					●	●					
	CPGP 621 L S	CPGH 040104 L S	80	3/16	1/16	11	.016					●	●					
	CPGH 21.508 L S	CPGH 060202 L S	80	1/4	3/32	11	.008					●	●					
	CPGH 21.51 L S	CPGH 060204 L S	80	1/4	3/32	11	.016					●	●					
	CPGH 21.508 FL A	CPGH 060202 FL A	80	1/4	3/32	11	.008						●		●			
	CPGH 21.51 FL A	CPGH 060204 FL A	80	1/4	3/32	11	.016						●		●			
	CPGP 0308 FL A	CPGH 080202 FL A	80	1/4	3/32	11	.008						●		●			
	CPGP 031 FL A	CPGH 080204 FL A	80	1/4	3/32	11	.016						●		●			
	CPGP 6208 FL A1	CPGH 040102 FL A1	80	3/16	1/16	11	.008						●		●			
	CPGP 621 FL A1	CPGH 040104 FL A1	80	3/16	1/16	11	.016						●		●			

For more information on the holders, please reference page V31-32.

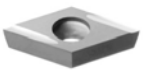
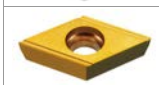
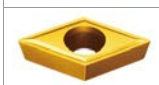


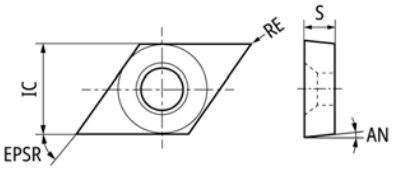
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number (Inch)	Item Number (Metric)	EPSR	IC	S	AN	RE	BS	Carbide PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
			°	inch	inch	°	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	DCGT 32.504M R TMV	DCGT 11T301M R TMV	55	1/4	3/32	7	.003	–	●	●	●			●					
	DCGT 32.508M R TMV	DCGT 11T302M R TMV	55	1/4	3/32	7	.007	–	●	●	●			●					
	DCGT 32.51M R TMV	DCGT 11T304M R TMV	55	1/4	3/32	7	.015	–	●	●	●			●					
	DCGT 21.504M YL	DCGT 070201M YL	55	1/4	3/32	7	.003	–			●		●						
	DCGT 21.508M YL	DCGT 070202M YL	55	1/4	3/32	7	.007	–			●		●						
	DCGT 21.51M YL	DCGT 070204M YL	55	1/4	3/32	7	.015	–			■		■						
	DCGT 32.501 YL	DCGT 11T300 YL	55	3/8	5/32	7	.001	–				●		●					
	DCGT 32.504M YL	DCGT 11T301M YL	55	3/8	5/32	7	.003	–	●	●	●	●	●	●					
	DCGT 32.508M YL	DCGT 11T302M YL	55	3/8	5/32	7	.007	–	●	●	●	●	●	●					
	DCGT 32.51M YL	DCGT 11T304M YL	55	3/8	5/32	7	.015	–	●	●	●	●	●	●					
	DCGT 32.52M YL	DCGT 11T308M YL	55	3/8	5/32	7	.031	–		●	●	●	●	●					
	DCGT 21.504M CL	DCGT 070201M CL	55	1/4	3/32	7	.003	–		●	●	●	●	●					
	DCGT 21.508M CL	DCGT 070202M CL	55	1/4	3/32	7	.007	–		●	●	●	●	●					
	DCGT 21.51M CL	DCGT 070204M CL	55	1/4	3/32	7	.015	–		●	●	●	●	●					
	DCGT 32.504M CL	DCGT 11T301M CL	55	3/8	5/32	7	.003	–	●	●	●	●	●	●					
	DCGT 32.508M CL	DCGT 11T302M CL	55	3/8	5/32	7	.007	–	●	●	●	●	●	●					
	DCGT 32.51M CL	DCGT 11T304M CL	55	3/8	5/32	7	.015	–	●	●	●	●	●	●					
	DCGT 21.501 FN AM3	DCGT 070200 FN AM3	55	1/4	3/32	7	.001	–				●	●	●	●	●			
	DCGT 21.504 FN AM3	DCGT 070201 FN AM3	55	1/4	3/32	7	.004	–							●	●			
	DCGT 21.508 FN AM3	DCGT 070202 FN AM3	55	1/4	3/32	7	.008	–							●	●			
	DCGT 21.51 FN AM3	DCGT 070204 FN AM3	55	1/4	3/32	7	.016	–							●	●			
	DCGT 21.504M FN AM3	DCGT 070201M FN AM3	55	1/4	3/32	7	.003	–		●		●	●	●					
	DCGT 21.508M FN AM3	DCGT 070202M FN AM3	55	1/4	3/32	7	.007	–		●		●	●	●					
	DCGT 21.51M FN AM3	DCGT 070204M FN AM3	55	1/4	3/32	7	.015	–		●		●	●	●					
	DCGT 32.501 FN AM3	DCGT 11T300 FN AM3	55	3/8	5/32	7	.001	–				●	●	●	●	●			
	DCGT 32.504M FN AM3	DCGT 11T301M FN AM3	55	3/8	5/32	7	.003	–	●	●		●	●	●	●	●			
	DCGT 32.508 FN AM3	DCGT 11T302 FN AM3	55	3/8	5/32	7	.008	–					●		●	●			
	DCGT 32.508M FN AM3	DCGT 11T302M FN AM3	55	3/8	5/32	7	.007	–	●	●		●	●	●	●	●			
	DCGT 32.51 FN AM3	DCGT 11T304 FN AM3	55	3/8	5/32	7	.016	–					●		●	●			
	DCGT 32.51M FN AM3	DCGT 11T304M FN AM3	55	3/8	5/32	7	.015	–	●	●		●	●	●	●	●			
	DCGT 32.52 FN AM3	DCGT 11T308 FN AM3	55	3/8	5/32	7	.031	–					●						
	DCMT 21.508 FN AM3	DCMT 070202 FN AM3	55	1/4	3/32	7	.008	–			●								
	DCMT 21.51 FN AM3	DCMT 070204 FN AM3	55	1/4	3/32	7	.016	–			●								
	DCMT 32.508 FN AM3	DCMT 11T302 FN AM3	55	3/8	5/32	7	.008	–			●								
	DCMT 32.51 FN AM3	DCMT 11T304 FN AM3	55	3/8	5/32	7	.016	–			●								
	DCMT 32.52 FN AM3	DCMT 11T308 FN AM3	55	3/8	5/32	7	.031	–			●								
	DCGT 21.501 AMX	DCGT 070200 AMX	55	1/4	3/32	7	.001	–			●			●					
	DCGT 21.504M AMX	DCGT 070201M AMX	55	1/4	3/32	7	.003	–		●	●	●		●					
	DCGT 21.508M AMX	DCGT 070202M AMX	55	1/4	3/32	7	.007	–		●	●	●		●					
	DCGT 21.51M AMX	DCGT 070204M AMX	55	1/4	3/32	7	.015	–			●	●		●					
	DCGT 32.501 AMX	DCGT 11T300 AMX	55	3/8	5/32	7	.001	–			●			●					
	DCGT 32.504M AMX	DCGT 11T301M AMX	55	3/8	5/32	7	.003	–	●	●	●	●		●					
	DCGT 32.508M AMX	DCGT 11T302M AMX	55	3/8	5/32	7	.007	–	●	●	●	●		●					
	DCGT 32.51M AMX	DCGT 11T304M AMX	55	3/8	5/32	7	.015	–	●	●	●	●		●					
	DCGT 21.501 AZ7	DCGT 070200 AZ7	55	1/4	3/32	7	.001	–					●						
	DCGT 21.504M AZ7	DCGT 070201M AZ7	55	1/4	3/32	7	.003	–					●						
	DCGT 21.508M AZ7	DCGT 070202M AZ7	55	1/4	3/32	7	.007	–					●						
	DCGT 32.501 AZ7	DCGT 11T300 AZ7	55	3/8	5/32	7	.001	–				●	●	●		●			
	DCGT 32.504M AZ7	DCGT 11T301M AZ7	55	3/8	5/32	7	.003	–				●	●	●		●			
	DCGT 32.508M AZ7	DCGT 11T302M AZ7	55	3/8	5/32	7	.007	–				●	●	●		●			
	DCGT 32.51M AZ7	DCGT 11T304M AZ7	55	3/8	5/32	7	.015	–				●	●	●		●			
	DCGT 32.52 AZ7	DCGT 11T308 AZ7	55	3/8	5/32	7	.031	–				●	●			●			
	DCMT 32.51 E02 AZ8	DCMT 11T304 E004 AZ8	55	3/8	5/32	7	.016	–										●	
	DCMT 32.52 E02 AZ8	DCMT 11T308 E004 AZ8	55	3/8	5/32	7	.031	–										●	

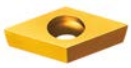
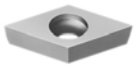


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	AN	RE	BS	Carbide										
									PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	DCGT 21.501 R S	DCGT 070200 R S	55	1/4	3/32	7	.001	–				●	●		●	●			
	DCGT 21.501 L S	DCGT 070200 L S	55	1/4	3/32	7	.001	–							●	●			
	DCGT 21.504M R S	DCGT 070201M R S	55	1/4	3/32	7	.003	–				●	●						
	DCGT 21.504 R S	DCGT 070201 R S	55	1/4	3/32	7	.004	–							●	●			
	DCGT 21.504 L S	DCGT 070201 L S	55	1/4	3/32	7	.004	–							●	●			
	DCGT 21.508M R S	DCGT 070202M R S	55	1/4	3/32	7	.007	–				●	●						
	DCGT 21.508 R S	DCGT 070202 R S	55	1/4	3/32	7	.008	–							●	●			
	DCGT 21.508 L S	DCGT 070202 L S	55	1/4	3/32	7	.008	–							●	●			
	DCGT 21.51 R S	DCGT 070204 R S	55	1/4	3/32	7	.016	–					●		●				
	DCGT 32.501 R S	DCGT 11T300 R S	55	3/8	5/32	7	.001	–				●	●	●	●	●			
	DCGT 32.501 L S	DCGT 11T300 L S	55	3/8	5/32	7	.001	–							●				
	DCGT 32.504M R S	DCGT 11T301M R S	55	3/8	5/32	7	.003	–				●	●	●					
	DCGT 32.504 R S	DCGT 11T301 R S	55	3/8	5/32	7	.004	–					●		●	●			
	DCGT 32.504 L S	DCGT 11T301 L S	55	3/8	5/32	7	.004	–							●				
	DCGT 32.508M R S	DCGT 11T302M R S	55	3/8	5/32	7	.007	–				●	●	●					
	DCGT 32.508 R S	DCGT 11T302 R S	55	3/8	5/32	7	.008	–					●		●	●			
	DCGT 32.508 L S	DCGT 11T302 L S	55	3/8	5/32	7	.008	–							●				
	DCGT 32.51M R S	DCGT 11T304M R S	55	3/8	5/32	7	.015	–				●	●	●					
	DCGT 32.51 R S	DCGT 11T304 R S	55	3/8	5/32	7	.016	–					●						
	DCGT 21.501 R U	DCGT 070200 R U	55	1/4	3/32	7	.001	–							●	●			
	DCGT 21.504 R U	DCGT 070201 R U	55	1/4	3/32	7	.004	–							●	●			
	DCGT 21.508 R U	DCGT 070202 R U	55	1/4	3/32	7	.008	–							●	●			
	DCGT 21.508 L U	DCGT 070202 L U	55	1/4	3/32	7	.008	–								●			
	DCGT 32.501 R U1	DCGT 11T300 R U1	55	3/8	5/32	7	.001	–				●		●	●	●			
	DCGT 32.501 L U1	DCGT 11T300 L U1	55	3/8	5/32	7	.001	–								●			
	DCGT 32.504 R U1	DCGT 11T301 R U1	55	3/8	5/32	7	.004	–				●		●	●	●			
	DCGT 32.504 L U1	DCGT 11T301 L U1	55	3/8	5/32	7	.004	–								●			
	DCGT 32.508 R U1	DCGT 11T302 R U1	55	3/8	5/32	7	.008	–				●		●	●	●			
	DCGT 32.508 L U1	DCGT 11T302 L U1	55	3/8	5/32	7	.008	–								●			
	DCGT 32.51 R U1	DCGT 11T304 R U1	55	3/8	5/32	7	.016	–				●		●	●	●			
	DCGT 32.51 L U1	DCGT 11T304 L U1	55	3/8	5/32	7	.016	–								●			
	DCET 21.502 R KHG	DCET 0702005 R KHG	55	1/4	3/32	7	.002	–							●				
	DCET 21.502 L KHG	DCET 0702005 L KHG	55	1/4	3/32	7	.002	–							●				
	DCET 21.503 R KHG	DCET 0702008 R KHG	55	1/4	3/32	7	.003	–							●				
	DCET 21.503 L KHG	DCET 0702008 L KHG	55	1/4	3/32	7	.003	–							●				
	DCET 21.507 R KHG	DCET 0702018 R KHG	55	1/4	3/32	7	.007	–							●				
	DCET 21.507 L KHG	DCET 0702018 L KHG	55	1/4	3/32	7	.007	–							●				
	DCET 21.508 R KHG	DCET 070202 R KHG	55	1/4	3/32	7	.008	–							●				
	DCET 21.508 L KHG	DCET 070202 L KHG	55	1/4	3/32	7	.008	–							●				
	DCET 32.502 R KHG	DCET 11T3005 R KHG	55	3/8	5/32	7	.002	–						●	●				
	DCET 32.502 L KHG	DCET 11T3005 L KHG	55	3/8	5/32	7	.002	–							●				
	DCET 32.503 R KHG	DCET 11T3008 R KHG	55	3/8	5/32	7	.003	–						●	●				
	DCET 32.503 L KHG	DCET 11T3008 L KHG	55	3/8	5/32	7	.003	–							●				
	DCET 32.507 R KHG	DCET 11T3018 R KHG	55	3/8	5/32	7	.007	–						●	●				
	DCET 32.507 L KHG	DCET 11T3018 L KHG	55	3/8	5/32	7	.007	–							●				
	DCET 32.508 R KHG	DCET 11T302 R KHG	55	3/8	5/32	7	.008	–						●	●				
	DCET 32.508 L KHG	DCET 11T302 L KHG	55	3/8	5/32	7	.008	–							●				
	DCET 21.503 R UHG	DCET 0702008 R UHG	55	1/4	3/32	7	.003	–							●				
	DCET 32.503 R UHG	DCET 11T3008 R UHG	55	3/8	5/32	7	.003	–							●				
	DCET 32.504M R AT Ⓜ	DCET 11T301M R AT Ⓜ	55	3/8	5/32	7	.003	–						●					
	DCET 32.508M R AT Ⓜ	DCET 11T302M R AT Ⓜ	55	3/8	5/32	7	.007	–						●					
	DCGT 32.504M R TMV -WP	DCGT 11T301M R TMV -WP	55	3/8	5/32	7	.003	(.012)	●	●									
	DCGT 32.508M R TMV -WP	DCGT 11T302M R TMV -WP	55	3/8	5/32	7	.007	(.012)	●	●									
	DCGT 32.502 AM3 -WP	DCGT 11T3005 AM3 -WP	55	3/8	5/32	7	.002	(.012)	●	●	●	●	●						
	DCGT 32.506 AM3 -WP	DCGT 11T3015 AM3 -WP	55	3/8	5/32	7	.006	(.012)	●	●	●	●	●						

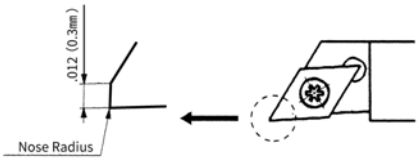


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	AN	RE	BS	Carbide										
									PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	DCGT 21.502 R S -WP	DCGT 0702005 R S -WP	55	1/4	3/32	7	.002	(.012)					●		●	●			
	DCGT 21.502 L S -WP	DCGT 0702005 L S -WP	55	1/4	3/32	7	.002	(.012)								●			
	DCGT 21.506 R S -WP	DCGT 0702015 R S -WP	55	1/4	3/32	7	.006	(.012)					●			●			
	DCGT 21.506 L S -WP	DCGT 0702015 L S -WP	55	1/4	3/32	7	.006	(.012)								●			
	DCGT 32.502 R S -WP	DCGT 11T3005 R S -WP	55	3/8	5/32	7	.002	(.012)					●		●	●			
	DCGT 32.506 R S -WP	DCGT 11T3015 R S -WP	55	3/8	5/32	7	.006	(.012)					●			●			
	DCGT 21.502 R U -WP	DCGT 0702005 R U -WP	55	1/4	3/32	7	.002	(.012)					●		●	●			
	DCGT 21.506 R U -WP	DCGT 0702015 R U -WP	55	1/4	3/32	7	.006	(.012)					●			●			
	DCGT 32.502 R U1 -WP	DCGT 11T3005 R U1 -WP	55	3/8	5/32	7	.002	(.012)					●		●	●			
	DCGT 32.506 R U1 -WP	DCGT 11T3015 R U1 -WP	55	3/8	5/32	7	.006	(.012)					●			●			
	DCGW 21.500 V Ⓜ	DCGW 07020 V Ⓜ	55	1/4	3/32	7	.000	–							●				
	DCGW 21.501 FN	DCGW 070200 FN	55	1/4	3/32	7	.001	–								●			
	DCGW 21.501 H Ⓜ	DCGW 070200 H Ⓜ	55	1/4	3/32	7	.001	–											●
	DCGW 21.504 FN	DCGW 070201 FN	55	1/4	3/32	7	.004	–								●			
	DCGW 21.504 H Ⓜ	DCGW 070201 H Ⓜ	55	1/4	3/32	7	.004	–											●
	DCGW 21.508 H Ⓜ	DCGW 070202 H Ⓜ	55	1/4	3/32	7	.008	–											●
	DCGW 32.500 V Ⓜ	DCGW 11T30 V Ⓜ	55	3/8	5/32	7	.000	–							●				
	DCGW 32.501 FN	DCGW 11T300 FN	55	3/8	5/32	7	.001	–								●			
	DCGW 32.501 H Ⓜ	DCGW 11T300 H Ⓜ	55	3/8	5/32	7	.001	–											●
	DCGW 32.504 FN	DCGW 11T301 FN	55	3/8	5/32	7	.004	–								●			
	DCGW 32.504 H Ⓜ	DCGW 11T301 H Ⓜ	55	3/8	5/32	7	.004	–											●
	DCGW 32.508 H Ⓜ	DCGW 11T302 H Ⓜ	55	3/8	5/32	7	.008	–											●
	DCGW 21.502 RH -WP Ⓜ	DCGW 0702005 RH -WP Ⓜ	55	1/4	3/32	7	.002	(.012)											●
	DCGW 32.502 RH -WP Ⓜ	DCGW 11T3005 RH -WP Ⓜ	55	3/8	5/32	7	.002	(.012)											●

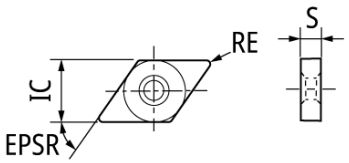
For more information on the holders, please reference page Q25-36.

Features of DC.T-WP insert

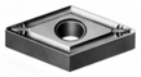
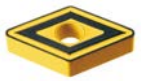


NTK WP style inserts have a wiper facet design.
The insert has a 0.3mm(.012") flat on the cutting edge when the insert is set into the toolholder.
The flat on the cutting edge ensures a superior surface when feed rates are increased.
WP style inserts can be used in toolholders: SDJC, CH-SDUL and DS-SDUL.

DN.G

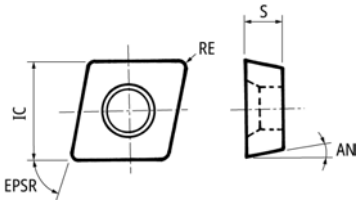


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	RE inch	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
	DNGG 431 FN ZP	DNGG 150404 FN ZP	55	1/2	3/16	.016		●	●		●			●			
	DNGG 432 FN ZP	DNGG 150408 FN ZP	55	1/2	3/16	.031		●	●		●			●			
	DNMG 432 T0225 Z5	DNMG 150408 T00525 Z5	55	1/2	3/16	.031			●		●						
	DNMG 431 G	DNMG 150404 TN G	55	1/2	3/16	.016					●						
	DNMG 431 G	DNMG 150404 G	55	1/2	3/16	.016									●		
	DNMG 432 G	DNMG 150408 G	55	1/2	3/16	.031									●		
	DNMG 433 G	DNMG 150412 G	55	1/2	3/16	.047									●		

For more information on the holders, please reference page E14-16,G11,Q67.

ERGP

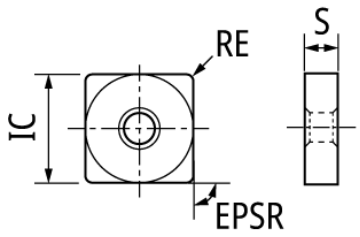


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

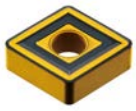
Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	AN °	RE inch	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
	ERGP 5204 FR F1	ERGH T30101 FR F1	75	5/32	1/16	9	.004		●			●	●					
	ERGP 5208 FR F1	ERGH T30102 FR F1	75	5/32	1/16	9	.008		●			●	●					
	ERGP 521 FR F1	ERGH T30104 FR F1	75	5/32	1/16	9	.016		●			●	●					
	ERGP 5208 FR A2	ERGH T30102 FR A2	75	5/32	1/16	9	.008						●		●			
	ERGP 5208 FL A2	ERGH T30102 FL A2	75	5/32	1/16	9	.008						●		●			
	ERGP 521 FR A2	ERGH T30104 FR A2	75	5/32	1/16	9	.016						●					
	ERGP 521 FL A2	ERGH T30104 FL A2	75	5/32	1/16	9	.016						●		●			

For more information on the holders, please reference page V29-30.

SNMG

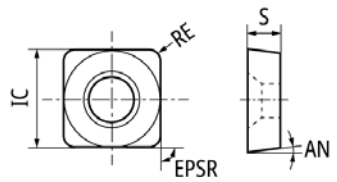


Steel	○ ○ ● ● ● ● ● ● ●
Stainless Steel	○ ● ○ ○ ○ ● ○ ● ●
Cast Iron	●
Non-Ferrous Material	○ ○ ●
Heat Resistant Alloy	● ● ○ ○
Hardened Material	○ ○ ○
Others (non-metallic)	●

Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	RE inch	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
	SNMG 432 T0225 Z5	SNMG 120408 T00525 Z5	90	1/2	3/16	.031			●		●						
	SNMG 432 G	SNMG 120408 G	90	1/2	3/16	.031									●		
	SNMG 433 G	SNMG 120412 G	90	1/2	3/16	.047									●		
	SNMG 434 G	SNMG 120416 G	90	1/2	3/16	.063									●		

For more information on the holders, please reference page E21-30,G16.

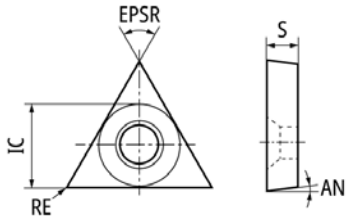
SDEW



Steel	○ ○ ● ● ● ● ● ● ●
Stainless Steel	○ ● ○ ○ ○ ● ○ ● ●
Cast Iron	●
Non-Ferrous Material	○ ○ ●
Heat Resistant Alloy	● ● ○ ○
Hardened Material	○ ○ ○
Others (non-metallic)	●

Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	AN °	RE inch	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
	SDEW 21.508 FN	SDEW 060202 FN	90	1/4	3/32	15	.008								●			

TCG.

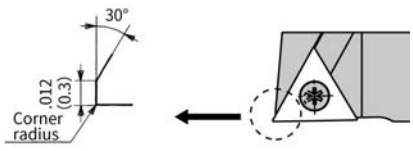


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

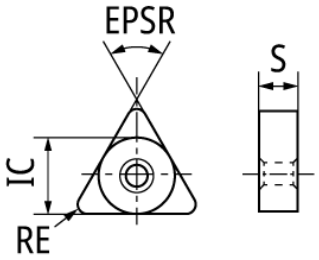
Shape	Item Number		EPSR	IC	S	AN	RE	BS	Carbide										
									PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	TCGP 5204 FR F05	TCGH 060101 FR F05	60	–	–	7	–	–		●			●	●					
	TCGP 5208 FL F05	TCGH 060102 FL F05	60	5/32	1/16	7	.008	–						●		●			
	TCGP 5208 FR F05	TCGH 060102 FR F05	60	5/32	1/16	7	.008	–		●			●	●		●			
	TCGP 521 FR F05	TCGH 060104 FR F05	60	5/32	1/16	7	.016	–		●			●	●		●			
	TCGP 7304 R S	TCGT 090201 R S	60	7/32	3/32	7	.004	–							●	●			
	TCGP 7304 L S	TCGT 090201 L S	60	7/32	3/32	7	.004	–							●				
	TCGP 7308 R S	TCGT 090202 R S	60	7/32	3/32	7	.008	–								●			
	TCGT 21.504 R S	TCGT 110201 R S	60	1/4	3/32	7	.004	–							●	●			
	TCGT 21.504 L S	TCGT 110201 L S	60	1/4	3/32	7	.004	–							●				
	TCGP 7304 R U	TCGT 090201 R U	60	7/32	3/32	7	.004	–								●			
	TCGP 7308 R U	TCGT 090202 R U	60	7/32	3/32	7	.008	–								●			
	TCGP 5208 FL K	TCGH 060102 FL K	60	5/32	1/16	7	.008	–						●					
	TCGP 521 FL K	TCGH 060104 FL K	60	5/32	1/16	7	.016	–						●					
	TCGP 5208 FL B1	TCGH 060102 FL B1	60	5/32	1/16	7	.008	–						●		●			
	TCGP 521 FL B1	TCGH 060104 FL B1	60	5/32	1/16	7	.016	–						●		●			
	TCGP 7302 R S -WP	TCGT 0902005 R S -WP	60	7/32	3/32	7	.002	(.012)								●			
	TCGP 7302 L S -WP	TCGT 0902005 L S -WP	60	7/32	3/32	7	.002	(.012)								●			
	TCGP 7306 R S -WP	TCGT 0902015 R S -WP	60	7/32	3/32	7	.006	(.012)								●			
	TCGP 7306 L S -WP	TCGT 0902015 L S -WP	60	7/32	3/32	7	.006	(.012)								●			
	TCGT 21.502 R S -WP	TCGT 1102005 R S -WP	60	1/4	3/32	7	.002	(.012)								●			
	TCGT 21.506 R S -WP	TCGT 1102015 R S -WP	60	1/4	3/32	7	.006	(.012)								●			
	TCGP 7302 R U -WP	TCGT 0902005 R U -WP	60	7/32	3/32	7	.002	(.012)								●			
	TCGP 7306 R U -WP	TCGT 0902015 R U -WP	60	7/32	3/32	7	.006	(.012)								●			
	TCGT 21.502 R U1 -WP	TCGT 1102005 R U1 -WP	60	1/4	3/32	7	.002	(.012)								●			
	TCGT 21.506 R U1 -WP	TCGT 1102015 R U1 -WP	60	1/4	3/32	7	.006	(.012)								●			
	TCGD 52.52 FN	TCGW 06T108 FN	60	5/32	.078	7	.031	–								●			
	TCGD 7301 FN	TCGW 090200 FN	60	7/32	3/32	7	.001	–								●			
	TCGD 7304 FN	TCGW 090201 FN	60	7/32	3/32	7	.004	–								●			
	TCGW 21.501 FN	TCGW 110200 FN	60	1/4	3/32	7	.001	–								●			
	TCGW 21.504 FN	TCGW 110201 FN	60	1/4	3/32	7	.004	–								●			

For more information on the holders, please reference page Q57,R47,V42.

Features of TCGT-WP insert



NTK WP style inserts have a wiper facet design.
The insert has a 0.3mm(.012") flat on the cutting edge when the insert is set into the toolholder.
The flat on the cutting edge ensures a superior surface when feed rates are increased.
WP style inserts can be used in toolholders: STAC

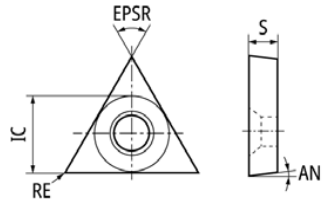


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	RE	Carbide										
							PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	TNGG 3308M R TMV	TNGG 160402M R TMV	60	3/8	3/16	.007	●	●	●			●					
	TNGG 331M R TMV	TNGG 160404M R TMV	60	3/8	3/16	.015	●	●	●			●					
	TNGG 3304M FN UL	TNGG 160401M FN UL	60	3/8	3/16	.003	●	●	●		●	●					
	TNGG 3308M FN UL	TNGG 160402M FN UL	60	3/8	3/16	.007	●	●	●		●	●					
	TNGG 331M FN UL	TNGG 160404M FN UL	60	3/8	3/16	.015	●	●	●		●	●					
	TNGG 332M FN UL	TNGG 160408M FN UL	60	3/8	3/16	.031		●	●		●	●					
	TNGG 3308 FN ZP	TNGG 160402 FN ZP	60	3/8	3/16	.008			●		●	●	●	●			
	TNGG 331 FN ZP	TNGG 160404 FN ZP	60	3/8	3/16	.016			●		●	●	●	●			
	TNGG 332 FN ZP	TNGG 160408 FN ZP	60	3/8	3/16	.031			●		●		●	●			
	TNMG 332 G	TNMG 160408 G	60	3/8	3/16	.031									●		
	TNMG 333 G	TNMG 160412 G	60	3/8	3/16	.047									●		
	TNMG 331 T0225 Z5	TNMG 160404 T00525 Z5	60	3/8	3/16	.016			●		●						
	TNMG 332 T0225 Z5	TNMG 160408 T00525 Z5	60	3/8	3/16	.031			●		●						
	TNEG 3308 FL D1	TNEG 160402 FL D1	60	3/8	3/16	.008						●					
	TNEG 3308 FR D1	TNEG 160402 FR D1	60	3/8	3/16	.008						●					
	TNEG 331 FL D1	TNEG 160404 FL D1	60	3/8	3/16	.016						●					
	TNEG 331 FR D1	TNEG 160404 FR D1	60	3/8	3/16	.016						●					
	TNEG 332 FL D1	TNEG 160408 FL D1	60	3/8	3/16	.031						●					
	TNEG 332 FR D1	TNEG 160408 FR D1	60	3/8	3/16	.031						●					
	TNGG 3304 FR U2	TNGG 160401 FR U2	60	3/8	3/16	.004							●	●			
	TNGG 3308 FL U2	TNGG 160402 FL U2	60	3/8	3/16	.008			●					●			
	TNGG 3308 FR U2	TNGG 160402 FR U2	60	3/8	3/16	.008			●					●			
	TNGG 331 FL U2	TNGG 160404 FL U2	60	3/8	3/16	.016			●					●			
	TNGG 331 FR U2	TNGG 160404 FR U2	60	3/8	3/16	.016			●					●			
	TNGG 332 FL U2	TNGG 160408 FL U2	60	3/8	3/16	.031								●			
	TNGG 332 FR U2	TNGG 160408 FR U2	60	3/8	3/16	.031								●			
	TNGG 3308 FR C	TNGG 160402 FR C	60	3/8	3/16	.008								●			
	TNGG 3304 FR DA	TNGG 160401 FR DA	60	3/8	3/16	.004							●	●			

For more information on the holders, please reference page E38-41,Q59-63.

TPG.

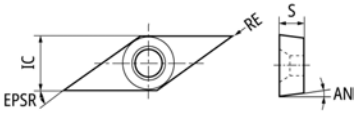


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	AN °	RE inch	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
	TPGP 7308 R FG	TPGH 090202 R FG	60	7/32	3/32	11	.008		●			●	●					
	TPGP 731 R FG	TPGH 090204 R FG	60	7/32	3/32	11	.016		●			●	●					
	TPGH 2208 R FG	TPGH 110302 R FG	60	1/4	1/8	11	.008	●	●			●	●					
	TPGH 221 R FG	TPGH 110304 R FG	60	1/4	1/8	11	.016	●	●			●	●					
	TPGP 6308 FR F1	TPGH 080202 FR F1	60	3/16	3/32	11	.008						●	●	●			
	TPGP 631 FR F1	TPGH 080204 FR F1	60	3/16	3/32	11	.016						●	●	●			
	TPGP 7304 FR F1	TPGH 090201 FR F1	60	7/32	3/32	11	.004		●			●	●					
	TPGP 7308 FR F1	TPGH 090202 FR F1	60	7/32	3/32	11	.008		●			●	●	●	●			
	TPGP 731 FR F1	TPGH 090204 FR F1	60	7/32	3/32	11	.016		●			●	●	●	●			
	TPGP 732 FR F1	TPGH 090208 FR F1	60	7/32	3/32	11	.031		●			●	●		●			
	TPGH 2208 FR F1	TPGH 110302 FR F1	60	1/4	1/8	11	.008		●			●	●	●	●			
	TPGH 221 FR F1	TPGH 110304 FR F1	60	1/4	1/8	11	.016		●			●	●	●	●			
	TPGH 222 FR F1	TPGH 110308 FR F1	60	1/4	1/8	11	.031		●			●	●		●			
	TPGP 7308 FL K	TPGH 090202 FL K	60	7/32	3/32	11	.008						●					
	TPGP 731 FL K	TPGH 090204 FL K	60	7/32	3/32	11	.016						●					
	TPGP 732 FL K	TPGH 090208 FL K	60	7/32	3/32	11	.031						●					
	TPGP 7308 FL B2	TPGH 090202 FL B2	60	7/32	3/32	11	.008						●		●			
	TPGP 731 FL B2	TPGH 090204 FL B2	60	7/32	3/32	11	.016						●		●			
	TPGP 732 FL B2	TPGH 090208 FL B2	60	7/32	3/32	11	.031						●		●			
	TPGP 6308 FL B3	TPGH 080202 FL B3	60	3/16	3/32	11	.008						●		●			
	TPGP 631 FL B3	TPGH 080204 FL B3	60	3/16	3/32	11	.016						●		●			

For more information on the holders, please reference page R45,V36-38.

VBGT

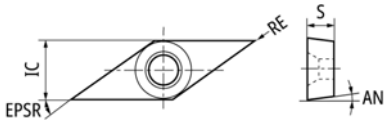


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

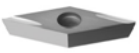
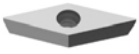
Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	AN °	RE inch	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
	VBGT 3308 FN YL	VBGT 160402 FN YL	35	3/8	3/16	5	.008		●	●		●	●					
	VBGT 331 FN YL	VBGT 160404 FN YL	35	3/8	3/16	5	.016		●	●		●	●					
	VBGT 332 FN YL	VBGT 160408 FN YL	35	3/8	3/16	5	.031		●	●		●	●					

For more information on the holders, please reference page Q40.

VC..

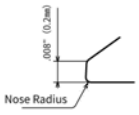


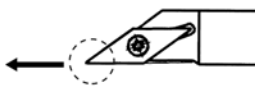
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number (Inch)	Item Number (Metric)	EPSR	IC	S	AN	RE	BS	Carbide PVD 650	Carbide PVD ST4	Carbide PVD DM4	Carbide PVD DT4	Carbide PVD QM3	Carbide PVD TM4	Carbide PVD VM1	Carbide PVD ZM3	Carbide CVD CP1	Carbide CVD CP7	Uncoated KM1
			°	inch	inch	°	inch	inch											
	VCGT 2208M R TMV	VCGT 110302M R TMV	35	1/4	1/8	7	.007	–	●	●									
	VCGT 221M R TMV	VCGT 110304M R TMV	35	1/4	1/8	7	.015	–	●	●									
	VCGT 2204M YL	VCGT 110301M YL	35	1/4	1/8	7	.003	–	●	●	●	●	●	●					
	VCGT 2208M YL	VCGT 110302M YL	35	1/4	1/8	7	.007	–	●	●	●	●	●	●					
	VCGT 221M YL	VCGT 110304M YL	35	1/4	1/8	7	.015	–	●	●	●	●	●	●					
	VCGT 21.508M CL	VCGT 110202M CL	35	1/4	3/32	7	.007	–			●	●	●	●					
	VCGT 2204M CL	VCGT 110301M CL	35	1/4	1/8	7	.003	–	●	●	●	●	●	●					
	VCGT 2208M CL	VCGT 110302M CL	35	1/4	1/8	7	.007	–	●	●	●	●	●	●					
	VCGT 2201 FN AM3	VCGT 110300 FN AM3	35	1/4	1/8	7	.001	–				●	●	●	●				
	VCGT 2204M FN AM3	VCGT 110301M FN AM3	35	1/4	1/8	7	.003	–	●	●		●	●	●	●				
	VCGT 2204 FN AM3	VCGT 110301 FN AM3	35	1/4	1/8	7	.004	–							●	●			
	VCGT 2208M FN AM3	VCGT 110302M FN AM3	35	1/4	1/8	7	.007	–	●	●		●	●	●	●				
	VCGT 2208 FN AM3	VCGT 110302 FN AM3	35	1/4	1/8	7	.008	–							●	●			
	VCGT 221M FN AM3	VCGT 110304M FN AM3	35	1/4	1/8	7	.015	–	●	●		●	●	●	●				
	VCMT 2208 FN AM3	VCMT 110302 FN AM3	35	1/4	1/8	7	.008	–			●								
	VCMT 221 FN AM3	VCMT 110304 FN AM3	35	1/4	1/8	7	.016	–			●								
	VCGT 2201 AZ7	VCGT 110300 AZ7	35	1/4	1/8	7	.001	–					●			●			
	VCGT 2204M AZ7	VCGT 110301M AZ7	35	1/4	1/8	7	.003	–					●			●			
	VCGT 2208M AZ7	VCGT 110302M AZ7	35	1/4	1/8	7	.007	–					●			●			
	VCGT 221M AZ7	VCGT 110304M AZ7	35	1/4	1/8	7	.015	–					●			●			
	VCGT 2.5201 FR 2M	VCGT 130300 FR 2M	35	5/16	1/8	7	–	–			●								
	VCGT 2.5201 FL 2M	VCGT 130300 FL 2M	35	5/16	1/8	7	–	–			●								
	VCGT 2.5204 FR 2M	VCGT 130301 FR 2M	35	5/16	1/8	7	–	–			●								
	VCGT 2.5204 FL 2M	VCGT 130301 FL 2M	35	5/16	1/8	7	–	–			●								
	VCGT 2201 R U	VCGT 110300 R U	35	1/4	1/8	7	.001	–							●	●			
	VCGT 2204M R U	VCGT 110301M R U	35	1/4	1/8	7	.003	–				●							
	VCGT 2204 R U	VCGT 110301 R U	35	1/4	1/8	7	.004	–							●	●			
	VCGT 2208M R U	VCGT 110302M R U	35	1/4	1/8	7	.007	–				●							
	VCGT 2208 R U	VCGT 110302 R U	35	1/4	1/8	7	.008	–							●	●			
	VCET 2203 R UHG	VCET 1103008 R UHG	35	1/4	1/8	7	.003	–							●				
	VCGT 2202 R U -WP	VCGT 1103005 R U -WP	35	1/4	1/8	7	.002	(.008)							●	●			
	VCGT 2204 R U -WP	VCGT 110301 R U -WP	35	1/4	1/8	7	.004	(.008)							●	●			
	VCGT 2202 R SX -WP Ⓜ	VCGT 1103005 R SX -WP Ⓜ	35	1/4	1/8	7	.002	(.008)							●	●			
	VCGT 2204 R SX -WP Ⓜ	VCGT 110301 R SX -WP Ⓜ	35	1/4	1/8	7	.004	(.008)							●	●			
	VCGW 2201 H Ⓜ	VCGW 110300 H Ⓜ	35	1/4	1/8	7	.001	–											●
	VCGW 2204 H Ⓜ	VCGW 110301 H Ⓜ	35	1/4	1/8	7	.004	–											●
	VCGW 2208 H Ⓜ	VCGW 110302 H Ⓜ	35	1/4	1/8	7	.008	–											●

For more information on the holders, please reference page Q42-51,R37.

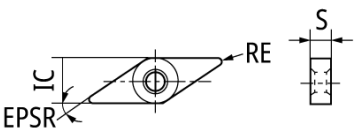
Features of VCGT-WP insert





NTK WP style inserts have a wiper facet design.
The insert has a 0.2mm(.008") flat on the cutting edge when the insert is set into the toolholder.
The flat on the cutting edge ensures a superior surface when feed rates are increased.
WP style inserts can be used in toolholders: SVAC

VN.G

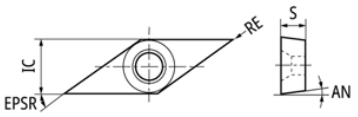


	PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	RE inch	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
	VNGG 3308 FN ZP	VNGG 160402 FN ZP	35	3/8	3/16	.008			●		●						
	VNGG 331 FN ZP	VNGG 160404 FN ZP	35	3/8	3/16	.016			●		●						
	VNGG 332 FN ZP	VNGG 160408 FN ZP	35	3/8	3/16	.031			●		●						
	VNMG 331 G	VNMG 160404 G	35	3/8	3/16	.016									●		
	VNMG 332 G	VNMG 160408 G	35	3/8	3/16	.031									●		
	VNMG 333 G	VNMG 160412 G	35	3/8	3/16	.047									●		
	VNMG 331 T0225 AM1	VNMG 160404 T00525 AM1	35	3/8	3/16	.016			●		●						
	VNMG 332 T0225 AM1	VNMG 160408 T00525 AM1	35	3/8	3/16	.031			●		●						

For more information on the holders, please reference page E34-35.

VP.T

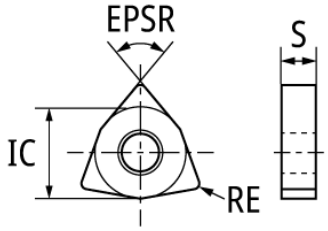


	PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number (Inch)	Item Number (Metric)	EPSR °	IC inch	S inch	AN °	RE inch	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
	VPEP 6302 R KHG	VPET 0802005 R KHG	35	3/16	3/32	11	.002						●	●				
	VPEP 6302 L KHG	VPET 0802005 L KHG	35	3/16	3/32	11	.002							●				
	VPEP 6303 R KHG	VPET 0802008 R KHG	35	3/16	3/32	11	.003				●		●	●				
	VPEP 6303 L KHG	VPET 0802008 L KHG	35	3/16	3/32	11	.003							●				
	VPEP 6307 R KHG	VPET 0802018 R KHG	35	3/16	3/32	11	.007						●	●				
	VPEP 6307 L KHG	VPET 0802018 L KHG	35	3/16	3/32	11	.007							●				
	VPEP 6308 R KHG	VPET 080202 R KHG	35	3/16	3/32	11	.008						●	●				
	VPEP 6308 L KHG	VPET 080202 L KHG	35	3/16	3/32	11	.008							●				
	VPET 2202 R KHG	VPET 1103005 R KHG	35	1/4	1/8	11	.002						●	●				
	VPET 2202 L KHG	VPET 1103005 L KHG	35	1/4	1/8	11	.002							●				
	VPET 2203 R KHG	VPET 1103008 R KHG	35	1/4	1/8	11	.003						●	●				
	VPET 2203 L KHG	VPET 1103008 L KHG	35	1/4	1/8	11	.003							●				
	VPET 2207 R KHG	VPET 1103018 R KHG	35	1/4	1/8	11	.007						●	●				
	VPET 2207 L KHG	VPET 1103018 L KHG	35	1/4	1/8	11	.007							●				
	VPET 2208 R KHG	VPET 110302 R KHG	35	1/4	1/8	11	.008						●	●				
	VPET 2208 L KHG	VPET 110302 L KHG	35	1/4	1/8	11	.008							●				
	VPEP 6303 L UHG	VPET 0802008 L UHG	35	3/16	3/32	11	.003				●							
	VPEP 6303 R UHG	VPET 0802008 R UHG	35	3/16	3/32	11	.003				●							
	VPGT 2201 FN AM3	VPGT 110300 FN AM3	35	1/4	1/8	11	.001				●		●					
	VPGT 2204M FN AM3	VPGT 110301M FN AM3	35	1/4	1/8	11	.003		●		●	●	●					
	VPGT 2208M FN AM3	VPGT 110302M FN AM3	35	1/4	1/8	11	.007		●		●	●	●					

For more information on the holders, please reference page Q53-55.

WN.G



Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	RE	Carbide										
							PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	WNGG 431 FN UL	WNGG 080404 FN UL	80	1/2	3/16	.016			●		●	●					
	WNGG 432 FN UL	WNGG 080408 FN UL	80	1/2	3/16	.031			●		●	●					
	WNGG 431 FN ZP	WNGG 080404 FN ZP	80	1/2	3/16	.016			●		●			●			
	WNGG 432 FN ZP	WNGG 080408 FN ZP	80	1/2	3/16	.031			●		●			●			
	WNMG 432 T0225 Z5	WNMG 080408 T00525 Z5	80	1/2	3/16	.031			●		●						
	WNMG 433 T0225 Z5	WNMG 080412 T00525 Z5	80	1/2	3/16	.047			●		●						
	WNMG 432 G	WNMG 080408 G	80	1/2	3/16	.031									●		
	WNMG 433 G	WNMG 080412 G	80	1/2	3/16	.047									●		

For more information on the holders, please reference page E45,G20.

MEMO

General Turning Toolholders

Selection Guide E02

Holder Identification System E03

Parts and Features of NTK Toolholders for General Turning E04

For CN..Inserts E05

For DN..Inserts E14

For SN..Inserts E21

For VN..Inserts E34

For TN..Inserts E38

For WN..Inserts E45

For RN..Inserts E48

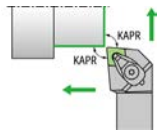
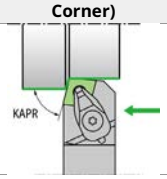
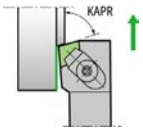
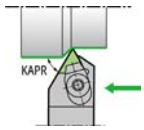
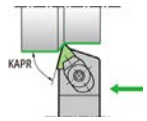
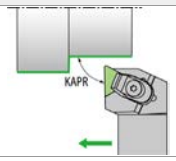
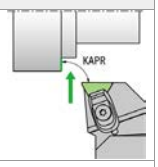
For CDH..Inserts E52

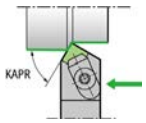
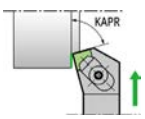
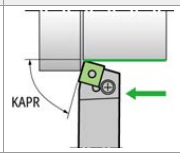
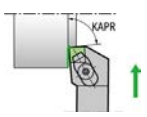
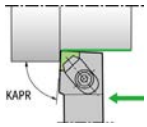
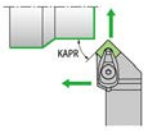
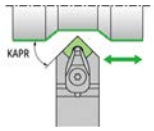
For RCGX/RPGX..Inserts E53

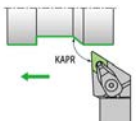
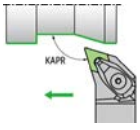
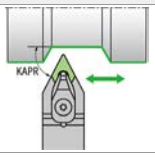
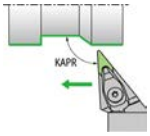
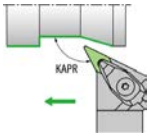
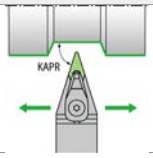
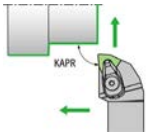
For RCGY..Inserts E62

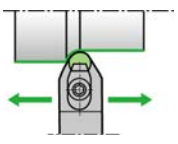
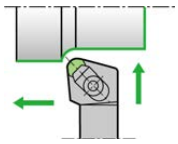
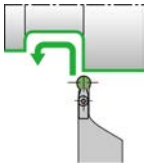
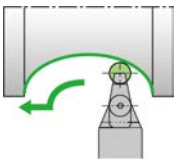
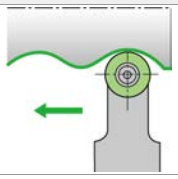
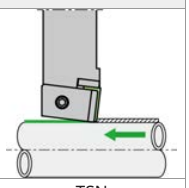
For TSN..Inserts E63

Selection Guide

Lead Angle (KAPR)		95°	75° (Using 100° Corner)	75°	60°	75°	91°	91°
Tooling								
Insert shape		CNG/CNGX/CNGA	CNG/CNGA		TNG/TNGA			
Perfect for Ceramic Insert	Multi Clamp	WCLN/TCLN/HCLN →E5	WCBN/TCBN →E8				WTGN/TTGN →E38	WTFN/TTFN →E38
	Clamp On	CCLN/C31 →E6,E8	CCBN →E9	CCKN →E9	C24 →E41	C23 →E41	C21/C22 →E39	C25 →E40
For Insert in General	Lever Lock	PCLN →E7						

Lead Angle (KAPR)		60°	75°	75°	85°	85°	45°	45°
Tooling								
Insert shape		SNGA/SNG					SNGA/SNGX/SNG	
Perfect for Ceramic Insert	Multi Clamp						WSSN/TSSN/HSSN →E23	WSDN/TSDN/HSDN →E24
	Clamp On	C13 →E27	CSKN →E21 C15 →E28	CSRN →E22 C11/C16 →E28,E29	C17 →E29	CSHN →E30	CSSN/C12 →E22,E23,E26	CSDN/C14 →E24,E25,E26
For Insert in General	Lever Lock			PSBN →E27				PSDN →E25

Lead Angle (KAPR)		93°	107°30'	62°30'	93°	117°30'	72°30'	95°
Tooling								
Insert shape		DNGA/DNGX			VNGA/VNGX			WNGA
Perfect for Ceramic Insert	Multi Clamp	WDJN/HDJN →E14	WDHN/HDHN →E15	WDNN/HDNN →E16	WVJN/HVJN →E34	WVPN/HVPN →E35	WVVNN/HVVN →E35	WWLN/WWLN-2 →E45
	Clamp On							
For Insert in General	Lever Lock	PDJN →E14,E15						

Lead Angle (KAPR)		-	-	-	-	-	-
Tooling							
Insert shape		RNG	RCGY	RCGX/RPGX	CDH	TSN	
Perfect for Ceramic Insert	Multi Clamp	CRDNN/C54 →E48,E49	CRGN/C55 →E48,E49,E50	CRXC →E62	VRAO →E57 VRAON →E58 CRDCN →E59		HN..ATS/BTS →E63
	Clamp On					HRCD →E52	
	Blade				GTWP →E53 GKWP →E54		

Holder Identification System

① Clamping System

B, C, V	Clamp-on
W	Multi-clamp
P	Lever-lock
H	Bolt-clamp
S	Screw-on

② Insert Shape

C	D	R	S
80° Diamond	55° Diamond	Round	Square

T	V	W
Triangular	35° Diamond	Trigon

③ Approach Angle

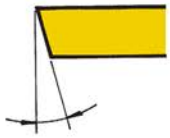
A	B	D	F	G
91°	75°	45°	91°	91°

H	J	K	L	N
107° 30′	93°	75°	95°	62° 30′

P	R	S	V	X
117° 30′	75°	45°	72° 30′	Special Design

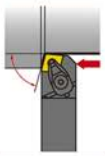
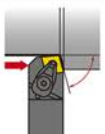
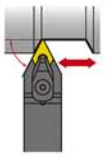
①	②	③	④	⑤	⑥		⑦	⑧
C	C	L	N	R	16	–	5	D

④ Insert Relief Angle



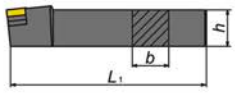
N	0°
B	5°
C	7°
P	11°
D	15°
E	20°

⑤ Hand of Tool

R	L	N
		

⑥ Shank Size [Height (*h*) and Width (*b*)] (inch)

	06	08	10	12	16	20	24	85
h	.375	.500	.625	.750	1.000	1.250	1.500	1.250
b	.375	.500	.625	.750	1.000	1.250	1.500	1.000



In case of $b = h$, the number will represent the number of sixteeths of b and h.

In case of $b \neq h$, the first digit represents the number of eighths of b, and the second digit represents the number of quarters of h.

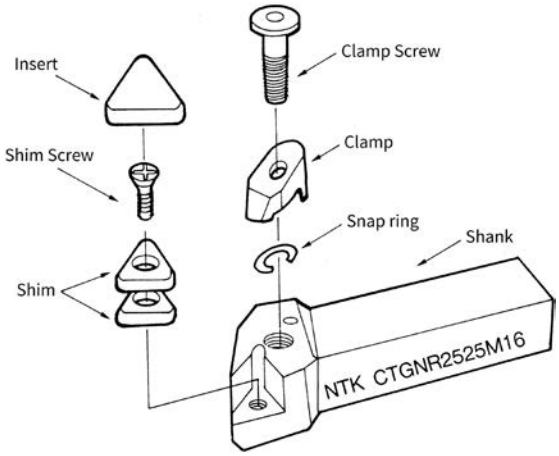
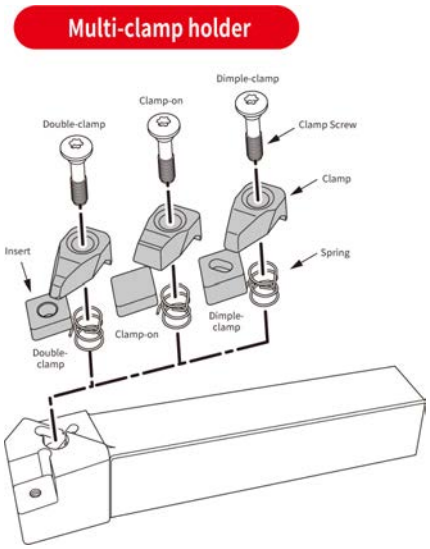
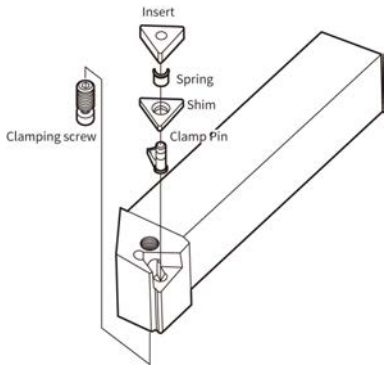
⑦ Insert Size

IC (inch)	1/4	3/8	1/2	5/8	3/4	1
T	2	3	4	5	6	8
S R	2	3	4	5	6	8
W	2	3	4	5	6	
80° C		3	4	5	6	8
55° D		3	4	5	6	8
35° V	2	3				

⑧ Length of toolholder (L_1) (inch)

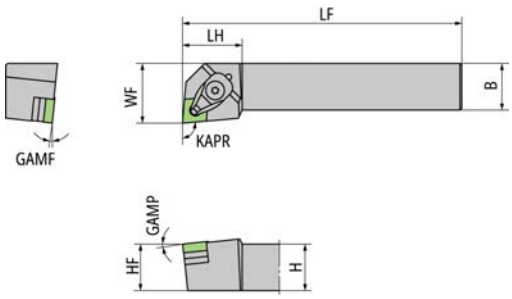
B	C	D	E
4.500	5.000	6.000	7.000

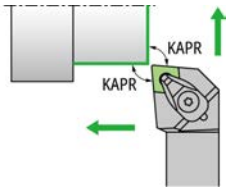
Parts and Features of NTK Toolholders for General Turning

Series	Parts	Features
C type : Clamp-on		• Secures the insert with high clamping force • Excellent in indexing accuracy • Suitable for heavy-duty applications including interrupted cut machining • Clamping system for ceramic cutting tools
W type : Double-clamp T type : Clamp-on H type : Dimple-clamp		• Shim screw clamping methods can be utilized by a simple clamp shim • Best for ceramic tools, improved system with stronger and more accurate clamping • Prevents insert breakage by optimizing the clamping force • Allows for highly accurate machining with highly repeatable accuracy • Inserts can be easily changed as clamping is possible from the top and bottom of the tool • Recommended Tightening Torque For LLR-T20 26.6 lbs.in (3.0Nm) : Double-clamp 66.5 ibs.in (7.5Nm) : Clamp-on,Dimple-clamp For LLR-T15 44.3 lbs.in (5.0Nm)
P type : Lever lock		• General-purpose toolholder • Allows for smooth chip control without damaging the clamping mechanism • For inserts of all material grades however not recommended for ceramics

CN..series/Toolholders

WCLN/TCLN/HCLN Multi Clamp Toolholders





● Diagram shows right-hand tool

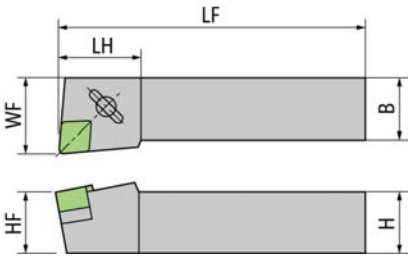
Item Number	Hand	B	GAMF	GAMP	H	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	°	°	inch	inch	°	inch	inch	inch		
WCLNR16-4D	R	1.000	6	6	1.000	1.000	95	6.000	1.250	1.250	CN..43..	(CN..45..)
WCLNR20-4D	R	1.250	6	6	1.250	1.250	95	6.000	1.250	1.500	CN..43..	(CN..45..)
WCLNL16-4D	L	1.000	6	6	1.000	1.000	95	6.000	1.250	1.250	CN..43..	(CN..45..)
WCLNL20-4D	L	1.250	6	6	1.250	1.250	95	6.000	1.250	1.500	CN..43..	(CN..45..)
WCLNR2525M12	R	.984	6	6	.984	.984	95	5.906	1.260	1.260	CN..43..	(CN..45..)
WCLNR3225P12	R	.984	6	6	1.260	1.260	95	6.693	1.260	1.260	CN..43..	(CN..45..)
WCLNL2525M12	L	.984	6	6	.984	.984	95	5.906	1.260	1.260	CN..43..	(CN..45..)
WCLNL3225P12	L	.984	6	6	1.260	1.260	95	6.693	1.260	1.260	CN..43..	(CN..45..)
TCLNR2525M12	R	.984	6	6	.984	.984	95	5.906	1.260	1.260	CN..43..	(CN..45..)
TCLNR3225P12	R	.984	6	6	1.260	1.260	95	6.693	1.260	1.260	CN..43..	(CN..45..)
TCLNL2525M12	L	.984	6	6	.984	.984	95	5.906	1.260	1.260	CN..43..	(CN..45..)
TCLNL3225P12	L	.984	6	6	1.260	1.260	95	6.693	1.260	1.260	CN..43..	(CN..45..)
HCLNR2525M12	R	.984	6	6	.984	.984	95	5.906	1.260	1.260	CNGX45..	–
HCLNR3225P12	R	.984	6	6	1.260	1.260	95	6.693	1.260	1.260	CNGX45..	–
HCLNL2525M12	L	.984	6	6	.984	.984	95	5.906	1.260	1.260	CNGX45..	–
HCLNL3225P12	L	.984	6	6	1.260	1.260	95	6.693	1.260	1.260	CNGX45..	–

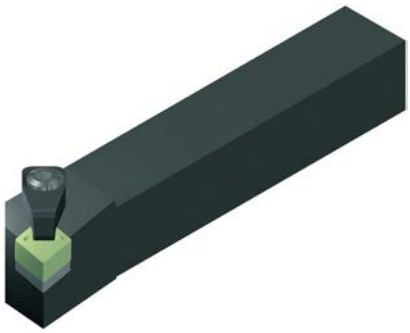
Spare Parts

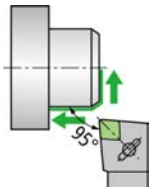
Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
CNGA 43	DC6CN	ACN423x2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
CNGA 45	DC6CN	ACN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
CNG 43	TC6CN	ACN423x2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
CNG 45	TC6CN	ACN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
CNGX 43	HC6CN	ACN423x2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
CNGX 45	HC6CN	ACN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D

Note: Toolholder body comes with spare parts for CNGA43.

CCLN-CX







● Diagram shows right-hand tool

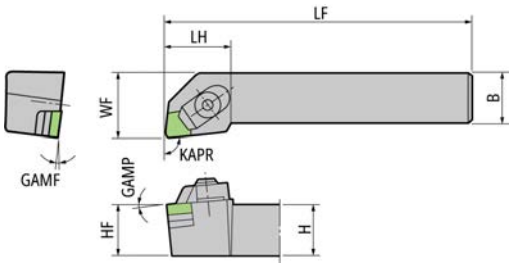
Item Number	Hand	B	H	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	inch	inch	°	inch	inch	inch		
CCLNR164CX	R	1.250	1.250	1.250	95	6.000	1.340	1.250	CNGX45..	(CN..43..)
CCLNR204CX	R	1.500	1.500	1.500	95	6.000	1.340	1.500	CNGX45..	(CN..43..)
CCLNL164CX	L	1.250	1.250	1.250	95	6.000	1.340	1.250	CNGX45..	(CN..43..)
CCLNL204CX	L	1.500	1.500	1.500	95	6.000	1.340	1.500	CNGX45..	(CN..43..)

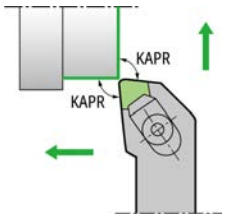
Spare Parts

Insert	Clamp	Blade	Shim	Shim screw	Wrench
CNGX 43	2415	-	ICSN454	1160	LW-4
CNGX 45	2415	-	ICSN434	1160	LW-4
CNG 43	2417	9414	ICSN454	1160	LW-4
CNG 45	2417	9414	ICSN434	1160	LW-4

Note: Toolholder body comes with spare parts for CNGX45.

CCLN





● Diagram shows right-hand tool

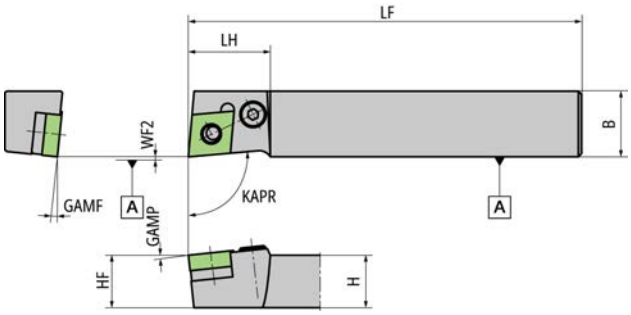
Item Number	Hand	B	GAMF	GAMP	H	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	°	°	inch	inch	°	inch	inch	inch		
CCLNR3225P12	R	.984	6	6	1.260	1.260	95	6.693	1.260	1.260	CN..43..	(CN..45..)
CCLNL3225P12	L	.984	6	6	1.260	1.260	95	6.693	1.260	1.260	CN..43..	(CN..45..)

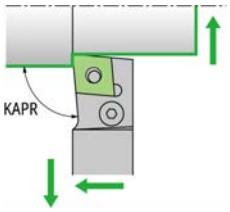
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
CNG 43	CC08M	ACN422x2	BS0835W	M3*12	LW-4	SR08
CNG 45	CC08M	ACN422x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for CNG43.

PCLN-N





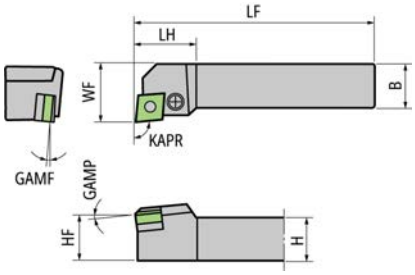
● Diagram shows right-hand tool

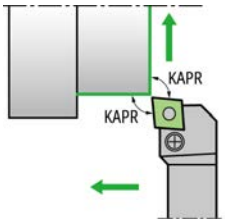
Item Number	Hand	B	GAMF	GAMP	H	HF	KAPR	LF	LH	WF2	Insert Gage
		inch	°	°	inch	inch	°	inch	inch	inch	
PCLNR1620X43N	R	.787	6	6	.630	.630	95	4.724	.984	.000	CN..43..

Spare Parts

Insert	Shim	Clamp screw	Wrench (for Clamp screw)	Clamp Pin	Spring
CNGA 43	LSC42	LCS4CA	LW-3	LCL4	LSP4

PCLN





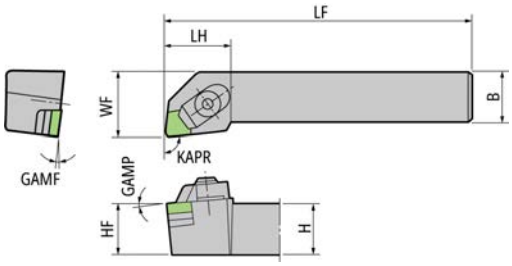
● Diagram shows right-hand tool

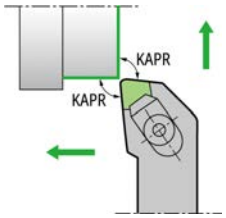
Item Number	Hand	B	GAMF	GAMP	H	HF	KAPR	LF	LH	WF	Insert Gage
		inch	°	°	inch	inch	°	inch	inch	inch	
PCLNR2020K43	R	.787	6	6	.787	.787	95	4.921	1.102	.984	CN..43..
PCLNR2525M43	R	.984	6	6	.984	.984	95	5.906	1.102	1.260	CN..43..
PCLNL2020K43	L	.787	6	6	.787	.787	95	4.921	1.102	.984	CN..43..
PCLNL2525M43	L	.984	6	6	.984	.984	95	5.906	1.102	1.260	CN..43..

Spare Parts

Insert	Shim	Clamp screw	Wrench (for Clamp screw)	Clamp Pin	Spring
CNGA 43	LSC42	LCS4CA	LW-3	LCL4	LSP4

C31





● Diagram shows right-hand tool

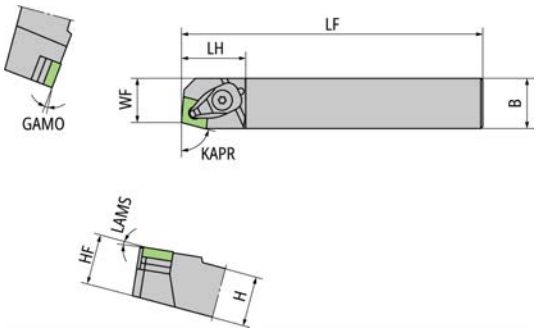
Item Number	Hand	B	GAMF	GAMP	H	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	°	°	inch	inch	°	inch	inch	inch		
C31R-44	R	.984	6	6	.984	.984	95	6.299	1.260	1.260	CN..43..	(CN..45..)
C31R-45	R	.984	6	6	1.260	1.260	95	6.299	1.260	1.260	CN..43..	(CN..45..)
C31L-33	L	.748	6	6	.748	.748	95	5.512	1.260	.984	CN..43..	–
C31L-44	L	.984	6	6	.984	.984	95	6.299	1.260	1.260	CN..43..	(CN..45..)
C31L-45	L	.984	6	6	1.260	1.260	95	6.299	1.260	1.260	CN..43..	(CN..45..)

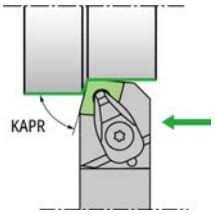
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
CNG 43	CC08M	ACN422x2	BS0835W	M3*12	LW-4	SR08
CNG 45	CC08M	ACN422x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for CNG43.
Clamp screw for C31L-33 : BS0829W.

WCBN/TCBN Multi Clamp Toolholders





● Diagram shows right-hand tool

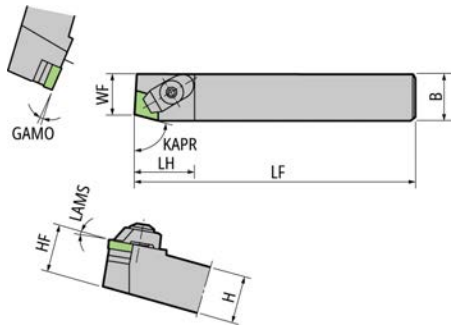
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
WCBNR16-4D	R	1.000	6	1.000	1.000	75	6	6.000	1.250	.880	CN..43..	(CN..45..)
WCBNL16-4D	L	1.000	6	1.000	1.000	75	6	6.000	1.250	.880	CN..43..	(CN..45..)
WCBNR2525M12	R	.984	6	.984	.984	75	6	5.906	1.260	.866	CN..43..	(CN..45..)
WCBNL2525M12	L	.984	6	.984	.984	75	6	5.906	1.260	.866	CN..43..	(CN..45..)
TCBNR2525M12	R	.984	6	.984	.984	75	6	5.906	1.260	.866	CN..43..	(CN..45..)
TCBNL2525M12	L	.984	6	.984	.984	75	6	5.906	1.260	.866	CN..43..	(CN..45..)

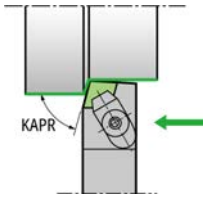
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
CNGA 43	DC6CN	ACN423x2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
CNGA 45	DC6CN	ACN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
CNG 43	TC6CN	ACN423x2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
CNG 45	TC6CN	ACN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D

Note: Toolholder body comes with spare parts for CNGA43.

CCBN





● Diagram shows right-hand tool

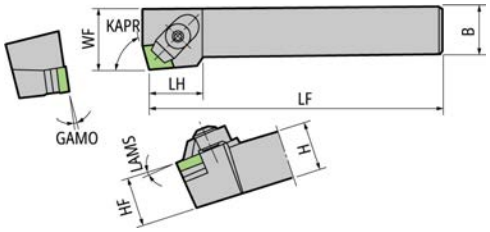
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
CCBNR2525M12	R	.984	6	.984	.984	75	6	5.906	1.260	.866	CN..43..	(CN..45..)

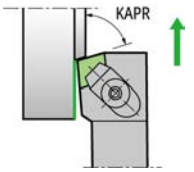
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
CNG 43	CC08M	ACN422x2	BS0835W	M3*12	LW-4	SR08
CNG 45	CC08M	ACN422x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for CNG43.

CCKN





● Diagram shows right-hand tool

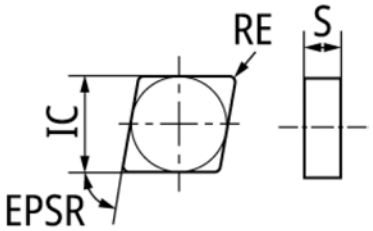
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
CCKNR2525M12	R	.984	6	.984	.984	75	6	5.906	1.181	1.260	CN..43..	(CN..45..)

Spare Parts

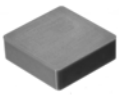
Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
CNG 43	CC08M	ACN422x2	BS0835W	M3*12	LW-4	SR08
CNG 45	CC08M	ACN422x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for CNG43.

CNGN



Steel																								
Stainless Steel																								
Cast Iron						●	●	●		●	●								●	●	○	○		
Non-Ferrous Material																								
Heat Resistant Alloy	●	●	●	●													●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●											
Others (non-metallic)																								

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	CNGN 431 T0425	CNGN 120404 T01025	80	1/2	3/16	.016								●			●		●								
	CNGN 431 S0825	CNGN 120404 S02025	80	1/2	3/16	.016													●								
	CNGN 432 E02	CNGN 120408 E004	80	1/2	3/16	.031				●										●			●				●
	CNGN 432 S0825	CNGN 120408 S02025	80	1/2	3/16	.031													●								
	CNGN 432 T0220	CNGN 120408 T00520	80	1/2	3/16	.031				●										●	●		●			●	●
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	CNGN 432 T0420	CNGN 120408 T01020	80	1/2	3/16	.031						●	●	●			●						●		●	●	●
	CNGN 432 T0425	CNGN 120408 T01025	80	1/2	3/16	.031								●			●		●								
	CNGN 432 T0820	CNGN 120408 T02020	80	1/2	3/16	.031																		●			
	CNGN 432 T0825	CNGN 120408 T02025	80	1/2	3/16	.031						●											●			●	●
	CNGN 432 Z0825	CNGN 120408 Z02025	80	1/2	3/16	.031																					
	CNGN 433 E02	CNGN 120412 E004	80	1/2	3/16	.047				●										●			●				●
	CNGN 433 S0825	CNGN 120412 S02025	80	1/2	3/16	.047													●								
	CNGN 433 T0220	CNGN 120412 T00520	80	1/2	3/16	.047				●										●	●		●			●	●
	CNGN 433 T0320	CNGN 120412 T00820	80	1/2	3/16	.047			●																		●
	CNGN 433 T0420	CNGN 120412 T01020	80	1/2	3/16	.047						●	●	●			●						●		●	●	●
	CNGN 433 T0425	CNGN 120412 T01025	80	1/2	3/16	.047						●	●	●			●		●							●	●
	CNGN 433 T0820	CNGN 120412 T02020	80	1/2	3/16	.047																		●			
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	CNGN 452 T0825	CNGN 120708 T02025	80	1/2	5/16	.031								●													
	CNGN 453 E02	CNGN 120712 E004	80	1/2	5/16	.047				●										●			●				●
	CNGN 453 T0220	CNGN 120712 T00520	80	1/2	5/16	.047				●										●	●					●	●
	CNGN 453 T0825	CNGN 120712 T02025	80	1/2	5/16	.047								●													
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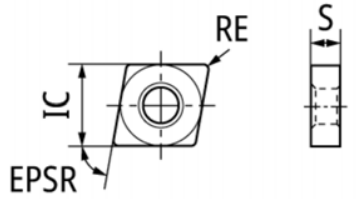
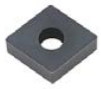
CNGA



Steel																									
Stainless Steel																									
Cast Iron						●	●	●		●	●										●	●	○	○	
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●		
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics							Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD							CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	CNGA 431 BQ E02	CNGA 120404 BQ E004	80	1/2	3/16	.016	●	●																			
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	CNGA 431 S0825	CNGA 120404 S02025	80	1/2	3/16	.016													●								
	CNGA 431 T0220	CNGA 120404 T00520	80	1/2	3/16	.016																				●	
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	CNGA 433 T0220	CNGA 120412 T00520	80	1/2	3/16	.047														●	●		●			●	
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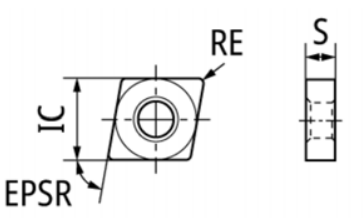
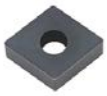
CNGA-WL with wiper for higher feed

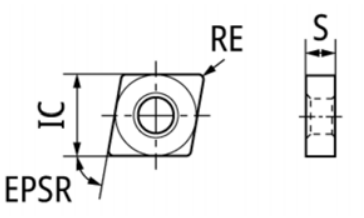


Steel																									
Stainless Steel																									
Cast Iron							●	●	●		●	●									●	●	○	○	
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●															●	●	●	●		●	●
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	CNGA 432 WL T0425	CNGA 120408 WL T01025	80	1/2	3/16	.031													●								
	CNGA 433 WL T0425	CNGA 120412 WL T01025	80	1/2	3/16	.047									●				●								

Wiper Width: R.016": .014", R.031": .026", R.047": .033"
Applicable holders: 95° cutting edge angle (C31, CCLN), 75° cutting edge angle (CCBN).

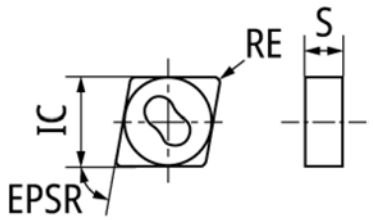
CNGG-AG with chipbreaker



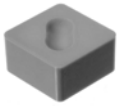
Steel																									
Stainless Steel																									
Cast Iron							●	●	●		●	●									●	●	○	○	
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●															●	●	●	●		●	●
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	CNGG 431 Z0430 AG	CNGG 120404 Z01030 AG	80	1/2	3/16	.016													●								
	CNGG 432 Z0430 AG	CNGG 120408 Z01030 AG	80	1/2	3/16	.031													●								
	CNGG 433 Z0430 AG	CNGG 120412 Z01030 AG	80	1/2	3/16	.047													●								

CNGX

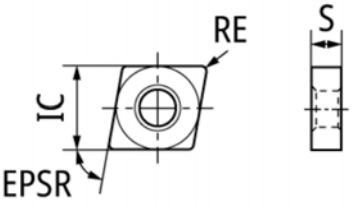


Steel																					○	○
Stainless Steel																						
Cast Iron						●	●	●		●	●								●	●	○	○
Non-Ferrous Material																						
Heat Resistant Alloy	●	●	●	●										●	●	●	●			●	●	
Hardened Material					●			○	●	○		●	●									
Others (non-metallic)																						

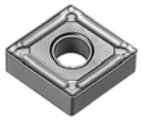
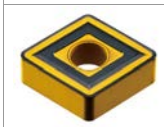
Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	CNGX 432 T0420	CNGX 120408 T01020	80	1/2	3/16	.031																	●		●		
	CNGX 432 T0820	CNGX 120408 T02020	80	1/2	3/16	.031																		●			
	CNGX 433 T0420	CNGX 120412 T01020	80	1/2	3/16	.047																	●		●		
	CNGX 433 T0820	CNGX 120412 T02020	80	1/2	3/16	.047																		●			
	CNGX 434 T0420	CNGX 120416 T01020	80	1/2	3/16	.063																	●		●		
	CNGX 452 T0420	CNGX 120708 T01020	80	1/2	5/16	.031																	●		●		
	CNGX 452 T0820	CNGX 120708 T02020	80	1/2	5/16	.031																		●	●		
	CNGX 453 T0420	CNGX 120712 T01020	80	1/2	5/16	.047																●	●		●		
	CNGX 453 T0820	CNGX 120712 T02020	80	1/2	5/16	.047																	●	●	●		
	CNGX 453 T0825	CNGX 120712 T02025	80	1/2	5/16	.047																			●		
	CNGX 454 T0420	CNGX 120716 T01020	80	1/2	5/16	.063																	●		●		
	CNGX 454 T0825	CNGX 120716 T02025	80	1/2	5/16	.063																			●		

CN.. series/Inserts Carbide

CN.G

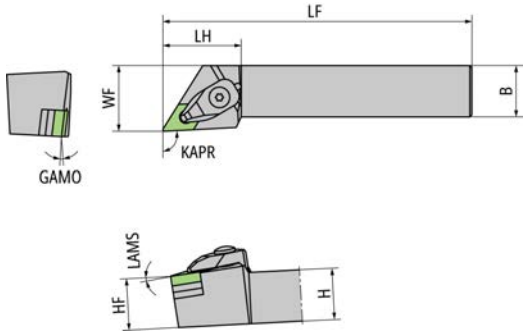


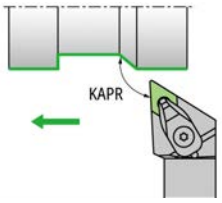
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	RE	Carbide										
							PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(ISO)	°	inch	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	CNGG 431 FN UL	CNGG 120404 FN UL	80	1/2	3/16	.016			●		●	●					
	CNGG 432 FN UL	CNGG 120408 FN UL	80	1/2	3/16	.031			●		●	●					
	CNGG 431 FN ZP	CNGG 120404 FN ZP	80	1/2	3/16	.016			●		●			●			
	CNGG 432 FN ZP	CNGG 120408 FN ZP	80	1/2	3/16	.031			●		●			●			
	CNMG 432 T0225 Z5	CNMG 120408 T00525 Z5	80	1/2	3/16	.031			●		●						
	CNMG 432 G	CNMG 120408 G	80	1/2	3/16	.031									●		
	CNMG 433 G	CNMG 120412 G	80	1/2	3/16	.047									●		
	CNMG 434 G	CNMG 120416 G	80	1/2	3/16	.063									●		

DN.. series/Toolholders

WDJN/HDJN Multi Clamp Toolholders





● Diagram shows right-hand tool

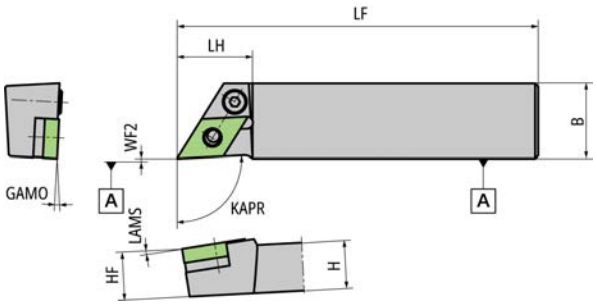
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
WDJNR16-4D	R	1.000	6	1.000	1.000	93	6	6.000	1.500	1.250	DN..43..	(DN..45..)
WDJNR20-4D	R	1.250	6	1.250	1.250	93	6	6.000	1.500	1.500	DN..43..	(DN..45..)
WDJNL16-4D	L	1.000	6	1.000	1.000	93	6	6.000	1.500	1.250	DN..43..	(DN..45..)
WDJNL20-4D	L	1.250	6	1.250	1.250	93	6	6.000	1.500	1.500	DN..43..	(DN..45..)
WDJNR2525M15	R	.984	6	.984	.984	93	6	5.906	1.496	1.260	DN..43..	(DN..45..)
WDJNR3225P15	R	.984	6	1.260	1.260	93	6	6.693	1.496	1.260	DN..43..	(DN..45..)
WDJNL2525M15	L	.984	6	.984	.984	93	6	5.906	1.496	1.260	DN..43..	(DN..45..)
WDJNL3225P15	L	.984	6	1.260	1.260	93	6	6.693	1.496	1.260	DN..43..	(DN..45..)
HDJNR2525M15	R	.984	6	.984	.984	93	6	5.906	1.496	1.260	DNGX45..	–
HDJNR3225P15	R	.984	6	1.260	1.260	93	6	6.693	1.496	1.260	DNGX45..	–
HDJNL2525M15	L	.984	6	.984	.984	93	6	5.906	1.496	1.260	DNGX45..	–
HDJNL3225P15	L	.984	6	1.260	1.260	93	6	6.693	1.496	1.260	DNGX45..	–

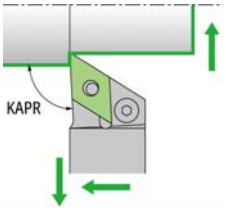
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
DNGA 43	DC6DN	ADN423x2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
DNGA 45	DC6DN	ADN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
DNGX 45	HC6DN	ADN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D

Note: Toolholder body comes with spare parts for DNGA43.

PDJN-N





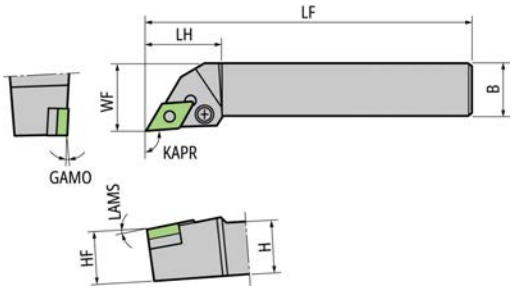
● Diagram shows right-hand tool

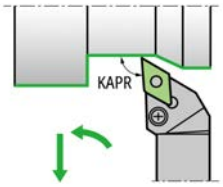
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF2	Insert Gage
		inch	°	inch	inch	°	°	inch	inch	inch	
PDJNR1625X43N	R	.984	6	.630	.630	93	6	4.724	.984	.000	DN..43..

Spare Parts

Insert	Shim	Clamp screw	Wrench (for Clamp screw)	Clamp Pin	Spring
DNGA 43	LSD42	LCS4CA	LW-3	LCL4	LSP4

PDJN





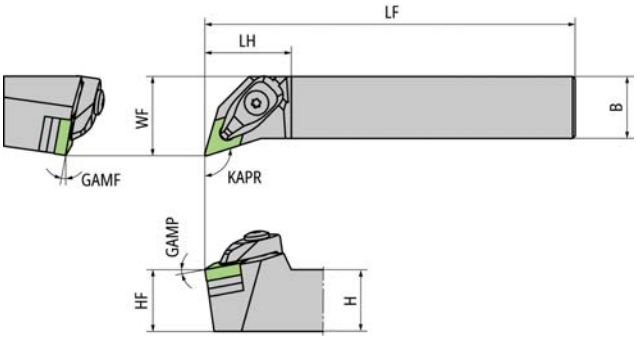
● Diagram shows right-hand tool

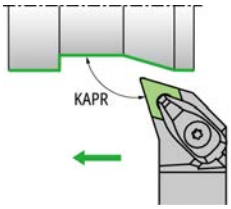
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage
		inch	°	inch	inch	°	°	inch	inch	inch	
PDJNR2020K43	R	.787	6	.787	.787	93	6	4.921	1.260	.984	DN..43..
PDJNR2525M43	R	.984	6	.984	.984	93	6	5.906	1.260	1.260	DN..43..
PDJNL2020K43	L	.787	6	.787	.787	93	6	4.921	1.260	.984	DN..43..

Spare Parts

Insert	Shim	Clamp screw	Wrench (for Clamp screw)	Clamp Pin	Spring
DNGA 43	LSD42	LCS4	LW-3	LCL4	LSP4

WDHN/HDHN Multi Clamp Toolholders





● Diagram shows right-hand tool

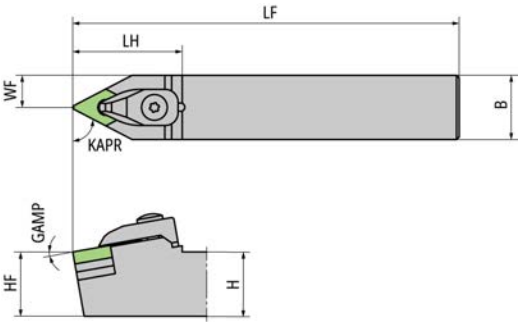
Item Number	Hand	B	GAMF	GAMP	H	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	°	°	inch	inch	°	inch	inch	inch		
WDHNR16-4D	R	1.250	8	8	1.000	1.000	107.5	6.000	1.380	1.250	DN..43..	(DN..45..)
WDHNL16-4D	L	1.250	8	8	1.000	1.000	107.5	6.000	1.380	1.250	DN..43..	(DN..45..)
WDHNR2525M15	R	.984	8	8	.984	.984	107.5	5.906	1.378	1.260	DN..43..	(DN..45..)
WDHNL2525M15	L	.984	8	8	.984	.984	107.5	5.906	1.378	1.260	DN..43..	(DN..45..)
HDHNR2525M15	R	.984	8	8	.984	.984	107.5	5.906	1.378	1.260	DNGX45..	–
HDHNL2525M15	L	.984	8	8	.984	.984	107.5	5.906	1.378	1.260	DNGX45..	–

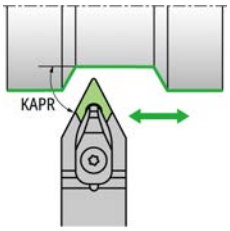
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
DNGA 43	DC6DN	ADN423x2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
DNGA 45	DC6DN	ADN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
DNGX 45	HC6DN	ADN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D

Note: Toolholder body comes with spare parts for DNGA43.

WDNN/HDNN Multi Clamp Toolholders





Item Number	Hand	B	GAMP	H	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	inch	inch	inch		
WDNNN16-4D	N	1.000	10	1.000	1.000	62.5	6.000	1.670	.500	DN..43..	(DN..45..)
WDNNN2525M15	N	.984	10	.984	.984	62.5	5.906	1.673	.492	DN..43..	(DN..45..)
HDNNN2525M15	N	.984	10	.984	.984	62.5	5.906	1.673	.492	DNGX45..	–

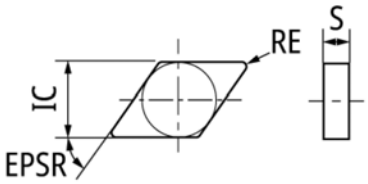
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
DNGA 43	DC6DN	ADN423x2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
DNGA 45	DC6DN	ADN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
DNGX 45	HC6DN	ADN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D

Note: Toolholder body comes with spare parts for DNGA43.

DN.. series/Inserts BIDEMICS / Ceramics / NTK CeramiX

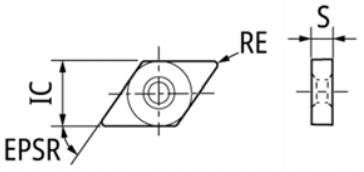
DNGN



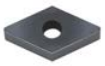
Steel																							
Stainless Steel																							
Cast Iron						●	●	●		●	●							●	●	○	○		
Non-Ferrous Material																							
Heat Resistant Alloy	●	●	●	●													●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●										
Others (non-metallic)																							

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	DNGN 431 T0425	DNGN 150404 T01025	55	1/2	3/16	.016								●													
	DNGN 432 S0825	DNGN 150408 S02025	55	1/2	3/16	.031													●								
	DNGN 432 T0420	DNGN 150408 T01020	55	1/2	3/16	.031						●	●	●			●						●		●	●	
	DNGN 432 T0425	DNGN 150408 T01025	55	1/2	3/16	.031											●		●								
	DNGN 432 T0820	DNGN 150408 T02020	55	1/2	3/16	.031																		●			
	DNGN 432 Z0825	DNGN 150408 Z02025	55	1/2	3/16	.031																					
	DNGN 433 T0220	DNGN 150412 T00520	55	1/2	3/16	.047																				●	●
	DNGN 433 T0420	DNGN 150412 T01020	55	1/2	3/16	.047						●	●	●			●						●		●	●	
	DNGN 433 T0820	DNGN 150412 T02020	55	1/2	3/16	.047																		●			
	DNGN 433 T0825	DNGN 150412 T02025	55	1/2	3/16	.047																				●	●
	DNGN 452 E02	DNGN 150708 E004	55	1/2	5/16	.031				●										●			●				●
	DNGN 452 T0220	DNGN 150708 T00520	55	1/2	5/16	.031				●										●			●				●
	DNGN 453 E02	DNGN 150712 E004	55	1/2	5/16	.047				●										●			●				●
	DNGN 453 T0220	DNGN 150712 T00520	55	1/2	5/16	.047				●										●			●				●
	DNGN 453 T0825	DNGN 150712 T02025	55	1/2	5/16	.047								●												●	●
	DNGN 454 E02	DNGN 150716 E004	55	1/2	5/16	.063				●										●			●				●
	DNGN 454 T0220	DNGN 150716 T00520	55	1/2	5/16	.063				●										●			●				●

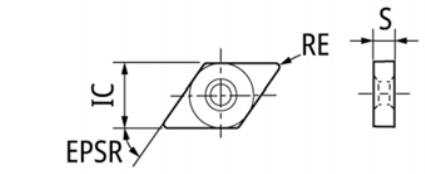
DNGA



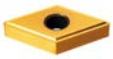
Steel																							
Stainless Steel																							
Cast Iron							●	●	●		●	●								●	●	○	○
Non-Ferrous Material																							
Heat Resistant Alloy	●	●	●	●													●	●	●	●		●	●
Hardened Material					●			○	●	○		●	●										
Others (non-metallic)																							

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	DNGA 431 BQ E02	DNGA 150404 BQ E004	55	1/2	3/16	.016	●	●																			
	DNGA 431 BQ T0220	DNGA 150404 BQ T00520	55	1/2	3/16	.016		●																			
	DNGA 432 E02	DNGA 150408 E004	55	1/2	3/16	.031														●			●				●
	DNGA 431 S0825	DNGA 150404 S02025	55	1/2	3/16	.016													●								
	DNGA 431 T0425	DNGA 150404 T01025	55	1/2	3/16	.016								●			●		●								
	DNGA 431 X0415	DNGA 150404 X01015	55	1/2	3/16	.016					●																
	DNGA 431 X0415 -10	DNGA 150404 X01015 -10	55	1/2	3/16	.016					●																
	DNGA 431 Z0825	DNGA 150404 Z02025	55	1/2	3/16	.016								●	●												
	DNGA 432 BQ E02	DNGA 150408 BQ E004	55	1/2	3/16	.031	●	●																			
	DNGA 432 BQ T0220	DNGA 150408 BQ T00520	55	1/2	3/16	.031		●																			
	DNGA 432 S0825	DNGA 150408 S02025	55	1/2	3/16	.031								●					●								
	DNGA 432 T0220	DNGA 150408 T00520	55	1/2	3/16	.031														●	●		●			●	
	DNGA 432 T0420	DNGA 150408 T01020	55	1/2	3/16	.031						●	●	●			●						●		●	●	●
	DNGA 432 T0425	DNGA 150408 T01025	55	1/2	3/16	.031								●			●		●								
	DNGA 432 T0820	DNGA 150408 T02020	55	1/2	3/16	.031								●										●			
	DNGA 432 T0825	DNGA 150408 T02025	55	1/2	3/16	.031						●											●				
	DNGA 432 X0415	DNGA 150408 X01015	55	1/2	3/16	.031					●																
	DNGA 432 X0415 -10	DNGA 150408 X01015 -10	55	1/2	3/16	.031					●																
	DNGA 432 Z0825	DNGA 150408 Z02025	55	1/2	3/16	.031									●												
	DNGA 433 BQ E02	DNGA 150412 BQ E004	55	1/2	3/16	.047	●	●																			
	DNGA 433 BQ T0220	DNGA 150412 BQ T00520	55	1/2	3/16	.047		●																			
	DNGA 433 E02	DNGA 150412 E004	55	1/2	3/16	.047														●			●				●
	DNGA 433 S0825	DNGA 150412 S02025	55	1/2	3/16	.047													●								
	DNGA 433 T0220	DNGA 150412 T00520	55	1/2	3/16	.047														●	●		●			●	●
	DNGA 433 T0420	DNGA 150412 T01020	55	1/2	3/16	.047						●	●	●			●						●		●	●	
	DNGA 433 T0425	DNGA 150412 T01025	55	1/2	3/16	.047							●						●								
	DNGA 433 T0820	DNGA 150412 T02020	55	1/2	3/16	.047								●										●			
	DNGA 433 T0825	DNGA 150412 T02025	55	1/2	3/16	.047						●											●				
	DNGA 433 X0415	DNGA 150412 X01015	55	1/2	3/16	.047					●																
	DNGA 433 X0415 -10	DNGA 150412 X01015 -10	55	1/2	3/16	.047					●																
	DNGA 434 E02	DNGA 150416 E004	55	1/2	3/16	.063														●			●				●
	DNGA 434 T0220	DNGA 150416 T00520	55	1/2	3/16	.063														●			●			●	●

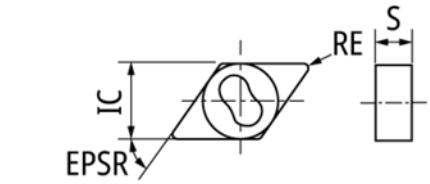
DNGG-AG with chipbreaker



Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	DNGG 431 Z0430 AG	DNGG 150404 Z01030 AG	55	1/2	3/16	.016													●								
	DNGG 432 Z0430 AG	DNGG 150408 Z01030 AG	55	1/2	3/16	.031													●								
	DNGG 433 Z0430 AG	DNGG 150412 Z01030 AG	55	1/2	3/16	.047													●								

DNGX

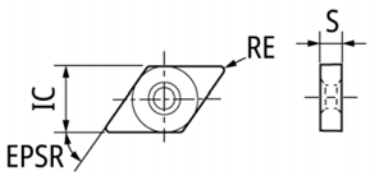


Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

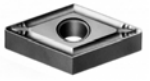
Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	DNGX 452 T0420	DNGX 150708 T01020	55	1/2	5/16	.031																	●		●		
	DNGX 452 T0820	DNGX 150708 T02020	55	1/2	5/16	.031																		●			
	DNGX 453 T0420	DNGX 150712 T01020	55	1/2	5/16	.047																	●		●		
	DNGX 454 T0420	DNGX 150716 T01020	55	1/2	5/16	.063																	●		●		
	DNGX 454 T0825	DNGX 150716 T02025	55	1/2	5/16	.063																			●		

DN.. series/Inserts Carbide

DN.G

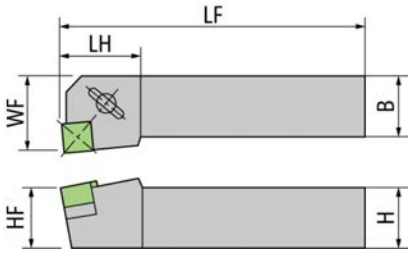


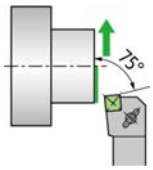
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	RE	Carbide										
							PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(ISO)	°	inch	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	DNGG 431 FN ZP	DNGG 150404 FN ZP	55	1/2	3/16	.016		●	●		●			●			
	DNGG 432 FN ZP	DNGG 150408 FN ZP	55	1/2	3/16	.031		●	●		●			●			
	DNMG 432 T0225 Z5	DNMG 150408 T00525 Z5	55	1/2	3/16	.031			●		●						
	DNMG 431 G	DNMG 150404 TN G	55	1/2	3/16	.016					●						
	DNMG 431 G	DNMG 150404 G	55	1/2	3/16	.016									●		
	DNMG 432 G	DNMG 150408 G	55	1/2	3/16	.031									●		
	DNMG 433 G	DNMG 150412 G	55	1/2	3/16	.047									●		

SN..series/Toolholders

CSKN-CX





● Diagram shows right-hand tool

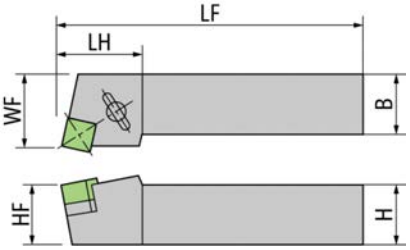
Item Number	Hand	B	H	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	inch	inch	°	inch	inch	inch		
CSKNR164CX	R	1.000	1.000	1.000	75	6.000	1.340	1.250	SNGX45..	(SN..43../SN..45..)
CSKNR204CX	R	1.250	1.250	1.250	75	6.000	1.340	1.500	SNGX45..	(SN..43../SN..45..)
CSKNR165CX	R	1.000	1.000	1.000	75	6.000	1.340	1.250	SNGX55..	(SNG 55..)
CSKNR205CX	R	1.250	1.250	1.250	75	6.000	1.340	1.500	SNGX55..	(SNG 55..)
CSKNL164CX	L	1.000	1.000	1.000	75	6.000	1.340	1.250	SNGX45..	(SN..43../SN..45..)
CSKNL204CX	L	1.250	1.250	1.250	75	6.000	1.340	1.500	SNGX45..	(SN..43../SN..45..)
CSKNL165CX	L	1.000	1.000	1.000	75	6.000	1.340	1.250	SNGX55..	(SNG 55..)
CSKNL205CX	L	1.250	1.250	1.250	75	6.000	1.340	1.500	SNGX55..	(SNG 55..)

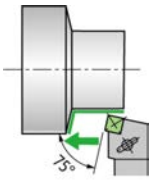
Spare Parts

Insert	Clamp	Blade	Shim	Shim screw	Wrench
SNGX 45	2415	-	ISSN434	1160	LW-4
SNG 43	2417	9414	ISSN454	1160	LW-4
SNG 45	2417	9414	ISSN434	1160	LW-4
SNGX 55	2415	-	ISSN534	1180	LW-4
SNG 55	2417	9414	ISSN534	1180	LW-4

Note: Toolholder body comes with spare parts for SNGX45 and SNGX55.

CSRN-CX





● Diagram shows right-hand tool

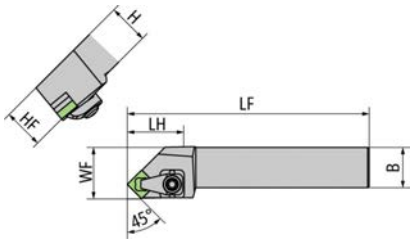
Item Number	Hand	B	H	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	inch	inch	°	inch	inch	inch		
CSRNR164CX	R	1.000	1.000	1.000	75	6.000	1.338	1.130	SNGX45..	(SN..43../SN..45..)
CSRNR204CX	R	1.250	1.250	1.250	75	6.000	1.338	1.380	SNGX45..	(SN..43../SN..45..)
CSRNR165CX	R	1.000	1.000	1.000	75	6.000	1.496	1.100	SNGX55..	(SNG 55..)
CSRNR205CX	R	1.250	1.250	1.250	75	6.000	1.496	1.350	SNGX55..	(SNG 55..)
CSRNR245CX	R	1.500	1.500	1.500	75	8.000	1.650	1.750	SNGX55..	(SNG 55..)
CSRNL164CX	L	1.000	1.000	1.000	75	6.000	1.338	1.130	SNGX45..	(SN..43../SN..45..)
CSRNL204CX	L	1-1/4	1-1/4	1-1/4	75	6.000	1.338	1.380	SNGX45..	(SN..43../SN..45..)
CSRNL165CX	L	1.000	1.000	1.000	75	6.000	1.496	1.100	SNGX55..	(SNG 55..)
CSRNL205CX	L	1-1/4	1-1/4	1-1/4	75	6.000	1.496	1.350	SNGX55..	(SNG 55..)
CSRNL245CX	L	1.500	1.500	1.500	75	8.000	1.650	1.750	SNGX55..	(SNG 55..)

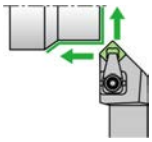
Spare Parts

Insert	Clamp	Blade	Shim	Shim screw	Wrench
SNGX 45	2415	-	ISSN434	1160	LW-4
SNG 43	2417	9414	ISSN454	1160	LW-4
SNG 45	2417	9414	ISSN434	1160	LW-4
SNGX 55	2415	-	ISSN534	1180	LW-4
SNG 55	2417	9414	ISSN534	1180	LW-4

Note: Toolholder body comes with spare parts for SNGX45 and SNGX55.

CSSN-CD





● Diagram shows right-hand tool

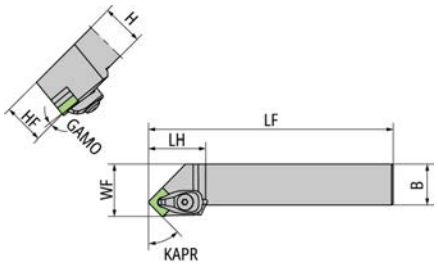
Item Number	Hand	B	H	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	inch	inch	°	inch	inch	inch		
CSSNR245CD	R	1.500	1.500	1.500	45	6.000	2.000	1.653	SNGX55..	(SNG 55..)
CSSNL245CD	L	1.500	1.500	1.500	45	6.000	2.000	1.653	SNGX55..	(SNG 55..)

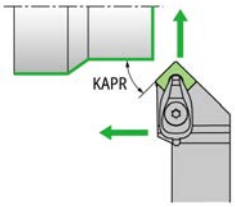
Spare Parts

Insert	Clamp	Blade	Shim	Shim screw	Wrench
SNGX 55	2415	-	ISSN534	1180	LW-4
SNG 55	2417	9414	ISSN534	1180	LW-4

Note: Toolholder body comes with spare parts for SNGX55.

WSSN/TSSN/HSSN Multi Clamp Toolholders





● Diagram shows right-hand tool

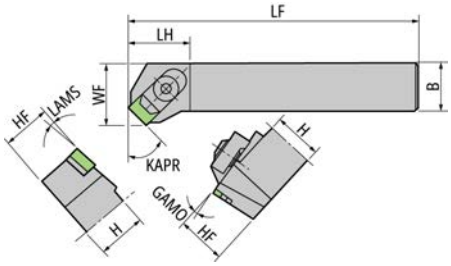
Item Number	Hand	B	GAMO	H	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	inch	inch	inch		
WSSNR16-4D	R	1.000	8	1.000	1.000	45	6.000	1.380	1.250	SN..43..	(SN..45..)
WSSNL16-4D	L	1.000	8	1.000	1.000	45	6.000	1.380	1.250	SN..43..	(SN..45..)
WSSNR2525M12	R	.984	8	.984	.984	45	5.906	1.378	1.260	SN..43..	(SN..45..)
WSSNL2525M12	L	.984	8	.984	.984	45	5.906	1.378	1.260	SN..43..	(SN..45..)
TSSNR2525M12	R	.984	8	.984	.984	45	5.906	1.378	1.260	SN..43..	(SN..45..)
TSSNL2525M12	L	.984	8	.984	.984	45	5.906	1.378	1.260	SN..43..	(SN..45..)
HSSNR2525M12	R	.984	8	.984	.984	45	5.906	1.378	1.260	SNGX45..	–
HSSNL2525M12	L	.984	8	.984	.984	45	5.906	1.378	1.260	SNGX45..	–

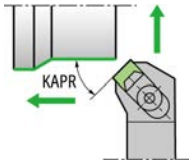
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
SNGA 43	DC6CN	ASN423x2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
SNGA 45	DC6CN	ASN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
SNG 43	TC6CN	ASN423x2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
SNG 45	TC6CN	ASN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
SNGX 45	HC6SN	ASN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D

Note: Toolholder body comes with spare parts for SNGA43.

CSSN





● Diagram shows right-hand tool

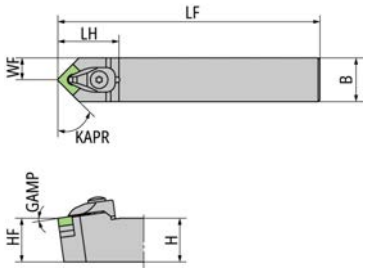
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
CSSNL2525M12	L	.984	8	.984	.984	45	8	5.906	1.220	1.260	SN..43..	(SN..45..)
CSSNL3225P12	L	.984	8	1.260	1.260	45	8	6.693	1.220	1.260	SN..43..	(SN..45..)

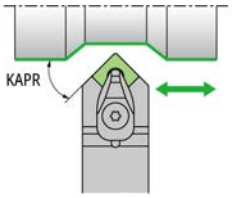
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
SNG 43	CC08M	ASN423x2	BS0835W	M3*12	LW-4	SR08
SNG 45	CC08M	ASN423x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for SNG43.

WSDN/TSDN/HSDN Multi Clamp Toolholders





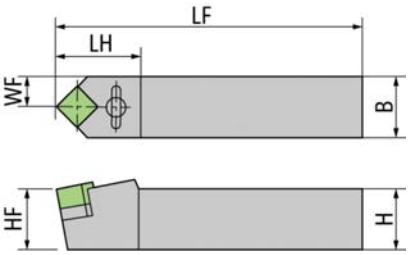
Item Number	Hand	B	GAMP	H	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	inch	inch	inch		
WSDNN16-4D	N	1.000	8	1.000	1.000	45	6.000	1.420	.500	SN..43..	(SN..45..)
WSDNN2525M12	N	.984	8	.984	.984	45	5.906	1.378	.492	SN..43..	(SN..45..)
WSDNN3225P12	N	.984	8	1.260	1.260	45	6.693	1.378	.492	SN..43..	(SN..45..)
TSDNN2525M12	N	.984	8	.984	.984	45	5.906	1.378	.492	SN..43..	(SN..45..)
TSDNN3225P12	N	.984	8	1.260	1.260	45	6.693	1.378	.492	SN..43..	(SN..45..)
HSDNN2525M12	N	.984	8	.984	.984	45	5.906	1.378	.492	SNGX45..	–
HSDNN3225P12	N	.984	8	1.260	1.260	45	6.693	1.378	.492	SNGX45..	–

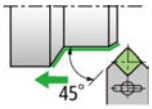
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
SNGA 43	DC6CN	ASN423x2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
SNGA 45	DC6CN	ASN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
SNG 43	TC6CN	ASN423x2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
SNG 45	TC6CN	ASN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
SNGX 45	HC6SN	ASN423x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D

Note: Toolholder body comes with spare parts for SNGA43.

CSDN-CX





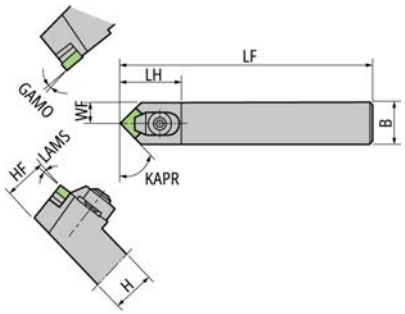
Item Number	Hand	B	H	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	inch	inch	°	inch	inch	inch		
CSDNN164CX	N	1.000	1.000	1.000	45	6.000	1.650	.500	SNGX45..	(SN..43../SN..45..)
CSDNN204CX	N	1.250	1.250	1.250	45	6.000	1.650	.625	SNGX45..	(SN..43../SN..45..)
CSDNN165CX	N	1.000	1.000	1.000	45	6.000	1.650	.500	SNGX55..	(SNG 55..)
CSDNN205CX	N	1.250	1.250	1.250	45	6.000	1.650	.625	SNGX55..	(SNG 55..)

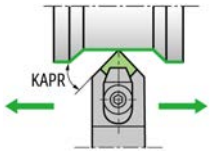
Spare Parts

Insert	Clamp	Blade	Shim	Shim screw	Wrench
SNGX 45	2415	-	ISSN434	1160	LW-4
SNG 43	2417	9414	ISSN454	1160	LW-4
SNG 45	2417	9414	ISSN434	1160	LW-4
SNGX 55	2415	-	ISSN534	1180	LW-4
SNG 55	2417	9414	ISSN534	1180	LW-4

Note: Toolholder body comes with spare parts for SNGX45 and SNGX55.

CSDNN





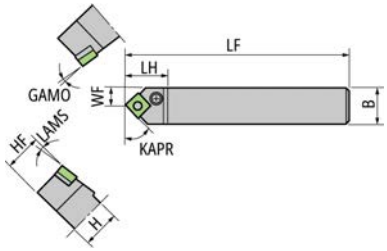
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
CSDNN2525M12	N	.984	6	.984	.984	45	6	5.906	1.378	.492	SN..43..	(SN..45..)

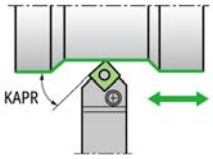
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
SNG 43	CC08M	ASN423x2	BS0835W	M3*12	LW-4	SR08
SNG 45	CC08M	ASN423x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for SNG43.

PSDN



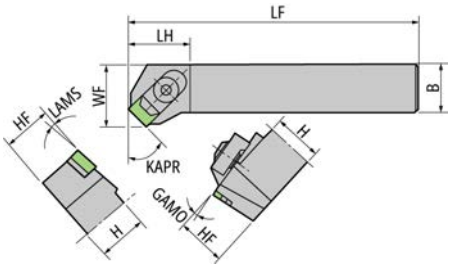


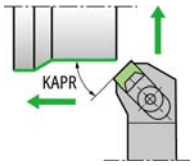
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage
		inch	°	inch	inch	°	°	inch	inch	inch	
PSDNN2020K43	N	.787	6	.787	.787	45	6	4.921	1.181	.394	SN..43..
PSDNN2525M43	N	.984	6	.984	.984	45	6	5.906	1.181	.492	SN..43..

Spare Parts

Insert	Shim	Clamp screw	Wrench (for Clamp screw)	Clamp Pin	Spring
SNGA 43	LSS42	LCS4	LW-3	LCL4	LSP4

C12





● Diagram shows right-hand tool

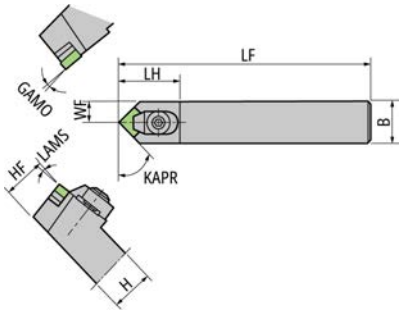
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
C12R-33	R	.748	8	.748	.748	45	8	5.512	1.102	1.063	SN..43..	–
C12R-44	R	.984	8	.984	.984	45	8	6.299	1.220	1.378	SN..43..	(SN..45..)
C12R-45	R	.984	8	1.260	1.260	45	8	6.299	1.220	1.378	SN..43..	(SN..45..)
C12L-33	L	.748	8	.748	.748	45	8	5.512	1.102	1.063	SN..43..	–
C12L-44	L	.984	8	.984	.984	45	8	6.299	1.220	1.378	SN..43..	(SN..45..)
C12L-45	L	.984	8	1.260	1.260	45	8	6.299	1.220	1.378	SN..43..	(SN..45..)

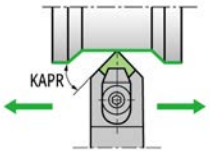
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
SNG 43	CC08M	ASN423x2	BS0835W	M3*12	LW-4	SR08
SNG 45	CC08M	ASN423x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for SNG43.
Clamp for C12R/L-33 : CS08MS.
Clamp screw for C12R/L-33 : BS0829W.

C14





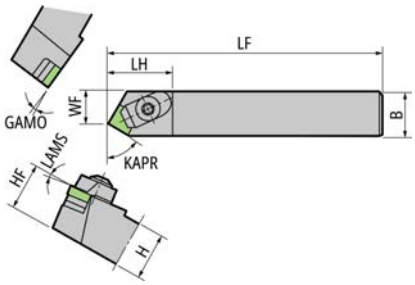
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
C14M-33	N	.748	6	.748	.748	45	6	5.512	1.378	.374	SN..43..	–
C14M-34	N	.748	6	.984	.984	45	6	6.299	1.378	.374	SN..43..	(SN..45..)
C14M-44	N	.984	6	.984	.984	45	6	6.299	1.378	.492	SN..43..	(SN..45..)
C14M-45	N	.984	6	1.260	1.260	45	6	6.299	1.378	.492	SN..43..	(SN..45..)

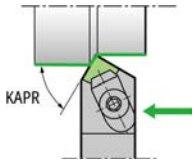
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
SNG 43	CC08M	ASN423x2	BS0835W	M3*12	LW-4	SR08
SNG 45	CC08M	ASN423x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for SNG43.
Clamp screw for C14M-33 : BS0829W.

C13





● Diagram shows right-hand tool

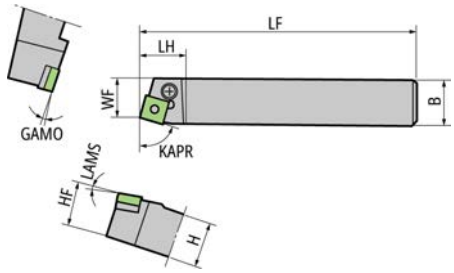
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
C13R-33	R	.748	6	.748	.748	60	6	5.512	1.378	.492	SN..43..	(SN..45..)
C13R-34	R	.748	6	.984	.984	60	6	6.299	1.378	.492	SN..43..	(SN..45..)
C13R-44	R	.984	6	.984	.984	60	6	6.299	1.378	.728	SN..43..	(SN..45..)
C13R-45	R	.984	6	1.299	1.260	60	6	6.299	1.378	.728	SN..43..	(SN..45..)
C13L-33	L	.748	6	.748	.748	60	6	5.512	1.378	.492	SN..43..	–
C13L-44	L	.984	6	.984	.984	60	6	6.299	1.378	.728	SN..43..	(SN..45..)
C13L-45	L	.984	6	1.260	1.260	60	6	6.299	1.378	.728	SN..43..	(SN..45..)

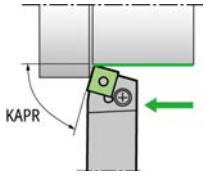
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
SNG 43	CC08M	ASN423x2	BS0835W	M3*12	LW-4	SR08
SNG 45	CC08M	ASN423x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for SNG43.
Clamp screw for C13R/L-33 : BS0829W.

PSBN





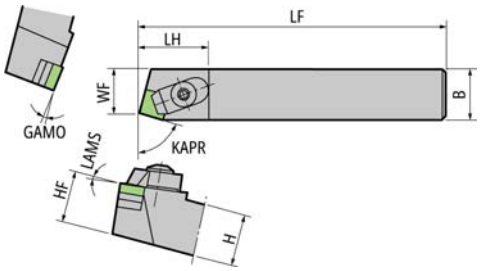
● Diagram shows right-hand tool

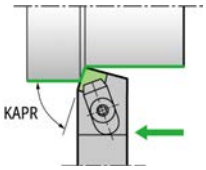
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage
		inch	°	inch	inch	°	°	inch	inch	inch	
PSBNL2020K43	L	.787	6	.787	.787	75	6	4.921	1.102	.669	SN..43..
PSBNR2020K43	R	.787	6	.787	.787	75	6	4.921	1.102	.669	SN..43..

Spare Parts

Insert	Shim	Clamp screw	Wrench (for Clamp screw)	Clamp Pin	Spring
SNGA 43	LSS42	LCS4	LW-3	LCL4	LSP4

C11





● Diagram shows right-hand tool

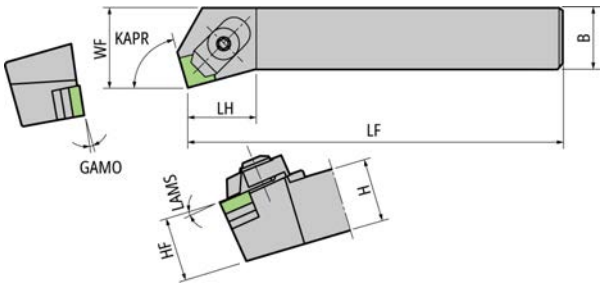
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
C11R-33	R	.748	6	.748	.748	75	6	5.512	1.339	.610	SN..43..	(SN..45..)
C11R-34	R	.748	6	.984	.984	75	6	6.299	1.339	.610	SN..43..	(SN..45..)
C11R-44	R	.984	6	.984	.984	75	6	6.299	1.339	.846	SN..43..	(SN..45..)
C11R-45	R	.984	6	1.260	1.260	75	6	6.299	1.339	.846	SN..43..	(SN..45..)
C11L-33	L	.748	6	.748	.748	75	6	5.512	1.339	.610	SN..43..	–
C11L-44	L	.984	6	.984	.984	75	6	6.299	1.339	.846	SN..43..	(SN..45..)
C11L-45	L	.984	6	1.260	1.260	75	6	6.299	1.339	.846	SN..43..	(SN..45..)

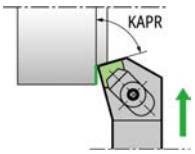
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
SNG 43	CC08M	ASN423x2	BS0835W	M3*12	LW-4	SR08
SNG 45	CC08M	ASN423x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for SNG43.
Clamp screw for C11R/L-33 : BS0829W.

C15





● Diagram shows right-hand tool

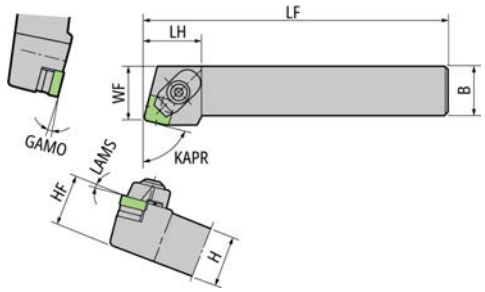
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
C15R-33	R	.748	6	.748	.748	75	6	5.512	1.142	.984	SN..43..	–
C15R-44	R	.984	6	.984	.984	75	6	6.299	1.102	1.220	SN..43..	(SN..45..)
C15R-45	R	.984	6	1.260	1.260	75	6	6.299	1.102	1.220	SN..43..	(SN..45..)
C15L-33	L	.748	6	.748	.748	75	6	5.512	1.142	.984	SN..43..	–
C15L-34	L	.748	6	.984	.984	75	6	6.299	1.142	.984	SN..43..	(SN..45..)
C15L-44	L	.984	6	.984	.984	75	6	6.299	1.102	1.220	SN..43..	(SN..45..)
C15L-45	L	.984	6	1.260	1.260	75	6	6.299	1.102	1.220	SN..43..	(SN..45..)

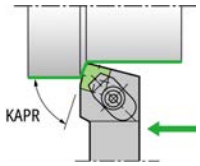
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
SNG 43	CC08M	ASN423x2	BS0835W	M3*12	LW-4	SR08
SNG 45	CC08M	ASN423x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for SNG43.
Clamp screw for C15R/L-33 : BS0829W.

C16





● Diagram shows right-hand tool

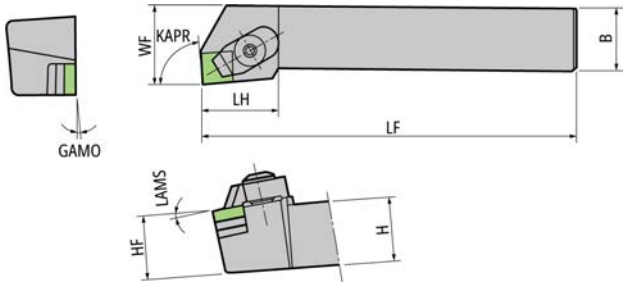
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
C16R-33	R	.748	6	.748	.748	75	6	5.512	1.260	.866	SN..43..	–
C16R-44	R	.984	6	.984	.984	75	6	6.299	.984	.984	SN..43..	(SN..45..)
C16R-45	R	.984	6	1.260	1.260	75	6	6.299	.984	.984	SN..43..	(SN..45..)
C16L-33	L	.748	6	.748	.748	75	6	5.512	1.260	.866	SN..43..	–
C16L-44	L	.984	6	.984	.984	75	6	6.299	.984	.984	SN..43..	(SN..45..)
C16L-45	L	.984	6	1.260	1.260	75	6	6.299	.984	.984	SN..43..	(SN..45..)

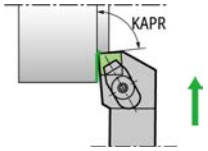
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
SNG 43	CC08M	ASN423x2	BS0835W	M3*12	LW-4	SR08
SNG 45	CC08M	ASN423x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for SNG43.
Clamp screw for C16R/L-33 : BS0829W.

C17





● Diagram shows right-hand tool

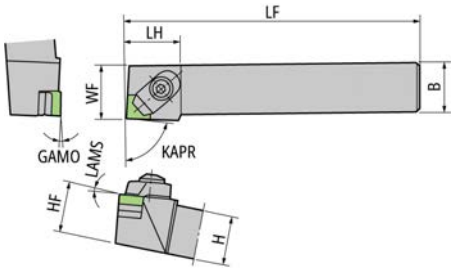
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
C17R-33	R	.748	6	.748	.748	85	6	5.512	1.181	.945	SN..43..	–
C17R-44	R	.984	6	.984	.984	85	6	6.299	1.181	1.181	SN..43..	(SN..45..)
C17R-45	R	.984	6	1.260	1.260	85	6	6.299	1.181	1.181	SN..43..	(SN..45..)
C17L-44	L	.984	6	.984	.984	85	6	6.299	1.181	1.181	SN..43..	(SN..45..)
C17L-45	L	.984	6	1.260	1.260	85	6	6.299	1.181	1.181	SN..43..	(SN..45..)

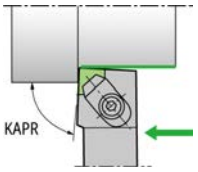
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
SNG 43	CC08M	ASN423x2	BS0835W	M3*12	LW-4	SR08
SNG 45	CC08M	ASN423x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for SNG43.
Clamp screw for C16R/L-33 : BS0829W.

CSHN





● Diagram shows right-hand tool

Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
CSHNR2525M12	R	.984	6	.984	.984	85	6	5.906	1.181	1.063	SN..43..	(SN..45..)
CSHNL2525M12	L	.984	6	.984	.984	85	6	5.906	1.181	1.063	SN..43..	(SN..45..)

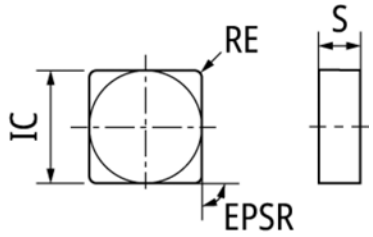
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
SNG 43	CC08M	ASN423x2	BS0835W	M3*12	LW-4	SR08
SNG 45	CC08M	ASN423x1	BS0835W	M3*12	LW-4	SR08

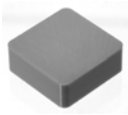
Note: Toolholder body comes with spare parts for SNG43.

SN.. series/Inserts BIDEMICS / Ceramics / NTK CeramiX

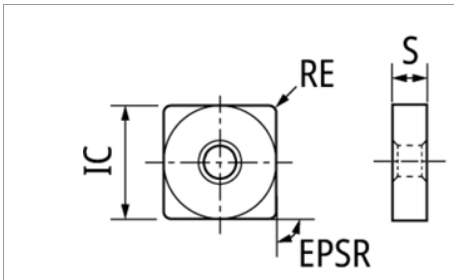
SNGN



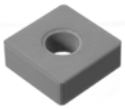
Steel																							
Stainless Steel																							
Cast Iron						●	●	●		●	●							●	●	○	○		
Non-Ferrous Material																							
Heat Resistant Alloy	●	●	●	●											●	●	●	●			●	●	
Hardened Material					●			○	●	○		●	●										
Others (non-metallic)																							

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	SNGN 431 S0825	SNGN 120404 S02025	90	1/2	3/16	.016													●								
	SNGN 431 T0425	SNGN 120404 T01025	90	1/2	3/16	.016								●					●								
	SNGN 432 E02	SNGN 120408 E004	90	1/2	3/16	.031														●			●				
	SNGN 432 S0825	SNGN 120408 S02025	90	1/2	3/16	.031													●								
	SNGN 432 T0220	SNGN 120408 T00520	90	1/2	3/16	.031															●		●	●		●	●
	SNGN 432 T0320	SNGN 120408 T00820	90	1/2	3/16	.031																					●
	SNGN 432 T0420	SNGN 120408 T01020	90	1/2	3/16	.031						●	●	●			●							●	●	●	●
	SNGN 432 T0425	SNGN 120408 T01025	90	1/2	3/16	.031						●		●			●		●							●	●
	SNGN 432 T0820	SNGN 120408 T02020	90	1/2	3/16	.031																		●			
	SNGN 432 T0825	SNGN 120408 T02025	90	1/2	3/16	.031																	●				
	SNGN 432 Z0825	SNGN 120408 Z02025	90	1/2	3/16	.031																					
	SNGN 433 E02	SNGN 120412 E004	90	1/2	3/16	.047														●			●				
	SNGN 433 S0825	SNGN 120412 S02025	90	1/2	3/16	.047													●								
	SNGN 433 T0220	SNGN 120412 T00520	90	1/2	3/16	.047															●		●			●	●
	SNGN 433 T0320	SNGN 120412 T00820	90	1/2	3/16	.047																					●
	SNGN 433 T0420	SNGN 120412 T01020	90	1/2	3/16	.047						●	●	●			●							●	●	●	●
	SNGN 433 T0425	SNGN 120412 T01025	90	1/2	3/16	.047						●		●			●		●							●	●
	SNGN 433 T0820	SNGN 120412 T02020	90	1/2	3/16	.047																		●	●		
	SNGN 433 T0825	SNGN 120412 T02025	90	1/2	3/16	.047																	●				
	SNGN 433 Z0825	SNGN 120412 Z02025	90	1/2	3/16	.047									●												
	SNGN 434 E02	SNGN 120416 E004	90	1/2	3/16	.063														●			●				
	SNGN 434 S0825	SNGN 120416 S02025	90	1/2	3/16	.063													●								
	SNGN 434 T0220	SNGN 120416 T00520	90	1/2	3/16	.063															●		●			●	●
	SNGN 434 T0420	SNGN 120416 T01020	90	1/2	3/16	.063						●	●	●			●							●	●	●	●
	SNGN 434 T0425	SNGN 120416 T01025	90	1/2	3/16	.063						●		●			●		●							●	●
	SNGN 434 T0820	SNGN 120416 T02020	90	1/2	3/16	.063																		●			
	SNGN 434 T0825	SNGN 120416 T02025	90	1/2	3/16	.063																	●				
	SNGN 434 Z0825	SNGN 120416 Z02025	90	1/2	3/16	.063																					
	SNGN 435 T0420	SNGN 120420 T01020	90	1/2	3/16	.079																			●		
	SNGN 435 T0425	SNGN 120420 T01025	90	1/2	3/16	.079								●			●										
	SNGN 435 T0820	SNGN 120420 T02020	90	1/2	3/16	.079																		●			
	SNGN 435 T0825	SNGN 120420 T02025	90	1/2	3/16	.079						●														●	●
	SNGN 436 T0425	SNGN 120424 T01025	90	1/2	3/16	.094								●													
	SNGN 436 T0820	SNGN 120424 T02020	90	1/2	3/16	.094																		●			
	SNGN 452 T0825	SNGN 120708 T02025	90	1/2	5/16	.031						●		●													
	SNGN 453 S0825	SNGN 120712 S02025	90	1/2	5/16	.047								●													
	SNGN 453 T0825	SNGN 120712 T02025	90	1/2	5/16	.047								●													
	SNGN 454 T0825	SNGN 120716 T02025	90	1/2	5/16	.063							●	●													

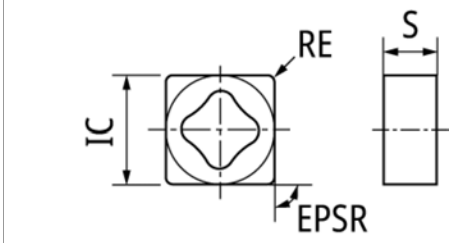
SNGA



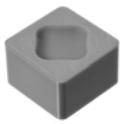
Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

Shape	Item Number (Inch)	Item Number (ISO)	EPSR °	IC inch	S inch	RE inch	BIDEMICS PVD 120	BIDEMICS PVD JP2	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics HC2	Alumina Ceramics PVD ZC4	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics PVD ZC7	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics CVD SP9	Whisker Ceramics WA1	Whisker Ceramics 533
	SNGA 431 T0425	SNGA 120404 T01025	90	1/2	3/16	.016													●								
	SNGA 431 S0825	SNGA 120404 S02025	90	1/2	3/16	.016													●								
	SNGA 432 E02	SNGA 120408 E004	90	1/2	3/16	.031														●			●				
	SNGA 432 S0825	SNGA 120408 S02025	90	1/2	3/16	.031													●								
	SNGA 432 T0420	SNGA 120408 T01020	90	1/2	3/16	.031						●	●	●			●						●		●		
	SNGA 432 T0425	SNGA 120408 T01025	90	1/2	3/16	.031													●								
	SNGA 432 T0820	SNGA 120408 T02020	90	1/2	3/16	.031																		●			
	SNGA 433 E02	SNGA 120412 E004	90	1/2	3/16	.047														●			●				
	SNGA 433 S0825	SNGA 120412 S02025	90	1/2	3/16	.047													●								
	SNGA 433 T0420	SNGA 120412 T01020	90	1/2	3/16	.047						●	●	●			●				●		●		●		
	SNGA 433 T0425	SNGA 120412 T01025	90	1/2	3/16	.047													●								
	SNGA 433 T0820	SNGA 120412 T02020	90	1/2	3/16	.047																		●			
	SNGA 434 E02	SNGA 120416 E004	90	1/2	3/16	.063														●			●				
	SNGA 434 T0420	SNGA 120416 T01020	90	1/2	3/16	.063						●	●	●			●						●		●		
	SNGA 434 T0820	SNGA 120416 T02020	90	1/2	3/16	.063																		●			

SNGX

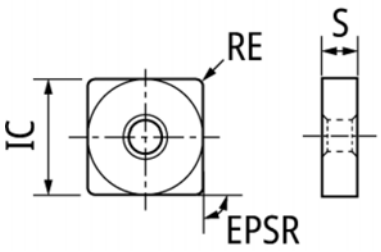


Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

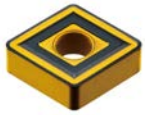
Shape	Item Number (Inch)	Item Number (ISO)	EPSR °	IC inch	S inch	RE inch	BIDEMICS PVD 120	BIDEMICS PVD JP2	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics HC2	Alumina Ceramics PVD ZC4	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics PVD ZC7	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics CVD SP9	Whisker Ceramics WA1	Whisker Ceramics 533
	SNGX 453 T0420	SNGX 120712 T01020	90	1/2	5/16	.047																	●		●		
	SNGX 453 T0820	SNGX 120712 T02020	90	1/2	5/16	.047																		●	●		
	SNGX 453 T0825	SNGX 120712 T02025	90	1/2	5/16	.047																			●		
	SNGX 454 T0420	SNGX 120716 T01020	90	1/2	5/16	.063																	●		●		
	SNGX 454 T0820	SNGX 120716 T02020	90	1/2	5/16	.063																		●	●		
	SNGX 454 T0825	SNGX 120716 T02025	90	1/2	5/16	.063																			●		

SN.. series/Inserts Carbide

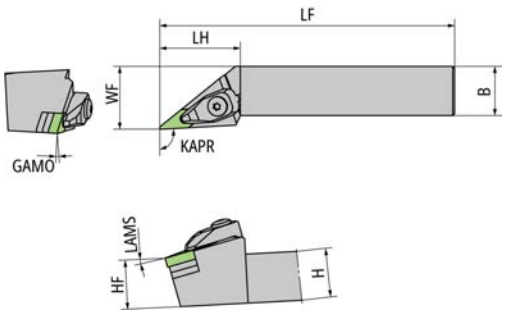
SNMG

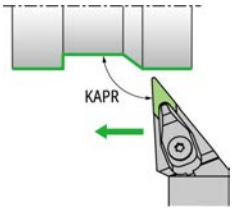


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	RE	Carbide										
							PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(ISO)	°	inch	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	SNMG 432 T0225 Z5	SNMG 120408 T00525 Z5	90	1/2	3/16	.031			●		●						
	SNMG 432 G	SNMG 120408 G	90	1/2	3/16	.031									●		
	SNMG 433 G	SNMG 120412 G	90	1/2	3/16	.047									●		
	SNMG 434 G	SNMG 120416 G	90	1/2	3/16	.063									●		

WVJN/HVJN Multi Clamp Toolholders





● Diagram shows right-hand tool

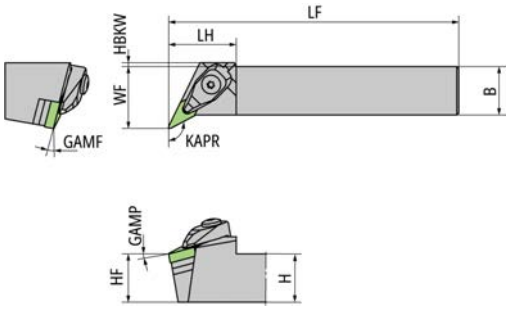
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
WVJNR16-3D	R	1.000	6	1.000	1.000	93	13	6.000	1.610	1.250	VN..33..	(VN..35..)
WVJNR20-3D	R	1.250	6	1.250	1.250	93	13	6.000	1.610	1.500	VN..33..	(VN..35..)
WVJNL16-3D	L	1.000	6	1.000	1.000	93	13	6.000	1.610	1.250	VN..33..	(VN..35..)
WVJNL20-3D	L	1.250	6	1.250	1.250	93	13	6.000	1.610	1.500	VN..33..	(VN..35..)
WVJNR2525M16	R	.984	6	.984	.984	93	13	5.906	1.614	1.260	VN..33..	(VN..35..)
WVJNR3225P16	R	.984	6	1.260	1.260	93	13	6.693	1.614	1.260	VN..33..	(VN..35..)
WVJNL2525M16	L	.984	6	.984	.984	93	13	5.906	1.614	1.260	VN..33..	(VN..35..)
WVJNL3225P16	L	.984	6	1.260	1.260	93	13	6.693	1.614	1.260	VN..33..	(VN..35..)
HVJNR2525M16	R	.984	6	.984	.984	93	13	5.906	1.614	1.260	VNGX35..	–
HVJNR3225P16	R	.984	6	1.260	1.260	93	13	6.693	1.614	1.260	VNGX35..	–
HVJNL2525M16	L	.984	6	.984	.984	93	13	5.906	1.614	1.260	VNGX35..	–
HVJNL3225P16	L	.984	6	1.260	1.260	93	13	6.693	1.614	1.260	VNGX35..	–

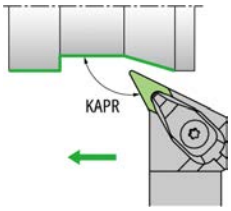
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
VNGA 33	DC6VN	AVN323x2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
VNGA 35	DC6VN	AVN323x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
VNGX 35	HC6VN	AVN323x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D

Note: Toolholder body comes with spare parts for VNGA33.

WVPN/HVPN Multi Clamp Toolholders





● Diagram shows right-hand tool

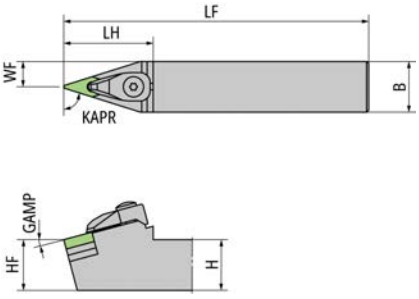
Item Number	Hand	B	GAMF	GAMP	H	HBKW	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	°	°	inch	inch	inch	°	inch	inch	inch		
WVPNR16-3D	R	1.000	10	10	1.000	.079	1.000	117.5	6.000	1.380	1.250	VN..33..	(VN..35..)
WVPNL16-3D	L	1.000	10	10	1.000	.079	1.000	117.5	6.000	1.380	1.250	VN..33..	(VN..35..)
WVPNR2525M16	R	.984	10	10	.984	.079	.984	117.5	5.906	1.378	1.260	VN..33..	(VN..35..)
WVPNL2525M16	L	.984	10	10	.984	.079	.984	117.5	5.906	1.378	1.260	VN..33..	(VN..35..)
HVPNR2525M16	R	.984	10	10	.984	.079	.984	117.5	5.906	1.378	1.260	VNGX35..	–
HVPNL2525M16	L	.984	10	10	.984	.079	.984	117.5	5.906	1.378	1.260	VNGX35..	–

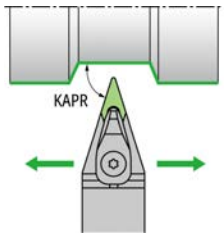
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
VNGA 33	DC6VN	AVN323x2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
VNGA 35	DC6VN	AVN323x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
VNGX 35	HC6VN	AVN323x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D

Note: Toolholder body comes with spare parts for VNGA33.

WVVN/HVVN Multi Clamp Toolholders





Item Number	Hand	B	GAMP	H	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	inch	inch	inch		
WVVNN16-3D	N	1.000	15	1.000	1.000	72.5	6.000	1.730	.500	VN..33..	(VN..35..)
WVVNN2525M16	N	.984	15	.984	.984	72.5	5.906	1.732	.492	VN..33..	(VN..35..)
HVVNN2525M16	N	.984	15	.984	.984	72.5	5.906	1.732	.492	VNGX35..	–

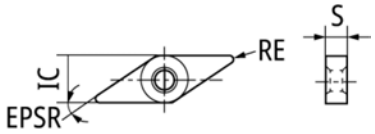
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
VNGA 33	DC6VN	AVN323x2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
VNGA 35	DC6VN	AVN323x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
VNGX 35	HC6VN	AVN323x1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D

Note: Toolholder body comes with spare parts for VNGA33.

VN.. series/Inserts BIDEMICS / Ceramics / NTK CeramiX

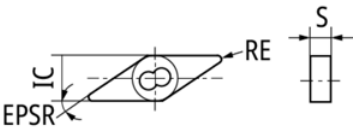
VNGA



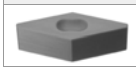
Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

Shape	Item Number (Inch)	Item Number (ISO)	EPSR °	IC inch	S inch	RE inch	BIDEMICS PVD 120	BIDEMICS PVD JP2	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics HC2	Alumina Ceramics PVD ZC4	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics PVD ZC7	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics CVD SP9	Whisker Ceramics WA1	Whisker Ceramics 533
	VNGA 331 BQ E02	VNGA 160404 BQ E004	35	3/8	3/16	.016	●	●																			
	VNGA 331 BQ T0220	VNGA 160404 BQ T00520	35	3/8	3/16	.016		●																			
	VNGA 331 S0825	VNGA 160404 S02025	35	3/8	3/16	.016													●								
	VNGA 331 T0420	VNGA 160404 T01020	35	3/8	3/16	.016						●	●	●			●							●			
	VNGA 331 T0425	VNGA 160404 T01025	35	3/8	3/16	.016								●			●		●								
	VNGA 331 X0415	VNGA 160404 X01015	35	3/8	3/16	.016					●																
	VNGA 331 X0415 -10	VNGA 160404 X01015 -10	35	3/8	3/16	.016					●																
	VNGA 331 Z0825	VNGA 160404 Z02025	35	3/8	3/16	.016									●												
	VNGA 332 BQ E02	VNGA 160408 BQ E004	35	3/8	3/16	.031	●	●																			
	VNGA 332 BQ T0220	VNGA 160408 BQ T00520	35	3/8	3/16	.031		●																			
	VNGA 332 S0825	VNGA 160408 S02025	35	3/8	3/16	.031													●								
	VNGA 332 T0220	VNGA 160408 T00520	35	3/8	3/16	.031															●					●	
	VNGA 332 T0420	VNGA 160408 T01020	35	3/8	3/16	.031						●	●	●			●						●	●	●		
	VNGA 332 T0425	VNGA 160408 T01025	35	3/8	3/16	.031								●			●		●					●			
	VNGA 332 X0415	VNGA 160408 X01015	35	3/8	3/16	.031					●																
	VNGA 332 X0415 -10	VNGA 160408 X01015 -10	35	3/8	3/16	.031					●																
	VNGA 332 Z0825	VNGA 160408 Z02025	35	3/8	3/16	.031									●												
	VNGA 333 BQ T0220	VNGA 160412 BQ T00520	35	3/8	3/16	.047		●																			
	VNGA 333 S0825	VNGA 160412 S02025	35	3/8	3/16	.047													●								
	VNGA 333 T0420	VNGA 160412 T01020	35	3/8	3/16	.047						●	●	●			●						●	●	●		
	VNGA 333 T0425	VNGA 160412 T01025	35	3/8	3/16	.047								●	●	●			●					●			
	VNGA 333 X0415	VNGA 160412 X01015	35	3/8	3/16	.047					●																
	VNGA 333 X0415 -10	VNGA 160412 X01015 -10	35	3/8	3/16	.047					●																
	VNGA 333 Z0825	VNGA 160412 Z02025	35	3/8	3/16	.047									●												

VNGX

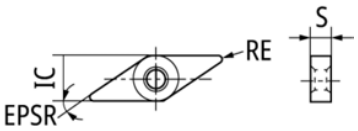


Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

Shape	Item Number (Inch)	Item Number (ISO)	EPSR °	IC inch	S inch	RE inch	BIDEMICS PVD 120	BIDEMICS PVD JP2	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics HC2	Alumina Ceramics PVD ZC4	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics PVD ZC7	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics CVD SP9	Whisker Ceramics WA1	Whisker Ceramics 533
	VNGX 352 T0820	VNGX 160708 T02020	35	3/8	5/16	.031																		●			
	VNGX 353 T0820	VNGX 160712 T02020	35	3/8	5/16	.047																		●			

VN.. series/Inserts Carbide

VN..

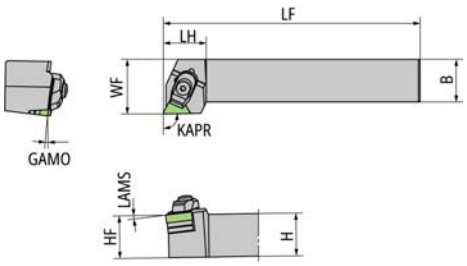


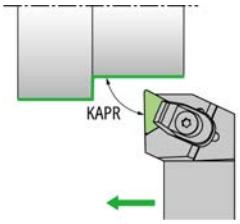
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	RE	Carbide										
							PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(ISO)	°	inch	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	VNGG 3308 FN ZP	VNGG 160402 FN ZP	35	3/8	3/16	.008			●		●						
	VNGG 331 FN ZP	VNGG 160404 FN ZP	35	3/8	3/16	.016			●		●						
	VNGG 332 FN ZP	VNGG 160408 FN ZP	35	3/8	3/16	.031			●		●						
	VNMG 331 G	VNMG 160404 G	35	3/8	3/16	.016									●		
	VNMG 332 G	VNMG 160408 G	35	3/8	3/16	.031									●		
	VNMG 333 G	VNMG 160412 G	35	3/8	3/16	.047									●		
	VNMG 331 T0225 AM1	VNMG 160404 T00525 AM1	35	3/8	3/16	.016			●		●						
	VNMG 332 T0225 AM1	VNMG 160408 T00525 AM1	35	3/8	3/16	.031			●		●						

TN.. series/Toolholders

WTGN/TTGN Multi Clamp Toolholders





● Diagram shows right-hand tool

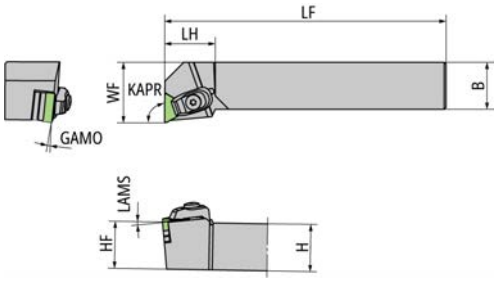
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
WTGNR16-3D	R	1.000	6	1.000	1.000	91	6	6.000	1.000	1.250	TN..33..	(TN..35..)
WTGNL16-3D	L	1.000	6	1.000	1.000	91	6	6.000	1.000	1.250	TN..33..	(TN..35..)
WTGNR2525M16	R	.984	6	.984	.984	91	6	5.906	.984	1.260	TN..33..	(TN..35..)
WTGNL2525M16	L	.984	6	.984	.984	91	6	5.906	.984	1.260	TN..33..	(TN..35..)
TTGNR2525M16	R	.984	6	.984	.984	91	6	5.906	.984	1.260	TN..33..	(TN..35..)
TTGNL2525M16	L	.984	6	.984	.984	91	6	5.906	.984	1.260	TN..33..	(TN..35..)

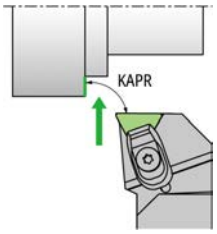
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
TNGA 33	DC5TN	ATN323x2	AOS-5*26W	LLR-T15	FSS15-3.0*12	LLR-T10	ASGL5-D
TNGA 35	DC5TN	ATN323x1	AOS-5*26W	LLR-T15	FSS15-3.0*12	LLR-T10	ASGL5-D
TNG 33	TC5TN	ATN323x2	AOS-5*26W	LLR-T15	FSS15-3.0*12	LLR-T10	ASGL5-D
TNG 35	TC5TN	ATN323x1	AOS-5*26W	LLR-T15	FSS15-3.0*12	LLR-T10	ASGL5-D

Note: Toolholder body comes with spare parts for TNGA33.

WTFN/TTFN Multi Clamp Toolholders





● Diagram shows right-hand tool

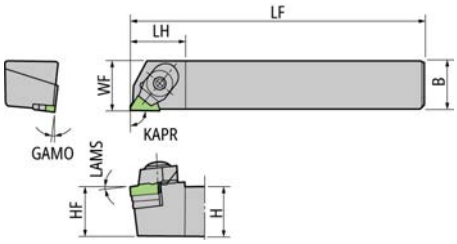
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
WTFNR16-3D	R	1.000	6	1.000	1.000	91	6	6.000	1.060	1.250	TN..33..	(TN..35..)
WTFNL16-3D	L	1.000	6	1.000	1.000	91	6	6.000	1.060	1.250	TN..33..	(TN..35..)
WTFNR2525M16	R	.984	6	.984	.984	91	6	5.906	1.063	1.260	TN..33..	(TN..35..)
WTFNL2525M16	L	.984	6	.984	.984	91	6	5.906	1.063	1.260	TN..33..	(TN..35..)
TTFNR2525M16	R	.984	6	.984	.984	91	6	5.906	1.063	1.260	TN..33..	(TN..35..)
TTFNL2525M16	L	.984	6	.984	.984	91	6	5.906	1.063	1.260	TN..33..	(TN..35..)

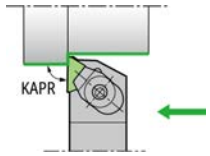
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
TNGA 33	DC5TN	ATN323x2	AOS-5*26W	LLR-T15	FSS15-3.0*12	LLR-T10	ASGL5-D
TNGA 35	DC5TN	ATN323x1	AOS-5*26W	LLR-T15	FSS15-3.0*12	LLR-T10	ASGL5-D
TNG 33	TC5TN	ATN323x2	AOS-5*26W	LLR-T15	FSS15-3.0*12	LLR-T10	ASGL5-D
TNG 35	TC5TN	ATN323x1	AOS-5*26W	LLR-T15	FSS15-3.0*12	LLR-T10	ASGL5-D

Note: Toolholder body comes with spare parts for TNGA33.

C21





● Diagram shows right-hand tool

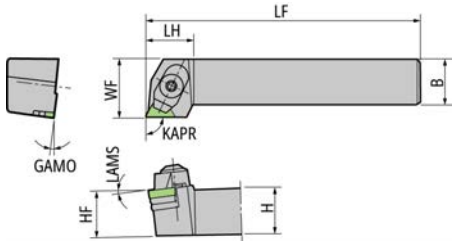
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
C21R-33	R	.748	6	.748	.748	91	6	5.512	1.102	.748	TN..33..	–
C21R-44	R	.984	6	.984	.984	91	6	6.299	1.102	.984	TN..33..	(TN..35..)
C21R-45	R	.984	6	1.260	1.260	91	6	6.299	1.102	.984	TN..33..	(TN..35..)
C21L-34	L	.748	6	.984	.984	91	6	6.299	1.102	.748	TN..33..	(TN..35..)
C21L-44	L	.984	6	.984	.984	91	6	6.299	1.102	.984	TN..33..	(TN..35..)
C21L-45	L	.984	6	1.260	1.260	91	6	6.299	1.102	.984	TN..33..	(TN..35..)

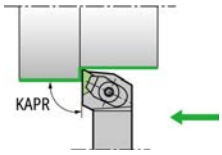
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
TNG 33	CC08MS	ATN323x2	BS0835W	M3*12	LW-4	SR08
TNG 35	CC08MS	ATN323x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for TNG33.
Clamp screw for C21R-33 : BS0829W.

C22





● Diagram shows right-hand tool

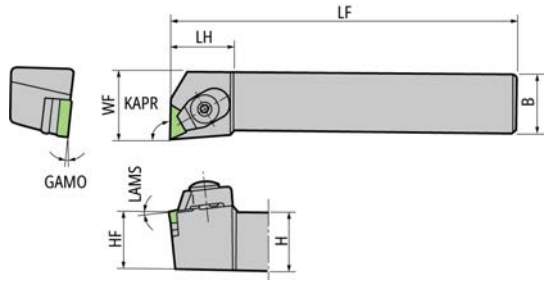
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
C22R-33	R	.748	6	.748	.748	91	6	5.512	.984	.984	TN..33..	–
C22R-34	R	.748	6	.984	.984	91	6	6.299	.984	.984	TN..33..	(TN..35..)
C22R-44	R	.984	6	.984	.984	91	6	6.299	.984	1.181	TN..33..	(TN..35..)
C22R-45	R	.984	6	1.260	1.260	91	6	6.299	.984	1.181	TN..33..	(TN..35..)
C22L-33	L	.748	6	.748	.748	91	6	5.512	.984	.984	TN..33..	–
C22L-44	L	.984	6	.984	.984	91	6	6.299	.984	1.181	TN..33..	(TN..35..)
C22L-45	L	.984	6	1.260	1.260	91	6	6.299	.984	1.181	TN..33..	(TN..35..)

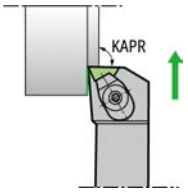
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
TNG 33	CC08MS	ATN323x2	BS0835W	M3*12	LW-4	SR08
TNG 35	CC08MS	ATN323x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for TNG33.
Clamp screw for C22R/L-33 : BS0829W.

C25





● Diagram shows right-hand tool

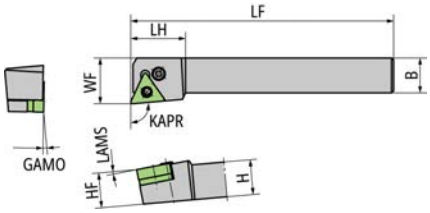
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
C25R-33	R	.748	6	.748	.748	91	6	5.512	.984	.984	TN..33..	–
C25R-34	R	.748	6	.984	.984	91	6	6.299	.984	.984	TN..33..	(TN..35..)
C25R-44	R	.984	6	.984	.984	91	6	6.299	1.102	1.181	TN..33..	(TN..35..)
C25R-45	R	.984	6	1.260	1.260	91	6	6.299	1.102	1.181	TN..33..	(TN..35..)
C25L-33	L	.748	6	.748	.748	91	6	5.512	.984	.984	TN..33..	–
C25L-44	L	.984	6	.984	.984	91	6	6.299	1.102	1.181	TN..33..	(TN..35..)

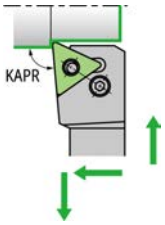
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
TNG 33	CC08MS	ATN323x2	BS0835W	M3*12	LW-4	SR08
TNG 35	CC08MS	ATN323x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for TNG33.
Clamp screw for C25R/L-33 : BS0829W.

PTLN





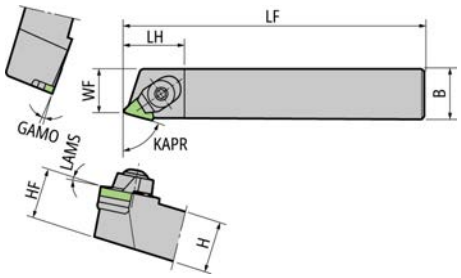
● Diagram shows right-hand tool

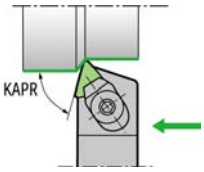
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage
		inch	°	inch	inch	°	°	inch	inch	inch	
PTLNR2020L33	R	.787	6	.787	.787	95	6	5.512	.984	.984	TN..33..
PTLNL2020L33	L	.787	6	.787	.787	95	6	5.512	.984	.984	TN..33..

Spare Parts

Insert	Shim	Clamp screw	Wrench (for Clamp screw)	Clamp Pin	Spring
TNGA 33	LST317	LCS3	LW-2.5	LCL3	LSP3

C23





● Diagram shows right-hand tool

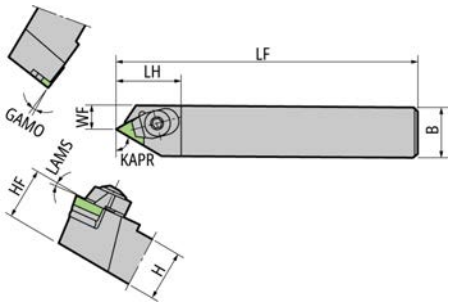
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
C23R-33	R	.748	6	.748	.748	75	6	5.512	1.181	.571	TN..33..	–
C23R-44	R	.984	6	.984	.984	75	6	6.299	1.181	.807	TN..33..	(TN..35..)
C23L-44	L	.984	6	.984	.984	75	6	6.299	1.181	.807	TN..33..	(TN..35..)

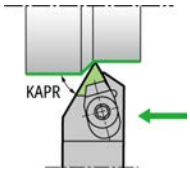
Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
TNG 33	CC08MS	ATN323x2	BS0835W	M3*12	LW-4	SR08
TNG 35	CC08MS	ATN323x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for TNG33.
Clamp screw for C23R-33 : BS0829W.

C24





● Diagram shows right-hand tool

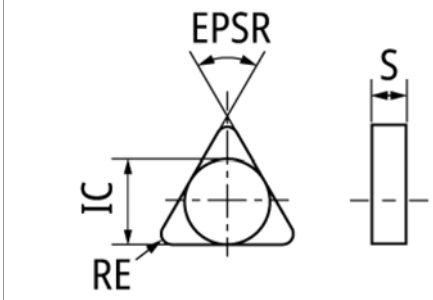
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	°	°	inch	inch	inch		
C24R-34	R	.748	6	.984	.984	60	6	6.299	1.260	.413	TN..33..	(TN..35..)
C24R-44	R	.984	6	.984	.984	60	6	6.299	1.260	.650	TN..33..	(TN..35..)
C24L-44	L	.984	6	.984	.984	60	6	6.299	1.260	.650	TN..33..	(TN..35..)

Spare Parts

Insert	Clamp	Shim	Clamp screw	Shim screw	Wrench (for Clamp screw)	Snap
TNG 33	CC08MS	ATN323x2	BS0835W	M3*12	LW-4	SR08
TNG 35	CC08MS	ATN323x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for TNG33.
Clamp screw for C24R-34 : BS0829W.

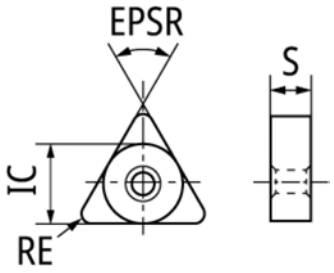
TNGN



Steel																							
Stainless Steel																							
Cast Iron						●	●	●		●	●								●	●	○	○	
Non-Ferrous Material																							
Heat Resistant Alloy	●	●	●	●											●	●	●	●			●	●	
Hardened Material					●			○	●	○		●	●										
Others (non-metallic)																							

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	TNGN 331 S0825	TNGN 160404 S02025	60	3/8	3/16	.016													●								
	TNGN 331 T0425	TNGN 160404 T01025	60	3/8	3/16	.016								●					●								
	TNGN 331 Z0825	TNGN 160404 Z02025	60	3/8	3/16	.016																					
	TNGN 332 S0825	TNGN 160408 S02025	60	3/8	3/16	.031													●								
	TNGN 332 T0320	TNGN 160408 T00820	60	3/8	3/16	.031																					●
	TNGN 332 T0420	TNGN 160408 T01020	60	3/8	3/16	.031						●	●	●			●								●	●	●
	TNGN 332 T0425	TNGN 160408 T01025	60	3/8	3/16	.031						●		●			●		●							●	●
	TNGN 332 T0820	TNGN 160408 T02020	60	3/8	3/16	.031																		●			
	TNGN 332 T0825	TNGN 160408 T02025	60	3/8	3/16	.031																	●				
	TNGN 332 Z0825	TNGN 160408 Z02025	60	3/8	3/16	.031																					
	TNGN 333 S0825	TNGN 160412 S02025	60	3/8	3/16	.047													●								
	TNGN 333 T0320	TNGN 160412 T00820	60	3/8	3/16	.047																					●
	TNGN 333 T0420	TNGN 160412 T01020	60	3/8	3/16	.047						●	●	●			●						●	●	●	●	●
	TNGN 333 T0425	TNGN 160412 T01025	60	3/8	3/16	.047						●		●			●		●							●	●
	TNGN 333 T0820	TNGN 160412 T02020	60	3/8	3/16	.047								●										●			
	TNGN 333 T0825	TNGN 160412 T02025	60	3/8	3/16	.047																	●				
	TNGN 333 Z0825	TNGN 160412 Z02025	60	3/8	3/16	.047																					
	TNGN 334 T0420	TNGN 160416 T01020	60	3/8	3/16	.063						●	●	●			●						●		●		●
	TNGN 334 T0425	TNGN 160416 T01025	60	3/8	3/16	.063						●	●	●													
	TNGN 334 T0820	TNGN 160416 T02020	60	3/8	3/16	.063																		●			
	TNGN 334 T0825	TNGN 160416 T02025	60	3/8	3/16	.063																	●				
	TNGN 335 T0425	TNGN 160420 T01025	60	3/8	3/16	.079						●		●													
	TNGN 335 T0820	TNGN 160420 T02020	60	3/8	3/16	.079																		●			
	TNGN 352 T0825	TNGN 160708 T02025	60	3/8	5/16	.031								●													
	TNGN 353 T0825	TNGN 160712 T02025	60	3/8	5/16	.047								●													

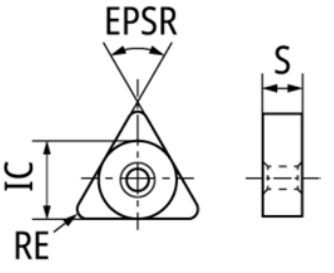
TNGA



Steel																									
Stainless Steel																									
Cast Iron						●	●	●		●	●							●	●	○	○				
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●		
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	TNGA 331 S0825	TNGA 160404 S02025	60	3/8	3/16	.016													●								
	TNGA 331 T0425	TNGA 160404 T01025	60	3/8	3/16	.016								●					●								
	TNGA 331 X0415	TNGA 160404 X01015	60	3/8	3/16	.016					●																
	TNGA 331 X0415 -10	TNGA 160404 X01015 -10	60	3/8	3/16	.016					●																
	TNGA 331 Z0825	TNGA 160404 Z02025	60	3/8	3/16	.016									●												
	TNGA 332 S0825	TNGA 160408 S02025	60	3/8	3/16	.031													●								
	TNGA 332 T0420	TNGA 160408 T01020	60	3/8	3/16	.031						●	●	●			●						●		●		
	TNGA 332 T0425	TNGA 160408 T01025	60	3/8	3/16	.031								●			●		●						●		
	TNGA 332 T0820	TNGA 160408 T02020	60	3/8	3/16	.031																		●			
	TNGA 332 T0825	TNGA 160408 T02025	60	3/8	3/16	.031																	●				
	TNGA 332 X0415	TNGA 160408 X01015	60	3/8	3/16	.031					●																
	TNGA 332 X0415 -10	TNGA 160408 X01015 -10	60	3/8	3/16	.031					●																
	TNGA 332 Z0825	TNGA 160408 Z02025	60	3/8	3/16	.031									●												
	TNGA 333 S0825	TNGA 160412 S02025	60	3/8	3/16	.047													●								
	TNGA 333 T0420	TNGA 160412 T01020	60	3/8	3/16	.047						●	●	●			●						●		●		
	TNGA 333 T0425	TNGA 160412 T01025	60	3/8	3/16	.047								●			●		●						●		
	TNGA 333 T0820	TNGA 160412 T02020	60	3/8	3/16	.047																		●			
	TNGA 333 T0825	TNGA 160412 T02025	60	3/8	3/16	.047																	●				
	TNGA 333 X0415	TNGA 160412 X01015	60	3/8	3/16	.047					●																
	TNGA 333 X0415 -10	TNGA 160412 X01015 -10	60	3/8	3/16	.047					●																
	TNGA 334 T0420	TNGA 160416 T01020	60	3/8	3/16	.063						●	●	●			●						●		●		
	TNGA 334 T0820	TNGA 160416 T02020	60	3/8	3/16	.063																		●			
	TNGA 334 T0825	TNGA 160416 T02025	60	3/8	3/16	.063																	●				

TNGG-AG with chipbreaker

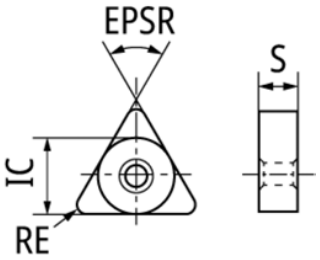


Steel																									
Stainless Steel																									
Cast Iron						●	●	●		●	●							●	●	○	○				
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●		
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	TNGG 332 Z0430 AG	TNGG 160408 Z01030 AG	60	3/8	3/16	.031													●								
	TNGG 333 Z0430 AG	TNGG 160412 Z01030 AG	60	3/8	3/16	.047													●								

TN.. series/Inserts Carbide

TN..

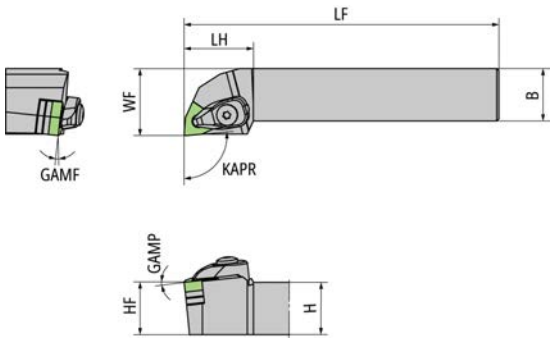


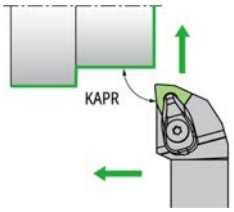
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	RE	Carbide										
							PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(ISO)	°	inch	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	TNGG 3308M R TMV	TNGG 160402M R TMV	60	3/8	3/16	.007	●	●	●			●					
	TNGG 331M R TMV	TNGG 160404M R TMV	60	3/8	3/16	.015	●	●	●			●					
	TNGG 3304M FN UL	TNGG 160401M FN UL	60	3/8	3/16	.003	●	●	●		●	●					
	TNGG 3308M FN UL	TNGG 160402M FN UL	60	3/8	3/16	.007	●	●	●		●	●					
	TNGG 331M FN UL	TNGG 160404M FN UL	60	3/8	3/16	.015	●	●	●		●	●					
	TNGG 332M FN UL	TNGG 160408M FN UL	60	3/8	3/16	.031		●	●		●	●					
	TNGG 3308 FN ZP	TNGG 160402 FN ZP	60	3/8	3/16	.008			●		●	●	●	●			
	TNGG 331 FN ZP	TNGG 160404 FN ZP	60	3/8	3/16	.016			●		●	●	●	●			
	TNGG 332 FN ZP	TNGG 160408 FN ZP	60	3/8	3/16	.031			●		●		●	●			
	TNMG 332 G	TNMG 160408 G	60	3/8	3/16	.031									●		
	TNMG 333 G	TNMG 160412 G	60	3/8	3/16	.047									●		
	TNMG 331 T0225 Z5	TNMG 160404 T00525 Z5	60	3/8	3/16	.016			●		●						
	TNMG 332 T0225 Z5	TNMG 160408 T00525 Z5	60	3/8	3/16	.031			●		●						
	TNEG 3308 FL D1	TNEG 160402 FL D1	60	3/8	3/16	.008						●					
	TNEG 3308 FR D1	TNEG 160402 FR D1	60	3/8	3/16	.008						●					
	TNEG 331 FL D1	TNEG 160404 FL D1	60	3/8	3/16	.016						●					
	TNEG 331 FR D1	TNEG 160404 FR D1	60	3/8	3/16	.016						●					
	TNEG 332 FL D1	TNEG 160408 FL D1	60	3/8	3/16	.031						●					
	TNEG 332 FR D1	TNEG 160408 FR D1	60	3/8	3/16	.031						●					
	TNGG 3304 FR U2	TNGG 160401 FR U2	60	3/8	3/16	.004							●	●			
	TNGG 3308 FL U2	TNGG 160402 FL U2	60	3/8	3/16	.008			●					●			
	TNGG 3308 FR U2	TNGG 160402 FR U2	60	3/8	3/16	.008			●					●			
	TNGG 331 FL U2	TNGG 160404 FL U2	60	3/8	3/16	.016			●					●			
	TNGG 331 FR U2	TNGG 160404 FR U2	60	3/8	3/16	.016			●					●			
	TNGG 332 FL U2	TNGG 160408 FL U2	60	3/8	3/16	.031								●			
	TNGG 332 FR U2	TNGG 160408 FR U2	60	3/8	3/16	.031								●			
	TNGG 3308 FR C	TNGG 160402 FR C	60	3/8	3/16	.008								●			
	TNGG 3304 FR DA	TNGG 160401 FR DA	60	3/8	3/16	.004							●	●			

WN.. series/Toolholders

WWLN Multi Clamp Toolholders





● Diagram shows right-hand tool

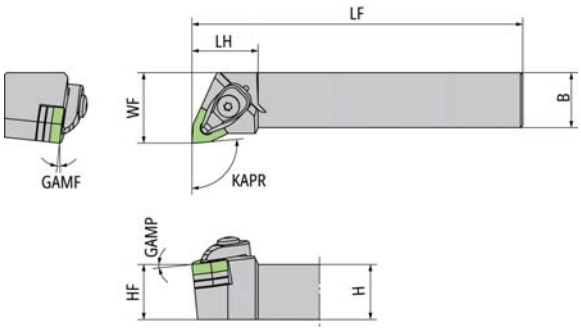
Item Number	Hand	B	GAMF	GAMP	H	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	°	°	inch	inch	°	inch	inch	inch		
WWLNR16-4D	R	1.000	6	6	1.000	1.000	95	6.000	1.300	1.250	WN..43..	(WN..45..)
WWLNL16-4D	L	1.000	6	6	1.000	1.000	95	6.000	1.300	1.250	WN..43..	(WN..45..)
WWLNR2525M08	R	.984	6	6	.984	.984	95	5.906	1.299	1.260	WN..43..	(WN..45..)
WWLNL2525M08	L	.984	6	6	.984	.984	95	5.906	1.299	1.260	WN..43..	(WN..45..)

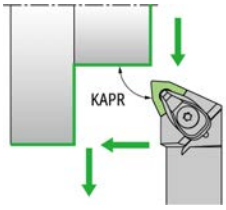
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
WNGA 43	DC6CN	AWN423-Wx2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
WNGA 45	DC6CN	AWN423-Wx1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D

Note: Toolholder body comes with spare parts for WNGA43.

WWLN-2 Multi Clamp Toolholders





● Diagram shows right-hand tool

Item Number	Hand	B	GAMF	GAMP	H	HF	KAPR	LF	LH	WF	Insert Gage	
		inch	°	°	inch	inch	°	inch	inch	inch		
WWLNR16-4D-2	R	1.000	6	6	1.000	1.000	95	6.000	1.180	1.250	WN..43..	(WN..45..)
WWLNL16-4D-2	L	1.000	6	6	1.000	1.000	95	6.000	1.180	1.250	WN..43..	(WN..45..)
WWLNR2525M08-2	R	.984	6	6	.984	.984	95	5.906	1.181	1.260	WN..43..	(WN..45..)
WWLNL2525M08-2	L	.984	6	6	.984	.984	95	5.906	1.181	1.260	WN..43..	(WN..45..)

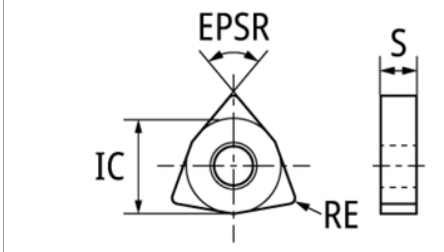
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
WNGA 43	DC6CN	AWN423-Wx2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
WNGA 45	DC6CN	AWN423-Wx1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D

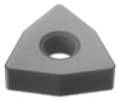
Note: Toolholder body comes with spare parts for WNGA43.

WN.. series/Inserts BIDEMICS / Ceramics / NTK CeramiX

WNGA

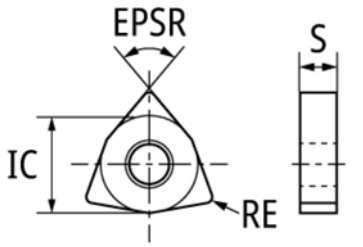


Steel																							
Stainless Steel																							
Cast Iron						●	●	●		●	●								●	●	○	○	
Non-Ferrous Material																							
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●										
Others (non-metallic)																							

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	WNGA 431 S0825	WNGA 080404 S02025	80	1/2	3/16	.016													●								
	WNGA 432 E02	WNGA 080408 E004	80	1/2	3/16	.031														●			●				
	WNGA 432 S0825	WNGA 080408 S02025	80	1/2	3/16	.031													●								
	WNGA 432 T0220	WNGA 080408 T00520	80	1/2	3/16	.031														●	●		●			●	
	WNGA 432 T0420	WNGA 080408 T01020	80	1/2	3/16	.031																	●		●		●
	WNGA 432 T0820	WNGA 080408 T02020	80	1/2	3/16	.031								●										●			
	WNGA 433 E02	WNGA 080412 E004	80	1/2	3/16	.047														●			●				
	WNGA 433 S0825	WNGA 080412 S02025	80	1/2	3/16	.047													●								
	WNGA 433 T0220	WNGA 080412 T00520	80	1/2	3/16	.047														●	●		●			●	
	WNGA 433 T0420	WNGA 080412 T01020	80	1/2	3/16	.047																	●		●		●
	WNGA 433 T0820	WNGA 080412 T02020	80	1/2	3/16	.047								●										●			
	WNGA 434 E02	WNGA 080416 E004	80	1/2	3/16	.063														●			●				
	WNGA 434 T0220	WNGA 080416 T00520	80	1/2	3/16	.063														●			●				
	WNGA 434 T0420	WNGA 080416 T01020	80	1/2	3/16	.063																	●		●		
	WNGA 434 T0820	WNGA 080416 T02020	80	1/2	3/16	.063																		●			

WN.. series/Inserts Carbide

WN..

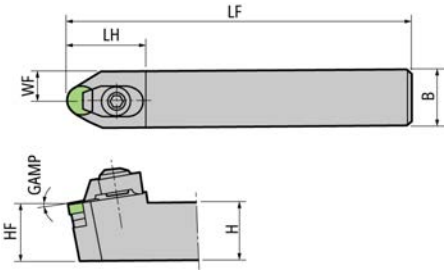


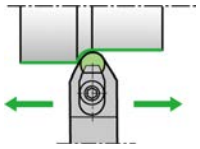
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	RE	Carbide										
							PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(ISO)	°	inch	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	WNGG 431 FN UL	WNGG 080404 FN UL	80	1/2	3/16	.016			●		●	●					
	WNGG 432 FN UL	WNGG 080408 FN UL	80	1/2	3/16	.031			●		●	●					
	WNGG 431 FN ZP	WNGG 080404 FN ZP	80	1/2	3/16	.016			●		●			●			
	WNGG 432 FN ZP	WNGG 080408 FN ZP	80	1/2	3/16	.031			●		●			●			
	WNMG 432 T0225 Z5	WNMG 080408 T00525 Z5	80	1/2	3/16	.031			●		●						
	WNMG 433 T0225 Z5	WNMG 080412 T00525 Z5	80	1/2	3/16	.047			●		●						
	WNMG 432 G	WNMG 080408 G	80	1/2	3/16	.031									●		
	WNMG 433 G	WNMG 080412 G	80	1/2	3/16	.047									●		

RN.. series/Toolholders

CRDN





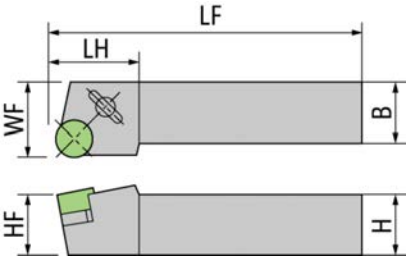
Item Number	Hand	B	GAMP	H	HF	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	inch	inch	inch		
CRDNN2525M12	N	.984	6	.984	.984	5.906	1.339	.492	RN..43..	(RN..45..)
CRDNN3225P12	N	.984	6	1.260	1.260	6.693	1.339	.492	RN..43..	(RN..45..)

Spare Parts

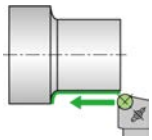
Insert	Clamp	Shim	Clamp screw	Screw (for Shim)	Wrench (for Clamp screw)	Snap
RN.. 43	CC08M	ARN42x2	BS0835W	M3*12	LW-4	SR08
RN.. 45	CC08M	ARN42x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for RN..43.

CRGN-CD



● Diagram shows right-hand tool



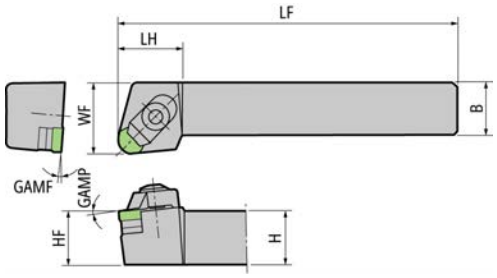
Item Number	Hand	B	H	HF	LF	LH	WF	Insert Gage	
		inch	inch	inch	inch	inch	inch		
CRGNR164CD	R	1.000	1.000	1.000	6.000	1.340	1.250	RN..45..	(RN..43..)
CRGNR204CD	R	1.250	1.250	1.250	6.000	1.340	1.500	RN..45..	(RN..43..)
CRGNR165CD	R	1.000	1.000	1.000	6.000	1.340	1.250	RN..55..	–
CRGNR205CD	R	1.250	1.250	1.250	6.000	1.340	1.500	RN..55..	–
CRGNR206CD	R	1.250	1.250	1.250	6.000	1.650	1.500	RN..65..	–
CRGNL164CD	L	1.000	1.000	1.000	6.000	1.340	1.250	RN..45..	(RN..43..)
CRGNL204CD	L	1.250	1.250	1.250	6.000	1.340	1.500	RN..45..	(RN..43..)
CRGNL165CD	L	1.000	1.000	1.000	6.000	1.340	1.250	RN..55..	–
CRGNL205CD	L	1.250	1.250	1.250	6.000	1.340	1.500	RN..55..	–
CRGNL206CD	L	1.250	1.250	1.250	6.000	1.650	1.500	RN..65..	–

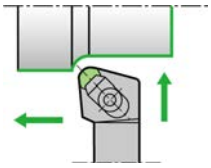
Spare Parts

Insert	Clamp	Blade	Shim	Shim screw	Wrench
RNG 45	2413	9414	IRSN43	1160	LW-4
RNG 43	2413	9414	IRSN45	1160	LW-4
RNG 55	2413	9414	IRSN53	1180	LW-4
RNG 65	2417	9414	3919	1182	LW-4

Note: Toolholder body comes with spare parts for RNG45 and RNG55 and RNG65.

CRGN





● Diagram shows right-hand tool

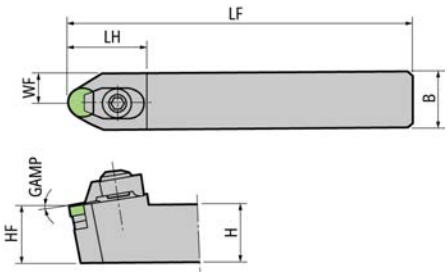
Item Number	Hand	B	GAMF	GAMP	H	HF	LF	LH	WF	Insert Gage	
		inch	°	°	inch	inch	inch	inch	inch		
CRGNR3225P12	R	.984	6	6	1.260	1.260	6.693	1.181	1.260	RN..43..	(RN..45..)

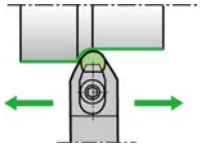
Spare Parts

Insert	Clamp	Shim	Clamp screw	Screw (for Shim)	Wrench (for Clamp screw)	Snap
RN.. 43	CC08M	ARN42x2	BS0835W	M3*12	LW-4	SR08
RN.. 45	CC08M	ARN42x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for RN..43.

C54





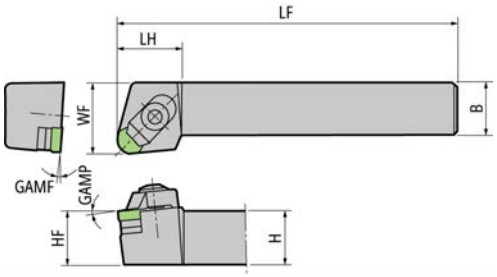
Item Number	Hand	B	GAMP	H	HF	LF	LH	WF	Insert Gage	
		inch	°	inch	inch	inch	inch	inch		
C54M-44	N	.984	8	.984	.984	6.299	1.299	.492	RN..43..	(RN..45..)

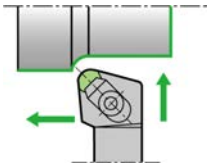
Spare Parts

Insert	Clamp	Shim	Clamp screw	Screw (for Shim)	Wrench (for Clamp screw)	Snap
RN.. 43	CC08M	ARN42x2	BS0835W	M3*12	LW-4	SR08
RN.. 45	CC08M	ARN42x1	BS0835W	M3*12	LW-4	SR08

Note: Toolholder body comes with spare parts for RN..43.

C55





● Diagram shows right-hand tool

Item Number	Hand	B	GAMF	GAMP	H	HF	LF	LH	WF	Insert Gage	
		inch	°	°	inch	inch	inch	inch	inch		
C55R-33	R	.748	6	6	.748	.748	5.512	1.181	1.102	RN..43..	–
C55R-44	R	.984	6	6	.984	.984	6.299	1.181	1.181	RN..43..	(RN..45..)
C55R-45	R	.984	6	6	1.260	1.260	6.299	1.181	1.181	RN..43..	(RN..45..)
C55L-44	L	.984	6	6	.984	.984	6.299	1.181	1.181	RN..43..	(RN..45..)

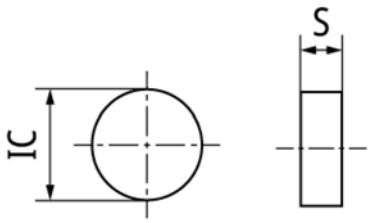
Spare Parts

Insert	Clamp	Shim	Clamp screw	Screw (for Shim)	Wrench (for Clamp screw)	Snap
RN.. 43	CC08M	ARN42x2	BS0835W	M3*12	LW-4	SR08
RN.. 45	CC08M	ARN42x1	BS0835W	M3*12	LW-4	SR08

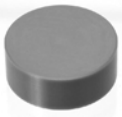
Note: Toolholder body comes with spare parts for RN..43.
Clamp screw for C55R-33 : BS0829W.

RN.. series/Inserts BIDEMICS / Ceramics / NTK CeramiX

RNGN

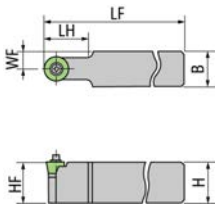


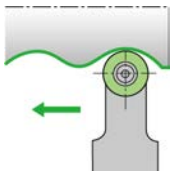
Steel																							
Stainless Steel																							
Cast Iron						●	●	●		●	●						●	●	○	○			
Non-Ferrous Material																							
Heat Resistant Alloy	●	●	●	●											●	●	●	●			●	●	
Hardened Material					●			○	●	○		●	●										
Others (non-metallic)																							

Shape	Item Number		IC	S	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
					PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	RNGN 430 E02	RNGN 120400 E004	1/2	3/16			●	●										●	●	●	●				●
	RNGN 430 S0425	RNGN 120400 S01025	1/2	3/16													●								●
	RNGN 430 S0825	RNGN 120400 S02025	1/2	3/16													●								
	RNGN 430 T0220	RNGN 120400 T00520	1/2	3/16				●										●	●		●			●	●
	RNGN 430 T0225	RNGN 120400 T00525	1/2	3/16																	●			●	●
	RNGN 430 T0320	RNGN 120400 T00820	1/2	3/16																●					●
	RNGN 430 T0420	RNGN 120400 T01020	1/2	3/16			●	●								●		●	●	●	●		●	●	●
	RNGN 430 T0425	RNGN 120400 T01025	1/2	3/16								●			●		●								●
	RNGN 430 T0820	RNGN 120400 T02020	1/2	3/16																		●			
	RNGN 430 T0825	RNGN 120400 T02025	1/2	3/16																	●				
	RNGN 430 Z0825	RNGN 120400 Z02025	1/2	3/16									●			●									
	RNGN 450 E01	RNGN 120700 E002	1/2	5/16																	●			●	
	RNGN 450 E02	RNGN 120700 E004	1/2	5/16			●	●										●	●	●	●				●
	RNGN 450 E03	RNGN 120700 E007	1/2	5/16								●													
	RNGN 450 K7915	RNGN 120700 K20015	1/2	5/16												●									
	RNGN 450 S0425	RNGN 120700 S01025	1/2	5/16													●								●
	RNGN 450 S0825	RNGN 120700 S02025	1/2	5/16													●								
	RNGN 450 T0220	RNGN 120700 T00520	1/2	5/16				●										●	●		●			●	●
	RNGN 450 T0225	RNGN 120700 T00525	1/2	5/16																	●			●	●
	RNGN 450 T0320	RNGN 120700 T00820	1/2	5/16			●	●												●					●
	RNGN 450 T0420	RNGN 120700 T01020	1/2	5/16			●	●								●		●	●		●		●	●	●
	RNGN 450 T0425	RNGN 120700 T01025	1/2	5/16													●								●
	RNGN 450 T0820	RNGN 120700 T02020	1/2	5/16																		●		●	
	RNGN 450 T0825	RNGN 120700 T02025	1/2	5/16								●					●								
	RNGN 450 Z0620	RNGN 120700 Z01520	1/2	5/16																				●	●
	RNGN 450 Z0825	RNGN 120700 Z02025	1/2	5/16									●			●									
	RNGN 450 P8015	RNGN 120700 P20015	1/2	5/16								●		●		●									●

CDH.. series/Toolholders

HRCD





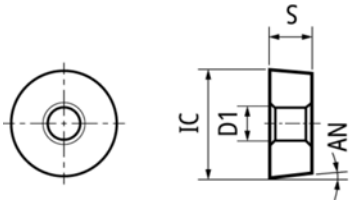
Item Number	Hand	B	H	HF	LF	LH	Insert Gage
		inch	inch	inch	inch	inch	
HRCD-22-IN	N	2.000	2.000	2.000	12.000	1.181	CDH22..
HRCD-33-IN	N	2.000	2.000	2.000	12.000	1.969	CDH33..
HRCD-42-IN	N	2.000	2.000	2.000	12.000	3.150	CDH42..
HRCD-43-IN	N	2.000	2.000	2.000	12.000	3.150	CDH43..
HRCD-53-IN	N	2.000	2.000	2.000	12.000	3.937	CDH53..
HRCD-22	N	1.969	1.969	1.969	11.811	1.181	CDH22..
HRCD-33	N	1.969	1.969	1.969	11.811	1.969	CDH33..

Spare Parts

Insert	Clamp screw	Washer	Shim	Wrench
CDH 22	CS0316	W120	HACDH22	LW-2.5
CDH 33	CS0625	W110	HACDH33	LW-5
CDH 42	1/4-20UNC*1-1/4	W106	HACDH42	LWU-4
CDH 43	1/4-20UNC*1-1/2	W106	HACDH43	LWU-4
CDH 53	3/8-16UNC*1-1/2	W107	HACDH53	LWU-5
CDH 515	3/8-16UNC*1-1/2	W107	HACDH515	LWU-5

CDH.. series/Inserts BIDEMICS / Ceramics / NTK CeramiX

CDH



Steel																									
Stainless Steel																									
Cast Iron							●	●	●		●	●										●	●	○	○
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●													●	●	●	●			●	●	
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

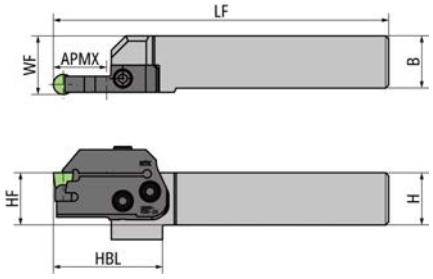
Shape	Item Number		IC	S	AN	D1	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics							Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD							CVD		
	(Inch)	(ISO)	inch	inch	°	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	CDH 22 P2810	**CDH 1207 P07010**	1/2	5/16	6	.125								●		●		●									
	CDH 33 P6010	**CDH 1909 P15010**	3/4	3/8	6	.250								●		●		●									
	CDH 33 P6015	**CDH 1909 P15015**	3/4	3/8	6	.250								●													
	CDH 33 KQ6010	**CDH 1909 KQ15010**	3/4	3/8	6	.250								●													
	CDH 33 Q6010B	**CDH 1909 Q15010B**	3/4	3/8	6	.250										●		●									
	CDH 42 P8015	**CDH 2512 P20015**	1.000	1/2	6	.266								●		●		●									
	CDH 42 P12010	**CDH 2512 P30010G**	1.000	1/2	6	.266								●		●											
	CDH 43 P6010	**CDH 2519 P15015**	1.000	3/4	6	.266								●													
	CDH 515 P7110B	**CDH 3209 P18010B**	1-1/4	3/8	6	.391								●				●									
	CDH 515 P7110	**CDH 3209 P18010**	1-1/4	3/8	6	.391								●													
	CDH 515 P8015	**CDH 3209 P20015**	1-1/4	3/8	6	.391								●		●		●									
	CDH 515 KQ7110	**CDH 3209 KQ18010**	1-1/4	3/8	6	.391								●		●											
	CDH 53 P8015	**CDH 3219 P20015**	1-1/4	3/4	6	.391								●		●		●									
	CDH 53 KQ9515	**CDH 3219 KQ24015**	1-1/4	3/4	6	.391								●		●											

RCGX/RPGX.. series/Toolholders

GROOVE DUO BLADE

Straight style toolholder

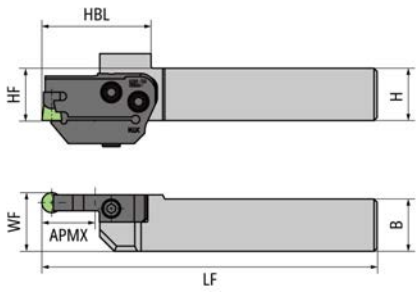
GTWPR



● Diagram shows right-hand tool with right-hand blade

Blade number	Insert	Dimensions(inch)	Holder	Dimensions(inch)					
		APMX		LF	HBL	WF	H	B	HF
GBRR-R23-19	RCGX23 RPGX23	.750	GTWPR16-IN-H	6.200	1.854	1.118	1.000	1.000	1.000
			GTWPR20-IN-H	7.200	-	1.368	1.250	1.250	1.250
			GTWPR2020-H	5.121	2.011	.906	.787	.787	.787
			GTWPR2525-H	6.106	1.854	1.102	.984	.984	.984
			GTWPR3232-H	6.893	-	1.378	1.260	1.260	1.260
GBRR-R35-25	RCGX35 RPGX35 RCGX103	1.000	GTWPR16-IN-H	6.400	2.054	1.118	1.000	1.000	1.000
			GTWPR20-IN-H	7.400	-	1.368	1.250	1.250	1.250
			GTWPR2020-H	5.321	2.211	.906	.787	.787	.787
			GTWPR2525-H	6.306	2.054	1.102	.984	.984	.984
			GTWPR3232-H	7.093	-	1.378	1.260	1.260	1.260
GBRR-R45-28	RCGX45 RPGX45 RCGX104	1.125	GTWPR16-IN-H	6.500	2.154	1.118	1.000	1.000	1.000
			GTWPR20-IN-H	7.500	-	1.368	1.250	1.250	1.250
			GTWPR2020-H	5.421	2.311	.906	.787	.787	.787
			GTWPR2525-H	6.406	2.154	1.102	.984	.984	.984
			GTWPR3232-H	7.193	-	1.378	1.260	1.260	1.260

GTWPL

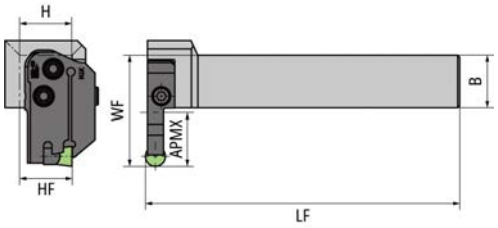


● Diagram shows left-hand tool with left-hand blade

Blade number	Insert	Dimensions(inch)	Holder	Dimensions(inch)					
		APMX		LF	HBL	WF	H	B	HF
GBRL-R23-19	RCGX23 RPGX23	.750	GTWPL16-IN-H	6.200	1.854	1.118	1.000	1.000	1.000
			GTWPL20-IN-H	7.200	-	1.368	1.250	1.250	1.250
			GTWPL2020-H	5.121	2.011	.906	.787	.787	.787
			GTWPL2525-H	6.106	1.854	1.102	.984	.984	.984
			GTWPL3232-H	6.893	-	1.378	1.260	1.260	1.260
GBRL-R35-25	RCGX35 RPGX35 RCGX103	1.000	GTWPL16-IN-H	6.400	2.054	1.118	1.000	1.000	1.000
			GTWPL20-IN-H	7.400	-	1.368	1.250	1.250	1.250
			GTWPL2020-H	5.321	2.211	.906	.787	.787	.787
			GTWPL2525-H	6.306	2.054	1.102	.984	.984	.984
			GTWPL3232-H	7.093	-	1.378	1.260	1.260	1.260
GBRL-R45-28	RCGX45 RPGX45 RCGX104	1.125	GTWPL16-IN-H	6.500	2.154	1.118	1.000	1.000	1.000
			GTWPL20-IN-H	7.500	-	1.368	1.250	1.250	1.250
			GTWPL2020-H	5.421	2.311	.906	.787	.787	.787
			GTWPL2525-H	6.406	2.154	1.102	.984	.984	.984
			GTWPL3232-H	7.193	-	1.378	1.260	1.260	1.260

L-style toolholder

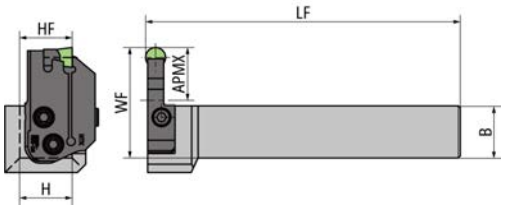
GKWPR



● Diagram shows right-hand tool with left-hand blade

Blade number	Insert	Dimensions(inch)	Holder	Dimensions(inch)					
		APMX		LF	HBL	WF	H	B	HF
GBRL-R23-19	RCGX23 RPGX23	.750	GKWPR16-IN-H	6.200	-	1.118	1.000	1.000	1.000
			GKWPR20-IN-H	7.200	-	1.368	1.250	1.250	1.250
			GKWPR2020-H	4.921	-	1.677	.787	.787	.787
			GKWPR2525-H	5.906	-	1.874	.984	.984	.984
			GKWPR3232-H	6.693	-	2.150	1.260	1.260	1.260
GBRL-R35-25	RCGX35 RPGX35 RCGX103	1.000	GKWPR16-IN-H	6.400	-	1.118	1.000	1.000	1.000
			GKWPR20-IN-H	7.400	-	1.368	1.250	1.250	1.250
			GKWPR2020-H	4.921	-	1.878	.787	.787	.787
			GKWPR2525-H	5.906	-	2.075	.984	.984	.984
			GKWPR3232-H	6.693	-	2.350	1.260	1.260	1.260
GBRL-R45-28	RCGX45 RPGX45 RCGX104	1.125	GKWPR16-IN-H	6.500	-	1.118	1.000	1.000	1.000
			GKWPR20-IN-H	7.500	-	1.368	1.250	1.250	1.250
			GKWPR2020-H	4.921	-	1.976	.787	.787	.787
			GKWPR2525-H	5.906	-	2.173	.984	.984	.984
			GKWPR3232-H	6.693	-	2.449	1.260	1.260	1.260

GKWPL



● Diagram shows left-hand tool with right-hand blade

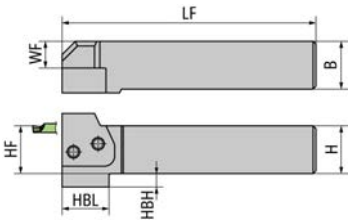
Blade number	Insert	Dimensions(inch)	Holder	Dimensions(inch)					
		APMX		LF	HBL	WF	H	B	HF
GBRR-R23-19	RCGX23 RPGX23	.750	GKWPL16-IN-H	6.200	-	1.118	1.000	1.000	1.000
			GKWPL20-IN-H	7.200	-	1.368	1.250	1.250	1.250
			GKWPL2020-H	4.921	-	1.677	.787	.787	.787
			GKWPL2525-H	5.906	-	1.874	.984	.984	.984
			GKWPL3232-H	6.693	-	2.150	1.260	1.260	1.260
GBRR-R35-25	RCGX35 RPGX35 RCGX103	1.000	GKWPL16-IN-H	6.400	-	1.118	1.000	1.000	1.000
			GKWPL20-IN-H	7.400	-	1.368	1.250	1.250	1.250
			GKWPL2020-H	4.921	-	1.878	.787	.787	.787
			GKWPL2525-H	5.906	-	2.075	.984	.984	.984
			GKWPL3232-H	6.693	-	2.350	1.260	1.260	1.260
GBRR-R45-28	RCGX45 RPGX45 RCGX104	1.125	GKWPL16-IN-H	6.500	-	1.118	1.000	1.000	1.000
			GKWPL20-IN-H	7.500	-	1.368	1.250	1.250	1.250
			GKWPL2020-H	4.921	-	1.976	.787	.787	.787
			GKWPL2525-H	5.906	-	2.173	.984	.984	.984
			GKWPL3232-H	6.693	-	2.449	1.260	1.260	1.260

Spare Parts

Blade Number	Clamp screw
GBRR/L-R23-19	CS0515
GBRR/L-R35-25	CS0515
GBRR/L-R45-28	CS0515

Toolholders

GTWP-H Straight style toolholder



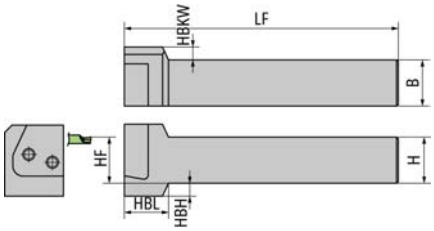
● Diagram shows right-hand tool

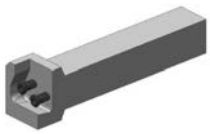
Item Number	Hand	B	H	HBH	HBL	HF	LF	Insert Gage
		inch	inch	inch	inch	inch	inch	
GTWPR16-IN-H	R	1.000	1.000	.260	.965	1.000	5.311	GWPFM../VGW../RCGX../RPGX..
GTWPR20-IN-H	R	1-1/4	1-1/4	–	–	1-1/4	6.311	GWPFM../VGW../RCGX../RPGX..
GTWPL16-IN-H	L	1.000	1.000	.260	.965	1.000	5.311	GWPFM../VGW../RCGX../RPGX..
GTWPL20-IN-H	L	1-1/4	1-1/4	–	–	1-1/4	6.311	GWPFM../VGW../RCGX../RPGX..
GTWPR2020-H	R	.787	.787	.315	1.122	.787	4.232	GWPFM../VGW../RCGX../RPGX..
GTWPR2525-H	R	.984	.984	.276	.965	.984	5.217	GWPFM../VGW../RCGX../RPGX..
GTWPR3232-H	R	1.260	1.260	–	–	1.260	6.004	GWPFM../VGW../RCGX../RPGX..
GTWPL2020-H	L	.787	.787	.315	1.122	.787	4.232	GWPFM../VGW../RCGX../RPGX..
GTWPL2525-H	L	.984	.984	.276	.965	.984	5.217	GWPFM../VGW../RCGX../RPGX..
GTWPL3232-H	L	1.260	1.260	–	–	1.260	6.004	GWPFM../VGW../RCGX../RPGX..

Spare Parts

Item Number	Blade	Mounting screw	Wrench (for Mounting screw)
GTWPR16-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPR20-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPL16-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPL20-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPR2020-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPR2525-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPR3232-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPL2020-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPL2525-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPL3232-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4

GKWP-H L-style toolholder





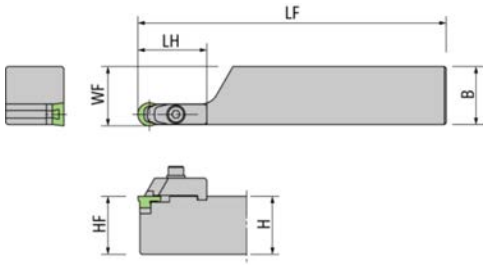
● Diagram shows right-hand tool

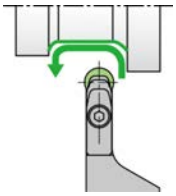
Item Number	Hand	B	H	HBH	HBKW	HBL	HF	LF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	
GKWPR16-IN-H	R	1.000	1.000	.260	.260	.945	1.000	5.961	GWPFM../VGW../RCGX../RPGX..
GKWPR20-IN-H	R	1-1/4	1-1/4	–	–	.945	1-1/4	6.961	GWPFM../VGW../RCGX../RPGX..
GKWPL16-IN-H	L	1.000	1.000	.260	.260	.945	1.000	5.961	GWPFM../VGW../RCGX../RPGX..
GKWPL20-IN-H	L	1-1/4	1-1/4	–	–	.945	1-1/4	6.961	GWPFM../VGW../RCGX../RPGX..
GKWPR2020-H	R	.787	.787	.315	.472	.945	.787	4.882	GWPFM../VGW../RCGX../RPGX..
GKWPR2525-H	R	.984	.984	.276	.276	.945	.984	5.866	GWPFM../VGW../RCGX../RPGX..
GKWPR3232-H	R	1.260	1.260	–	–	–	1.260	6.654	GWPFM../VGW../RCGX../RPGX..
GKWPL2020-H	L	.787	.787	.315	.472	.945	.787	4.882	GWPFM../VGW../RCGX../RPGX..
GKWPL2525-H	L	.984	.984	.276	.276	.945	.984	5.866	GWPFM../VGW../RCGX../RPGX..
GKWPL3232-H	L	1.260	1.260	–	–	–	1.260	6.654	GWPFM../VGW../RCGX../RPGX..

Spare Parts

Item Number	Blade	Mounting screw	Wrench (for Mounting screw)
GKWPR16-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPR20-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPL16-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPL20-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPR2020-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPR2525-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPR3232-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPL2020-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPL2525-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPL3232-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4

VRAO





● Diagram shows right-hand tool

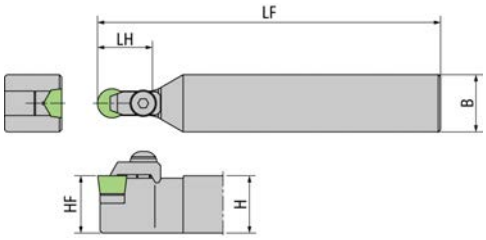
Item Number	Hand	B	H	HF	LF	LH	WF	Insert Gage	
		inch	inch	inch	inch	inch	inch		
VRAOR16-2D	R	1.000	1.000	1.000	6.000	1.000	1.003	RCGX25../RPGX25../RCGX102..	(RCGX23../RPGX23..)
VRAOR20-2D	R	1.250	1.250	1.250	6.000	1.000	1.253	RCGX25../RPGX25../RCGX102..	(RCGX23../RPGX23..)
VRAOR16-3D	R	1.000	1.000	1.000	6.000	1.250	1.025	RCGX35../RPGX35..	–
VRAOR20-3D	R	1.250	1.250	1.250	6.000	1.250	1.275	RCGX35../RPGX35..	–
VRAOR24-3E	R	1.500	1.500	1.500	7.000	1.250	1.525	RCGX35../RPGX35..	–
VRAOR16-4D	R	1.000	1.000	1.000	6.000	1.500	1.028	RCGX45../RPGX45..	–
VRAOR20-4D	R	1.250	1.250	1.250	6.000	1.500	1.278	RCGX45../RPGX45..	–
VRAOR24-4E	R	1.500	1.500	1.500	7.000	1.500	1.528	RCGX45../RPGX45..	–
VRAOL16-2D	L	1.000	1.000	1.000	6.000	1.000	1.003	RCGX25../RPGX25../RCGX102..	(RCGX23../RPGX23..)
VRAOL20-2D	L	1.250	1.250	1.250	6.000	1.000	1.253	RCGX25../RPGX25../RCGX102..	(RCGX23../RPGX23..)
VRAOL16-3D	L	1.000	1.000	1.000	6.000	1.250	1.025	RCGX35../RPGX35..	–
VRAOL20-3D	L	1.250	1.250	1.250	6.000	1.250	1.275	RCGX35../RPGX35..	–
VRAOL24-3E	L	1.500	1.500	1.500	7.000	1.250	1.525	RCGX35../RPGX35..	–
VRAOL16-4D	L	1.000	1.000	1.000	6.000	1.500	1.028	RCGX45../RPGX45..	–
VRAOL20-4D	L	1.250	1.250	1.250	6.000	1.500	1.278	RCGX45../RPGX45..	–
VRAOL24-4E	L	1.500	1.500	1.500	7.000	1.500	1.528	RCGX45../RPGX45..	–

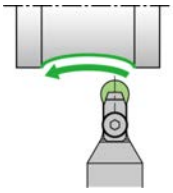
Spare Parts

Item Number	Clamp	Shim	Clamp screw	Screw (for Shim)
VRAOR16-2D	CL2RVRL(comes with screw)	*SM2RV	–	SC02C-08
VRAOR20-2D	CL2RVRL(comes with screw)	*SM2RV	–	SC02C-08
VRAOR16-3D	CL3RV	SM3RV	SC10F-10	SC05C-08
VRAOR20-3D	CL3RV	SM3RV	SC10F-10	SC05C-10
VRAOR24-3E	CL3RV	SM3RV	SC10F-10	SC05C-10
VRAOR16-4D	CL4RV	SM4RV	SC40F-12	SC06C-08
VRAOR20-4D	CL4RV	SM4RV	SC40F-12	SC06C-10
VRAOR24-4E	CL4RV	SM4RV	SC40F-12	SC06C-10
VRAOL16-2D	CL2RVRL(comes with screw)	*SM2RV	–	SC02C-08
VRAOL20-2D	CL2RVRL(comes with screw)	*SM2RV	–	SC02C-08
VRAOL16-3D	CL3RV	SM3RV	SC10F-10	SC05C-08
VRAOL20-3D	CL3RV	SM3RV	SC10F-10	SC05C-10
VRAOL24-3E	CL3RV	SM3RV	SC10F-10	SC05C-10
VRAOL16-4D	CL4RV	SM4RV	SC40F-12	SC06C-08
VRAOL20-4D	CL4RV	SM4RV	SC40F-12	SC06C-10
VRAOL24-4E	CL4RV	SM4RV	SC40F-12	SC06C-10

* : R.GX23 insert the shim is SM2RVS(OP)

VRAON





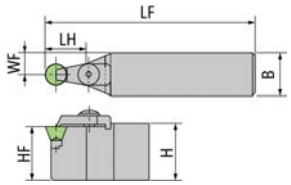
Item Number	Hand	B	H	HF	LF	LH	Insert Gage	
		inch	inch	inch	inch	inch		
VRAON16-2D	N	1.000	1.000	1.000	6.000	1.000	RCGX25../RPGX25../RCGX102..	(RCGX23../RPGX23..)
VRAON20-2D	N	1.250	1.250	1.250	6.000	1.000	RCGX25../RPGX25../RCGX102	(RCGX23../RPGX23..)
VRAON16-3D	N	1.000	1.000	1.000	6.000	1.250	RCGX35../RPGX35..	–
VRAON20-3D	N	1.250	1.250	1.250	6.000	1.250	RCGX35../RPGX35..	–
VRAON24-3E	N	1.500	1.500	1.500	7.000	1.250	RCGX35../RPGX35..	–
VRAON16-4D	N	1.000	1.000	1.000	6.000	1.500	RCGX45../RPGX45..	–
VRAON20-4D	N	1.250	1.250	1.250	6.000	1.500	RCGX45../RPGX45..	–
VRAON24-4E	N	1.500	1.500	1.500	7.000	1.500	RCGX45../RPGX45..	–
VRAON20-5D	N	1.250	1.250	1.250	6.000	1.500	RCGX105..	–
VRAON24-5E	N	1.500	1.500	1.500	7.000	1.500	RCGX105..	–
VRAON20-6F	N	1.250	1.250	1.250	8.000	1.750	RCGX106..	–
VRAON24-6F	N	1.500	1.500	1.500	8.000	1.750	RCGX106..	–
VRAON20-8F	N	1.250	1.250	1.250	8.000	2.000	RCGX108..	–
VRAON24-8F	N	1.500	1.500	1.500	8.000	2.000	RCGX108..	–

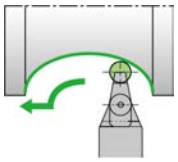
Spare Parts

Item Number	Clamp	Shim	Clamp screw	Screw (for Shim)
VRAON16-2D	CL2RV	*SM2RV	SC40F-16	SC02C-08
VRAON20-2D	CL2RV	*SM2RV	SC40F-16	SC02C-08
VRAON16-3D	CL3RV	SM3RV	SC10F-10	SC05C-08
VRAON20-3D	CL3RV	SM3RV	SC10F-10	SC05C-10
VRAON24-3E	CL3RV	SM3RV	SC10F-10	SC05C-10
VRAON16-4D	CL4RV	SM4RV	SC40F-12	SC06C-08
VRAON20-4D	CL4RV	SM4RV	SC40F-12	SC06C-10
VRAON24-4E	CL4RV	SM4RV	SC40F-12	SC06C-10
VRAON20-5D	CL6RV	SM5RV	SC50F-16	SC08C-10
VRAON24-5E	CL6RV	SM5RV	SC50F-16	SC08C-10
VRAON20-6F	CL6RV	SM6RV	SC50F-16	SC10F-10
VRAON24-6F	CL6RV	SM6RV	SC50F-16	SC10F-10
VRAON20-8F	CL8RV	SM8RV	SC60F-16	SC40C-10
VRAON24-8F	CL8RV	SM8RV	SC60F-16	SC40C-10

* : R.GX23 insert the shim is SM2RVS(OP)

CRDC



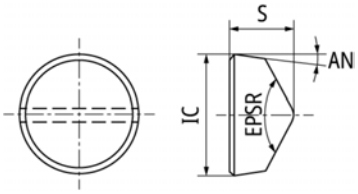


Item Number	Hand	B	H	HF	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	
CRDCN3225P06	N	.984	1.260	1.260	6.693	.787	.492	RCGX25../RPGX25..
CRDCN3225P09	N	.984	1.260	1.260	6.693	.787	.492	RCGX35../RPGX35..
CRDCN3225P12	N	.984	1.260	1.260	6.693	.984	.492	RCGX45../RPGX45..

Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench	Washer	Spring pin
RCGX 25/RPGX 25	HC35KR-4099	HARCGX06	BS0520	LW-3	WS-5	-
RCGX 35/RPGX 35	HC35KR-6075	HARCGX0908V	BS0625	LW-4	WS-6	2*8AW
RCGX 45/RPGX 45	HC35KR-6076	HARCGX1208V	BS0625	LW-4	WS-6	2.5*8AW

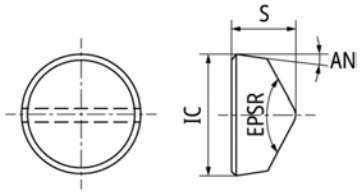
RCGX



Steel																									
Stainless Steel																									
Cast Iron						●	●	●		●	●									●	●	○	○		
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●		
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number		EPSR	IC	S	AN	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	°	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	RCGX 230 E02	RCGX 060400 E004	120	1/4	3/16	7			●	●										●	●	●	●				●
	RCGX 230 T0220	RCGX 060400 T00520	120	1/4	3/16	7				●										●	●		●			●	●
	RCGX 230 T0320	RCGX 060400 T00820	120	1/4	3/16	7			●	●												●					
	RCGX 230 T0420	RCGX 060400 T01020	120	1/4	3/16	7			●	●										●	●	●	●				●
	RCGX 230 T0425	RCGX 060400 T01025	120	1/4	3/16	7								●		●		●									●
	RCGX 230 T0820	RCGX 060400 T02020	120	1/4	3/16	7												●									
	RCGX 230 P2815	RCGX 060400 P07015	120	1/4	3/16	7										●		●									●
	RCGX 350 E02	RCGX 090700 E004	120	3/8	5/16	7			●	●										●	●	●	●				●
	RCGX 350 K7915	RCGX 090700 K20015	120	3/8	5/16	7												●									
	RCGX 350 P2815	RCGX 090700 P07015	120	3/8	5/16	7								●												●	●
	RCGX 350 T0220	RCGX 090700 T00520	120	3/8	5/16	7				●										●	●		●			●	●
	RCGX 350 T0225	RCGX 090700 T00525	120	3/8	5/16	7																	●			●	●
	RCGX 350 T0320	RCGX 090700 T00820	120	3/8	5/16	7			●	●												●				●	●
	RCGX 350 T0420	RCGX 090700 T01020	120	3/8	5/16	7			●	●										●	●	●	●			●	●
	RCGX 350 T0425	RCGX 090700 T01025	120	3/8	5/16	7								●		●		●									●
	RCGX 450 E02	RCGX 120700 E004	120	1/2	5/16	7			●	●										●	●	●	●				●
	RCGX 450 K7915	RCGX 120700 K20015	120	1/2	5/16	7												●									
	RCGX 450 T0220	RCGX 120700 T00520	120	1/2	5/16	7				●										●	●		●			●	●
	RCGX 450 T0225	RCGX 120700 T00525	120	1/2	5/16	7																	●				
	RCGX 450 T0320	RCGX 120700 T00820	120	1/2	5/16	7			●	●												●				●	●
	RCGX 450 T0420	RCGX 120700 T01020	120	1/2	5/16	7			●	●										●	●		●			●	●
	RCGX 450 T0425	RCGX 120700 T01025	120	1/2	5/16	7								●		●		●									●
	RCGX 450 P6015	RCGX 120700 P15015	120	1/2	5/16	7								●												●	
	RCGX 450 P8015	RCGX 120700 P20015	120	1/2	5/16	7								●		●		●									●
	RCGX 450 Z0620	RCGX 120700 Z01520	120	1/2	5/16	7																				●	●

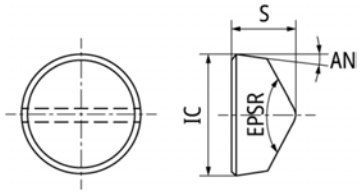
RCGX10



Steel																									
Stainless Steel																									
Cast Iron						●	●	●		●	●							●	●	○	○
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number		EPSR	IC	S	AN	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	°	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	RCGX 102 P4815	RCGX 102 P12015	120	1/4	.309	7								●		●		●									
	RCGX 102 T0225	RCGX 102 T00525	120	1/4	.309	7																	●				
	RCGX 102 T0820	RCGX 102 T02020	120	1/4	.309	7								●													
	RCGX 103 P4815	RCGX 103 P12015	120	3/8	.309	7								●		●		●									
	RCGX 103 P8015	RCGX 103 P20015	120	3/8	.309	7										●		●									
	RCGX 103 T0820	RCGX 103 T02020	120	3/8	.309	7								●													
	RCGX 103 T0825	RCGX 103 T02025	120	3/8	.309	7									●												
	RCGX 103 T1625	RCGX 103 T04025	120	3/8	.309	7									●												
	RCGX 104 P6015	RCGX 104 P15015	120	1/2	5/16	7								●		●		●									
	RCGX 104 P8015	RCGX 104 P20015	120	1/2	5/16	7										●		●									
	RCGX 104 T0820	RCGX 104 T02020	120	1/2	5/16	7								●													
	RCGX 104 T1625	RCGX 104 T04025	120	1/2	5/16	7									●												
	RCGX 105 P4815	RCGX 105 P12015	120	5/8	.388	7								●		●											
	RCGX 105 P8015	RCGX 105 P20015	120	5/8	.388	7										●		●									
	RCGX 105 S8020	RCGX 105 S20020	120	5/8	.388	7								●	●			●									
	RCGX 106 P4815	RCGX 106 P12015	120	3/4	.388	7								●													
	RCGX 106 P8015	RCGX 106 P20015	120	3/4	.388	7								●		●		●									
	RCGX 108 P8015	RCGX 108 P20015	120	1.000	.461	7								●													

RPGX

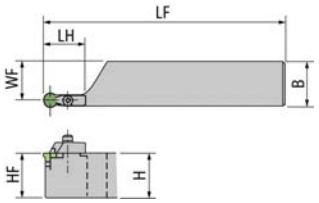


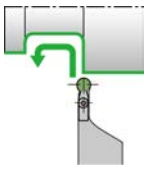
Steel																									
Stainless Steel																									
Cast Iron						●	●	●		●	●							●	●	○	○
Non-Ferrous Material																									
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●												
Others (non-metallic)																									

Shape	Item Number		EPSR	IC	S	AN	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	°	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	RPGX 230 T0220	RPGX 060400 T00520	120	1/4	3/16	11				●										●	●					●	●
	RPGX 350 E02	RPGX 090700 E004	120	3/8	5/16	11			●	●										●	●	●	●				●
	RPGX 350 T0220	RPGX 090700 T00520	120	3/8	5/16	11				●										●	●		●			●	●
	RPGX 350 T0320	RPGX 090700 T00820	120	3/8	5/16	11			●	●												●					●
	RPGX 350 T0225	RPGX 090800 T00525	120	3/8	.309	11																	●				
	RPGX 450 E02	RPGX 120700 E004	120	1/2	5/16	11			●	●										●	●	●	●				●
	RPGX 450 T0220	RPGX 120700 T00520	120	1/2	5/16	11				●										●	●		●			●	●
	RPGX 450 T0225	RPGX 120700 T00525	120	1/2	5/16	11																	●				
	RPGX 450 T0320	RPGX 120700 T00820	120	1/2	5/16	11			●	●												●					●
	RPGX 450 T0420	RPGX 120700 T01020	120	1/2	5/16	11			●	●										●	●	●	●			●	●

RCGY.. series/Toolholders

CRXC





● Diagram shows right-hand tool

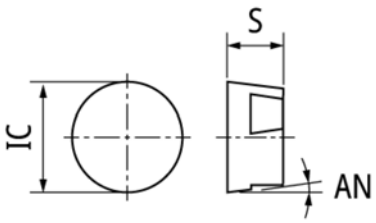
Item Number	Hand	B	H	HF	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	
CRXCR3232P09Y	R	1.260	1.260	1.260	6.693	1.102	1.287	RCGY34..
CRXCR3232P12Y	R	1.260	1.260	1.260	6.693	1.496	1.287	RCGY44..

Spare Parts

Insert	Clamp	Shim	Clamp screw	Screw (for Shim)	Wrench (for Clamp screw)	Spring	Washer
RCGY 34	CRN4	HAR09Y	CS0425	M2*8	LW-3	ASGL4	WS-4
RCGY 44	CRN5	HAR12Y	CS0525	M3*8	LW-4	ASGL5	WS-5

RCGY.. series/Inserts BIDEMICS / Ceramics

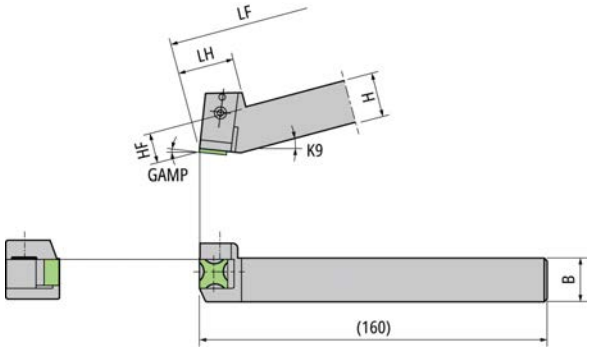
RCGY

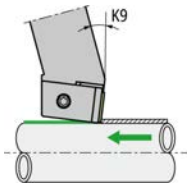


Steel																						
Stainless Steel																						
Cast Iron						●	●	●		●	●						●	●	○	○		
Non-Ferrous Material																						
Heat Resistant Alloy	●	●	●	●										●	●	●	●		●	●		
Hardened Material					●			○	●	○		●	●									
Others (non-metallic)																						

Shape	Item Number		IC	S	AN	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
						PVD	PVD			PVD				PVD				PVD							CVD		
	(Inch)	(ISO)	inch	inch	°	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	RCGY 34 T0225	**RCGY 090603 T00525**	3/8	1/4	7																				●	●
	RCGY 44 T0225	**RCGY 120603 T00525**	1/2	1/4	7																				●	●

HN..ATS





● Diagram shows left-hand(60) tool

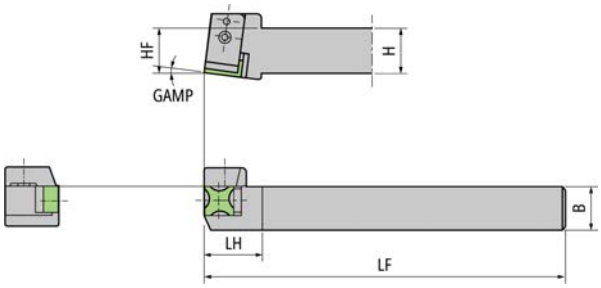
Item Number	Hand	B	GAMP	H	HF	K9	LF	LH	Insert Gage
		inch	°	inch	inch	°	inch	inch	
HN59ATS-33E	R	.748	7	.748	.492	15	6.299	1.024	TSN45..
HN59ATS-44E	R	.984	7	.984	.728	15	6.299	1.024	TSN45..
HN59ATS-44E-5	R	.984	7	.984	.728	15	6.299	1.024	TSN55..
HN60ATS-33E	L	.748	7	.748	.492	15	6.299	1.024	TSN45..
HN60ATS-44E	L	.984	7	.984	.728	15	6.299	1.024	TSN45..
HN60ATS-44E-5	L	.984	7	.984	.728	15	6.299	1.024	TSN55..

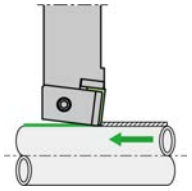
Spare Parts

Insert	Clamp	Shim	Shim	Clamp screw	Shim Screw	Shim Screw	Wrench (for Clamp screw)
TSN 45	HC59TS-4	ASN423	AZT659D	WS0620	M3*5.5	M3*8	LW-3
TSN 55	HC59TS-4	ASN522	HAZT1255A	WS0620	M3*8	M4*5.5	LW-3

Note: Toolholder body comes with Clamp for HN60ATS.. : HC60TS-4.

HN..BTS





● Diagram shows left-hand(60) tool

Item Number	Hand	B	GAMP	H	HF	LF	LH	Insert Gage
		inch	°	inch	inch	inch	inch	
HN59BTS-44E	R	.984	7	.984	.984	6.299	.984	TSN45..
HN59BTS-44E-5	R	.984	7	.984	.984	6.299	.984	TSN55..
HN60BTS-33E	L	.748	7	.748	.748	6.299	.984	TSN45..
HN60BTS-44E	L	.984	7	.984	.984	6.299	.984	TSN45..
HN60BTS-44E-5	L	.984	7	.984	.984	6.299	.984	TSN55..

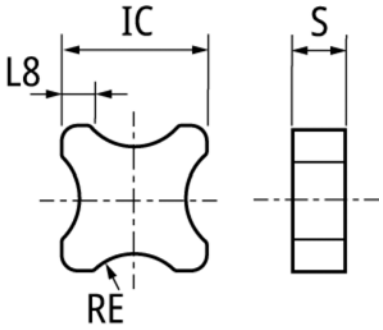
Spare Parts

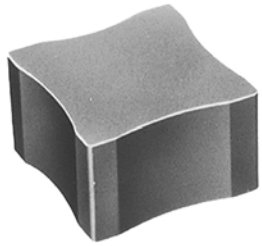
Insert	Clamp	Shim	Shim	Clamp screw	Shim Screw	Shim Screw	Wrench (for Clamp screw)
TSN 45	HC59TS-4	ASN423	AZT659D	WS0620	M3*5.5	M3*8	LW-3
TSN 55	HC59TS-4	ASN522	HAZT1255A	WS0620	M3*8	M4*5.5	LW-3

Note: Toolholder body comes with Clamp for HN60BTS.. : HC60TS-4.

TSN.. series/Inserts Ceramics For Tube scarfing

TSN





Item Number		IC	RE	S	L8	Alumina Ceramics	
(Inch)	(ISO)	inch	inch	inch	inch	CX3	HC1
TSN 45-10	TSN 1207-10	1/2	.394	5/16	.083	■	●
TSN 45-12	TSN 1207-12	1/2	.472	5/16	.083	■	●
TSN 45-14	TSN 1207-14	1/2	.551	5/16	.083	■	●
TSN 45-16	TSN 1207-16	1/2	.630	5/16	.083	■	●
TSN 45-18	TSN 1207-18	1/2	.709	5/16	.083	■	●
TSN 45-20	TSN 1207-20	1/2	.787	5/16	.083	■	●
TSN 45-25	TSN 1207-25	1/2	.984	5/16	.083	■	●
TSN 45-30	TSN 1207-30	1/2	1.181	5/16	.083	■	●
TSN 45-35	TSN 1207-35	1/2	1.378	5/16	.083	■	●
TSN 45-40	TSN 1207-40	1/2	1.772	5/16	.083	■	●
TSN 45-50	TSN 1207-50	1/2	1.969	5/16	.083	■	●
TSN 55-20	TSN 1507-20	5/8	.787	5/16	.126	■	●
TSN 55-25	TSN 1507-25	5/8	.984	5/16	.126	■	●
TSN 55-30	TSN 1507-30	5/8	1.181	5/16	.126	■	●
TSN 55-35	TSN 1507-35	5/8	1.378	5/16	.126	■	●
TSN 55-40	TSN 1507-40	5/8	1.575	5/16	.126	■	●
TSN 55-45	TSN 1507-45	5/8	1.772	5/16	.126	■	●

Grooving / Side-Turning

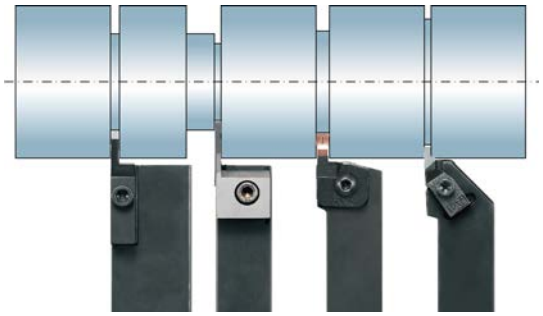
Product Lines F02
Recommended Cutting Conditions F03
General Information F04
OD Grooving F05
- VDB.. series F05
- GKN/GKP//RKN.. series F07
- GTMT/GTMA.. series F09
- GWPG(M).. series F12
- VGW.. series F15
- GEV/GTV.. series F23

ID Grooving F26
- GEV.. series F26

Face Grooving F27
- VDB.. series F27
- VGW.. series F29
- GWPFM.. series F37
- GFV.. series F48

POLY-V Grooving F50
- PTM.. series F50

Product Lines

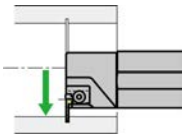


OD Grooving

Insert	GWPG / GWPM →F14		GTMA43 / GTMT43 →F11		GTV/GEV →F25	
	GTWP	GKWP	NGTN(B)	NGTA	GTV	GKV
Holder	→F12	→F13	→F9	→F10	→F23	→F24
Blade width	.118"-.236"	.118"-.236"	.057"-.217"		.118"-.315"	.118"-.315"
Depth of cut	-.984"	-.472"	-.177"		-.433"	-.433"

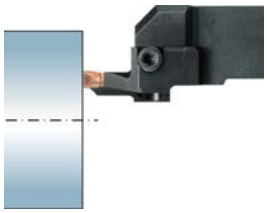
Insert	VGW / VGW..R →F21		VDB/VDB..R →F6	GKN/GKP/RKN →F8	PTM.. →F50
	GBV-GT	GBV-GK	DB1	NS	POLY-V
Holder	→F15	→F17	→F5	→F7	→F50
Blade width	.125"-.375"	.125"-.375"	.125"-.375"	.031"-.189"	
Depth of cut	-1.122"	-1.122"	.750"	.210"	

ID Grooving



Insert	GEV →F26
	GKV
Holder	→F26
Blade width	.118"-.138"
Depth of cut	-.374"
Min bore Dia.	-2.165"

Face Grooving



Insert	VGW →F35		VDB →F28	GWPFM →F47		GFV →F49	
	GBI/O-GT	GBI/O-GK	DB7	GTWP-H	GKWP-H	GFV	GSV
Holder	→F29,F31	→F30,F32	→F27	→F37	→F41	→F48	→F48
Blade width	.125"-.250"		.156"-.250"	.118"-.236"		.236"	
Depth of cut	-.600"		-.750"	-.591"		.236"	
Min bore Dia.	4"		3"	1.142"		1.496"	

Recommended Cutting Conditions

GTMT / GTMA

Work Material		High Temperature Alloys	Titanium Alloys	Cobalt Chrome Alloys	Stainless Steels			Alloy Steels	Carbon Steels
					Hard to cut		Free cutting		
Common Name		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	304	316 17-4PH	303 430F	5120 4137	1045 1046
Grade	1st choice	DM4 / DT4			ST4 DM4	DM4 DT4	TM4	QM3	
	2nd choice	TM4 / QM3			QM3 / VM1		QM3	TM4 / DM4 / DT4	
Cutting Speed (SFM)		75 125 225	100 200 275		130 230 330		150 300 600	150 300 500	
Feed Rate (IPR) A. Grooving B. Side turning*	Width .010-.020	A. .0002 - .0012							
		B. .0001 - .0002							
	.020-.040	A. .0008 - .0024							A. .0008 - .0028
		B. .0002 - .0004							B. .0002 - .0004
	.040-.080	A. .0012 - .0028							A. .0012 - .0031
		B. .0008 - .0020							B. .0012 - .0024
	> .080	A. .0012 - .0079							
		B. .0012 - .0024							

※When side turning, Max. DOC is under
- MAX .008" CSV/GTPS
- MAX .079" GTMH/GTMX/GTMT/GTMA
- MAX .004" SBG/GTG

Under .016" width - side turning impossible.

GWPG / GWPM / GTV / GEV / GFV

Work Material		High Temperature Alloys	Titanium Alloys	Cobalt Chrome Alloys	Stainless Steels		Alloy Steels	Carbon Steels
					Hard to cut	Free cutting		
Common Name		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	304 316 17-4PH	303 430F	5120 4137	1045 1046
Grade	1st choice	QM3						
	2nd choice							
Cutting Speed (SFM)		75 125 225	100 200 275		130 230 330	150 300 600	150 300 500	
Feed Rate (IPR) A. Grooving B. Side turning*	Width .118-.157	A. .0020 - .0059						
	.157-.197	A. .0039 - .0079					A. .0039 - .0098	
							B. .0059 - .0118	
	> .197	A. .0059 - .0138						

*Max DOC when side turning
Groove width x .020"

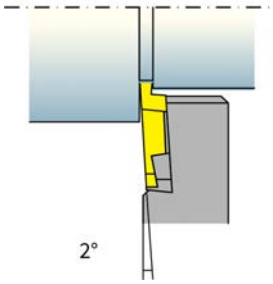
GWPFM

Work Material		High Temperature Alloys	Titanium Alloys	Cobalt Chrome Alloys	Stainless Steels		Alloy Steels	Carbon Steels
					Hard to cut	Free cutting		
Common Name		Inconel Hastelloy MP35N	Ti-6Al-4V	ASTM F-75	304 316 17-4PH	303 430F	5120 4137	1045 1046
Grade	1st choice	**DM4**						
	2nd choice							
Cutting Speed (SFM)		75 125 225	100 200 275		130 230 330	150 300 600	150 300 500	
Feed Rate (IPR)		.002 .004 .008			.003 .004 .008	.002 .004 .008	.003 .004 .008	

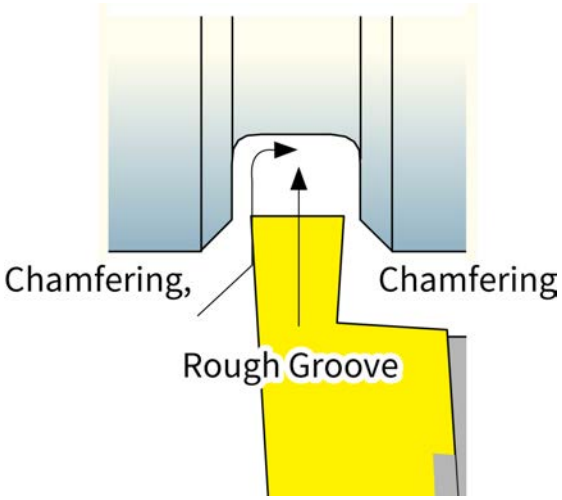
●No step feed

※When side turning, Max. DOC
Roughing .008" - .020"
Finishing .039" - .118"

General Information



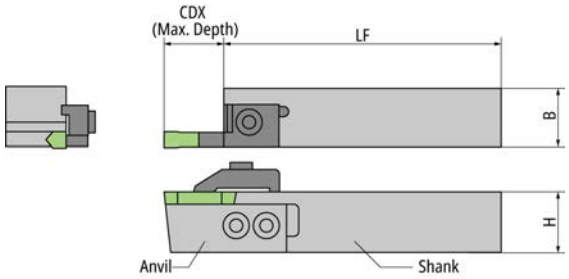
GTMT / GTMH series can be used for uneven diameter grooving thanks to the 2 degree mounting angle designed on the toolholder

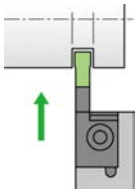


Chamfering and radius machining can be done after the rough grooving process at the center of the groove

OD Grooving
VDB.. series/Toolholder

DB1





● Diagram shows right-hand tool

Item Number	Hand	B	CDX	H	LF	Insert Gage
		inch	inch	inch	inch	
DB1-1-16R	R	1.000	.750	1.000	6.000	VDB../VDB..R..
DB1-1-20R	R	1.250	.750	1.250	7.000	VDB../VDB..R..
DB1-1-16L	L	1.000	.750	1.000	6.000	VDB../VDB..R..
DB1-1-20L	L	1.250	.750	1.250	7.000	VDB../VDB..R..

Spare Parts

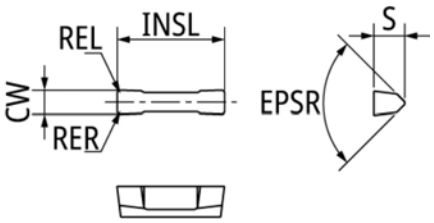
Insert	DB-1-16R		DB-1-16L		Anvil screw	Clamp screw
	Anvil	Clamp	Anvil	Clamp		
VDB125	R1E04	CR1-1-E04	L1E04	CL1-1-E04	DAS41	SC40F10
VDB156	R1E05	CR1-1-E06	L1E05	CL1-1-E06		
VDB188/VDB218	R1E06	CR1-1-E06	L1E06	CL1-1-E06		
VDB250	R1E07	CR1-1-E07	L1E07	CL1-1-E07		
VDB281/VDB312	R1E09	CR1-1-E09	L1E09	CL1-1-E09		
VDB344/VDB375	R1E11	CR1-1-E11	L1E11	CL1-1-E11		

Insert	DB-1-20R		DB-1-20L		Anvil screw	Clamp screw
	Anvil	Clamp	Anvil	Clamp		
VDB125	R2E04	CR1-1-E04	L2E04	CL1-1-E04	DAS41	SC40F10
VDB156	R2E05	CR1-1-E06	L2E05	CL1-1-E06		
VDB188/VDB218	R2E06	CR1-1-E06	L2E06	CL1-1-E06		
VDB250	R2E07	CR1-1-E07	L2E07	CL1-1-E07		
VDB281/VDB312	R2E09	CR1-1-E09	L2E09	CL1-1-E09		
VDB344/VDB375	R2E11	CR1-1-E11	L2E11	CL1-1-E11		

Note: Toolholder body comes with anvil screw and clamp screw. Anvils and Clamps are sold separately.

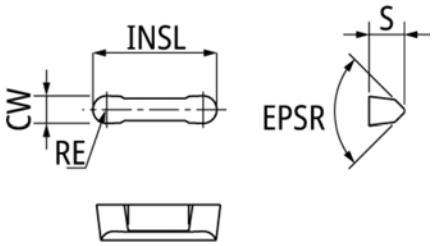
Face Grooving
VDB.. series/Inserts Ceramics

VDB



Item Number	CW	EPSR	INSL	REL	RER	S	SiAlON		Whisker	Alumina-TiC
	inch	°	inch	inch	inch	inch	SX9	SX5	WA1	HC2
VDB 125 A015 T00525	.125	90	1.125	.015	.015	1/4				●
VDB 156 A015 T00525	.156	90	1.125	.015	.015	1/4				●
VDB 188 A015 T00525	.188	90	1.125	.015	.015	1/4				●
VDB 218 A015 T00525	.218	90	1.125	.015	.015	1/4				●
VDB 250 B015 T00525	.250	90	1.125	.015	.015	.337				●
VDB 250 B031 T00520	.250	90	1.125	.031	.031	.337	●	●	●	
VDB 250 B062 T00520	.250	90	1.125	.062	.062	.337	●			
VDB 281 B015 T00525	.281	90	1.125	.015	.015	.337				●
VDB 312 B015 T00525	.312	90	1.125	.015	.015	.337				●
VDB 312 B031 EX0001	.312	90	1.125	.031	.031	.337			●	
VDB 312 B031 T00520	.312	90	1.125	.031	.031	.337		●		
VDB 312 B062 EX0001	.312	90	1.125	.062	.062	.337			●	
VDB 312 B062 T00520	.312	90	1.125	.062	.062	.337		●		
VDB 344 B015 T00525	.344	90	1.125	.015	.015	.337				●
VDB 375 B015 T00525	.375	90	1.125	.015	.015	.337				●
VDB 375 B031 EX0001	.375	90	1.125	.031	.031	.337			●	
VDB 375 B031 T00520	.375	90	1.125	.031	.031	.337		●		
VDB 375 B046 E004	.375	90	1.125	.046	.046	.337	●			
VDB 375 B046 T00520	.375	90	1.125	.046	.046	.337	●			
VDB 375 B062 E004	.375	90	1.125	.062	.062	.337	●			
VDB 375 B062 T00520	.375	90	1.125	.062	.062	.337	●	●		

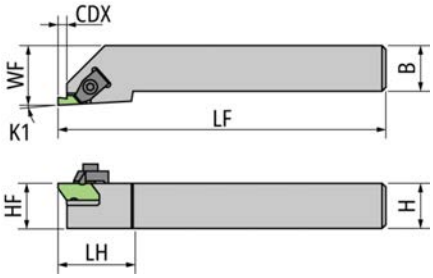
VDB-R Full Radius style



Item Number	CW	EPSR	INSL	RE	S	SiAlON		Whisker	Alumina-TiC
	inch	°	inch	inch	inch	SX9	SX5	WA1	HC2
VDB 125 RA T00525	.125	90	1.125	.063	1/4				●
VDB 156 RA T00525	.156	90	1.125	.078	1/4				●
VDB 188 RA T00525	.188	90	1.125	.094	1/4				●
VDB 218 RA T00525	.218	90	1.125	.109	1/4				●
VDB 250 RB T00520	.250	90	1.125	.125	.337		●	●	
VDB 250 RB T00525	.250	90	1.125	.125	.337				●
VDB 281 RB T00525	.281	90	1.125	.141	.337				●
VDB 312 RB T00525	.312	90	1.125	.156	.337				●
VDB 344 RB T00525	.344	90	1.125	.172	.337				●
VDB 375 RB T00525	.375	90	1.125	.188	.337				●

OD Grooving
GKN/GKP/RKN.. series/Toolholder

NS



● Diagram shows right-hand tool

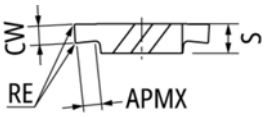
Item Number	Hand	B	CDX	H	HF	K1	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	°	inch	inch	inch	
NSR16-3D	R	1.000	.210	1.000	1.000	3	6.000	1.250	1.250	GKN../GKP..
NSL16-3D	L	1.000	.210	1.000	1.000	3	6.000	1.250	1.250	GKN../GKP..

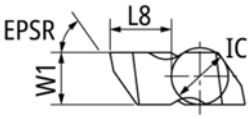
Spare Parts

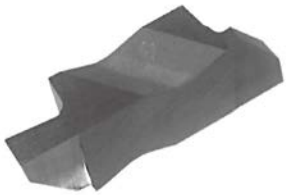
Item Number	Clamp	Clamp screw
NSR16-3D	CM-72	S-412
NSL16-3D	CM-73	S-412

OD Grooving
GKN/GKP/RKN.. series/Inserts Ceramics,Carbide

GKN/GKP



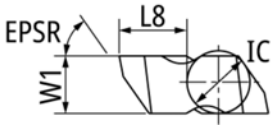


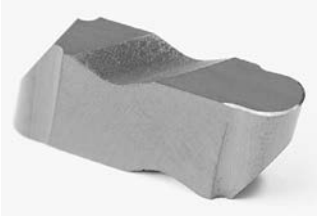


Item Number	APMX	CW	EPSR	IC	L8	RE	S	W1	Alumina-TiC		PVD-Carbide
	inch	inch	°	inch	inch	inch	inch	inch	HC2	ZC4	QM3
GKP 3031 R	.050	.031	55	3/8	.405	.004	.195	.344			●
GKN 3062 R	.094	.062	55	3/8	.405	.008	.195	.344	●	●	
GKP 3062 R	.094	.062	55	3/8	.405	.008	.195	.344			●
GKN 3094 R	.150	.094	55	3/8	.405	.008	.195	.344	●	●	
GKP 3094 R	.150	.094	55	3/8	.405	.008	.195	.344			●
GKN 3125 R	.150	.125	55	3/8	.405	.012	.195	.344	●	●	
GKN 3156 R	.150	.156	55	3/8	.405	.012	.195	.344	●		
GKN 3189 R	.150	.193	55	3/8	.405	.012	.195	.344	●		
GKP 3189 R	.150	.189	55	3/8	.405	.012	.195	.344			●
GKP 3031 L	.050	.031	55	3/8	.405	.004	.195	.344			●
GKN 3062 L	.094	.062	55	3/8	.405	.008	.195	.344	●	●	
GKP 3062 L	.094	.062	55	3/8	.405	.008	.195	.344			●
GKN 3094 L	.150	.094	55	3/8	.405	.008	.195	.344	●	●	
GKN 3125 L	.150	.125	55	3/8	.405	.012	.195	.344	●	●	
GKP 3125 L	.150	.125	55	3/8	.405	.008	.195	.344			●
GKN 3156 L	.150	.156	55	3/8	.405	.012	.195	.344	●		
GKP 3156 L	.150	.156	55	3/8	.405	.008	.195	.344			●
GKN 3189 L	.150	.189	55	3/8	.405	.012	.195	.344	●		
GKP 3189 L	.150	.189	55	3/8	.405	.012	.195	.344			●

※ Inserts with special width and R in both GKN and GKP are available upon requests.

RKN

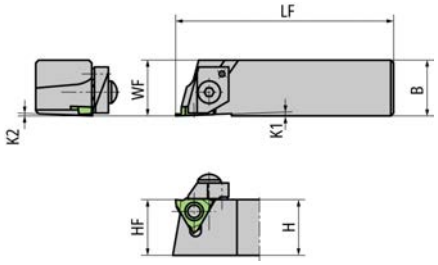


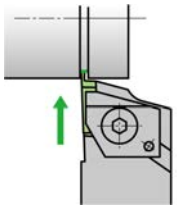


Item Number	APMX	CW	EPSR	IC	L8	RE	S	W1	Alumina-TiC		PVD-Carbide
	inch	inch	°	inch	inch	inch	inch	inch	HC2	ZC4	QM3
RKN 3078 R	.150	.078	55	3/8	.405	.039	.195	.344		●	
RKN 3094 R	.150	.094	55	3/8	.405	.047	.195	.344		●	
RKN 3125 R	.150	.125	55	3/8	.405	.063	.195	.344		●	
RKN 3156 R	.150	.156	55	3/8	.405	.078	.195	.344		●	
RKN 3189 R	.150	.189	55	3/8	.405	.095	.195	.344		●	
RKN 3078 L	.150	.078	55	3/8	.405	.039	.195	.344		●	
RKN 3094 L	.150	.094	55	3/8	.405	.047	.195	.344		●	
RKN 3125 L	.150	.125	55	3/8	.405	.063	.195	.344		●	
RKN 3156 L	.150	.156	55	3/8	.405	.078	.195	.344		●	

OD Grooving
GTMT / GTMA.. series/Toolholder

NGTN





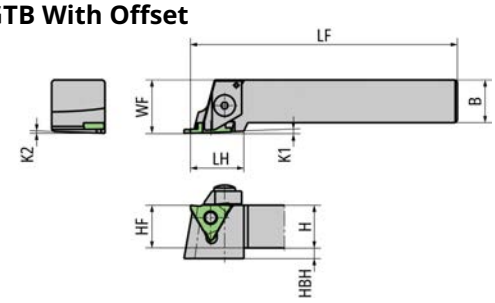
● Diagram shows right-hand tool

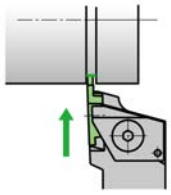
Item Number	Hand	B	H	HF	K1	K2	LF	WF	Insert Gage
		inch	inch	inch	°	°	inch	inch	
NGTNR161643-20	R	.630	.630	.630	2	2	3.071	.630	GT..43..
NGTNR161643-35	R	.630	.630	.630	2	2	3.071	.630	GT..43..
NGTNL161643-20	L	.630	.630	.630	2	2	3.071	.630	GT..43..
NGTNL161643-35	L	.630	.630	.630	2	2	3.071	.630	GT..43..

Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
NGTNR161643-20	CPR5S	AOS-5*25	ASG-5	LW-2.5
NGTNR161643-35	CPR5S	AOS-5*25	ASG-5	LW-2.5
NGTNL161643-20	CPL5S	AOS-5*25	ASG-5	LW-2.5
NGTNL161643-35	CPL5S	AOS-5*25	ASG-5	LW-2.5

NGTB With Offset





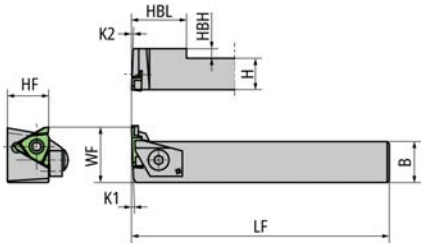
● Diagram shows right-hand tool

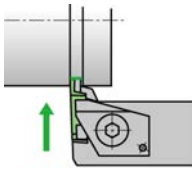
Item Number	Hand	B	H	HBH	HF	K1	K2	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	°	°	inch	inch	inch	
NGTBR161643-00S	R	.630	.630	.354	.630	2	2	3.937	.984	.787	GT..43..
NGTBR161643-20S	R	.630	.630	.354	.630	2	2	3.937	.984	.787	GT..43..
NGTBR161643-35S	R	.630	.630	.354	.630	2	2	3.937	.984	.787	GT..43..
NGTBR202043-00S	R	.787	.787	.197	.787	2	2	4.921	.984	.984	GT..43..
NGTBR202043-20S	R	.787	.787	.197	.787	2	2	4.921	.984	.984	GT..43..
NGTBR202043-35S	R	.787	.787	.197	.787	2	2	4.921	.984	.984	GT..43..
NGTBR252543-00S	R	.984	.984	–	.984	2	2	5.906	.984	1.181	GT..43..
NGTBR252543-20S	R	.984	.984	–	.984	2	2	5.906	.984	1.181	GT..43..
NGTBR252543-35S	R	.984	.984	–	.984	2	2	5.906	.984	1.181	GT..43..
NGTBR322543-20S	R	.984	1.260	–	1.260	2	2	6.693	.984	1.181	GT..43..
NGTBR322543-35S	R	.984	1.260	–	1.260	2	2	6.693	.984	1.181	GT..43..
NGTBL161643-00S	L	.630	.630	.354	.630	2	2	3.937	.984	.787	GT..43..
NGTBL161643-20S	L	.630	.630	.354	.630	2	2	3.937	.984	.787	GT..43..
NGTBL161643-35S	L	.630	.630	.354	.630	2	2	3.937	.984	.787	GT..43..
NGTBL202043-00S	L	.787	.787	.197	.787	2	2	4.921	.984	.984	GT..43..
NGTBL202043-20S	L	.787	.787	.197	.787	2	2	4.921	.984	.984	GT..43..
NGTBL202043-35S	L	.787	.787	.197	.787	2	2	4.921	.984	.984	GT..43..
NGTBL252543-00S	L	.984	.984	–	.984	2	2	5.906	.984	1.181	GT..43..
NGTBL252543-20S	L	.984	.984	–	.984	2	2	5.906	.984	1.181	GT..43..
NGTBL252543-35S	L	.984	.984	–	.984	2	2	5.906	.984	1.181	GT..43..
NGTBL322543-20S	L	.984	1.260	–	1.260	2	2	6.693	.984	1.181	GT..43..
NGTBL322543-35S	L	.984	1.260	–	1.260	2	2	6.693	.984	1.181	GT..43..

Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
NGTBR161643-00S	CPR5	AOS-5*25	ASG-5	LW-2.5
NGTBR161643-20S	CPR5	AOS-5*25	ASG-5	LW-2.5
NGTBR161643-35S	CPR5	AOS-5*25	ASG-5	LW-2.5
NGTBR202043-00S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBR202043-20S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBR202043-35S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBR252543-00S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBR252543-20S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBR252543-35S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBR322543-20S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBR322543-35S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBL161643-00S	CPL5	AOS-5*25	ASG-5	LW-2.5
NGTBL161643-20S	CPL5	AOS-5*25	ASG-5	LW-2.5
NGTBL161643-35S	CPL5	AOS-5*25	ASG-5	LW-2.5
NGTBL202043-00S	CPL6	AOS-6*30	ASG-6	LW-3
NGTBL202043-20S	CPL6	AOS-6*30	ASG-6	LW-3
NGTBL202043-35S	CPL6	AOS-6*30	ASG-6	LW-3
NGTBL252543-00S	CPL6	AOS-6*30	ASG-6	LW-3
NGTBL252543-20S	CPL6	AOS-6*30	ASG-6	LW-3
NGTBL252543-35S	CPL6	AOS-6*30	ASG-6	LW-3
NGTBL322543-20S	CPL6	AOS-6*30	ASG-6	LW-3
NGTBL322543-35S	CPL6	AOS-6*30	ASG-6	LW-3

NGTA for horizontal gang style tool post





● Diagram shows left-hand tool
NOTE: Use a right-handed (R) insert.

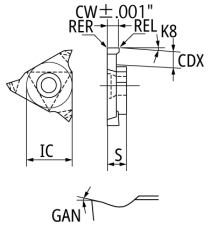
Item Number	Hand	B	H	HBH	HBL	HF	K1	K2	LF	WF	Insert Gage
		inch	inch	inch	inch	inch	°	°	inch	inch	
NGTAL161643-00S	L	.630	.630	.157	.787	.630	2	2	3.937	.906	GT..43..
NGTAL202043-00S	L	.787	.787	–	–	.787	2	2	4.921	1.063	GT..43..

Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
NGTAL161643-00S	CPL5S	AOS-5*20	ASG-5	LW-2.5
NGTAL202043-00S	CPL6	AOS-6*30	ASG-6	LW-3

OD Grooving
GTMT / GTMA.. series/Insert Carbide

GTMT43

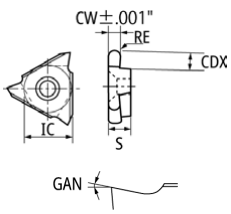


● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	APMX※	CDX	CW	GAN	IC	K8	REL	RER	S	Carbide	
												PVD	
			inch	inch	inch	°	inch	°	inch	inch	inch	DM4	QM3
GTMT43145R	R	Yes	.118	.138	.057	11	1/2	2	.008	.008	3/16	●	●
GTMT43150R	R	Yes	.118	.138	.059	11	1/2	2	.008	.008	3/16	●	●
GTMT43175R	R	Yes	.118	.138	.069	11	1/2	2	.008	.008	3/16	●	●
GTMT43185R	R	Yes	.118	.138	.073	11	1/2	2	.008	.008	3/16	●	●
GTMT43200R	R	Yes	.118	.138	.079	11	1/2	2	.008	.008	3/16	●	●
GTMT43230R	R	Yes	.118	.138	.091	11	1/2	2	.008	.008	3/16	●	●
GTMT43250R	R	Yes	.169	.217	.098	11	1/2	2	.012	.012	3/16	●	●
GTMT43265R	R	Yes	.169	.217	.104	11	1/2	2	.012	.012	3/16	●	●
GTMT43280R	R	Yes	.169	.217	.110	11	1/2	2	.012	.012	3/16	●	●
GTMT43300R	R	Yes	.169	.217	.118	11	1/2	2	.012	.012	3/16	●	●
GTMT43330R	R	Yes	.169	.217	.130	11	1/2	2	.012	.012	3/16		●
GTMT43350R	R	Yes	.169	.217	.138	11	1/2	2	.012	.012	3/16	●	●
GTMT43400R	R	Yes	.169	.217	.157	11	1/2	2	.016	.016	3/16	●	●
GTMT43450R	R	Yes	.169	.217	.177	11	1/2	2	.016	.016	3/16	●	●
GTMT43500R	R	Yes	.169	.217	.197	11	1/2	2	.016	.016	.227	●	●
GTMT43550R	R	Yes	.169	.217	.217	11	1/2	2	.016	.016	.227	●	●
GTMT43145L	L	Yes	.118	.138	.057	11	1/2	2	.008	.008	3/16	●	●
GTMT43150L	L	Yes	.118	.138	.059	11	1/2	2	.008	.008	3/16	●	●
GTMT43175L	L	Yes	.118	.138	.069	11	1/2	2	.008	.008	3/16	●	●
GTMT43185L	L	Yes	.118	.138	.073	11	1/2	2	.008	.008	3/16	●	●
GTMT43200L	L	Yes	.118	.138	.079	11	1/2	2	.008	.008	3/16	●	●
GTMT43230L	L	Yes	.118	.138	.091	11	1/2	2	.008	.008	3/16	●	●
GTMT43280L	L	Yes	.169	.217	.110	11	1/2	2	.012	.012	3/16	●	●
GTMT43300L	L	Yes	.169	.217	.118	11	1/2	2	.012	.012	3/16	●	●
GTMT43330L	L	Yes	.169	.217	.130	11	1/2	2	.012	.012	3/16		●
GTMT43350L	L	Yes	.169	.217	.138	11	1/2	2	.012	.012	3/16	●	●
GTMT43400L	L	Yes	.169	.217	.157	11	1/2	2	.016	.016	3/16	●	●
GTMT43450L	L	Yes	.169	.217	.177	11	1/2	2	.016	.016	3/16	●	●
GTMT43500L	L	Yes	.169	.217	.197	11	1/2	2	.016	.016	.227	●	●
GTMT43550L	L	Yes	.169	.217	.217	11	1/2	2	.016	.016	.227	●	●

※APMX : Depth of cut maximum

GTMA43-Full Radius style



● Diagram shows right-hand tool

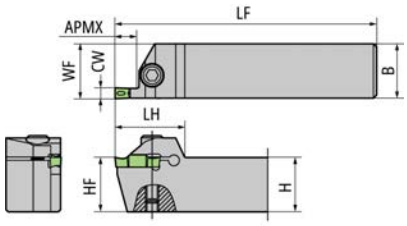
Item Number	Hand	Chipbreaker	APMX※	CDX	CW	GAN	IC	RE	S	Carbide	
										PVD	
			inch	inch	inch	°	inch	inch	inch	DM4	QM3
GTMA43200R10R	R	Yes	.118	.138	.079	11	1/2	.039	3/16		●
GTMA43300R15R	R	Yes	.177	.217	.118	11	1/2	.059	3/16		●
GTMA43400R20R	R	Yes	.177	.217	.157	11	1/2	.079	3/16		●

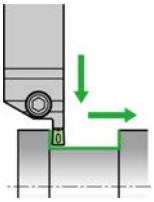
※APMX : Depth of cut maximum

OD Grooving
GROOVE DUO

GWPG(M).. series/Toolholder

GTWP





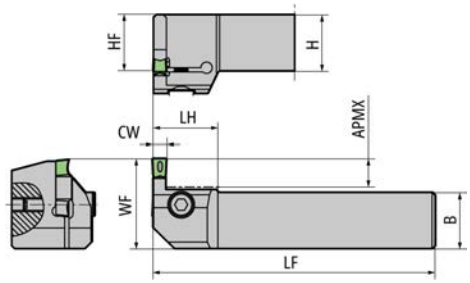
● Diagram shows right-hand tool

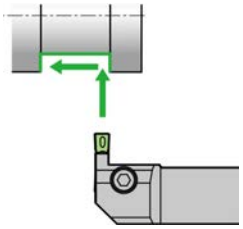
Item Number	Hand	APMX	B	CW	H	HF	LF	LH	WF	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch	inch		
GTWPR2020K-3D10	R	.394	.787	.118	.787	.787	4.921	1.142	.795	GWPG300..	GWPM300..
GTWPR2020K-3D20	R	.787	.787	.118	.787	.787	4.921	1.614	.795	GWPG300..	GWPM300..
GTWPR2020K-4E10	R	.394	.787	.157	.787	.787	4.921	1.142	.799	GWPG400..	GWPM400..
GTWPR2020K-4E20	R	.787	.787	.157	.787	.787	4.921	1.614	.799	GWPG400..	GWPM400..
GTWPR2020K-5F10	R	.394	.787	.197	.787	.787	4.921	1.142	.799	GWPG500..	GWPM500..
GTWPR2020K-5F20	R	.787	.787	.197	.787	.787	4.921	1.614	.799	GWPG500..	GWPM500..
GTWPR2020K-6G12	R	.472	.787	.236	.787	.787	4.921	1.339	.801	GWPG600..	GWPM600..
GTWPR2020K-6G25	R	.984	.787	.236	.787	.787	4.921	1.929	.801	GWPG600..	GWPM600..
GTWPR2525M-3D10	R	.394	.984	.118	.984	.984	5.906	1.260	.992	GWPG300..	GWPM300..
GTWPR2525M-3D20	R	.787	.984	.118	.984	.984	5.906	1.732	.992	GWPG300..	GWPM300..
GTWPR2525M-4E10	R	.394	.984	.157	.984	.984	5.906	1.260	.996	GWPG400..	GWPM400..
GTWPR2525M-4E20	R	.787	.984	.157	.984	.984	5.906	1.732	.996	GWPG400..	GWPM400..
GTWPR2525M-5F10	R	.394	.984	.197	.984	.984	5.906	1.260	.996	GWPG500..	GWPM500..
GTWPR2525M-5F20	R	.787	.984	.197	.984	.984	5.906	1.732	.996	GWPG500..	GWPM500..
GTWPR2525M-6G12	R	.472	.984	.236	.984	.984	5.906	1.457	.998	GWPG600..	GWPM600..
GTWPR2525M-6G25	R	.984	.984	.236	.984	.984	5.906	2.047	.998	GWPG600..	GWPM600..
GTWPL2020K-3D10	L	.394	.787	.118	.787	.787	4.921	1.142	.795	GWPG300..	GWPM300..
GTWPL2020K-3D20	L	.787	.787	.118	.787	.787	4.921	1.614	.795	GWPG300..	GWPM300..
GTWPL2020K-4E10	L	.394	.787	.157	.787	.787	4.921	1.142	.799	GWPG400..	GWPM400..
GTWPL2020K-4E20	L	.787	.787	.157	.787	.787	4.921	1.614	.799	GWPG400..	GWPM400..
GTWPL2020K-5F10	L	.394	.787	.197	.787	.787	4.921	1.142	.799	GWPG500..	GWPM500..
GTWPL2020K-5F20	L	.787	.787	.197	.787	.787	4.921	1.614	.799	GWPG500..	GWPM500..
GTWPL2020K-6G12	L	.472	.787	.236	.787	.787	4.921	1.339	.801	GWPG600..	GWPM600..
GTWPL2020K-6G25	L	.984	.787	.236	.787	.787	4.921	1.929	.801	GWPG600..	GWPM600..
GTWPL2525M-3D10	L	.394	.984	.118	.984	.984	5.906	1.260	.992	GWPG300..	GWPM300..
GTWPL2525M-3D20	L	.787	.984	.118	.984	.984	5.906	1.732	.992	GWPG300..	GWPM300..
GTWPL2525M-4E10	L	.394	.984	.157	.984	.984	5.906	1.260	.996	GWPG400..	GWPM400..
GTWPL2525M-4E20	L	.787	.984	.157	.984	.984	5.906	1.732	.996	GWPG400..	GWPM400..
GTWPL2525M-5F10	L	.394	.984	.197	.984	.984	5.906	1.260	.996	GWPG500..	GWPM500..
GTWPL2525M-5F20	L	.787	.984	.197	.984	.984	5.906	1.732	.996	GWPG500..	GWPM500..
GTWPL2525M-6G12	L	.472	.984	.236	.984	.984	5.906	1.457	.998	GWPG600..	GWPM600..
GTWPL2525M-6G25	L	.984	.984	.236	.984	.984	5.906	2.047	.998	GWPG600..	GWPM600..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)	Wrench (for Back side clamping)
GTWPR2020K-3D10	CS0520W	LW-4	(LW-2.5)
GTWPR2020K-3D20	CS0520W	LW-4	(LW-2.5)
GTWPR2020K-4E10	CS0520W	LW-4	(LW-2.5)
GTWPR2020K-4E20	CS0520W	LW-4	(LW-2.5)
GTWPR2020K-5F10	CS0520W	LW-4	(LW-2.5)
GTWPR2020K-5F20	CS0520W	LW-4	(LW-2.5)
GTWPR2020K-6G12	CS0520W	LW-4	(LW-2.5)
GTWPR2020K-6G25	CS0520W	LW-4	(LW-2.5)
GTWPR2525M-3D10	CS0625W	LW-5	(LW-3)
GTWPR2525M-3D20	CS0625W	LW-5	(LW-3)
GTWPR2525M-4E10	CS0625W	LW-5	(LW-3)
GTWPR2525M-4E20	CS0625W	LW-5	(LW-3)
GTWPR2525M-5F10	CS0625W	LW-5	(LW-3)
GTWPR2525M-5F20	CS0625W	LW-5	(LW-3)
GTWPR2525M-6G12	CS0625W	LW-5	(LW-3)
GTWPR2525M-6G25	CS0625W	LW-5	(LW-3)
GTWPL2020K-3D10	CS0520W	LW-4	(LW-2.5)
GTWPL2020K-3D20	CS0520W	LW-4	(LW-2.5)
GTWPL2020K-4E10	CS0520W	LW-4	(LW-2.5)
GTWPL2020K-4E20	CS0520W	LW-4	(LW-2.5)
GTWPL2020K-5F10	CS0520W	LW-4	(LW-2.5)
GTWPL2020K-5F20	CS0520W	LW-4	(LW-2.5)
GTWPL2020K-6G12	CS0520W	LW-4	(LW-2.5)
GTWPL2020K-6G25	CS0520W	LW-4	(LW-2.5)
GTWPL2525M-3D10	CS0625W	LW-5	(LW-3)
GTWPL2525M-3D20	CS0625W	LW-5	(LW-3)
GTWPL2525M-4E10	CS0625W	LW-5	(LW-3)
GTWPL2525M-4E20	CS0625W	LW-5	(LW-3)
GTWPL2525M-5F10	CS0625W	LW-5	(LW-3)
GTWPL2525M-5F20	CS0625W	LW-5	(LW-3)
GTWPL2525M-6G12	CS0625W	LW-5	(LW-3)
GTWPL2525M-6G25	CS0625W	LW-5	(LW-3)

GKWP for horizontal gang style tool post





● Diagram shows left-hand tool

Item Number	Hand	APMX	B	CW	H	HF	LF	LH	WF	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch	inch		
GKWPL2020K-3D10	L	.394	.787	.118	.787	.787	4.921	.906	1.260	GWPG300..	GWPM300..
GKWPL2020K-4E10	L	.394	.787	.157	.787	.787	4.921	.906	1.260	GWPG400..	GWPM400..
GKWPL2020K-5F10	L	.394	.787	.197	.787	.787	4.921	.906	1.260	GWPG500..	GWPM500..
GKWPL2020K-6G12	L	.472	.787	.236	.787	.787	4.921	.906	1.339	GWPG600..	GWPM600..

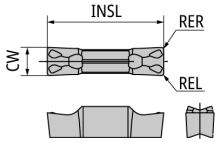
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)	Wrench (for Back side clamping)
GKWPL2020K-3D10	CS0520W	LW-4	LW-2.5
GKWPL2020K-4E10	CS0520W	LW-4	LW-2.5
GKWPL2020K-5F10	CS0520W	LW-4	LW-2.5
GKWPL2020K-6G12	CS0520W	LW-4	LW-2.5

OD Grooving
GROOVE DUO

GWPG(M).. series/Insert Carbide

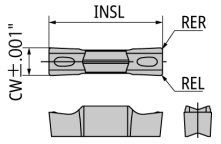
GWPG(M)-GW Best for side turning



Item Number	Hand	Chipbreaker	CW	INSL	REL	RER	Carbide
							PVD
			inch	inch	inch	inch	DM4
GWPG300N02D-GW	N	Yes	.118	.811	.008	.008	●
GWPG300N04D-GW	N	Yes	.118	.811	.016	.016	●
GWPG400N02E-GW	N	Yes	.157	.811	.008	.008	●
GWPG400N04E-GW	N	Yes	.157	.811	.016	.016	●
GWPG400N08E-GW	N	Yes	.157	.811	.031	.031	●
GWPG500N02F-GW	N	Yes	.197	.811	.008	.008	●
GWPG500N04F-GW	N	Yes	.197	.811	.016	.016	●
GWPG500N08F-GW	N	Yes	.197	.811	.031	.031	●
GWPG600N02G-GW	N	Yes	.236	1.008	.008	.008	●
GWPG600N04G-GW	N	Yes	.236	1.008	.016	.016	●
GWPG600N08G-GW	N	Yes	.236	1.008	.031	.031	●
GWPM300N04D-GW	N	Yes	.118	.811	.016	.016	●
GWPM400N04E-GW	N	Yes	.157	.811	.016	.016	●
GWPM500N04F-GW	N	Yes	.197	.811	.016	.016	●
GWPM600N04G-GW	N	Yes	.236	1.008	.016	.016	●

GWPG.. : Outside ground
Width tolerance ±.001
GWPM.. : Full-molded
Width tolerance ±.002

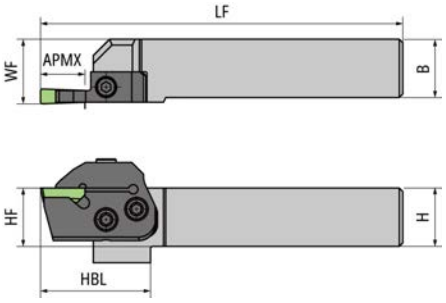
GWPG-GV Generates less tool pressure



Item Number	Hand	Chipbreaker	CW	INSL	REL	RER	Carbide
							PVD
			inch	inch	inch	inch	DM4
GWPG300N02D-GV	N	Yes	.118	.811	.008	.008	●
GWPG300N04D-GV	N	Yes	.118	.811	.016	.016	●
GWPG400N02E-GV	N	Yes	.157	.811	.008	.008	●
GWPG400N04E-GV	N	Yes	.157	.811	.016	.016	●
GWPG500N02F-GV	N	Yes	.197	.811	.008	.008	●
GWPG500N04F-GV	N	Yes	.197	.811	.016	.016	●
GWPG600N02G-GV	N	Yes	.236	1.008	.008	.008	●
GWPG600N04G-GV	N	Yes	.236	1.008	.016	.016	●

OD Grooving
GROOVE DUO BLADE
VGW.. series/For straight shank toolholder

GTWPR

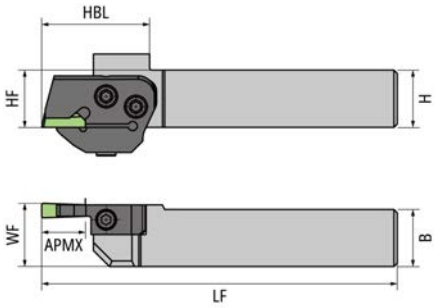


● Diagram shows right-hand tool

Hand	Blade number	Insert	Dimensions(inch)	Holder	Dimensions(inch)					
			APMX		LF	HBL	WF	H	B	HF
R	GBVR-VGW4-3T09	VGW4125 VGW4156	.375	GTWPR16-IN-H	5.750	1.404	1.090	1.000	1.000	1.000
				GTWPR20-IN-H	6.750	–	1.340	1.250	1.250	1.250
				GTWPR2020-H	4.671	1.561	.878	.787	.787	.787
				GTWPR2525-H	5.656	1.404	1.074	.984	.984	.984
				GTWPR3232-H	6.443	–	1.350	1.260	1.260	1.260
	GBVR-VGW4-4T14	VGW4156 VGW4187	.562	GTWPR16-IN-H	6.000	1.654	1.094	1.000	1.000	1.000
				GTWPR20-IN-H	7.000	–	1.344	1.250	1.250	1.250
				GTWPR2020-H	4.921	1.811	.881	.787	.787	.787
				GTWPR2525-H	5.906	1.654	1.078	.984	.984	.984
				GTWPR3232-H	6.693	–	1.354	1.260	1.260	1.260
	GBVR-VGW6-6T14	VGW6218 VGW6250	.562	GTWPR16-IN-H	6.000	1.654	1.109	1.000	1.000	1.000
				GTWPR20-IN-H	7.000	–	1.359	1.250	1.250	1.250
				GTWPR2020-H	4.921	1.811	.897	.787	.787	.787
				GTWPR2525-H	5.906	1.654	1.094	.984	.984	.984
				GTWPR3232-H	6.693	–	1.369	1.260	1.260	1.260
	GBVR-VGW6-6T19	VGW6250 VGW6281	.750	GTWPR16-IN-H	6.200	1.854	1.106	1.000	1.000	1.000
				GTWPR20-IN-H	7.200	–	1.356	1.250	1.250	1.250
				GTWPR2020-H	5.121	2.011	.893	.787	.787	.787
				GTWPR2525-H	6.106	1.854	1.090	.984	.984	.984
				GTWPR3232-H	6.893	–	1.365	1.260	1.260	1.260
	GBVR-VGW8-8T19	VGW8312 VGW8344	.750	GTWPR16-IN-H	6.400	2.054	1.138	1.000	1.000	1.000
				GTWPR20-IN-H	7.400	–	1.388	1.250	1.250	1.250
				GTWPR2020-H	5.321	2.211	.926	.787	.787	.787
				GTWPR2525-H	6.306	2.054	1.122	.984	.984	.984
				GTWPR3232-H	7.093	–	1.398	1.260	1.260	1.260
	GBVR-VGW8-8T28	VGW8344 VGW8375	1.125	GTWPR16-IN-H	6.500	2.154	1.133	1.000	1.000	1.000
				GTWPR20-IN-H	7.500	–	1.383	1.250	1.250	1.250
				GTWPR2020-H	5.421	2.311	.920	.787	.787	.787
				GTWPR2525-H	6.406	2.154	1.117	.984	.984	.984
				GTWPR3232-H	7.193	–	1.393	1.260	1.260	1.260

※Insert clamp screw : GBVR/L-VGW4/6 → CS0515 , GBVR/L-VGW8 → CS0615

GTWPL



● Diagram shows left-hand tool

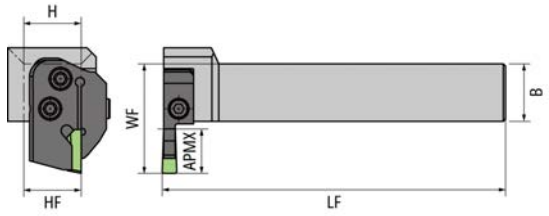
Hand	Blade number	Insert	Dimensions(inch)	Holder	Dimensions(inch)					
			APMX		LF	HBL	WF	H	B	HF
L	GBVL-VGW4-3T09	VGW4125 VGW4156	.375	GTWPL16-IN-H	5.750	1.404	1.090	1.000	1.000	1.000
				GTWPL20-IN-H	6.750	–	1.340	1.250	1.250	1.250
				GTWPL2020-H	4.671	1.561	.878	.787	.787	.787
				GTWPL2525-H	5.656	1.404	1.074	.984	.984	.984
				GTWPL3232-H	6.443	–	1.350	1.260	1.260	1.260
	GBVL-VGW4-4T14	VGW4156 VGW4187	.562	GTWPL16-IN-H	6.000	1.654	1.094	1.000	1.000	1.000
				GTWPL20-IN-H	7.000	–	1.344	1.250	1.250	1.250
				GTWPL2020-H	4.921	1.811	.881	.787	.787	.787
				GTWPL2525-H	5.906	1.654	1.078	.984	.984	.984
				GTWPL3232-H	6.693	–	1.354	1.260	1.260	1.260
	GBVL-VGW6-6T14	VGW6218 VGW6250	.562	GTWPL16-IN-H	6.000	1.654	1.109	1.000	1.000	1.000
				GTWPL20-IN-H	7.000	–	1.359	1.250	1.250	1.250
				GTWPL2020-H	4.921	1.811	.897	.787	.787	.787
				GTWPL2525-H	5.906	1.654	1.094	.984	.984	.984
				GTWPL3232-H	6.693	–	1.369	1.260	1.260	1.260
	GBVL-VGW6-6T19	VGW6250 VGW6281	.750	GTWPL16-IN-H	6.200	1.854	1.106	1.000	1.000	1.000
				GTWPL20-IN-H	7.200	–	1.356	1.250	1.250	1.250
				GTWPL2020-H	5.121	2.011	.893	.787	.787	.787
				GTWPL2525-H	6.106	1.854	1.090	.984	.984	.984
				GTWPL3232-H	6.893	–	1.365	1.260	1.260	1.260
	GBVL-VGW8-8T19	VGW8312 VGW8344	.750	GTWPL16-IN-H	6.400	2.054	1.138	1.000	1.000	1.000
				GTWPL20-IN-H	7.400	–	1.388	1.250	1.250	1.250
				GTWPL2020-H	5.321	2.211	.926	.787	.787	.787
				GTWPL2525-H	6.306	2.054	1.122	.984	.984	.984
				GTWPL3232-H	7.093	–	1.398	1.260	1.260	1.260
	GBVL-VGW8-8T28	VGW8344 VGW8375	1.125	GTWPL16-IN-H	6.500	2.154	1.133	1.000	1.000	1.000
				GTWPL20-IN-H	7.500	–	1.383	1.250	1.250	1.250
				GTWPL2020-H	5.421	2.311	.920	.787	.787	.787
				GTWPL2525-H	6.406	2.154	1.117	.984	.984	.984
				GTWPL3232-H	7.193	–	1.393	1.260	1.260	1.260

※Insert clamp screw : GBVR/L-VGW4/6 → CS0515 , GBVR/L-VGW8 → CS0615

OD Grooving
GROOVE DUO BLADE

VGW.. series/For L-style toolholder

GKWPR

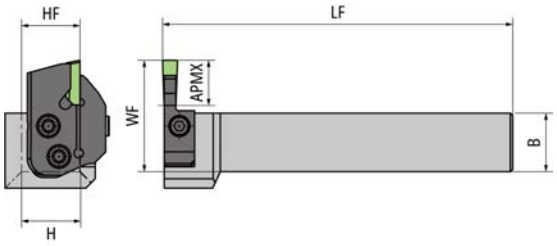


● Diagram shows right-hand tool

Hand	Blade number	Insert	Dimensions(inch)	Holder	Dimensions(inch)					
			APMX		LF	HBL	WF	H	B	HF
L	GBVL-VGW4-3T09	VGW4125 VGW4156	.375	GKWPR16-IN-H	5.750	1.404	1.106	1.000	1.000	1.000
				GKWPR20-IN-H	6.750	–	1.356	1.250	1.250	1.250
				GKWPR2020-H	4.671	1.561	.893	.787	.787	.787
				GKWPR2525-H	5.656	1.404	1.090	.984	.984	.984
				GKWPR3232-H	6.443	–	1.365	1.260	1.260	1.260
	GBVL-VGW4-4T14	VGW4156 VGW4187	.562	GKWPR16-IN-H	6.000	1.654	1.109	1.000	1.000	1.000
				GKWPR20-IN-H	7.000	–	1.359	1.250	1.250	1.250
				GKWPR2020-H	4.921	1.811	.897	.787	.787	.787
				GKWPR2525-H	5.906	1.654	1.094	.984	.984	.984
				GKWPR3232-H	6.693	–	1.369	1.260	1.260	1.260
	GBVL-VGW6-6T14	VGW6218 VGW6250	.562	GKWPR16-IN-H	6.000	1.654	1.125	1.000	1.000	1.000
				GKWPR20-IN-H	7.000	–	1.375	1.250	1.250	1.250
				GKWPR2020-H	4.921	1.811	.913	.787	.787	.787
				GKWPR2525-H	5.906	1.654	1.109	.984	.984	.984
				GKWPR3232-H	6.693	–	1.385	1.260	1.260	1.260
	GBVL-VGW6-6T19	VGW6250 VGW6281	.750	GKWPR16-IN-H	6.200	1.854	1.121	1.000	1.000	1.000
				GKWPR20-IN-H	7.200	–	1.371	1.250	1.250	1.250
				GKWPR2020-H	5.121	2.011	.908	.787	.787	.787
				GKWPR2525-H	6.106	1.854	1.105	.984	.984	.984
				GKWPR3232-H	6.893	–	1.381	1.260	1.260	1.260
	GBVL-VGW8-8T19	VGW8312 VGW8344	.750	GKWPR16-IN-H	6.400	2.054	1.154	1.000	1.000	1.000
				GKWPR20-IN-H	7.400	–	1.404	1.250	1.250	1.250
				GKWPR2020-H	5.321	2.211	.942	.787	.787	.787
				GKWPR2525-H	6.306	2.054	1.139	.984	.984	.984
				GKWPR3232-H	7.093	–	1.414	1.260	1.260	1.260
	GBVL-VGW8-8T28	VGW8344 VGW8375	1.125	GKWPR16-IN-H	6.500	2.154	1.148	1.000	1.000	1.000
				GKWPR20-IN-H	7.500	–	1.398	1.250	1.250	1.250
				GKWPR2020-H	5.421	2.311	.935	.787	.787	.787
				GKWPR2525-H	6.406	2.154	1.132	.984	.984	.984
				GKWPR3232-H	7.193	–	1.408	1.260	1.260	1.260

※Insert clamp screw : GBVR/L-VGW4/6 → CS0515 , GBVR/L-VGW8 → CS0615

GKWPL



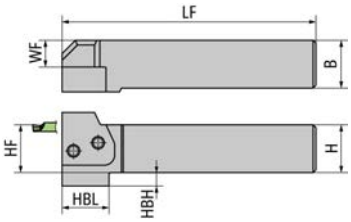
● Diagram shows left-hand tool

Hand	Blade number	Insert	Dimensions(inch)	Holder	Dimensions(inch)					
			APMX		LF	HBL	WF	H	B	HF
R	GBVR-VGW4-3T09	VGW4125 VGW4156	.375	GKWPL16-IN-H	5.750	1.404	1.106	1.000	1.000	1.000
				GKWPL20-IN-H	6.750	–	1.356	1.250	1.250	1.250
				GKWPL2020-H	4.671	1.561	.893	.787	.787	.787
				GKWPL2525-H	5.656	1.404	1.090	.984	.984	.984
				GKWPL3232-H	6.443	–	1.365	1.260	1.260	1.260
	GBVR-VGW4-4T14	VGW4156 VGW4187	.562	GKWPL16-IN-H	6.000	1.654	1.109	1.000	1.000	1.000
				GKWPL20-IN-H	7.000	–	1.359	1.250	1.250	1.250
				GKWPL2020-H	4.921	1.811	.897	.787	.787	.787
				GKWPL2525-H	5.906	1.654	1.094	.984	.984	.984
				GKWPL3232-H	6.693	–	1.369	1.260	1.260	1.260
	GBVR-VGW6-6T14	VGW6218 VGW6250	.562	GKWPL16-IN-H	6.000	1.654	1.125	1.000	1.000	1.000
				GKWPL20-IN-H	7.000	–	1.375	1.250	1.250	1.250
				GKWPL2020-H	4.921	1.811	.913	.787	.787	.787
				GKWPL2525-H	5.906	1.654	1.109	.984	.984	.984
				GKWPL3232-H	6.693	–	1.385	1.260	1.260	1.260
	GBVR-VGW6-6T19	VGW6250 VGW6281	.750	GKWPL16-IN-H	6.200	1.854	1.121	1.000	1.000	1.000
				GKWPL20-IN-H	7.200	–	1.371	1.250	1.250	1.250
				GKWPL2020-H	5.121	2.011	.908	.787	.787	.787
				GKWPL2525-H	6.106	1.854	1.105	.984	.984	.984
				GKWPL3232-H	6.893	–	1.381	1.260	1.260	1.260
	GBVR-VGW8-8T19	VGW8312 VGW8344	.750	GKWPL16-IN-H	6.400	2.054	1.154	1.000	1.000	1.000
				GKWPL20-IN-H	7.400	–	1.404	1.250	1.250	1.250
				GKWPL2020-H	5.321	2.211	.942	.787	.787	.787
				GKWPL2525-H	6.306	2.054	1.139	.984	.984	.984
				GKWPL3232-H	7.093	–	1.414	1.260	1.260	1.260
	GBVR-VGW8-8T28	VGW8344 VGW8375	1.125	GKWPL16-IN-H	6.500	2.154	1.148	1.000	1.000	1.000
				GKWPL20-IN-H	7.500	–	1.398	1.250	1.250	1.250
				GKWPL2020-H	5.421	2.311	.935	.787	.787	.787
				GKWPL2525-H	6.406	2.154	1.132	.984	.984	.984
				GKWPL3232-H	7.193	–	1.408	1.260	1.260	1.260

※Insert clamp screw : GBVR/L-VGW4/6 → CS0515 , GBVR/L-VGW8 → CS0615

OD Grooving
GROOVE DUO BLADE
VGW.. series/Toolholders

GTWP-H Straight style toolholder



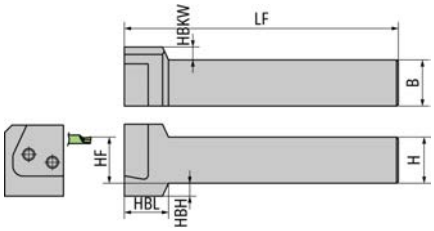
● Diagram shows right-hand tool

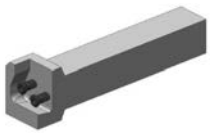
Item Number	Hand	B	H	HBH	HBL	HF	LF	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	
GTWPR16-IN-H	R	1.000	1.000	.260	.965	1.000	5.311	.567	GWPFM../VGW../RCGX../RPGX..
GTWPR20-IN-H	R	1-1/4	1-1/4	–	–	1-1/4	6.311	.817	GWPFM../VGW../RCGX../RPGX..
GTWPL16-IN-H	L	1.000	1.000	.260	.965	1.000	5.311	.567	GWPFM../VGW../RCGX../RPGX..
GTWPL20-IN-H	L	1-1/4	1-1/4	–	–	1-1/4	6.311	.817	GWPFM../VGW../RCGX../RPGX..
GTWPR2020-H	R	.787	.787	.315	1.122	.787	4.232	.354	GWPFM../VGW../RCGX../RPGX..
GTWPR2525-H	R	.984	.984	.276	.965	.984	5.217	.551	GWPFM../VGW../RCGX../RPGX..
GTWPR3232-H	R	1.260	1.260	–	–	1.260	6.004	.827	GWPFM../VGW../RCGX../RPGX..
GTWPL2020-H	L	.787	.787	.315	1.122	.787	4.232	.354	GWPFM../VGW../RCGX../RPGX..
GTWPL2525-H	L	.984	.984	.276	.965	.984	5.217	.551	GWPFM../VGW../RCGX../RPGX..
GTWPL3232-H	L	1.260	1.260	–	–	1.260	6.004	.827	GWPFM../VGW../RCGX../RPGX..

Spare Parts

Item Number	Blade	Mounting screw	Wrench (for Mounting screw)
GTWPR16-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPR20-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPL16-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPL20-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPR2020-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPR2525-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPR3232-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPL2020-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPL2525-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPL3232-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4

GKWP-H L-style toolholder





● Diagram shows right-hand tool

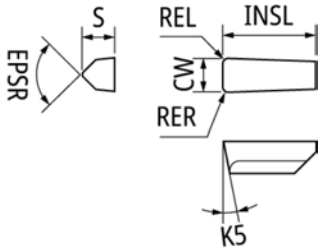
Item Number	Hand	B	H	HBH	HBKW	HBL	HF	LF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	
GKWPR16-IN-H	R	1.000	1.000	.260	.260	.945	1.000	5.961	GWPFM../VGW../RCGX../RPGX..
GKWPR20-IN-H	R	1-1/4	1-1/4	–	–	.945	1-1/4	6.961	GWPFM../VGW../RCGX../RPGX..
GKWPL16-IN-H	L	1.000	1.000	.260	.260	.945	1.000	5.961	GWPFM../VGW../RCGX../RPGX..
GKWPL20-IN-H	L	1-1/4	1-1/4	–	–	.945	1-1/4	6.961	GWPFM../VGW../RCGX../RPGX..
GKWPR2020-H	R	.787	.787	.315	.472	.945	.787	4.882	GWPFM../VGW../RCGX../RPGX..
GKWPR2525-H	R	.984	.984	.276	.276	.945	.984	5.866	GWPFM../VGW../RCGX../RPGX..
GKWPR3232-H	R	1.260	1.260	–	–	–	1.260	6.654	GWPFM../VGW../RCGX../RPGX..
GKWPL2020-H	L	.787	.787	.315	.472	.945	.787	4.882	GWPFM../VGW../RCGX../RPGX..
GKWPL2525-H	L	.984	.984	.276	.276	.945	.984	5.866	GWPFM../VGW../RCGX../RPGX..
GKWPL3232-H	L	1.260	1.260	–	–	–	1.260	6.654	GWPFM../VGW../RCGX../RPGX..

Spare Parts

Item Number	Blade	Mounting screw	Wrench (for Mounting screw)
GKWPR16-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPR20-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPL16-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPL20-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPR2020-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPR2525-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPR3232-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPL2020-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPL2525-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPL3232-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4

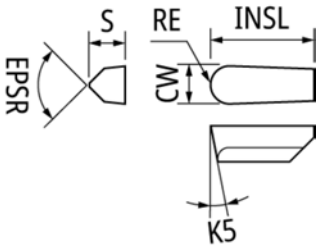
OD Grooving
GROOVE DUO BLADE
VGW.. series/Inserts BIDEMICS / Ceramics

VGW



Item Number	CW	EPSR	INSL	K5	REL	RER	S	BIDEMICS		SiAlON Ceramics				Whisker Ceramics	
	inch	°	inch	°	inch	inch	inch	JX1	JX3	SX3	SX5	SX7	SX9	533	WA1
VGW 4125-1 E02	.125	90	.500	11	.016	.016	.178	●	●	●				●	
VGW 4125-1 EA02X	.125	90	.500	11	.016	.016	.178					●	●		
VGW 4125-1 T0220	.125	90	.500	11	.016	.016	.178			●		●	●		
VGW 4125-2 E02	.125	90	.500	11	.031	.031	.178	●	●	●				●	
VGW 4125-2 EX001	.125	90	.500	11	.031	.031	.178							●	●
VGW 4125-2 EA02X	.125	90	.500	11	.031	.031	.178					●	●		
VGW 4125-2 T0220	.125	90	.500	11	.031	.031	.178			●		●	●		
VGW 4156-1 E02	.156	90	.500	11	.016	.016	.178	●	●	●				●	
VGW 4156-1 EX001	.156	90	.500	11	.016	.016	.178								●
VGW 4156-1 EA02X	.156	90	.500	11	.016	.016	.178					●	●		
VGW 4156-1 T0220	.156	90	.500	11	.016	.016	.178			●		●	●		
VGW 4156-2 E02	.156	90	.500	11	.031	.031	.178	●	●	●				●	
VGW 4156-2 EX001	.156	90	.500	11	.031	.031	.178							●	●
VGW 4156-2 EA02X	.156	90	.500	11	.031	.031	.178					●	●		
VGW 4156-2 T0220	.156	90	.500	11	.031	.031	.178			●		●	●		
VGW 4187-1 E02	.187	90	.500	11	.016	.016	.178	●	●	●				●	
VGW 4187-1 EA02X	.187	90	.500	11	.016	.016	.178					●	●		
VGW 4187-1 T0220	.187	90	.500	11	.016	.016	.178			●		●	●		
VGW 4187-2 E02	.187	90	.500	11	.031	.031	.178	●	●	●				●	
VGW 4187-2 EX001	.187	90	.500	11	.031	.031	.178							●	●
VGW 4187-2 EA02X	.187	90	.500	11	.031	.031	.178					●	●		
VGW 4187-2 T0220	.187	90	.500	11	.031	.031	.178			●	●	●	●		
VGW 6250-1 E02	.250	90	.750	11	.016	.016	.238	●	●	●				●	
VGW 6250-1 EA02X	.250	90	.750	11	.016	.016	.238					●	●		
VGW 6250-1 T0220	.250	90	.750	11	.016	.016	.238			●		●	●		●
VGW 6250-1 T0420	.250	90	.750	11	.016	.016	.238								●
VGW 6250-1 Z0420	.250	90	.750	11	.016	.016	.238								●
VGW 6250-2 E02	.250	90	.750	11	.031	.031	.238	●	●	●				●	
VGW 6250-2 EX001	.250	90	.750	11	.031	.031	.238							●	●
VGW 6250-2 EA02X	.250	90	.750	11	.031	.031	.238					●	●		
VGW 6250-2 T0220	.250	90	.750	11	.031	.031	.238			●	●	●	●		
VGW 6250-3 E02	.250	90	.750	11	.047	.047	.238	●	●						
VGW 6250-3 T0220	.250	90	.750	11	.047	.047	.238			●	●	●			
VGW 6281-4 E02	.281	90	.750	11	.063	.063	.238	●	●						
VGW 6281-4 T0220	.281	90	.750	11	.063	.063	.238			●		●			
VGW 8312-2 E02	.312	90	1.000	11	.031	.031	.327	●	●						
VGW 8312-2 EX001	.312	90	1.000	11	.031	.031	.327								●
VGW 8312-2 T0220	.312	90	1.000	11	.031	.031	.327			●		●			
VGW 8312-4 E02	.312	90	1.000	11	.063	.063	.327	●	●						
VGW 8312-4 EX001	.312	90	1.000	11	.063	.063	.327								●
VGW 8312-4 T0220	.312	90	1.000	11	.063	.063	.327			●	●	●			
VGW 8375-2 E02	.375	90	1.000	11	.031	.031	.327	●	●	●				●	
VGW 8375-2 EX001	.375	90	1.000	11	.031	.031	.327							●	●
VGW 8375-2 EA02X	.375	90	1.000	11	.031	.031	.327					●	●		
VGW 8375-2 T0220	.375	90	1.000	11	.031	.031	.327			●	●	●	●		
VGW 8375-4 E02	.375	90	1.000	11	.063	.063	.327	●	●						
VGW 8375-4 EX001	.375	90	1.000	11	.063	.063	.327								●
VGW 8375-4 T0220	.375	90	1.000	11	.063	.063	.327			●	●	●			●

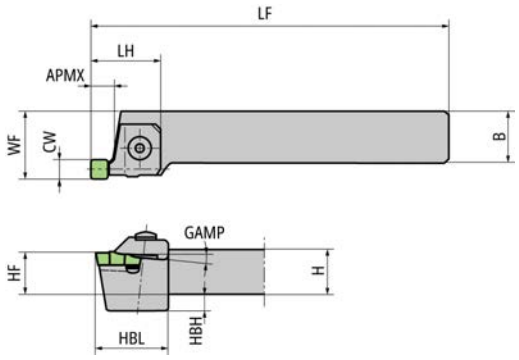
VGW-R Full Radius style

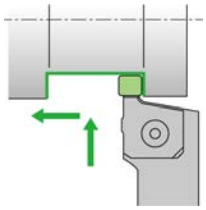


Item Number	CW	EPSR	INSL	K5	RE	S	BIDEMICS		SiAlON Ceramics				Whisker Ceramics	
	inch	°	inch	°	inch	inch	JX1	JX3	SX3	SX5	SX7	SX9	533	WA1
VGW 4125-R E02	.125	90	.500	11	.063	.178	●	●	●				●	
VGW 4125-R EX001	.125	90	.500	11	.063	.178							●	●
VGW 4125-R EA02X	.125	90	.500	11	.063	.178					●	●		
VGW 4125-R T0220	.125	90	.500	11	.063	.178			●		●	●		
VGW 4156-R E02	.156	90	.500	11	.078	.178	●	●	●				●	
VGW 4156-R EX001	.156	90	.500	11	.078	.178							●	●
VGW 4156-R EA02X	.156	90	.500	11	.078	.178					●	●		
VGW 4156-R T0220	.156	90	.500	11	.078	.178			●		●	●		●
VGW 4156-R Z0820	.156	90	.500	11	.078	.178								●
VGW 4187-R E02	.187	90	.500	11	.094	.178	●	●	●				●	
VGW 4187-R EX001	.187	90	.500	11	.094	.178							●	●
VGW 4187-R EA02X	.187	90	.500	11	.094	.178					●	●		
VGW 4187-R T0220	.187	90	.500	11	.094	.178			●	●	●	●		
VGW 6250-R E02	.250	90	.750	11	.125	.238	●	●	●				●	
VGW 6250-R EX001	.250	90	.750	11	.125	.238							●	●
VGW 6250-R EA02X	.250	90	.750	11	.125	.238					●	●		
VGW 6250-R T0220	.250	90	.750	11	.125	.238			●	●	●	●		
VGW 6281-R EX001	.281	90	.750	11	.141	.238								●
VGW 8312-R E02	.312	90	1.000	11	.156	.327	●	●						
VGW 8312-R EX001	.312	90	1.000	11	.156	.327								●
VGW 8312-R T0220	.312	90	1.000	11	.156	.327			●	●	●			
VGW 8344-R EX001	.344	90	1.000	11	.172	.327								●
VGW 8375-R E02	.375	90	1.000	11	.188	.327	●	●	●				●	
VGW 8375-R EX001	.375	90	1.000	11	.188	.327							●	
VGW 8375-R EA02X	.375	90	1.000	11	.188	.327					●	●		
VGW 8375-R T0220	.375	90	1.000	11	.188	.327			●	●	●	●		

OD Grooving
GEV / GTV.. series/Toolholders

GTV





● Diagram shows right-hand tool

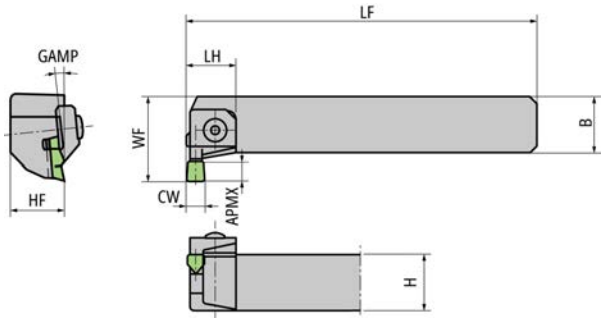
Item Number	Hand	APMX	B	CW	GAMP	H	HBH	HBL	HF	LF	LH	WF	Insert Gage	
		inch	inch	inch	°	inch	inch	inch	inch	inch	inch	inch		
GTVR16-3N	R	.433	.630	.118-.138	6	.630	.354	.984	.630	3.937	.984	.787	GEV..	–
GTVR16-4N	R	.433	.630	.157-.232	6	.630	.354	.984	.630	3.937	.984	.787	GEV..	GTV..
GTVR20-3N	R	.433	.787	.118-.138	6	.787	–	–	.787	4.921	1.260	.984	GEV..	–
GTVR20-4N	R	.433	.787	.157-.232	6	.787	–	–	.787	4.921	1.260	.984	GEV..	GTV..
GTVR20-6	R	.433	.787	.236-.311	6	.787	–	–	.787	4.921	1.260	.984	GEV..	GTV..
GTVR20-8	R	.433	.787	.315-.354	6	.787	–	–	.787	4.921	1.260	.984	GEV..	GTV..
GTVR25-3N	R	.433	.984	.118-.138	6	.984	–	–	.984	5.906	1.260	1.181	GEV..	–
GTVR25-4N	R	.433	.984	.157-.232	6	.984	–	–	.984	5.906	1.260	1.181	GEV..	GTV..
GTVR25-6	R	.433	.984	.236-.311	6	.984	–	–	.984	5.906	1.260	1.181	GEV..	GTV..
GTVR25-8	R	.433	.984	.315-.354	6	.984	–	–	.984	5.906	1.260	1.181	GEV..	GTV..
GTVL16-4N	L	.433	.630	.157-.232	6	.630	.354	.984	.630	3.937	.984	.787	GEV..	GTV..
GTVL20-4N	L	.433	.787	.157-.232	6	.787	–	–	.787	4.921	1.260	.984	GEV..	GTV..
GTVL20-6	L	.433	.787	.236-.311	6	.787	–	–	.787	4.921	1.260	.984	GEV..	GTV..
GTVL25-3N	L	.433	.984	.118-.138	6	.984	–	–	.984	5.906	1.260	1.181	GEV..	–
GTVL25-4N	L	.433	.984	.157-.232	6	.984	–	–	.984	5.906	1.260	1.181	GEV..	GTV..
GTVL25-6	L	.433	.984	.236-.311	6	.984	–	–	.984	5.906	1.260	1.181	GEV..	GTV..
GTVL25-8	L	.433	.984	.315-.354	6	.984	–	–	.984	5.906	1.260	1.181	GEV..	GTV..

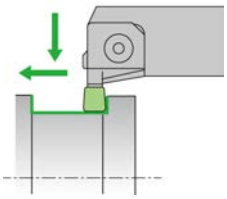
Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
GTVR16-3N	CVR3SN	AOB-5C	ASG-5	LW-3
GTVR16-4N	CVR4SN	AOB-5C	ASG-5	LW-3
GTVR20-3N	CVR3N	AOB-6C	ASG-6	LW-4
GTVR20-4N	CVR4N	AOB-6C	ASG-6	LW-4
GTVR20-6	CVR6	AOB-6C	ASG-6	LW-4
GTVR20-8	CVR8	AOB-6C	ASG-6	LW-4
GTVR25-3N	CVR3N	AOB-6C	ASG-6	LW-4
GTVR25-4N	CVR4N	AOB-6C	ASG-6	LW-4
GTVR25-6	CVR6	AOB-6C	ASG-6	LW-4
GTVR25-8	CVR8	AOB-6C	ASG-6	LW-4
GTVL16-4N	CVL4SN	AOB-5C	ASG-5	LW-3
GTVL20-4N	CVL4N	AOB-6C	ASG-6	LW-4
GTVL20-6	CVL6	AOB-6C	ASG-6	LW-4
GTVL25-3N	CVL3N	AOB-6C	ASG-6	LW-4
GTVL25-4N	CVL4N	AOB-6C	ASG-6	LW-4
GTVL25-6	CVL6	AOB-6C	ASG-6	LW-4
GTVL25-8	CVL8	AOB-6C	ASG-6	LW-4

OD Grooving
GEV / GTV.. series/Toolholders

GKV





● Diagram shows right-hand tool

Item Number	Hand	APMX	B	CW	GAMP	H	HF	LF	LH	WF	Insert Gage	
		inch	inch	inch	°	inch	inch	inch	inch	inch		
GKVR20-4N	R	.433	.787	.157-.232	6	.787	.787	4.921	1.260	1.299	GEV..	GTV..
GKVR20-6	R	.433	.787	.236-.311	6	.787	.787	4.921	1.260	1.299	GEV..	GTV..
GKVR25-4N	R	.433	.984	.157-.232	6	.984	.984	5.906	1.260	1.496	GEV..	GTV..
GKVR25-6	R	.433	.984	.236-.311	6	.984	.984	5.906	1.260	1.496	GEV..	GTV..
GKVL20-4N	L	.433	.787	.157-.232	6	.787	.787	4.921	1.260	1.299	GEV..	GTV..
GKVL25-4N	L	.433	.984	.157-.232	6	.984	.984	5.906	1.260	1.496	GEV..	GTV..
GKVL25-6	L	.433	.984	.236-.311	6	.984	.984	5.906	1.260	1.496	GEV..	GTV..

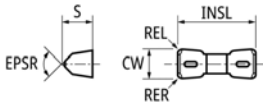
Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
GKVR20-4N	CVR4N	AOB-6C	ASG-6	LW-4
GKVR20-6	CVR6	AOB-6C	ASG-6	LW-4
GKVR25-4N	CVR4N	AOB-6C	ASG-6	LW-4
GKVR25-6	CVR6	AOB-6C	ASG-6	LW-4
GKVL20-4N	CVL4N	AOB-6C	ASG-6	LW-4
GKVL25-4N	CVL4N	AOB-6C	ASG-6	LW-4
GKVL25-6	CVL6	AOB-6C	ASG-6	LW-4

OD Grooving

GEV / GTV.. series/Insert Carbide

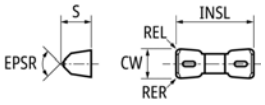
GEV



Item Number	Hand	Chipbreaker	CW	EPSR	INSL	REL	RER	S	Carbide
									PVD
			inch	°	inch	inch	inch	inch	QM3
GEV300N	N	Yes	.118	90	.787	.008	.008	.205	●
GEV300N04	N	Yes	.118	90	.787	.016	.016	.205	●
GEV350N04	N	Yes	.138	90	.787	.016	.016	.205	●
GEV400N	N	Yes	.157	90	.787	.008	.008	.335	●
GEV400N04	N	Yes	.157	90	.787	.016	.016	.335	●
GEV450N04	N	Yes	.177	90	.787	.016	.016	.335	●
GEV500N	N	Yes	.197	90	.787	.008	.008	.335	●
GEV500N04	N	Yes	.197	90	.787	.016	.016	.335	●
GEV550N04	N	Yes	.217	90	.787	.016	.016	.335	●
GEV600N	N	Yes	.236	90	.787	.008	.008	.335	●
GEV600N04	N	Yes	.236	90	.787	.016	.016	.335	●
GEV650N04	N	Yes	.256	90	.787	.016	.016	.335	●
GEV700N04	N	Yes	.276	90	.787	.016	.016	.335	●
GEV750N04	N	Yes	.295	90	.787	.016	.016	.335	●
GEV800N04	N	Yes	.315	90	.787	.016	.016	.335	●

GTV

No.1



No.2

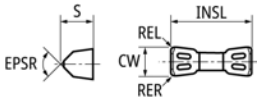
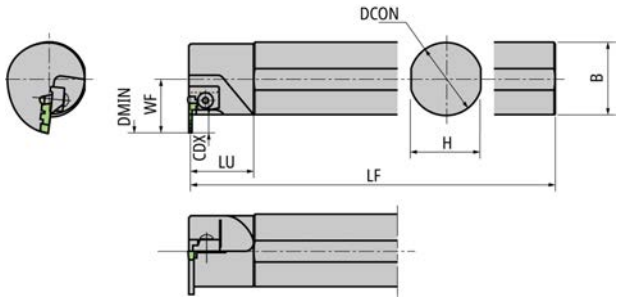


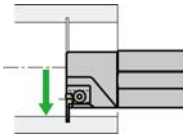
Figure	Item Number	Hand	Chipbreaker	CW	EPSR	INSL	REL	RER	S	Carbide
										PVD
				inch	°	inch	inch	inch	inch	QM3
1	**GTV400N**	N	Yes	.157	90	.787	.006	.006	.335	●
1	**GTV400N04**	N	Yes	.157	90	.787	.016	.016	.335	●
2	**GTV600N**	N	Yes	.236	90	.787	.006	.006	.335	●
2	**GTV600N04**	N	Yes	.236	90	.787	.016	.016	.335	●

ID Grooving

GEV.. series/Toolholders

GKV-3





● Diagram shows right-hand tool

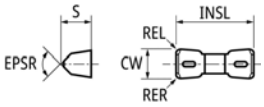
Item Number	Hand	DMIN	APMX	B	CDX	DCON	H	LF	LU	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	inch	inch	
GKVR3230-3	R	1.181	.217	1.220	.236	1.260	1.181	7.874	1.969	.827	GEV..
GKVR3240-3	R	1.575	.295	1.220	.315	1.260	1.181	9.843	1.969	.906	GEV..
GKVR4055-3	R	2.165	.374	1.535	.394	1.575	1.496	11.811	1.378	1.142	GEV..

Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
GKVR3230-3	CVL3SN	AOB-5C	ASG-5	LW-3
GKVR3240-3	CVL3SN	AOB-5C	ASG-5	LW-3
GKVR4055-3	CVL3SN	AOB-5C	ASG-5	LW-3

GEV.. series/Insert Carbide

GEV

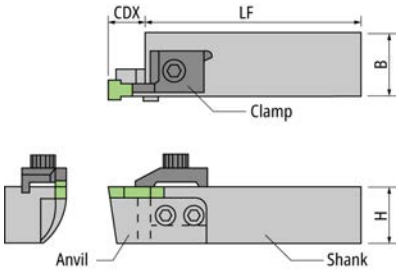


Item Number	Hand	Chipbreaker	CW	EPSR	INSL	REL	RER	S	Carbide
									PVD
			inch	°	inch	inch	inch	inch	QM3
GEV300N	N	Yes	.118	90	.787	.008	.008	.205	●
GEV300N04	N	Yes	.118	90	.787	.016	.016	.205	●
GEV350N04	N	Yes	.138	90	.787	.016	.016	.205	●

Face Grooving
VDB.. series/Toolholder

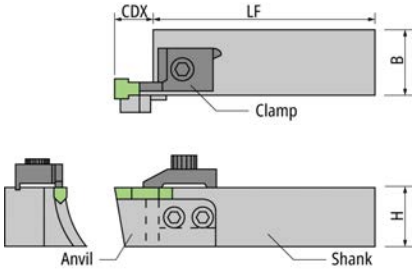
DB7

Curve In



● Diagram shows right-hand tool

Curve Out



● Diagram shows right-hand tool

Item Number	Hand	B	CDX	H	LF	Insert Gage
		inch	inch	inch	inch	
DB7-1-7-16R	R	1.000	.750	1.000	6.000	VDB../VDB..R..
DB7-1-7-20R	R	1.250	.750	1.250	7.000	VDB../VDB..R..
DB7-1-7-16L	L	1.000	.750	1.000	6.000	VDB../VDB..R..
DB7-1-7-20L	L	1.250	.750	1.250	7.000	VDB../VDB..R..

Spare Parts

Curve In

Shank	Insert	O.D. range				Clamp	Anvil screw	Clamp screw
		3" - 4 1/2"	4 1/2" - 7"	7" - 14"	14" and over			
DB7-1-7-16R DB7-1-7-20R	VDB156/VDB188	DBA-3305	DBA-3405	DBA-3505	DBA-3605	CR1-1-E06A	DAS41	SC40F10
	VDB250	DBA-3307	DBA-3407	DBA-3507	DBA-3607	CR1-1-E07A		
	VDB281/VDB312	DBA-3309	DBA-3309	DBA-3509	DBA-3509	CR1-1-E09A		
	VDB344/VDB375	DBA-3311	DBA-3311	DBA-3511	DBA-3511	CR1-1-E11A		
DB7-1-7-16L DB7-1-7-20L	VDB156/VDB188	DBA-7305	DBA-7405	DBA-7505	DBA-7605	CL1-1-E06A	DAS41	SC40F10
	VDB250	DBA-7307	DBA-7407	DBA-7507	DBA-7607	CL1-1-E07A		
	VDB281/VDB312	DBA-7309	DBA-7309	DBA-7509	DBA-7509	CL1-1-E09A		
	VDB344/VDB375	DBA-7311	DBA-7311	DBA-7511	DBA-7511	CL1-1-E11A		

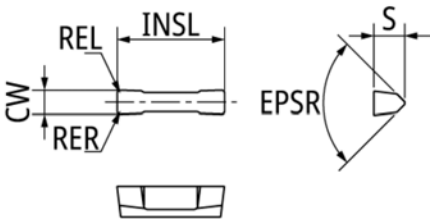
Curve Out

Shank	Insert	O.D. range				Clamp	Anvil screw	Clamp screw
		3" - 4 1/2"	4 1/2" - 7"	7" - 14"	14" and over			
DB7-1-7-16R DB7-1-7-20R	VDB156/VDB188	DBA-4305	DBA-4405	DBA-4505	DBA-4605	CR1-1-E06A	DAS41	SC40F10
	VDB250	DBA-4307	DBA-4407	DBA-4507	DBA-4607	CR1-1-E07A		
	VDB281/VDB312	DBA-4309	DBA-4309	DBA-4509	DBA-4509	CR1-1-E09A		
	VDB344/VDB375	DBA-4311	DBA-4311	DBA-4511	DBA-4511	CR1-1-E11A		
DB7-1-7-16L DB7-1-7-20L	VDB156/VDB188	DBA-8305	DBA-8405	DBA-8505	DBA-8605	CL1-1-E06A	DAS41	SC40F10
	VDB250	DBA-8307	DBA-8407	DBA-8507	DBA-8607	CL1-1-E07A		
	VDB281/VDB312	DBA-8309	DBA-8309	DBA-8509	DBA-8509	CL1-1-E09A		
	VDB344/VDB375	DBA-8311	DBA-8311	DBA-8511	DBA-8511	CL1-1-E11A		

Note: Toolholder body comes with anvil screw and clamp screw. Anvils and Clamps are sold separately.

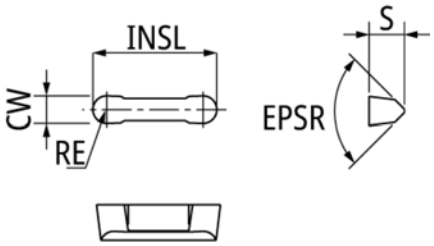
Face Grooving
VDB.. series/Inserts Ceramics

VDB



Item Number	CW	EPSR	INSL	REL	RER	S	SiAlON		Whisker	Alumina-TiC
	inch	°	inch	inch	inch	inch	SX9	SX5	WA1	HC2
VDB 125 A015 T00525	.125	90	1.125	.015	.015	1/4				●
VDB 156 A015 T00525	.156	90	1.125	.015	.015	1/4				●
VDB 188 A015 T00525	.188	90	1.125	.015	.015	1/4				●
VDB 218 A015 T00525	.218	90	1.125	.015	.015	1/4				●
VDB 250 B015 T00525	.250	90	1.125	.015	.015	.337				●
VDB 250 B031 T00520	.250	90	1.125	.031	.031	.337	●	●	●	
VDB 250 B062 T00520	.250	90	1.125	.062	.062	.337	●			
VDB 281 B015 T00525	.281	90	1.125	.015	.015	.337				●
VDB 312 B015 T00525	.312	90	1.125	.015	.015	.337				●
VDB 312 B031 EX0001	.312	90	1.125	.031	.031	.337			●	
VDB 312 B031 T00520	.312	90	1.125	.031	.031	.337		●		
VDB 312 B062 EX0001	.312	90	1.125	.062	.062	.337			●	
VDB 312 B062 T00520	.312	90	1.125	.062	.062	.337		●		
VDB 344 B015 T00525	.344	90	1.125	.015	.015	.337				●
VDB 375 B015 T00525	.375	90	1.125	.015	.015	.337				●
VDB 375 B031 EX0001	.375	90	1.125	.031	.031	.337			●	
VDB 375 B031 T00520	.375	90	1.125	.031	.031	.337		●		
VDB 375 B046 E004	.375	90	1.125	.046	.046	.337	●			
VDB 375 B046 T00520	.375	90	1.125	.046	.046	.337	●			
VDB 375 B062 E004	.375	90	1.125	.062	.062	.337	●			
VDB 375 B062 T00520	.375	90	1.125	.062	.062	.337	●	●		

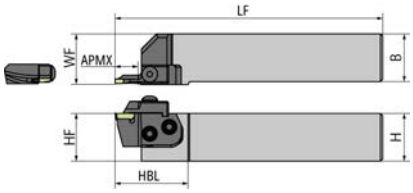
VDB-R Full Radius style



Item Number	CW	EPSR	INSL	RE	S	SiAlON		Whisker	Alumina-TiC
	inch	°	inch	inch	inch	SX9	SX5	WA1	HC2
VDB 125 RA T00525	.125	90	1.125	.063	1/4				●
VDB 156 RA T00525	.156	90	1.125	.078	1/4				●
VDB 188 RA T00525	.188	90	1.125	.094	1/4				●
VDB 218 RA T00525	.218	90	1.125	.109	1/4				●
VDB 250 RB T00520	.250	90	1.125	.125	.337		●	●	
VDB 250 RB T00525	.250	90	1.125	.125	.337				●
VDB 281 RB T00525	.281	90	1.125	.141	.337				●
VDB 312 RB T00525	.312	90	1.125	.156	.337				●
VDB 344 RB T00525	.344	90	1.125	.172	.337				●
VDB 375 RB T00525	.375	90	1.125	.188	.337				●

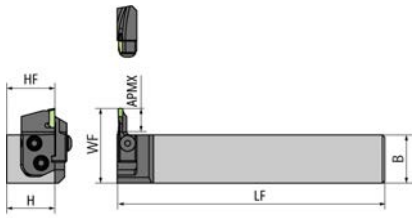
Face Grooving
VGW.. series/Toolholder
GBI-VGW-R

For GTWPR



● Diagram shows right-hand tool

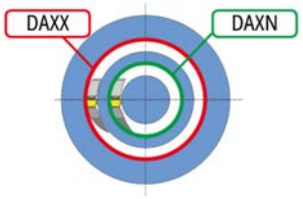
For GKWPL



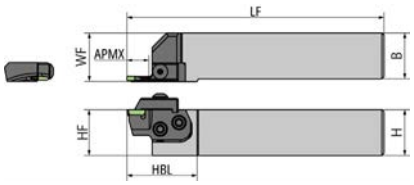
● Diagram shows left-hand tool

Curve	Blade number	O.D. range	Dimensions(inch)	Holder	Insert	Dimensions(inch)					
			APMX			LF	HBL	WF	H	B	HF
In	GBI-VGW4R3T15-101177	4"-7"	.600	GTWPR16-IN-H	VGW4125	6.000	1.909	1.055	1.000	1.000	1.000
				GKWPL16-IN-H	VGW4156	5.952	-	1.949	1.000	1.000	1.000
				GTWPR20-IN-H	VGW4125	7.000	1.909	1.305	1.250	1.250	1.250
				GKWPL20-IN-H	VGW4156	6.952	-	1.939	1.250	1.250	1.250
				GTWPR2020-H	VGW4125	4.921	1.909	.842	.787	.787	.787
				GKWPL2020-H	VGW4156	4.873	-	1.949	.787	.787	.787
				GTWPR2525-H	VGW4125	5.906	1.909	1.039	.984	.984	.984
				GKWPL2525-H	VGW4156	5.857	-	1.949	.984	.984	.984
				GTWPR3232-H	VGW4125	6.693	1.909	1.315	1.260	1.260	1.260
				GKWPL3232-H	VGW4156	6.645	-	1.949	1.260	1.260	1.260
	GBI-VGW4R3T15-177999	7" and over	.600	GTWPR16-IN-H	VGW4125	6.000	1.909	1.055	1.000	1.000	1.000
				GKWPL16-IN-H	VGW4156	5.952	-	1.949	1.000	1.000	1.000
				GTWPR20-IN-H	VGW4125	7.000	1.909	1.305	1.250	1.250	1.250
				GKWPL20-IN-H	VGW4156	6.952	-	1.939	1.250	1.250	1.250
				GTWPR2020-H	VGW4125	4.921	1.909	.842	.787	.787	.787
				GKWPL2020-H	VGW4156	4.873	-	1.949	.787	.787	.787
				GTWPR2525-H	VGW4125	5.906	1.909	1.039	.984	.984	.984
				GKWPL2525-H	VGW4156	5.857	-	1.949	.984	.984	.984
				GTWPR3232-H	VGW4125	6.693	1.909	1.315	1.260	1.260	1.260
				GKWPL3232-H	VGW4156	6.645	-	1.949	1.260	1.260	1.260
	GBI-VGW4R4T15-101177	4"-7"	.600	GTWPR16-IN-H	VGW4156	6.000	1.909	1.058	1.000	1.000	1.000
				GKWPL16-IN-H	VGW4187	5.956	-	1.949	1.000	1.000	1.000
				GTWPR20-IN-H	VGW4156	7.000	1.909	1.308	1.250	1.250	1.250
				GKWPL20-IN-H	VGW4187	6.956	-	1.939	1.250	1.250	1.250
				GTWPR2020-H	VGW4156	4.921	1.909	.846	.787	.787	.787
				GKWPL2020-H	VGW4187	4.877	-	1.949	.787	.787	.787
				GTWPR2525-H	VGW4156	5.906	1.909	1.043	.984	.984	.984
				GKWPL2525-H	VGW4187	5.861	-	1.949	.984	.984	.984
				GTWPR3232-H	VGW4156	6.693	1.909	1.318	1.260	1.260	1.260
				GKWPL3232-H	VGW4187	6.649	-	1.949	1.260	1.260	1.260
	GBI-VGW4R4T15-177999	7" and over	.600	GTWPR16-IN-H	VGW4156	6.000	1.909	1.058	1.000	1.000	1.000
				GKWPL16-IN-H	VGW4187	5.956	-	1.949	1.000	1.000	1.000
				GTWPR20-IN-H	VGW4156	7.000	1.909	1.308	1.250	1.250	1.250
				GKWPL20-IN-H	VGW4187	6.956	-	1.939	1.250	1.250	1.250
				GTWPR2020-H	VGW4156	4.921	1.909	.846	.787	.787	.787
				GKWPL2020-H	VGW4187	4.877	-	1.949	.787	.787	.787
				GTWPR2525-H	VGW4156	5.906	1.909	1.043	.984	.984	.984
				GKWPL2525-H	VGW4187	5.861	-	1.949	.984	.984	.984
				GTWPR3232-H	VGW4156	6.693	1.909	1.318	1.260	1.260	1.260
				GKWPL3232-H	VGW4187	6.649	-	1.949	1.260	1.260	1.260
	GBI-VGW6R6T15-101177	4"-7"	.600	GTWPR16-IN-H	VGW6218	6.000	1.909	1.078	1.000	1.000	1.000
				GKWPL16-IN-H	VGW6250	5.976	-	1.949	1.000	1.000	1.000
				GTWPR20-IN-H	VGW6218	7.000	1.909	1.328	1.250	1.250	1.250
				GKWPL20-IN-H	VGW6250	6.976	-	1.939	1.250	1.250	1.250
				GTWPR2020-H	VGW6218	4.921	1.909	.865	.787	.787	.787
				GKWPL2020-H	VGW6250	4.897	-	1.949	.787	.787	.787
				GTWPR2525-H	VGW6218	5.906	1.909	1.062	.984	.984	.984
				GKWPL2525-H	VGW6250	5.881	-	1.949	.984	.984	.984
				GTWPR3232-H	VGW6218	6.693	1.909	1.338	1.260	1.260	1.260
				GKWPL3232-H	VGW6250	6.669	-	1.949	1.260	1.260	1.260
	GBI-VGW6R6T15-177999	7" and over	.600	GTWPR16-IN-H	VGW6218	6.000	1.909	1.082	1.000	1.000	1.000
				GKWPL16-IN-H	VGW6250	5.980	-	1.949	1.000	1.000	1.000
				GTWPR20-IN-H	VGW6218	7.000	1.909	1.332	1.250	1.250	1.250
				GKWPL20-IN-H	VGW6250	6.980	-	1.939	1.250	1.250	1.250
				GTWPR2020-H	VGW6218	4.921	1.909	.869	.787	.787	.787
				GKWPL2020-H	VGW6250	4.901	-	1.949	.787	.787	.787
				GTWPR2525-H	VGW6218	5.906	1.909	1.066	.984	.984	.984
				GKWPL2525-H	VGW6250	5.885	-	1.949	.984	.984	.984
				GTWPR3232-H	VGW6218	6.693	1.909	1.342	1.260	1.260	1.260
				GKWPL3232-H	VGW6250	6.672	-	1.949	1.260	1.260	1.260

GBO-VGW-R

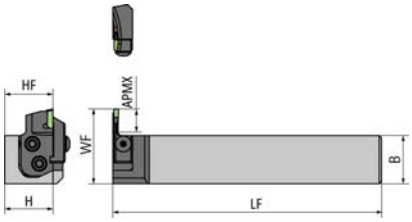


For GTWPR



● Diagram shows right-hand tool

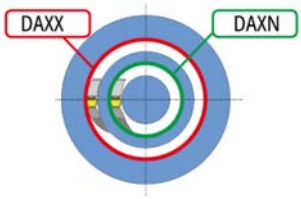
For GKWPL



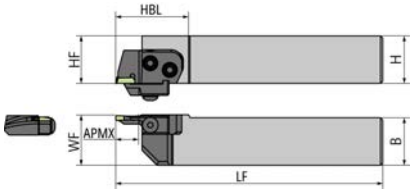
● Diagram shows left-hand tool

Curve	Blade number	O.D. range	Dimensions(inch) APMX	Holder	Insert	Dimensions(inch) LF	HBL	WF	H	B	HF
In	GBO-VGW4R3T15-101177	4"-7"	.600	GTWPR16-IN-H	VGW4125	6.000	1.909	1.055	1.000	1.000	1.000
				GKWPL16-IN-H	VGW4156	5.952	-	1.949	1.000	1.000	1.000
				GTWPR20-IN-H	VGW4125	7.000	1.909	1.305	1.250	1.250	1.250
				GKWPL20-IN-H	VGW4156	6.952	-	1.939	1.250	1.250	1.250
				GTWPR2020-H	VGW4125	4.921	1.909	.842	.787	.787	.787
				GKWPL2020-H	VGW4156	4.873	-	1.949	.787	.787	.787
				GTWPR2525-H	VGW4125	5.906	1.909	1.039	.984	.984	.984
				GKWPL2525-H	VGW4156	5.857	-	1.949	.984	.984	.984
				GTWPR3232-H	VGW4125	6.693	1.909	1.315	1.260	1.260	1.260
				GKWPL3232-H	VGW4156	6.645	-	1.949	1.260	1.260	1.260
	GBO-VGW4R3T15-177999	7" and over	.600	GTWPR16-IN-H	VGW4125	6.000	1.909	1.055	1.000	1.000	1.000
				GKWPL16-IN-H	VGW4156	5.952	-	1.949	1.000	1.000	1.000
				GTWPR20-IN-H	VGW4125	7.000	1.909	1.305	1.250	1.250	1.250
				GKWPL20-IN-H	VGW4156	6.952	-	1.939	1.250	1.250	1.250
				GTWPR2020-H	VGW4125	4.921	1.909	.842	.787	.787	.787
				GKWPL2020-H	VGW4156	4.873	-	1.949	.787	.787	.787
				GTWPR2525-H	VGW4125	5.906	1.909	1.039	.984	.984	.984
				GKWPL2525-H	VGW4156	5.857	-	1.949	.984	.984	.984
				GTWPR3232-H	VGW4125	6.693	1.909	1.315	1.260	1.260	1.260
				GKWPL3232-H	VGW4156	6.645	-	1.949	1.260	1.260	1.260
	GBO-VGW4R4T15-101177	4"-7"	.600	GTWPR16-IN-H	VGW4156	6.000	1.909	1.058	1.000	1.000	1.000
				GKWPL16-IN-H	VGW4187	5.956	-	1.949	1.000	1.000	1.000
				GTWPR20-IN-H	VGW4156	7.000	1.909	1.308	1.250	1.250	1.250
				GKWPL20-IN-H	VGW4187	6.956	-	1.939	1.250	1.250	1.250
				GTWPR2020-H	VGW4156	4.921	1.909	.846	.787	.787	.787
				GKWPL2020-H	VGW4187	4.877	-	1.949	.787	.787	.787
				GTWPR2525-H	VGW4156	5.906	1.909	1.043	.984	.984	.984
				GKWPL2525-H	VGW4187	5.861	-	1.949	.984	.984	.984
				GTWPR3232-H	VGW4156	6.693	1.909	1.318	1.260	1.260	1.260
				GKWPL3232-H	VGW4187	6.649	-	1.949	1.260	1.260	1.260
	GBO-VGW4R4T15-177999	7" and over	.600	GTWPR16-IN-H	VGW4156	6.000	1.909	1.058	1.000	1.000	1.000
				GKWPL16-IN-H	VGW4187	5.956	-	1.949	1.000	1.000	1.000
				GTWPR20-IN-H	VGW4156	7.000	1.909	1.308	1.250	1.250	1.250
				GKWPL20-IN-H	VGW4187	6.956	-	1.939	1.250	1.250	1.250
				GTWPR2020-H	VGW4156	4.921	1.909	.846	.787	.787	.787
				GKWPL2020-H	VGW4187	4.877	-	1.949	.787	.787	.787
				GTWPR2525-H	VGW4156	5.906	1.909	1.043	.984	.984	.984
				GKWPL2525-H	VGW4187	5.861	-	1.949	.984	.984	.984
				GTWPR3232-H	VGW4156	6.693	1.909	1.318	1.260	1.260	1.260
				GKWPL3232-H	VGW4187	6.649	-	1.949	1.260	1.260	1.260
	GBO-VGW6R6T15-101177	4"-7"	.600	GTWPR16-IN-H	VGW6218	6.000	1.909	1.078	1.000	1.000	1.000
				GKWPL16-IN-H	VGW6250	5.976	-	1.949	1.000	1.000	1.000
				GTWPR20-IN-H	VGW6218	7.000	1.909	1.328	1.250	1.250	1.250
				GKWPL20-IN-H	VGW6250	6.976	-	1.939	1.250	1.250	1.250
				GTWPR2020-H	VGW6218	4.921	1.909	.865	.787	.787	.787
				GKWPL2020-H	VGW6250	4.897	-	1.949	.787	.787	.787
				GTWPR2525-H	VGW6218	5.906	1.909	1.062	.984	.984	.984
				GKWPL2525-H	VGW6250	5.881	-	1.949	.984	.984	.984
				GTWPR3232-H	VGW6218	6.693	1.909	1.338	1.260	1.260	1.260
				GKWPL3232-H	VGW6250	6.669	-	1.949	1.260	1.260	1.260
	GBO-VGW6R6T15-177999	7" and over	.600	GTWPR16-IN-H	VGW6218	6.000	1.909	1.082	1.000	1.000	1.000
				GKWPL16-IN-H	VGW6250	5.980	-	1.949	1.000	1.000	1.000
				GTWPR20-IN-H	VGW6218	7.000	1.909	1.332	1.250	1.250	1.250
				GKWPL20-IN-H	VGW6250	6.980	-	1.939	1.250	1.250	1.250
				GTWPR2020-H	VGW6218	4.921	1.909	.869	.787	.787	.787
				GKWPL2020-H	VGW6250	4.901	-	1.949	.787	.787	.787
				GTWPR2525-H	VGW6218	5.906	1.909	1.066	.984	.984	.984
				GKWPL2525-H	VGW6250	5.885	-	1.949	.984	.984	.984
				GTWPR3232-H	VGW6218	6.693	1.909	1.342	1.260	1.260	1.260
				GKWPL3232-H	VGW6250	6.672	-	1.949	1.260	1.260	1.260

GBI-VGW-L

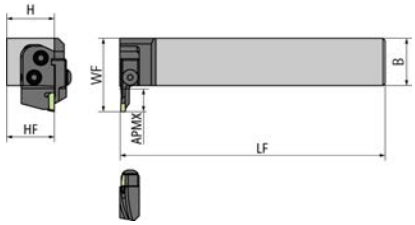


For GTWPL



● Diagram shows left-hand tool

For GKWPR

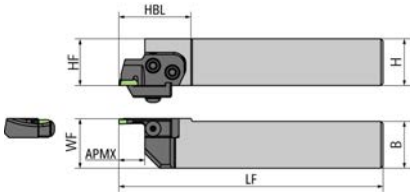


● Diagram shows right-hand tool

Curve	Blade number	O.D. range	Dimensions(inch)	Holder	Insert	Dimensions(inch)					
			APMX			LF	HBL	WF	H	B	HF
In	GBI-VGW4L3T15-101177	4"-7"	.600	GTWPL16-IN-H	VGW4125	6.000	1.909	1.055	1.000	1.000	1.000
				GKWPR16-IN-H	VGW4156	5.952	-	1.949	1.000	1.000	1.000
				GTWPL20-IN-H	VGW4125	7.000	1.909	1.305	1.250	1.250	1.250
				GKWPR20-IN-H	VGW4156	6.952	-	1.939	1.250	1.250	1.250
				GTWPL2020-H	VGW4125	4.921	1.909	.842	.787	.787	.787
				GKWPR2020-H	VGW4156	4.873	-	1.949	.787	.787	.787
				GTWPL2525-H	VGW4125	5.906	1.909	1.039	.984	.984	.984
				GKWPR2525-H	VGW4156	5.857	-	1.949	.984	.984	.984
				GTWPL3232-H	VGW4125	6.693	1.909	1.315	1.260	1.260	1.260
				GKWPR3232-H	VGW4156	6.645	-	1.949	1.260	1.260	1.260
	GBI-VGW4L3T15-177999	7" and over	.600	GTWPL16-IN-H	VGW4125	6.000	1.909	1.055	1.000	1.000	1.000
				GKWPR16-IN-H	VGW4156	5.952	-	1.949	1.000	1.000	1.000
				GTWPL20-IN-H	VGW4125	7.000	1.909	1.305	1.250	1.250	1.250
				GKWPR20-IN-H	VGW4156	6.952	-	1.939	1.250	1.250	1.250
				GTWPL2020-H	VGW4125	4.921	1.909	.842	.787	.787	.787
				GKWPR2020-H	VGW4156	4.873	-	1.949	.787	.787	.787
				GTWPL2525-H	VGW4125	5.906	1.909	1.039	.984	.984	.984
				GKWPR2525-H	VGW4156	5.857	-	1.949	.984	.984	.984
				GTWPL3232-H	VGW4125	6.693	1.909	1.315	1.260	1.260	1.260
				GKWPR3232-H	VGW4156	6.645	-	1.949	1.260	1.260	1.260
	GBI-VGW4L4T15-101177	4"-7"	.600	GTWPL16-IN-H	VGW4156	6.000	1.909	1.058	1.000	1.000	1.000
				GKWPR16-IN-H	VGW4187	5.956	-	1.949	1.000	1.000	1.000
				GTWPL20-IN-H	VGW4156	7.000	1.909	1.308	1.250	1.250	1.250
				GKWPR20-IN-H	VGW4187	6.956	-	1.939	1.250	1.250	1.250
				GTWPL2020-H	VGW4156	4.921	1.909	.846	.787	.787	.787
				GKWPR2020-H	VGW4187	4.877	-	1.949	.787	.787	.787
				GTWPL2525-H	VGW4156	5.906	1.909	1.043	.984	.984	.984
				GKWPR2525-H	VGW4187	5.861	-	1.949	.984	.984	.984
				GTWPL3232-H	VGW4156	6.693	1.909	1.318	1.260	1.260	1.260
				GKWPR3232-H	VGW4187	6.649	-	1.949	1.260	1.260	1.260
	GBI-VGW4L4T15-177999	7" and over	.600	GTWPL16-IN-H	VGW4156	6.000	1.909	1.058	1.000	1.000	1.000
				GKWPR16-IN-H	VGW4187	5.956	-	1.949	1.000	1.000	1.000
				GTWPL20-IN-H	VGW4156	7.000	1.909	1.308	1.250	1.250	1.250
				GKWPR20-IN-H	VGW4187	6.956	-	1.939	1.250	1.250	1.250
				GTWPL2020-H	VGW4156	4.921	1.909	.846	.787	.787	.787
				GKWPR2020-H	VGW4187	4.877	-	1.949	.787	.787	.787
				GTWPL2525-H	VGW4156	5.906	1.909	1.043	.984	.984	.984
				GKWPR2525-H	VGW4187	5.861	-	1.949	.984	.984	.984
				GTWPL3232-H	VGW4156	6.693	1.909	1.318	1.260	1.260	1.260
				GKWPR3232-H	VGW4187	6.649	-	1.949	1.260	1.260	1.260
	GBI-VGW6L6T15-101177	4"-7"	.600	GTWPL16-IN-H	VGW6218	6.000	1.909	1.078	1.000	1.000	1.000
				GKWPR16-IN-H	VGW6250	5.976	-	1.949	1.000	1.000	1.000
				GTWPL20-IN-H	VGW6218	7.000	1.909	1.328	1.250	1.250	1.250
				GKWPR20-IN-H	VGW6250	6.976	-	1.939	1.250	1.250	1.250
				GTWPL2020-H	VGW6218	4.921	1.909	.865	.787	.787	.787
				GKWPR2020-H	VGW6250	4.897	-	1.949	.787	.787	.787
				GTWPL2525-H	VGW6218	5.906	1.909	1.062	.984	.984	.984
				GKWPR2525-H	VGW6250	5.881	-	1.949	.984	.984	.984
				GTWPL3232-H	VGW6218	6.693	1.909	1.338	1.260	1.260	1.260
				GKWPR3232-H	VGW6250	6.669	-	1.949	1.260	1.260	1.260
	GBI-VGW6L6T15-177999	7" and over	.600	GTWPL16-IN-H	VGW6218	6.000	1.909	1.082	1.000	1.000	1.000
				GKWPR16-IN-H	VGW6250	5.980	-	1.949	1.000	1.000	1.000
				GTWPL20-IN-H	VGW6218	7.000	1.909	1.332	1.250	1.250	1.250
				GKWPR20-IN-H	VGW6250	6.980	-	1.939	1.250	1.250	1.250
				GTWPL2020-H	VGW6218	4.921	1.909	.869	.787	.787	.787
				GKWPR2020-H	VGW6250	4.901	-	1.949	.787	.787	.787
				GTWPL2525-H	VGW6218	5.906	1.909	1.066	.984	.984	.984
				GKWPR2525-H	VGW6250	5.885	-	1.949	.984	.984	.984
				GTWPL3232-H	VGW6218	6.693	1.909	1.342	1.260	1.260	1.260
				GKWPR3232-H	VGW6250	6.672	-	1.949	1.260	1.260	1.260

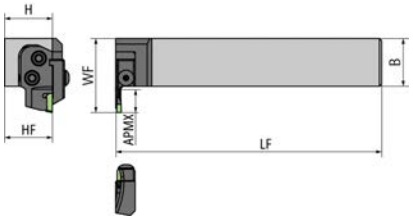
GBO-VGW-L

For GTWPL



● Diagram shows left-hand tool

For GKWPR



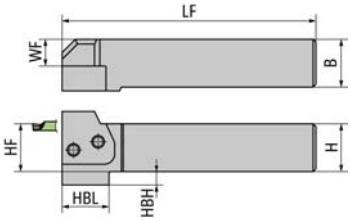
● Diagram shows right-hand tool

Curve	Blade number	O.D. range	Dimensions(inch) APMX	Holder	Insert	Dimensions(inch) LF	HBL	WF	H	B	HF
Out	GBO-VGW4L3T15-101177	4"-7"	.600	GTWPL16-IN-H	VGW4125	6.000	1.909	1.055	1.000	1.000	1.000
				GKWPR16-IN-H	VGW4156	5.952	-	1.949	1.000	1.000	1.000
				GTWPL20-IN-H	VGW4125	7.000	1.909	1.305	1.250	1.250	1.250
				GKWPR20-IN-H	VGW4156	6.952	-	1.939	1.250	1.250	1.250
				GTWPL2020-H	VGW4125	4.921	1.909	.842	.787	.787	.787
				GKWPR2020-H	VGW4156	4.873	-	1.949	.787	.787	.787
				GTWPL2525-H	VGW4125	5.906	1.909	1.039	.984	.984	.984
				GKWPR2525-H	VGW4156	5.857	-	1.949	.984	.984	.984
				GTWPL3232-H	VGW4125	6.693	1.909	1.315	1.260	1.260	1.260
				GKWPR3232-H	VGW4156	6.645	-	1.949	1.260	1.260	1.260
	GBO-VGW4L3T15-177999	7" and over	.600	GTWPL16-IN-H	VGW4125	6.000	1.909	1.055	1.000	1.000	1.000
				GKWPR16-IN-H	VGW4156	5.952	-	1.949	1.000	1.000	1.000
				GTWPL20-IN-H	VGW4125	7.000	1.909	1.305	1.250	1.250	1.250
				GKWPR20-IN-H	VGW4156	6.952	-	1.939	1.250	1.250	1.250
				GTWPL2020-H	VGW4125	4.921	1.909	.842	.787	.787	.787
				GKWPR2020-H	VGW4156	4.873	-	1.949	.787	.787	.787
				GTWPL2525-H	VGW4125	5.906	1.909	1.039	.984	.984	.984
				GKWPR2525-H	VGW4156	5.857	-	1.949	.984	.984	.984
				GTWPL3232-H	VGW4125	6.693	1.909	1.315	1.260	1.260	1.260
				GKWPR3232-H	VGW4156	6.645	-	1.949	1.260	1.260	1.260
	GBO-VGW4L4T15-101177	4"-7"	.600	GTWPL16-IN-H	VGW4156	6.000	1.909	1.058	1.000	1.000	1.000
				GKWPR16-IN-H	VGW4187	5.956	-	1.949	1.000	1.000	1.000
				GTWPL20-IN-H	VGW4156	7.000	1.909	1.308	1.250	1.250	1.250
				GKWPR20-IN-H	VGW4187	6.956	-	1.939	1.250	1.250	1.250
				GTWPL2020-H	VGW4156	4.921	1.909	.846	.787	.787	.787
				GKWPR2020-H	VGW4187	4.877	-	1.949	.787	.787	.787
				GTWPL2525-H	VGW4156	5.906	1.909	1.043	.984	.984	.984
				GKWPR2525-H	VGW4187	5.861	-	1.949	.984	.984	.984
				GTWPL3232-H	VGW4156	6.693	1.909	1.318	1.260	1.260	1.260
				GKWPR3232-H	VGW4187	6.649	-	1.949	1.260	1.260	1.260
	GBO-VGW4L4T15-177999	7" and over	.600	GTWPL16-IN-H	VGW4156	6.000	1.909	1.058	1.000	1.000	1.000
				GKWPR16-IN-H	VGW4187	5.956	-	1.949	1.000	1.000	1.000
				GTWPL20-IN-H	VGW4156	7.000	1.909	1.308	1.250	1.250	1.250
				GKWPR20-IN-H	VGW4187	6.956	-	1.939	1.250	1.250	1.250
				GTWPL2020-H	VGW4156	4.921	1.909	.846	.787	.787	.787
				GKWPR2020-H	VGW4187	4.877	-	1.949	.787	.787	.787
				GTWPL2525-H	VGW4156	5.906	1.909	1.043	.984	.984	.984
				GKWPR2525-H	VGW4187	5.861	-	1.949	.984	.984	.984
				GTWPL3232-H	VGW4156	6.693	1.909	1.318	1.260	1.260	1.260
				GKWPR3232-H	VGW4187	6.649	-	1.949	1.260	1.260	1.260
	GBO-VGW6L6T15-101177	4"-7"	.600	GTWPL16-IN-H	VGW6218	6.000	1.909	1.078	1.000	1.000	1.000
				GKWPR16-IN-H	VGW6250	5.976	-	1.949	1.000	1.000	1.000
				GTWPL20-IN-H	VGW6218	7.000	1.909	1.328	1.250	1.250	1.250
				GKWPR20-IN-H	VGW6250	6.976	-	1.939	1.250	1.250	1.250
				GTWPL2020-H	VGW6218	4.921	1.909	.865	.787	.787	.787
				GKWPR2020-H	VGW6250	4.897	-	1.949	.787	.787	.787
				GTWPL2525-H	VGW6218	5.906	1.909	1.062	.984	.984	.984
				GKWPR2525-H	VGW6250	5.881	-	1.949	.984	.984	.984
				GTWPL3232-H	VGW6218	6.693	1.909	1.338	1.260	1.260	1.260
				GKWPR3232-H	VGW6250	6.669	-	1.949	1.260	1.260	1.260
	GBO-VGW6L6T15-177999	7" and over	.600	GTWPL16-IN-H	VGW6218	6.000	1.909	1.082	1.000	1.000	1.000
				GKWPR16-IN-H	VGW6250	5.980	-	1.949	1.000	1.000	1.000
				GTWPL20-IN-H	VGW6218	7.000	1.909	1.332	1.250	1.250	1.250
				GKWPR20-IN-H	VGW6250	6.980	-	1.939	1.250	1.250	1.250
				GTWPL2020-H	VGW6218	4.921	1.909	.869	.787	.787	.787
				GKWPR2020-H	VGW6250	4.901	-	1.949	.787	.787	.787
				GTWPL2525-H	VGW6218	5.906	1.909	1.066	.984	.984	.984
				GKWPR2525-H	VGW6250	5.885	-	1.949	.984	.984	.984
				GTWPL3232-H	VGW6218	6.693	1.909	1.342	1.260	1.260	1.260
				GKWPR3232-H	VGW6250	6.672	-	1.949	1.260	1.260	1.260

Face Grooving
GROOVE DUO BLADE

VGW.. series/Toolholder

GTWP-H Straight style toolholder



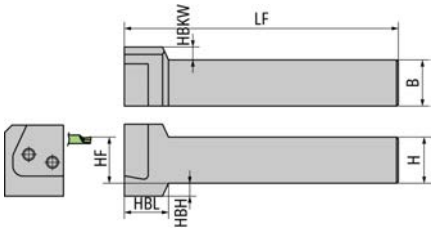
● Diagram shows right-hand tool

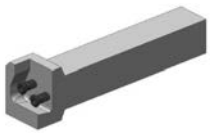
Item Number	Hand	B	H	HBH	HBL	HF	LF	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	
GTWPR16-IN-H	R	1.000	1.000	.260	.965	1.000	5.311	.567	GWPFM../VGW../RCGX../RPGX..
GTWPR20-IN-H	R	1-1/4	1-1/4	–	–	1-1/4	6.311	.817	GWPFM../VGW../RCGX../RPGX..
GTWPL16-IN-H	L	1.000	1.000	.260	.965	1.000	5.311	.567	GWPFM../VGW../RCGX../RPGX..
GTWPL20-IN-H	L	1-1/4	1-1/4	–	–	1-1/4	6.311	.817	GWPFM../VGW../RCGX../RPGX..
GTWPR2020-H	R	.787	.787	.315	1.122	.787	4.232	.354	GWPFM../VGW../RCGX../RPGX..
GTWPR2525-H	R	.984	.984	.276	.965	.984	5.217	.551	GWPFM../VGW../RCGX../RPGX..
GTWPR3232-H	R	1.260	1.260	–	–	1.260	6.004	.827	GWPFM../VGW../RCGX../RPGX..
GTWPL2020-H	L	.787	.787	.315	1.122	.787	4.232	.354	GWPFM../VGW../RCGX../RPGX..
GTWPL2525-H	L	.984	.984	.276	.965	.984	5.217	.551	GWPFM../VGW../RCGX../RPGX..
GTWPL3232-H	L	1.260	1.260	–	–	1.260	6.004	.827	GWPFM../VGW../RCGX../RPGX..

Spare Parts

Item Number	Blade	Mounting screw	Wrench (for Mounting screw)
GTWPR16-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPR20-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPL16-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPL20-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPR2020-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPR2525-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPR3232-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPL2020-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPL2525-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPL3232-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4

GKWP-H L-style toolholder





● Diagram shows right-hand tool

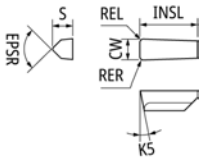
Item Number	Hand	B	H	HBH	HBKW	HBL	HF	LF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	
GKWPR16-IN-H	R	1.000	1.000	.260	.260	.945	1.000	5.961	GWPFM../VGW../RCGX../RPGX..
GKWPR20-IN-H	R	1-1/4	1-1/4	–	–	.945	1-1/4	6.961	GWPFM../VGW../RCGX../RPGX..
GKWPL16-IN-H	L	1.000	1.000	.260	.260	.945	1.000	5.961	GWPFM../VGW../RCGX../RPGX..
GKWPL20-IN-H	L	1-1/4	1-1/4	–	–	.945	1-1/4	6.961	GWPFM../VGW../RCGX../RPGX..
GKWPR2020-H	R	.787	.787	.315	.472	.945	.787	4.882	GWPFM../VGW../RCGX../RPGX..
GKWPR2525-H	R	.984	.984	.276	.276	.945	.984	5.866	GWPFM../VGW../RCGX../RPGX..
GKWPR3232-H	R	1.260	1.260	–	–	–	1.260	6.654	GWPFM../VGW../RCGX../RPGX..
GKWPL2020-H	L	.787	.787	.315	.472	.945	.787	4.882	GWPFM../VGW../RCGX../RPGX..
GKWPL2525-H	L	.984	.984	.276	.276	.945	.984	5.866	GWPFM../VGW../RCGX../RPGX..
GKWPL3232-H	L	1.260	1.260	–	–	–	1.260	6.654	GWPFM../VGW../RCGX../RPGX..

Spare Parts

Item Number	Blade	Mounting screw	Wrench (for Mounting screw)
GKWPR16-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPR20-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPL16-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPL20-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPR2020-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPR2525-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPR3232-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPL2020-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPL2525-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPL3232-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4

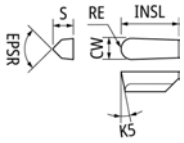
Face Grooving
GROOVE DUO BLADE
VGW.. series/Inserts BIDEMICS / Ceramics

VGW



Item Number	CW	EPSR	INSL	K5	REL	RER	S	BIDEMICS		SiAlON Ceramics			Whisker Ceramics	
	inch	°	inch	°	inch	inch	inch	JX1	JX3	SX3	SX7	SX9	533	WA1
VGW 4125-1 E02	.125	90	.500	11	.016	.016	.178	●	●	●			●	
VGW 4125-1 EA02X	.125	90	.500	11	.016	.016	.178				●	●		
VGW 4125-1 T0220	.125	90	.500	11	.016	.016	.178			●	●	●		
VGW 4125-2 E02	.125	90	.500	11	.031	.031	.178	●	●	●			●	
VGW 4125-2 EX001	.125	90	.500	11	.031	.031	.178						●	●
VGW 4125-2 EA02X	.125	90	.500	11	.031	.031	.178				●	●		
VGW 4125-2 T0220	.125	90	.500	11	.031	.031	.178			●	●	●		
VGW 4156-1 E02	.156	90	.500	11	.016	.016	.178	●	●	●			●	
VGW 4156-1 EA02X	.156	90	.500	11	.016	.016	.178				●	●		
VGW 4156-1 T0220	.156	90	.500	11	.016	.016	.178			●	●	●		
VGW 4156-2 E02	.156	90	.500	11	.031	.031	.178	●	●	●			●	
VGW 4156-2 EX001	.156	90	.500	11	.031	.031	.178						●	●
VGW 4156-2 EA02X	.156	90	.500	11	.031	.031	.178				●	●		
VGW 4156-2 T0220	.156	90	.500	11	.031	.031	.178			●	●	●		
VGW 4187-1 E02	.187	90	.500	11	.016	.016	.178	●	●	●			●	
VGW 4187-1 EA02X	.187	90	.500	11	.016	.016	.178				●	●		
VGW 4187-1 T0220	.187	90	.500	11	.016	.016	.178			●	●	●		
VGW 4187-2 E02	.187	90	.500	11	.031	.031	.178	●	●	●			●	
VGW 4187-2 EX001	.187	90	.500	11	.031	.031	.178						●	●
VGW 4187-2 EA02X	.187	90	.500	11	.031	.031	.178				●	●		
VGW 4187-2 T0220	.187	90	.500	11	.031	.031	.178			●	●	●		
VGW 6250-1 E02	.250	90	.750	11	.016	.016	.238	●	●	●			●	
VGW 6250-1 EA02X	.250	90	.750	11	.016	.016	.238				●	●		
VGW 6250-1 T0220	.250	90	.750	11	.016	.016	.238			●	●	●		●
VGW 6250-2 E02	.250	90	.750	11	.031	.031	.238	●	●	●			●	
VGW 6250-2 EX001	.250	90	.750	11	.031	.031	.238						●	●
VGW 6250-2 EA02X	.250	90	.750	11	.031	.031	.238				●	●		
VGW 6250-2 T0220	.250	90	.750	11	.031	.031	.238			●	●	●		
VGW 6250-3 E02	.250	90	.750	11	.047	.047	.238	●	●					
VGW 6281-4 E02	.281	90	.750	11	.063	.063	.238	●	●					
VGW 6281-4 T0220	.281	90	.750	11	.063	.063	.238			●	●			
VGW 8375-2 E02	.375	90	1.000	11	.031	.031	.327	●	●	●			●	
VGW 8375-2 EX001	.375	90	1.000	11	.031	.031	.327						●	●
VGW 8375-2 EA02X	.375	90	1.000	11	.031	.031	.327				●	●		
VGW 8375-2 T0220	.375	90	1.000	11	.031	.031	.327			●	●	●		

VGW-R Full Radius style

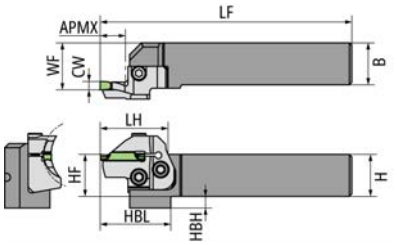


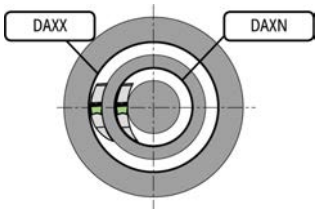
Item Number	CW	EPSR	INSL	K5	RE	S	BIDEMICS		SiAlON Ceramics			Whisker Ceramics	
	inch	°	inch	°	inch	inch	JX1	JX3	SX3	SX7	SX9	533	WA1
VGW 4125-R E02	.125	90	.500	11	.063	.178	●	●	●			●	
VGW 4125-R EX001	.125	90	.500	11	.063	.178						●	●
VGW 4125-R EA02X	.125	90	.500	11	.063	.178				●	●		
VGW 4125-R T0220	.125	90	.500	11	.063	.178			●	●	●		
VGW 4156-R E02	.156	90	.500	11	.078	.178	●	●	●			●	
VGW 4156-R EX001	.156	90	.500	11	.078	.178						●	●
VGW 4156-R EA02X	.156	90	.500	11	.078	.178				●	●		
VGW 4156-R T0220	.156	90	.500	11	.078	.178			●	●	●		●
VGW 4187-R E02	.187	90	.500	11	.094	.178	●	●	●			●	
VGW 4187-R EX001	.187	90	.500	11	.094	.178						●	●
VGW 4187-R EA02X	.187	90	.500	11	.094	.178				●	●		
VGW 4187-R T0220	.187	90	.500	11	.094	.178			●	●	●		
VGW 6250-R E02	.250	90	.750	11	.125	.238	●	●	●			●	
VGW 6250-R EX001	.250	90	.750	11	.125	.238						●	●
VGW 6250-R EA02X	.250	90	.750	11	.125	.238				●	●		
VGW 6250-R T0220	.250	90	.750	11	.125	.238			●	●	●		
VGW 6281-R EX001	.281	90	.750	11	.141	.238							●
VGW 8344-R EX001	.344	90	1.000	11	.172	.327							●
VGW 8375-R E02	.375	90	1.000	11	.188	.327	●	●	●			●	
VGW 8375-R EX001	.375	90	1.000	11	.188	.327						●	
VGW 8375-R EA02X	.375	90	1.000	11	.188	.327				●	●		
VGW 8375-R T0220	.375	90	1.000	11	.188	.327			●	●	●		

Face Grooving
GROOVE DUO BLADE

GWPFM.. series/For straight style toolholder

GTWPR



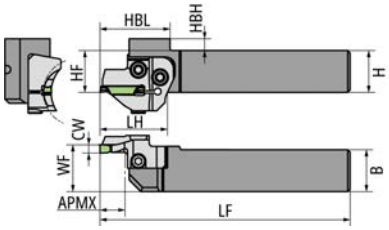


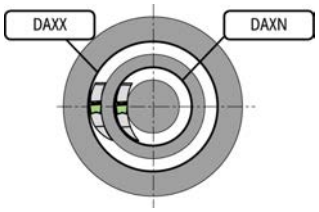
- Diagram shows right-hand tool
- Insert clamp screw : CS0515

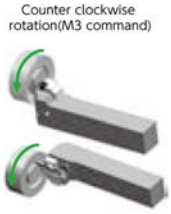
Holder	Width (inch)	Face grooving OD		Max grooving depth (inch)	Blade number	Insert	Dimensions (inch)							
	CW	Min DAXN	Max DAXX	APMX			H	B	LF	LH	HF	WF	HBL	HBH
GTWPR16-IN-H	.118	1.142	1.378	.512	GBWPFR-3T13-029035	GWPFM300	1	1	6	1.614	1	.102	1.654	.260
		1.378	1.772	.512	GBWPFR-3T13-035045									
		1.772	2.362	.591	GBWPFR-3T15-045060									
		2.362	3.937	.591	GBWPFR-3T15-060100									
		3.937	9.843	.591	GBWPFR-3T15-100250									
	.157	1.181	1.575	.591	GBWPFR-4T15-030040	GWPFM400								
		1.575	2.362	.591	GBWPFR-4T15-040060									
		2.362	4.724	.591	GBWPFR-4T15-060120									
		4.724	11.811	.591	GBWPFR-4T15-120300									
	.197	1.181	1.969	.591	GBWPFR-5T15-030050	GWPFM500								
		1.969	4.724	.591	GBWPFR-5T15-050120									
		4.724	∞	.591	GBWPFR-5T15-120999									
	.236	1.378	3.150	.591	GBWPFR-6T15-035080	GWPFM600								
		3.150	∞	.591	GBWPFR-6T15-080999									
GTWPR20-IN-H	.118	1.142	1.378	.512	GBWPFR-3T13-029035	GWPFM300	1.25	1.25	7	1.614	1.25	1.378	-	-
		1.378	1.772	.512	GBWPFR-3T13-035045									
		1.772	2.362	.591	GBWPFR-3T15-045060									
		2.362	3.937	.591	GBWPFR-3T15-060100									
		3.937	9.843	.591	GBWPFR-3T15-100250									
	.157	1.181	1.575	.591	GBWPFR-4T15-030040	GWPFM400								
		1.575	2.362	.591	GBWPFR-4T15-040060									
		2.362	4.724	.591	GBWPFR-4T15-060120									
		4.724	11.811	.591	GBWPFR-4T15-120300									
	.197	1.181	1.969	.591	GBWPFR-5T15-030050	GWPFM500								
		1.969	4.724	.591	GBWPFR-5T15-050120									
		4.724	∞	.591	GBWPFR-5T15-120999									
	.236	1.378	3.150	.591	GBWPFR-6T15-035080	GWPFM600								
		3.150	∞	.591	GBWPFR-6T15-080999									
GTWPR2020-H	.118	1.142	1.378	.512	GBWPFR-3T13-029035	GWPFM300	.787	.787	4.921	1.614	.787	.906	1.810	.315
		1.378	1.772	.512	GBWPFR-3T13-035045									
		1.772	2.362	.591	GBWPFR-3T15-045060									
		2.362	3.937	.591	GBWPFR-3T15-060100									
		3.937	9.843	.591	GBWPFR-3T15-100250									
	.157	1.181	1.575	.591	GBWPFR-4T15-030040	GWPFM400								
		1.575	2.362	.591	GBWPFR-4T15-040060									
		2.362	4.724	.591	GBWPFR-4T15-060120									
		4.724	11.811	.591	GBWPFR-4T15-120300									
	.197	1.181	1.969	.591	GBWPFR-5T15-030050	GWPFM500								
		1.969	4.724	.591	GBWPFR-5T15-050120									
		4.724	∞	.591	GBWPFR-5T15-120999									
	.236	1.378	3.150	.591	GBWPFR-6T15-035080	GWPFM600								
		3.150	∞	.591	GBWPFR-6T15-080999									
GTWPR2525-H	.118	1.142	1.378	.512	GBWPFR-3T13-029035	GWPFM300	.984	.984	5.906	1.614	.984	1.102	1.654	.276
		1.378	1.772	.512	GBWPFR-3T13-035045									
		1.772	2.362	.591	GBWPFR-3T15-045060									
		2.362	3.937	.591	GBWPFR-3T15-060100									
		3.937	9.843	.591	GBWPFR-3T15-100250									
	.157	1.181	1.575	.591	GBWPFR-4T15-030040	GWPFM400								
		1.575	2.362	.591	GBWPFR-4T15-040060									
		2.362	4.724	.591	GBWPFR-4T15-060120									
		4.724	11.811	.591	GBWPFR-4T15-120300									
	.197	1.181	1.969	.591	GBWPFR-5T15-030050	GWPFM500								
		1.969	4.724	.591	GBWPFR-5T15-050120									
		4.724	∞	.591	GBWPFR-5T15-120999									
	.236	1.378	3.150	.591	GBWPFR-6T15-035080	GWPFM600								
		3.150	∞	.591	GBWPFR-6T15-080999									

Holder	Width (inch)	Face grooving OD		Max grooving depth (inch)	Blade number	Insert	Dimensions (inch)							
	CW	Min DAXN	Max DAXX	APMX			H	B	LF	LH	HF	WF	HBL	HBH
GTWPR3232-H	.118	1.142	1.378	.512	GBWPFR-3T13-029035	GWPFM300	1.260	1.260	6.693	1.614	1.260	1.378	–	–
		1.378	1.772	.512	GBWPFR-3T13-035045									
		1.772	2.362	.591	GBWPFR-3T15-045060									
		2.362	3.937	.591	GBWPFR-3T15-060100									
		3.937	9.843	.591	GBWPFR-3T15-100250									
	.157	1.181	1.575	.591	GBWPFR-4T15-030040	GWPFM400								
		1.575	2.362	.591	GBWPFR-4T15-040060									
		2.362	4.724	.591	GBWPFR-4T15-060120									
		4.724	11.811	.591	GBWPFR-4T15-120300									
	.197	1.181	1.969	.591	GBWPFR-5T15-030050	GWPFM500								
		1.969	4.724	.591	GBWPFR-5T15-050120									
		4.724	∞	.591	GBWPFR-5T15-120999									
	.236	1.378	3.150	.591	GBWPFR-6T15-035080	GWPFM600								
		3.150	∞	.591	GBWPFR-6T15-080999									

GTWPL







- Diagram shows right-hand tool
- Insert clamp screw : CS0515

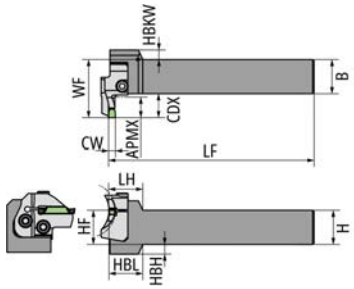
Holder	Width (inch)	Face grooving OD		Max grooving depth (inch)	Blade number	Insert	Dimensions (inch)							
	CW	Min DAXN	Max DAXX	APMX			H	B	LF	LH	HF	WF	HBL	HBH
GTWPL16-IN-H	.118	1.142	1.378	.512	GBWPFL-3T13-029035	GWPFM300	1	1	6	1.614	1	.102	1.654	.260
		1.378	1.772	.512	GBWPFL-3T13-035045									
		1.772	2.362	.591	GBWPFL-3T15-045060									
		2.362	3.937	.591	GBWPFL-3T15-060100									
		3.937	9.843	.591	GBWPFL-3T15-100250									
	.157	1.181	1.575	.591	GBWPFL-4T15-030040	GWPFM400								
		1.575	2.362	.591	GBWPFL-4T15-040060									
		2.362	4.724	.591	GBWPFL-4T15-060120									
		4.724	11.811	.591	GBWPFL-4T15-120300									
	.197	1.181	1.969	.591	GBWPFL-5T15-030050	GWPFM500								
		1.969	4.724	.591	GBWPFL-5T15-050120									
		4.724	∞	.591	GBWPFL-5T15-120999									
	.236	1.378	3.150	.591	GBWPFL-6T15-035080	GWPFM600								
		3.150	∞	.591	GBWPFL-6T15-080999									
GTWPL20-IN-H	.118	1.142	1.378	.512	GBWPFL-3T13-029035	GWPFM300	1.25	1.25	7	1.614	1.25	1.378	-	-
		1.378	1.772	.512	GBWPFL-3T13-035045									
		1.772	2.362	.591	GBWPFL-3T15-045060									
		2.362	3.937	.591	GBWPFL-3T15-060100									
		3.937	9.843	.591	GBWPFL-3T15-100250									
	.157	1.181	1.575	.591	GBWPFL-4T15-030040	GWPFM400								
		1.575	2.362	.591	GBWPFL-4T15-040060									
		2.362	4.724	.591	GBWPFL-4T15-060120									
		4.724	11.811	.591	GBWPFL-4T15-120300									
	.197	1.181	1.969	.591	GBWPFL-5T15-030050	GWPFM500								
		1.969	4.724	.591	GBWPFL-5T15-050120									
		4.724	∞	.591	GBWPFL-5T15-120999									
	.236	1.378	3.150	.591	GBWPFL-6T15-035080	GWPFM600								
		3.150	∞	.591	GBWPFL-6T15-080999									
GTWPL2020-H	.118	1.142	1.378	.512	GBWPFL-3T13-029035	GWPFM300	.787	.787	4.921	1.614	.787	.906	1.810	.315
		1.378	1.772	.512	GBWPFL-3T13-035045									
		1.772	2.362	.591	GBWPFL-3T15-045060									
		2.362	3.937	.591	GBWPFL-3T15-060100									
		3.937	9.843	.591	GBWPFL-3T15-100250									
	.157	1.181	1.575	.591	GBWPFL-4T15-030040	GWPFM400								
		1.575	2.362	.591	GBWPFL-4T15-040060									
		2.362	4.724	.591	GBWPFL-4T15-060120									
		4.724	11.811	.591	GBWPFL-4T15-120300									
	.197	1.181	1.969	.591	GBWPFL-5T15-030050	GWPFM500								
		1.969	4.724	.591	GBWPFL-5T15-050120									
		4.724	∞	.591	GBWPFL-5T15-120999									
	.236	1.378	3.150	.591	GBWPFL-6T15-035080	GWPFM600								
		3.150	∞	.591	GBWPFL-6T15-080999									
GTWPL2525-H	.118	1.142	1.378	.512	GBWPFL-3T13-029035	GWPFM300	.984	.984	5.906	1.614	.984	1.102	1.654	.276
		1.378	1.772	.512	GBWPFL-3T13-035045									
		1.772	2.362	.591	GBWPFL-3T15-045060									
		2.362	3.937	.591	GBWPFL-3T15-060100									
		3.937	9.843	.591	GBWPFL-3T15-100250									
	.157	1.181	1.575	.591	GBWPFL-4T15-030040	GWPFM400								
		1.575	2.362	.591	GBWPFL-4T15-040060									
		2.362	4.724	.591	GBWPFL-4T15-060120									
		4.724	11.811	.591	GBWPFL-4T15-120300									
	.197	1.181	1.969	.591	GBWPFL-5T15-030050	GWPFM500								
		1.969	4.724	.591	GBWPFL-5T15-050120									
		4.724	∞	.591	GBWPFL-5T15-120999									
	.236	1.378	3.150	.591	GBWPFL-6T15-035080	GWPFM600								
		3.150	∞	.591	GBWPFL-6T15-080999									
GTWPL3232-H	.118	1.142	1.378	.512	GBWPFL-3T13-029035	GWPFM300	1.260	1.260	6.693	1.614	1.260	1.378	–	–
		1.378	1.772	.512	GBWPFL-3T13-035045									
		1.772	2.362	.591	GBWPFL-3T15-045060									
		2.362	3.937	.591	GBWPFL-3T15-060100									
		3.937	9.843	.591	GBWPFL-3T15-100250									
	.157	1.181	1.575	.591	GBWPFL-4T15-030040	GWPFM400								
		1.575	2.362	.591	GBWPFL-4T15-040060									
		2.362	4.724	.591	GBWPFL-4T15-060120									
		4.724	11.811	.591	GBWPFL-4T15-120300									
	.197	1.181	1.969	.591	GBWPFL-5T15-030050	GWPFM500								
		1.969	4.724	.591	GBWPFL-5T15-050120									
		4.724	∞	.591	GBWPFL-5T15-120999									

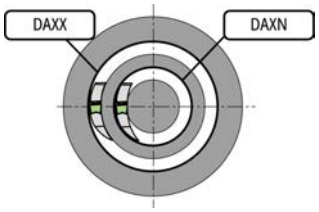
Holder	Width (inch)	Face grooving OD		Max grooving depth (inch)	Blade number	Insert	Dimensions (inch)							
	CW	Min DAXN	Max DAXX	APMX			H	B	LF	LH	HF	WF	HBL	HBH
	.236	1.378 3.150	3.150 ∞	.591 .591	GBWPFL-6T15-035080 GBWPFL-6T15-080999	GWPFM600								

Face Grooving
GROOVE DUO BLADE

GWPFM.. series/For L-style toolholder

GKWPR



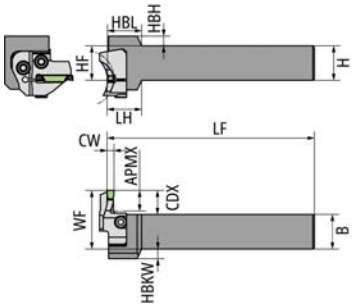


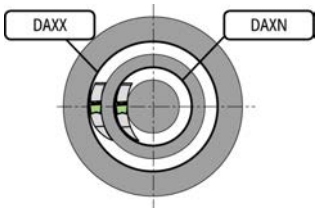
- Diagram shows right-hand tool
- Insert clamp screw : CS0515

Holder	Width (inch)	Face grooving OD		Max grooving depth (inch)	Blade number	Insert	Dimensions (inch)									
	CW	Min DAXN	Max DAXX	APMX			H	B	CDX	LF	LH	HF	WF	HBKW	HBL	HBH
GTWPR16-IN-H	.118	1.142	1.378	.512	GBWPFL-3T13-029035	GWPFM300	1	1	6	1.614	.984	1	1.689	.260	.984	.260
		1.378	1.772	.512	GBWPFL-3T13-035045											
		1.772	2.362	.591	GBWPFL-3T15-045060											
		2.362	3.937	.591	GBWPFL-3T15-060100											
		3.937	9.843	.591	GBWPFL-3T15-100250											
	.157	1.181	1.575	.591	GBWPFL-4T15-030040	GWPFM400										
		1.575	2.362	.591	GBWPFL-4T15-040060											
		2.362	4.724	.591	GBWPFL-4T15-060120											
		4.724	11.811	.591	GBWPFL-4T15-120300											
	.197	1.181	1.969	.591	GBWPFL-5T15-030050	GWPFM500										
		1.969	4.724	.591	GBWPFL-5T15-050120											
		4.724	∞	.591	GBWPFL-5T15-120999											
	.236	1.378	3.150	.591	GBWPFL-6T15-035080	GWPFM600										
		3.150	∞	.591	GBWPFL-6T15-080999											
GTWPR20-IN-H	.118	1.142	1.378	.512	GBWPFL-3T13-029035	GWPFM300	1.25	1.25	7	1.614	.984	1.25	1.939	-	-	-
		1.378	1.772	.512	GBWPFL-3T13-035045											
		1.772	2.362	.591	GBWPFL-3T15-045060											
		2.362	3.937	.591	GBWPFL-3T15-060100											
		3.937	9.843	.591	GBWPFL-3T15-100250											
	.157	1.181	1.575	.591	GBWPFL-4T15-030040	GWPFM400										
		1.575	2.362	.591	GBWPFL-4T15-040060											
		2.362	4.724	.591	GBWPFL-4T15-060120											
		4.724	11.811	.591	GBWPFL-4T15-120300											
	.197	1.181	1.969	.591	GBWPFL-5T15-030050	GWPFM500										
		1.969	4.724	.591	GBWPFL-5T15-050120											
		4.724	∞	.591	GBWPFL-5T15-120999											
	.236	1.378	3.150	.591	GBWPFL-6T15-035080	GWPFM600										
		3.150	∞	.591	GBWPFL-6T15-080999											
GKWPR2020-H	.118	1.142	1.378	.512	GBWPFL-3T13-029035	GWPFM300	.787	.787	.689	4.921	.984	.787	1.476	.472	.984	.315
		1.378	1.772	.512	GBWPFL-3T13-035045											
		1.772	2.362	.591	GBWPFL-3T15-045060											
		2.362	3.937	.591	GBWPFL-3T15-060100											
		3.937	9.843	.591	GBWPFL-3T15-100250											
	.157	1.181	1.575	.591	GBWPFL-4T15-030040	GWPFM400										
		1.575	2.362	.591	GBWPFL-4T15-040060											
		2.362	4.724	.591	GBWPFL-4T15-060120											
		4.724	11.811	.591	GBWPFL-4T15-120300											
	.197	1.181	1.969	.591	GBWPFL-5T15-030050	GWPFM500										
		1.969	4.724	.591	GBWPFL-5T15-050120											
		4.724	∞	.591	GBWPFL-5T15-120999											
	.236	1.378	3.150	.591	GBWPFL-6T15-035080	GWPFM600										
		3.150	∞	.591	GBWPFL-6T15-080999											
GKWPR2525-H	.118	1.142	1.378	.512	GBWPFL-3T13-029035	GWPFM300	.984	.984	.689	5.906	.984	.984	1.673	.276	.984	.276
		1.378	1.772	.512	GBWPFL-3T13-035045											
		1.772	2.362	.591	GBWPFL-3T15-045060											
		2.362	3.937	.591	GBWPFL-3T15-060100											
		3.937	9.843	.591	GBWPFL-3T15-100250											
	.157	1.181	1.575	.591	GBWPFL-4T15-030040	GWPFM400										
		1.575	2.362	.591	GBWPFL-4T15-040060											
		2.362	4.724	.591	GBWPFL-4T15-060120											
		4.724	11.811	.591	GBWPFL-4T15-120300											
	.197	1.181	1.969	.591	GBWPFL-5T15-030050	GWPFM500										
		1.969	4.724	.591	GBWPFL-5T15-050120											
		4.724	∞	.591	GBWPFL-5T15-120999											
	.236	1.378	3.150	.591	GBWPFL-6T15-035080	GWPFM600										
		3.150	∞	.591	GBWPFL-6T15-080999											

Holder	Width (inch)	Face grooving OD		Max grooving depth (inch)	Blade number	Insert	Dimensions (inch)									
	CW	Min DAXN	Max DAXX	APMX			H	B	CDX	LF	LH	HF	WF	HBKW	HBL	HBH
GKWPR3232-H	.118	1.142	1.378	.512	GBWPFL-3T13-029035	GWPFM300	1.260	1.260	.689	6.693	.984	1.260	1.949	–	–	–
		1.378	1.772	.512	GBWPFL-3T13-035045											
		1.772	2.362	.591	GBWPFL-3T15-045060											
		2.362	3.937	.591	GBWPFL-3T15-060100											
		3.937	9.843	.591	GBWPFL-3T15-100250											
	.157	1.181	1.575	.591	GBWPFL-4T15-030040	GWPFM400										
		1.575	2.362	.591	GBWPFL-4T15-040060											
		2.362	4.724	.591	GBWPFL-4T15-060120											
		4.724	11.811	.591	GBWPFL-4T15-120300											
	.197	1.181	1.969	.591	GBWPFL-5T15-030050	GWPFM500										
		1.969	4.724	.591	GBWPFL-5T15-050120											
		4.724	∞	.591	GBWPFL-5T15-120999											
	.236	1.378	3.150	.591	GBWPFL-6T15-035080	GWPFM600										
		3.150	∞	.591	GBWPFL-6T15-080999											

GKWPL





- Diagram shows right-hand tool
- Insert clamp screw : CS0515

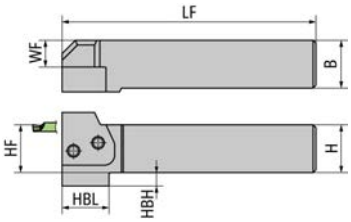
Holder	Width (inch)	Face grooving OD		Max grooving depth (inch)	Blade number	Insert	Dimensions (inch)									
	CW	Min DAXN	Max DAXX	APMX			H	B	CDX	LF	LH	HF	WF	HBKW	HBL	HBH
GTWPL16-IN-H	.118	1.142	1.378	.512	GBWPFR-3T13-029035	GWPFM300	1	1	6	1.614	.984	1	1.689	.260	.984	.260
		1.378	1.772	.512	GBWPFR-3T13-035045											
		1.772	2.362	.591	GBWPFR-3T15-045060											
		2.362	3.937	.591	GBWPFR-3T15-060100											
		3.937	9.843	.591	GBWPFR-3T15-100250											
	.157	1.181	1.575	.591	GBWPFR-4T15-030040	GWPFM400										
		1.575	2.362	.591	GBWPFR-4T15-040060											
		2.362	4.724	.591	GBWPFR-4T15-060120											
		4.724	11.811	.591	GBWPFR-4T15-120300											
	.197	1.181	1.969	.591	GBWPFR-5T15-030050	GWPFM500										
		1.969	4.724	.591	GBWPFR-5T15-050120											
		4.724	∞	.591	GBWPFR-5T15-120999											
	.236	1.378	3.150	.591	GBWPFR-6T15-035080	GWPFM600										
		3.150	∞	.591	GBWPFR-6T15-080999											
GTWPL20-IN-H	.118	1.142	1.378	.512	GBWPFR-3T13-029035	GWPFM300	1.25	1.25	7	1.614	.984	1.25	1.939	-	-	-
		1.378	1.772	.512	GBWPFR-3T13-035045											
		1.772	2.362	.591	GBWPFR-3T15-045060											
		2.362	3.937	.591	GBWPFR-3T15-060100											
		3.937	9.843	.591	GBWPFR-3T15-100250											
	.157	1.181	1.575	.591	GBWPFR-4T15-030040	GWPFM400										
		1.575	2.362	.591	GBWPFR-4T15-040060											
		2.362	4.724	.591	GBWPFR-4T15-060120											
		4.724	11.811	.591	GBWPFR-4T15-120300											
	.197	1.181	1.969	.591	GBWPFR-5T15-030050	GWPFM500										
		1.969	4.724	.591	GBWPFR-5T15-050120											
		4.724	∞	.591	GBWPFR-5T15-120999											
	.236	1.378	3.150	.591	GBWPFR-6T15-035080	GWPFM600										
		3.150	∞	.591	GBWPFR-6T15-080999											
GKWPL2020-H	.118	1.142	1.378	.512	GBWPFR-3T13-029035	GWPFM300	.787	.787	.689	4.921	.984	.787	1.476	.472	.984	.315
		1.378	1.772	.512	GBWPFR-3T13-035045											
		1.772	2.362	.591	GBWPFR-3T15-045060											
		2.362	3.937	.591	GBWPFR-3T15-060100											
		3.937	9.843	.591	GBWPFR-3T15-100250											
	.157	1.181	1.575	.591	GBWPFR-4T15-030040	GWPFM400										
		1.575	2.362	.591	GBWPFR-4T15-040060											
		2.362	4.724	.591	GBWPFR-4T15-060120											
		4.724	11.811	.591	GBWPFR-4T15-120300											
	.197	1.181	1.969	.591	GBWPFR-5T15-030050	GWPFM500										
		1.969	4.724	.591	GBWPFR-5T15-050120											
		4.724	∞	.591	GBWPFR-5T15-120999											
	.236	1.378	3.150	.591	GBWPFR-6T15-035080	GWPFM600										
		3.150	∞	.591	GBWPFR-6T15-080999											
GKWPL2525-H	.118	1.142	1.378	.512	GBWPFR-3T13-029035	GWPFM300	.984	.984	.689	5.906	.984	.984	1.673	.276	.984	.276
		1.378	1.772	.512	GBWPFR-3T13-035045											
		1.772	2.362	.591	GBWPFR-3T15-045060											
		2.362	3.937	.591	GBWPFR-3T15-060100											
		3.937	9.843	.591	GBWPFR-3T15-100250											
	.157	1.181	1.575	.591	GBWPFR-4T15-030040	GWPFM400										
		1.575	2.362	.591	GBWPFR-4T15-040060											
		2.362	4.724	.591	GBWPFR-4T15-060120											
		4.724	11.811	.591	GBWPFR-4T15-120300											
	.197	1.181	1.969	.591	GBWPFR-5T15-030050	GWPFM500										
		1.969	4.724	.591	GBWPFR-5T15-050120											
		4.724	∞	.591	GBWPFR-5T15-120999											
	.236	1.378	3.150	.591	GBWPFR-6T15-035080	GWPFM600										
		3.150	∞	.591	GBWPFR-6T15-080999											
GKWPL3232-H	.118	1.142	1.378	.512	GBWPFR-3T13-029035	GWPFM300	1.260	1.260	.689	6.693	.984	1.260	1.949	–	–	–
		1.378	1.772	.512	GBWPFR-3T13-035045											
		1.772	2.362	.591	GBWPFR-3T15-045060											
		2.362	3.937	.591	GBWPFR-3T15-060100											
		3.937	9.843	.591	GBWPFR-3T15-100250											
	.157	1.181	1.575	.591	GBWPFR-4T15-030040	GWPFM400										
		1.575	2.362	.591	GBWPFR-4T15-040060											
		2.362	4.724	.591	GBWPFR-4T15-060120											

Holder	Width (inch)	Face grooving OD		Max grooving depth (inch)	Blade number	Insert	Dimensions (inch)									
	CW	Min DAXN	Max DAXX	APMX			H	B	CDX	LF	LH	HF	WF	HBKW	HBL	HBH
		4.724	11.811	.591	GBWPFR-4T15-120300											
	.197	1.181	1.969	.591	GBWPFR-5T15-030050	GWPFM500										
		1.969	4.724	.591	GBWPFR-5T15-050120											
		4.724	∞	.591	GBWPFR-5T15-120999											
	.236	1.378	3.150	.591	GBWPFR-6T15-035080	GWPFM600										
		3.150	∞	.591	GBWPFR-6T15-080999											

Face Grooving
GROOVE DUO BLADE

GWPFM..

GTWP-H Straight style toolholder



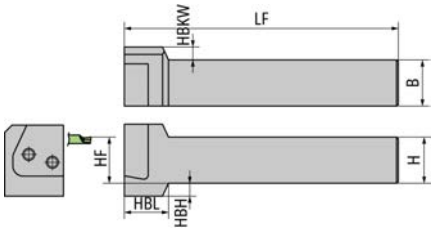
● Diagram shows right-hand tool

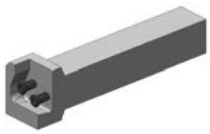
Item Number	Hand	B	H	HBH	HBL	HF	LF	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	
GTWPR16-IN-H	R	1.000	1.000	.260	.965	1.000	5.311	.567	GWPFM../VGW../RCGX../RPGX..
GTWPR20-IN-H	R	1-1/4	1-1/4	–	–	1-1/4	6.311	.817	GWPFM../VGW../RCGX../RPGX..
GTWPL16-IN-H	L	1.000	1.000	.260	.965	1.000	5.311	.567	GWPFM../VGW../RCGX../RPGX..
GTWPL20-IN-H	L	1-1/4	1-1/4	–	–	1-1/4	6.311	.817	GWPFM../VGW../RCGX../RPGX..
GTWPR2020-H	R	.787	.787	.315	1.122	.787	4.232	.354	GWPFM../VGW../RCGX../RPGX..
GTWPR2525-H	R	.984	.984	.276	.965	.984	5.217	.551	GWPFM../VGW../RCGX../RPGX..
GTWPR3232-H	R	1.260	1.260	–	–	1.260	6.004	.827	GWPFM../VGW../RCGX../RPGX..
GTWPL2020-H	L	.787	.787	.315	1.122	.787	4.232	.354	GWPFM../VGW../RCGX../RPGX..
GTWPL2525-H	L	.984	.984	.276	.965	.984	5.217	.551	GWPFM../VGW../RCGX../RPGX..
GTWPL3232-H	L	1.260	1.260	–	–	1.260	6.004	.827	GWPFM../VGW../RCGX../RPGX..

Spare Parts

Item Number	Blade	Mounting screw	Wrench (for Mounting screw)
GTWPR16-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPR20-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPL16-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPL20-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPR2020-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPR2525-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPR3232-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GTWPL2020-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPL2525-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GTWPL3232-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4

GKWP-H L-style toolholder





● Diagram shows right-hand tool

Item Number	Hand	B	H	HBH	HBKW	HBL	HF	LF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	
GKWPR16-IN-H	R	1.000	1.000	.260	.260	.945	1.000	5.961	GWPFM../VGW../RCGX../RPGX..
GKWPR20-IN-H	R	1-1/4	1-1/4	–	–	.945	1-1/4	6.961	GWPFM../VGW../RCGX../RPGX..
GKWPL16-IN-H	L	1.000	1.000	.260	.260	.945	1.000	5.961	GWPFM../VGW../RCGX../RPGX..
GKWPL20-IN-H	L	1-1/4	1-1/4	–	–	.945	1-1/4	6.961	GWPFM../VGW../RCGX../RPGX..
GKWPR2020-H	R	.787	.787	.315	.472	.945	.787	4.882	GWPFM../VGW../RCGX../RPGX..
GKWPR2525-H	R	.984	.984	.276	.276	.945	.984	5.866	GWPFM../VGW../RCGX../RPGX..
GKWPR3232-H	R	1.260	1.260	–	–	–	1.260	6.654	GWPFM../VGW../RCGX../RPGX..
GKWPL2020-H	L	.787	.787	.315	.472	.945	.787	4.882	GWPFM../VGW../RCGX../RPGX..
GKWPL2525-H	L	.984	.984	.276	.276	.945	.984	5.866	GWPFM../VGW../RCGX../RPGX..
GKWPL3232-H	L	1.260	1.260	–	–	–	1.260	6.654	GWPFM../VGW../RCGX../RPGX..

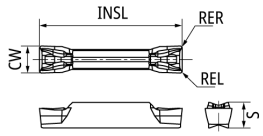
Spare Parts

Item Number	Blade	Mounting screw	Wrench (for Mounting screw)
GKWPR16-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPR20-IN-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPL16-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPL20-IN-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPR2020-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPR2525-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPR3232-H	GBWPFL../GBRL-R../GBVL-VGW../GBI-VGW.L../GBO-VGW.L..	FSI28-6.0*18	LW-4
GKWPL2020-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPL2525-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4
GKWPL3232-H	GBWPFR../GBRR-R../GBVR-VGW../GBI-VGW.R../GBO-VGW.R..	FSI28-6.0*18	LW-4

Face Grooving
GROOVE DUO BLADE

GWPFM.. series/Insert Carbide

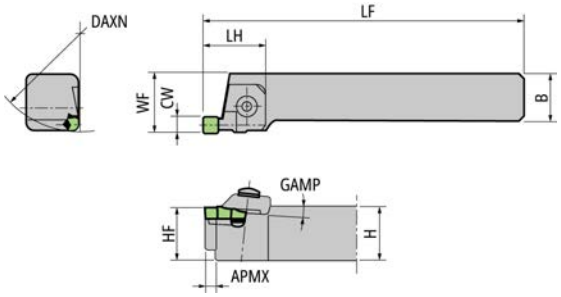
GWPFM-GT

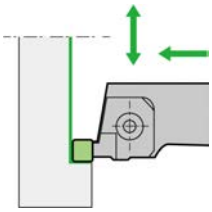


Item Number	Hand	Chipbreaker	CW	INSL	REL	RER	S	Carbide
								PVD
			inch	inch	inch	inch	inch	DM4
GWPFM300N02-GT	N	Yes	.118	.965	.008	.008	.165	●
GWPFM300N04-GT	N	Yes	.118	.965	.016	.016	.165	●
GWPFM400N04-GT	N	Yes	.157	1.043	.016	.016	.165	●
GWPFM400N08-GT	N	Yes	.157	1.043	.031	.031	.165	●
GWPFM500N04-GT	N	Yes	.197	1.043	.016	.016	.165	●
GWPFM500N08-GT	N	Yes	.197	1.043	.031	.031	.165	●
GWPFM600N04-GT	N	Yes	.236	1.043	.016	.016	.165	●
GWPFM600N08-GT	N	Yes	.236	1.043	.031	.031	.165	●

Face Grooving
GFV.. series/Toolholders

GFV





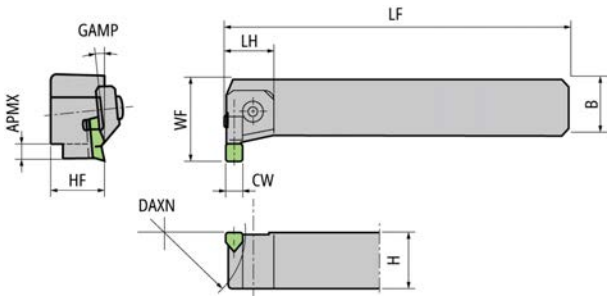
● Diagram shows right-hand tool

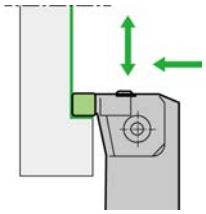
Item Number	Hand	DAXN	APMX	B	CW	GAMP	H	HF	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	°	inch	inch	inch	inch	inch	
GFVR20-6	R	1.496	.236	.787	.236	6	.787	.787	4.921	1.260	.984	GFV..
GFVR25-6	R	1.496	.236	.984	.236	6	.984	.984	5.906	1.260	1.181	GFV..
GFVL20-6	L	1.496	.236	.787	.236	6	.787	.787	4.921	1.260	.984	GFV..
GFVL25-6	L	1.496	.236	.984	.236	6	.984	.984	5.906	1.260	1.181	GFV..

Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
GFVR20-6	CVR6	AOB-6C	ASG-6	LW-4
GFVR25-6	CVR6	AOB-6C	ASG-6	LW-4
GFVL20-6	CVL6	AOB-6C	ASG-6	LW-4
GFVL25-6	CVL6	AOB-6C	ASG-6	LW-4

GSV





● Diagram shows right-hand tool

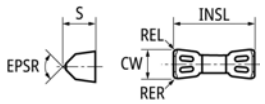
Item Number	Hand	DAXN	APMX	B	CW	GAMP	H	HF	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	°	inch	inch	inch	inch	inch	
GSVR20-6	R	1.496	.236	.787	.236	6	.787	.787	4.921	.925	1.299	GFV..
GSVR25-6	R	1.496	.236	.984	.236	6	.984	.984	5.906	.925	1.496	GFV..
GSVL20-6	L	1.496	.236	.787	.236	6	.787	.787	4.921	.925	1.299	GFV..
GSVL25-6	L	1.496	.236	.984	.236	6	.984	.984	5.906	.925	1.496	GFV..

Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
GSVR20-6	CVL6	AOB-6C	ASG-6	LW-4
GSVR25-6	CVL6	AOB-6C	ASG-6	LW-4
GSVL20-6	CVR6	AOB-6C	ASG-6	LW-4
GSVL25-6	CVR6	AOB-6C	ASG-6	LW-4

Face Grooving
GFV.. series/Insert Carbide

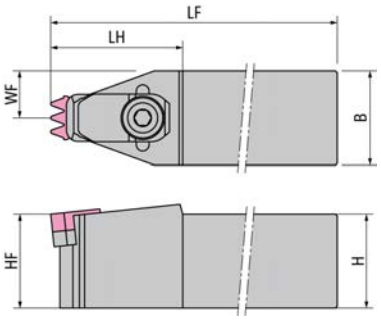
GFV-N

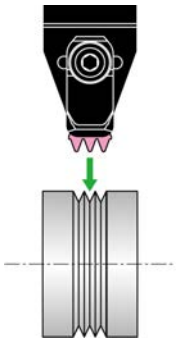


Item Number	Hand	Chipbreaker	CW	EPSR	INSL	REL	RER	S	Carbide
									PVD
			inch	°	inch	inch	inch	inch	QM3
GFV600N	N	Yes	.236	90	.787	.006	.006	.205	●
GFV600N04	N	Yes	.236	90	.787	.016	.016	.205	●

Machining Poly-V Pulley Profiles -3V-
PTM.. series/Toolholders

POLY-V (3V)





Item Number	Hand	B	H	HF	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	
POLY-V163	N	1.000	1.000	1.000	6.000	.500	1.400	PTM33K30..

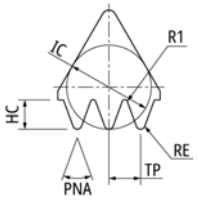
Spare Parts

Item Number	Clamp	Shim	Clamp screw	Thrust Plate
POLY-V163	2417-C	K3-C	1230-C	9414

PTM.. series/Inserts Ceramics

PTM33

No.1



No.2

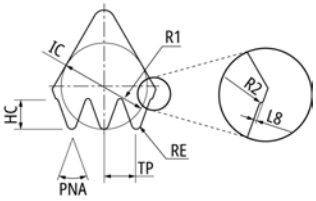
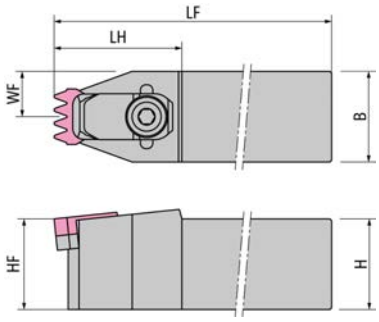


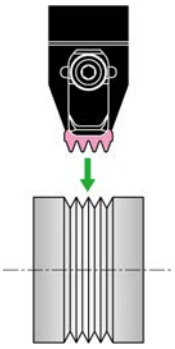
Figure	Item Number	Hand	Chipbreaker	EPSR	HC	IC	L8	PNA	R1	R2	RE	S	TPI	Alumina Ceramics
				°	inch	inch	inch	°	inch	inch	inch	inch	inch	HW2
1	**PTM33K305E02**	N	No	60	.132	3/8	–	40	.012	–	.020	3/16	.140	●
1	**PTM33K30504E02**	N	No	60	.124	3/8	–	40	.016	–	.020	3/16	.140	●
2	**PTM33K305NSE02**	N	No	60	.132	3/8	.008	40	.012	.012	.020	3/16	.140	●
2	**PTM33K30504NSE02**	N	No	60	.124	3/8	.008	40	.016	.016	.020	3/16	.140	●

For technical information on Pulley grooving, please reference pages B22 and B23.

Machining Poly-V Pulley Profiles -4V-
PTM.. series/Toolholders

POLY-V (4V)





Item Number	Hand	B	H	HF	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	
POLY-V164	N	1.000	1.000	1.000	6.000	.500	1.400	PTM43K40..

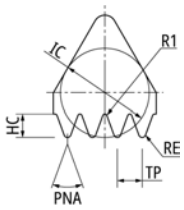
Spare Parts

Item Number	Clamp	Shim	Clamp screw	Thrust Plate
POLY-V164	2417-C	K4-C	1230-C	9414

PTM.. series/Inserts Ceramics

PTM43

No.1



No.2

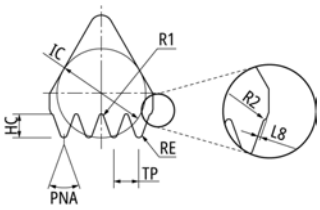
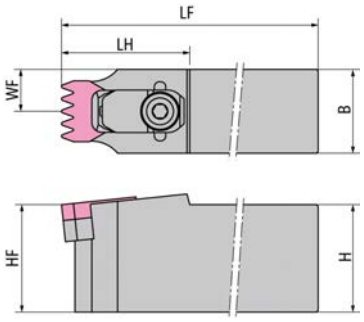


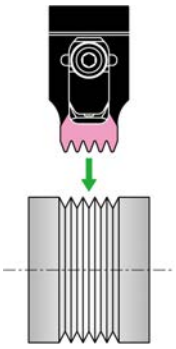
Figure	Item Number	Hand	Chipbreaker	EPSR	HC	IC	L8	PNA	R1	R2	RE	S	TPI	Alumina Ceramics
				°	inch	inch	inch	°	inch	inch	inch	inch	inch	HW2
1	**PTM43K405E02**	N	No	60	.132	1/2	–	40	.012	–	.020	3/16	.140	●
1	**PTM43K40504E02**	N	No	60	.124	1/2	–	40	.016	–	.020	3/16	.140	●
2	**PTM43K405NSE02**	N	No	60	.132	1/2	.008	40	.012	.012	.020	3/16	.140	●
2	**PTM43K40504NSE02**	N	No	60	.124	1/2	.008	40	.016	.016	.020	3/16	.140	●

For technical information on Pulley grooving, please reference pages B22 and B23.

Machining Poly-V Pulley Profiles -5V-
PTM.. series/Toolholders

POLY-V (5V)





Item Number	Hand	B	H	HF	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	
POLY-V205	N	1.250	1.250	1.250	7.000	.625	1.500	PTM53K50..

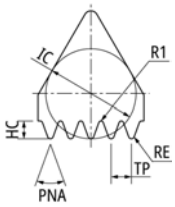
Spare Parts

Item Number	Clamp	Shim	Clamp screw	Thrust Plate
POLY-V205	2417-C	K5-C	1230-C	9414

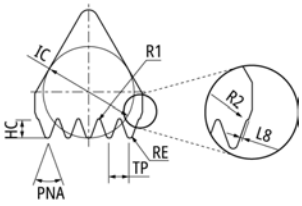
PTM.. series/Inserts Ceramics

PTM53K5

No.1



No.2



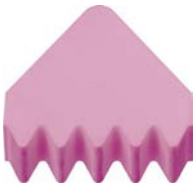
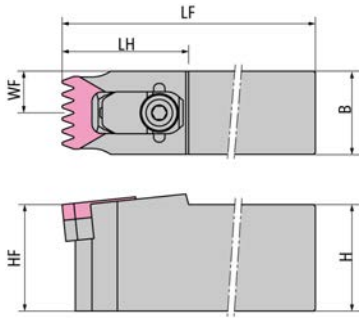


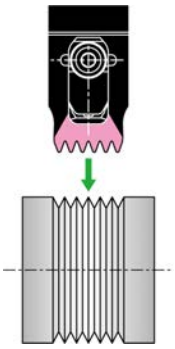
Figure	Item Number	Hand	Chipbreaker	EPSR	HC	IC	L8	PNA	R1	R2	RE	S	TPI	Alumina Ceramics
				°	inch	inch	inch	°	inch	inch	inch	inch	inch	HW2
1	**PTM53K505E02**	N	No	60	.132	5/8	–	40	.012	–	.020	3/16	.140	●
1	**PTM53K50504E02**	N	No	60	.124	5/8	–	40	.016	–	.020	3/16	.140	●
2	**PTM53K505NSE02**	N	No	60	.132	5/8	.008	40	.012	.012	.020	3/16	.140	●
2	**PTM53K50504NSE02**	N	No	60	.124	5/8	.008	40	.016	.016	.020	3/16	.140	●

For technical information on Pulley grooving, please reference pages B22 and B23.

Machining Poly-V Pulley Profiles -6V-
PTM.. series/Toolholders

POLY-V (6V)





Item Number	Hand	B	H	HF	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	
POLY-V206	N	1.250	1.250	1.250	7.000	.625	1.500	PTM53K60..

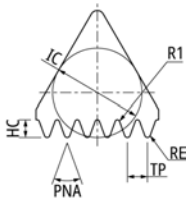
Spare Parts

Item Number	Clamp	Shim	Clamp screw	Thrust Plate
POLY-V206	2417-C	K6-C	1230-C	9414

PTM.. series/Inserts Ceramics

PTM53K6

No.1



No.2

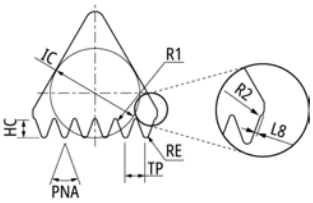


Figure	Item Number	Hand	Chipbreaker	EPSR	HC	IC	L8	PNA	R1	R2	RE	S	TPI	Alumina Ceramics
				°	inch	inch	inch	°	inch	inch	inch	inch	inch	HW2
1	**PTM53K605E02**	N	No	60	.132	5/8	–	40	.012	–	.020	3/16	.140	●
1	**PTM53K60504E02**	N	No	60	.124	5/8	–	40	.016	–	.020	3/16	.140	●
2	**PTM53K605NSE02**	N	No	60	.132	5/8	.008	40	.012	.012	.020	3/16	.140	●
2	**PTM53K60504NSE02**	N	No	60	.124	5/8	.008	40	.016	.016	.020	3/16	.140	●

For technical information on Pulley grooving, please reference pages B22 and B23.

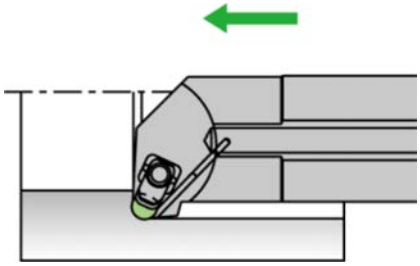
MEMO

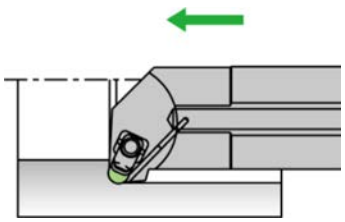
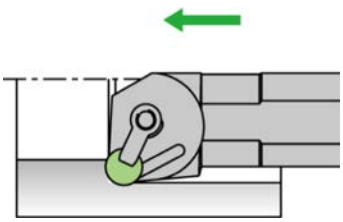
ID Tooling

Product Lines	G02
For RN.. Inserts	G03
For RP.. Inserts	G05
For CN.. Inserts	G06
For DN.. Inserts	G11
For SN.. Inserts	G16
For WN.. Inserts	G20

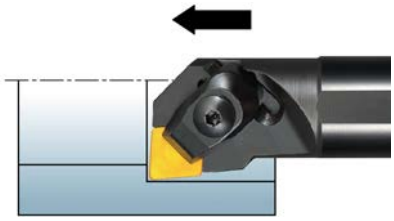
Product Lines

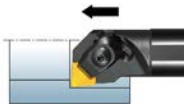
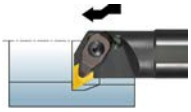
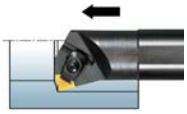
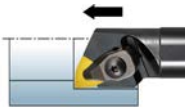
For round inserts



Insert	RN.. →G4	RP.. →G5
Holder	S50-CRGN	S12-CRGP
	 →G3	 →G5
Min. Bore Dia.	ø3.0"	ø1.25"

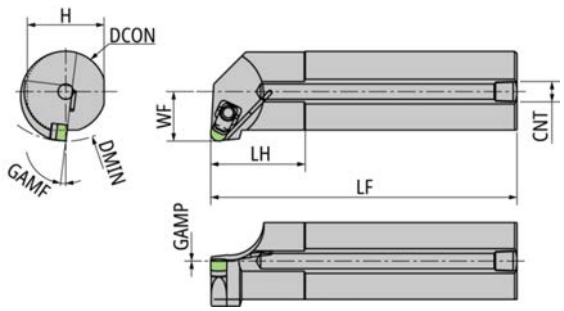
Multi Clamp Toolholders

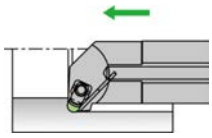


Insert	CN.. →G7-10	DN.. →G12-15	SN.. →G17-19	WN.. →G21-22
Holder	S-W/T/HCLN	S-W/HDUN	S-W/T/HSKN	S-WWLN
	 →G6	 →G11	 →G16	 →G20
Min. Bore Dia.	ø1.299"	ø1.654"	ø1.969"	ø1.299"

RN.. series/Toolholders

S-CRGN Coolant through





● Diagram shows right-hand tool

Item Number	Hand	DMIN	DCON	GAMF	GAMP	H	LF	LH	WF	Insert Gage	
		inch	inch	°	°	inch	inch	inch	inch		
S50-CRGNR-32-4	R	3.000	2.000	7	0	1.870	16.000	2.362	1.281	RN..45..	(RN..43..)
S50-CRGNR-40-4	R	3.500	2.500	7	0	2.380	16.000	2.950	1.531	RN..45..	(RN..43..)

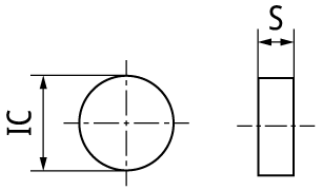
Spare Parts

Insert	Clamp	Blade	Shim	Shim screw	Wrench
RNG 45	2413	9414	IRSN43	1161	5104
RNG 43	2413	9414	IRSN45	1161	5104

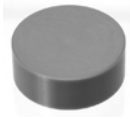
Note: Toolholder body comes with spare parts for RNG45.

RN.. series/Inserts BIDEMICS / Ceramics / NTK CeramiX

RNGN

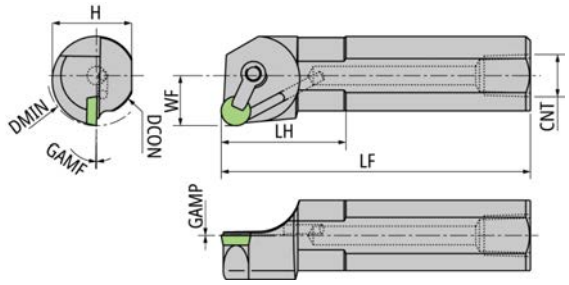


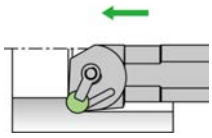
Steel																							
Stainless Steel																							
Cast Iron						●	●	●		●	●								●	●	○	○	
Non-Ferrous Material																							
Heat Resistant Alloy	●	●	●	●										●	●	●	●			●	●		
Hardened Material					●			○	●	○		●	●										
Others (non-metallic)																							

Shape	Item Number		IC	S	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
					PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	RNGN 430 E02	RNGN 120400 E004	1/2	3/16			●	●										●	●	●	●				●
	RNGN 430 S0425	RNGN 120400 S01025	1/2	3/16													●								●
	RNGN 430 S0825	RNGN 120400 S02025	1/2	3/16													●								
	RNGN 430 T0220	RNGN 120400 T00520	1/2	3/16				●										●	●		●			●	●
	RNGN 430 T0225	RNGN 120400 T00525	1/2	3/16																	●			●	●
	RNGN 430 T0320	RNGN 120400 T00820	1/2	3/16																●					●
	RNGN 430 T0420	RNGN 120400 T01020	1/2	3/16			●	●								●		●	●	●	●		●	●	●
	RNGN 430 T0425	RNGN 120400 T01025	1/2	3/16								●			●		●								●
	RNGN 430 T0820	RNGN 120400 T02020	1/2	3/16																		●			
	RNGN 430 T0825	RNGN 120400 T02025	1/2	3/16																	●				
	RNGN 430 Z0825	RNGN 120400 Z02025	1/2	3/16									●			●									
	RNGN 450 E01	RNGN 120700 E002	1/2	5/16																	●			●	
	RNGN 450 E02	RNGN 120700 E004	1/2	5/16			●	●										●	●	●	●				●
	RNGN 450 E03	RNGN 120700 E007	1/2	5/16								●													
	RNGN 450 K7915	RNGN 120700 K20015	1/2	5/16												●									
	RNGN 450 S0425	RNGN 120700 S01025	1/2	5/16													●								●
	RNGN 450 S0825	RNGN 120700 S02025	1/2	5/16													●								
	RNGN 450 T0220	RNGN 120700 T00520	1/2	5/16				●										●	●		●			●	●
	RNGN 450 T0225	RNGN 120700 T00525	1/2	5/16																	●			●	●
	RNGN 450 T0320	RNGN 120700 T00820	1/2	5/16			●	●												●					●
	RNGN 450 T0420	RNGN 120700 T01020	1/2	5/16			●	●								●		●	●		●		●	●	●
	RNGN 450 T0425	RNGN 120700 T01025	1/2	5/16													●								●
	RNGN 450 T0820	RNGN 120700 T02020	1/2	5/16																		●		●	
	RNGN 450 T0825	RNGN 120700 T02025	1/2	5/16								●					●								
	RNGN 450 Z0620	RNGN 120700 Z01520	1/2	5/16																				●	●
	RNGN 450 Z0825	RNGN 120700 Z02025	1/2	5/16									●			●									
	RNGN 450 P8015	RNGN 120700 P20015	1/2	5/16								●		●		●									●

RP.. series/Toolholders

S-CRGP Coolant through





● Diagram shows right-hand tool

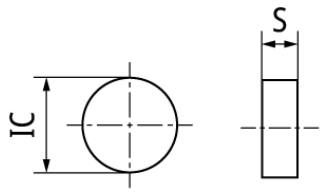
Item Number	Hand	DMIN	DCON	GAMF	GAMP	H	LF	LH	WF	Insert Gage	
		inch	inch	°	°	inch	inch	inch	inch		
S12-CRGPR-16-3	R	1.250	1.000	1	0	.890	12.000	1.574	.640	RP..32..	–

Spare Parts

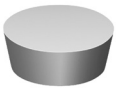
Insert	Clamp	Diff Screw	Wrench
RPG 32	CL-7	XNS-36	5104

RP.. series/Inserts BIDEMICS / Ceramics / NTK CeramiX

RPGN

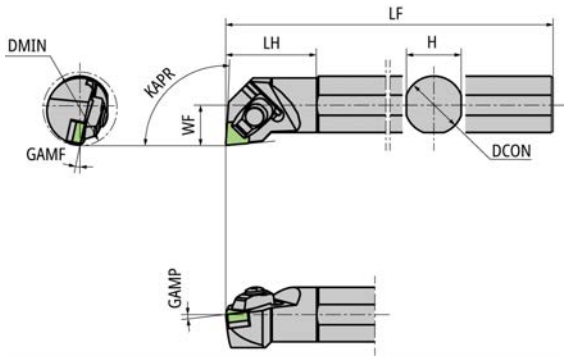


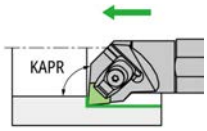
Steel																							
Stainless Steel																							
Cast Iron						●	●	●		●	●						●	●	○	○			
Non-Ferrous Material																							
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●										
Others (non-metallic)																							

Shape	Item Number		IC	S	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
					PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	RPGN 320 E02	RPGN 090300 E004	3/8	1/8														●		●	●				
	RPGN 320 T0220	RPGN 090300 T00520	3/8	1/8														●		●	●			●	●
	RPGN 320 T0320	RPGN 090300 T00820	3/8	1/8																●					
	RPGN 320 T0420	RPGN 090300 T01020	3/8	1/8																				●	
	RPGN 320 T0425	RPGN 090300 T01025	3/8	1/8								●													

CN.. series/Toolholders

S-WCLN/S-TCLN/S-HCLN Multi Clamp Toolholders





● Diagram shows right-hand tool
●RE : Std. corner radius

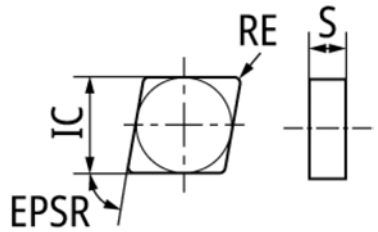
Item Number	Hand	DMIN	DCON	GAMF	GAMP	H	KAPR	LF	LH	RE	WF	Insert Gage	
		inch	inch	°	°	inch	°	inch	inch	inch	inch		
S25R-WCLNR12	R	1.299	.984	14	6	.945	95	7.874	1.575	.031	.669	CN..43..	(CN..45..)
S32S-WCLNR12	R	1.575	1.260	12	6	1.181	95	9.843	1.969	.031	.866	CN..43..	(CN..45..)
S40T-WCLNR12	R	1.969	1.575	10	6	1.496	95	11.811	2.362	.031	1.063	CN..43..	(CN..45..)
S50U-WCLNR12	R	2.480	1.969	8	6	1.850	95	13.780	2.559	.031	1.378	CN..43..	(CN..45..)
S25R-WCLNL12	L	1.299	.984	14	6	.945	95	7.874	1.575	.031	.669	CN..43..	(CN..45..)
S32S-WCLNL12	L	1.575	1.260	12	6	1.181	95	9.843	1.969	.031	.866	CN..43..	(CN..45..)
S40T-WCLNL12	L	1.969	1.575	10	6	1.496	95	11.811	2.362	.031	1.063	CN..43..	(CN..45..)
S50U-WCLNL12	L	2.480	1.969	8	6	1.850	95	13.780	2.559	.031	1.378	CN..43..	(CN..45..)
S25R-TCLNL12	L	1.299	.984	14	6	.945	95	7.874	1.575	.031	.669	CN..43..	(CN..45..)
S25R-TCLNR12	R	1.299	.984	14	6	.945	95	7.874	1.575	.031	.669	CN..43..	(CN..45..)
S32S-TCLNR12	R	1.575	1.260	12	6	1.181	95	9.843	1.969	.031	.866	CN..43..	(CN..45..)
S40T-TCLNR12	R	1.969	1.575	10	6	1.496	95	11.811	2.362	.031	1.063	CN..43..	(CN..45..)
S50U-TCLNR12	R	2.480	1.969	8	6	1.850	95	13.780	2.559	.031	1.378	CN..43..	(CN..45..)
S32S-TCLNL12	L	1.575	1.260	12	6	1.181	95	9.843	1.969	.031	.866	CN..43..	(CN..45..)
S40T-TCLNL12	L	1.969	1.575	10	6	1.496	95	11.811	2.362	.031	1.063	CN..43..	(CN..45..)
S50U-TCLNL12	L	2.480	1.969	8	6	1.850	95	13.780	2.559	.031	1.378	CN..43..	(CN..45..)
S25R-HCLNL12	L	1.299	.984	14	6	.945	95	7.874	1.575	.031	.669	CNGX45..	–
S25R-HCLNR12	R	1.299	.984	14	6	.945	95	7.874	1.575	.031	.669	CNGX45..	–
S32S-HCLNR12	R	1.575	1.260	12	6	1.181	95	9.843	1.969	.031	.866	CNGX45..	–
S40T-HCLNR12	R	1.969	1.575	10	6	1.496	95	11.811	2.362	.031	1.063	CNGX45..	–
S50U-HCLNR12	R	2.480	1.969	8	6	1.850	95	13.780	2.559	.031	1.378	CNGX45..	–
S32S-HCLNL12	L	1.575	1.260	12	6	1.181	95	9.843	1.969	.031	.866	CNGX45..	–
S40T-HCLNL12	L	1.969	1.575	10	6	1.496	95	11.811	2.362	.031	1.063	CNGX45..	–
S50U-HCLNL12	L	2.480	1.969	8	6	1.850	95	13.780	2.559	.031	1.378	CNGX45..	–

Spare Parts

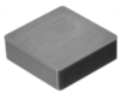
Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
CNGA 43	DC6CN	ACN423x1	AOS-6*26W (S25R-WCLNR/L12) AOS-6*30W (Others)	LLR-T20	FSS16-3.0*8	LLR-T10	ASGL6-D
CNGA 45	DC6CN	-	AOS-6*26W (S25R-WCLNR/L12) AOS-6*30W (Others)	LLR-T20	-	-	ASGL6-D
CNG 43	TC6CN	ACN423x1	AOS-6*26W (S25R-WCLNR/L12) AOS-6*30W (Others)	LLR-T20	FSS16-3.0*8	LLR-T10	ASGL6-D
CNG 45	TC6CN	-	AOS-6*26W (S25R-WCLNR/L12) AOS-6*30W (Others)	LLR-T20	-	-	ASGL6-D
CNGX 43	HC6CN	ACN423x1	AOS-6*26W (S25R-WCLNR/L12) AOS-6*30W (Others)	LLR-T20	FSS16-3.0*8	LLR-T10	ASGL6-D
CNGX 45	HC6CN	-	AOS-6*26W (S25R-WCLNR/L12) AOS-6*30W (Others)	LLR-T20	-	-	ASGL6-D

Note: Toolholder body comes with spare parts for CNGA43.

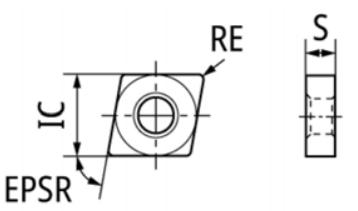
CNGN



Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

Shape	Item Number (Inch)	Item Number (ISO)	EPSR °	IC inch	S inch	RE inch	BIDEMICS PVD 120	BIDEMICS PVD JP2	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics HC2	Alumina Ceramics PVD ZC4	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics PVD ZC7	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics CVD SP9	Whisker Ceramics WA1	Whisker Ceramics 533
	CNGN 431 T0425	CNGN 120404 T01025	80	1/2	3/16	.016								●			●		●								
	CNGN 431 S0825	CNGN 120404 S02025	80	1/2	3/16	.016													●								
	CNGN 432 E02	CNGN 120408 E004	80	1/2	3/16	.031				●										●			●				●
	CNGN 432 S0825	CNGN 120408 S02025	80	1/2	3/16	.031													●								
	CNGN 432 T0220	CNGN 120408 T00520	80	1/2	3/16	.031				●										●	●		●			●	●
	CNGN 432 T0320	CNGN 120408 T00820	80	1/2	3/16	.031																					●
	CNGN 432 T0420	CNGN 120408 T01020	80	1/2	3/16	.031						●	●	●			●			●			●		●	●	●
	CNGN 432 T0425	CNGN 120408 T01025	80	1/2	3/16	.031								●			●		●								
	CNGN 432 T0820	CNGN 120408 T02020	80	1/2	3/16	.031																		●			
	CNGN 432 T0825	CNGN 120408 T02025	80	1/2	3/16	.031						●											●			●	●
	CNGN 432 Z0825	CNGN 120408 Z02025	80	1/2	3/16	.031																					
	CNGN 433 E02	CNGN 120412 E004	80	1/2	3/16	.047				●										●			●				●
	CNGN 433 S0825	CNGN 120412 S02025	80	1/2	3/16	.047													●								
	CNGN 433 T0220	CNGN 120412 T00520	80	1/2	3/16	.047				●										●	●		●			●	●
	CNGN 433 T0320	CNGN 120412 T00820	80	1/2	3/16	.047			●																		●
	CNGN 433 T0420	CNGN 120412 T01020	80	1/2	3/16	.047						●	●	●			●			●			●		●	●	●
	CNGN 433 T0425	CNGN 120412 T01025	80	1/2	3/16	.047						●	●	●			●		●							●	●
	CNGN 433 T0820	CNGN 120412 T02020	80	1/2	3/16	.047																		●			
	CNGN 433 T0825	CNGN 120412 T02025	80	1/2	3/16	.047						●											●			●	●
	CNGN 433 Z0825	CNGN 120412 Z02025	80	1/2	3/16	.047																					
	CNGN 434 E02	CNGN 120416 E004	80	1/2	3/16	.063				●										●			●				●
	CNGN 434 T0220	CNGN 120416 T00520	80	1/2	3/16	.063				●										●	●		●			●	●
	CNGN 434 T0420	CNGN 120416 T01020	80	1/2	3/16	.063						●	●	●			●						●		●		●
	CNGN 434 T0820	CNGN 120416 T02020	80	1/2	3/16	.063																		●			
	CNGN 434 T0825	CNGN 120416 T02025	80	1/2	3/16	.063																	●				
	CNGN 435 T0425	CNGN 120420 T01025	80	1/2	3/16	.079											●										
	CNGN 452 E02	CNGN 120708 E004	80	1/2	5/16	.031				●										●			●				●
	CNGN 452 T0220	CNGN 120708 T00520	80	1/2	5/16	.031				●										●			●			●	●
	CNGN 452 T0825	CNGN 120708 T02025	80	1/2	5/16	.031								●													
	CNGN 453 E02	CNGN 120712 E004	80	1/2	5/16	.047				●										●			●				●
	CNGN 453 T0220	CNGN 120712 T00520	80	1/2	5/16	.047				●										●	●					●	●
	CNGN 453 T0825	CNGN 120712 T02025	80	1/2	5/16	.047								●													
	CNGN 454 E02	CNGN 120716 E004	80	1/2	5/16	.063				●										●			●				●
	CNGN 454 T0220	CNGN 120716 T00520	80	1/2	5/16	.063				●										●			●			●	●
	CNGN 554 T0220	CNGN 160716 T00520	80	5/8	5/16	.063																				●	●

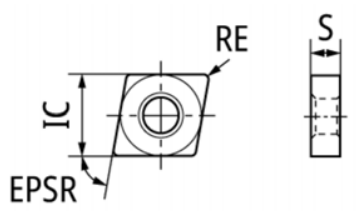
CNGA



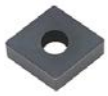
Steel																								
Stainless Steel																								
Cast Iron							●	●	●		●	●									●	●	○	○
Non-Ferrous Material																								
Heat Resistant Alloy	●	●	●	●													●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●											
Others (non-metallic)																								

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics							Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD							CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	CNGA 431 BQ E02	CNGA 120404 BQ E004	80	1/2	3/16	.016	●	●																			
	CNGA 431 BQ T0220	CNGA 120404 BQ T00520	80	1/2	3/16	.016		●																			
	CNGA 431 S0825	CNGA 120404 S02025	80	1/2	3/16	.016													●								
	CNGA 431 T0220	CNGA 120404 T00520	80	1/2	3/16	.016																				●	
	CNGA 431 T0425	CNGA 120404 T01025	80	1/2	3/16	.016								●					●								
	CNGA 431 T0525	CNGA 120404 T01225	80	1/2	3/16	.016									●		●										
	CNGA 431 X0415	CNGA 120404 X01015	80	1/2	3/16	.016					●																
	CNGA 431 X0415 -10	CNGA 120404 X01015 -10	80	1/2	3/16	.016					●																
	CNGA 431 Z0825	CNGA 120404 Z02025	80	1/2	3/16	.016									●												
	CNGA 432 BQ E02	CNGA 120408 BQ E004	80	1/2	3/16	.031	●	●																			
	CNGA 432 BQ T0220	CNGA 120408 BQ T00520	80	1/2	3/16	.031		●																			
	CNGA 432 E02	CNGA 120408 E004	80	1/2	3/16	.031														●			●				●
	CNGA 432 S0825	CNGA 120408 S02025	80	1/2	3/16	.031													●								
	CNGA 432 T0220	CNGA 120408 T00520	80	1/2	3/16	.031														●	●		●			●	
	CNGA 432 T0420	CNGA 120408 T01020	80	1/2	3/16	.031						●	●	●			●						●		●	●	
	CNGA 432 T0425	CNGA 120408 T01025	80	1/2	3/16	.031								●			●		●								
	CNGA 432 T0820	CNGA 120408 T02020	80	1/2	3/16	.031								●										●			
	CNGA 432 T0825	CNGA 120408 T02025	80	1/2	3/16	.031																	●				
	CNGA 432 X0415	CNGA 120408 X01015	80	1/2	3/16	.031					●																
	CNGA 432 X0415 -10	CNGA 120408 X01015 -10	80	1/2	3/16	.031					●																
	CNGA 432 Z0825	CNGA 120408 Z02025	80	1/2	3/16	.031									●												
	CNGA 433 BQ E02	CNGA 120412 BQ E004	80	1/2	3/16	.047	●	●																			
	CNGA 433 BQ T0220	CNGA 120412 BQ T00520	80	1/2	3/16	.047		●																			
	CNGA 433 E02	CNGA 120412 E004	80	1/2	3/16	.047														●			●				●
	CNGA 433 S0825	CNGA 120412 S02025	80	1/2	3/16	.047													●								
	CNGA 433 T0220	CNGA 120412 T00520	80	1/2	3/16	.047														●	●		●			●	
	CNGA 433 T0420	CNGA 120412 T01020	80	1/2	3/16	.047						●	●	●			●						●		●	●	
	CNGA 433 T0425	CNGA 120412 T01025	80	1/2	3/16	.047						●		●			●		●								
	CNGA 433 T0820	CNGA 120412 T02020	80	1/2	3/16	.047								●										●			
	CNGA 433 T0825	CNGA 120412 T02025	80	1/2	3/16	.047											●						●				
	CNGA 433 X0415	CNGA 120412 X01015	80	1/2	3/16	.047					●																
	CNGA 433 X0415 -10	CNGA 120412 X01015 -10	80	1/2	3/16	.047					●																
	CNGA 434 E02	CNGA 120416 E004	80	1/2	3/16	.063														●			●				●
	CNGA 434 T0220	CNGA 120416 T00520	80	1/2	3/16	.063														●	●		●			●	
	CNGA 434 T0420	CNGA 120416 T01020	80	1/2	3/16	.063						●	●	●			●						●		●	●	●
	CNGA 434 T0820	CNGA 120416 T02020	80	1/2	3/16	.063																		●			
	CNGA 434 T0825	CNGA 120416 T02025	80	1/2	3/16	.063																	●				
	CNGA 452 S1235	CNGA 120708 S03035	80	1/2	5/16	.031													●								
	CNGA 453 T0825	CNGA 120712 T02025	80	1/2	5/16	.047						●													●		

CNGA-WL with wiper for higher feed

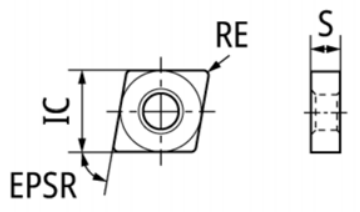


	Steel																							
	Stainless Steel																							
	Cast Iron						●	●	●		●	●									●	●	○	○
	Non-Ferrous Material																							
	Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●
	Hardened Material					●			○	●	○		●	●										
	Others (non-metallic)																							

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	CNGA 432 WL T0425	CNGA 120408 WL T01025	80	1/2	3/16	.031													●								
	CNGA 433 WL T0425	CNGA 120412 WL T01025	80	1/2	3/16	.047									●				●								

Wiper Width: R.016": .014", R.031": .026", R.047": .033"
Applicable holders: 95° cutting edge angle (C31, CCLN), 75° cutting edge angle (CCBN).

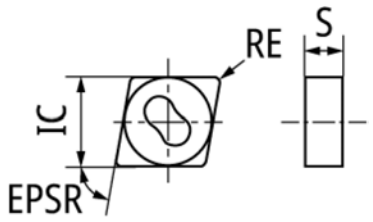
CNGG-AG with chipbreaker



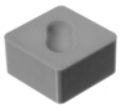
	Steel																							
	Stainless Steel																							
	Cast Iron						●	●	●		●	●									●	●	○	○
	Non-Ferrous Material																							
	Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●
	Hardened Material					●			○	●	○		●	●										
	Others (non-metallic)																							

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	CNGG 431 Z0430 AG	CNGG 120404 Z01030 AG	80	1/2	3/16	.016													●								
	CNGG 432 Z0430 AG	CNGG 120408 Z01030 AG	80	1/2	3/16	.031													●								
	CNGG 433 Z0430 AG	CNGG 120412 Z01030 AG	80	1/2	3/16	.047													●								

CNGX

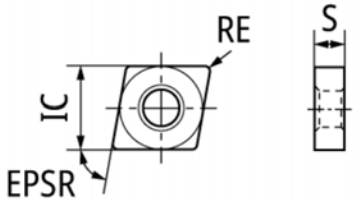


Steel							●	●	●		●	●								●	●	○	○
Stainless Steel																							
Cast Iron																							
Non-Ferrous Material																							
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●										
Others (non-metallic)																							

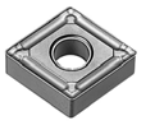
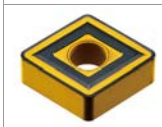
Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	CNGX 432 T0420	CNGX 120408 T01020	80	1/2	3/16	.031																	●		●		
	CNGX 432 T0820	CNGX 120408 T02020	80	1/2	3/16	.031																		●			
	CNGX 433 T0420	CNGX 120412 T01020	80	1/2	3/16	.047																	●		●		
	CNGX 433 T0820	CNGX 120412 T02020	80	1/2	3/16	.047																		●			
	CNGX 434 T0420	CNGX 120416 T01020	80	1/2	3/16	.063																	●		●		
	CNGX 452 T0420	CNGX 120708 T01020	80	1/2	5/16	.031																	●		●		
	CNGX 452 T0820	CNGX 120708 T02020	80	1/2	5/16	.031																		●	●		
	CNGX 453 T0420	CNGX 120712 T01020	80	1/2	5/16	.047																●	●		●		
	CNGX 453 T0820	CNGX 120712 T02020	80	1/2	5/16	.047																	●	●	●		
	CNGX 453 T0825	CNGX 120712 T02025	80	1/2	5/16	.047																			●		
	CNGX 454 T0420	CNGX 120716 T01020	80	1/2	5/16	.063																	●		●		
	CNGX 454 T0825	CNGX 120716 T02025	80	1/2	5/16	.063																			●		

CN.. series/Inserts Carbide

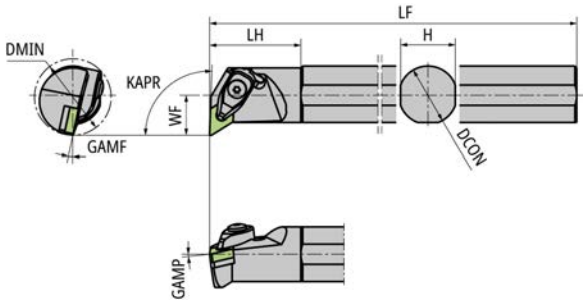
CN.G

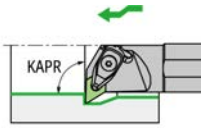


Steel	○	○	●	●	●	●	●	●		●			
Stainless Steel	○	●	○	○	○	●	○	●		●			
Cast Iron									●				
Non-Ferrous Material						○		○					●
Heat Resistant Alloy	●		●	○	○								
Hardened Material			○	○	○								
Others (non-metallic)													●

Shape	Item Number		EPSR	IC	S	RE	Carbide										
							PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(ISO)	°	inch	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	CNGG 431 FN UL	CNGG 120404 FN UL	80	1/2	3/16	.016			●		●	●					
	CNGG 432 FN UL	CNGG 120408 FN UL	80	1/2	3/16	.031			●		●	●					
	CNGG 431 FN ZP	CNGG 120404 FN ZP	80	1/2	3/16	.016			●		●			●			
	CNGG 432 FN ZP	CNGG 120408 FN ZP	80	1/2	3/16	.031			●		●			●			
	CNMG 432 T0225 Z5	CNMG 120408 T00525 Z5	80	1/2	3/16	.031			●		●						
	CNMG 432 G	CNMG 120408 G	80	1/2	3/16	.031									●		
	CNMG 433 G	CNMG 120412 G	80	1/2	3/16	.047									●		
	CNMG 434 G	CNMG 120416 G	80	1/2	3/16	.063									●		

S-WDUN/S-HDUN Multi Clamp Toolholders





● Diagram shows right-hand tool
●RE : Std. corner radius

Item Number	Hand	DMIN	DCON	GAMF	GAMP	H	KAPR	LF	LH	RE	WF	Insert Gage	
		inch	inch	°	°	inch	°	inch	inch	inch	inch		
S32S-WDUNR15	R	1.654	1.260	12	6	1.181	93	9.843	1.969	.031	.866	DN..43..	(DN..45..)
S40T-WDUNR15	R	1.969	1.575	10	6	1.496	93	11.811	2.362	.031	1.063	DN..43..	(DN..45..)
S32S-WDUNL15	L	1.654	1.260	12	6	1.181	93	9.843	1.969	.031	.866	DN..43..	(DN..45..)
S40T-WDUNL15	L	1.969	1.575	10	6	1.496	93	11.811	2.362	.031	1.063	DN..43..	(DN..45..)
S32S-HDUNR15	R	1.654	1.260	12	6	1.181	93	9.843	1.969	.031	.866	DNGX45..	–
S40T-HDUNR15	R	1.969	1.575	10	6	1.496	93	11.811	2.362	.031	1.063	DNGX45..	–
S32S-HDUNL15	L	1.654	1.260	12	6	1.181	93	9.843	1.969	.031	.866	DNGX45..	–
S40T-HDUNL15	L	1.969	1.575	10	6	1.496	93	11.811	2.362	.031	1.063	DNGX45..	–

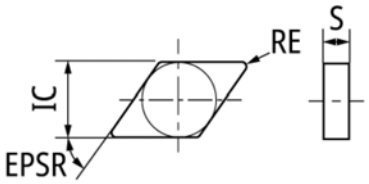
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
DNGA 43	DC6DN	ADN423x1	AOS-6*26W (S32S-WDUNR/L15) AOS-6*30W (S32S-WDUNR/L15)	LLR-T20	FSS16-3.0*8	LLR-T10	ASGL6-D
DNGA 45	DC6DN	-	AOS-6*26W (S32S-WDUNR/L15) AOS-6*30W (S32S-WDUNR/L15)	LLR-T20	-	-	ASGL6-D
DNGX 45	HC6DN	-	AOS-6*26W (S32S-WDUNR/L15) AOS-6*30W (S32S-WDUNR/L15)	LLR-T20	-	-	ASGL6-D

Note: Toolholder body comes with spare parts for DNGA43.

DN.. series/Inserts BIDEMICS / Ceramics / NTK CeramiX

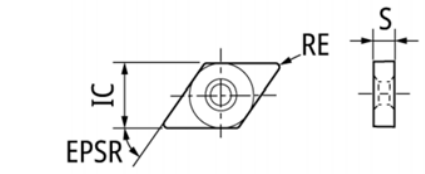
DNGN



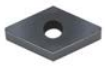
Steel	
Stainless Steel	
Cast Iron	● ● ● ● ● ● ● ● ○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

Shape	Item Number (Inch)	Item Number (ISO)	EPSR °	IC inch	S inch	RE inch	BIDEMICS 120 PVD	BIDEMICS JP2 PVD	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX 450 PVD	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics HC2	Alumina Ceramics ZC4 PVD	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics ZC7 PVD	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics SP9 CVD	Whisker Ceramics WA1	Whisker Ceramics 533
	DNGN 431 T0425	DNGN 150404 T01025	55	1/2	3/16	.016								●														
	DNGN 432 S0825	DNGN 150408 S02025	55	1/2	3/16	.031													●									
	DNGN 432 T0420	DNGN 150408 T01020	55	1/2	3/16	.031						●	●	●			●						●		●	●		
	DNGN 432 T0425	DNGN 150408 T01025	55	1/2	3/16	.031											●		●									
	DNGN 432 T0820	DNGN 150408 T02020	55	1/2	3/16	.031																		●				
	DNGN 432 Z0825	DNGN 150408 Z02025	55	1/2	3/16	.031																						
	DNGN 433 T0220	DNGN 150412 T00520	55	1/2	3/16	.047																					●	●
	DNGN 433 T0420	DNGN 150412 T01020	55	1/2	3/16	.047						●	●	●			●						●		●		●	
	DNGN 433 T0820	DNGN 150412 T02020	55	1/2	3/16	.047																		●				
	DNGN 433 T0825	DNGN 150412 T02025	55	1/2	3/16	.047																					●	●
	DNGN 452 E02	DNGN 150708 E004	55	1/2	5/16	.031				●										●			●					●
	DNGN 452 T0220	DNGN 150708 T00520	55	1/2	5/16	.031				●										●			●					●
	DNGN 453 E02	DNGN 150712 E004	55	1/2	5/16	.047				●										●			●					●
	DNGN 453 T0220	DNGN 150712 T00520	55	1/2	5/16	.047				●										●			●					●
	DNGN 453 T0825	DNGN 150712 T02025	55	1/2	5/16	.047								●													●	●
	DNGN 454 E02	DNGN 150716 E004	55	1/2	5/16	.063				●										●			●					●
	DNGN 454 T0220	DNGN 150716 T00520	55	1/2	5/16	.063				●										●			●					●

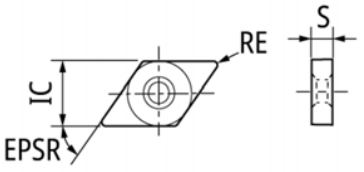
DNGA



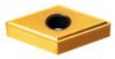
Steel	
Stainless Steel	
Cast Iron	○ ○
Non-Ferrous Material	
Heat Resistant Alloy	● ● ● ● ● ●
Hardened Material	● ○ ● ○ ● ●
Others (non-metallic)	

Shape	Item Number (Inch)	Item Number (ISO)	EPSR °	IC inch	S inch	RE inch	BIDEMICS PVD 120	BIDEMICS PVD JP2	BIDEMICS JX1	BIDEMICS JX3	NTK CeramiX PVD 450	Alumina Ceramics HC1	Alumina Ceramics HW2	Alumina Ceramics HC2	Alumina Ceramics PVD ZC4	Alumina Ceramics HC5	Alumina Ceramics HC6	Alumina Ceramics HC7	Alumina Ceramics PVD ZC7	Silicon Nitride Ceramics SX3	Silicon Nitride Ceramics SX5	Silicon Nitride Ceramics SX7	Silicon Nitride Ceramics SX9	Silicon Nitride Ceramics SX6	Silicon Nitride Ceramics CVD SP9	Whisker Ceramics WA1	Whisker Ceramics 533
	DNGA 431 BQ E02	DNGA 150404 BQ E004	55	1/2	3/16	.016	●	●																			
	DNGA 431 BQ T0220	DNGA 150404 BQ T00520	55	1/2	3/16	.016		●																			
	DNGA 432 E02	DNGA 150408 E004	55	1/2	3/16	.031														●			●				●
	DNGA 431 S0825	DNGA 150404 S02025	55	1/2	3/16	.016													●								
	DNGA 431 T0425	DNGA 150404 T01025	55	1/2	3/16	.016								●			●		●								
	DNGA 431 X0415	DNGA 150404 X01015	55	1/2	3/16	.016					●																
	DNGA 431 X0415 -10	DNGA 150404 X01015 -10	55	1/2	3/16	.016					●																
	DNGA 431 Z0825	DNGA 150404 Z02025	55	1/2	3/16	.016								●	●												
	DNGA 432 BQ E02	DNGA 150408 BQ E004	55	1/2	3/16	.031	●	●																			
	DNGA 432 BQ T0220	DNGA 150408 BQ T00520	55	1/2	3/16	.031		●																			
	DNGA 432 S0825	DNGA 150408 S02025	55	1/2	3/16	.031								●					●								
	DNGA 432 T0220	DNGA 150408 T00520	55	1/2	3/16	.031														●	●		●			●	
	DNGA 432 T0420	DNGA 150408 T01020	55	1/2	3/16	.031						●	●	●			●						●		●	●	●
	DNGA 432 T0425	DNGA 150408 T01025	55	1/2	3/16	.031								●			●		●								
	DNGA 432 T0820	DNGA 150408 T02020	55	1/2	3/16	.031								●										●			
	DNGA 432 T0825	DNGA 150408 T02025	55	1/2	3/16	.031						●											●				
	DNGA 432 X0415	DNGA 150408 X01015	55	1/2	3/16	.031					●																
	DNGA 432 X0415 -10	DNGA 150408 X01015 -10	55	1/2	3/16	.031					●																
	DNGA 432 Z0825	DNGA 150408 Z02025	55	1/2	3/16	.031									●												
	DNGA 433 BQ E02	DNGA 150412 BQ E004	55	1/2	3/16	.047	●	●																			
	DNGA 433 BQ T0220	DNGA 150412 BQ T00520	55	1/2	3/16	.047		●																			
	DNGA 433 E02	DNGA 150412 E004	55	1/2	3/16	.047														●			●				●
	DNGA 433 S0825	DNGA 150412 S02025	55	1/2	3/16	.047													●								
	DNGA 433 T0220	DNGA 150412 T00520	55	1/2	3/16	.047														●	●		●			●	●
	DNGA 433 T0420	DNGA 150412 T01020	55	1/2	3/16	.047						●	●	●			●						●		●	●	
	DNGA 433 T0425	DNGA 150412 T01025	55	1/2	3/16	.047							●						●								
	DNGA 433 T0820	DNGA 150412 T02020	55	1/2	3/16	.047								●										●			
	DNGA 433 T0825	DNGA 150412 T02025	55	1/2	3/16	.047						●											●				
	DNGA 433 X0415	DNGA 150412 X01015	55	1/2	3/16	.047					●																
	DNGA 433 X0415 -10	DNGA 150412 X01015 -10	55	1/2	3/16	.047					●																
	DNGA 434 E02	DNGA 150416 E004	55	1/2	3/16	.063														●			●				●
	DNGA 434 T0220	DNGA 150416 T00520	55	1/2	3/16	.063														●			●			●	●

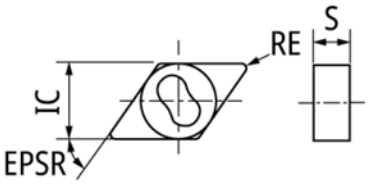
DNGG-AG with chipbreaker



Steel							●	●	●		●	●															○	○
Stainless Steel																														
Cast Iron																														
Non-Ferrous Material																														
Heat Resistant Alloy	●	●	●	●															●	●	●	●			●	●				
Hardened Material					●			○	●	○		●	●																	
Others (non-metallic)																														

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics							Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD							CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	DNGG 431 Z0430 AG	DNGG 150404 Z01030 AG	55	1/2	3/16	.016													●								
	DNGG 432 Z0430 AG	DNGG 150408 Z01030 AG	55	1/2	3/16	.031													●								
	DNGG 433 Z0430 AG	DNGG 150412 Z01030 AG	55	1/2	3/16	.047													●								

DNGX

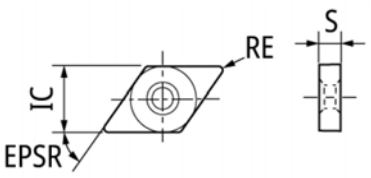


Steel							●	●	●		●	●															○	○
Stainless Steel																														
Cast Iron																														
Non-Ferrous Material																														
Heat Resistant Alloy	●	●	●	●															●	●	●	●			●	●				
Hardened Material					●			○	●	○		●	●																	
Others (non-metallic)																														

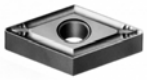
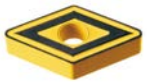
Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics							Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD							CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	DNGX 452 T0420	DNGX 150708 T01020	55	1/2	5/16	.031																	●		●		
	DNGX 452 T0820	DNGX 150708 T02020	55	1/2	5/16	.031																		●			
	DNGX 453 T0420	DNGX 150712 T01020	55	1/2	5/16	.047																	●		●		
	DNGX 454 T0420	DNGX 150716 T01020	55	1/2	5/16	.063																	●		●		
	DNGX 454 T0825	DNGX 150716 T02025	55	1/2	5/16	.063																			●		

DN.. series/Inserts Carbide

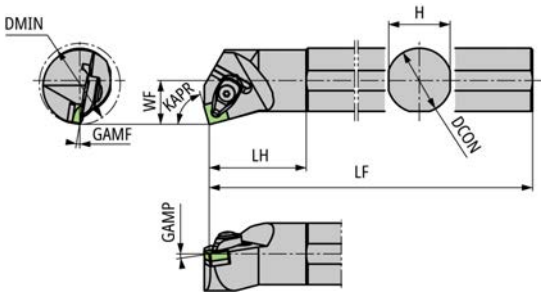
DN.G

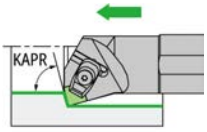


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	RE	Carbide										
							PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(ISO)	°	inch	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	DNGG 431 FN ZP	DNGG 150404 FN ZP	55	1/2	3/16	.016		●	●		●			●			
	DNGG 432 FN ZP	DNGG 150408 FN ZP	55	1/2	3/16	.031		●	●		●			●			
	DNMG 432 T0225 Z5	DNMG 150408 T00525 Z5	55	1/2	3/16	.031			●		●						
	DNMG 431 G	DNMG 150404 TN G	55	1/2	3/16	.016					●						
	DNMG 431 G	DNMG 150404 G	55	1/2	3/16	.016									●		
	DNMG 432 G	DNMG 150408 G	55	1/2	3/16	.031									●		
	DNMG 433 G	DNMG 150412 G	55	1/2	3/16	.047									●		

S-WSKN/S-TSKN/S-HSKN Multi Clamp Toolholders





● Diagram shows right-hand tool
●RE : Std. corner radius

Item Number	Hand	DMIN	DCON	GAMF	GAMP	H	KAPR	LF	LH	RE	WF	Insert Gage	
		inch	inch	°	°	inch	°	inch	inch	inch	inch		
S40T-WSKNR12	R	1.969	1.575	10	6	1.496	75	11.811	2.362	.031	1.063	SN..43..	(SN..45..)
S40T-WSKNL12	L	1.969	1.575	10	6	1.496	75	11.811	2.362	.031	1.063	SN..43..	(SN..45..)
S40T-TSKNR12	R	1.969	1.575	10	6	1.496	75	11.811	2.362	.031	1.063	SN..43..	(SN..45..)
S40T-TSKNL12	L	1.969	1.575	10	6	1.496	75	11.811	2.362	.031	1.063	SN..43..	(SN..45..)
S40T-HSKNR12	R	1.969	1.575	10	6	1.496	75	11.811	2.362	.031	1.063	SNGX45..	–
S40T-HSKNL12	L	1.969	1.575	10	6	1.496	75	11.811	2.362	.031	1.063	SNGX45..	–

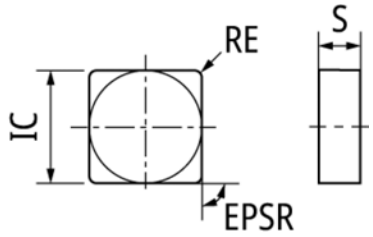
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
SNGA 43	DC6CN	ASN423x1	AOS-6*30W	LLR-T20	FSS16-3.0*8	LLR-T10	ASGL6-D
SNGA 45	DC6CN	-	AOS-6*30W	LLR-T20	-	-	ASGL6-D
SNG 43	TC6CN	ASN423x1	AOS-6*30W	LLR-T20	FSS16-3.0*8	LLR-T10	ASGL6-D
SNG 45	TC6CN	-	AOS-6*30W	LLR-T20	-	-	ASGL6-D
SNGX 45	HC6SN	-	AOS-6*30W	LLR-T20	-	-	ASGL6-D

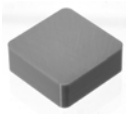
Note: Toolholder body comes with spare parts for SNGA43.

SN.. series/Inserts BIDEMICS / Ceramics / NTK CeramiX

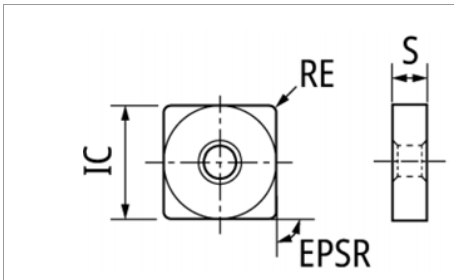
SNGN



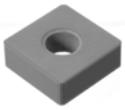
Steel																							
Stainless Steel																							
Cast Iron						●	●	●		●	●							●	●	○	○		
Non-Ferrous Material																							
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●										
Others (non-metallic)																							

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	SNGN 431 S0825	SNGN 120404 S02025	90	1/2	3/16	.016													●								
	SNGN 431 T0425	SNGN 120404 T01025	90	1/2	3/16	.016								●					●								
	SNGN 432 E02	SNGN 120408 E004	90	1/2	3/16	.031														●			●				
	SNGN 432 S0825	SNGN 120408 S02025	90	1/2	3/16	.031													●								
	SNGN 432 T0220	SNGN 120408 T00520	90	1/2	3/16	.031															●		●	●		●	●
	SNGN 432 T0320	SNGN 120408 T00820	90	1/2	3/16	.031																					●
	SNGN 432 T0420	SNGN 120408 T01020	90	1/2	3/16	.031						●	●	●			●							●	●	●	●
	SNGN 432 T0425	SNGN 120408 T01025	90	1/2	3/16	.031						●		●			●		●							●	●
	SNGN 432 T0820	SNGN 120408 T02020	90	1/2	3/16	.031																		●			
	SNGN 432 T0825	SNGN 120408 T02025	90	1/2	3/16	.031																	●				
	SNGN 432 Z0825	SNGN 120408 Z02025	90	1/2	3/16	.031																					
	SNGN 433 E02	SNGN 120412 E004	90	1/2	3/16	.047														●			●				
	SNGN 433 S0825	SNGN 120412 S02025	90	1/2	3/16	.047													●								
	SNGN 433 T0220	SNGN 120412 T00520	90	1/2	3/16	.047															●		●			●	●
	SNGN 433 T0320	SNGN 120412 T00820	90	1/2	3/16	.047																					●
	SNGN 433 T0420	SNGN 120412 T01020	90	1/2	3/16	.047						●	●	●			●							●	●	●	●
	SNGN 433 T0425	SNGN 120412 T01025	90	1/2	3/16	.047						●		●			●		●							●	●
	SNGN 433 T0820	SNGN 120412 T02020	90	1/2	3/16	.047																		●	●		
	SNGN 433 T0825	SNGN 120412 T02025	90	1/2	3/16	.047																	●				
	SNGN 433 Z0825	SNGN 120412 Z02025	90	1/2	3/16	.047									●												
	SNGN 434 E02	SNGN 120416 E004	90	1/2	3/16	.063														●			●				
	SNGN 434 S0825	SNGN 120416 S02025	90	1/2	3/16	.063													●								
	SNGN 434 T0220	SNGN 120416 T00520	90	1/2	3/16	.063															●		●			●	●
	SNGN 434 T0420	SNGN 120416 T01020	90	1/2	3/16	.063						●	●	●			●							●	●	●	●
	SNGN 434 T0425	SNGN 120416 T01025	90	1/2	3/16	.063						●		●			●		●							●	●
	SNGN 434 T0820	SNGN 120416 T02020	90	1/2	3/16	.063																		●			
	SNGN 434 T0825	SNGN 120416 T02025	90	1/2	3/16	.063																	●				
	SNGN 434 Z0825	SNGN 120416 Z02025	90	1/2	3/16	.063																					
	SNGN 435 T0420	SNGN 120420 T01020	90	1/2	3/16	.079																			●		
	SNGN 435 T0425	SNGN 120420 T01025	90	1/2	3/16	.079								●			●										
	SNGN 435 T0820	SNGN 120420 T02020	90	1/2	3/16	.079																		●			
	SNGN 435 T0825	SNGN 120420 T02025	90	1/2	3/16	.079						●														●	●
	SNGN 436 T0425	SNGN 120424 T01025	90	1/2	3/16	.094								●													
	SNGN 436 T0820	SNGN 120424 T02020	90	1/2	3/16	.094																		●			
	SNGN 452 T0825	SNGN 120708 T02025	90	1/2	5/16	.031						●		●													
	SNGN 453 S0825	SNGN 120712 S02025	90	1/2	5/16	.047								●													
	SNGN 453 T0825	SNGN 120712 T02025	90	1/2	5/16	.047								●													
	SNGN 454 T0825	SNGN 120716 T02025	90	1/2	5/16	.063							●	●													

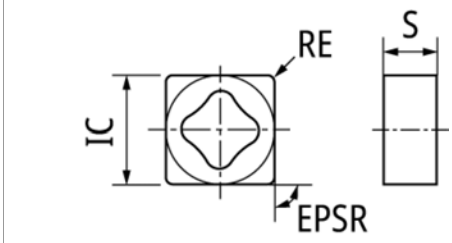
SNGA



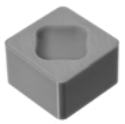
Steel																								
Stainless Steel																								
Cast Iron							●	●	●		●	●									●	●	○	○
Non-Ferrous Material																								
Heat Resistant Alloy	●	●	●	●													●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●											
Others (non-metallic)																								

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	SNGA 431 T0425	SNGA 120404 T01025	90	1/2	3/16	.016													●								
	SNGA 431 S0825	SNGA 120404 S02025	90	1/2	3/16	.016													●								
	SNGA 432 E02	SNGA 120408 E004	90	1/2	3/16	.031														●			●				
	SNGA 432 S0825	SNGA 120408 S02025	90	1/2	3/16	.031													●								
	SNGA 432 T0420	SNGA 120408 T01020	90	1/2	3/16	.031						●	●	●			●						●		●		
	SNGA 432 T0425	SNGA 120408 T01025	90	1/2	3/16	.031													●								
	SNGA 432 T0820	SNGA 120408 T02020	90	1/2	3/16	.031																		●			
	SNGA 433 E02	SNGA 120412 E004	90	1/2	3/16	.047														●			●				
	SNGA 433 S0825	SNGA 120412 S02025	90	1/2	3/16	.047													●								
	SNGA 433 T0420	SNGA 120412 T01020	90	1/2	3/16	.047						●	●	●			●				●		●		●	●	
	SNGA 433 T0425	SNGA 120412 T01025	90	1/2	3/16	.047													●								
	SNGA 433 T0820	SNGA 120412 T02020	90	1/2	3/16	.047																		●			
	SNGA 434 E02	SNGA 120416 E004	90	1/2	3/16	.063														●			●				
	SNGA 434 T0420	SNGA 120416 T01020	90	1/2	3/16	.063						●	●	●			●						●		●		
	SNGA 434 T0820	SNGA 120416 T02020	90	1/2	3/16	.063																		●			

SNGX

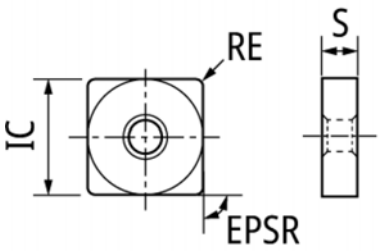


Steel																								
Stainless Steel																								
Cast Iron							●	●	●		●	●									●	●	○	○
Non-Ferrous Material																								
Heat Resistant Alloy	●	●	●	●													●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●											
Others (non-metallic)																								

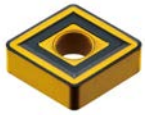
Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	SNGX 453 T0420	SNGX 120712 T01020	90	1/2	5/16	.047																	●		●		
	SNGX 453 T0820	SNGX 120712 T02020	90	1/2	5/16	.047																		●	●		
	SNGX 453 T0825	SNGX 120712 T02025	90	1/2	5/16	.047																			●		
	SNGX 454 T0420	SNGX 120716 T01020	90	1/2	5/16	.063																	●		●		
	SNGX 454 T0820	SNGX 120716 T02020	90	1/2	5/16	.063																		●	●		
	SNGX 454 T0825	SNGX 120716 T02025	90	1/2	5/16	.063																			●		

SN.. series/Inserts Carbide

SNMG

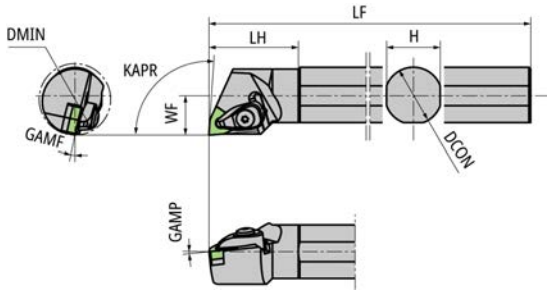


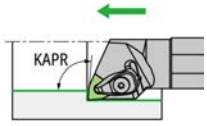
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	RE	Carbide										
							PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(ISO)	°	inch	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	SNMG 432 T0225 Z5	SNMG 120408 T00525 Z5	90	1/2	3/16	.031			●		●						
	SNMG 432 G	SNMG 120408 G	90	1/2	3/16	.031									●		
	SNMG 433 G	SNMG 120412 G	90	1/2	3/16	.047									●		
	SNMG 434 G	SNMG 120416 G	90	1/2	3/16	.063									●		

WN.. series/Toolholders

S-WWLN Multi Clamp Toolholders





● Diagram shows right-hand tool
●RE : Std. corner radius

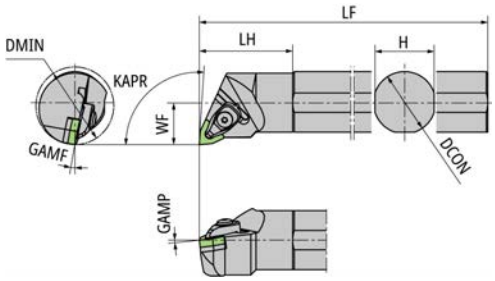
Item Number	Hand	DMIN	DCON	GAMF	GAMP	H	KAPR	LF	LH	RE	WF	Insert Gage	
		inch	inch	°	°	inch	°	inch	inch	inch	inch		
S25R-WWLNR08	R	1.299	.984	14	6	.945	95	7.874	1.575	.031	.669	WN..43..	(WN..45..)
S32S-WWLNR08	R	1.575	1.260	12	6	1.181	95	9.843	1.969	.031	.866	WN..43..	(WN..45..)
S40T-WWLNR08	R	1.969	1.575	10	6	1.496	95	11.811	2.362	.031	1.063	WN..43..	(WN..45..)
S25R-WWLNL08	L	1.299	.984	14	6	.945	95	7.874	1.575	.031	.669	WN..43..	(WN..45..)
S32S-WWLNL08	L	1.575	1.260	12	6	1.181	95	9.843	1.969	.031	.866	WN..43..	(WN..45..)
S40T-WWLNL08	L	1.969	1.575	10	6	1.496	95	11.811	2.362	.031	1.063	WN..43..	(WN..45..)

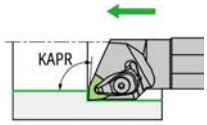
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
WNGA 43	DC6CN	AWN423-Wx1	AOS-6*30W	LLR-T20	FSS16-3.0*8	LLR-T10	ASGL6-D
WNGA 45	DC6CN	-	AOS-6*30W	LLR-T20	-	-	ASGL6-D

Note: Toolholder body comes with spare parts for WNGA43.

S-WWLN-2 Multi Clamp Toolholders





● Diagram shows right-hand tool
●RE : Std. corner radius

Item Number	Hand	DMIN	DCON	GAMF	GAMP	H	KAPR	LF	LH	RE	WF	Insert Gage	
		inch	inch	°	°	inch	°	inch	inch	inch	inch		
S40T-WWLNR08-2	R	1.969	1.575	10	6	1.496	95	11.811	2.362	.031	1.063	WN..43..	(WN..45..)
S40T-WWLNL08-2	L	1.969	1.575	10	6	1.496	95	11.811	2.362	.031	1.063	WN..43..	(WN..45..)

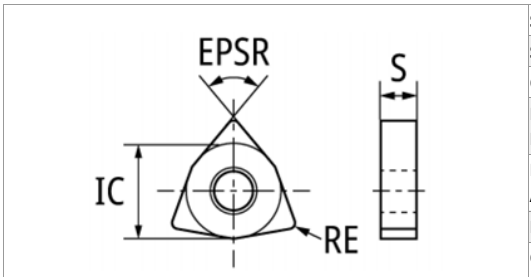
Spare Parts

Insert	Clamp	Shim	Clamp screw	Wrench (for Clamp screw)	Shim screw	Wrench (for Shim screw)	Spring
WNGA 43	DC6CN	AWN423-Wx2	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D
WNGA 45	DC6CN	AWN423-Wx1	AOS-6*30W	LLR-T20	FSS15-3.0*12	LLR-T10	ASGL6-D

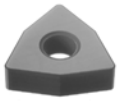
Note: Toolholder body comes with spare parts for WNGA43.

WN.. series/Inserts BIDEMICS / Ceramics / NTK CeramiX

WNGA

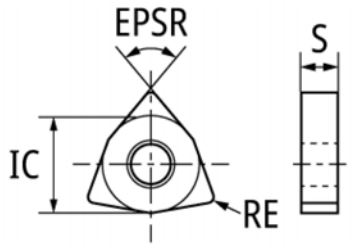


Steel																							
Stainless Steel																							
Cast Iron						●	●	●		●	●							●	●	○	○		
Non-Ferrous Material																							
Heat Resistant Alloy	●	●	●	●												●	●	●	●			●	●
Hardened Material					●			○	●	○		●	●										
Others (non-metallic)																							

Shape	Item Number		EPSR	IC	S	RE	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
							PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	°	inch	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	WNGA 431 S0825	WNGA 080404 S02025	80	1/2	3/16	.016													●								
	WNGA 432 E02	WNGA 080408 E004	80	1/2	3/16	.031														●			●				
	WNGA 432 S0825	WNGA 080408 S02025	80	1/2	3/16	.031													●								
	WNGA 432 T0220	WNGA 080408 T00520	80	1/2	3/16	.031														●	●		●			●	
	WNGA 432 T0420	WNGA 080408 T01020	80	1/2	3/16	.031																	●		●		●
	WNGA 432 T0820	WNGA 080408 T02020	80	1/2	3/16	.031								●										●			
	WNGA 433 E02	WNGA 080412 E004	80	1/2	3/16	.047														●			●				
	WNGA 433 S0825	WNGA 080412 S02025	80	1/2	3/16	.047													●								
	WNGA 433 T0220	WNGA 080412 T00520	80	1/2	3/16	.047														●	●		●			●	
	WNGA 433 T0420	WNGA 080412 T01020	80	1/2	3/16	.047																	●		●		●
	WNGA 433 T0820	WNGA 080412 T02020	80	1/2	3/16	.047								●										●			
	WNGA 434 E02	WNGA 080416 E004	80	1/2	3/16	.063														●			●				
	WNGA 434 T0220	WNGA 080416 T00520	80	1/2	3/16	.063														●			●				
	WNGA 434 T0420	WNGA 080416 T01020	80	1/2	3/16	.063																	●		●		
	WNGA 434 T0820	WNGA 080416 T02020	80	1/2	3/16	.063																		●			

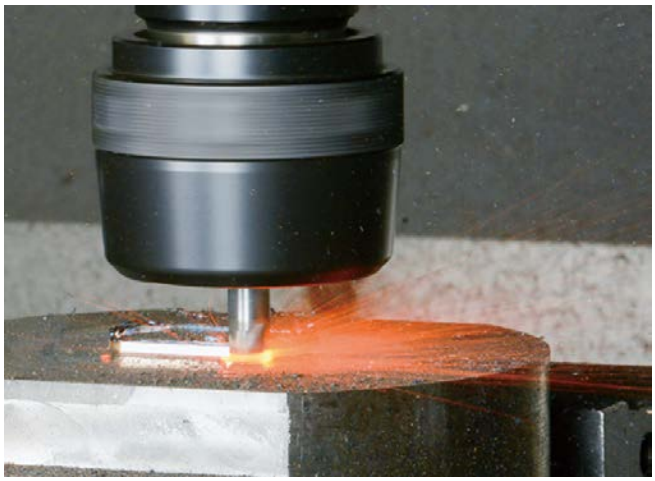
WN.. series/Inserts Carbide

WN..



Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	RE	Carbide										
							PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(ISO)	°	inch	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	WNGG 431 FN UL	WNGG 080404 FN UL	80	1/2	3/16	.016			●		●	●					
	WNGG 432 FN UL	WNGG 080408 FN UL	80	1/2	3/16	.031			●		●	●					
	WNGG 431 FN ZP	WNGG 080404 FN ZP	80	1/2	3/16	.016			●		●			●			
	WNGG 432 FN ZP	WNGG 080408 FN ZP	80	1/2	3/16	.031			●		●			●			
	WNMG 432 T0225 Z5	WNMG 080408 T00525 Z5	80	1/2	3/16	.031			●		●						
	WNMG 433 T0225 Z5	WNMG 080412 T00525 Z5	80	1/2	3/16	.047			●		●						
	WNMG 432 G	WNMG 080408 G	80	1/2	3/16	.031									●		
	WNMG 433 G	WNMG 080412 G	80	1/2	3/16	.047									●		



Endmill

Product Lines H02

Recommended Cutting Conditions H03

RCE.. series H04

RCL.. series H05

Product Lines

CERAMATIC / Ceramic Endmill

Series	Features	DC (inch)	CICT	APMX (inch)	Pages
RCE.. series	For HRSA materials • High-speed machining of heat-resistant alloy is possible by utilizing the sialon ceramic grade "SX9" with excellent wear resistance. • Compared to carbide end mills, high-efficiency machining can achieve over 10 times the performance.	ø.315 - 1/2	4,6 flute	- 3/8	A11 H4

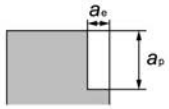
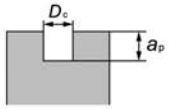
RCL type rectangular tooth chamfering type

Series	Features	DC (inch)	CICT	APMX (inch)	Pages
RCL.. series	Gear tooth chamfering type • Special two-flute end mill with indexable inserts. • C/T can be shortened by utilizing fine particle carbide inserts (compared to high-end mills) • Longer life than single-flute end mill	ø.315 - 1/2	4,6	- 3/8	H5-7

Recommended Cutting Conditions

CERAMATIC / Ceramic Endmill

Recommended Cutting Conditions for HRSA material

Application	Grade	ϕ D_c	Flute	Cutting Speed (SFM) 500 — 2000 — 3500	Feed (IPT)	Depth of cut (a_p —inch)	Width of cut (a_e —inch)	Coolant
Face Milling	SX9	3/8"	4/6		.0012	.056	—	DRY
		1/2"				.075		
		5/8"				.094		
		3/4"				.113		
		8mm				.047		
		10mm				.059		
		12mm				.071		
		16mm				.094		
		20mm				.118		
Side Milling 	SX9	3/8"	4/6		.0012	.187	.037	DRY
		1/2"				.250	.050	
		5/8"				.313	.063	
		3/4"				.375	.075	
		8mm				.157	.031	
		10mm				.197	.039	
		12mm				.236	.047	
		16mm				.315	.063	
		20mm				.394	.079	
Slotting	SX9	3/8"	4		.0012	.094	—	DRY
		1/2"				.125		
		5/8"				.156		
		8mm				.079		
		10mm				.098		
		12mm				.118		
		16mm				.157		
		3/8"	6		.0012	.056	—	DRY
		1/2"				.075		
		5/8"				.094		
		8mm				.047		
		10mm				.059		
		12mm				.071		
		16mm				.094		

Notes on Heat-Resistant Alloy Machining

- Toolpaths in which the cutting edge leaves the workpiece during machining are likely to cause defects due to rapid cooling of the cutting edge. Use a toolpath that allows for continuous cutting as much as possible.
- Continue machining without removing the BUE (built up edge) on the cutting edge.
- Cutting speed should be 980 SFM or more.
- Maximum ramping angle of 1.5° is recommended. When ramping, please machine at 50% of the feed rate.
- Since work hardening occurs due to high-speed machining, leave a machining allowance of .012 inch or more for finish machining.
- Recommended arbor: 1st recommended hydro chuck, 2nd recommended milling chuck.

RCL type rectangular tooth chamfering type

Cutter diameter	Recommended module	Recommended feed rate
ø.551	.089" or less	.012" IPR or less
ø.472	.085" or less	.012" IPR or less

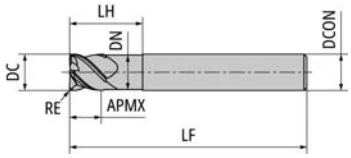
If the recommended module or the recommended feed rate is exceeded, the clamping screw should be retightened at least once or twice a day to keep insert secure.

Precautions

1. When mounting the end milling tool, ensure a minimum amount of overhang from the chuck to the tool nose in order to prevent run out during machining (Target value: approx. .787").
2. As is probably known, gear tooth chamfering applies shock loading due to interrupted cutting. For this reason, the holder and clamping screw may deteriorate quicker than normal. Therefore, we request that you replace the holder and clamping screw periodically with new ones for safer and more stable operation.
3. In addition, please re-tighten the clamping screw regularly to avoid loss of clamping force during machining.

CERAMATIC
RCE.. series for HRSA materials

RCE-H4



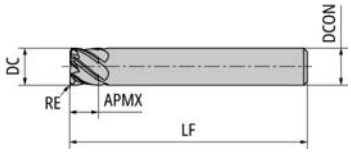
●No center cutting edge

Tolerances (inch)

DC	DC (e8)	DCON (h6)
3/8",8,10	-.00098"/-.00185"	+0/-.00035"
1/2",12	-.00126/-.00232"	+0/-.00043"

Item Number	NOF	DC		APMX		DCON		DN		FHA	LF		LH		RE		Silicon Nitride Ceramics
		inch	mm	inch	mm	inch	mm	inch	mm	°	inch	mm	inch	mm	inch	mm	SX9
RCEI375H4R047S	4	3/8	9.525	9/32	7.14	3/8	9.525	.359	9.125	35	2.500	63.5	3/4	19.05	.047	1.19	●
RCEI500H4R068S	4	1/2	12.7	3/8	9.525	1/2	12.7	.484	12.3	35	2.750	69.85	1.000	25.4	.068	1.73	●
RCEM080H4R100S	4	.315	8	.236	6	.315	8	.299	7.6	35	2.362	60	.630	16	.039	1	●
RCEM100H4R125S	4	.394	10	.295	7.5	.394	10	.378	9.6	35	2.559	65	.787	20	.049	1.25	●
RCEM120H4R150S	4	.472	12	.354	9	.472	12	.457	11.6	35	2.756	70	.945	24	.059	1.5	●

RCE-J6



●No center cutting edge

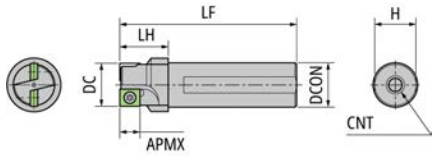
Tolerances (inch)

DC	DC (e8)	DCON (h6)
3/8",8,10	-.00098"/-.00185"	+0/-.00035"
1/2",12	-.00126"/-.00232"	+0/-00043"

Item Number	NOF	DC		APMX		DCON		FHA	LF		RE		Silicon Nitride Ceramics
		inch	mm	inch	mm	inch	mm	°	inch	mm	inch	mm	SX9
RCEI375J6R047S	6	3/8	9.525	9/32	7.14	3/8	9.525	40	2.500	63.5	.047	1.19	●
RCEI500J6R068S	6	1/2	12.7	3/8	9.525	1/2	12.7	40	2.750	69.85	.068	1.73	●
RCEM080J6R100S	6	.315	8	.236	6	.315	8	40	2.362	60	.039	1	●
RCEM100J6R125S	6	.394	10	.295	7.5	.394	10	40	2.559	65	.049	1.25	●
RCEM120J6R150S	6	.472	12	.354	9	.472	12	40	2.756	70	.059	1.5	●

RCL type rectangular tooth chamfering type
RCL.. series/Toolholders

RCL-066



● Diagram shows right-hand tool

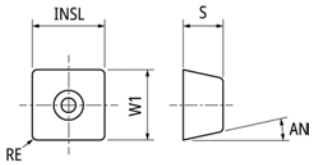
Item Number	Hand	APMX	CICT	CNT	DC	DCON	H	KAPR	LF	LH	Insert Gage
		inch			inch	inch	inch	°	inch	inch	
RCL100D2R066	R	(.197)	2	M4*20L	.394	.394	.374	90	2.362	.709	CLH04..035
RCL100D2L066	L	(.197)	2	M4*20L	.394	.394	.374	90	2.362	.709	CLH04..035

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
RCL100D2R066	FSI04-2.0*4.3	T-06
RCL100D2L066	FSI04-2.0*4.3	T-06

RCL.. series/Insert Carbide

CLH04-035

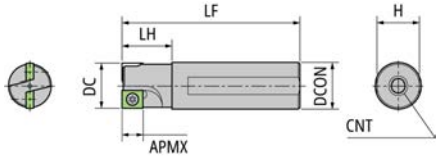


●No center cutting edge

Item Number	Chipbreaker	Wiper	AN	INSL	KAPR	RE	S	W1	Carbide PVD	
			°	inch	°	inch	inch	inch	DM4	ZM3
CLH0402CFN-035	No	No	7	.219	90	.008	.074	.165	●	●
CLH0402CT00525-035	No	No	7	.219	90	.008	.074	.165	●	●

RCL.. series/Toolholders

RCL-050



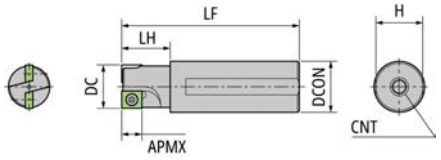
● Diagram shows right-hand tool

Item Number	Hand	APMX	CICT	CNT	DC	DCON	H	KAPR	LF	LH	Insert Gage
		inch			inch	inch	inch	°	inch	inch	
RCL120D2R050	R	(.197)	2	M4*20L	.472	.472	.433	90	2.362	.591	CLH04..004
RCL120D2L050	L	(.197)	2	M4*20L	.472	.472	.433	90	2.362	.591	CLH04..004

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
RCL120D2R050	FSI01-2.5*5	CLR-15S
RCL120D2L050	FSI01-2.5*5	CLR-15S

RCL-059



● Diagram shows right-hand tool

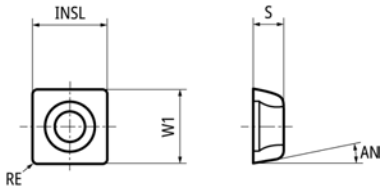
Item Number	Hand	APMX	CICT	CNT	DC	DCON	H	KAPR	LF	LH	Insert Gage
		inch			inch	inch	inch	°	inch	inch	
RCL120D2R059	R	(.197)	2	M6*20L	.472	.551	.512	90	2.165	.591	CLH04..004
RCL120D2L059	L	(.197)	2	M6*20L	.472	.551	.512	90	2.165	.591	CLH04..004

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
RCL120D2R059	FSI01-2.5*5	CLR-15S
RCL120D2L059	FSI01-2.5*5	CLR-15S

RCL.. series/Insert Carbide

CLH04-004

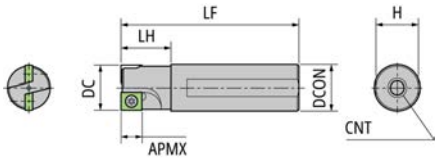


●No center cutting edge

Item Number	Chipbreaker	Wiper	AN	INSL	KAPR	RE	S	W1	Carbide PVD	
			°	inch	°	inch	inch	inch	DM4	ZM3
CLH0402CFN-004	No	No	7	.219	90	.008	.074	.187	●	●
CLH0402CT00525-004	No	No	7	.219	90	.008	.074	.187	●	●

RCL.. series/Toolholders

RCL-021



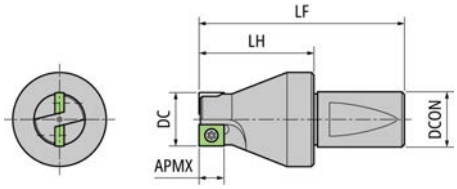
● Diagram shows right-hand tool

Item Number	Hand	APMX	CICT	CNT	DC	DCON	H	KAPR	LF	LH	Insert Gage
		inch			inch	inch	inch	°	inch	inch	
RCL140D2R021	R	(.236)	2	M6*20L	.551	.551	.512	90	2.165	.591	CLH05..
RCL140D2L021	L	(.236)	2	M6*20L	.551	.551	.512	90	2.165	.591	CLH05..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
RCL140D2R021	FSI01-2.5*5	CLR-15S
RCL140D2L021	FSI01-2.5*5	CLR-15S

RCL-020



● Diagram shows right-hand tool

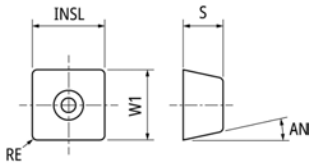
Item Number	Hand	APMX	CICT	CNT	DC	DCON	H	KAPR	LF	LH	Insert Gage
		inch			inch	inch	inch	°	inch	inch	
RCL140Z2R020	R	(.236)	2	–	.551	.551	–	90	2.126	1.181	CLH05..
RCL140Z2L020	L	(.236)	2	–	.551	.551	–	90	2.126	1.181	CLH05..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
RCL140Z2R020	FSI01-2.5*5	CLR-15S
RCL140Z2L020	FSI01-2.5*5	CLR-15S

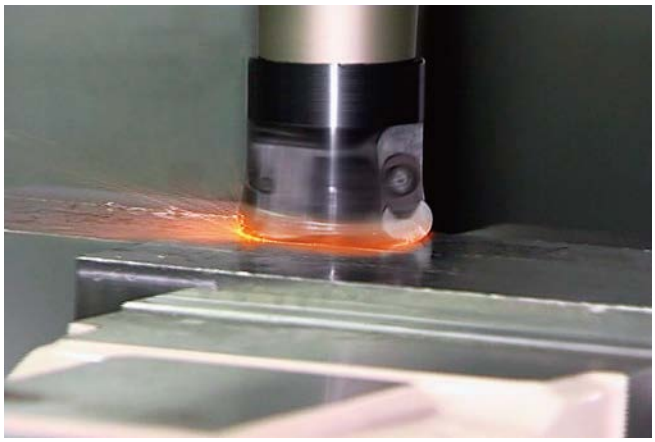
RCL.. series/Insert Carbide

CLH05



Item Number	Chipbreaker	Wiper	AN	INSL	KAPR	RE	S	W1	Carbide PVD	
			°	inch	°	inch	inch	inch	DM4	ZM3
CLH0502CFN	No	No	11	.250	90	.008	.086	.219	●	●
CLH0504CFN	No	No	11	.250	90	.016	.086	.219	●	●

MEMO



Milling Cutter

Product Lines I02

Recommend Cutting Conditions I03

Machine power requirements -Quick Check Table- I04

Compatible arbor standard table I05

JRF series I06

JR series I10

JWNXM series I14

JFDX series I15

JXTM series I24

JQ series I26

JSDW series I28

Product Lines

HRSA materials and Hardened Materials

Series	Features	DC inch	KAPR °	APMX inch	Page
JRF series	High-speed machining of HRSA materials • Enhancing Machining Efficiency Further with Increased Insert Count • Economical with Double-Sided Usable Negative Inserts • Extended Lifespan Chipbreaker	ø.630" - 1.260"	–	- .039"	**A13 I6-9**
JR series	High-speed machining of HRSA materials • High performance milling cutter line that uses round-shaped inserts for machining both aerospace and hardened steels • SX7, SiAlON grade, has the best performance for high speed machining of high temperature alloys	ø.750" - 4.00"	–	- .126"	**I10-13**

Gray / Ductile Cast Iron

Series	Features	DC inch	KAPR °	APMX inch	Page
JWNXM series	Low resistance × multiple corners • Reduces occurrence of insert edge chipping which is common during cast iron machining • Ideal for machining through scale • Tooling cost is reduced by using the unique 6 corner insert.	ø2.480" - 6.300"	88°	- .217"	**A18 I14**
JFDX series	Low cost x versatility • Extremely economical 8-corner inserts • Covers various applications with 45, 75, and 88 degree angle milling cutters • Ceramic inserts with chipbreaker and wiper are also available	ø2.480" - 6.300"	45°,75°,88°	- .236"	**I15-23**
JXTM series	High rigidity • Large DOC is possible because of the fine pitch of inserts which results in higher productivity • LNX Insert comes with special chipbreaker to reduce tool pressure • Newly added Left-hand cutters	ø1.50" - 6.00"	88°	- .315"	**I24-25**
JQ series	Shoulder milling × Small diameter cutter • Capable of 90-degree shoulder milling • A variety of cutter diameters as small as φ.787"	ø.787" - 2.480"	90°	- .315"	**I26-27**
JSDW series	Low tool pressure • Positive inserts reduce tool pressure and produce excellent surface finish in addition to long tool life • Best for milling thin parts thanks to reduced tool pressure	ø2.500" - 6.300"	45°,75°	- .236"	**I28-33**

Recommended Cutting Conditions

For HRSA materials and Hardened materials

Work Material		Grade	Dry	Wet	Cutting Speed (SFM) 200 700 1200 1700 2200 2700 3200 3700	Feed (IPT) .002 .003 .004 .005 .006 .007	Depth of Cut (inch)
S							
Heat Resistant Alloys		SX7	●				~.150
		SX3	●				~.150
		SX9	●				~.150
H							
Hardened Steel	HRC 45-55	WA1	●	○			~.150
		HC7	●	○			~.150
	HRC 55-65	WA1	●	○			~.150
		HC7	●	○			~.150

For Gray / Ductile Cast Iron

Material	Grade	Dry	Wet	Cutting Speed (SFM) 350 700 1200 1700 2200 2700 3200 3700 4200 4600	Feed (IPT) .002 .004 .006 .008 .010 .012
K					
Gray Cast Iron	SX6	●	●		
	SP9	●	○		
Ductile Cast Iron	SP9	●	○		
	DM4	●	○		
Steel	DM4	●	○		

Machine power requirements -Quick Check Table-

Calculation

※Assuming that normal cast iron is machined at a cutting speed of 2600 SFM

Required mechanical power(hp) = ○○% × ○○hp

Width of cutting a_e = __ __ % of the cutter diameter

The value __ __ hp determined from the applicable table below

〈Example of calculation〉
Cutter used : HVMΦ4"−10 teeth Width of cutting a_e=1.2"→This is 30% of the cutter diameter
Cutting conditions : 2600 SFM .008 IPT .118 DOC → The value 54hp in the table is located.

→ The required power (hp)=30%×54hp= 16hp

JFDX series

JFDXø2.5" - 6 teeth

		Feed rate per tooth (IPT)			
		.004	.008	.012	.016
Depth of cut (inch)	.039	5	8	9	12
	.079	9	15	19	23
	.118	15	22	30	35
	.157	19	30	39	47

JFDXø3" - 8 teeth

		Feed rate per tooth (IPT)			
		.004	.008	.012	.016
Depth of cut (inch)	.039	8	12	16	19
	.079	16	24	32	39
	.118	24	36	47	58
	.157	31	48	63	76

JFDXø4" -10 teeth

		Feed rate per tooth (IPT)			
		.004	.008	.012	.016
Depth of cut (inch)	.039	12	17	24	28
	.079	23	36	47	56
	.118	35	54	71	86
	.157	47	72	94	114

JFDXø5" - 12 teeth

		Feed rate per tooth (IPT)			
		.004	.008	.012	.016
Depth of cut (inch)	.039	16	26	34	40
	.079	32	50	66	79
	.118	48	75	98	119
	.157	64	99	131	158

JFDXø6" - 16 teeth

		Feed rate per tooth (IPT)			
		.004	.008	.012	.016
Depth of cut (inch)	.039	28	43	56	67
	.079	55	85	111	134
	.118	83	127	168	203
	.157	110	170	223	270

JSDW series

JSDWø2.5" - 4 teeth

		Feed rate per tooth (IPT)			
		.004	.008	.012	.016
Depth of cut (inch)	.039	4	5	8	9
	.079	8	12	16	19
	.118	12	17	24	30
	.157	16	24	32	39

JSDWø3" - 6 teeth

		Feed rate per tooth (IPT)			
		.004	.008	.012	.016
Depth of cut (inch)	.039	7	11	15	17
	.079	15	22	30	35
	.118	22	32	44	52
	.157	28	43	58	70

JSDWø4" - 7 teeth

		Feed rate per tooth (IPT)			
		.004	.008	.012	.016
Depth of cut (inch)	.039	9	13	19	23
	.079	19	27	36	44
	.118	27	42	55	67
	.157	36	55	74	89

JSDWø5" - 8 teeth

		Feed rate per tooth (IPT)			
		.004	.008	.012	.016
Depth of cut (inch)	.039	11	17	23	27
	.079	23	34	46	55
	.118	34	51	68	82
	.157	44	67	91	110

JSDWø6" - 10 teeth

		Feed rate per tooth (IPT)			
		.004	.008	.012	.016
Depth of cut (inch)	.039	16	24	32	39
	.079	32	48	66	79
	.118	48	72	98	118
	.157	64	97	130	157

JXTM series

JXTMø3" - 10 teeth

		Feed rate per tooth (IPT)			
		.004	.008	.012	.016
Depth of cut (inch)	.197	48	74	102	125
	.236	58	89	122	149
	.276	67	102	142	174
	.315	76	117	162	199

JXTMø4" - 13 teeth

		Feed rate per tooth (IPT)			
		.004	.008	.012	.016
Depth of cut (inch)	.197	82	125	174	213
	.236	98	150	209	255
	.276	114	176	244	298
	.315	130	200	279	341

JXTMø5" - 16 teeth

		Feed rate per tooth (IPT)			
		.004	.008	.012	.016
Depth of cut (inch)	.197	125	192	266	325
	.236	149	229	319	390
	.276	174	268	372	455
	.315	199	306	425	519

Unit: kW

*Please make use of the above tables, understanding that they are approximations only to use as a guide.

Tips for utilizing the above tables

1. The assumption is that gray cast iron is machined at a cutting speed of 2600 SFM, with the cutter diameter shown as the width of cut (a_e= 100% of the cutter diameter).
2. The required power becomes approximately half (50%) if the cutting width a_e or depth of cut is halved. (The power is proportional to a_e or a_p.)
3. The required power is reduced to approximately 60% if the number of inserts is halved.
4. Machines that have an output of 30hp or greater are recommended.

Compatible arbor standard table

HRSA materials and Hardened Materials

Series		Mountable standard	
		Type of standard arbor	Arbor diameter
JRPMW	ø1.260" ※	ø.984" Gripping diameter sleeve ※	Shank diameter ø.984" ※
	ø1.260" ※	ø1.260" Gripping diameter sleeve ※	Shank diameter ø1.260" ※
	ø1.575" ※	ø1.260" Gripping diameter sleeve ※	Shank diameter ø1.260" ※
	ø1.969"	FMC	ø.866"
	ø2.480"	FMC	ø.866"
	ø3.150"	FMA	ø1.000"

※Shank-type body

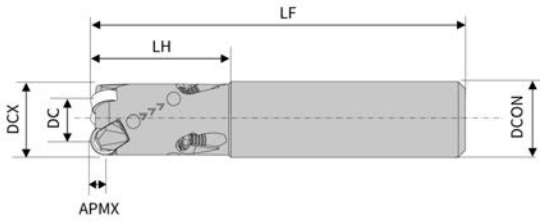
Gray / Ductile Cast Iron

Series		Mountable standard	
		Type of standard arbor	Arbor diameter
JWNXM	ø2.480"	FMC	ø.866"
	ø3.150"	FMA	ø1.000"
	ø3.937"	FMA	ø1.250"
	ø4.921"	FMA	ø1.500"
	ø6.300"	FMA	ø2.000"
JFDX	ø2.480"	FMC	ø.866"
	ø3.150"	FMA	ø1.000"
	ø3.937"	FMA	ø1.250"
	ø4.921"	FMA	ø1.500"
JSDW	ø2.480"	FMC	ø.866"
	ø3.150"	FMA	ø1.000"
	ø3.937"	FMA	ø1.250"
	ø4.921"	FMA	ø1.500"
JXTM	ø3.150"	FMA	ø1.000"
	ø3.937"	FMA	ø1.250"
	ø4.921"	FMA	ø1.500"
JQTS	ø1.575"		ø.630"
	ø1.969"	FMC	ø.866"
	ø2.480"	FMC	ø.866"
JQTE	ø.787" ※	ø.787 Gripping diameter sleeve ※	Shank diameter ø.787 ※
	ø.984" ※	ø.984" Gripping diameter sleeve ※	Shank diameter ø.984" ※
	ø1.260" ※	ø1.260" Gripping diameter sleeve ※	Shank diameter ø1.260" ※
	ø1.575" ※	ø1.260" Gripping diameter sleeve ※	Shank diameter ø1.260" ※

※Shank-type body

JRF series / Cutter Shank type

JRFIH Inch size



Item Number	Hand	Number of teeth	APMX	DC	DCON	DCX	GAMF	GAMP	LF	LH	Weight	MAX RPM	Insert Gage
			inch	inch	inch	inch	(R.R.)°	(A.R.)°	inch	inch	lbs	min-1	
JRFIH0625E0625R03	R	3	~.039	.375	.625	.625	-20	-10	3.160	1.191	0.243	20000	RNGF22...
JRFIH075E075R03	R	3	~.039	.500	.750	.750	-20	-10	4.000	1.638	0.463	17500	RNGF23...
JRFIH100E100R03	R	3	~.039	.625	1.000	1.000	-25	-12	4.000	1.638	0.772	15000	RNGF33...
JRFIH100E100R04	R	4	~.039	.750	1.000	1.000	-25	-10	4.000	1.638	0.794	15000	RNGF23...
JRFIH125E125R03	R	3	~.039	.750	1.250	1.250	-25	-12	4.725	1.969	1.455	12500	RNGF43...
JRFIH125E125R04	R	4	~.039	.875	1.250	1.250	-28	-15	4.725	1.969	1.455	12500	RNGF33...
JRFIH125E125R05	R	5	~.039	.875	1.250	1.250	-25	-15	4.725	1.969	1.477	12500	RNGF33...

Spare Parts

Item Number	Cap screw	Wedge screw	Wrench	Wrench (sold separately)
JRFIH0625E0625R03	HCS3P050	HWS3P050	LW-2.5S	(DL-025-08-JRF)
JRFIH075E075R03	HCS3P050	HWS3P050	LW-2.5S	(DL-025-08-JRF)
JRFIH100E100R03	HCS5P080	HWS5P080	LW-4	(DL-040-20-JRF)
JRFIH100E100R04	HCS3P050	HWS3P050	LW-2.5	(DL-025-20-JRF)
JRFIH125E125R03	HCS5P080	HWS5P080	LW-4	(DL-040-20-JRF)
JRFIH125E125R04	HCS5P080	HWS5P080	LW-4	(DL-040-20-JRF)
JRFIH125E125R05	HCS3P050	HWS3P050	LW-2.5	(DL-025-20-JRF)

JRFMH Metric size

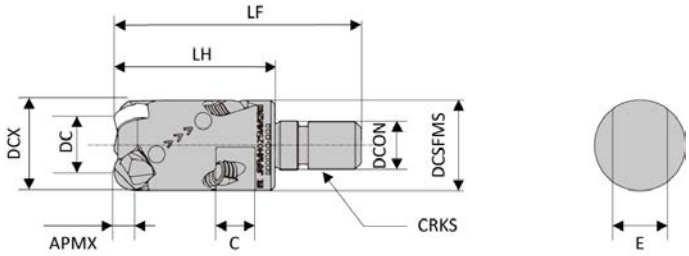
Item Number	Hand	Number of teeth	APMX	DC	DCON	DCX	GAMF	GAMP	LF	LH	Weight	MAX RPM	Insert Gage
			mm	mm	mm	mm	(R.R.)°	(A.R.)°	mm	mm	kg	min-1	
JRFMH016E160R03	R	3	~1.0	9.65	16	16	-20	-10	80	30	0.11	20000	RNGF22...
JRFMH020E200R03	R	3	~1.0	13.65	20	20	-20	-10	100	40	0.22	17500	RNGF23...
JRFMH025E250R03	R	3	~1.0	15.475	25	25	-25	-12	100	40	0.33	15000	RNGF33...
JRFMH025E250R04	R	4	~1.0	18.65	25	25	-25	-10	100	40	0.34	15000	RNGF23...
JRFMH032E320R03	R	3	~1.0	19.3	32	32	-25	-12	120	50	0.67	12500	RNGF43...
JRFMH032E320R04	R	4	~1.0	22.475	32	32	-28	-15	120	50	0.67	12500	RNGF33...
JRFMH032E320R05	R	5	~1.0	22.475	32	32	-25	-15	120	50	0.68	12500	RNGF33...

Spare Parts

Item Number	Cap screw	Wedge screw	Wrench	Wrench (sold separately)
JRFMH016E160R03	HCS3P050	HWS3P050	LW-2.5S	(DL-025-08-JRF)
JRFMH020E200R03	HCS3P050	HWS3P050	LW-2.5S	(DL-025-08-JRF)
JRFMH025E250R03	HCS5P080	HWS5P080	LW-4	(DL-040-20-JRF)
JRFMH025E250R04	HCS3P050	HWS3P050	LW-2.5	(DL-025-20-JRF)
JRFMH032E320R03	HCS5P080	HWS5P080	LW-4	(DL-040-20-JRF)
JRFMH032E320R04	HCS5P080	HWS5P080	LW-4	(DL-040-20-JRF)
JRFMH032E320R05	HCS3P050	HWS3P050	LW-2.5	(DL-025-20-JRF)

JRF series / Cutter　Modular type

JRFMH-MM　Metric size



Item Number	Hand	Number of teeth	APMX	DC	DCON	DCX	GAMF	GAMP	DCSFMS	CRKS	LF	LH	E	Insert Gage
			inch	inch	inch	inch	(R.R.)°	(A.R.)°	inch	M	inch	inch	inch	
JRFMH016MM08R03	R	3	~.039	.380	.335	.630	-20	-10	.591	M8	2.087	1.378	.512	RNGF22...
JRFMH020MM10R03	R	3	~.039	.537	.413	.787	-20	-10	.748	M10	2.126	1.378	.630	RNGF23...
JRFMH025MM12R03	R	3	~.039	.609	.492	.984	-25	-12	.906	M12	2.480	1.614	.748	RNGF33...
JRFMH025MM12R04	R	4	~.039	.734	.492	.984	-25	-10	.906	M12	2.480	1.614	.748	RNGF23...
JRFMH032MM16R03	R	3	~.039	.760	.669	1.260	-25	-12	1.181	M16	2.480	1.594	.945	RNGF43...
JRFMH032MM16R04	R	4	~.039	.885	.669	1.260	-28	-15	1.181	M16	2.480	1.594	.945	RNGF33...
JRFMH032MM16R05	R	5	~.039	.885	.669	1.260	-25	-15	1.181	M16	2.480	1.594	.945	RNGF33...

Spare Parts

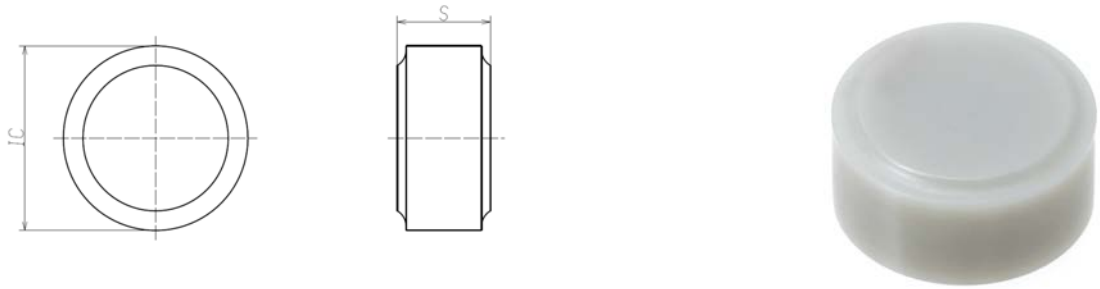
Item Number	Cap screw	Wedge screw	Wrench	Wrench (sold separately)
JRFMH016MM08R03	HCS3P050	HWS3P050	LW-2.5	(DL-025-08-JRF)
JRFMH020MM10R03	HCS3P050	HWS3P050	LW-2.5	(DL-025-08-JRF)
JRFMH025MM12R03	HCS5P080	HWS5P080	LW-4	(DL-040-20-JRF)
JRFMH025MM12R04	HCS3P050	HWS3P050	LW-2.5	(DL-025-20-JRF)
JRFMH032MM16R03	HCS5P080	HWS5P080	LW-4	(DL-040-20-JRF)
JRFMH032MM16R04	HCS5P080	HWS5P080	LW-4	(DL-040-20-JRF)
JRFMH032MM16R05	HCS3P050	HWS3P050	LW-2.5	(DL-025-20-JRF)

Recommended Torque Table

Mounting Screw Size（CRKS）	Recommended Torque（N・m）
M8	23
M10	46
M12	80
M16	90

JRF series / Insert

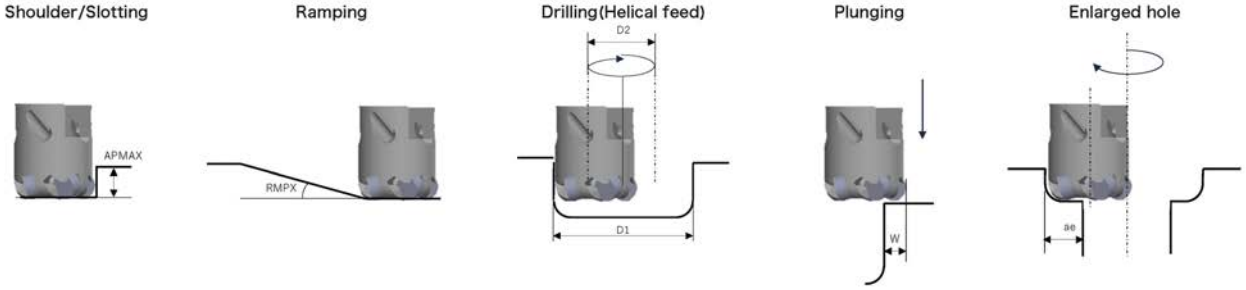
RNGF



U.S. Design Patent No. D1,068,888 S

Item Number		Edge Condition	IC	S	Silicon Nitride Ceramics	
(Inch)	(ISO)		inch	inch	SX3	SX9
RNGF 220 E02 -HNF	**RNGF 060300 E -HNF**	E02	1/4	1/8	●	●
RNGF 230 E02 -HNF	**RNGF 060400 E -HNF**	E02	1/4	3/16	●	●
RNGF 330 E02 -HNF	**RNGF 090400 E -HNF**	E02	3/8	3/16	●	●
RNGF 430 E02 -HNF	**RNGF 120400 E -HNF**	E02	1/2	3/16	●	

Processing form



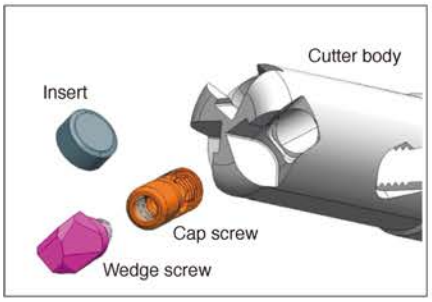
Machinable range (mm)

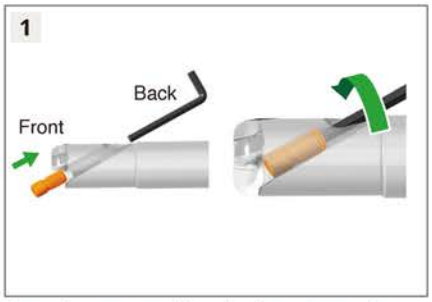
Modular type	Shank	ϕDc(mm)	Max. Depth of cut APMAX (mm)	Max. ramping angle RMPX(°)	Min. machinable hole dia. ϕD1(mm)	Max. machinable hole dia. ϕD1(mm)	Min. machinable hole dia. ϕD2(mm)	Max. machinable hole dia. ϕD2(mm)	Max. Cutting width in plunging W(mm)	Max. cutting width in enlarged hole ae(mm)
JRFMH016MM08R03	JRFMH016E160R03	16	1.0	1.0	25.7	30.0	9.7	14.0	3.1	12.9
JRFMH020MM10R03	JRFMH020E200R03	20	1.0	0.9	33.7	38.0	13.7	18.0	3.2	16.8
JRFMH025MM12R03	JRFMH025E250R03	25	1.0	1.0	40.7	48.0	15.7	23.0	4.7	20.3
JRFMH025MM12R04	JRFMH025E250R04	25	1.0	0.5	43.8	48.0	18.8	23.0	3.1	21.9
JRFMH032MM16R03	JRFMH032E320R03	32	1.0	0.9	51.6	62.0	19.6	30.0	6.2	25.8
JRFMH032MM16R04	JRFMH032E320R04	32	1.0	0.9	54.5	62.0	22.5	30.0	4.7	27.3
JRFMH032MM16R05	JRFMH032E320R05	32	1.0	1.1	54.4	62.0	22.4	30.0	4.8	27.2

Machinable range (in)

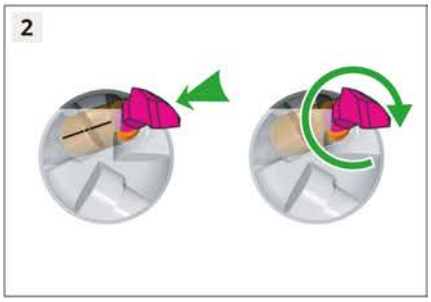
Shank type	ϕDc	Max. Depth of cut APMAX	Max. ramping angle RMPX(°)	Min. machinable hole dia. ϕD1	Max. machinable hole dia. ϕD1	Min. machinable hole dia. ϕD2	Max. machinable hole dia. ϕD2	Max. Cutting width in plunging W	Max. cutting width in enlarged hole ae
JRFIH0625E0625R03	0.625	0.039	1.00	1.003	1.171	0.378	0.546	0.124	0.501
JRFIH075E075R03	0.75	0.039	0.90	1.252	1.421	0.502	0.671	0.124	0.626
JRFIH100E100R03	1.00	0.039	1.00	1.633	1.921	0.633	0.921	0.184	0.816
JRFIH100E100R04	1.00	0.039	0.50	1.758	1.921	0.758	0.921	0.121	0.879
JRFIH125E125R03	1.25	0.039	1.1	2.012	2.421	0.762	1.171	0.244	1.006
JRFIH125E125R04	1.25	0.039	1.0	2.127	2.421	0.877	1.171	0.186	1.064
JRFIH125E125R05	1.25	0.039	1.20	2.121	2.421	0.871	1.171	0.189	1.061

JRF cutter parts installation manual

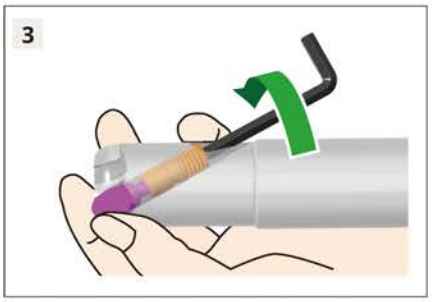




Insert the cap screw from the front, insert a hex wrench from the back side, and rotate it 360 degrees (1 turn).

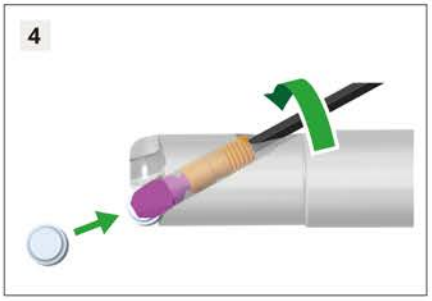


Insert the wedge screw into the cap screw and rotate it 360 degrees (1 turn) by hand.



Hold the wedge screw and tighten the cap screw with the hex wrench until it stops, then loosen it 360 degrees (1 turn) *.

*Loosen 360° for insert space



First, insert the insert.
Then, insert the torque wrench from the back side and tighten to the specified torque value.

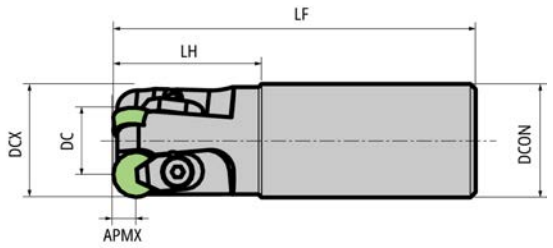
Video explanation

Shank type Designation	Modular type Designation	Recommended tightening torque※	Cap screw	Wedge screw
JRFMH016E160R03	JRFMH016MM08R03	2N·m	HCS3P050	HWS3P050
JRFIH0625E0625R03				
JRFMH020E200R03	JRFMH020MM10R03			
JRFIH075E075R03				
JRFMH025E250R04	JRFMH025MM12R04			
JRFIH100E100R04				
JRFMH032E320R05	JRFMH032MM16R05			
JRFIH125E125R05				
JRFMH025E250R03	JRFMH025MM12R03	4N·m	HCS5P080	HWS5P080
JRFIH100E100R03				
JRFMH032E320R03	JRFMH032MM16R03			
JRFIH125E125R03				
JRFMH032E320R04	JRFMH032MM16R04			
JRFIH125E125R04				

※If the recommended cutting conditions or tightening torque are exceeded, the insert, cutter body, cap screw, or wedge screw may be damaged. Please ensure machining is performed within the specified recommended range.

JR series / Cutter

JRPMW Shank type



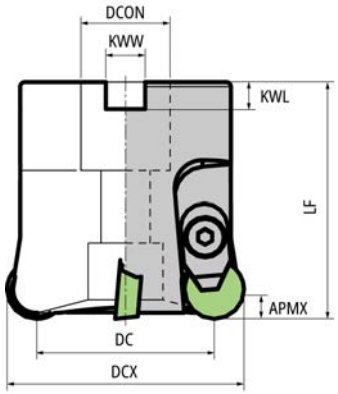
Item Number	Hand	Number of teeth	APMX	DC	DCON	DCX	GAMF	GAMP	LF	LH	Weight	Insert Gage
			inch	inch	inch	inch	°	°	inch	inch	lbs	
RPIW075E075R02	R	2	~.059	1/2	.750	3/4	+7.5	+5	3.270	1.220	0.397	RP..21.5..
RPIW100E100R03	R	3	~.091	5/8	1.000	1.000	+7.5	+5	3.270	1.000	0.595	RP..32..
RPIW125E125R03	R	3	~.126	3/4	1.250	1-1/4	+7.5	+5	4.000	1.640	1.102	RP..43..
RPIW150E150R03	R	3	~.126	1.000	1.500	1-1/2	+7.5	+5	4.000	1.830	1.609	RP..43..
JRPMW032E250R03	R	3	~.126	.760	.984	1.260	-7.5	+5	4.724	1.575	0.926	RP..43..
JRPMW032E320R03	R	3	~.126	.760	1.260	1.260	-7.5	+5	4.724	1.575	1.323	RP..43..
JRPMW040E320R03	R	3	~.126	1.075	1.260	1.575	-7.5	+5	4.724	1.575	1.587	RP..43..

※Weight : Includes inserts and parts

Spare Parts

Item Number	Clamp	Clamp screw	Wrench (for Clamp screw)
RPIW075E075R02	AMS-3	AOB-3S	–
RPIW100E100R03	AMS-4	AOB-4S	–
RPIW125E125R03	AMS-5T	AOB-5S-T25	LLR-T25
RPIW150E150R03	AMS-5T	AOB-5S-T25	LLR-T25
JRPMW032E250R03	AMS-5T	AOB-5S-T25	LLR-T25
JRPMW032E320R03	AMS-5T	AOB-5S-T25	LLR-T25
JRPMW040E320R03	AMS-5T	AOB-5S-T25	LLR-T25

JRPMW Arbor type



Item Number	Hand	Number of teeth	APMX	DC	DCON	DCX	GAMF	GAMP	KWL	KWW	LF	Weight	Insert Gage
			inch	inch	inch	inch	°	°	inch	inch	inch	lbs	
RPIW200S075R04	R	4	~.126	1.500	.750	2.000	+5	+5	.217	.315	2.000	0.904	RP..43..
RPIW300S100R05	R	5	~.126	2.500	1.000	3.000	+5	+5	.236	.378	2.000	2.006	RP..43..
RPIW400S125R06	R	6	~.126	3.500	1.250	4.000	+5	+5	.299	.500	2.000	4.211	RP..43..
JRPMW050S220R04	R	4	~.126	1.469	.866	1.969	-5	+5	.248	.409	1.969	0.772	RP..43..
JRPMW063S220R04	R	4	~.126	1.980	.866	2.480	-5	+5	.248	.409	1.969	1.213	RP..43..
JRPMW080S254R05	R	5	~.126	2.650	1.000	3.150	-2.5	+5	.236	.374	1.969	1.918	RP..43..

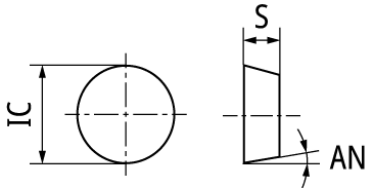
※Weight : Includes inserts and parts

Spare Parts

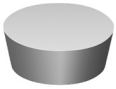
Item Number	Clamp	Shim	Clamp screw	Screw (for Shim)	Wrench (for Clamp screw)
RPIW200S075R04	AMS-5T	ARP42A	AOB-5S-T25	M3*8	LLR-T25
RPIW300S100R05	AMS-5T	ARP42A	AOB-5S-T25	M3*8	LLR-T25
RPIW400S125R06	AMS-5T	ARP42A	AOB-5S-T25	M3*8	LLR-T25
JRPMW050S220R04	AMS-5T	ARP42A	AOB-5S-T25	M3*8	LLR-T25
JRPMW063S220R04	AMS-5T	ARP42A	AOB-5S-T25	M3*8	LLR-T25
JRPMW080S254R05	AMS-5T	ARP42A	AOB-5S-T25	M3*8	LLR-T25

JR series / Positive Inserts BIDEMICS Ceramics NTK CeramiX

RPGN

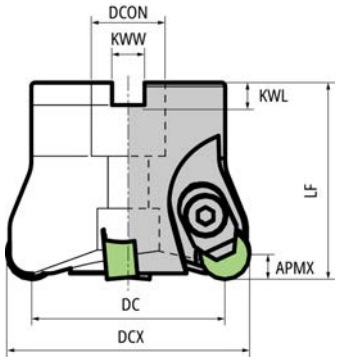


Steel																						
Stainless Steel																						
Cast Iron						●	●	●		●	●						●	●	○	○		
Non-Ferrous Material																						
Heat Resistant Alloy	●	●	●	●										●	●	●	●			●	●	
Hardened Material					●			○	●	○		●	●									
Others (non-metallic)																						

Shape	Item Number		IC	S	AN	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
						PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	inch	inch	°	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	**RPGN 21.50 E02**	**RPGN 060200 E004**	1/4	3/32	11														●		●					
	RPGN 21.50 T0220	**RPGN 060200 T00520**	1/4	3/32	11														●	●	●	●			●	●
	RPGN 320 E02	**RPGN 090300 E004**	3/8	1/8	11														●		●	●				
	RPGN 320 T0220	**RPGN 090300 T00520**	3/8	1/8	11														●		●	●			●	●
	RPGN 320 T0320	**RPGN 090300 T00820**	3/8	1/8	11																●					
	RPGN 320 T0420	**RPGN 090300 T01020**	3/8	1/8	11																				●	
	RPGN 320 T0425	**RPGN 090300 T01025**	3/8	1/8	11								●													
	RPGN 430 E02	**RPGN 120400 E004**	1/2	3/16	11														●		●	●				
	RPGN 430 EA01X	**RPGN 120400 EM02X**	1/2	3/16	11																	●				
	RPGN 430 T0220	**RPGN 120400 T00520**	1/2	3/16	11														●	●	●	●			●	●
	RPGN 430 T0225	**RPGN 120400 T00525**	1/2	3/16	11																	●				
	RPGN 430 T0320	**RPGN 120400 T00820**	1/2	3/16	11																●					
	RPGN 430 T0420	**RPGN 120400 T01020**	1/2	3/16	11												●		●	●	●	●			●	●

JR series / Cutter

JRNMW Arbor type



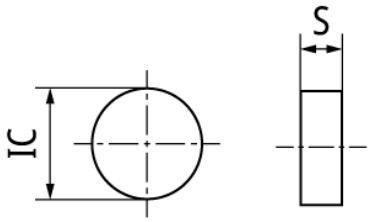
Item Number	Hand	Number of teeth	APMX	DC	DCON	DCX	GAMF	GAMP	KWL	KWW	LF	Weight	Insert Gage
			inch	inch	inch	inch	°	°	inch	inch	inch	lbs	
RNIW200S075R04-43	R	4	~.126	1.500	.750	2.000	-10	-5	.217	.315	2.000	0.992	RN..43..
RNIW200S075R03	R	3	~.126	1.500	.750	2.000	-10	-5	.217	.315	2.000	0.992	RN..45..
RNIW250S075R04	R	4	~.126	2.000	.750	2.500	-10	-5	.217	.315	2.000	1.301	RN..45..
RNIW300S100R05	R	5	~.126	2.500	1.000	3.000	-10	-5	.236	.378	2.000	1.609	RN..45..
RNIW400S125R06	R	6	~.126	3.500	1.250	4.000	-10	-5	.300	.510	2.000	4.211	RN..45..
JRNMW050S220R03	R	3	~.126	1.469	.866	1.969	-10	-5	.236	.394	1.969	0.926	RN..45..
JRNMW063S220R04	R	4	~.126	1.980	.866	2.480	-10	-5	.236	.394	1.969	1.213	RN..45..
JRNMW080S254R05	R	5	~.126	2.650	1.000	3.150	-10	-5	.236	.374	1.969	1.874	RN..45..

※Weight : Includes inserts and parts

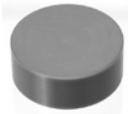
Spare Parts

Item Number	Clamp	Clamp screw	Wrench (for Clamp screw)
RNIW200S075R04-43	AMS-6T	AOB-6S-T30	–
RNIW200S075R03	AMS-6T	AOB-6S-T30	LLR-T30
RNIW250S075R04	AMS-6T	AOB-6S-T30	LLR-T30
RNIW300S100R05	AMS-6T	AOB-6S-T30	LLR-T30
RNIW400S125R06	AMS-6T	AOB-6S-T30	LLR-T30
JRNMW050S220R03	AMS-6T	AOB-6S-T30	LLR-T30
JRNMW063S220R04	AMS-6T	AOB-6S-T30	LLR-T30
JRNMW080S254R05	AMS-6T	AOB-6S-T30	LLR-T30

RNGN

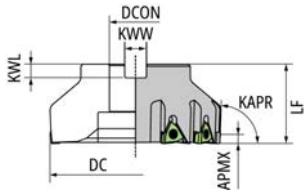


Steel																							
Stainless Steel																							
Cast Iron						●	●	●		●	●							●	●	○	○		
Non-Ferrous Material																							
Heat Resistant Alloy	●	●	●	●										●	●	●	●			●	●		
Hardened Material					●			○	●	○		●	●										
Others (non-metallic)																							

Shape	Item Number		IC	S	BIDEMICS				NTK CeramiX	Alumina Ceramics								Silicon Nitride Ceramics						Whisker Ceramics	
					PVD	PVD			PVD				PVD				PVD						CVD		
	(Inch)	(ISO)	inch	inch	120	JP2	JX1	JX3	450	HC1	HW2	HC2	ZC4	HC5	HC6	HC7	ZC7	SX3	SX5	SX7	SX9	SX6	SP9	WA1	533
	RNGN 430 E02	RNGN 120400 E004	1/2	3/16			●	●										●	●	●	●				●
	RNGN 430 S0425	RNGN 120400 S01025	1/2	3/16													●								●
	RNGN 430 S0825	RNGN 120400 S02025	1/2	3/16													●								
	RNGN 430 T0220	RNGN 120400 T00520	1/2	3/16				●										●	●		●			●	●
	RNGN 430 T0225	RNGN 120400 T00525	1/2	3/16																	●			●	●
	RNGN 430 T0320	RNGN 120400 T00820	1/2	3/16																●					●
	RNGN 430 T0420	RNGN 120400 T01020	1/2	3/16			●	●								●		●	●	●	●		●	●	●
	RNGN 430 T0425	RNGN 120400 T01025	1/2	3/16								●			●		●								●
	RNGN 430 T0820	RNGN 120400 T02020	1/2	3/16																		●			
	RNGN 430 T0825	RNGN 120400 T02025	1/2	3/16																	●				
	RNGN 430 Z0825	RNGN 120400 Z02025	1/2	3/16									●			●									
	RNGN 450 E01	RNGN 120700 E002	1/2	5/16																	●			●	
	RNGN 450 E02	RNGN 120700 E004	1/2	5/16			●	●										●	●	●	●				●
	RNGN 450 E03	RNGN 120700 E007	1/2	5/16								●													
	RNGN 450 K7915	RNGN 120700 K20015	1/2	5/16												●									
	RNGN 450 S0425	RNGN 120700 S01025	1/2	5/16													●								●
	RNGN 450 S0825	RNGN 120700 S02025	1/2	5/16													●								
	RNGN 450 T0220	RNGN 120700 T00520	1/2	5/16				●										●	●		●			●	●
	RNGN 450 T0225	RNGN 120700 T00525	1/2	5/16																	●			●	●
	RNGN 450 T0320	RNGN 120700 T00820	1/2	5/16			●	●												●					●
	RNGN 450 T0420	RNGN 120700 T01020	1/2	5/16			●	●								●		●	●		●		●	●	●
	RNGN 450 T0425	RNGN 120700 T01025	1/2	5/16													●								●
	RNGN 450 T0820	RNGN 120700 T02020	1/2	5/16																		●		●	
	RNGN 450 T0825	RNGN 120700 T02025	1/2	5/16								●					●								
	RNGN 450 Z0620	RNGN 120700 Z01520	1/2	5/16																				●	●
	RNGN 450 Z0825	RNGN 120700 Z02025	1/2	5/16									●			●									
	RNGN 450 P8015	RNGN 120700 P20015	1/2	5/16								●		●		●									●

For Gray / Ductile Cast Iron
JWNXM series / Cutter Lead angle 88 degree

JWNXM Arbor type



Item Number	Hand	Number of teeth	APMX	APMX2	DC	DCON	GAMF	GAMP	KAPR	KWL	KWW	LF	Weight	Insert Gage
			inch	inch	inch	inch	°	°	°	inch	inch	inch	lbs	
JWNXM063C2200R06-A	R	6	~.217	.177	2.480	.866	+4	+5	88	.248	.409	1.969	1.984	WNX44..
JWNXM080A2540R08-A	R	8	~.217	.177	3.150	1.000	+7	+5	88	.236	.374	1.969	2.425	WNX44..
JWNXM100A3175R10-A	R	10	~.217	.177	3.937	1.250	+10	+5	88	.315	.500	1.969	3.968	WNX44..
JWNXM125A3810R12-A	R	12	~.217	.177	4.921	1.500	+10	+5	88	.394	.626	2.283	6.614	WNX44..
JWNXM160A5080R16-A	R	16	~.217	.177	6.299	2.000	+10	+5	88	.433	.748	2.362	10.803	WNX44..

※Weight : Includes inserts and parts

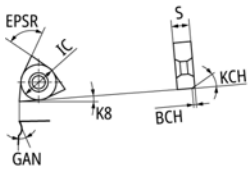
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
JWNXM063C2200R06-A	FSI26-4.0*12-LH	LLR-T15
JWNXM080A2540R08-A	FSI26-4.0*12-LH	LLR-T15
JWNXM100A3175R10-A	FSI26-4.0*12-LH	LLR-T15
JWNXM125A3810R12-A	FSI26-4.0*12-LH	LLR-T15
JWNXM160A5080R16-A	FSI26-4.0*12-LH	LLR-T15

JWNXM series / Inserts Ceramics

WNX44

No.1



No.2

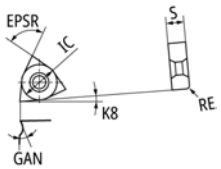
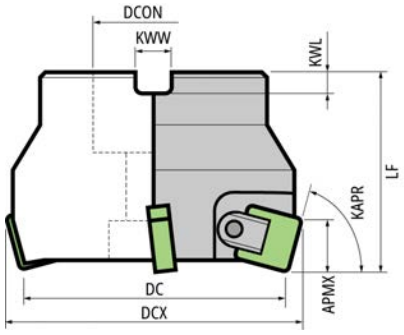


Figure	Item Number	Chipbreaker	Wiper	APMX	BCH	BS	EPSR	GAN	IC	K8	KCH	RE	S	Silicon Nitride Ceramics	
															CVD
				inch	inch	inch	°	°	inch	°	°	inch	inch	SX6	SP9
1	**WNX44-C10T01020**	Yes	Straight	.217	.039	(.024)	80	20	1/2	10	30	–	1/4	●	●
2	**WNX44-R12T01020**	Yes	No	.177	–	–	80	20	1/2	10	–	.047	1/4	●	●

For Gray / Ductile Cast Iron

JFDX.. series / Cutter Lead angle 75 degree

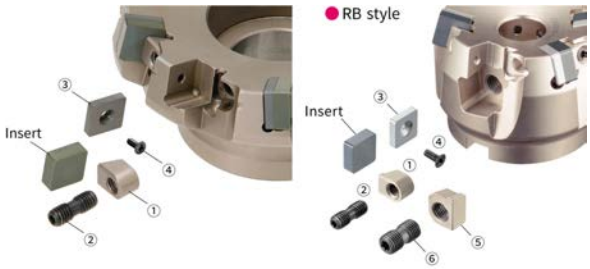
JFDX-75



Item Number	Hand	Number of teeth	APMX	DC	DCON	DCX	GAMF	GAMP	KAPR	KWL	KWW	LF	Weight	Insert Gage	
			inch	inch	inch	inch	°	°	°	inch	inch	inch	lbs		
JFDX25IN-75-06R	R	6	~.236	2.500	.750	2.732	-10	-6	75	.217	.315	2.000	2.006	SN..43..	FDX1204..
JFDX30IN-75-08R	R	8	~.236	3.000	1.000	3.232	-10	-6	75	.225	.387	2.000	2.205	SN..43..	FDX1204..
JFDX40IN-75-10R	R	10	~.236	4.000	1.500	4.232	-10	-6	75	.380	.640	2.000	3.307	SN..43..	FDX1204..
JFDX50IN-75-12R	R	12	~.236	5.000	1.500	5.232	-10	-6	75	.380	.640	2.000	5.71	SN..43..	FDX1204..
JFDX60IN-75-16R	R	16	~.236	6.000	2.000	6.244	-10	-6	75	.433	.748	2.500	8.818	SN..43..	FDX1204..
JFDX063-75-06R	R	6	~.236	2.480	.866	2.756	-10	-6	75	.236	.409	1.969	1.742	SN..43..	FDX1204..
JFDX063-75-06RB	R	6	~.236	2.480	.866	2.756	-10	-6	75	.236	.409	1.969	2.138	SN..43..	FDX1204..
JFDX080-75-08R	R	8	~.236	3.150	1.000	3.425	-10	-6	75	.236	.374	1.969	2.337	SN..43..	FDX1204..
JFDX080-75-08RB	R	8	~.236	3.150	1.000	3.425	-10	-6	75	.236	.374	1.969	2.998	SN..43..	FDX1204..
JFDX100-75-10R	R	10	~.236	3.937	1.250	4.213	-10	-6	75	.315	.500	1.969	3.064	SN..43..	FDX1204..
JFDX100-75-10RB	R	10	~.236	3.937	1.250	4.213	-10	-6	75	.315	.500	1.969	4.034	SN..43..	FDX1204..
JFDX125-75-12R	R	12	~.236	4.921	1.500	5.197	-10	-6	75	.394	.626	2.283	5.644	SN..43..	FDX1204..
JFDX125-75-12RB	R	12	~.236	4.921	1.500	5.197	-10	-6	75	.394	.626	2.283	7.363	SN..43..	FDX1204..
JFDX160-75-16RB	R	16	~.236	6.299	2.000	6.535	-10	-6	75	.433	.748	2.362	12.059	SN..43..	FDX1204..

※Weight : Includes inserts and parts
※RB type : One insert pocket can be adjusted for height

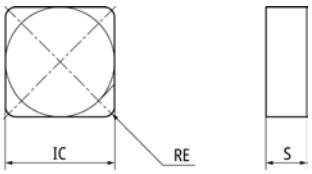
Spare Parts



Item Number	Wedge	Wedge	Shim	Clamp screw	Screw (for Shim)	Screw (for Wedge)	Wrench (for Clamp screw)	Wrench (for Wedge)
	①	⑤	③	②	④	⑥		
JFDX25IN-75-06R	HLW175	–	ASN423	WS0616-T15	M3*8	–	T-15A	–
JFDX30IN-75-08R	HLW175	–	ASN423	WS0616-T15	M3*8	–	T-15A	–
JFDX40IN-75-10R	HLW175	–	ASN423	WS0616-T15	M3*8	–	T-15A	–
JFDX50IN-75-12R	HLW175	–	ASN423	WS0616-T15	M3*8	–	T-15A	–
JFDX60IN-75-16R	HLW175	–	ASN423	WS0616-T15	M3*8	–	T-15A	–
JFDX063-75-06R	HLW175	–	ASN423	WS0616-T15	M3*8	–	T-15A	–
JFDX063-75-06RB	HLW175	HLW177	ASN423	WS0616-T15	M3*8	WS0816-T25	T-15A	LLR-T25
JFDX080-75-08R	HLW175	–	ASN423	WS0616-T15	M3*8	–	T-15A	–
JFDX080-75-08RB	HLW175	HLW177	ASN423	WS0616-T15	M3*8	WS0816-T25	T-15A	LLR-T25
JFDX100-75-10R	HLW175	–	ASN423	WS0616-T15	M3*8	–	T-15A	–
JFDX100-75-10RB	HLW175	HLW177	ASN423	WS0616-T15	M3*8	WS0816-T25	T-15A	LLR-T25
JFDX125-75-12R	HLW175	–	ASN423	WS0616-T15	M3*8	–	T-15A	–
JFDX125-75-12RB	HLW175	HLW177	ASN423	WS0616-T15	M3*8	WS0816-T25	T-15A	LLR-T25
JFDX160-75-16RB	HLW175	HLW177	ASN423	WS0616-T15	M3*8	WS0816-T25	T-15A	LLR-T25

SNGN/SNGF

No.1



No.2

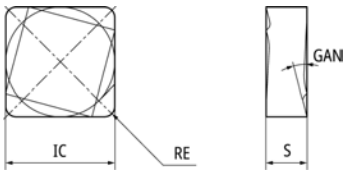
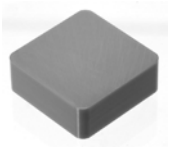
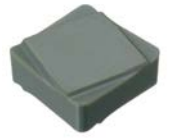
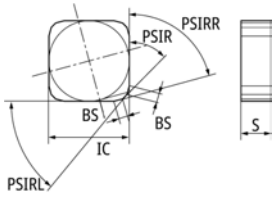


Figure	Shape	Item Number		IC	S	RE	GAN	Silicon Nitride Ceramics		Whisker Ceramics	
									CVD		
		(inch)	(metric)	inch	inch	inch	°	SX6	SP9	533	WA1
1		SNGN 432 T0220	SNGN 120408 T00520	1/2	3/16	.031	–	●		●	●
1		SNGN 432 T0320	SNGN 120408 T00820	1/2	3/16	.031	–			●	
1		SNGN 432 T0420	SNGN 120408 T01020	1/2	3/16	.031	–	●	●	●	●
1		SNGN 432 T0425	SNGN 120408 T01025	1/2	3/16	.031	–			●	●
1		SNGN 432 T0820	SNGN 120408 T02020	1/2	3/16	.031	–	●			
1		SNGN 433 T0220	SNGN 120412 T00520	1/2	3/16	.047	–			●	●
1		SNGN 433 T0320	SNGN 120412 T00820	1/2	3/16	.047	–			●	
1		SNGN 433 T0420	SNGN 120412 T01020	1/2	3/16	.047	–	●	●	●	●
1		SNGN 433 T0425	SNGN 120412 T01025	1/2	3/16	.047	–			●	●
1		SNGN 433 T0820	SNGN 120412 T02020	1/2	3/16	.047	–	●	●		
1		SNGN 434 T0220	SNGN 120416 T00520	1/2	3/16	.063	–			●	●
1		SNGN 434 T0420	SNGN 120416 T01020	1/2	3/16	.063	–	●	●	●	●
1		SNGN 434 T0425	SNGN 120416 T01025	1/2	3/16	.063	–			●	●
1		SNGN 434 T0820	SNGN 120416 T02020	1/2	3/16	.063	–	●			
1		SNGN 435 T0420	SNGN 120420 T01020	1/2	3/16	.079	–		●		
1		SNGN 435 T0820	SNGN 120420 T02020	1/2	3/16	.079	–	●			
1		SNGN 435 T0825	SNGN 120420 T02025	1/2	3/16	.079	–			●	●
1		SNGN 436 T0820	SNGN 120424 T02020	1/2	3/16	.094	–	●			
2		SNGF 433 T0425 RC	SNGF 120412 T01025 RC	1/2	3/16	.047	14	●	●		
2		SNGF 433 T0425 RC-CM	SNGF 120412 T01025 RC-CM	1/2	3/16	.047	14	●			

※Recommended Cutting Conditions
Cutting Speed = - 3280 SFM
Feed = - .004" IPT

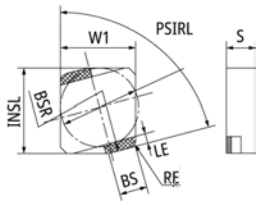
SNGN-EN Inserts Ceramic Wiper : The insert must be installed in all insert pockets



Item Number	Chipbreaker	Wiper	BS	IC	KAPR	PSIR	PSIRL	PSIRR	S	Silicon Nitride Ceramics	
											CVD
			inch	inch	°	°	°	°	inch	SX6	SP9
SNGN 43 EN T0425	No	Straight	.055	1/2	75	45	75	75	3/16	●	●

FDX-75 Inserts CBN Wiper : Can install 1 or 2 CBN Wiper inserts with ceramic insert

No.1



No.2

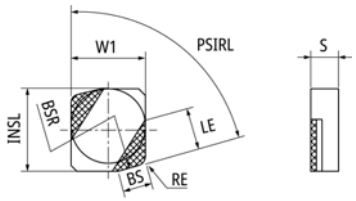


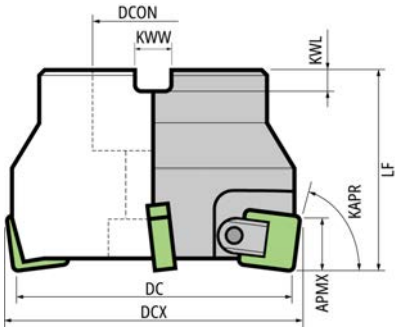
Figure	Item Number	Chipbreaker	Wiper	BS	BSR	INSL	LE	PSIRL	RE	S	W1	CBN	
				inch	inch	inch	inch	°	inch	inch	inch	BK310	BK350
1	**FDX 1204-75-50R**	No	Arch	.177	9.843	.543	.059	75	.047	3/16	.480	●	●
2	**FDX 1204-75-51R**	No	Arch	.197	9.843	.543	(.276)	75	.047	3/16	1/2		
2	**FDX 1204-75-52R**	No	Arch	.197	9.843	.543	(.276)	75	.063	3/16	1/2		

※FDX 1204-75-51R/52R : For RB type. Bottom wiper insert that can also be machined around the periphery.
Use for pockets with adjustable insert height.
Selecting the same corner radius as the ceramic insert enables high-efficiency machining.

For Gray / Ductile Cast Iron

JFDX.. series / Cutter Lead angle 88 degree

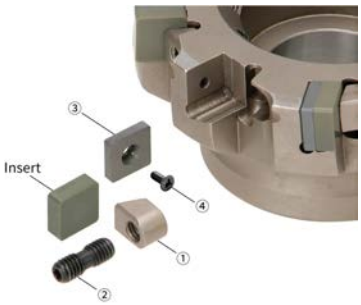
JFDX-88



Item Number	Hand	Number of teeth	APMX	DC	DCON	DCX	GAMF	GAMP	KAPR	KWL	KWW	LF	Weight	Insert Gage	
			inch	inch	inch	inch	°	°	°	inch	inch	inch	lbs		
JFDX25IN-88-06R	R	6	~.236	2.500	.750	2.531	-10	-6	88	.217	.315	2.000	1.808	SN..43..	FDX1204..
JFDX30IN-88-08R	R	8	~.236	3.000	1.000	3.031	-10	-6	88	.225	.387	2.000	2.094	SN..43..	FDX1204..
JFDX40IN-88-10R	R	10	~.236	4.000	1.500	4.031	-10	-6	88	.380	.640	2.000	3.197	SN..43..	FDX1204..
JFDX50IN-88-12R	R	12	~.236	5.000	1.500	5.031	-10	-6	88	.380	.640	2.000	5.798	SN..43..	FDX1204..
JFDX063-88-06R	R	6	~.236	2.480	.866	2.520	-10	-6	88	.236	.409	1.969	1.742	SN..43..	FDX1204..
JFDX080-88-08R	R	8	~.236	3.150	1.000	3.189	-10	-6	88	.236	.374	1.969	2.271	SN..43..	FDX1204..
JFDX100-88-10R	R	10	~.236	3.937	1.250	3.976	-10	-6	88	.315	.500	1.969	3.042	SN..43..	FDX1204..
JFDX125-88-12R	R	12	~.236	4.921	1.500	4.961	-10	-6	88	.394	.626	2.283	5.754	SN..43..	FDX1204..

※Weight : Includes inserts and parts

Spare Parts

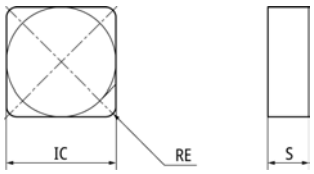


Item Number	Wedge	Shim	Clamp screw	Screw (for Shim)	Wrench (for Clamp screw)
	①	③	②	④	
JFDX25IN-88-06R	HLW175	ASN423	WS0616-T15	M3*8	T-15A
JFDX30IN-88-08R	HLW175	ASN423	WS0616-T15	M3*8	T-15A
JFDX40IN-88-10R	HLW175	ASN423	WS0616-T15	M3*8	T-15A
JFDX50IN-88-12R	HLW175	ASN423	WS0616-T15	M3*8	T-15A
JFDX063-88-06R	HLW175	ASN423	WS0616-T15	M3*8	T-15A
JFDX080-88-08R	HLW175	ASN423	WS0616-T15	M3*8	T-15A
JFDX100-88-10R	HLW175	ASN423	WS0616-T15	M3*8	T-15A
JFDX125-88-12R	HLW175	ASN423	WS0616-T15	M3*8	T-15A

JFDX.. series / Inserts Ceramics

SNGN/SNGF

No.1



No.2

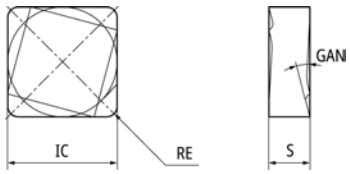
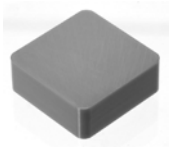
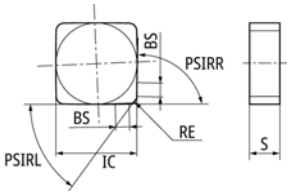


Figure	Shape	Item Number		IC	S	RE	GAN	Silicon Nitride Ceramics		Whisker Ceramics	
									CVD		
		(inch)	(metric)	inch	inch	inch	°	SX6	6p9	E33	WA1
1		SNGN 432 T0220	SNGN 120408 T00520	1/2	3/16	.031	–	●		●	●
1		SNGN 432 T0320	SNGN 120408 T00820	1/2	3/16	.031	–			●	
1		SNGN 432 T0420	SNGN 120408 T01020	1/2	3/16	.031	–	●	●	●	●
1		SNGN 432 T0425	SNGN 120408 T01025	1/2	3/16	.031	–			●	●
1		SNGN 432 T0820	SNGN 120408 T02020	1/2	3/16	.031	–	●			
1		SNGN 433 T0220	SNGN 120412 T00520	1/2	3/16	.047	–			●	●
1		SNGN 433 T0320	SNGN 120412 T00820	1/2	3/16	.047	–			●	
1		SNGN 433 T0420	SNGN 120412 T01020	1/2	3/16	.047	–	●	●	●	●
1		SNGN 433 T0425	SNGN 120412 T01025	1/2	3/16	.047	–			●	●
1		SNGN 433 T0820	SNGN 120412 T02020	1/2	3/16	.047	–	●	●		
1		SNGN 434 T0220	SNGN 120416 T00520	1/2	3/16	.063	–			●	●
1		SNGN 434 T0420	SNGN 120416 T01020	1/2	3/16	.063	–	●	●	●	●
1		SNGN 434 T0425	SNGN 120416 T01025	1/2	3/16	.063	–			●	●
1		SNGN 434 T0820	SNGN 120416 T02020	1/2	3/16	.063	–	●			
1		SNGN 435 T0420	SNGN 120420 T01020	1/2	3/16	.079	–		●		
1		SNGN 435 T0820	SNGN 120420 T02020	1/2	3/16	.079	–	●			
1		SNGN 435 T0825	SNGN 120420 T02025	1/2	3/16	.079	–			●	●
1		SNGN 436 T0820	SNGN 120424 T02020	1/2	3/16	.094	–	●			
2		SNGF 433 T0425 RC	SNGF 120412 T01025 RC	1/2	3/16	.047	14	●	●		
2		SNGF 433 T0425 RC-CM	SNGF 120412 T01025 RC-CM	1/2	3/16	.047	14	●			

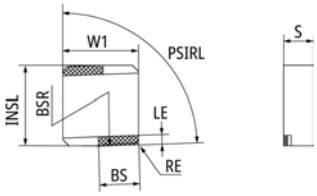
※Recommended Cutting Conditions
Cutting Speed V_c = - 3280 SFM
Feed = - .004" IPT

SNEN-ZN Inserts Ceramic Wiper : The insert must be installed in all insert pockets



Item Number	Chipbreaker	Wiper	BS	IC	KAPR	PSIRL	PSIRR	RE	S	Silicon Nitride Ceramics	
											CVD
			inch	inch	°	°	°	inch	inch	SX6	SP9
SNEN 43ZN T0425	No	Straight	.079	1/2	89	89	89	.047	3/16	●	●

FDX-88 Inserts CBN Wiper : Can install 1 or 2 CBN Wiper inserts with ceramic insert

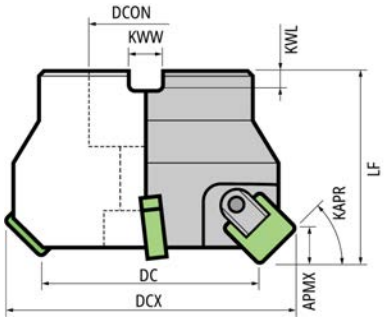


Item Number	Chipbreaker	Wiper	BS	BSR	INSL	LE	PSIRL	RE	S	W1	CBN	
			inch	inch	inch	inch	°	inch	inch	inch	BK310	BK350
FDX 1204-88-50R	No	Arch	.242	9.843	.510	.059	88	.047	3/16	.480	●	●

For Gray / Ductile Cast Iron

JFDX.. series / Cutter Lead angle 45 degree

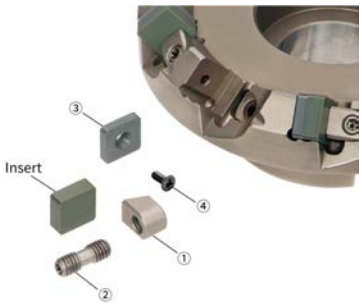
JFDX-45



Item Number	Hand	Number of teeth	APMX	DC	DCON	DCX	GAMF	GAMP	KAPR	KWL	KWW	LF	Weight	Insert Gage	
			inch	inch	inch	inch	°	°	°	inch	inch	inch	lbs		
JFDX25IN-45-06R	R	6	~.236	2.500	.750	3.129	-10	-6	45	.217	.315	2.000	2.205	SN..43..	FDX1204..
JFDX30IN-45-08R	R	8	~.236	3.000	1.000	3.629	-10	-6	45	.225	.387	2.000	2.8	SN..43..	FDX1204..
JFDX40IN-45-10R	R	10	~.236	4.000	1.500	4.629	-10	-6	45	.380	.640	2.000	3.902	SN..43..	FDX1204..
JFDX063-45-06R	R	6	~.236	2.480	.866	2.835	-10	-6	45	.236	.409	1.969	2.05	SN..43..	FDX1204..
JFDX080-45-08R	R	8	~.236	3.150	1.000	3.740	-10	-6	45	.236	.374	1.969	2.668	SN..43..	FDX1204..
JFDX100-45-10R	R	10	~.236	3.937	1.250	4.724	-10	-6	45	.315	.500	1.969	3.66	SN..43..	FDX1204..
JFDX125-45-12R	R	12	~.236	4.921	1.500	5.748	-10	-6	45	.394	.626	2.283	6.173	SN..43..	FDX1204..

※Weight : Includes inserts and parts

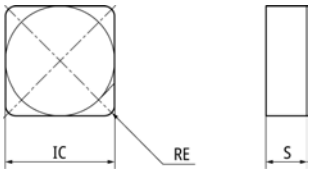
Spare Parts



Item Number	Wedge	Shim	Clamp screw	Screw (for Shim)	Wrench (for Clamp screw)
	①	③	②	④	
JFDX25IN-45-06R	HLW175	ASN423	WS0616-T15	M3*8	T-15A
JFDX30IN-45-08R	HLW175	ASN423	WS0616-T15	M3*8	T-15A
JFDX40IN-45-10R	HLW175	ASN423	WS0616-T15	M3*8	T-15A
JFDX063-45-06R	HLW175	ASN423	WS0616-T15	M3*8	T-15A
JFDX080-45-08R	HLW175	ASN423	WS0616-T15	M3*8	T-15A
JFDX100-45-10R	HLW175	ASN423	WS0616-T15	M3*8	T-15A
JFDX125-45-12R	HLW175	ASN423	WS0616-T15	M3*8	T-15A

SNGN/SNGF

No.1



No.2

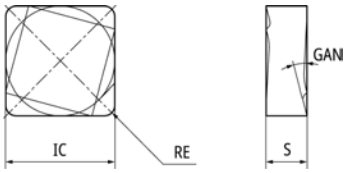
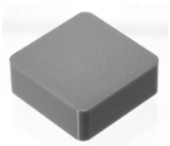
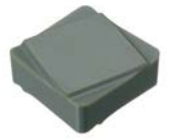
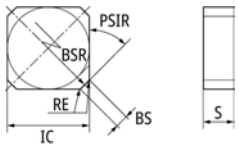


Figure	Shape	Item Number		IC	S	RE	GAN	Silicon Nitride Ceramics		Whisker Ceramics	
									CVD		
		(inch)	(metric)	inch	inch	inch	°	SX6	SP9	533	WA1
1		SNGN 432 T0220	SNGN 120408 T00520	1/2	3/16	.031	–	●		●	●
1		SNGN 432 T0320	SNGN 120408 T00820	1/2	3/16	.031	–			●	
1		SNGN 432 T0420	SNGN 120408 T01020	1/2	3/16	.031	–	●	●	●	●
1		SNGN 432 T0425	SNGN 120408 T01025	1/2	3/16	.031	–			●	●
1		SNGN 432 T0820	SNGN 120408 T02020	1/2	3/16	.031	–	●			
1		SNGN 433 T0220	SNGN 120412 T00520	1/2	3/16	.047	–			●	●
1		SNGN 433 T0320	SNGN 120412 T00820	1/2	3/16	.047	–			●	
1		SNGN 433 T0420	SNGN 120412 T01020	1/2	3/16	.047	–	●	●	●	●
1		SNGN 433 T0425	SNGN 120412 T01025	1/2	3/16	.047	–			●	●
1		SNGN 433 T0820	SNGN 120412 T02020	1/2	3/16	.047	–	●	●		
1		SNGN 434 T0220	SNGN 120416 T00520	1/2	3/16	.063	–			●	●
1		SNGN 434 T0420	SNGN 120416 T01020	1/2	3/16	.063	–	●	●	●	●
1		SNGN 434 T0425	SNGN 120416 T01025	1/2	3/16	.063	–			●	●
1		SNGN 434 T0820	SNGN 120416 T02020	1/2	3/16	.063	–	●			
1		SNGN 435 T0420	SNGN 120420 T01020	1/2	3/16	.079	–		●		
1		SNGN 435 T0820	SNGN 120420 T02020	1/2	3/16	.079	–	●			
1		SNGN 435 T0825	SNGN 120420 T02025	1/2	3/16	.079	–			●	●
1		SNGN 436 T0820	SNGN 120424 T02020	1/2	3/16	.094	–	●			
2		SNGF 433 T0425 RC	SNGF 120412 T01025 RC	1/2	3/16	.047	14	●	●		
2		SNGF 433 T0425 RC-CM	SNGF 120412 T01025 RC-CM	1/2	3/16	.047	14	●			

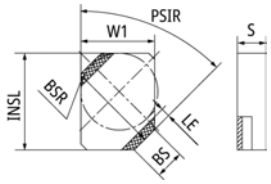
※Recommended Cutting Conditions
Cutting Speed = - 3280 SFM
Feed = - .004" IPT

SNGN-AN Inserts Ceramic Wiper : The insert must be installed in all insert pockets



Item Number	Chipbreaker	Wiper	BS	BSR	IC	PSIR	RE	S	Silicon Nitride Ceramics	
										CVD
			inch	inch	inch	°	inch	inch	SX6	SP9
SNGN 43 AN W T0420	No	Arch	.079	5.906	1/2	45	.020	3/16	●	●

FDX-45 Inserts CBN Wiper : Can install 1 or 2 CBN Wiper inserts with ceramic insert

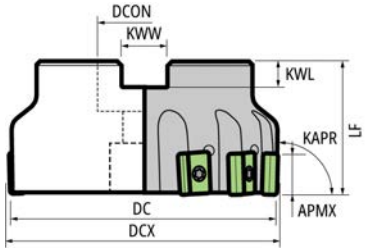


Item Number	Chipbreaker	Wiper	BS	BSR	INSL	LE	PSIR	S	W1	CBN	
			inch	inch	inch	inch	°	inch	inch	BK310	BK350
FDX 1204-45-50R	No	Arch	(.189)	9.843	.630	.059	45	3/16	.480	●	●

For Gray / Ductile Cast Iron

JXTM series / Cutter Lead angle 88 degree

JXTM-88 Arbor type



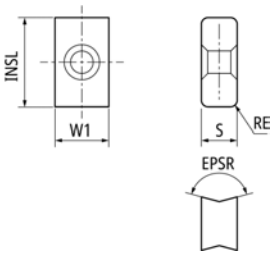
Item Number	Hand	Number of teeth	APMX	DC	DCON	DCX	GAMF	GAMP	KAPR	KWL	KWW	LF	Weight	Insert Gage
			inch	inch	inch	inch	°	°	°	inch	inch	inch	lbs	
JXTM15IN-88-4R	R	4	~.315	1.500	.750	1.550	0	-4	88	.200	.320	1.720	0.992	LNX324A..
JXTM15IN-88-5R	R	5	~.315	1.500	.750	1.550	0	-4	88	.200	.320	1.720	0.992	LNX324A..
JXTM20IN-88-6R	R	6	~.315	2.000	.750	2.050	0	-4	88	.200	.320	2.000	0.992	LNX324A..
JXTM25IN-88-8R	R	8	~.315	2.500	1.000	2.550	0	-4	88	.230	.390	2.000	1.499	LNX324A..
JXTM30IN-88-10R	R	10	~.315	3.000	1.000	3.040	0	-4	88	.230	.390	2.000	2.403	LNX324A..
JXTM40IN-88-13R	R	13	~.315	4.000	1.500	4.040	0	-4	88	.380	.640	2.000	3.902	LNX324A..
JXTM50IN-88-16R	R	16	~.315	5.000	1.500	5.040	0	-4	88	.380	.640	2.000	6.504	LNX324A..
JXTM60IN-88-18R	R	18	~.315	6.000	2.000	6.050	0	-4	88	.440	.765	2.000	8.003	LNX324A..
JXTM15IN-88-4L	L	4	~.315	1.500	.750	1.550	0	-4	88	.200	.320	1.720	0.992	LNX324A..
JXTM15IN-88-5L	L	5	~.315	1.500	.750	1.550	0	-4	88	.200	.320	1.720	0.992	LNX324A..
JXTM20IN-88-6L	L	6	~.315	2.000	.750	2.050	0	-4	88	.200	.320	2.000	0.992	LNX324A..
JXTM25IN-88-8L	L	8	~.315	2.500	1.000	2.550	0	-4	88	.230	.390	2.000	1.499	LNX324A..
JXTM30IN-88-10L	L	10	~.315	3.000	1.000	3.040	0	-4	88	.230	.390	2.000	2.403	LNX324A..
JXTM40IN-88-13L	L	13	~.315	4.000	1.500	4.040	0	-4	88	.380	.640	2.000	3.902	LNX324A..
JXTM50IN-88-16L	L	16	~.315	5.000	1.500	5.040	0	-4	88	.380	.640	2.000	6.504	LNX324A..
JXTM60IN-88-18L	L	18	~.315	6.000	2.000	6.050	0	-4	88	.440	.765	2.000	8.003	LNX324A..
JXTM080-88-10R	R	10	~.315	3.150	1.000	3.268	0	-4	88	.236	.374	1.969	2.425	LNX324A..
JXTM100-88-13R	R	13	~.315	3.937	1.250	4.055	0	-4	88	.315	.500	1.969	3.968	LNX324A..
JXTM125-88-16R	R	16	~.315	4.921	1.500	5.039	0	-4	88	.394	.626	2.283	6.834	LNX324A..

※Weight : Includes inserts and parts

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
JXTM15IN-88-4R	LRIS-4*12	LLR-25S
JXTM15IN-88-5R	LRIS-4*12	LLR-25S
JXTM20IN-88-6R	LRIS-4*12	LLR-25S
JXTM25IN-88-8R	LRIS-4*12	LLR-25S
JXTM30IN-88-10R	LRIS-4*12	LLR-25S
JXTM40IN-88-13R	LRIS-4*12	LLR-25S
JXTM50IN-88-16R	LRIS-4*12	LLR-25S
JXTM60IN-88-18R	LRIS-4*12	LLR-25S
JXTM15IN-88-4L	LRIS-4*12	LLR-25S
JXTM15IN-88-5L	LRIS-4*12	LLR-25S
JXTM20IN-88-6L	LRIS-4*12	LLR-25S
JXTM25IN-88-8L	LRIS-4*12	LLR-25S
JXTM30IN-88-10L	LRIS-4*12	LLR-25S
JXTM40IN-88-13L	LRIS-4*12	LLR-25S
JXTM50IN-88-16L	LRIS-4*12	LLR-25S
JXTM60IN-88-18L	LRIS-4*12	LLR-25S
JXTM080-88-10R	LRIS-4*12	LLR-25S
JXTM100-88-13R	LRIS-4*12	LLR-25S
JXTM125-88-16R	LRIS-4*12	LLR-25S

LNX

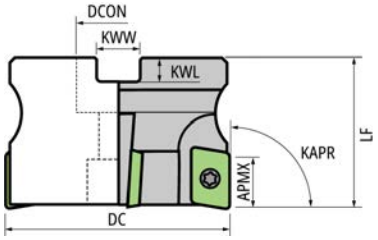


Item Number	Chipbreaker	Wiper	EPSR	INSL	RE	S	W1	Silicon Nitride Ceramics	
									CVD
			°	inch	inch	inch	inch	SX6	SP9
LNX 324A-02 T0420	Yes	No	150	5/8	.031	1/4	3/8	●	●
LNX 324A-03 T0420	Yes	No	150	5/8	.047	1/4	3/8	●	●
LNX 324A-04 T0420	Yes	No	150	5/8	.063	1/4	3/8	●	●

For Gray / Ductile Cast Iron

JQ series / Cutter Lead angle 90 degree

JQTS Arbor type



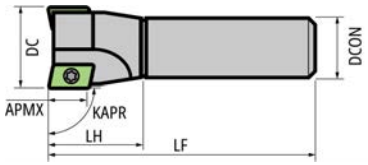
Item Number	Hand	Number of teeth	APMX	DC	DCON	GAMF	GAMP	KAPR	KWL	KWW	LF	Weight	Insert Gage
			inch	inch	inch	°	°	°	inch	inch	inch	lbs	
JQTS040-90-4R	R	4	~.315	1.575	.630	-13	+6	90	.220	.331	1.575	0.441	APCW1604..
JQTS050-90-5R	R	5	~.315	1.969	.866	-13	+6	90	.248	.409	1.575	0.705	APCW1604..
JQTS063-90-6R	R	6	~.315	2.480	.866	-12	+6	90	.248	.409	1.969	3.086	APCW1604..
JQTS080-90-8R	R	8	~.315	3.150	1.000	-12	+6	90	.236	.374	1.969	4.189	APCW1604..

※Weight : Includes inserts and parts

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
JQTS040-90-4R	FSI22-4.0*11	T-15A
JQTS050-90-5R	FSI22-4.0*11	T-15A
JQTS063-90-6R	FSI22-4.0*11	T-15A
JQTS080-90-8R	FSI22-4.0*11	T-15A

JQTE Shank type



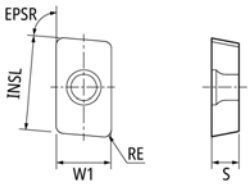
Item Number	Hand	Number of teeth	APMX	DC	DCON	GAMF	GAMP	KAPR	LF	LH	Weight	Insert Gage
			inch	inch	inch	°	°	°	inch	inch	lbs	
JQTE020-90-1R	R	1	~.315	.787	.787	-8	+3	90	3.937	1.181	0.485	APCW1604..
JQTE025-90-2R	R	2	~.315	.984	.984	-13	+6	90	3.937	1.181	0.705	APCW1604..
JQTE032-90-3R	R	3	~.315	1.260	1.260	-13	+6	90	4.724	1.378	1.168	APCW1604..
JQTE040-90-4R	R	4	~.315	1.575	1.260	-13	+6	90	4.724	1.457	1.411	APCW1604..

※Weight : Includes inserts and parts

Spare Parts

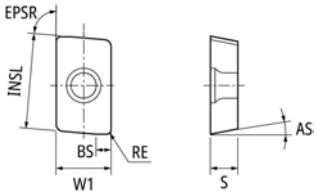
Item Number	Clamp screw	Wrench (for Clamp screw)
JQTE020-90-1R	FSI23-4.0*7	T-15A
JQTE025-90-2R	FSI23-4.0*7	T-15A
JQTE032-90-3R	FSI22-4.0*11	T-15A
JQTE040-90-4R	FSI22-4.0*11	T-15A

APCW



Item Number	Chipbreaker	Wiper	EPSR	INSL	RE	S	W1	Silicon Nitride Ceramics	
									CVD
			°	inch	inch	inch	inch	SX6	SP9
APCW 160408 T0420	No	No	85	.648	.031	3/16	3/8	●	●
APCW 160412 T0420	No	No	85	.648	.047	3/16	3/8	●	●
APCW 160416 T0420	No	No	85	.648	.063	3/16	3/8	●	●
APCW 160420 T0420	No	No	85	.648	.079	3/16	3/8	●	●

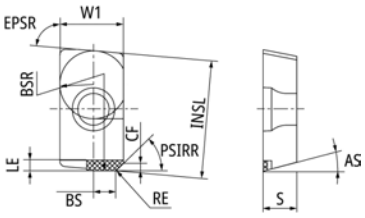
APCW-PD Insert Ceramics Wiper



Item Number	Chipbreaker	Wiper	AS	BS	EPSR	INSL	RE	S	W1	Silicon Nitride Ceramics	
											CVD
			°	inch	°	inch	inch	inch	inch	SX6	SP9
APCW1604 PDR T0420	No	Straight	15	.102	85	.648	.031	3/16	3/8	●	●

Note: Insert must be installed in all pockets.

APCW-PD Insert CBN Wiper : Can install 1 or 2 CBN Wiper inserts with ceramic insert

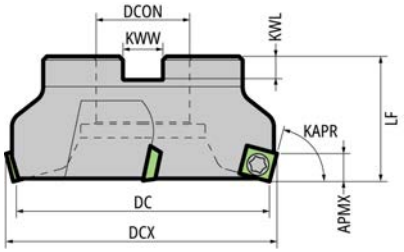


Item Number	Chipbreaker	Wiper	AS	BS	BSR	CF	EPSR	INSL	LE	PSIRR	RE	S	W1	CBN
			°	inch	inch	inch	°	inch	inch	°	inch	inch	inch	BK310
APCW 1604 PDR S0420	No	Arch	15	.126	9.843	.039	85	.653	.059	45	.016	3/16	.354	●

For Gray / Ductile Cast Iron

JSDW series / Cutter Lead angle 75 degree

Arbor type



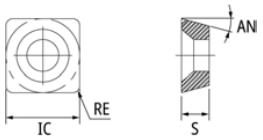
Item Number	Hand	Number of teeth	APMX	DC	DCON	DCX	GAMF	GAMP	KAPR	KWL	KWW	LF	Weight	Insert Gage	
			inch	inch	inch	inch	°	°	°	inch	inch	inch	lbs		
E250R100-SDW43-4C	R	4	~.236	2.500	1.000	2.780	0	+12	75	.200	.385	2.000	1.896	SDCW43..	SDW1204..
E300R100-SDW43-5C	R	5	~.236	3.000	1.000	3.280	0	+12	75	.200	.385	2.000	2.403	SDCW43..	SDW1204..
E400R150-SDW43-6C	R	6	~.236	4.000	1.500	4.280	0	+12	75	.320	.640	2.000	3.704	SDCW43..	SDW1204..
E500R150-SDW43-7C	R	7	~.236	5.000	1.500	5.280	0	+12	75	.320	.640	2.000	5.401	SDCW43..	SDW1204..
JSDW063-75-04R	R	4	~.236	2.480	.866	2.780	0	+12	75	.248	.409	1.969	1.808	SDCW43..	SDW1204..
JSDW080-75-05R	R	5	~.236	3.150	1.000	3.280	0	+12	75	.236	.374	1.969	2.293	SDCW43..	SDW1204..
JSDW100-75-06R	R	6	~.236	3.937	1.250	4.280	0	+12	75	.315	.500	1.969	2.932	SDCW43..	SDW1204..
JSDW125-75-07R	R	7	~.236	4.921	1.500	5.280	0	+12	75	.394	.626	2.283	5.6	SDCW43..	SDW1204..

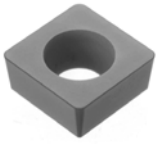
※Weight : Includes inserts and parts
※APMX : Carbide inserts Max .157"

Spare Parts

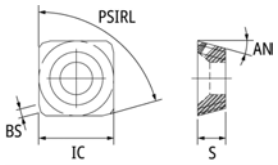
Item Number	Clamp screw	Wrench (for Clamp screw)
E250R100-SDW43-4C	FSI21-5.0*12.45	T-20
E300R100-SDW43-5C	FSI21-5.0*12.45	T-20
E400R150-SDW43-6C	FSI21-5.0*12.45	T-20
E500R150-SDW43-7C	FSI21-5.0*12.45	T-20
JSDW063-75-04R	FSI21-5.0*12.45	T-20
JSDW080-75-05R	FSI21-5.0*12.45	T-20
JSDW100-75-06R	FSI21-5.0*12.45	T-20
JSDW125-75-07R	FSI21-5.0*12.45	T-20

SDCW



Shape	Item Number		EPSR	IC	S	AN	RE	D1	Silicon Nitride Ceramics	
										CVD
	(Inch)	(ISO)	°	inch	inch	°	inch	inch	SX6	SP9
	SDCW 432 T0420	SDCW 120408 T01020	90	1/2	3/16	15	.031	.217	●	●
	SDCW 433 T0420	SDCW 120412 T01020	90	1/2	3/16	15	.047	.217	●	
	SDCW 434 T0420	SDCW 120416 T01020	90	1/2	3/16	15	.063	.217	●	

SDCW-EE Insert Ceramic Wiper



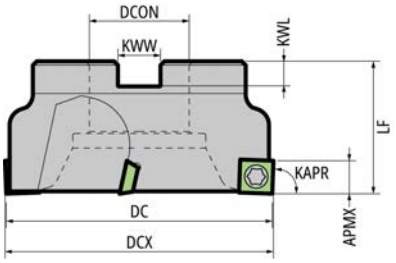
Item Number	Chipbreaker	Wiper	AN	BS	IC	PSIRL	S	Silicon Nitride Ceramics		Carbide
									CVD	PVD
			°	inch	inch	°	inch	SX6	SP9	DM4
SDCW 43EER T0420	No	Straight	15	.055	1/2	75	3/16	●	●	●

Note: Insert must be installed in all pockets.

For Gray / Ductile Cast Iron

JSDW series / Cutter Lead angle 88 degree

Arbor type



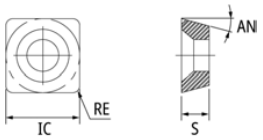
Item Number	Hand	Number of teeth	APMX	DC	DCON	DCX	GAMF	GAMP	KAPR	KWL	KWW	LF	Weight	Insert Gage
			inch	inch	inch	inch	°	°	°	inch	inch	inch	lbs	
P250R100-SDW43-4C	R	4	~.236	2.500	1.000	2.590	0	12	88	.200	.385	2.000	1.698	SDCW43..
P300R100-SDW43-6C	R	6	~.236	3.000	1.000	3.070	0	12	88	.200	.385	2.000	2.205	SDCW43..
P400R150-SDW43-8C	R	8	~.236	4.000	1.500	4.070	0	12	88	.320	.640	2.000	3.505	SDCW43..
P500R150-SDW43-10C	R	10	~.236	5.000	1.500	5.070	0	12	88	.320	.640	2.000	5.203	SDCW43..

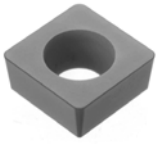
※Weight : Includes inserts and parts
※APMX : Carbide inserts Max .157"

Spare Parts

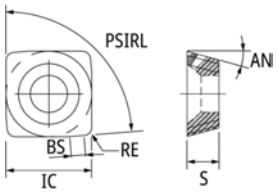
Item Number	Clamp screw	Wrench (for Clamp screw)
P250R100-SDW43-4C	FSI21-5.0*12.45	T-20
P300R100-SDW43-6C	FSI21-5.0*12.45	T-20
P400R150-SDW43-8C	FSI21-5.0*12.45	T-20
P500R150-SDW43-10C	FSI21-5.0*12.45	T-20

SDCW



Shape	Item Number		EPSR	IC	S	AN	RE	D1	Silicon Nitride Ceramics	
										CVD
	(Inch)	(ISO)	°	inch	inch	°	inch	inch	SX6	SP6
	SDCW 432 T0420	SDCW 120408 T01020	90	1/2	3/16	15	.031	.217	●	●
	SDCW 433 T0420	SDCW 120412 T01020	90	1/2	3/16	15	.047	.217	●	
	SDCW 434 T0420	SDCW 120416 T01020	90	1/2	3/16	15	.063	.217	●	

SDCW-PE Insert Ceramic Wiper



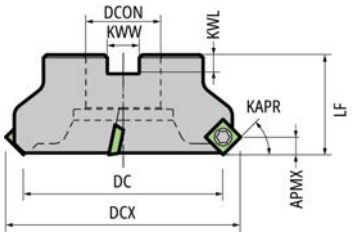
Item Number	Chipbreaker	Wiper	AN	BS	IC	PSIRL	RE	S	Silicon Nitride Ceramics
			°	inch	inch	°	inch	inch	SX6
SDCW 43 PE R T0420	No	Straight	15	.094	1/2	88	.031	3/16	●

Note: Insert must be installed in all pockets.

For Gray / Ductile Cast Iron

JSDW series / Cutter Lead angle 45 degree

Arbor type



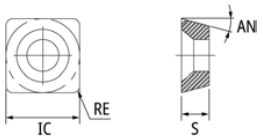
Item Number	Hand	Number of teeth	APMX	DC	DCON	DCX	GAMF	GAMP	KAPR	KWL	KWW	LF	Weight	Insert Gage	
			inch	inch	inch	inch	°	°	°	inch	inch	inch	lbs		
A300R100-SDW43-6C	R	6	~.177	3.000	1.000	3.740	0	+12	45	.187	.385	2.000	2.293	SDCW43..	SDW1204..
A400R150-SDW43-7C	R	7	~.177	4.000	1.500	4.740	0	+12	45	.320	.640	2.000	3.307	SDCW43..	SDW1204..
A500R150-SDW43-8C	R	8	~.177	5.000	1.500	5.740	0	+12	45	.320	.640	2.000	5.004	SDCW43..	SDW1204..
JSDW080-45-06R	R	6	~.177	3.150	1.000	3.740	0	+12	45	.236	.374	1.969	2.425	SDCW43..	SDW1204..
JSDW100-45-07R	R	7	~.177	3.937	1.250	4.740	0	+12	45	.315	.500	1.969	3.064	SDCW43..	SDW1204..
JSDW125-45-08R	R	8	~.177	4.921	1.500	5.740	0	+12	45	.394	.626	2.283	5.622	SDCW43..	SDW1204..

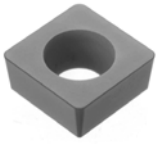
※Weight : Includes inserts and parts
※APMX : Carbide inserts Max .157"

Spare Parts

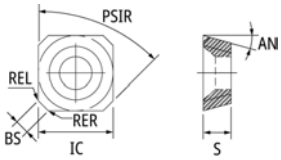
Item Number	Clamp screw	Wrench (for Clamp screw)
A300R100-SDW43-6C	FSI21-5.0*12.45	T-20
A400R150-SDW43-7C	FSI21-5.0*12.45	T-20
A500R150-SDW43-8C	FSI21-5.0*12.45	T-20
JSDW080-45-06R	FSI21-5.0*12.45	T-20
JSDW100-45-07R	FSI21-5.0*12.45	T-20
JSDW125-45-08R	FSI21-5.0*12.45	T-20

SDCW



Shape	Item Number		EPSR	IC	S	AN	RE	D1	Silicon Nitride Ceramics	
										CVD
	(Inch)	(ISO)	°	inch	inch	°	inch	inch	SX6	SP9
	SDCW 432 T0420	SDCW 120408 T01020	90	1/2	3/16	15	.031	.217	●	●
	SDCW 433 T0420	SDCW 120412 T01020	90	1/2	3/16	15	.047	.217	●	
	SDCW 434 T0420	SDCW 120416 T01020	90	1/2	3/16	15	.063	.217	●	

SDCW-AE Insert Ceramic Wiper : The insert must be installed in all insert pockets



Item Number	Chipbreaker	Wiper	AN	BS	IC	PSIR	REL	RER	S	Silicon Nitride Ceramics		Carbide
											CVD	PVD
			°	inch	inch	°	inch	inch	inch	SX6	SP9	DM4
SDCW 43 AE T0420	No	Straight	15	.094	1/2	45	.047	.047	3/16	●	●	●

Note: Insert must be installed in all pockets.

MEMO

Member IMC Group

NTK CUTTING TOOLS

CUTTING TOOLS

2025

Swiss Tooling

Safety instructions for using ultra hard cutting tools

1. Instructions for using ultra hard cutting tools

As required by the laws concerning Product Liability enforced on July 1, 1996, we place warning or caution labels on the packages of applicable NTK products. However, each tool body itself bears no detailed safety instructions. Therefore, you are requested to read and understand fully the “Safety instructions for the use of carbide cutting tools” before putting any ultra hard tool materials into use. In addition, we request that all relevant staff and operators fully understand these safety instructions prior to use.

2. Basic characteristics of ultra hard tool materials

2-1. Meaning and classifications of terms used in this catalog

Ultra hard tool materials: The collective name for materials used as cutting tools, including carbides, ceramics, CBN and diamond (PCD) sintered materials.
Carbide: Tool materials where the main component is WC (Tungsten Carbide)
Ultra hard materials: The collective name for materials used as ultra hard tools. Also used as a convenient way of referring to carbides under a narrower definition.
Ultra hard tools: The collective name for tools using ultra hard tool materials.

2-2. Physical properties

Appearance: Varies depending on the material. Example: gray, black or gold
Odor: Odorless
Hardness: Cemented carbide: HV500 up to 3,000 kg/mm^2
Specific gravity: Carbide: 9 up to 19

2-3. Composition / Ingredients

Carbide, nitride, carbo-nitride, or oxidized materials of W, Ti, Al, Ta, B or the like; some contain metallic components such as Co, Ni, Cr and/or Mo.

3. Precautions for handling ultra hard tool materials

- One of the properties specific to these materials is high hardness, another is brittleness. Therefore, shock loads or impacts, or excessive clamping of these materials may result in breakage or other damage.
- As the specific gravity (density) of these materials is very high, a large component made up of these materials or such products in large quantity should be handled with care.
- Ultra hard materials are different in their thermal expansion ratio from metals. These products are prone to thermal shock and subsequent breakage when subjected to a sudden increase or decrease in temperature.
- As cutting oil, lubricant and general moisture may corrode ultra hard materials and affect their strength, pay extra attention to storing them in good conditions.

4. Precautions machining ultra hard tools

- The strength of ultra hard tools may be significantly lowered depending on the surface condition. Always use diamond grinding wheels for finish machining.
- Dust is produced when ultra hard tools are ground. Install appropriate ventilation/disposal equipment and wear protective gear such as masks, as inhalation of such dust may be hazardous to health. If such dust contacts your skin or comes into contact with your eyes, flush well with flowing water.
- After the grinding of ultra hard tools or brazed tools, the waste coolant contains components of heavy metals. Be sure to dispose of such waste liquid properly.
- After re-grinding ultra hard tools, check that they are free of cracks or damage before use.
- When ultra hard material or products made of ultra hard material is marked with lasers or an electric pen, cracking may occur to the marked area. Do not mark in areas where stress is applied during use.
- Processing ultra hard material by electric discharge may cause residual cracks on the surface, resulting in lower strength. Thus, remove any cracks completely by grinding as required.
- Be careful when brazing ultra hard material. If the temperature is lower or higher than the melting point of the brazing material, the insert may not be permanently fixed.

Metalcutting Safety

Applicable Products	Possible Risks	Safety Measures
General Cutting Tools	Contact with a sharp cutting edge with bare hands may result in injury.	Use protective gear such as protective gloves when taking the tool out of packaging and installing into the machine.
	Misuse or using under inappropriate conditions may cause the cutting tool to break and/or shatter into pieces, resulting in personal injury.	Use protective equipment, machine guarding and/or protective glasses. Use within the range of recommended conditions. Please refer to the instruction manual and catalogue.
	Sudden increase in cutting resistance due to impact load or excessive wear may cause the cutting tool to break and/or shatter into pieces, resulting in personal injury.	Use protective gear such as protective gloves when taking the tool out of packaging and installing into the machine.
	High-temperature chips may be produced and long chips may be ejected, resulting in injury and/or burns.	Use protective equipment, machine guarding and/or protective glasses. Before removing chips, always stop the machine. Wear protective gloves and use proper equipment for chip removal.
	The tool and material/work being cut can become very hot. Touching them immediately after use may cause burns.	Use protective gear such as protective gloves.
	Sparks, heat generation due to breakage and/or chips during cutting may cause fire.	Do not use the machine and tools in locations where there are risks of ignition or explosion. When using water-insoluble cutting oil, fire prevention measures must be implemented.
	Out of balance machine set ups when run at a high speed, may cause insert breakage due to excess vibration or chatter, resulting in injury.	Use protective equipment, machine guarding and/or protective glasses. Perform a trial-run beforehand to make sure the setup is stable, free of chatter, vibration and abnormal noise.
	Touching burrs and flashes on machined work may result in personal injury.	Use adequate hand protection.
Throw-Away Type Tools (With indexable insert)	Inappropriately clamped inserts and/or components may become detached from the machine during cutting, resulting in injury.	Before installing the insert, clean the seating surface and clamping components so that they are free of debris. Use the wrench supplied to install the insert and check that the insert and components are securely clamped. Do not use any inserts or components other than the items specified.
	Excessively tightening with a device such as a pipe extension may cause the insert and/or components to break or detach due to over clamping.	Do not use tightening devices such as pipe extensions to obtain further torque. Always use the supplied wrench.
	At high speeds inserts and/or components may lose clamping pressure due to the loosening effect of centrifugal force. This is very dangerous. Always ensure secure clamping systems and check regularly.	Use within the range the recommended conditions. Please refer to the instruction manual and catalogue.
Cutters and Rotational Tools	As cutters have sharp cutting edges, contact with bare hands may result in injury.	Use protective equipment such as protective gloves.
	Imbalance or eccentric rotation may cause the tool to break due to vibration or chatter, resulting in potential injury.	Use at a rotational speed within the recommended conditions. To prevent eccentric rotation and vibration due to worn bearings, regularly check the machine rotor/ rotating parts for the accuracy and balance and adjust as required.
Drills	Extra care should be taken when through hole drilling as chips may be ejected at high speed as the drill breaks through the workpiece.	Use protective equipment such as machine guards and/or protective glasses. Additional guarding around the chuck and drill may be advisable.
	Drill tips of a very small diameter are usually pointed and extremely sharp. Extra care and safety precautions should be taken when handling to avoid puncture wounds.	Always use precautions and secure safe handling methods. Wear protective gloves and glasses.
Brazed Inserts / Tools	Inserts may break or become, detached due to incorrect brazing.	Use protective equipment such as machine guards and/or protective glasses. Additional guarding around the chuck and drill may be advisable.
Others	It is not advisable to use repeatedly brazed inserts as the braze may progressively weaken.	Do not use repeatedly brazed inserts as the strength of such inserts is lowered.
	Use only for the original and intended purpose. Using outside recommended parameters is very dangerous, causing damages to machines and/or tools.	Always use and operate as specified, observing the required safety rules and conditions.

Guidelines for Catalog

- This catalog lists products as of December 2025.
- Please note that specifications of the products listed in this catalog may be changed without notice due to continuous research & development and product improvements.
- This catalog contains the major features and relevant information on all of our products. Please contact our sales representatives or dealers if more detailed information is needed.
- Stock Status Symbols

● : Standard stock
★ : Standard stock (specific)
◎ : Semi-standard inventory (delivery: approx. 3 weeks)
● : New standard stock
★ : New standard stock (Specified)
■ : While stock lasts (discontinued item)
Ⓜ : Mirror finish
💧 : Coolant through
Blank: Special order

Standard

1) Holder Type	Package quantity	Notes
Turning holder	1 pc / case	
Drill	1 pc / case	
Milling cutter	1 pc / case	
2) Spare parts	**Package quantity**	**Notes**
Screw	10 pc / case	Clamp screw, Clamp bolt, Double screw, Button screw, Set screw, Shim screw, Balancing screw, Positioning clamp screw, Ball screw fixture, Screw part
Spring	10 pc / case	Spring
Seat	10 pc / case	Shim seat
Clamp	10 pc / case	
Snap ring	10 pc / case	
Spring pin	10 pc / case	
Clamp pin	5 pc / case	
Washer	10 pc / case	
Blade	1 pc / case	
Joint	1 pc / case	
Coupling	1 pc / case	
Coolant hose	1 pc / case	
Wrench	5 pc / case	Torque-wrench: 1 pc / case
Handle, Bit, Driver	1 pc / case	
Clamp, Wedge, Cartridge, Thrust Plate, Clamping bolt: for cutter	1 pc / case	
Clamp screw: for cutter	4 pc / case	
3) Insert Type	**Package quantity**	**Notes**
All others	10 pc / case	
BIDEMICS(Brazed)	1 pc / case	JP2,120
Insert for cut-off	5 pc / case	CTPW series
STICK DUO SHAPER DUO	1 pc / case	
Endmill	1 pc / case	S-MILL

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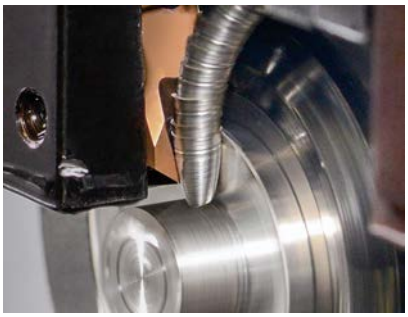
Section T. Grooving/Side-Turning	T1-47	T
Section U. Threading	U1-38	U
Section V. ID Tooling	V1-47	V
Section W. Shaper	W1-18	W
Section X. Endmill	X1-8	X
Section Y. Information	Y1-35	Y
Section Z. Index	Z1-8	Z

What is Swiss Tooling?

This tool series was developed specifically for Swiss-type CNC automated lathes.
(Old name: SS Tool)
Swiss-type CNC automated lathes and CNC lathes differ in their mechanical construction, workpieces, and sizes, so cutting tools must also be selected to suit these requirements.

MEMO



New and Unique Swiss Tooling

NEW TMV Molded chipbreaker O02

NEW SPLASH series O03
Direct gang coolant connection "OH3"

Coolant Components O06

NTK650 ..... O11

Stainless steel processing solutions O13

The Front Max O15

S-MILL O16

Thread Whirling O17

Indexable Endmills O21

TBP/TBPA-BM Molded chipbreaker O23

GTMH-GX Molded chipbreaker O24

Y-axis Toolholders O25

CTP/CTPA-CX Molded chipbreaker O28

DS-ACH Toolholders O29

SHAPER DUO O31

CSV series O32

CUT DUO O33

CUT MAX O34

GROOVE DUO O35

GTPA series O36

SATURN DUO O37

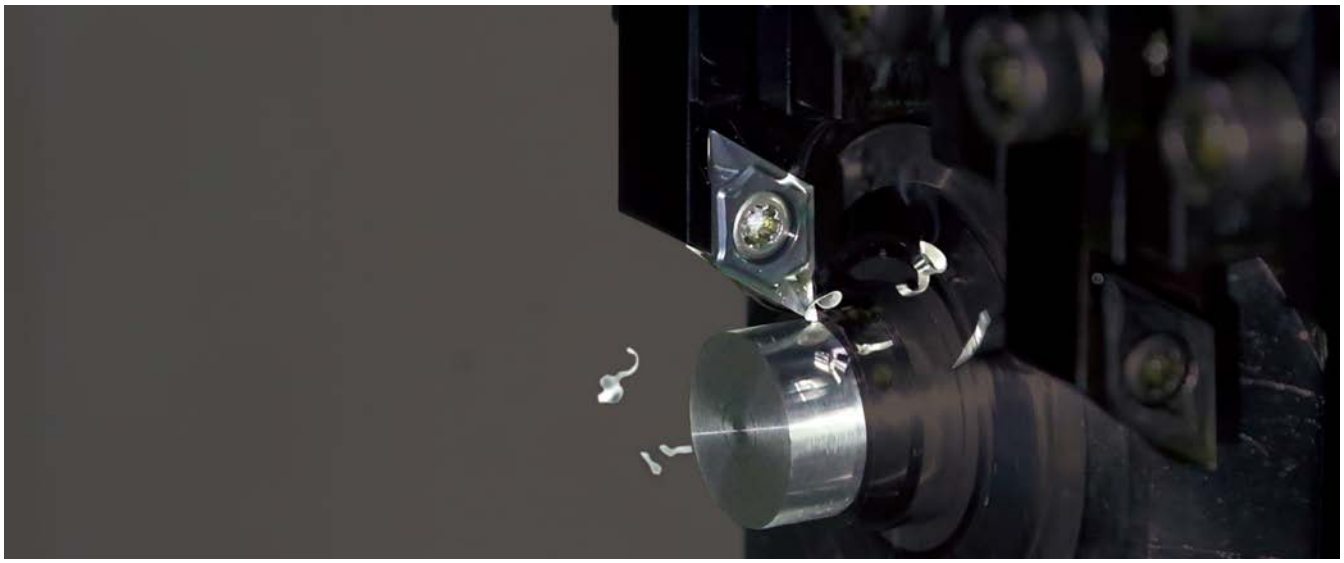
DS Sleeves O39

Mogul Bar O42

STICK DUO O43

STICK DUO HYPER O44

STICK DUO SPLASH O45



Vibration / Oscillation cutting × Conventional cutting

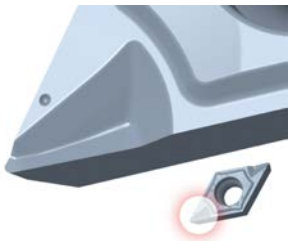
TMV Chipbreaker

Reliably long tool life and stable chip evacuation during vibration cutting

The development of a cutting tool that delivers maximum performance during vibration cutting utilization.
NTK provides the best choice and eliminates the guess work of selecting a tool.

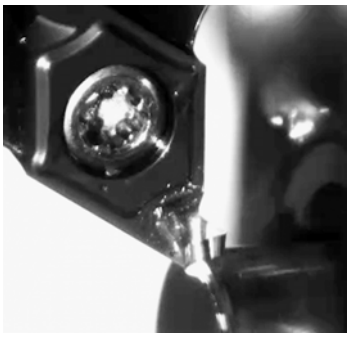
Performance

Wiper insert has been added to the lineup for broader use.
Dramatic reduction in cutting edge wear.
Stable chip removal with dramatic reduction in cutting edge wear



Applications

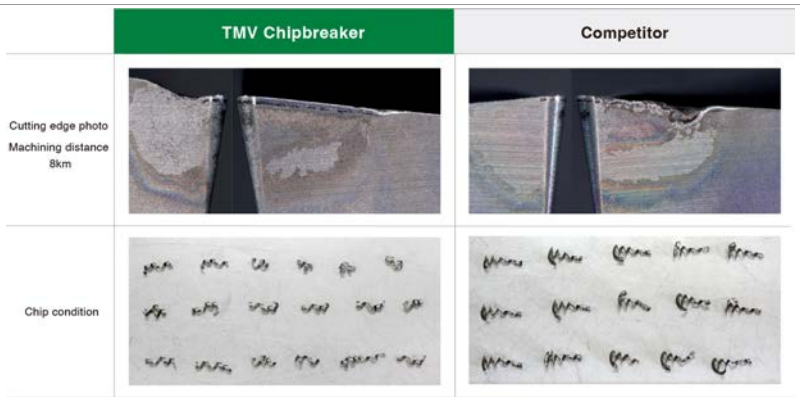
Front turning operations on swiss cnc using vibration cutting function.



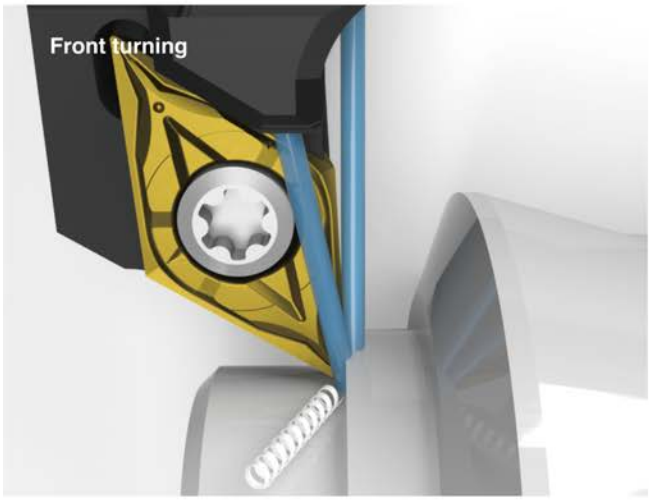
[Cutting conditions] Work material : 316LSS　270SFM
ap= .040"　.001 IPR　Mode1　D1.5　Q1.5 (LFV)

Case study

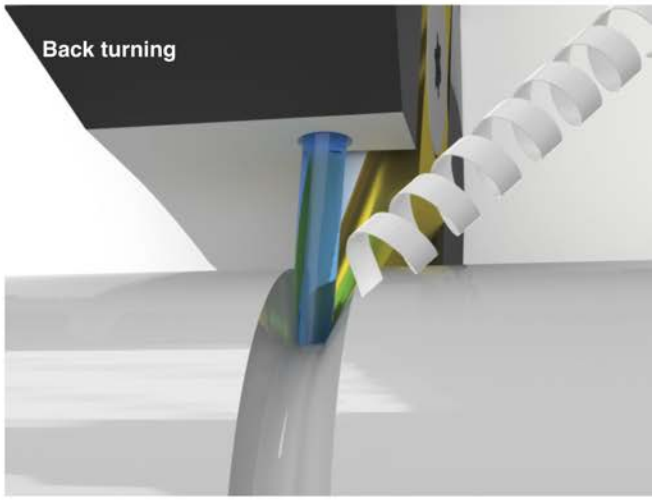
Work material	316LSS
Cutting speed	270 SFM
Feed	.002 IPR
Depth of cut	.040 inch
Coolant	WET
Vibration condition	Mode 1 Q0.5　D0.5



lineup → D32,D35-36,D41,D43



Coolant flow from two locations (12mm and 16mm shank) directs the chips away from the guide bushing.



By focusing coolant to cutting edge chips are flushed away from the machined surface to achieve an excellent surface finish.

SPLASH SERIES

Coolant Through Holders | For Swiss CNC Lathes

lineup → Q7-61,R11-R32,S11-33,T13-20,U17,V10-V12

Utilizing coolant through tools eliminates chip issues and ensures stable machining
Effectively cools the cutting edge and extends tool life

Features

- Curling and breaking chips with coolant pressure
- Coolant is focused on the cutting edge to suppress heat and edge wear
- Variety of coolant connection options

Tooling operations

Front turning / Back turning / Grooving / Threading / Cut-off / ID boring

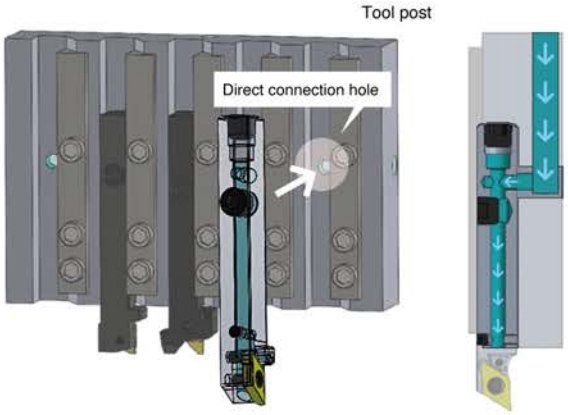
Application	Type	Coolant hose connection	Coolant directly from tool post	Machine models with coolant directly from tool post	
Front turning Back turning Grooving Threading Cut-off ID boring	NEW ! OH3	●	●	L12, L20, D25, M32	Citizen-Cincom
				SB-16III, SD-26type S	STAR
				B026/32-III Series, BW269/329ZJ SS267/327-III, SS267/327-III-5AX SS207-III, SS207-III-5AX S205/206-II, S205A/206A-II	TSUGAMI
	OH2	●	●	L12, L20, D25, M32	Citizen
				SB-16III, SD-26 type S	STAR
	OH	●	-	-	

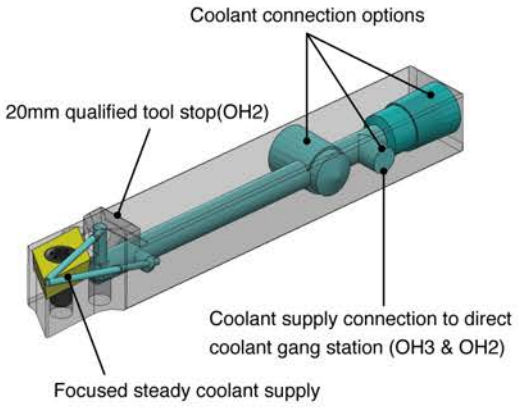
Direct gang coolant connection "OH3"

OH3 Features

- New CTP-SUB cut-off holder lineup
- Lineup expansion of 16mm sq. shank tools with direct connect capability

Coolant is supplied directly from the tool post to the tool





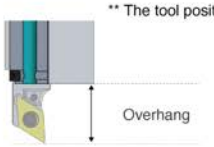
New OH3 tools make it possible to directly connect to a tool post through coolant system
Also supports side and rear coolant hose connections

Reference Chart of OH3 Hole Position

*Based on information from September 2023

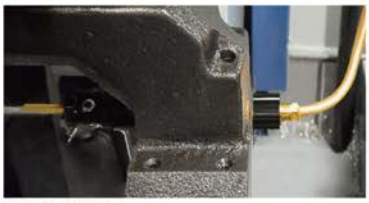
Make*	Model	Tool position**	Shank size	Overhang(inch)	Direct Connect Toolholder Coolant Port
Citizen	L12(2M)	T1	□12	.965	C
		T2-T7	□10	.689	B
		T2-T6	□12	.689	B
	L20E(2M)	T1	□12/□16	1.181	A
		T2-T5	□12	.787	A
	L20E(3M)	T1	□12/□16	1.181	A
		T2-T6	□12	.787	A
	D25(1M)	T10	□16/□20	1.181	C
		T11-T13	□16	.984	C
		T30	□16/□20	.984	C
		T31-T32	□16	.984	C
	M32(5M)	T1	□16/□20	.984	C
		T2-T5	□16	.984	C
STAR	SB-16Ⅲ	T1-T5(T6)	□12	.866	C
	SD-26 Type-S,G,E,C	T1	□16	1.181	C
		T2-T7	□16	.984	C
	SB-20/23RⅡ	T1-T6	□12	.866	C
		T1	□16	1.181	C
		T2-T5	□16	.984	C
TSUGAMI	B026/32-Ⅲ	T5-T9、T11-T15、T26-T27	□16	1.024	B
	BW269/329ZJ	T5-T9、T26-T27	□16	1.024	B
	SS267/327-Ⅲ(-5AX)	T5-T9、T25-T27	□16	1.024	B
	SS207-Ⅲ(-5AX)	T5-T10、T26-T28	□16	1.024	A
	S205(A)/S206(A)-Ⅱ	T5-T10、T26-T28	□16	1.024	A

** The tool position varies depending on the option setting. Please confirm in advance.

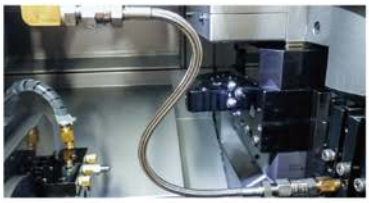


Compatible with various coolant hose connections (OH, OH2, OH3)

Side connection

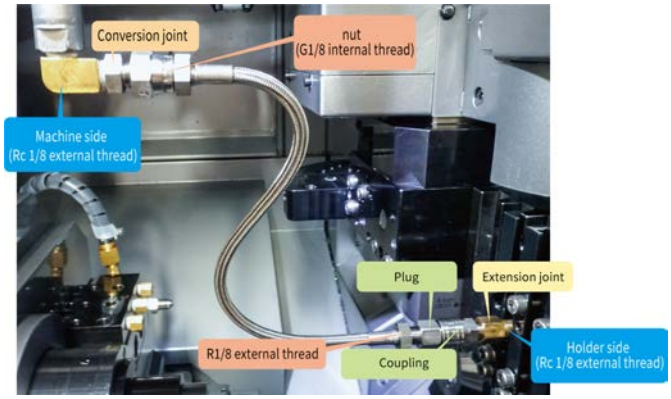

Rear connection

I.D. toolholder with side connection


Hose mounting example (vertical tool post)

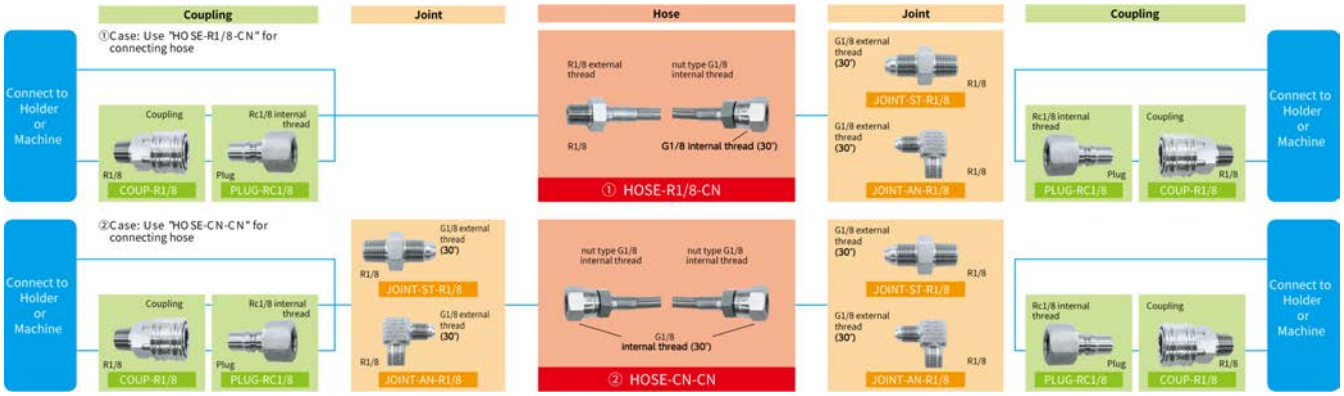
Coolant parts for hose connection ①.

Coolant connection options



Name	P/N
joint	JOINT-ST-R1/8
hose	HOSE-R1/8-CN-400
plug	PLUG-RC1/8
coupling	COUP-R1/8
extension joint	SCJ-R1/8-RC1/8-L

Connection example

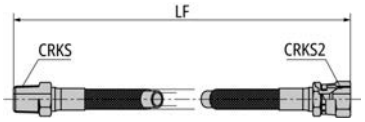


How to use quick change coupling and joint

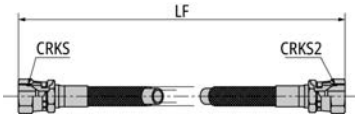
- Frequent hose removal
  ➡Coupling(Max. coolant pressure 1080psi)
- Less hose removal
  ➡Joint(Max. coolant pressure 2900psi)

Hose

No.1



No.2



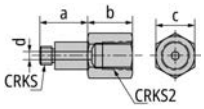
R1/8 male thread
Rotate hose to secure

Cap nut G1/8 female thread
Fastening by rotating nut
(No hose rotation required)

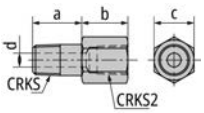
Figure	Item Number	LF	CRKS	CRKS2	CP
		inch			Max. operating pressure (psi)
1	**HOSE-R1/8-CN-200**	7.874	R1/8	G1/8	20.6
1	**HOSE-R1/8-CN-250**	9.843	R1/8	G1/8	20.6
1	**HOSE-R1/8-CN-300**	11.811	R1/8	G1/8	20.6
1	**HOSE-R1/8-CN-400**	15.748	R1/8	G1/8	20.6
1	**HOSE-R1/8-CN-500**	19.685	R1/8	G1/8	20.6
1	**HOSE-R1/8-CN-800**	31.496	R1/8	G1/8	20.6
2	**HOSE-CN-CN-200**	7.874	G1/8	G1/8	20.6
2	**HOSE-CN-CN-250**	9.843	G1/8	G1/8	20.6
2	**HOSE-CN-CN-300**	11.811	G1/8	G1/8	20.6
2	**HOSE-CN-CN-400**	15.748	G1/8	G1/8	20.6
2	**HOSE-CN-CN-500**	19.685	G1/8	G1/8	20.6
2	**HOSE-CN-CN-800**	31.496	G1/8	G1/8	20.6

Joints (for screw replacement and extension)

No.1



No.2



No.3

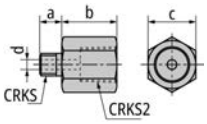
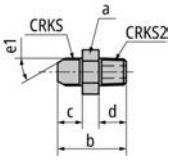


Figure	Item Number	CRKS	CRKS2	a	b	c	d
				inch	inch	inch	inch
1	SCJ-M6-RC1/8-L	M6×1	Rc1/8	.630	.591	.512	.098
2	SCJ-R1/8-M10-L	R1/8	M10×1	.630	.472	.512	.177
2	SCJ-R1/8-RC1/8-L	R1/8	Rc1/8	.630	.591	.512	.177
2	SCJ-R1/8-NPT1/8-L	R1/8	NPT1/8	.630	.591	.512	.177
3	SCJ-M6-M10-N	M6×1	M10×1	.236	.591	.472	.098
3	SCJ-M6-RC1/8-N	M6×1	Rc1/8	.236	.591	.512	.098
3	SCJ-M6-NPT1/8-N	M6×1	NPT1/8	.236	.591	.512	.098
3	SCJ-M8-RC1/8-N	M8×1	Rc1/8	.236	.591	.512	.138
3	SCJ-R1/8-M10	R1/8	M10×1	.394	.591	.472	.177
3	SCJ-R1/8-NPT1/8	R1/8	NPT1/8	.394	.591	.512	.177

Joint (for connection with G1/8 female thread)

No.1



No.2

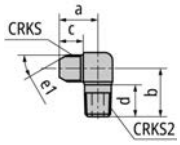
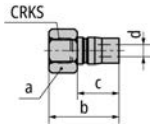


Figure	Item Number	CRKS	CRKS2	a	b	c	d	e1	CP
				inch	inch	inch	inch	inch	Max. operating pressure (psi)
1	JOINT-ST-R1/8	G1/8	R1/8	HEX:.551	1.220	.512	.394	1.181	2900
2	JOINT-AN-R1/8	G1/8	R1/8	.787	.827	.512	.551	1.181	2900

*The threads of the straight and L-shaped joints have different thread standards on both sides.
When connecting to a hose or one-touch coupler, use a combination of the same thread standard.

Coupling

No.1



No.2

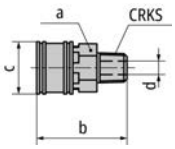
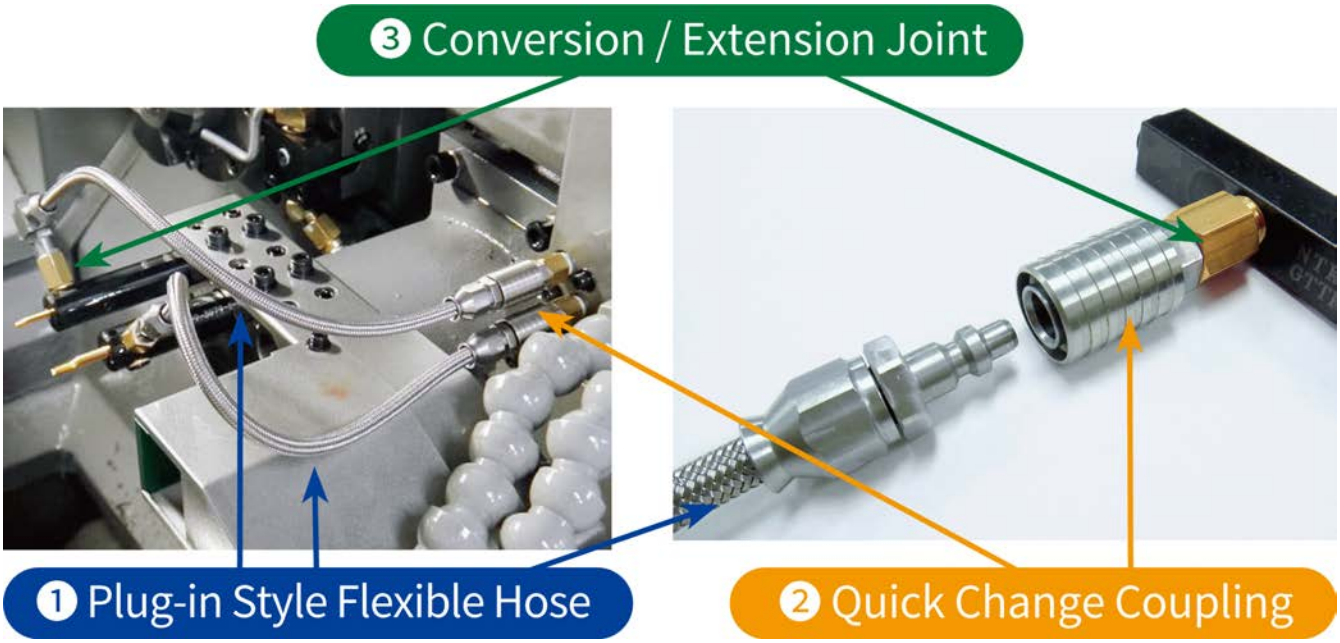


Figure	Item Number	CRKS	a	b	c	d	CP
			inch	inch	inch	inch	Max. operating pressure (psi)
1	PLUG-RC1/8	Rc1/8	HEX:.551	1.024	.610	.177	1080
2	COUP-R1/8	R1/8	HEX:.551	1.181	.689	.177	1080

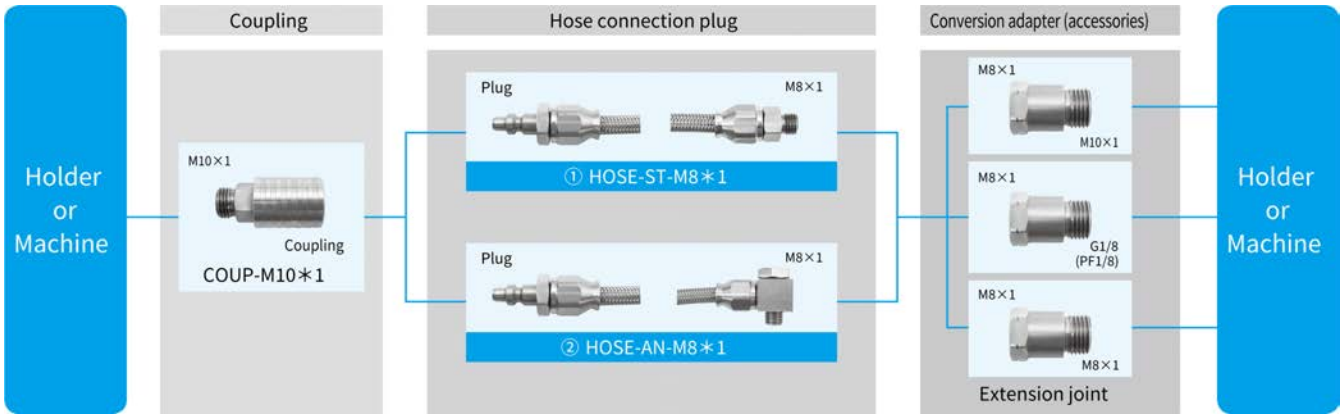
Coolant parts for hose connection ②.

One-touch coupler type made by HEB

Coolant connection options



Coolant connection example

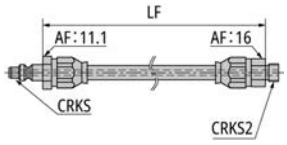


Features

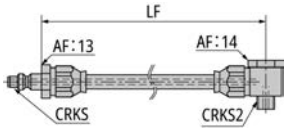
High quality stainless steel flexible tubing
Maximum working pressure 2900 psi

Hose with plug (conversion adapter included)

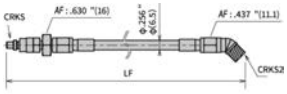
No.1



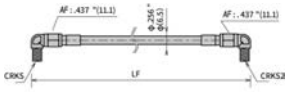
No.2



No.3



No.4



Conversion adapter

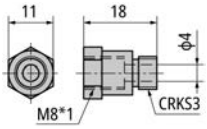
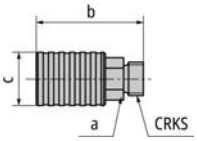


Figure	Item Number	LF	CRKS	CRKS2	CRKS3	CP
		inch			Conversion adapters	Max. operating pressure (psi)
1	**HOSE-ST-1/8NPT-6IN**	6.000	Quick change connector	NPT1/8	–	2900
1	**HOSE-ST-1/8NPT-10IN**	10.000	Quick change connector	NPT1/8	–	2900
1	**HOSE-ST-M8*1**	11.811	Quick change connector	M8*1	①M8*1→M10*1②M8*1→G1/8	2900
1	**HOSE-ST-1/8NPT-18IN**	18.000	Quick change connector	NPT1/8	–	2900
2	**HOSE-AN-M8*1**	11.890	Quick change connector	M8*1	①M8*1→M10*1②M8*1→G1/8③M8*1→M8*1	2900
3	**HOSE-45DEG-QC-7IN**	7.000	Quick change connector	45 Deg * NPT1/8	–	2900
4	**HOSE-DA-1/8NPT2-6IN**	6.000	NPT1/8	NPT1/8	–	2900
4	**HOSE-DA-1/8NPT2-8IN**	8.000	NPT1/8	NPT1/8	–	2900
4	**HOSE-DA-1/8NPT2-10IN**	10.000	NPT1/8	NPT1/8	–	2900

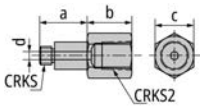
One-touch coupler



Item Number	CRKS	a	b	c	CP
		inch	inch	inch	Max. operating pressure (psi)
COUP-M10*1	M10×1	HEX:.433	1.280	.630	2900
COUP-NPT1/8	NPT1/8	HEX:.433	1.280	.630	2900

Joints (for screw replacement and extension)

No.1



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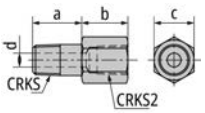

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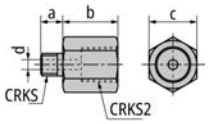
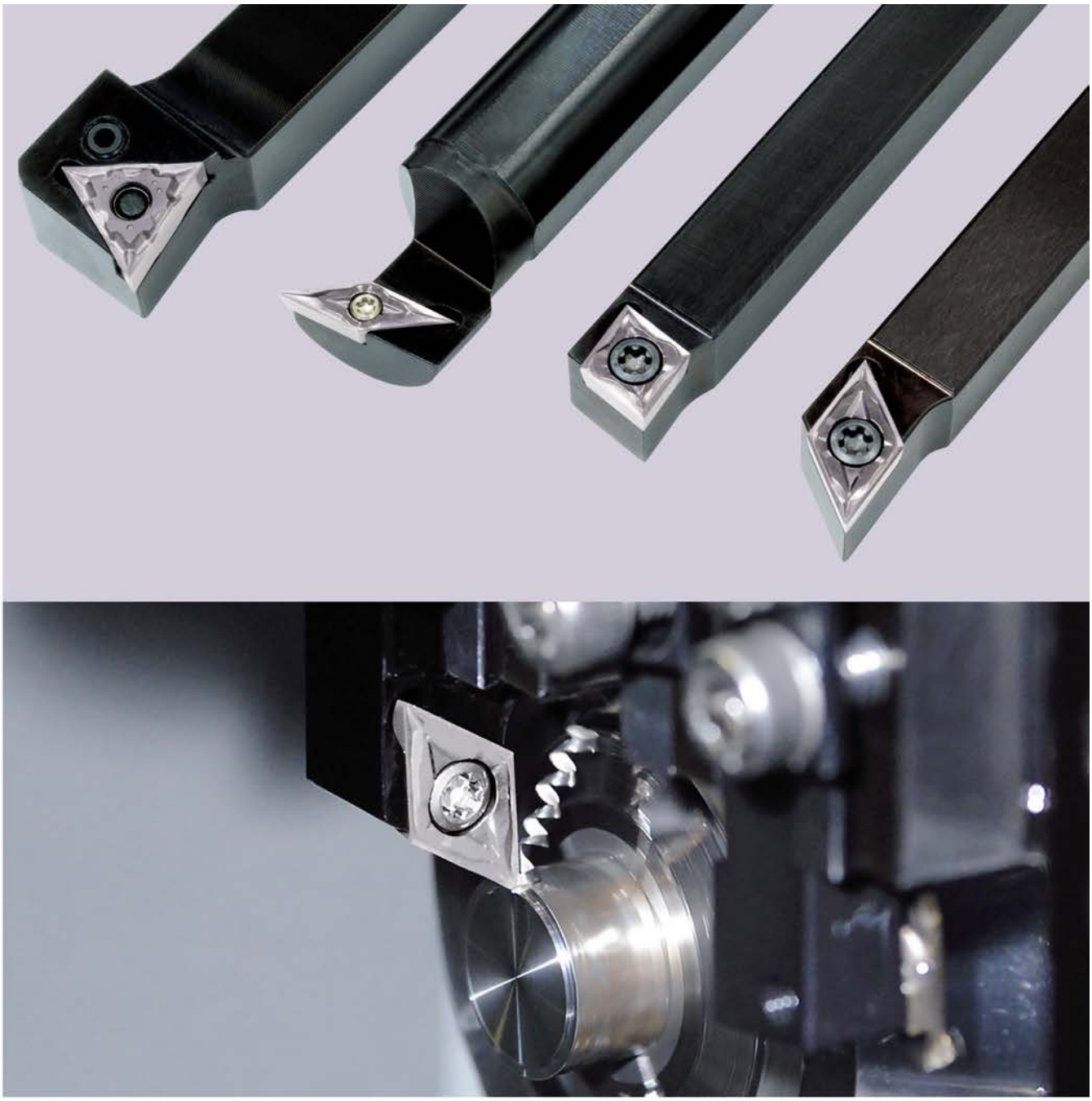


Figure	Item Number	CRKS	CRKS2	a	b	c	d
				inch	inch	inch	inch
1	SCJ-M6-RC1/8-L	M6×1	Rc1/8	.630	.591	.512	.098
2	SCJ-R1/8-M10-L	R1/8	M10×1	.630	.472	.512	.177
2	SCJ-R1/8-RC1/8-L	R1/8	Rc1/8	.630	.591	.512	.177
2	SCJ-R1/8-NPT1/8-L	R1/8	NPT1/8	.630	.591	.512	.177
3	SCJ-M6-M10-N	M6×1	M10×1	.236	.591	.472	.098
3	SCJ-M6-RC1/8-N	M6×1	Rc1/8	.236	.591	.512	.098
3	SCJ-M6-NPT1/8-N	M6×1	NPT1/8	.236	.591	.512	.098
3	SCJ-M8-RC1/8-N	M8×1	Rc1/8	.236	.591	.512	.138
3	SCJ-R1/8-M10	R1/8	M10×1	.394	.591	.472	.177
3	SCJ-R1/8-NPT1/8	R1/8	NPT1/8	.394	.591	.512	.177



For more stable machining of small-diameter Ni based components

**Common challenges in Ni-based alloy Machining: Edge damage and wear from welding.
Discover stable machining with NTK's Innovative Material, 650.**

New HiPIMS PVD grade

NTK650

For small diameter parts I Materials for processing Ni-based alloys

lineup → D32 - D45

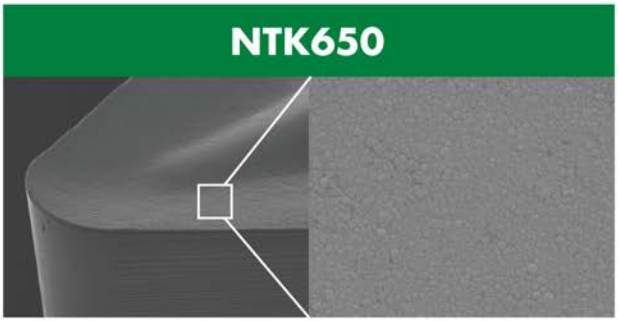
Stable machining of [Ni base alloys × small diameter parts] for all users

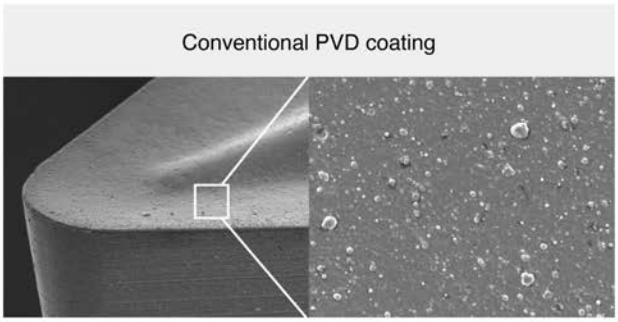
Features

- **Adoption of new HiPIMS coating technology. Improvement of surface-smoothness and suppression of imperfections in film**
  Improves welding performance, which is critical to Ni base alloys. Provides stable machining
- **TiAlN coating with excellent hardness and heat resistance achieves long life**
  Excellent wear resistance even in difficult-to-machine material processing with high cutting edge temperature

Applicable Applications

- Small diameter of Ni base alloys. (Approx. Φ.787″) for best performance on workpieces
- Introducing three new types of NTK's best-selling chipbreakers

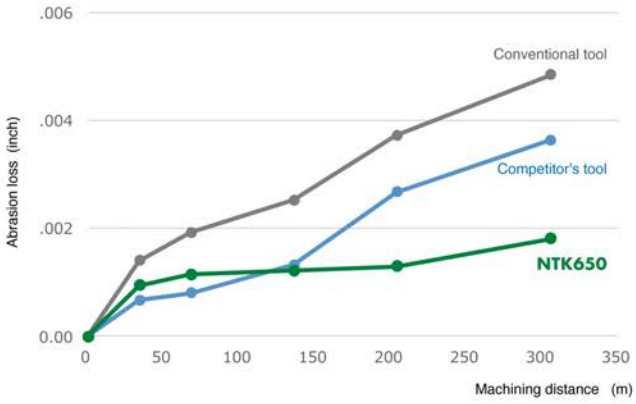




Performance

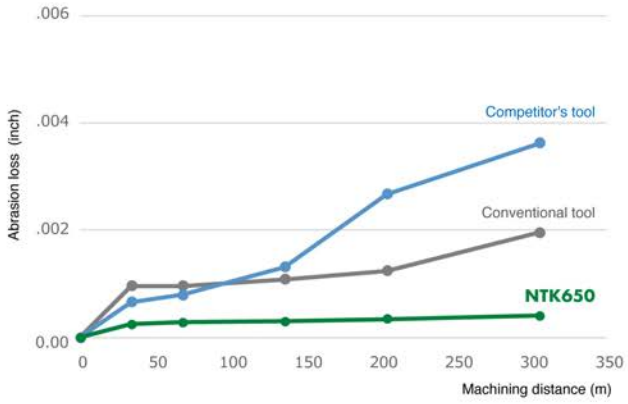
Material: Inconel 718

V_c=164 sfm f=.002 ipr a_p=.039″ WET , DCGT 32.508M



Material: Hastelloy C22

V_c=262 sfm f=.002 ipr a_p=.039″ WET , DCGT 32.508M

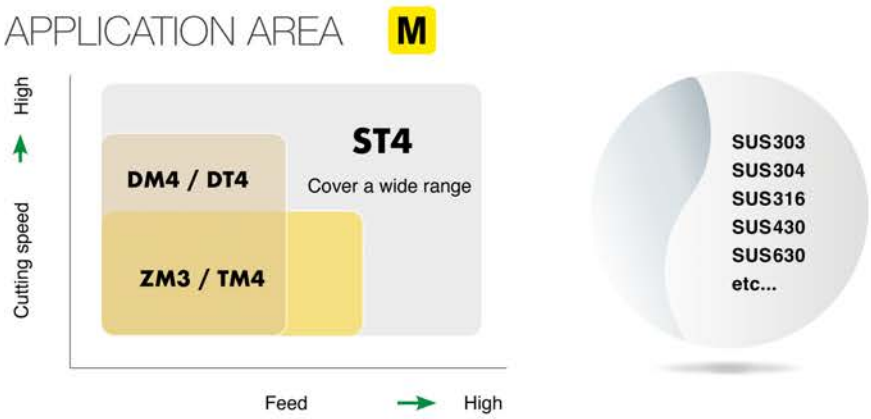


Cutting conditions

Grade	Work material	Cutting parameters		
		Cutting Speed (sfm)	Feed (ipr)	D.O.C. (inch)
NTK650	Inconel	100 - 200	.0012 - .0028	.019 - .059
	Hastelloy	160 - 330	.0012 - .0028	.019 - .059

ST4

Dedicated to stainless steel machining | CNC auto lathe tool material



ST4 has long life with high-hardness and excellent oxidation resistance

Through our proprietary coating technology, we generate a high aluminum coating film, effectively reducing adhesion and weld-related issues.
Our tool effectively minimizes tool wear due to increased cutting edge temperatures during high-speed machining and difficult-to-cut stainless steel machining

Example of machining

Stainless steel | Cut-off

SUS304 Φ11 V_c=267 SFM f=.0012″ IPR WET , CTPA15FLN

ST4 is not welded and tool wear is low.

Electromagnetic stainless steel | Front turning

After 2,100m processing	PVD coating ST4	Competitor's
Picture of cutting edge		
Machined surface		
Surface roughness Ra(μin)	1.57	43.3
Tool wear (inch)	.0055"	.0063"

Electromagnetic stainless steel V_c=533 SFM f=.002″ IPR a_p=.0394″ WET , DCGT11T302MYL

ST4 can also be machined with electro magnetic stainless-steel

In all applications, "ST4",

lineup → D32 - 45

NTK Chipbreaker + SPLASH Holder Series

NTK Chipbreaker

New Addition of lineup

Expansion of lineup for all applications

Select optimum chipbreaker according to machining conditions

SPLASH

New Addition of lineup

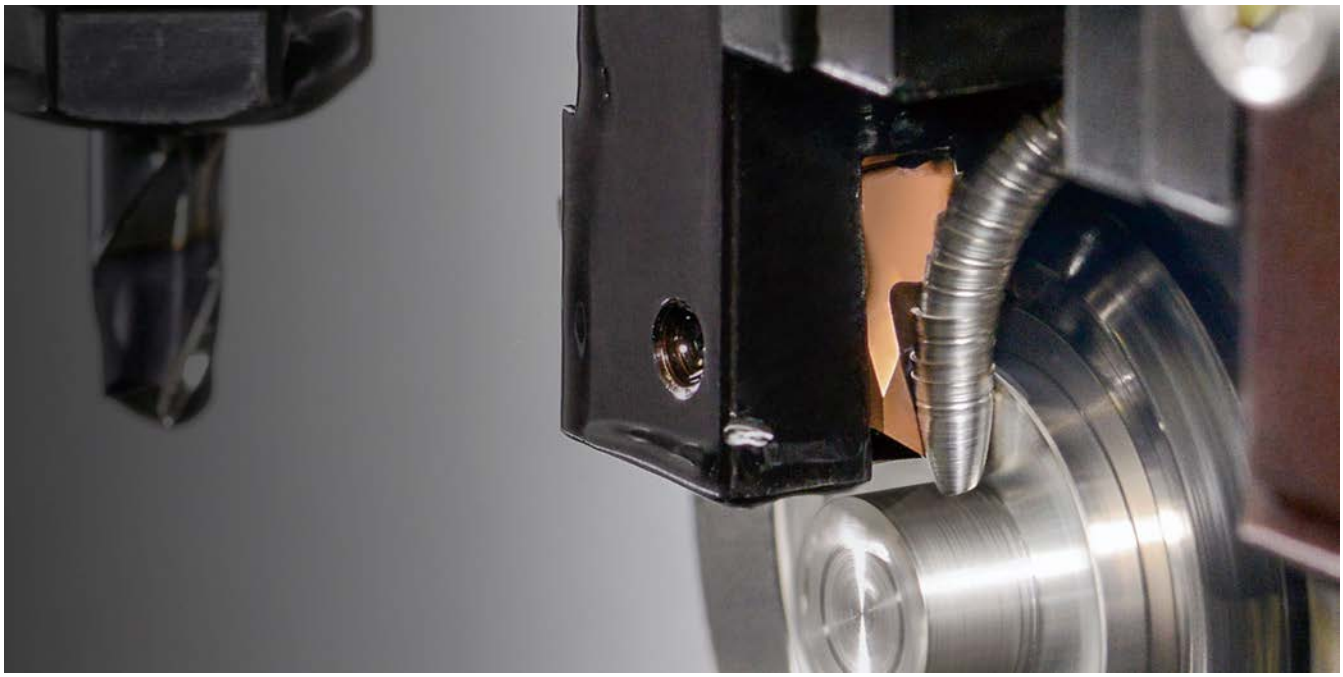
Coolant Through Holders | For Swiss CNC Lathes

See **SPLASH** brochure for details.

Set up SPLASH series for each application

Reducing the heat at the cutting edge reducing tool wear and forcibly controls chips

"Chipbreaker" and "SPLASH" are selectable



For front turning | Swiss CNC Lathes

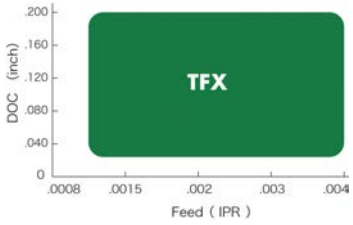
The Front Max

Significant reduction in cycle time due to large depth of cut capability

Chip control at both large DOC and high feed and low DOC and low feed conditions

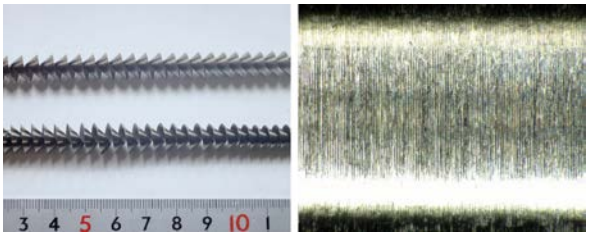
Performance

Capable of a .197" maximum depth of cut
NTK's unique insert design provides excellent chip control and surface finish.



Performance

Outstanding chip control in any cutting conditions.
NTK's original chipbreaker design provides excellent chip control and a good machined surface.
Coolant through holders are available for TFX inserts to provide further machining stability

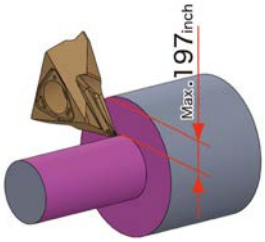


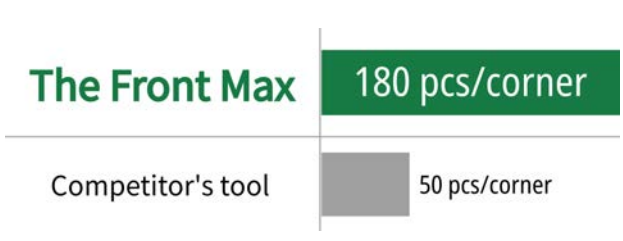
[cutting conditions] DOC : .197 inch Material : 304SS 270 SFM
f=.001 inch WET

Case study

The TFX "Front Max" machined at an increased feed and a large DOC of .197”, succeeding at extending tool life by more than 3 times compared to the competitor's insert.

Work material	SUS304
Cutting speed	270 SFM
Feed	.001 IPR
Depth of cut	.197 inch
Coolant	WET





lineup → Q7 - 9

For end milling | Swiss CNC lathes

S-MILL

Ideal for small diameter parts that are prone to vibrations

Targets small diameter parts with rigidity issues that benefits from a sharp cutting edge

Performance

Designed with a focus on sharpness
Stable machining of even the smallest workpieces

Part surface finish comparison

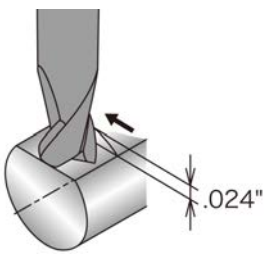
The sharp cutting edge design achieves an overwhelmingly good machined surface.

[Cutting conditions]
Material : 304SS ø.630" .118 DOC ae=.047 width S = 3,000rpm F = 11.8 IPM
[Tools used]
ø.236" - 2 flute

Case study

The competitor's end mill showed an obvious decrease in surface finish quality as it reached the end of its tool life.
The S-Mill maintained a quality finish throughout the extent of its long tool life.

Work material	SUS416F
Spindle speed	3,200 rpm/min
Feed	5.5 IPM
Depth of cut	.024 inch
Coolant	WET



lineup → X4

For high-efficiency thread cutting | Swiss CNC lathes

Thread Whirling

High productivity for precision screw manufacturing, like implant screws and bone screws

Ideal for medical screw thread forms that are becoming more complex

Single pass thread forming reduces cycle time

Features

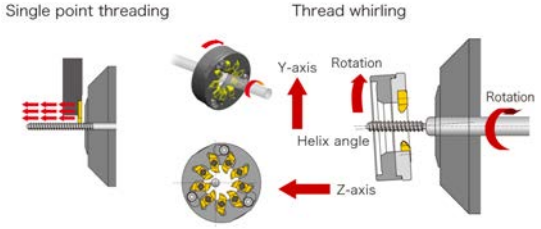
- NTK's insert design technology creates precise inserts matching even the most complex thread forms
- Sharp cutting edges and PVD coated inserts generate superior surface finishes and achieves long tool life

	Double-lead threads	Triple-lead threads
Work	Bone screw	Worm screw
Work material	Ti-6Al-4V ELI	brass
Workpiece		
Insert shape		
Major Dia.	ø.039"	ø.276"
Minor Dia.	ø.094"	ø.185"
Lead [Pitch×No. of Lead]	.126 inch	.193 inch

Machining multi-lead thread forms has many process requirements.
So it is important to contact us to discuss: mechanical specifications, spindle specifications, insert specifications, tooling specifications.

Thread whirling process vs. single point threading

In thread whirling, the whirling head is tilted to a specific helix angle, the cutter is rotated at high speed, the bar stock (c axis) is rotated at a low speed, and the pitch (z axis) is the feed.
The inserts shear the material which enables single pass thread forming.



lineup → U30 - 38

Special Item Capability

- Even though almost all bone screw shapes are special, NTK thread whirling inserts can make the correct shape of thread the first time, without any redesign or remanufacturing
- The combination of a sharp cutting edge and PVD coating achieves an excellent finish and long tool life.

Instructions

1. Refer to our chart and find your machine and spindle model. Select the suitable whirling cutter.
2. Submit the machine , spindle model information, workpiece drawing, material, and bar stock diameter to NTK. NTK calculates the lead angle and insert geometry from the work drawing and manufactures a dedicated insert.
3. Set the whirling cutter at the specified lead angle and set the cutting conditions.

Recommended Cutting Conditions

Conditions / No. of teeth		9	6	4	
Main spindle	RPM	10-40	10-25	7-15	Faster RPM reduces machining time
Whirling cutter	RPM	1500-4000			
Feed Rate		Same as thread lead = pitch			
Bar stock	mm	-ø.400"	-ø.400"	-ø.200	
Work Material		Ti-6Al-4V EL / SUS316 / 17-4PH / Titanium / brass			

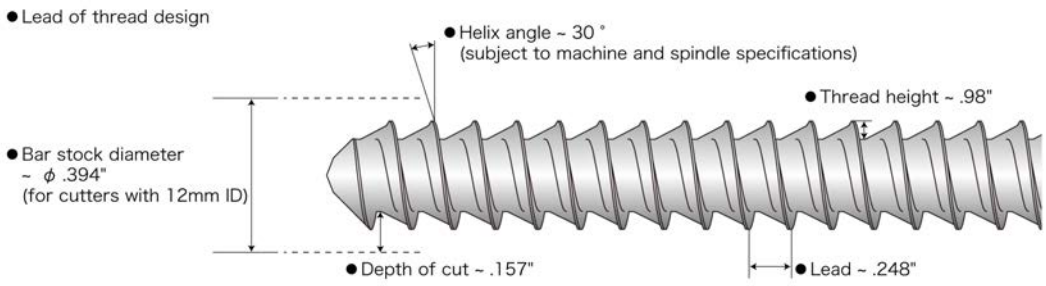
●Formula for calculating thread whirling process time

$$T\ (\text{Seconds}) = \frac{60 \times \text{Thread length}}{\text{Main spindle rpm} \times \text{Feed rate (Thread lead)}}$$

Ex.) Double lead / 2" length / .100" lead (2×.050" pitch) / 30 rpm

$$T\ (\text{Seconds}) = \frac{60 \times 2}{30 \times .100"} = 40\ \text{Seconds}$$

Applicable Thread Geometry (Approximated)



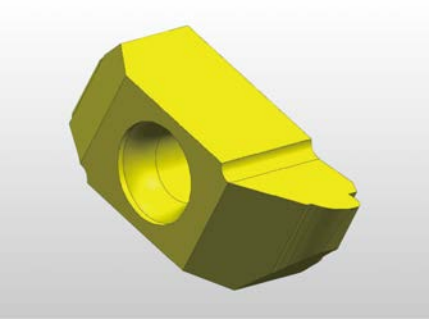
The geometries shown above are approximated and could vary by actual applications

Double-lead Bone Screw Process Example

1. 1st thread whirl at taper area
2. Rotate the bar 180°and whirl the 2nd thread on same area as 1
3. Thread whirl the straight section
4. To obtain two exits on the screw, back up half a lead (one pitch) and rotate 180 degrees. Additional machining is performed at the exit.

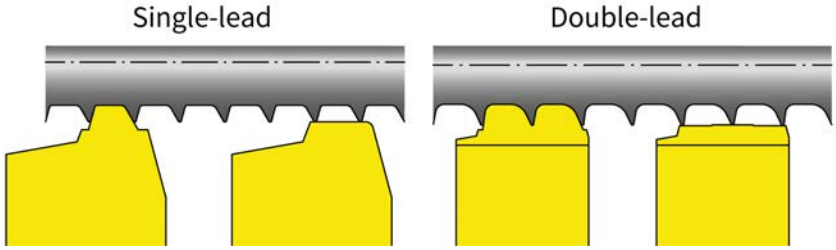
Basic Insert Grade : ZM3

ZM3 is the common grade for NTK thread whirling
ZM3 offers excellent surface finish
NTK can make inserts with other coatings to meet customers demands



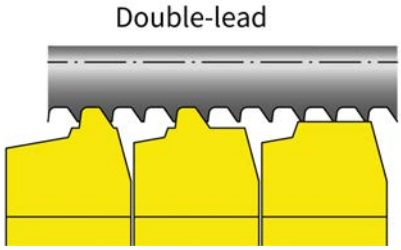
NTK Thread Machining Examples

For absolute flat on OD



Two insert combination brings absolute flat on OD to meet drawing specifications.

For tiny thread



NTK's Thread Whirling system can machine small diameter multi-lead screws to spec, with lower tool pressure, by using several types of specially designed and accurately ground inserts on the cutter.

NTK's Unique Attachment System

NTK's whirling insert holder can be attached and detached without removing mounting screws

①Loosen the Mounting Screws

②Rotate the Insert Holder 10 degrees

③Detach the Insert Holder without removing the Mounting Screws

Application Examples

Double-lead Bone Screw

Work Material : Ti-6Al-4v ELI

Bar Stock Dia.	ϕ.375	Number of start	2
Major Dia.	ϕ.157	Helix Angle	28.5°
Minor Dia.	ϕ.098	Hand of thread	Right
Cutting condition			
Main Spindle Speed (rpm)	15	Speed of whirling cutter (rpm)	3,500
Lead = Feed (IPR)	.217	Result	OK

NTK Thread Whirling — Dramatically improved productivity

Competitor's Thread Whirling — *Cannot complete with single pass. Requires feeding stock multiple times and two passes for threading each time.*

NTK thread whirling succeeded in double lead screw machining when one of the major thread whirling suppliers has failed many times.

Double-lead Bone Screw

Work Material : Ti-6Al-4v ELI

Bar Stock Dia.	ϕ.350	Number of start	2
Major Dia.	ϕ.180	Helix Angle	23.0°
Minor Dia.	ϕ.120	Hand of thread	Right
Cutting condition			
Main Spindle Speed (rpm)	12	Speed of whirling cutter (rpm)	2,500
Lead = Feed (IPR)	.200	Result	OK

NTK Thread Whirling — Dramatically improved productivity

Competitor's Thread Whirling — *Cannot complete with single pass. Requires feeding stock multiple times and two passes for threading each time.*

The customer could not get perfect double lead thread form in single pass from other manufacturers. NTK got perfect thread form with a single pass on first trial saving cycle time.

Double-lead Bone Screw

Work Material : Ti-6Al-4v ELI

Bar Stock Dia.	ϕ.250	Number of start	2
Major Dia.	ϕ.118	Helix Angle	15.4°
Minor Dia.	ϕ.083	Hand of thread	Right
Cutting condition			
Main Spindle Speed (rpm)	11	Speed of whirling cutter (rpm)	2,200
Lead = Feed (IPR)	.087	Result	OK

NTK Thread Whirling — Dramatically improved productivity

Competitor's Thread Whirling — *Cannot complete with single pass. Requires feeding stock multiple times and two passes for threading each time.*

Customer was concerned with stock rigidity and long cycle time. NTK applied three geometry inserts to achieve single pass machining, in dramatically short time. The up-sharp cutting edges and low cutting pressure produced "excellent" surface finish.

Single-lead Bone Screw

Work Material : 316SS

Bar Stock Dia.	ϕ.315	Number of start	1
Major Dia.	ϕ.138	Helix Angle	7.5°
Minor Dia.	ϕ.098	Hand of thread	Right
Cutting condition			
Main Spindle Speed (rpm)	23	Speed of whirling cutter (rpm)	2,000
Pitch = Feed (IPR)	.049	Result	OK

NTK Thread Whirling — 2600 pcs

Competitor's Thread Whirling — 1000 pcs

Some thread whirling manufacturers offer 6-teeth or 12-teeth systems, too many teeth cause chip packing issues and more tool pressure. Fewer teeth means greater cycle time. NTK concluded that 9-teeth is the best configuration. Our customers can run 1.5 times faster and get longer tool life.

Single-lead Bone Screw

Work Material : Ti-6Al-4v ELI

Bar Stock Dia.	ϕ.197	Number of start	1
Major Dia.	ϕ.091	Helix Angle	5.3°
Minor Dia.	ϕ.067	Hand of thread	Right
Cutting condition			
Main Spindle Speed (rpm)	30	Speed of whirling cutter (rpm)	3,100
Pitch = Feed (IPR)	.023	Result	OK

NTK Thread Whirling — 2200 pcs

This thread is up to 1.26" length with a small pitch. Cycle time could be increased with a single-point threading tool. NTK's inserts, designed for lower tool pressure, ran 2,200 pcs/corner at 30 rpm of bar stock (F10,800). It only took 110 seconds to finish a 1.26" length thread.

Triple-lead Worm Gear

Work Material : Brass

Bar Stock Dia.	ϕ.315	Number of start	3
Major Dia.	ϕ.276	Helix Angle	14.6°
Minor Dia.	ϕ.185	Hand of thread	Left
Cutting condition			
Main Spindle Speed (rpm)	20	Speed of whirling cutter (rpm)	3,500
Lead = Feed (IPR)	.189	Result	OK

Multi-lead threads, common in the Worm Gear industry are made by a forming or cutting process. The large helix angle is difficult to machine with single-point threading.
NTK now makes thread whirling inserts for multi-lead threads. Cycle time is reduced with a one pass process and thread form dimensions are stable with the low tool pressure.

For end milling | Swiss CNC lathes

Indexable insert end mills

Optimum size lineup for CNC automatic lathes

Indexable cutting edges simplifies tool management and reduces the need for re-sharpening and recoating a solid end mill.
PVD coated carbide inserts enable 3 to 5 times higher machining efficiency than HSS endmills.
Use of inserts with center cutting edges enables not only D-cutting, but also slotting and ramp milling.

Large head type

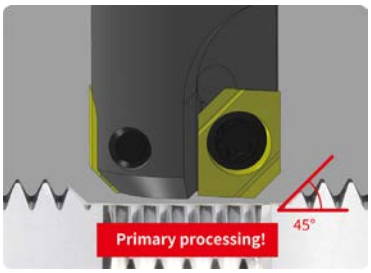
Machining close to the guide bushing is possible. Enables stable machining of even small-diameter workpieces. Can be mounted close to the tool post, providing high rigidity and reduced chatter during high-speed machining. Larger cutting edge diameter enables highly efficient machining.

Specialized chip breaker to reduce cutting resistance

Significantly reduced cutting resistance achieves high-precision machining.
Wiper shape improves surface finish roughness.

End mill for D-cut 45° machining

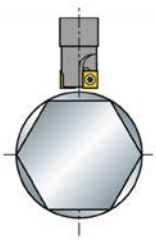
45° machining geometry is available with indexable inserts.
Contributes to higher efficiency by reducing machining processes.

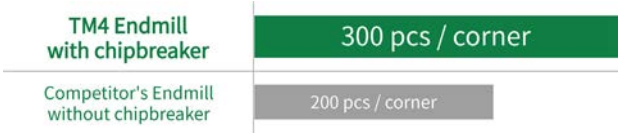


Case study

NTK's end mills with chipbreakers have good cutting performance, which reduces machining noise and eliminates surface lines. Machining dimensions were also stable and the tool life extended.

Work material	SUS304
Cutting speed	250 SFM
Feed	2.76 IPM
Depth of cut	~.049 inch
Coolant	WET



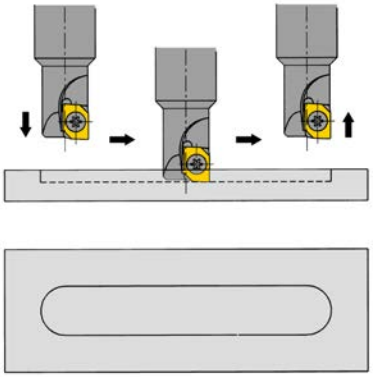


lineup → X5 - 8

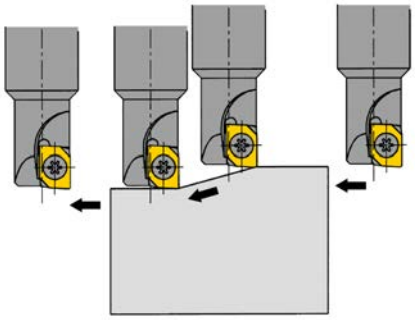
Advantages of installing an insert with a center edge

- Machining example (1): Single flute end mill can be used for infeed and side machining.
- Machining example (2): Ramp milling is possible with a single-flute end mill.
- Wiper is provided at the cutting edge corner to obtain a good machined surface.

Machining example (1)



Machining example (2)



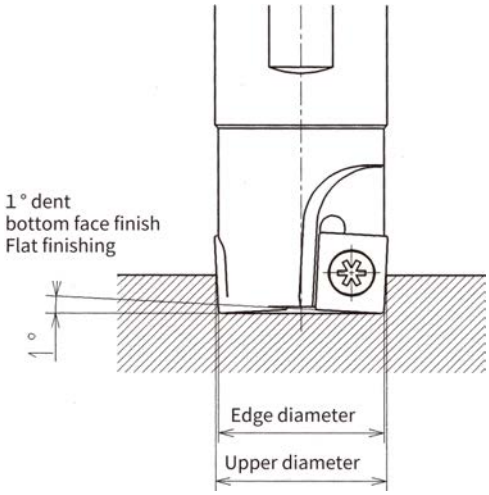
Notes

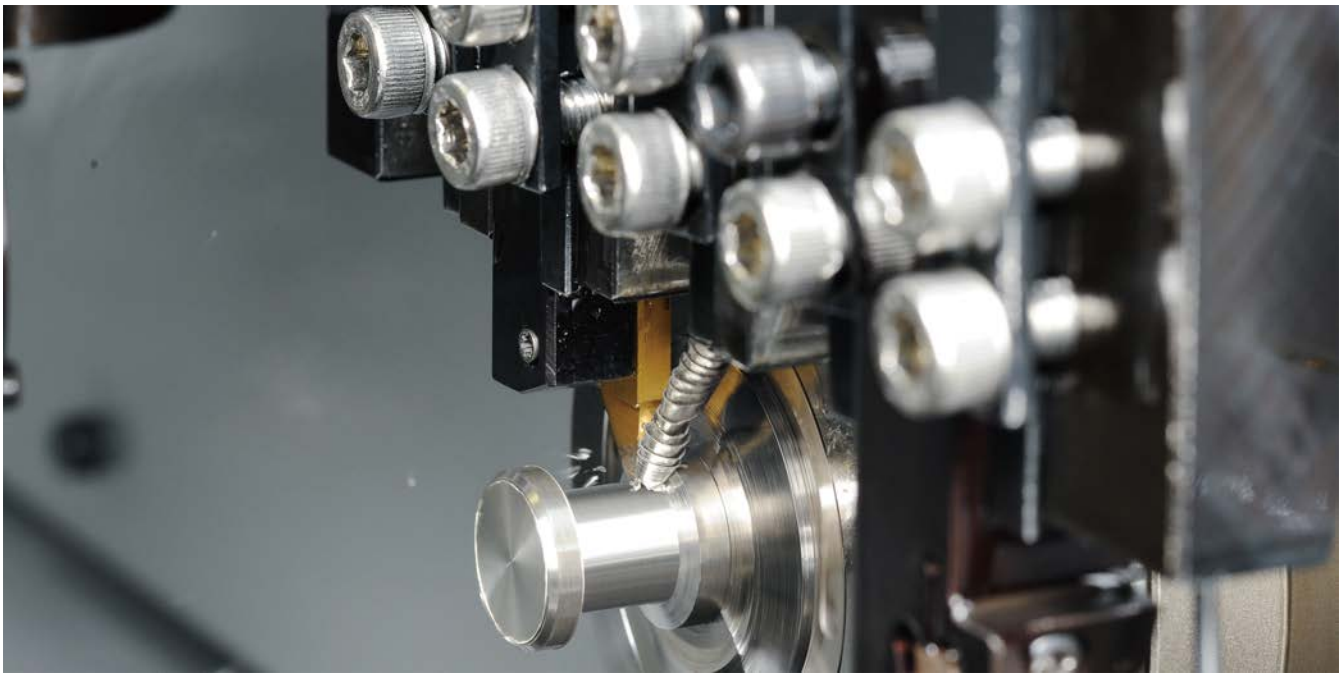
- Center fluted inserts can also be mounted on 2- and 3-flute type end mills, but infeed machining cannot be performed. However, the surface roughness of the machined bottom surface can be improved.
- When performing ramp milling with a center-edged insert mounted on a single flute type end mill, the effective cutting edge length (.157") should be taken into account when setting up the machining program.

Notes on the use of the REL series

When REL type end mills are used, a taper will occur on the machining side of the workpiece. See chart for amount.

Depth of cut (inch)	(1)Top machining dia. - (2)Bottom machining diameter (inch)
.079	.002
.118	.003
.157	.005
.197	.006





For back turning | Swiss CNC lathes

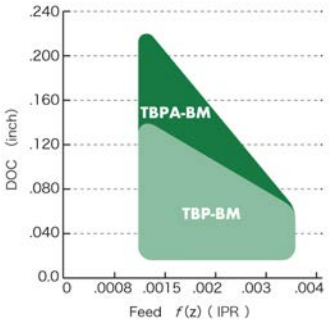
TBP/TBPA-BM chipbreaker

Achieves outstanding surface finish in single pass machining

A traditional 2 pass operation can be completed in a single pass while providing chip control.
Dramatically shortens cycle time.

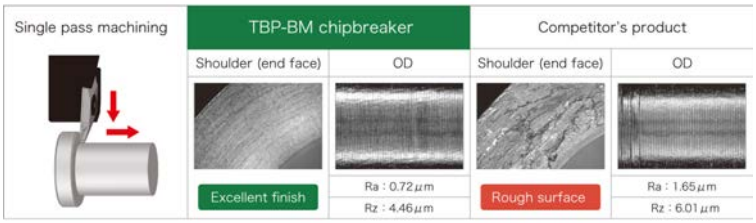
Features

High rigidity with vertically mounted inserts and screw clamps.
Surface finish is stable even under high feed conditions due to the cutting edge wiper.



Cutting performance

Single pass back turning, with good machined surface finish.

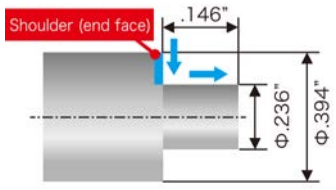


[Cutting conditions]
Material : 304SS ⌀.630" 270 SFM f (x)=.0001 IPR f (z)=.003 IPR .118 DOC WET
[Tools used]
Holder : TBPR12 Insert : ST4 TBP72FR10M-BM

Case study

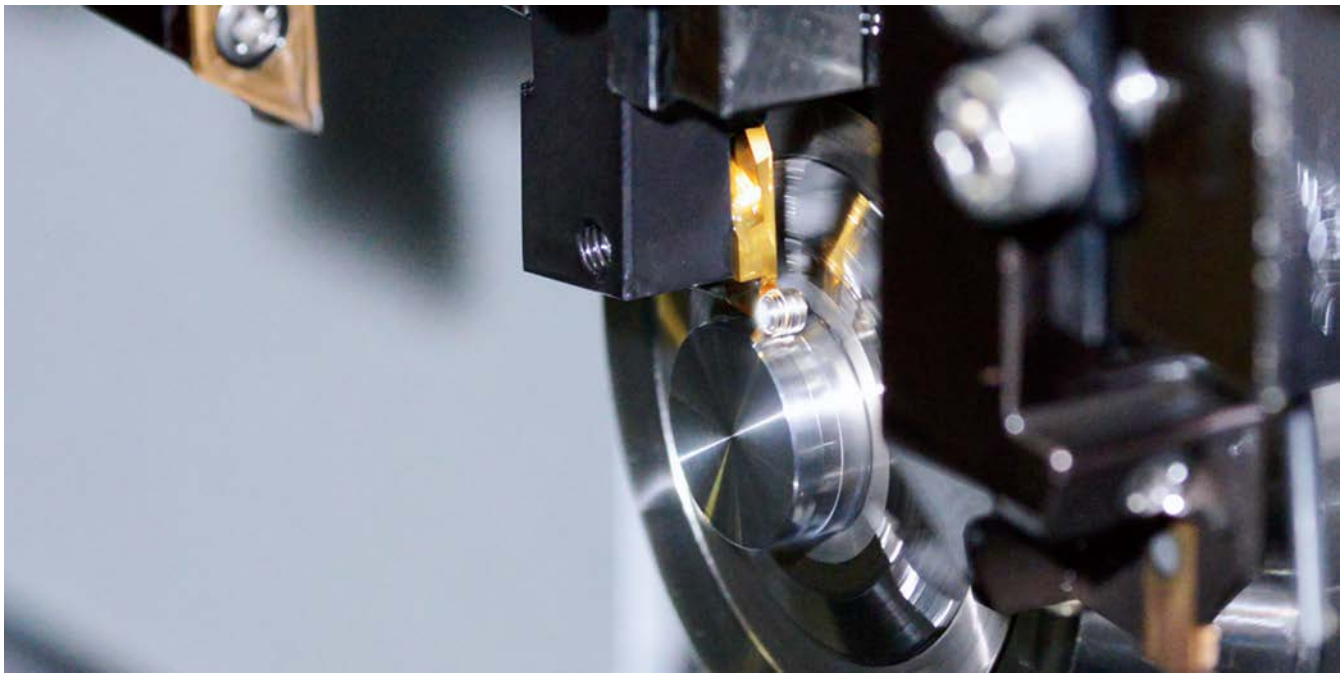
Conventional back- turning operation includes a roughing pass and a finishing pass.
The NTK-BM chipbreaker reduces the cycle time with one-pass machining, and its unique chipbreaker provides excellent chip control.
Scratched and rough machined surfaces due to chips is eliminated and high quality machined surfaces obtained.

Work material	SUS430F
Cutting speed	170 SFM
Feed	.002 IPR
Depth of cut	.079 inch
Coolant	WET



TBP-BM	①1 pass machining * no extra operations required
Competitor's product	①Roughing - grooving operations ②Finishing - back turn operation

lineup → R16,R21



For grooving | Swiss CNC lathes

GTMH-GX chipbreaker

Tightly curls the chip to prevent tangling

Dimple design on insert rake face ensures chip control when grooving and side turning

Performance

Groove widths from: .013 - .118 inch
Good surface finish in the groove and on the side face
Capable of up to .078" DOC when side turning with larger width inserts

Chip control comparison (Grooving E-ring)

Solves problems of chips (rings) remaining at the bottom of grooves and wrapping around the workpieces

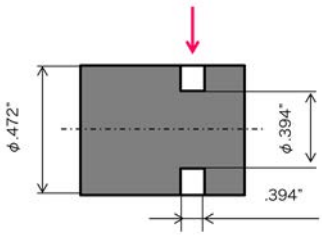
	Feed (IPR)		
	.0004	.001	.002
GX chipbreaker			
Conventional product (Ground chipbreaker)			

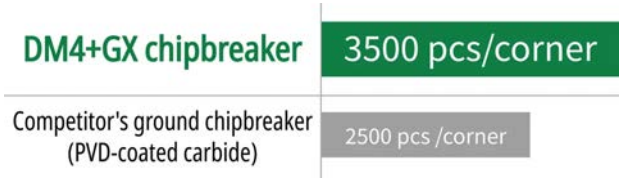
[Cutting conditions]
Material : 304SS (ø.236" → ø.118") 270 SFM .059 DOC
Groove width : .030 inch

Case study

The GX insert solved the issue of chips remaining in the groove which eliminated an inspection process.

Work material	SUS430
Cutting speed	270 SFM
Feed	.001 IPR
Depth of cut	.039 inch
Coolant	WET





lineup → T25

For OD, back turning, grooving, and multi-functional machining | For Swiss CNC lathes (gang type)

Y-axis holder series

Solves chip evacuation problems using gravity

Using the tool change control axis (Y-axis) of the gang tool post

Chips naturally fall to the bed of the machine

Performance

Eliminates the concern of chips tangling up

- chips automatically drop down away from part

Utilize coolant through y-axis holders and improve tool life and dimensional stability

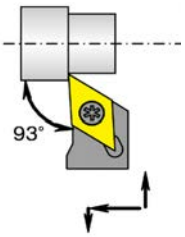
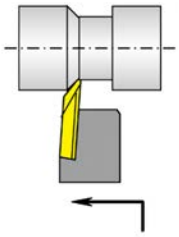
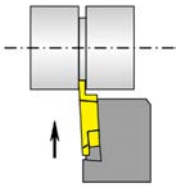
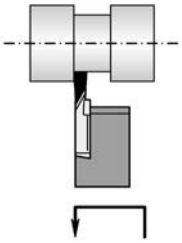
Application

Front turning / Back turning / For grooving

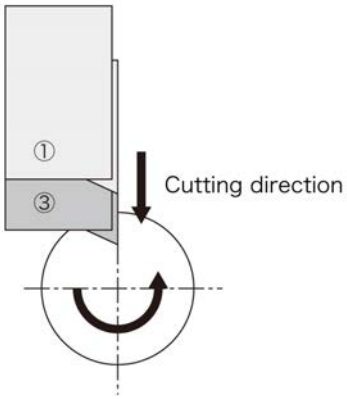
Pure Copper Processing / Machining Plastics

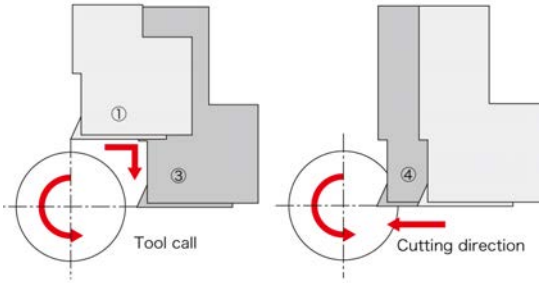
lineup → Q18,29-30,Q36,Q44-45,Q49,R13-14,R20,R22,R32-33,T13-14,T20-21

Line up

Front turning	Back turning	Grooving / Back turning	Multi-function
Y-SDJC Y-SDJC-OH Y-SDJC-OH2	Y-TBPR Y-TBPR-OH Y-TBP-OH2	Y-GTT Y-GTT-OH Y-GTT-OH2	Y-GTPA Y-GTPA-OH
			

Programming guidance





Regular Toolholder

①T300	Select tool
②G0 X.450 Z.000 T3	Position tool
③	
④G1 X.300 F.003	Move to OD to cut
⑤Z.200 F.002	Cut .200" length
⑥X.400	Cut face
⑦G0 X.450	

In general front turning, a tool is selected and moved to readying position and then cutting is initiated.
The cut direction is the "**X-axis**"

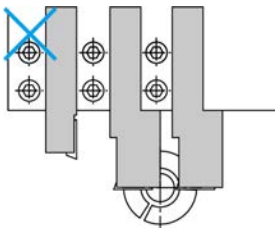
Y-axis Toolholder

①T300	Select tool
②G0 Y.450 Z.000 T3	Position tool
③X.000	
④G1 Y.300 F.003	Move to OD to cut
⑤Z.200 F.002	Cut .200" length
⑥Y.450	Cut face
⑦G0 X.450	

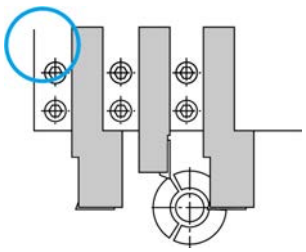
When using the Y-axis holder, the tool selection ①. Then, at position 3 the system starts the cutting operation.
The cut direction is the "**Y axis**"
Note: Need y-offset in the program for the holder shank size.

Y-axis holder positioning guidelines

Use a maximum of 2 in vertical gang, and do not install side by side to prevent interference issues

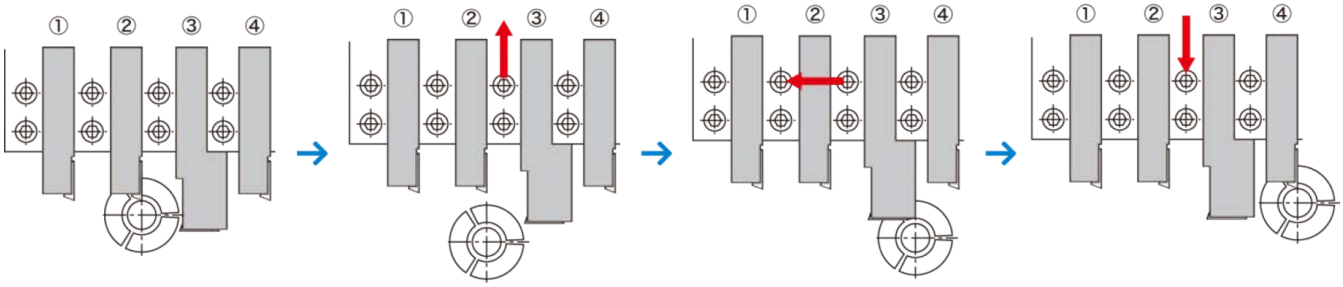


The workpiece and Y-axis holder may interfere with each other



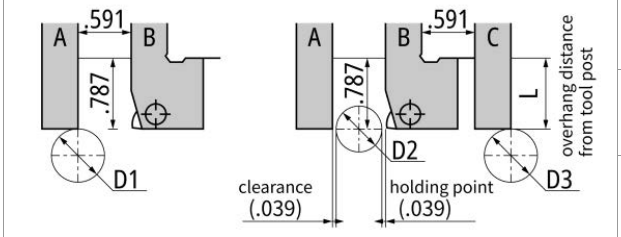
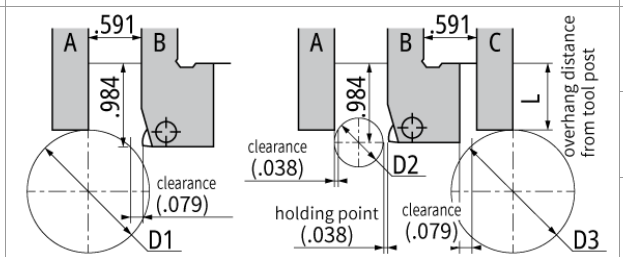
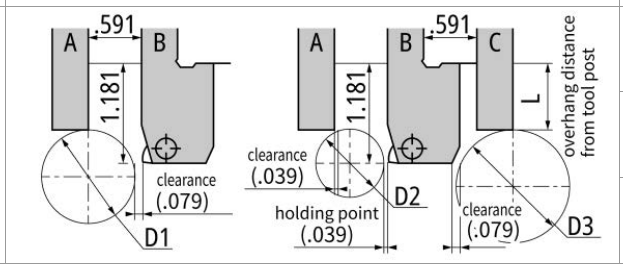
Typical positioning is sandwiching them in gang

When moving from tool No. ② to ④ , program retraction position based on the amount of y-axis holder overhang.



Workpiece diameters and Y-axis holder table

Example uses Y-GTTR grooving holder to show holder and workpiece diameters in machine area

Overhang of the Y-axis holder	Figures	Item L	.787"	.866"	.984"
.787"		D1 (Machinable outer dia. for holder A)	Not limited	Not limited	Not limited
		D2 (Machinable outer dia. for holder B)	.512"	.512"	.512"
		D3 (Machinable outer dia. for holder C)	Not limited	Not limited	Not limited
.984"		D1 (Machinable outer dia. for holder A)	1.496"	2.283"	Not limited
		D2 (Machinable outer dia. for holder B)	.9.587"	.535"	.512"
		D3 (Machinable outer dia. for holder C)	1.496"	2.283"	Not limited
1.181"		D1 (Machinable outer dia. for holder A)	1.055"	1.142"	1.516"
		D2 (Machinable outer dia. for holder B)	.811"	.705"	.587"
		D3 (Machinable outer dia. for holder C)	1.299" (1.055" for TBP)	1.457" (1.142" for TBP)	2.028" (1.516" for TBP)

For cut-off with max. diameter up to ⌀.630" | Swiss CNC lathes

CTP/CTPA-CX chipbreaker

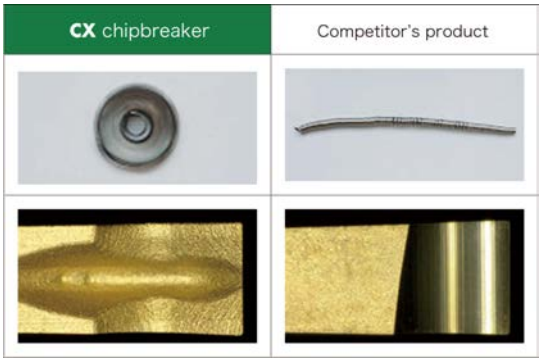
Prevents machine stoppage due to chip problems and achieves stable machining

CX molded chipbreaker curls and controls chips.

Prevents damage to machined surface by directing chips away from the part surface

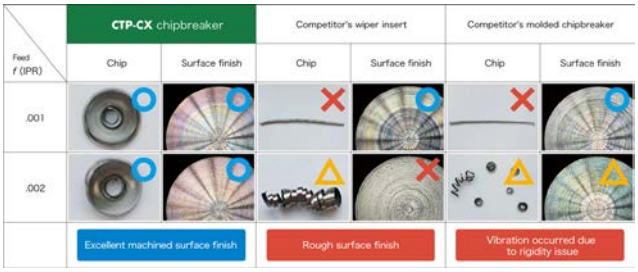
Features

Uniquely developed CX breaker achieves outstanding chip control and evacuation.



Cutting performance

Chips are strongly folded from both ends of the breaker, preventing damage to the machined surface.

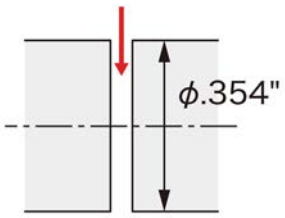


Case study

Competitor's insert edge chipped resulting in a rough machined surface.

The CX insert maintained a good cutting edge resulting in stable machining, smooth machined surface, and long tool life.

Work material	SS400
Cutting speed	270 SFM
Feed	.002 IPR
Cut-off dia.	⌀.354 inch
Coolant	WET



lineup → S16-18,S24-25

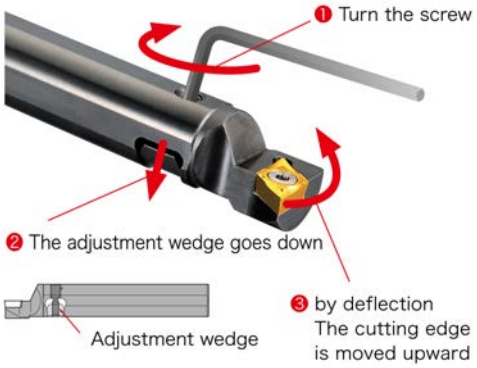
For front turning | Swiss CNC Lathes

DS-ACH holder series

Wedge mechanism adjusts centerline height of the cutting edge by turning a set screw with a wrench
Eliminates time consuming cutting edge alignment process

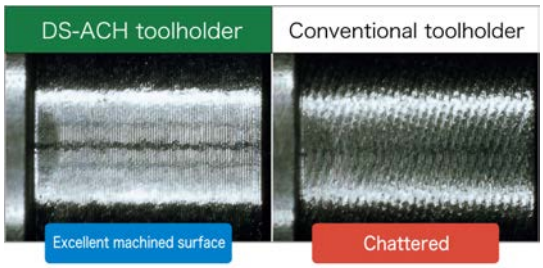
Feature 1.

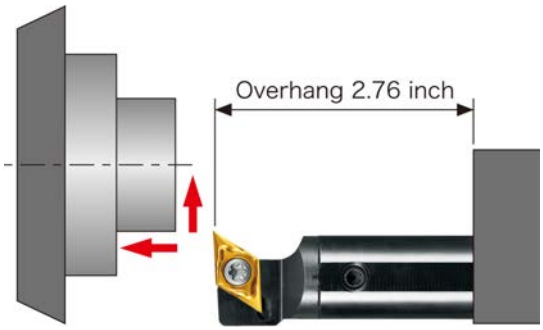
Cutting edge height can be easily adjusted in the machine
Adjusted by turning the screw and deflecting the tip of the holder.



Feature 2.

Design optimizes vibration resistance



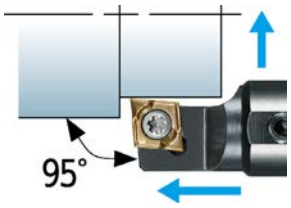


[Cutting conditions]
Material : 304SS
Holder : DS-SDUL19-11-ACH
Insert : ST4 DCGT11T302MCL
Cutting conditions : 250 SFM .002 IPR .079" DOC WET

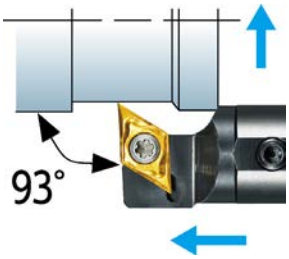
Lineup

Front turning

DS-SCL-ACH → Q18

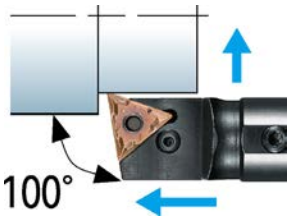


DS-SDU-ACH → Q31



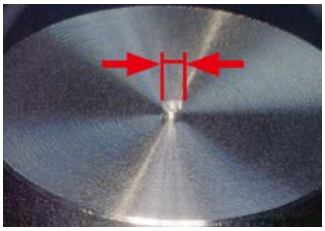
DS-SVVP-ACH → Q54

DS-PTX-ACH → Q61



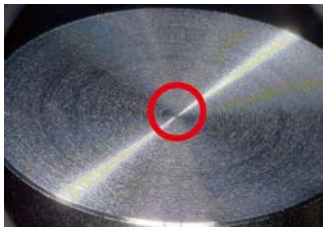
How to use: The insert moves in an upward direction only. (Loosen wedge screw before making any adjustments)

① Install the holder slightly below centerline.
Then take a facing test cut. (be sure to loosen the wedge screw)



② Measure the diameter of the center boss

③ Raise the center height by one half of the diameter of the boss.
Adjustment instruction sheet is supplied in the toolholder case.



④ Re-machine the end face.

Range of centerline adjustment: 0 - .012 inch

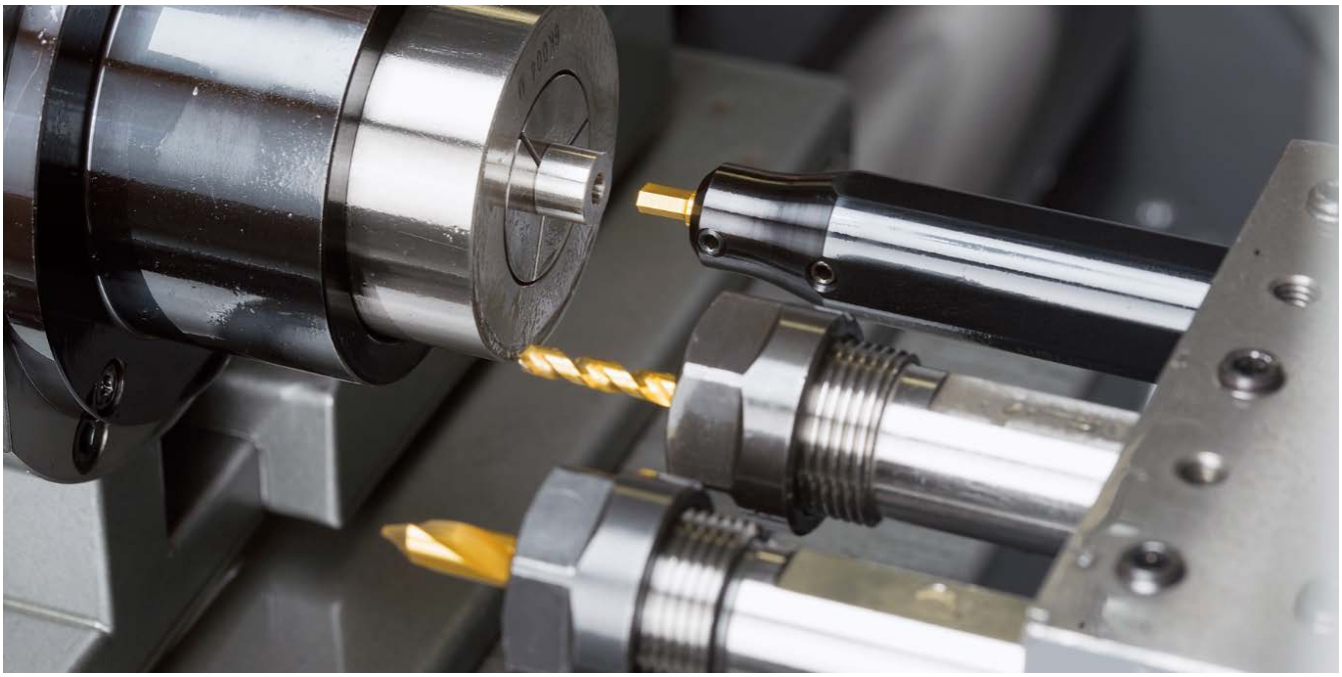
*Adjustment instructions are supplied in the tool case

Type A

Angle of rotation	Approx. raise amt. (Diameter)
180°	.002 (.004) inch
360°	.004 (.008) inch
540°	.006 (.012) inch
720°	.008 (.016) inch

Type B

Angle of rotation	Approx. raise amt. (Diameter)
180°	.002 (.004) inch
360°	.004 (.008) inch
540°	.008 (.016) inch
720°	.012 (.024) inch



For socket hole machining on CNC automatic lathes

SHAPER DUO

Hexagon, square and hexalobular socket machining can be achieved at a low cost and without any special equipment .

Wide range of socket styles and sizes can be machined by using the sub-spindle of automatic lathes.

Features ①

- Machine square, hexagon, and hexalobular socket holes
- Less tool pressure than Rotary-Broaching. Ideal for machining small diameter work pieces
- Wide range of socket dimensions can be machined with one size of SHAPER DUO
- Special workpieces and small quantity part runs can be machined with less tool costs

Features ②

Comparison Chart of Hexalobular Socket Machining

	Tool Pressure	Cycle Time	Tool Cost	High speed spindle	Programming	
Shaper Duo	◎	◎	◎	Not necessary	Simple	• No high speed spindle needed • A lot less cycle time
End mill	○	×	△	Necessary	Complicated	• Need high speed spindle • Time consuming process

***Small diameter end mill driven by high-speed spindle is popular way to create Hexalobular(6-lobe) socket.**
It has some flexibility but needs high speed spindle unit and it is a time consuming process.
***SHAPER DUO can make Hexalobular(6-lobe) socket faster and simpler.**

Comparison Chart of HEX Socket Machining

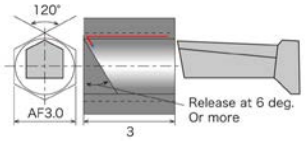
	Tool Pressure	Cycle Time	Flexibility	Tool Cost	
Shaper Duo	◎	△ ※Can be off-set by over-wrapping operation	○	◎	• Less tool pressure-especially on small diameter parts • One size can cover several socket sizes
Broach Tool	△	○	×	△	• Need to have tools for each socket size

***Rotary-broaching is an efficient way to machine a Hexagon socket.**
But tool pressure is high and often times it pushes part too hard.
***SHAPER DUO system enables less tool pressure and provides better tolerance with less cost.**

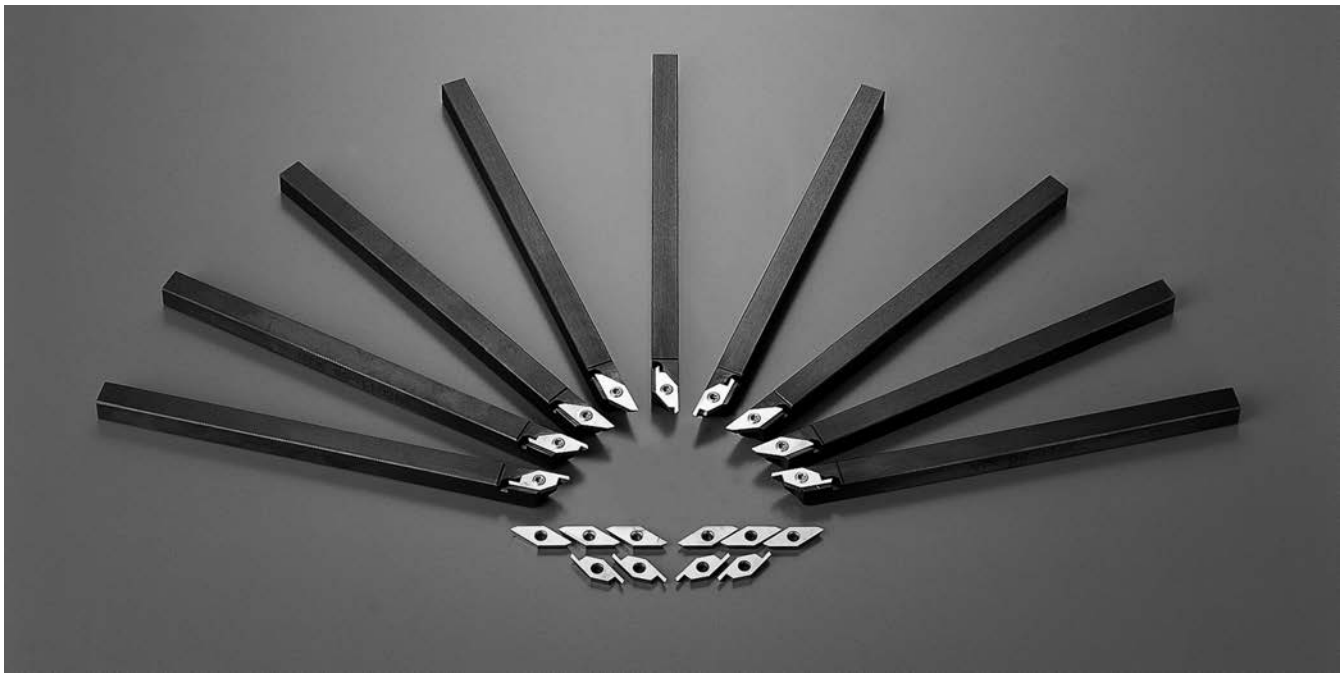
Example of machining Hexagon socket

SHAPER DUO has better tool life compared to the competitor which has an immediate worn and rounded cutting edge.
NTK's special grinding process and TM4 grade enable to:
① Keep good corner edge sharpness and long tool life ② Provide better tolerance and accuracy ③ Provide better surface quality

Work materials	303SS
Feed	78.7 IPM
Depth of cut (ap)	Roughing .001 inch
	Finishing .0002 inch
Coolant	WET



lineup → W3



Designed to machine extremely small diameter workpieces | Swiss CNC lathes & CAM style machines

CSV series

Designed for workpieces of ⌀.200" diameter or less

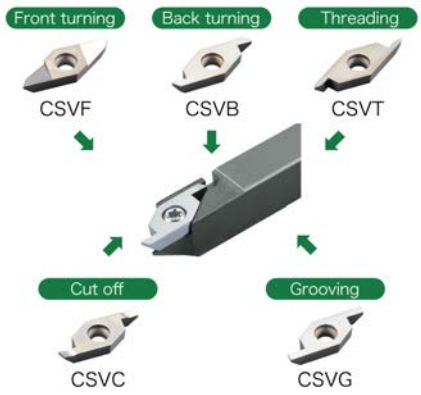
A highly polished insert achieves high quality machined parts

Reduction in cutting time compared to a standard carbide insert

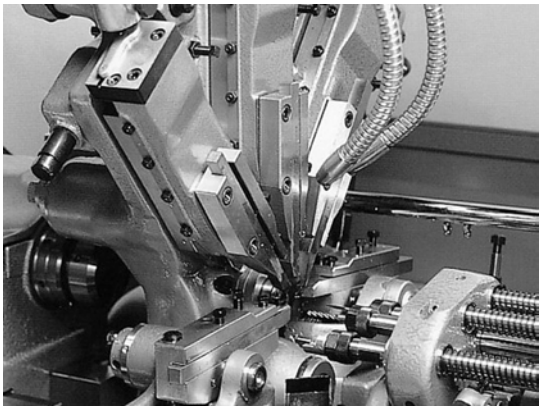
All CSV inserts styles can be installed in same holder

Insert cutting edge is designed specifically for machining very small diameter parts

High precision achieved with the mirror finish polished insert



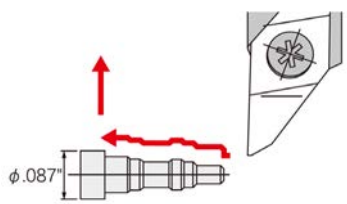
CSV holders are also available for cam-style cnc lathes

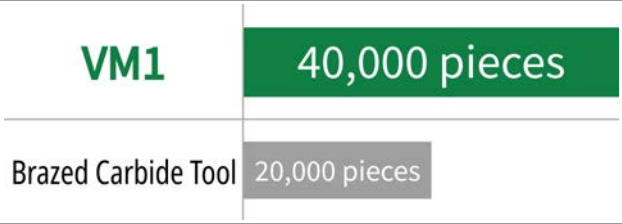


Case study Clock parts

The CSV insert achieves excellent part consistency and long tool life machining extremely small parts

Material	SK4
Cutting speed	50 SFM
Feed	.0002 IPR
DOC	.001 inch
Coolant	WET





lineup → Q10-13,R6-9,S6-8,T8-11,U12-15

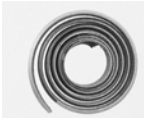
Cut-off operations for diameters up to ⌀1.339" | Swiss CNC Lathes

CUT DUO

Increased insert clamp rigidity to ensure stable machining
Molded chipbreaker and rigid holder system for stable performance
Coolant through holders available to further improve chip control

Cutting performance

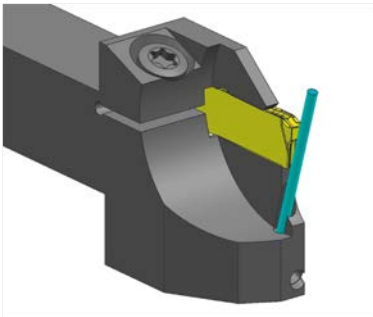
Unique molded chipbreaker that tightly curls chips
Sharpness is improved by polishing the insert edge
Reduced tool pressure improves part surface finish

Cutting performance	.002 IPR	.003 IPR	.005 IPR
SCM435			
SUS304			

[Chip comparison] 270 SFM

Coolant through series of holders (CTDP..OH/OH2/OH3)

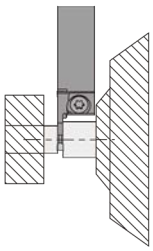
Evacuates chips to eliminate chip tangling.
Coolant is directed at the cutting edge which greatly improves insert tool life.

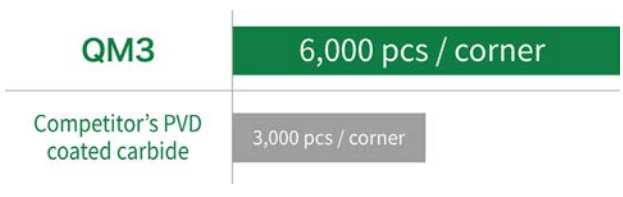


Case study Shaft

Cut Duo achieved 2x the tool life and generated high quality surface finishes compared to the competitor's PVD coated insert

Material	SCM435
Cutting speed	270 SFM
Feed	.002 IPR
DOC	-
Coolant	WET





lineup → S31 - 36

Cut-off operations for diameters up to ⌀1.653" | Swiss CNC lathe / Conventional CNC lathe

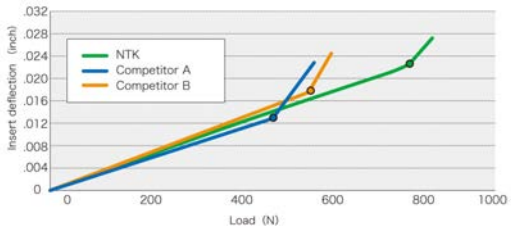
CUT MAX

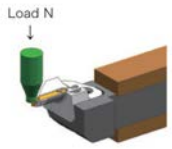
A highly rigid holder design combined with a molded insert chipbreaker ensures stability

Rigid system supports the process of large-diameter cut-off operations that are subject to high cutting loads
Chip control is achieved with the unique chipbreaker design

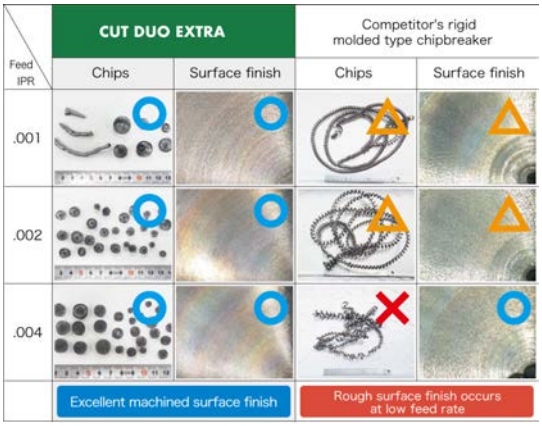
Tool rigidity comparison

Rigidity developed to accommodate high load cut-off applications to ensure reliability and productivity.
※The highest clamping strength of any holder currently on the market (according to our research)





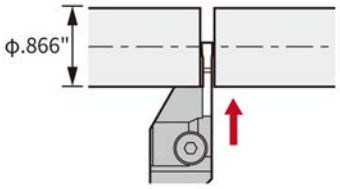
Chip formation comparison

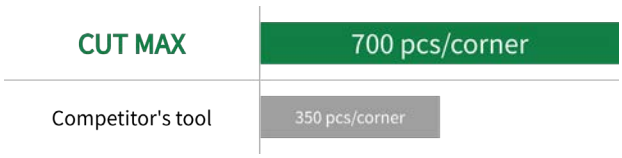


Case study Coolant control parts

CUT MAX with its 2 cutting edges significantly reduced cost compared to the competitor's 1 cutting edge insert.
CUT MAX achieved excellent chip control and 2 times the tool life.

Material	1045 tempered steel
Cutting speed	370 SFM
Feed	.0028 IPR
DOC	-
Coolant	WET





lineup → S37 - S38

For grooving | Swiss CNC lathes / Conventional CNC lathes

GROOVE DUO

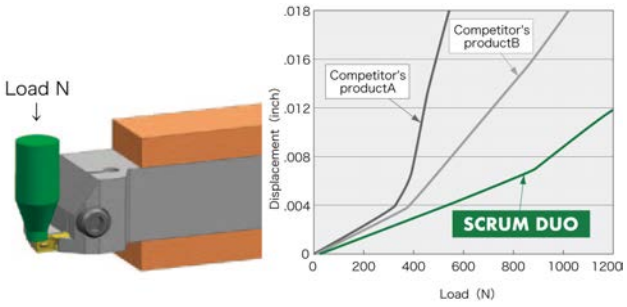
Exceptionally rigid design to ensure stable grooving

Prevents the insert from shifting during machining and achieves a good machined surface

Performance

- Applicable groove width: .118-.236 of an inch
- Highly rigid holder achieves a .138 inch depth of cut during side turning operation

Tool pressure comparison when grooving



Two chipbreaker styles - select the best fit for your grooving application

GW chipbreaker: A versatile design with edge sharpness and chip control. Multi-functional for grooving and side turning.
GV chipbreaker: Features superior sharpness with high rake face. Ideal for applications requiring low tool pressure.

GW chipbreaker

GV chipbreaker

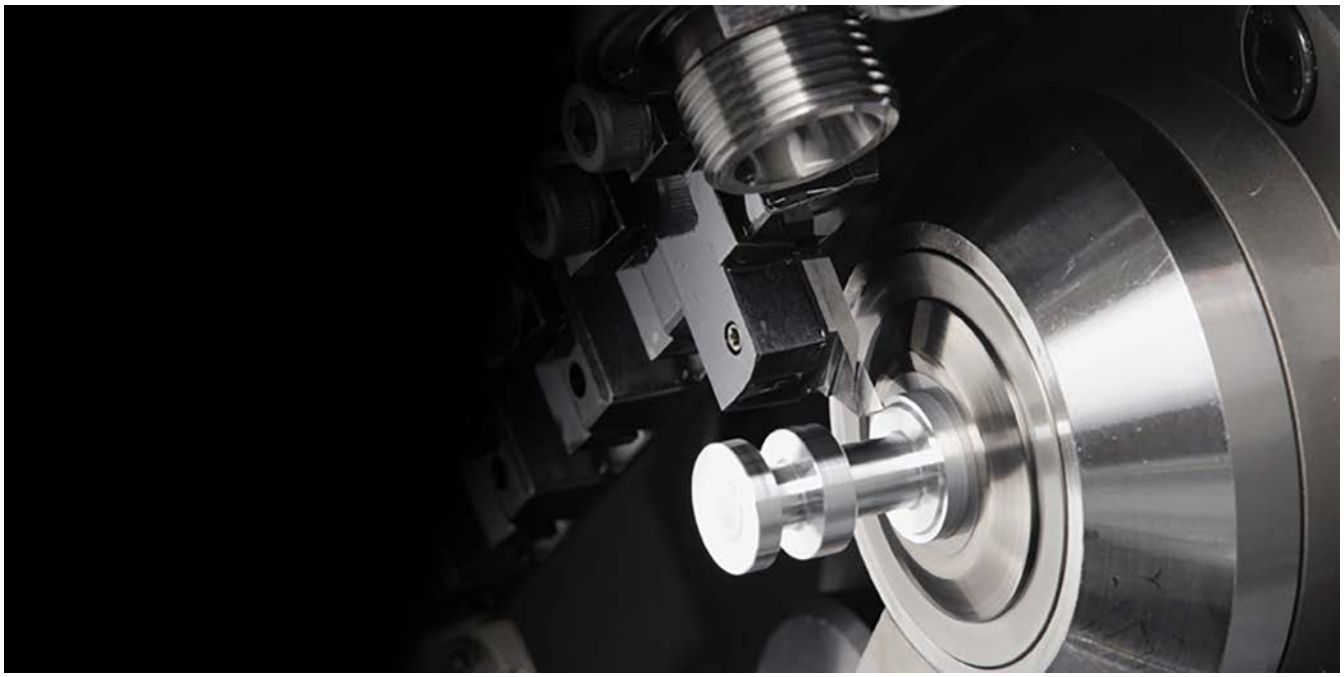
Grooving

[Cutting conditions] Material: SCM415 Groove width: .0197 inch 500 SFM .004 IPR .275 DOC; No step feed; with coolant.
[Tools] Insert: DM4 GWPG500N04F-GW Holder: GTWPR2525M-5F10

Side turning

[Cutting conditions] Material: SCM415 Groove width: .0197 inch 500 SFM .004 IPR .039 DOC; No step feed; with coolant.
[Tools] Insert: DM4 GWPG500N04F-GW Holder: GTWPR2525M-5F10

lineup → F12-14,T33-35



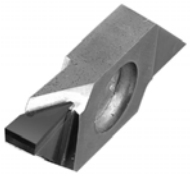
Multifunctioning tool for machining non-ferrous material | Swiss CNC Lathes

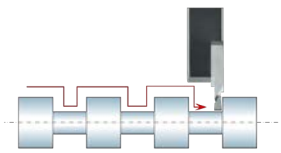
GTPA

High-precision and high efficiency machining
Grooving - side turning capability
Single pass machining to improve productivity

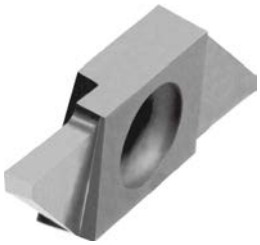
2 grades to choose from for machining needs

PD1 - PCD grade
Increased strength with fine grain polycrystalline diamond material
Adhesion resistance for non-ferrous materials
Prevents built-up edge for high precision and stable machining
Hard fine grain diamond to achieve high speed machining and long tool life





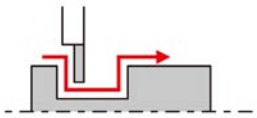
KM1 - carbide grade
Uncoated fine grain carbide grade designed for machining non-ferrous material
Up sharp edges and mirror finished inserts to achieve high-quality machined surfaces
Significantly lower insert cost compared to PCD inserts

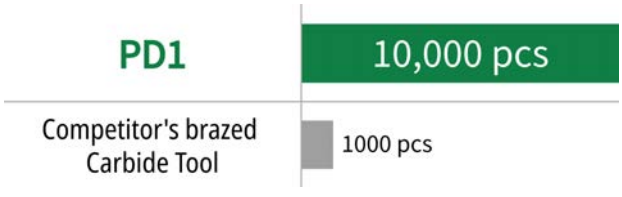


Case study Spool

Cut time shortened with one pass traversing.
PD1 insert generated super surface finish with efficiency. Tool life is extended with inserts adhesion resistance.

Material	A6063
Cutting speed	370 SFM
Feed	.002 IPR
DOC	-
Coolant	WET





lineup → T13 - 14

Face Grooving | Swiss CNC Lathes

SATURN DUO

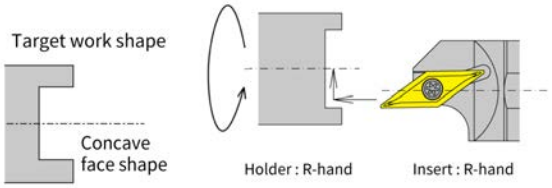
Single tool enables end face grooving and face machining

Reducing the number of tools and realizing process integration

FBV type for face machining

Minimum machining diameter ⌀.315"

Improves the efficiency of End face boring of up to .157" depth

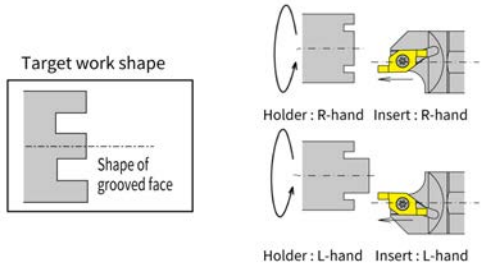


FGV type for face grooving

Minimum machining diameter ⌀.236" and grooving width .039"

High rigidity of inserts and holders enables machining in a wide range of cutting conditions

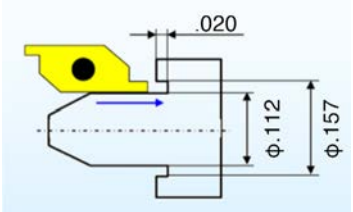
A lineup of left-handed tools is available for machining work with a boss feature

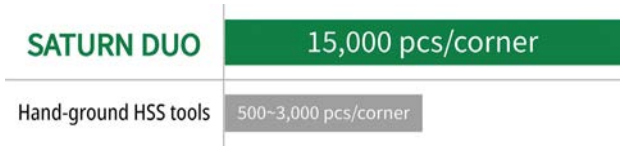


Case Study

Previously, hand-polished high-speed tools were used, but by using SATURN DUO [FGV type], there was no variation in processing, and the life could be extended by about five times.

Material	303SS
Cutting speed	89 SFM
Feed	.001 IPR
DOC	.020 inch
Coolant	WET



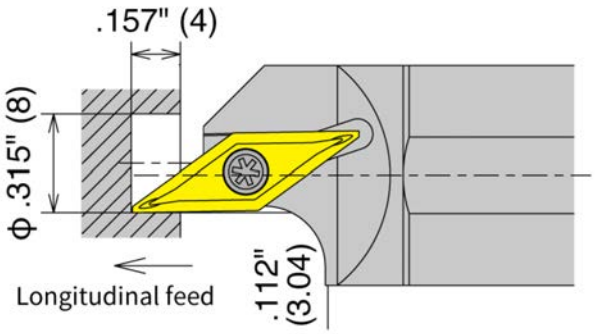


lineup → T42 - 44

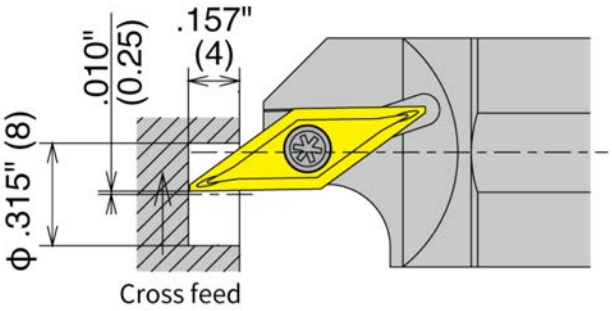
FBV type for face machining

Machining process

- For materials with good machinability, it is possible to machine up to .157" deep at a low feed rate in a single pass for both longitudinal feed and cross feed.



Cutting in Z direction : Longitudinal feed



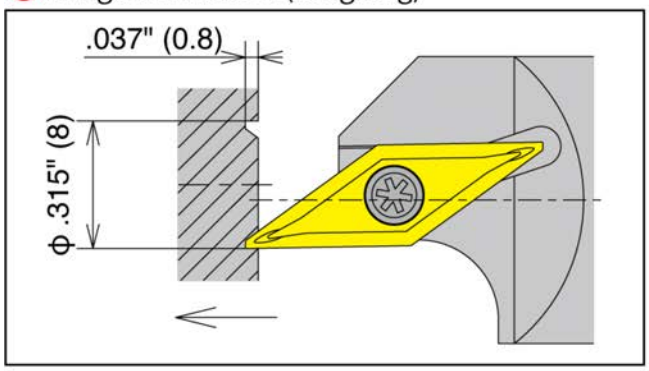
Cutting in X direction : Cross feed

Useful tips for machining

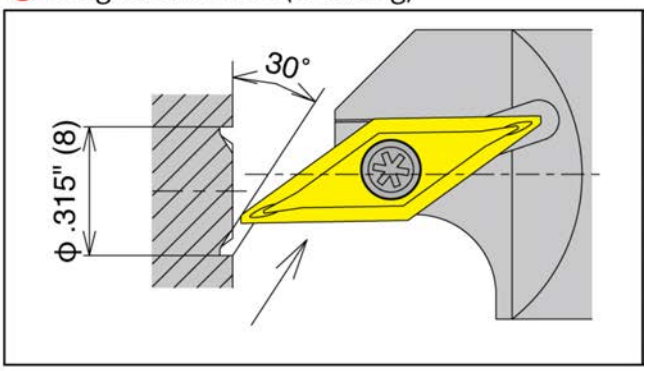
When burrs occur on ID surface, it is recommended to perform the cut in 2 passes, one for roughing and one for finishing as shown in the following procedure:

☆Example of 2-pass machining: Leave .008" on roughing then run a finish cut

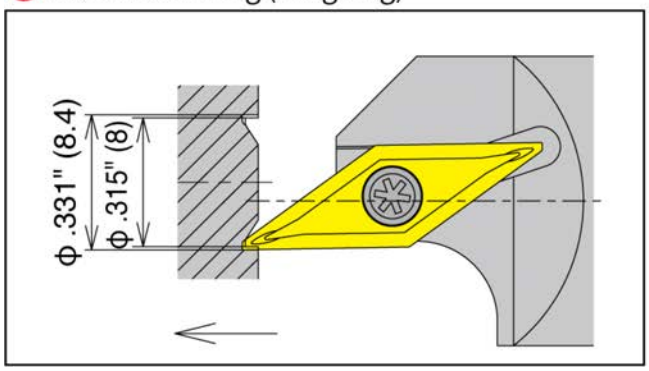
1 Longitudinal feed (roughing)



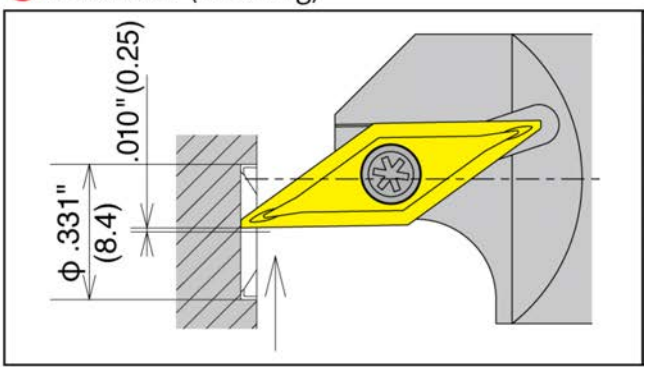
2 Longitudinal feed (finishing)



3 Slant machining (roughing)



4 Cross feed (finishing)



FGV type for face grooving

1. Run multiple passes if turning wider grooves.
   Make sure to groove from outer diameter to inner diameter to avoid any interference.
2. If lines appear on the boss section, slow down feed rate when retracting the tool.
3. If scratch appears at the end of the boss, slow down the feed rate.
4. If groove surface looks torn, either slow down feed rate or increase speed.
5. If groove bottom looks torn with a speed and feed condition, increase the speed.

☆Note

- Side turning cannot be performed with FGV style tooling.

Live tool station sleeve | Swiss CNC Lathes

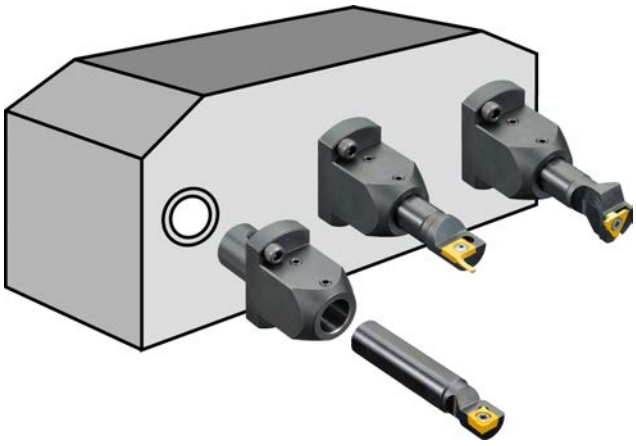
DS Sleeve

Prevents coolant and chips from damaging the rotating tool unit

I would like to use DS holder, but there is a gap in the mounting... this is the solution

Stop coolant and chips from damaging live tool stations

By using the DS Sleeve, you can use the DS Series holders without any worry about damaging live stations



Accepts DS Series holders to perform various back working

Front turning, Back turning, Grooving, Threading, and Small boring which fit into the machines vacant drill sleeves

DS Series toolholders can be used with both Swiss or non-Swiss type CNC lathes

Compatible machine

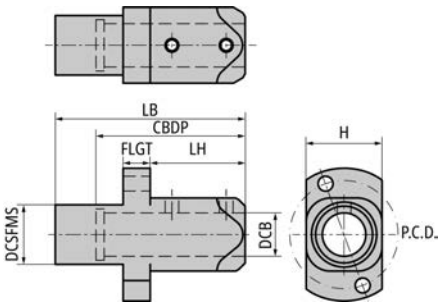
Accepts DS Series holders to perform various back working

Designed exclusively for .866" and 1.339" round shank stations

Compatible with .630" / .866" round shank DS Series holders

For Back 4-spindle unit

SS-DSU-SK

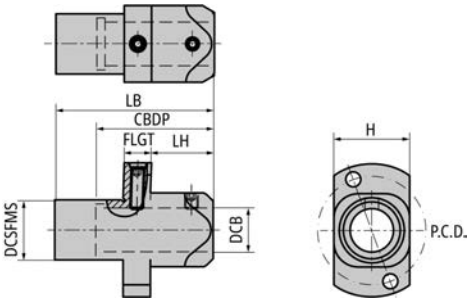


Item Number	CBDP	DCB	DCSFMS	FLGT	H	LB	LH	P.C.D.	Comment
	inch	inch	inch	inch	inch	inch	inch	inch	
SS-DSU-SK	2.165	.630	.866	.394	1.102	2.756	1.378	1.575	for DS holder

Spare Parts

Item Number	Screw (for Sleeve)	Screw (for Holder)	Wrench (for Sleeve)	Wrench (for Holder)
SS-DSU-SK	CS0520	SS0506	LW-4	LW-2.5

SS-DSU-L23



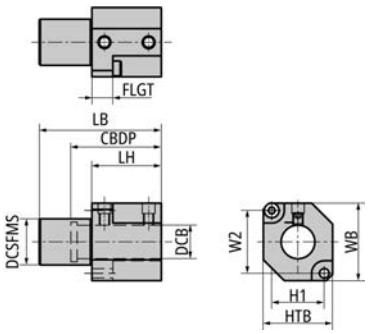
Item Number	CBDP	DCB	DCSFMS	FLGT	H	LB	LH	P.C.D.	Comment
	inch	inch	inch	inch	inch	inch	inch	inch	
SS-DSU-L23	1.693	.630	.866	.394	1.102	2.283	.906	1.575	for DS holder

Spare Parts

Item Number	Screw (for Sleeve)	Screw (for Holder)	Screw (for Holder)	Wrench (for Sleeve)	Wrench (for Holder)
SS-DSU-L23	CS0520	SS0506	SS0515	LW-4	LW-2.5

For Back 8-spindle unit

SS-DSU-B8L23

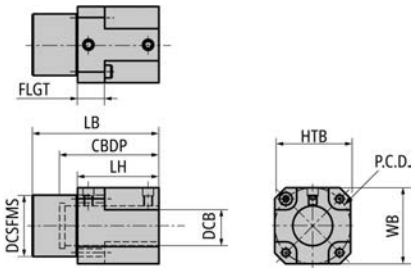


Item Number	CBDP	DCB	DCSFMS	FLGT	H1	HTB	LB	LH	WB	W2	Comment
	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	
SS-DSU-B8L23	1.693	.630	.866	.394	.984	1.299	2.283	1.299	1.457	1.181	for DS holder

Spare Parts

Item Number	Screw (for Sleeve)	Screw (for Holder)	Wrench (for Sleeve)	Wrench (for Holder)
SS-DSU-B8L23	CS0420	SS0506	LW-3	LW-2.5

SS-DSU-B8D34



Item Number	CBDP	DCB	DCSFMS	FLGT	HTB	LB	LH	WB	P.C.D.	Comment
	inch	inch	inch	inch	inch	inch	inch	inch	inch	
SS-DSU-B8D34	2.165	.866	1.339	.591	1.654	2.756	1.772	1.654	1.654	for DS holder

Spare Parts

Item Number	Screw (for Sleeve)	Screw (for Holder)	Wrench (for Sleeve)	Wrench (for Holder)
SS-DSU-B8D34	CS0425	SS0506	LW-3	LW-2.5

For ID boring operations | Swiss CNC Lathes

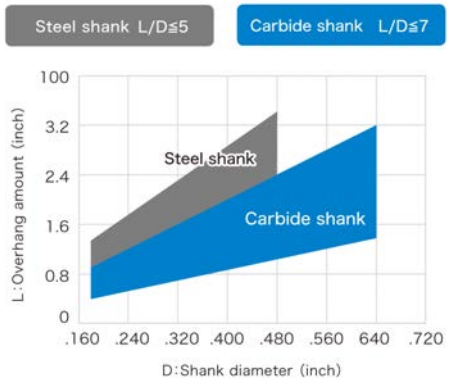
Mogul Bar

Highly rigid bars and inserts that direct chips away from the part

Unique boring bar design greatly improves rigidity combined with chipbreakers that control the direction of the chip evacuation during the boring operation

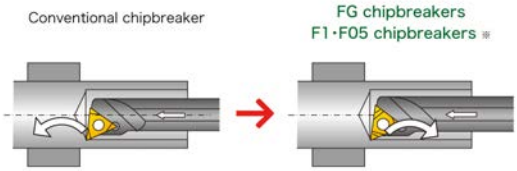
Features①

Toolholder overhang



Features②

F1, F05, FG chipbreakers developed for blind hole applications to direct chips backward and out of the hole to prevent chip packing
Coolant through boring bars to support chip evacuation

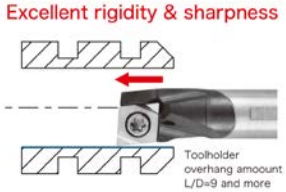


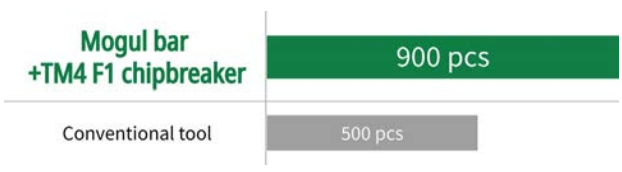
[Cutting conditions]
Material : Alloy steel,Stainless steel 260 SFM .002 - .004 IPR .004 - .020 DOC WET

Case study Sleeve

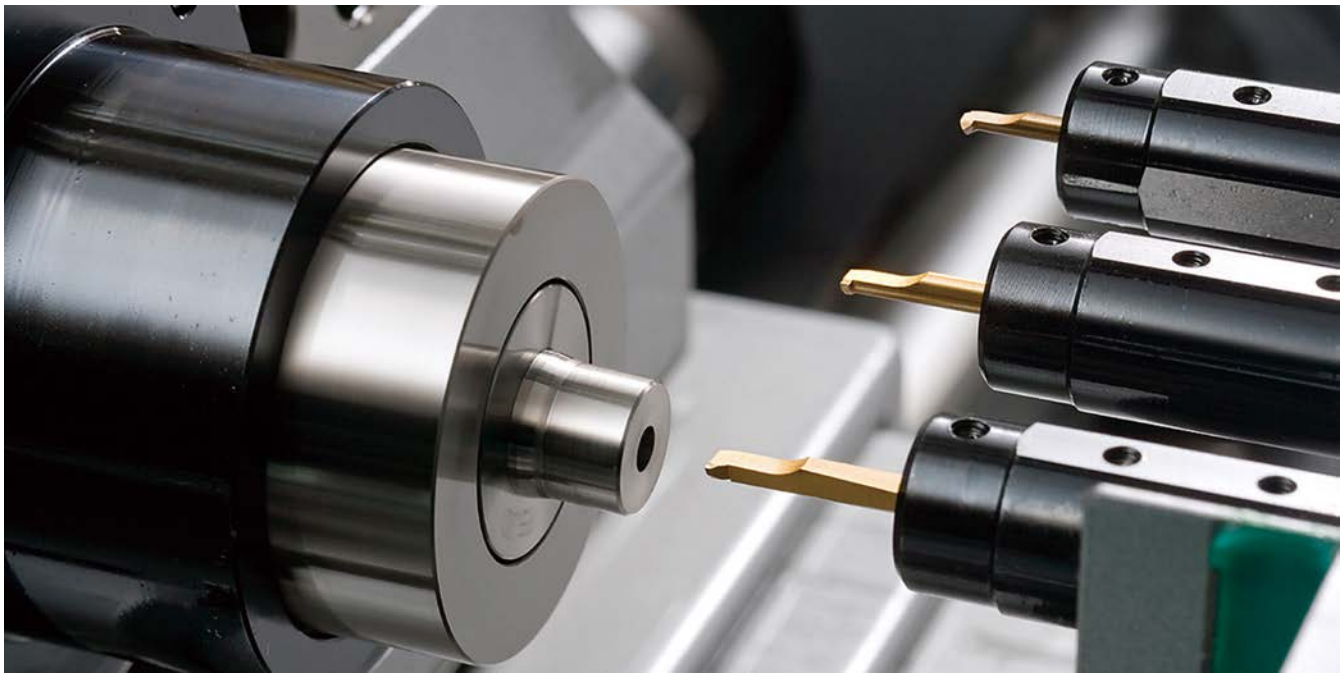
The competitor's boring bar experienced a heavy amount of vibration due to extended overhang.
NTK's boring bar eliminated vibration issues and insert with F1 chipbreaker achieved 1.8 x more tool life.

Material	SUM43
Cutting speed	250 SFM
Feed	.002 IPR
DOC	.0039 inch
Coolant	WET





lineup → V25-26,V28-30,V32,V35,V37,V39,V41,V43



For ID boring operations | Swiss CNC Lathes

STICK DUO

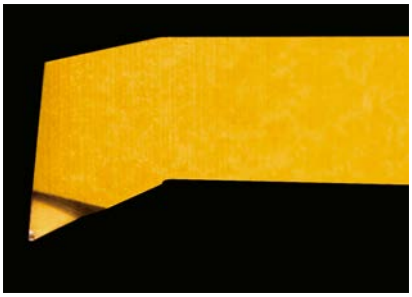
2-cornered solid bar type
Available from Min. bore diameter ø.087"

Three types of breakers are set according to the machining application.

S chipbreaker

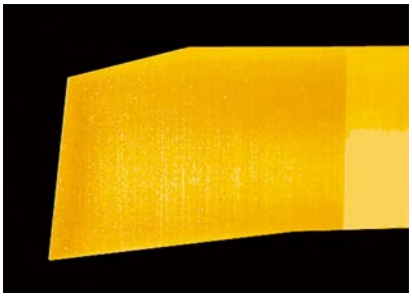
Sharp cutting edge
For Through hole

F chipbreaker



Evacuates chips BACKWARD
For Blind hole

H Flat type



Mirror finish edge
(Regrindable)

For ID Grooving	For ID Face Grooving	For ID Back turning	For ID threading
Min. Bore Dia. ø.118" - Blade width .020"- .079"	Min. Bore Dia. ø.236" - Blade width .039" - .118"	Min. Bore Dia. ø.118 -	Min. Bore Dia. ø.098 - Pitch 51 - 15 TPI

lineup → V16 - 24

For ID boring operations | Swiss CNC Lathes

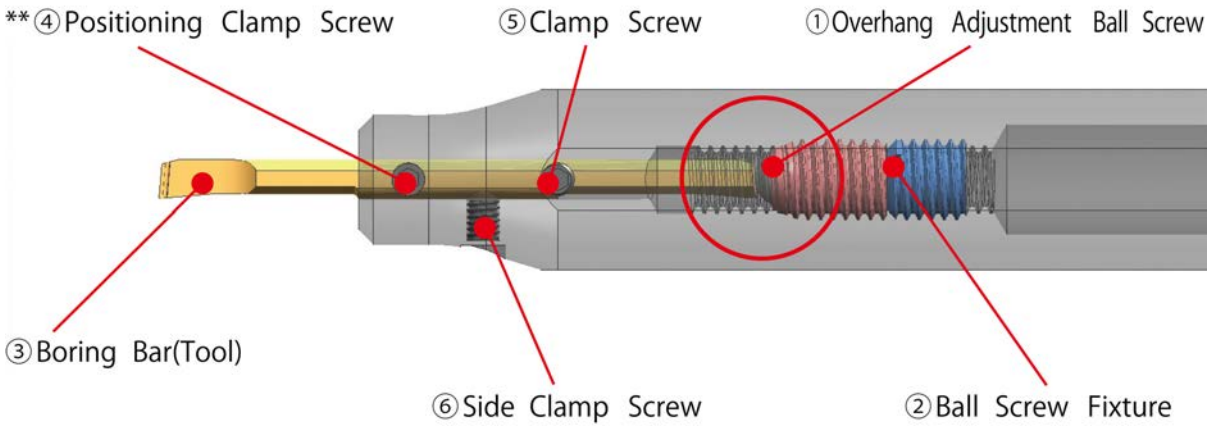
STICK DUO HYPER

Sleeves for ID Boring with Adjustable Overhang Mechanism

Adjustable overhang length

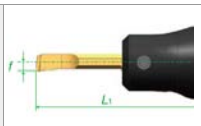
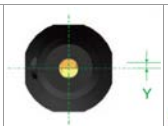
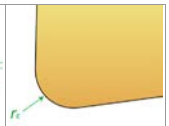
Offers high precision while maintaining compatibility with STICK DUO series

Can index boring bars like inserts



Features①

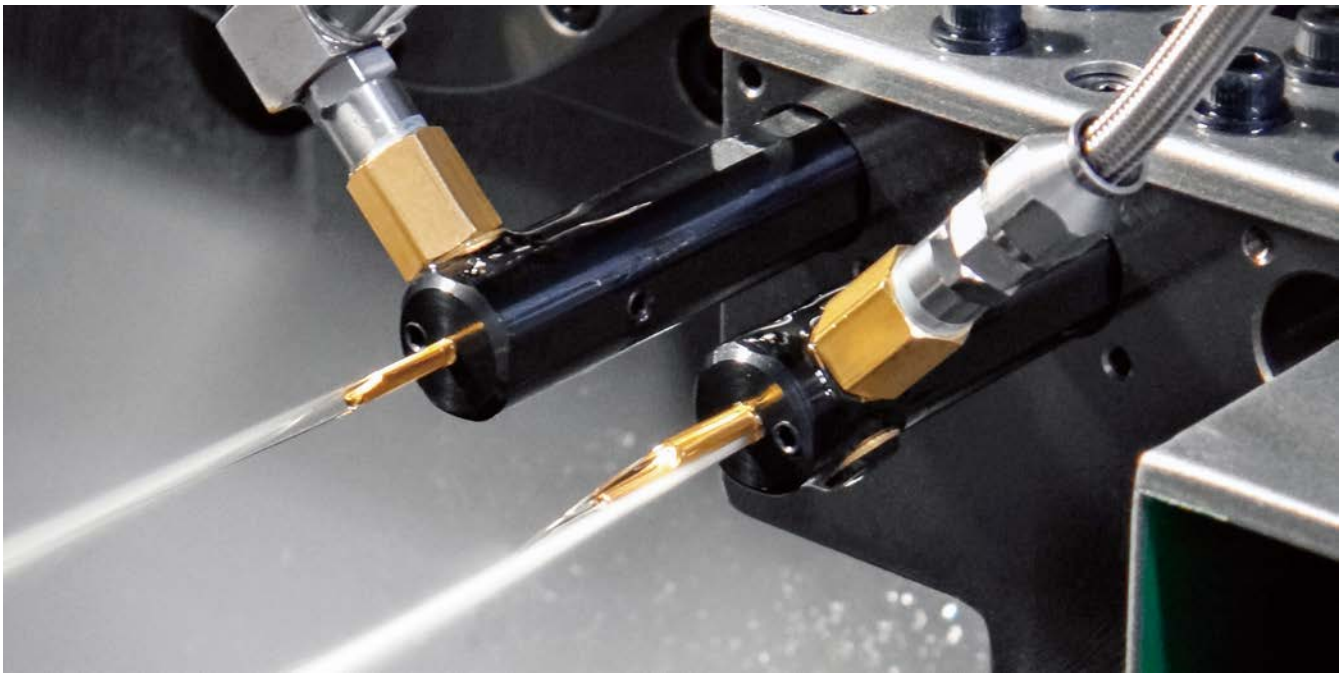
High Precision Insert

				
	Tool Length L_1	Offset f	Centerline Y	Corner
STICK DUO	±.004"	±.001"	±.004"/.000"	.001"
STICK DUO Hyper	±.0008"	±.0006"	.002"/.000"	.002"

Features②

- Min. Bore Dia. ø.087" -
- Three types of breakers are set according to the machining application.

lineup → V13 - 15



For ID boring operations | Swiss CNC Lathes

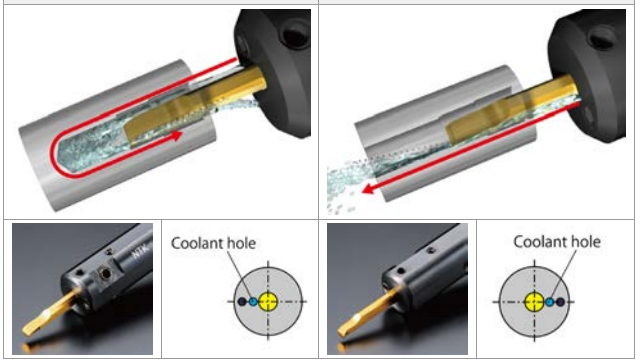
STICK DUO SPLASH

Coolant through sleeves for ID Boring with Adjustable Overhang Mechanism

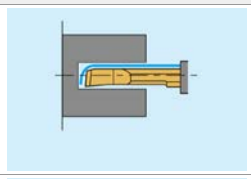
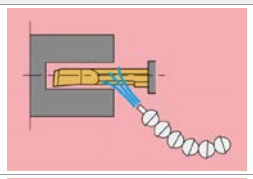
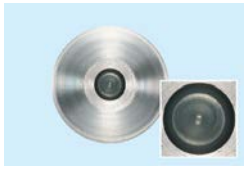
For high-precision machining, a combination of HYPER function and a coolant through holder
Offers high precision while maintaining compatibility with STICK DUO series

Choose from 2 coolant directions

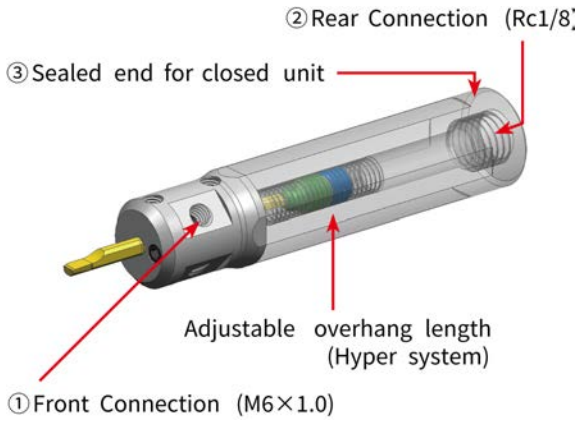
Just rotated 180 degrees

For Blind hole	For Through hole
	

No chip problems

STICK DUO SPLASH	External coolant
	
	
No chips inside hole	Chips packed

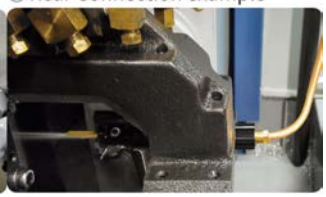
3 coolant connection options



Coolant horse connection

①Front Connection example

②Rear Connection example



lineup → V10-12,V15

MEMO

Tool Materials / Selection Guide

NTK's Recommendation for Swiss Tooling P02
Tooling P04
ANSI / ISO Insert Nomenclature P06
Carbide P08
Recommended cutting conditions P20
Chipbreaker Introduction P27
Multi-purpose Holders P32

NTK's Recommendation for Swiss Tooling

Front turning

General Purpose

DM4-YL

Up to .020 DOC

DM4-AMX

Splash Series

Y-axis with Coolant Through

- DM4 has excellent heat resistance. It is the best grade to machine for Titanium Alloys, Cobalt Chrome, and HRSA materials.
- YL chipbreaker is designed for both sharpness and chip control. It can hold dimensions very well and evacuate chips smooth.
- AMX chipbreaker is optimized for very small DOC operations. It can perform very well in thin chip control situations.
- Use with a coolant through tool holder to help with chip evacuation. Y-axis coolant through toolholder is the best solution for chip control problems.

Cut-off

Up to .472"

DM4-CTP-CX

Up to .630"

DM4-CTPA-CX

Splash series

- CTP/CTPA style cut-off tool is a best-seller in the Swiss market. They have excellent rigidity and sharpness. Now NTK added the CX chipbreaker to them. 3D shaped CX chipbreaker can control chips extremely well.
- Use with coolant through toolholder for better chip evacuation.
- CTP style is designed for up to .472" material and CTPA is for up to .630".

Up to 1.00"

CUT DUO

Splash series

- NTK recently added another coolant through cut-off toolholder for larger diameter materials.
- CTDP-OH toolholder can cut up to 1" materials and can control chips very well.

Back turning

General Purpose

DM4-TBP / TBPA-BM

Splash Series

Y-axis with Coolant through

- NTK's TBP/TBPA back turning tools are solid and can provide stable machining even with heavy DOC operations.
- Now, NTK added a 3D chipbreaker named BM to this series. BM chipbreaker can manage chip direction. Just one pass is needed to get excellent face/OD finish.
- Use with coolant through tool holder to help with chip evacuation and the Y-axis coolant through toolholder is the best solution for chip problems.

Grooving

General Purpose

DM4-GX

Splash Series

Y-axis with Coolant through

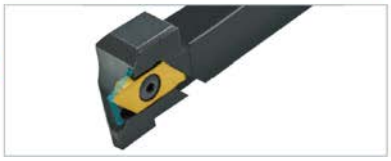
- NTK is expanding its triangle style grooving tools. Now NTK accommodates wide grooving widths from .012" to .125".
- GX chipbreaker can control chips very well, not only for grooving but also side-turning operations.
- Use with coolant through tool holder to help with chip evacuation and the Y-axis coolant through toolholder is the best solution for chip problems.

Threading

General Purpose

QM3-TTP

TTP



- NTK's side-clamping TTP inserts are rigid and produces high quality good threads. Various lineups are available for each specific threading operations.
- QM3 has good wear resistance and toughness and can cut most materials.

ID turning

General Purpose

STICK DUO Hyper

STICK DUO SPLASH

- Stick Duo Splash are coolant through sleeves for ID operations. NTK has a variety of ID tooling inserts, bars for ID boring, ID back turning, ID grooving and ID threading to use with Stick Duo Splash.
- The sleeves are equipped with an adjustable overhang mechanism that allow you to index bars easily without length adjustment.

Mogul Bar

- Mogul Bar is a series name for boring tools with indexable inserts. The series starts from .197" minimum bore diameter and ID and use with F-style chipbreaker which makes chip evacuate backward.
- They include a coolant through system that ensures better chip evacuation.

End milling

General Purpose

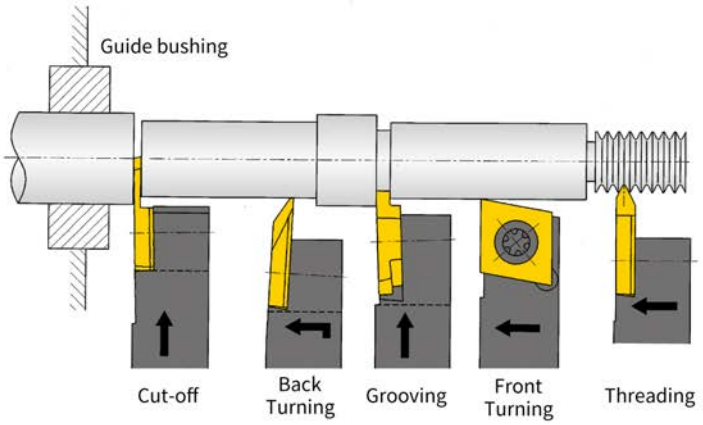
DM4-BL

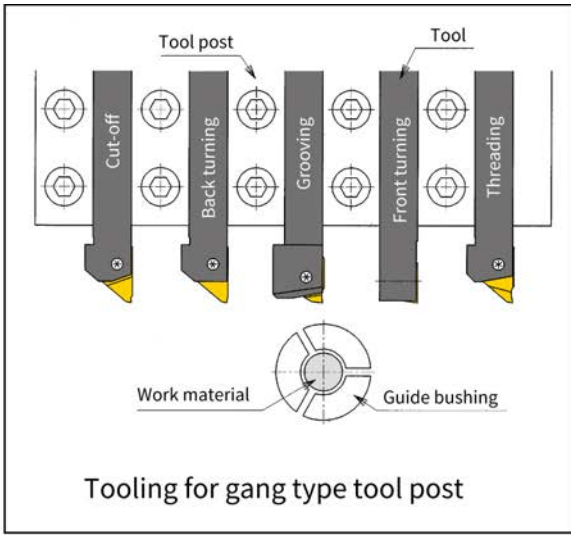
Indexable Endmill

- NTK has a variety of indexable type endmill tools for Swiss machines. The big head endmills can cut in close proximity to the Guide-bushing and provide excellent rigidity. Due to the big diameter, you can also run faster than small diameter endmills.

Tooling example for a small CNC automatic lathe

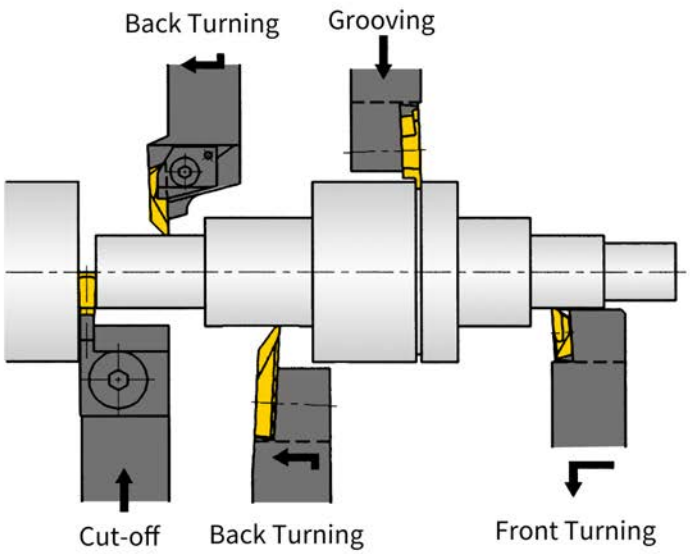
Gang type

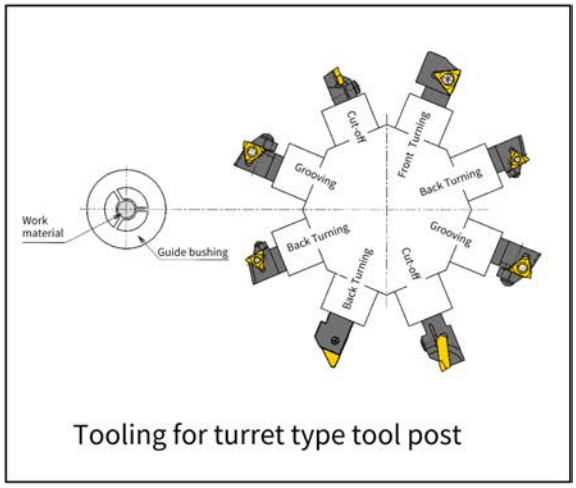




Tooling for gang type tool post

Turret type

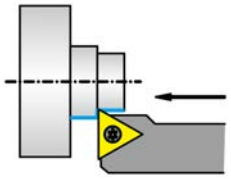




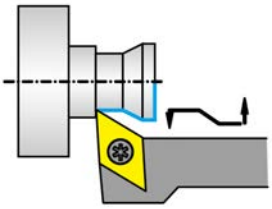
Tooling for turret type tool post

Horizontal gang type

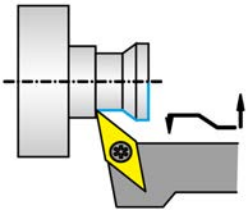
Front Turning



holder : CH-STUCL (screw-on type)
insert : TC..73

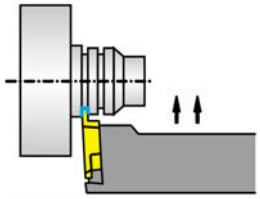


holder : CH-SDUCL (screw-on type)
insert : DC..32.5/DC..32.5..-WP

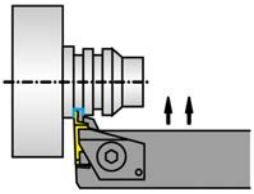


holder : CH-SVUCL(screw-on type)
insert : VC..22/VC..22..-WP
holder : CH-SVUPL(screw-on type)
insert : VP..0802

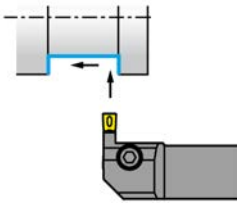
Grooving



holder : CH-GTTL(screw-on type)
insert : GTMH32/GTMX32

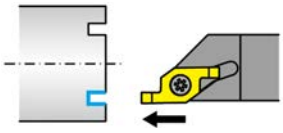


holder : NGTAL..32--..S(clamp-on type)
insert : GTMH32/GTMX32
holder : NGTAL..43-00S5(clamp-on type)
insert : GTMA43/GTMT43



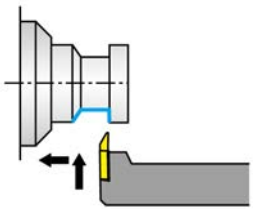
holder : GKWPL (clamp-on type)
insert : GWPG/GWPM

Face grooving

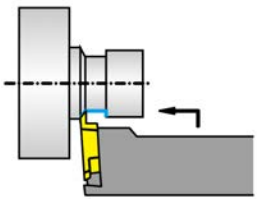


holder : CH-FGVR/L(screw-on type)
insert : FGV/FBV

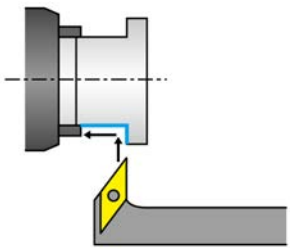
Back turning



holder : CH-TBPAL(screw-on type)
insert : TBPA..FR

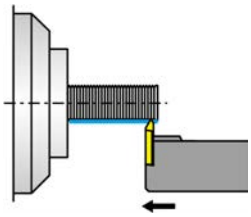


holder : CH-GTTL(screw-on type)
insert : TBMH32



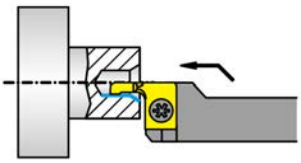
holder : CH-SVXCL(screw-on type)
insert : VC..22

Threading



holder : CH-TTPL(screw-on type)
insert : TTP..FR

ID Tooling

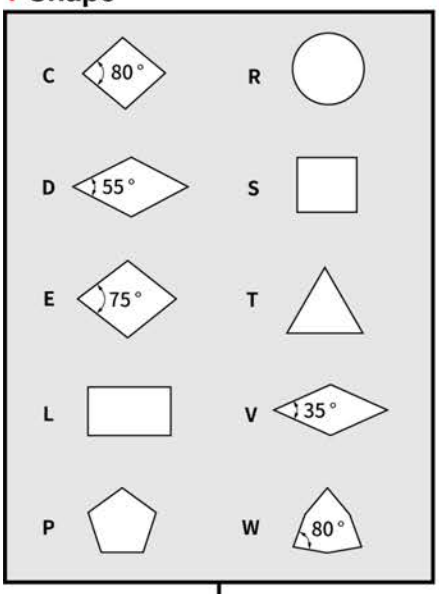


holder : CH-LBML(screw-on type)
insert : LBM

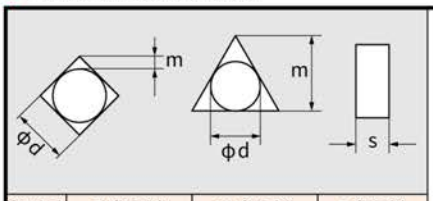
ANSI / ISO Insert Nomenclature

Carbide

1 Shape



3 Tolerance Class



Symbol	d (inch)	m (inch)	s (inch)
A	±.0010	±.0002	±.0010
F	±.0050	±.0002	±.0010
C	±.0010	±.0005	±.0010
H	±.0050	±.0005	±.0010
E	±.0010	±.0010	±.0010
G	±.0010	±.0010	±.0050
J	±.0020	±.0020	±.0050
K	±.002 ~ ±.005	±.0005	±.0010
L	±.002 ~ ±.005	±.0010	±.0010
M	±.002 ~ ±.005	±.003 ~ ±.007	±.0050
N	±.002 ~ ±.005	±.003 ~ ±.007	±.0010
U	±.003 ~ ±.010	±.005 ~ ±.015	±.0050

C S T

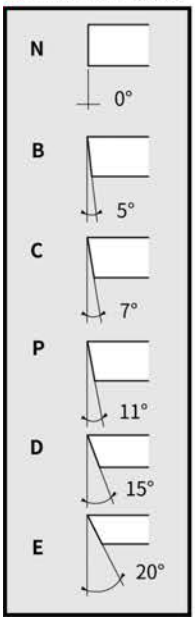
Inscribed Circle	M tolerance d (inch)	M tolerance m (inch)
1/4	±.002	±.003
3/8	±.002	±.003
1/2	±.003	±.005
5/8	±.004	±.006
3/4	±.004	±.006
1	±.005	±.007

D K

Inscribed Circle	M tolerance d (inch)	M tolerance m (inch)
1/4	±.002	±.004
3/8	±.002	±.004
1/2	±.003	±.006
5/8	±.004	±.006
3/4	±.004	±.007

	1	2	3	4
Inch	C	C	G	T
Metric	C	C	G	T

2 Clearances



4 Type

Type	Symbol	Type	Symbol
	N (E)	70°–90°	H
	F		
	R	70°–90°	B
	A		
	G	40°–60°	T
	M	40°–60°	W
Special design	X		

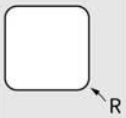
6 Thickness

Thickness S(inch)	Inch	Metric
3/32	1.5	02
1/8	2	03
5/32	2.5	T3
3/16	3	04
1/4	4	06
5/16	5	07
3/8	6	09
1/2	8	12

5 Cutting Edge Length

Inch		Metric						
Inscribed Circle		C	D	R	S	T	V	W
1/4	2	06	07	06	11	11	04	
3/8	3	09	11	09	16	16	06	
1/2	4	12	15	12	22	22	08	
5/8	5	16	19	15	27	27	10	
3/4	6	19	23	19	33	33	13	
1	8	25	31	25	44	44	17	

7 Nose Radius



Corner Radius	Inch	Metric
.001	01	00
.003	04M	01M
.004	04	01
.007	08M	02M
.008	08	02
.015	1M	04M
.016 (1/64)	1	04
.031 (1/32)	2	08

3	2.5	08M	F	N	AM3
5	6	7	8	9	10
09	T3	02M	F	N	AM3

8 Edge Sharpness

F	Up-sharp edge (without any edge preparation)
(Blank)	Non up-sharp edge

9 Hand of Chipbreaker

N	Neutral*
R	Right-hand
L	Left-hand

* Omitted when edge is not "up-sharp"

10 Type of Chipbreaker

See page P20 to P23 for chipbreaker information

11 Wiper insert

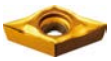
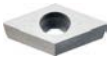
"-WP" after chipbreaker

Micro-grain Carbide and PVD/CVD-coated Carbide

Excellence in precision machining and machining of hard-to-cut materials

These material grades use WC micro-grain carbide, the hard base material is a micro size 1um granulated substrate. Furthermore, the substrate is coated using a PVD method with TiN, TiCN, and/ or TiAlN. The process results in a tougher and harder carbide with ultra sharp cutting edges. The variety of grades are suitable for machining difficult-to cut materials and demanding high precision small part applications. This selection of micro-grain carbide grades exhibit excellent wear resistance and thermal crack resistance.

Features

Work material	Grade		Coating		Application	Physical properties*					
						Density g/cm³	Hardness HRA	Bending strength Mpa	Young's modulus GPa	Thermal expansion coefficient ×10⁻⁶/K	Thermal conductivity W/m.K
S Heat resistant alloy	650		thick PVD	HiPIMS	Best performance on small diameter Ni-based alloy workpieces. (Approx. dia. 0.787")	14.4	91.0	3000	580	5.8	63
M Stainless steel	ST4		thick PVD	CrAlN	Best grade for 304 SS	14.4	91.0	3000	580	5.8	63
	DT4		thin PVD	TiAlN	Excellent oxidation resistance for Swiss-type lathes	14.4	91.0	3000	580	5.8	63
	TM4		thin PVD	TiN-TiCN	Best combination of wear resistance, toughness and adhesion resistance for Swiss-type lathes	14.4	91.0	3000	580	5.8	63
	ZM3		thick PVD	TiN	Best adhesion resistance enables high accuracy machining	14.4	91.0	3000	580	5.8	63
	DM4		thick PVD	TiAlN	Best oxidation resistance for high temperature machining	14.4	91.0	3000	580	5.8	63
P Steel	QM3		thick PVD	TiCN	Best wear resistance enables stable machining	14.4	91.0	3000	580	5.8	63
	VM1		thin PVD	TiCN	Best edge sharpness and good wear resistance	14.8	92.0	2500	640	5.7	84
	CP7		thick CVD	Al_2O_3-TiCN	Roughing to semi-finishing of steel	13.8	90.1	2200	580	-	-
K Cast iron	CP1		thick CVD	Al_2O_3-TiCN	For cast iron and ductile cast iron	14.9	92.0	2400	640	-	-
N Non-ferrous material	KM1		uncoated	-	Best for non-ferrous materials; features a polished mirror finish surface	14.8	92.0	2500	640	5.7	84
M P N	AC3		thin PVD	TiAlN-TiAlCrN	Developed for solid carbide endmills	14.2	91.0	3000	560	6.1	49

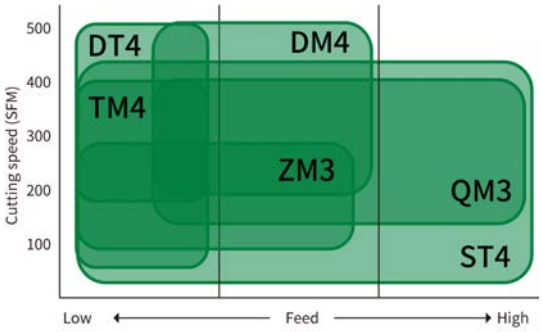
※The values of the base material are indicated.

Coating specifications

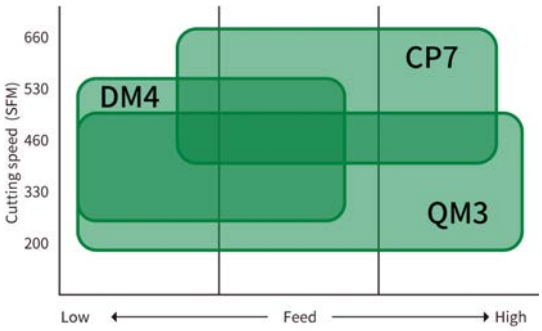
	650	ST4	QM3	DM4	DT4	TM4	VM1	ZM3
Thickness	Thick	Thick	Thick	Thick	Thin	Thin	Thin	Thick
Wear resistance		○	◎	○	○	○	○	
Heat resistance	◎	○		◎	◎			○
Adhesion Resistance		◎				○		◎
Edge Sharpness					○	○	◎	
Composition	HiPIMS	CrAlN	TiCN	TiAlN	TiAlN	TiN-TiCN	TiCN	TiN

◎1st choice ○2nd choice

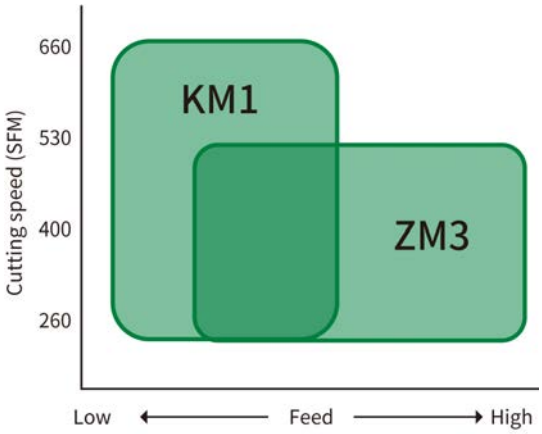
Stainless steel



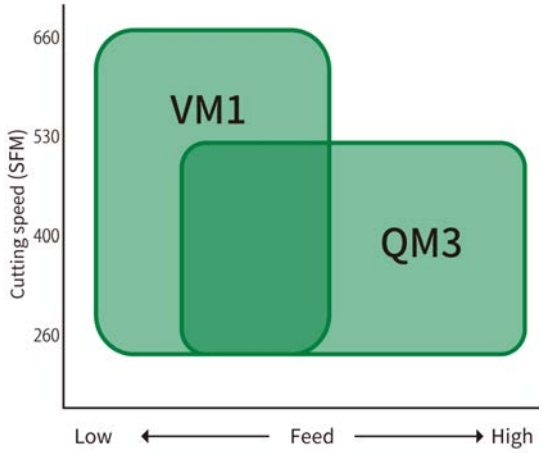
Carbon and alloy steel



Aluminum and brass



Free-cutting steel



Ideal for stainless steel machining | PVD coated carbide

ST4

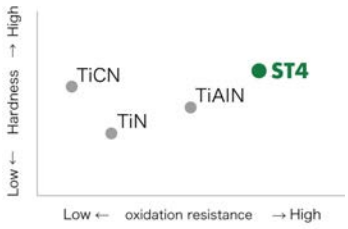
Stable and consistent performance machining tough materials like 304 SS

Solution for stainless steel machining issues like reduced tool life, inconsistency of part dimensions, and poor chip control.

Performance

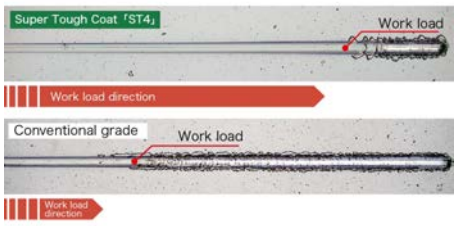
Unique coating with a high aluminum composition dramatically improves hardness and oxidation resistance.
Extended tool life is achieved by suppressing wear due to increased cutting temperatures.

Coating wear and oxidation chart



Coating layer adhesion strength

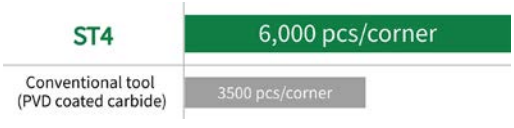
Significantly improved insert surface smoothness and coating adhesion.
Prevents adhesion to the cutting edge, which tends to occur in stainless steel machining, leading to stabilization of dimensional accuracy and machined surfaces.



Case study

ST4 has approximately 1.7 times longer tool life than competitor's tools.

Work material	SUS316L
Cutting speed	200 SFM
Feed	End face .0004 IPR External .0012 IPR
Depth of cut	.012 - .079 inch
Coolant	WET



General-purpose machining with excellent adhesion resistance | PVD coated carbide

ZM3

Excellent adhesion resistance and dimensional stability, ideal for high-precision machining of small-diameter workpieces

Achieves stable machining with its resistance to built up edge

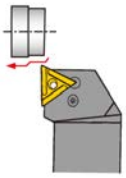
Performance

- Stable machining dimensions due to high adhesion of the coating
- Smooth TiN coating provides outstanding adhesion resistance

Case study

ZM3 offers outstanding adhesion resistance and dimensional stability with a tool life that is 40 times longer than that of competitor's tools.

Work material	S10C
Cutting speed	330 SFM
Feed	.005 IPR
Depth of cut	.012 ~ .016 inch
Coolant	WET



General purpose machining with excellent wear resistance | PVD coated carbide

TM4

Versatile grade for all types of work materials

Easy-to-use grade with excellent sharpness and adhesion resistance

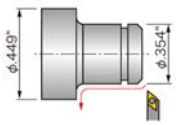
Performance

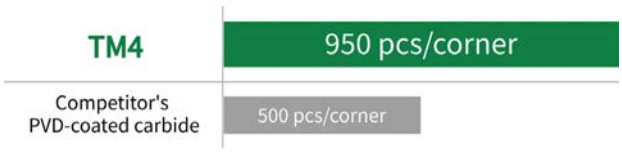
- Excellent workpiece dimensional stability and tool life due to multilayer coating
- A smooth hard coating with excellent adhesion resistance

Case study automotive parts

TM4 achieved 1.9 times longer tool life than the competitor's product. Its superior wear resistance ensured long stable machining.

Work material	304SS
Cutting speed	270 SFM
Feed	.0008 IPR
Depth of cut	~.047 inch
Coolant	WET





Machining difficult-to-cut materials | PVD-coated carbide

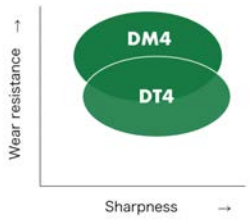
DT4 / DM4

Ideal for machining difficult-to-cut materials such as titanium and heat-resistant alloys

Stable machining even under conditions where cutting heat tends to concentrate on the cutting edge

Performance

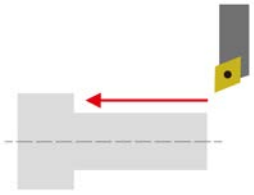
- Thick TiAlN coating reduces cutting tool damage due to heat generated during machining.
- DT4 has a thin coating layer. A sharp cutting edge ideal for machining small diameter parts.
- DM4 has a thick coating layer. A combination of heat resistance and wear resistance makes it ideal for high load machining such as parting and grooving.

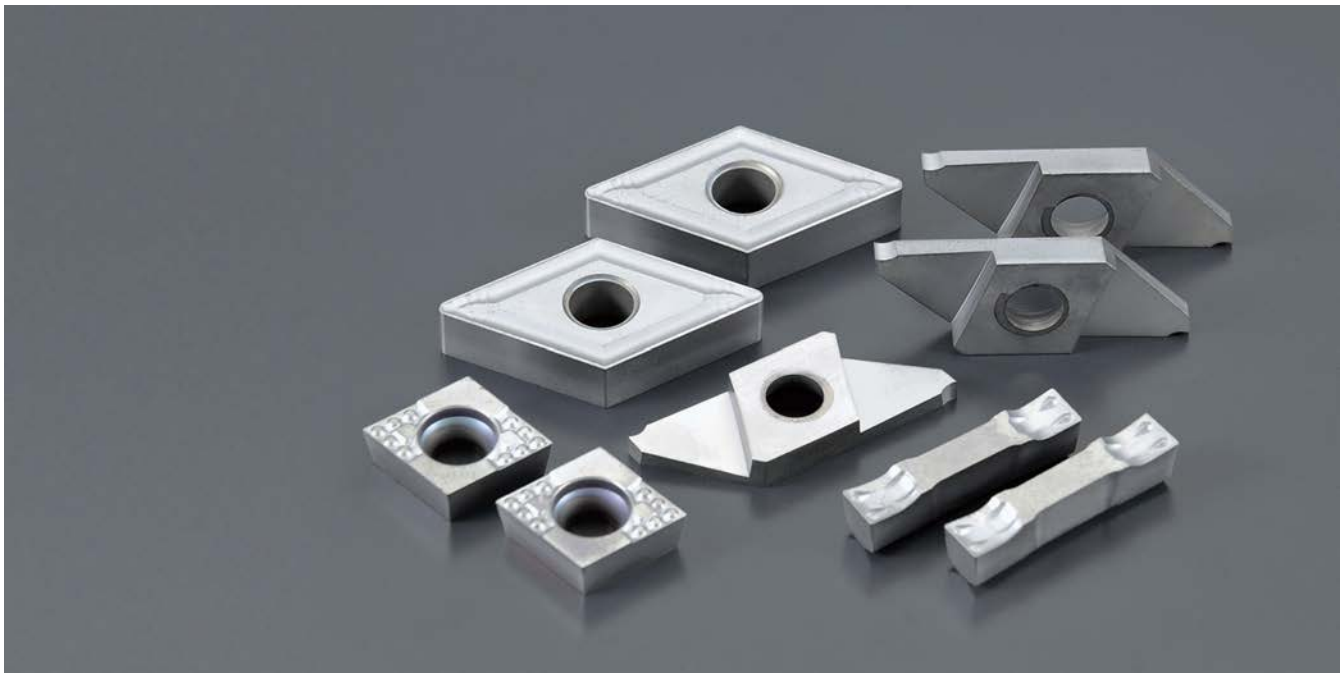


Case study medical screw

DM4 achieved approximately 1.6 times longer tool life than the competitor's product.

Work material	Titanium alloy
Cutting speed	200 SFM
Feed	.0008 IPR
Depth of cut	.002 inch
Coolant	WET





Carbon and alloy steel machining | PVD coated carbide

QM3

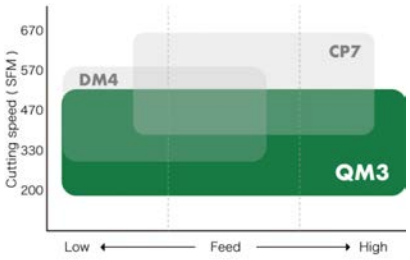
Longer tool life and stable machining of carbon and alloy steels such as S45C and SCM materials

Excellent wear resistance ensures stable machining and extended tool life

Performance

- Combination of tough carbide material and TiCN coating provides excellent chipping resistance.
- Excellent wear resistance, especially in the low speed range.
- Stable machining even in heavy interruptions.

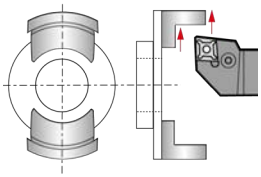
Application area

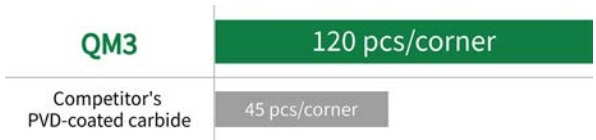


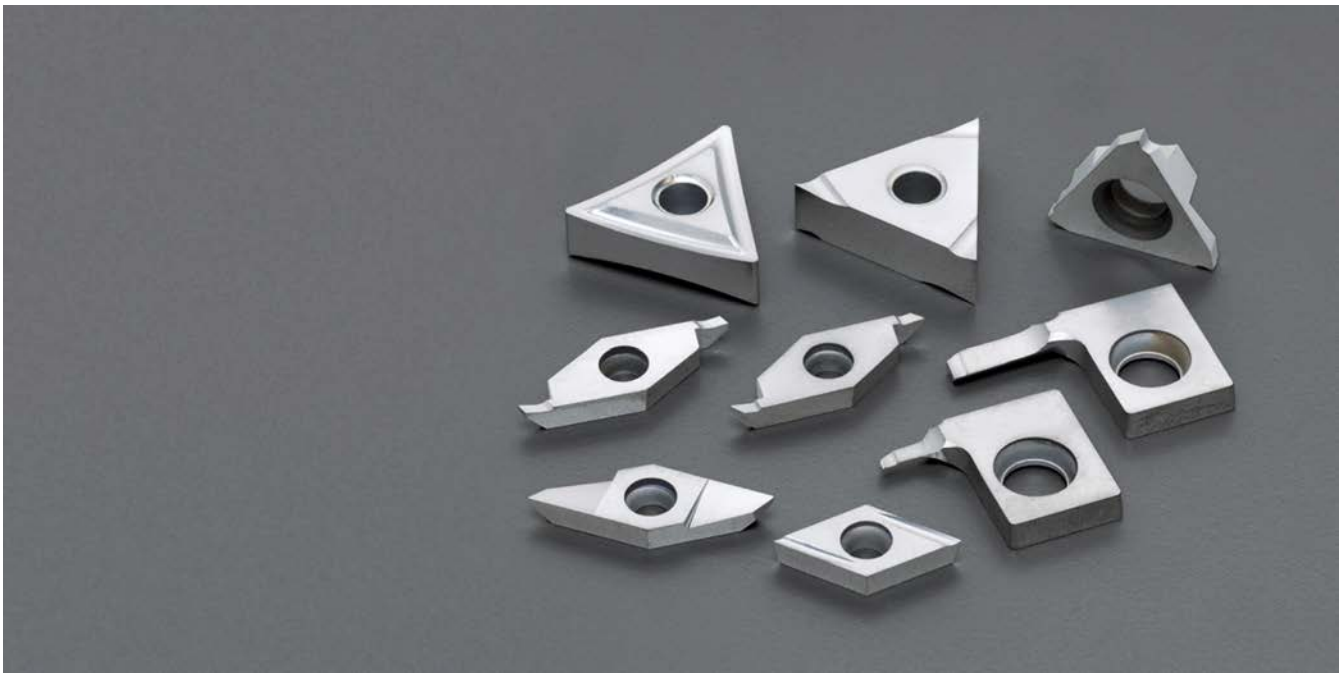
Case study

The combination of QM3 and Z5 chipbreaker extends the tool life by more than 2.5 times, while the competitor's tool experienced unstable tool life.

Work material	S50C
Cutting speed	520 SFM
Feed	.013 IPR
Depth of cut	.059 inch
Coolant	WET







Free-cutting steel machining | PVD-coated carbide

VM1

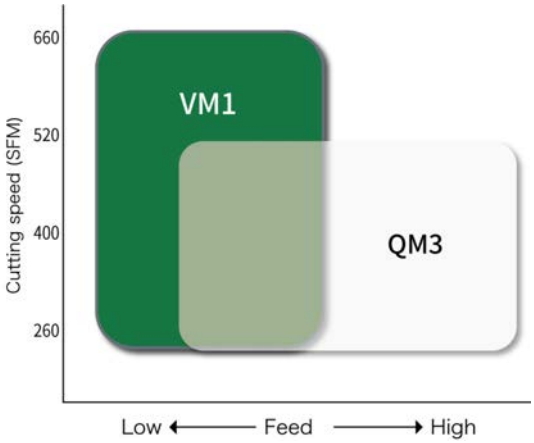
Ideal for machining free-cutting steel (SUM)

Long-tool life machining is achieved by reducing the built up edge on the cutting edge.

Performance

- Thin-layer TiCN coating provides both outstanding sharpness and wear resistance.
- Achieves long tool life and high-precision machining even at high speeds.

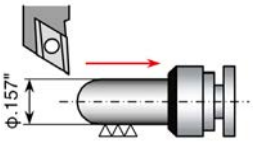
Application area

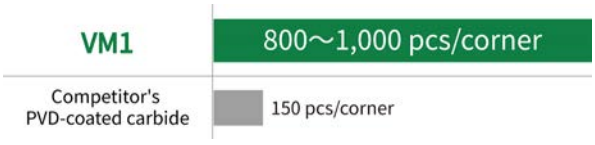


Case study

VM1 is stable in both dimensions and surface finish and has 5 times longer tool life than the competitor's product.

Work material	SUM24L
Cutting speed	460 SFM
Feed	.001 IPR
Depth of cut	.004 inch
Coolant	WET





High-speed machining of carbon and alloy steel | CVD coated carbide

CP7

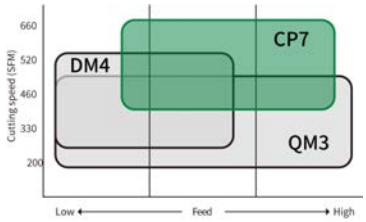
Ideal for high-speed machining of alloy steel and carbon steel

CVD multilayer coating for outstanding performance machining steel

Performance

The CVD multi-layer coating and high strength base material provides excellent wear resistance and toughness that can be used in a wide range of applications.

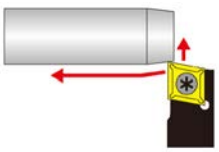
Application area

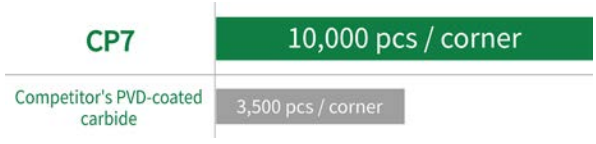


Case study

Achieves approximately 3 times the tool life of the competitor's coated carbide.
Wide range of applications are possible.

Work material	SUJ2
Cutting speed	300 SFM
Feed	.006 IPR
Depth of cut	.020 inch
Coolant	WET





Grey cast iron and ductile cast iron with scale machining | CVD coated carbide

CP1

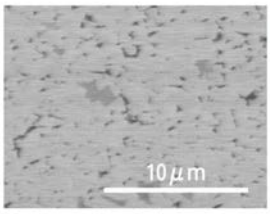
Achieves high efficiency and stable machining even under conditions where cutting speed cannot be increased

Outstanding wear resistance at 1000 SFM

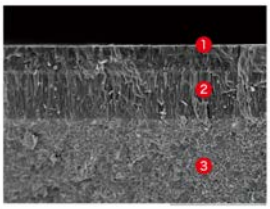
Performance

- Specializing in scale machining of grey and ductile cast iron.
- Excellent wear resistance and stable machining are achieved with a thick TiCN layer and an Al_2O_3 layer in the coating.
- Unique smooth rake face surface provides superior adhesion resistance.

Structure photo (COMP) × 5,000



Coating structure



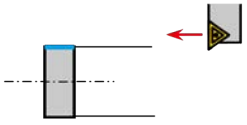
Equivalent to HRA 91.3
Young's modulus: 640GPa

① A very smooth layer of fine grain Al2O3
② Fine column shaped grain TiCN layer
③ Ultra - hard carbide base material

Case study

CP1 achieves higher machining efficiency than competitor's tools.

Work material	FCD450
Cutting speed	660 SFM
Feed	.005 IPR
Depth of cut	.039 inch
Coolant	WET



Non-ferrous metal machining, cost effective | Uncoated carbide

KM1

Ideal for machining non-ferrous metals such as aluminum, brass, and resin
Excellent machined surfaces are achieved by reducing the occurrence of built up edge
Outstanding sharpness solves the problem of a rough machined surface

Performance

- Uncoated fine-grained carbide with excellent sharpness.
- Mirror polished surface reduces built up edge.
- Stable machining dimensions and excellent surface finishes.

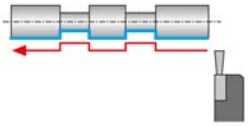
KM1 comparison chart

Up sharp edges and mirror finish

Case study

The competitor's product machined 3 roughing passes and a finishing pass. The chips often scratched the workpiece. The cycle time was more than 3 minutes.
KM1 machined in a single pass, reducing the cycle time to 1 minute and 50 seconds.

Work material	A5056
Cutting speed	300~570 SFM
Feed	.0015 IPR
Depth of cut	.020~.200 inch
Coolant	WET



End mill tools | PVD coated carbide

AC3

Developed for solid carbide end milling

Ideal for end milling of small-diameter workpieces that are prone to chattering, or applications that have problems with burrs forming

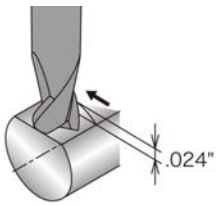
Performance

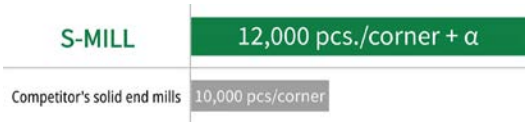
- TiAlN-TiAlCrN coated + fine grain carbide
- Grade with both excellent sharpness and wear resistance required for end milling on CNC type automatic lathes

Case study

The current tool created a poor machined surface when it reached the end of its tool life. The S-Mill achieved good surface finish and an extended tool life.

Work material	SUS416F
Cutting speed	3,200 rpm
Feed	5.5 IPM
Depth of cut	.024 inch
Coolant	WET



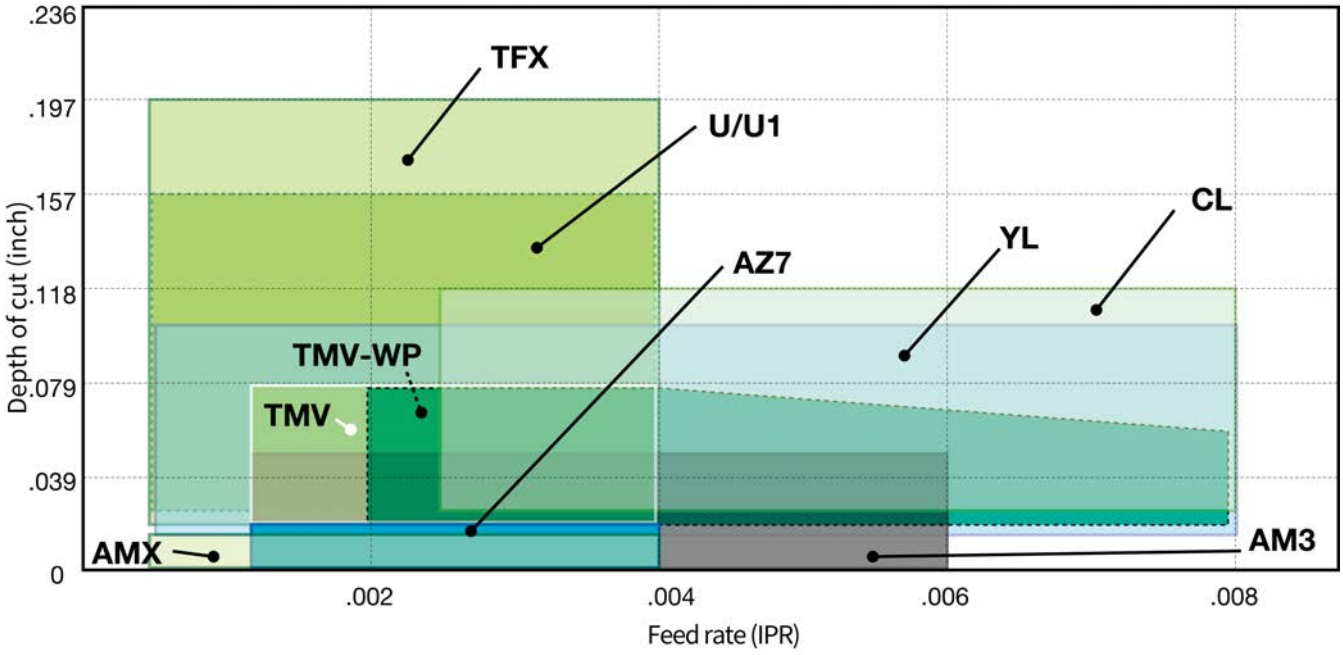


Recommended cutting conditions

Front turning

CSVF / CC.. / DC.. / VC.. / VB.. / TN.. / TF

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**650 / DM4**		**DT4 / DM4**	**650 / ST4**		**650 / QM3**	
	2nd choice	DT4 / QM3		TM4	DT4 / DM4		TM4 / DM4	
Cutting speed (SFM)		65 - 130 - 195	100 - 195 - 260	100 - 195 - 260	130 - 230 - 330	130 - 360 - 590	130 - 295 - 490	130 - 295 - 490
Feed rate (IPR)		Please refer to the chip control range below and set the feed rate according to the cutting amount.						



Back turning

CSVB / TBPS

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**VM1**						
	2nd choice	DT4					ZM3	
Cutting speed (SFM)		65 - 130 - 195	100 - 195 - 260		100 - 195 - 295			
Feed rate (IPR) X Direction		.0004 - .0008 - .0012						
Feed rate (IPR) Z Direction		.0004 - .0012 - .0016						

TBDP / TBMH / TBP / TBPA / TBVC

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**650 / DT4**			**ST4 / 650**		**650 / QM3**	
	2nd choice	TM4 / DM4			QM3 / TM4		TM4 / DM4	
Cutting speed (SFM)		65 - 130 - 195	100 - 200 - 260		100 - 195 - 295	130 - 295 - 490		
Feed rate (IPR) X Direction		.0004 - .0008 - .0012				.0004 - .0008 - .0016		
Feed rate (IPR) Z Direction		.0008 - .0016 - .0024				.0008 - .0016 - .0024		

TB32 / TB43

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**ZM3**						
Cutting speed (SFM)		50 - 100 - 150				130 - 295 - 430		
Feed rate (IPR) X Direction		.0004 - .0012 - .002						
Feed rate (IPR) Z Direction		.0016 - .002 - .003			.0016 - .003 - .006			

Cut-off

CSVC / CTPS

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**ZM3**					**VM1**	
	2nd choice	VM1					ZM3	
Cutting speed (SFM)		100 - 165 - 230				100 - 195 - 295		
Feed rate (IPR)		.0004 - .0008 - .0012				.0004 - .0012 - .002		

CTP / CTPA / CTPW

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**650 / DT4**		**DT4**	**650 / ST4**		**650 / QM3**	
	2nd choice	TM4 / DM4			QM3 / TM4		TM4 / DM4	
Cutting speed (SFM)		100 - 165 - 230				100 - 195 - 295		
Feed rate (IPR)		.0008 - .0012 - .002				.0008 - .0016 - .0024		

CTDP / CTWP / CTV

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**DM4**			**ST4 / DM4**		**QM3**	
	2nd choice	TM4 / QM3					TM4 / DM4	
Cutting speed (SFM)		100 - 165 - 230				100 - 2195 - 295		
Feed rate (IPR)		.0012 - .002 - .003				.0016 - .003 - .0047		

Grooving

CSV / GTPS

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**ZM3**					**VM1**	
	2nd choice	VM1					ZM3	
Cutting speed (SFM)		65 - 130 - 195	100 - 195 - 260		130 - 230 - 330	130 - 295 - 590	130 - 295 - 490	
Feed rate (IPR) a: X Direction b: Z Direction	Groove width .010 - .020	a: .0002 - .0012 b: .0001 - .0002						
	Groove width .020 - .039	a: .002 - .0024 b: .0002 - .0004					a: .0008 - .0028 b: .0002 - .0004	
	Groove width .039 - .079	a: .0012 - .0028 b: .0008 - .002					a: .0012 - .003 b: .0012 - .0024	

*MAX DOC when side turning (Under 0.4 width side turning impossible)

- MAX .0079" CSV/GTPS
- MAX .079" GTMH/GTMX/GTMT/GTMA
- MAX .0039" SBG/GTG

GTMH / GTMX / SBG / GTG

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**DM4 / DT4**			**ST4 / 650**	**ST4 / TM4**	**650 / QM3**	
	2nd choice	TM4 / QM3 / VM1					TM4 / VM1	
Cutting speed (SFM)		65 - 130 - 195	100 - 195 - 260		130 - 230 - 330	130 - 295 - 590	130 - 295 - 490	
Feed rate (IPR) a: X Direction b: Z Direction	Groove width .010 - .020	a: .0002 - .0012 b: .0001 - .0002						
	Groove width .020 - .039	a: .002 - .0024 b: .0002 - .0004					a: .0008 - .0028 b: .0002 - .0004	
	Groove width .039 - .079	a: .0012 - .0028 b: .0008 - .002					a: .0012 - .003 b: .0012 - .0024	
	Groove width .079 <	a: .0012 - .0079 b: .0012 - .0024						

*Max DOC when side turning
Groove width × 0.5 inch

GTPA

ISO Classification		N
Work Material		Aluminum alloys
Common Name		A5056 A6061
Grade	1st choice	**KM1**
Cutting speed (SFM)	PD1	330 - 660 - 990
	KM1	165 - 330 - 660
Feed rate (IPR)	a: X Direction b: Z Direction	a: .002 - .0079 b: .0039 - .0079

*Max DOC when side turning
Groove width × 0.8 inch

GWPG / GWPM

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**650**		**DM4**			**650**	
	2nd choice	DM4		650			DM4	
Cutting speed (SFM)		65 - 130 - 195	100 - 195 - 260		130 - 230 - 330	130 - 295 - 590	130 - 295 - 490	
Feed rate (IPR) a: X Direction b: Z Direction	Groove width .010 - .020	a: .002 - .006						
		b: .0012 - .006						
	Groove width .020 - .039	a: .0039 - .0079						
		b: .0012 - .006						
	Groove width .039 - .079	a: .006 - .0138						
		b: .0012 - .006						

*Max DOC when side turning Groove width × 0.5 inch

GTMT/GTMA

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**DM4**			**QM3**		**DM4**	
	2nd choice	**QM3**			**DM4**		**QM3**	
Cutting speed (SFM)		100 - 195 - 260			165 - 230 - 330	165 - 330 - 560	165 - 260 - 430	
Feed rate (IPR) a: X Direction b: Z Direction	Groove width .039 - .079	a: .0012 - .0028			a: .0004 - .0012	a: .0004 - .0012	a: .0008 - .003	
		b: .0008 - .002			b: .0004 - .0008	b: .0004 - .0008	b: .0008 - .002	
	Groove width .079 - .118	a: .0012 - .0079			a: .0004 - .0012	a: .0004 - .0016	a: .0012 - .0039	
		b: .0012 - .0024			b: .0004 - .0008	b: .0004 - .0008	b: .0012 - .0028	
	Groove width .118 - .217	a: .0012 - .0079			a: .0004 - .0012	a: .0004 - .002	a: .002 - .006	
		b: .0012 - .0024			b: .0004 - .0008	b: .0004 - .0008	b: .0016 - .0039	

*DOC when side turning .008"

FGV

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	TM4						
Cutting speed (SFM)		100 - 195 - 260			165 - 230 - 330	165 - 330 - 560	165 - 260 - 430	
Feed rate (IPR) a: X Direction b: Z Direction	Groove width .039	a: .0004 - .0012			a: .0004 - .0012	a: .0004 - .0012	a: .0004 - .0012	
		b: .0004 - .0008			b: .0004 - .0008	b: .0004 - .0008	b: .0004 - .0008	
	Groove width .059	a : 0.01 - 0.04			a: .0004 - .0012	a: .0004 - .0016	a: .0004 - .0016	
		b: .0004 - .0008			b: .0004 - .0008	b: .0004 - .0008	b: .0004 - .0008	
	Groove width .079	a : 0.01 - 0.04			a: .0004 - .0012	a: .0004 - .002	a: .0004 - .002	
		b: .0004 - .0008			b: .0004 - .0008	b: .0004 - .0008	b: .0004 - .0008	

*DOC when side turning .004"

Key points of processing: please reference page **O38**

FBV

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	TM4						
Cutting speed (SFM)		100 - 195 - 260			130 (100 - 195)	195 (100 - 260)	165 (100 - 230)	
Feed rate (IPR) a: Longitudinal feed : Z Direction b: Cross feed : X Direction (mm/rev)	Groove depth .039	a: .0006 / b: .002			a: .0006 / b: .0024	a: .0012 / b: .0024	a: .0006 / b: .0024	
	Groove depth .079	a: .0006 / b: .0012			※	a: .0006 / b: .0012	a: .0004 / b: .0016	
	Groove depth .118	a: .0006 / b: .0012			※	a: .0006 / b: .0012	※	
	Groove depth .157	a: .0006 / b: .0012			※	a: .0006 / b: .0012	※	

If burrs occur on the ID surface, it is recommended to perform cutting in two stages: rough machining and finishing machining.

Key points of processing: please reference page **O38**

SFG

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	TM4						
Cutting speed (SFM)		100 - 195 - 260			165 - 230 - 330	165 - 330 - 560	165 - 260 - 430	
Feed rate (IPR) a: X Direction b: Z Direction	Shank diameter ϕ.236	a: .0004 - .002			a: .0004 - .002	a: .0004 - .0024	a: .0004 - .0024	
		b: .0004 - .0008			b: .0004 - .0008	b: .0004 - .0008	b: .0004 - .0008	
	Shank diameter ϕ.315	a: .0004 - .0028			a: .0004 - .0028	a: .0004 - .003	a: .0004 - .0028	
		b: .0004 - .0008			b: .0004 - .0008	b: .0004 - .0008	b: .0004 - .0008	

*DOC when side turning .004"

Threading

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**650**		**ZM3**	**650 / ST4**		**650 / QM3**	
	2nd choice	ZM3		QM3	QM3 / ZM3		VM1	
Cutting speed (SFM)		65 - 130 - 195	100 - 165 - 260		130 - 230 - 330	130 - 295 - 590	130 - 295 - 490	

*Please set the feed rate to 80 IPM or lower to prevent making incomplete threads
(Unless your machine is equipped with high speed threading program)

Calculation ①Calculating the revolution speed $n = \frac{Vc \times 1000}{\pi \times \text{Screw nominal diameter}}$

②Calculating the feeding speed F = n (Revolution speed) × P (Pitch)

ID turning

Min bore diameter ≦ φ.236 (LBM / STICK DUO)

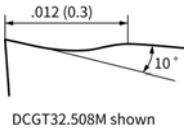
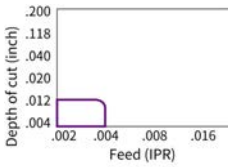
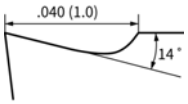
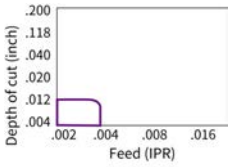
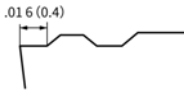
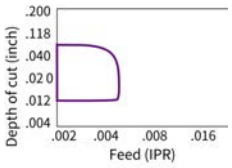
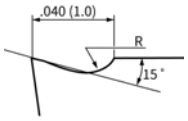
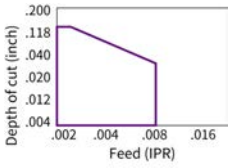
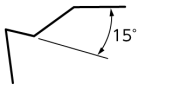
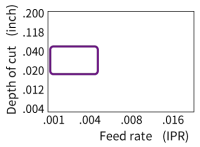
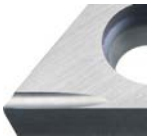
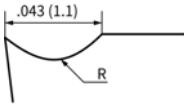
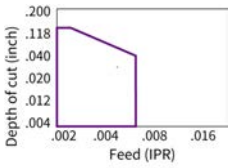
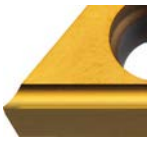
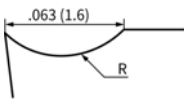
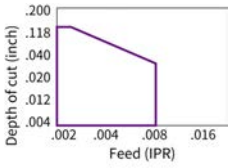
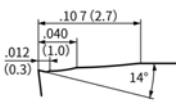
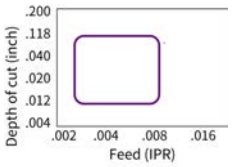
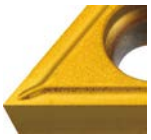
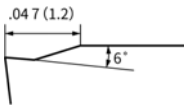
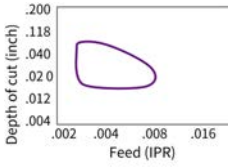
ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**DT4**					**VM1 / TM4**	
	2nd choice	VM1 / ZM3					ZM3	
Cutting speed (SFM)		65 - 165 - 230				100 - 195 - 295		
Feed rate (IPR)		.0004 - .0012 - .002						
Depth of cut (inch)		.002 - .003 - .0039						

Min bore diameter > φ.236

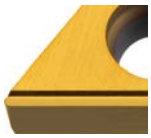
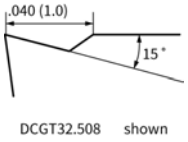
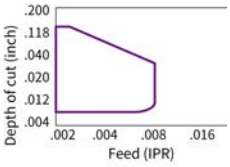
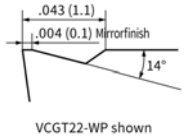
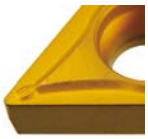
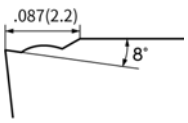
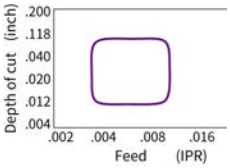
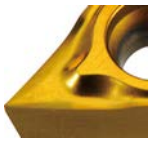
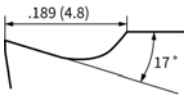
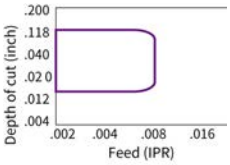
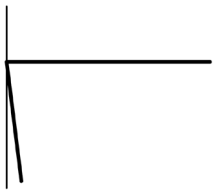
ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**650 / DT4**		**DT4**	**650 / ST4**		**650 / QM3**	
	2nd choice	DM4 / TM4					TM4	
Cutting speed (SFM)		130 - 230 - 330				130 - 295 - 590	130 - 295 - 490	
Feed rate (IPR)		.0008 - .0024 - .0047						
Depth of cut (inch)		.002 - .006 - .012						

Chipbreaker for turning

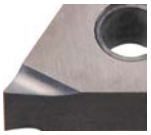
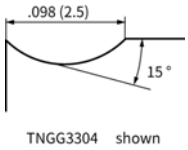
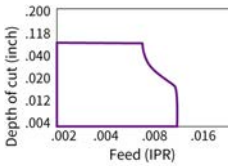
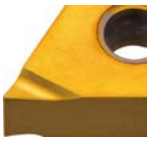
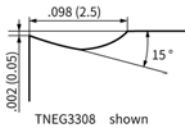
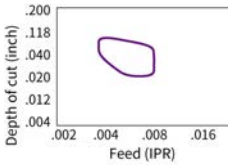
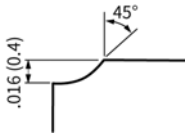
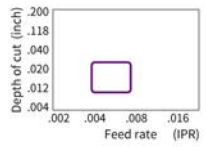
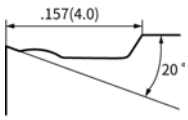
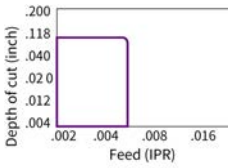
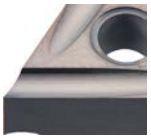
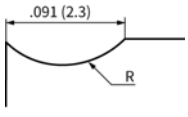
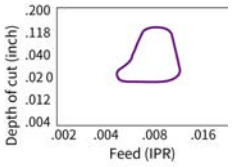
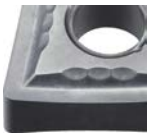
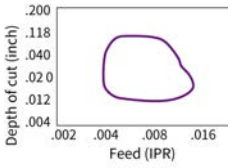
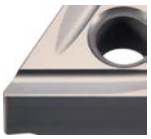
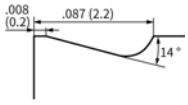
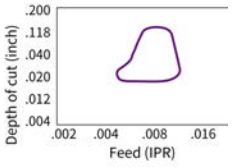
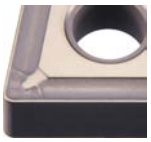
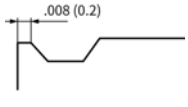
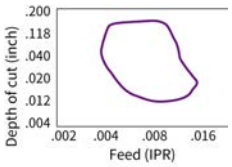
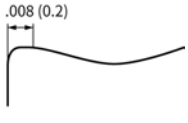
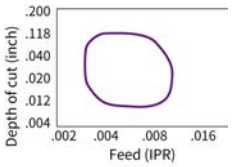
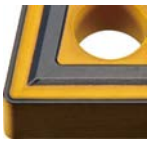
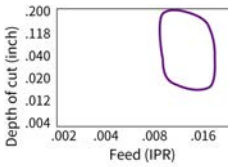
Positive inserts - Chipbreaker Overview

Application	Type	Chipbreaker design		Features	Applicable range
Finishing	**AMX**		 DCGT32.508M shown	• Designed for very light depth of cut	
	KHG		 DCET32.508 shown	• Excellent chip control on finishing cuts • For super high-precision machining • Precision tolerance in corner radius: ±.0004"	
	AZ7		 DCGT32.508M shown	• Excellent chip control at light feed and light depth of cut	
	AT		 DCGT32.508 shown	• Excellent adhesion resistance with dimensional stability • Best for small diameter parts and for machining low carbon steels	
Light cut	**TMV**			• Chipbreaker for Vibration Cutting • Reliably long tool life and stable chip evacuation during vibration cutting	
	UHG		 DCET32.504M shown	• Excellent chip control on finishing cuts • Precision tolerance in corner radius: ±.0004"	
	U **U1**		 DCGT32.508 shown	• Sharp cutting edge prevents materials from work hardening [chipbreaker width] U →.043" U1→.063"	
	YL		 DCGT11T302MYL	• Great combination of sharpness and toughness • Excellent chip control	
	AM3		 DCGT32.508 shown	• All purpose chipbreaker • Sharp edge with toughness	

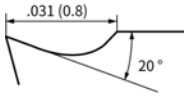
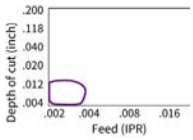
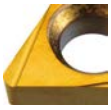
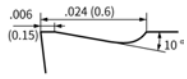
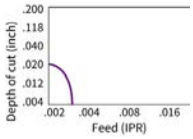
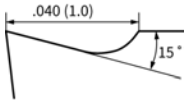
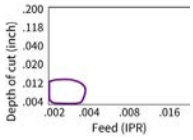
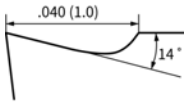
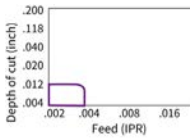
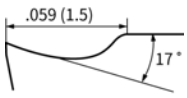
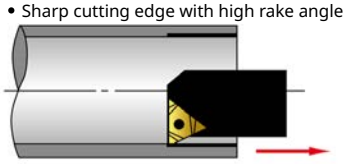
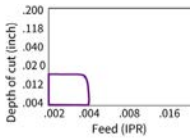
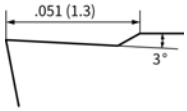
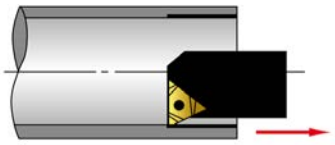
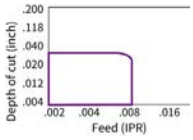
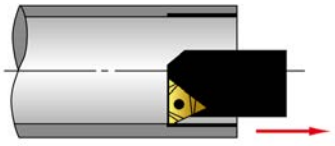
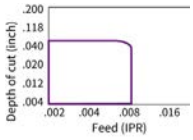
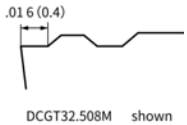
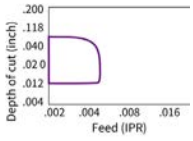
Positive inserts - Chipbreaker Overview

Application	Type	Chipbreaker design	Features	Applicable range
Middle Cut	**S**	  DCGT32.508 shown	• Standard ground chipbreaker with wide cutting condition coverage • Sharp cutting edge with excellent chip control	
	SX	 VCGT22-WP shown		
	AZ8	  ※DCMT32.508 shown	• Superior cutting quality and versatile breaker with CVD coating	
	CL	  DCGT32.508M shown	• Sharpest molded chipbreaker • Excellent chip control • Less tool pressure	
Non-ferrous	**V** **P** **H**		• Very up-sharp edge with mirror finish • V: Mirror finish on Top and Flank side with R0 nose radius • P: Mirror finish on Top and Flank side • H: Mirror finish on Top side	–

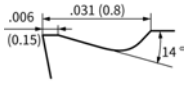
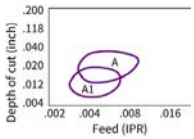
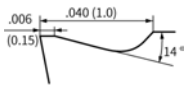
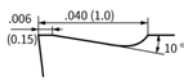
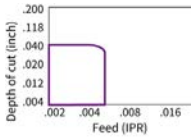
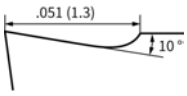
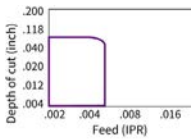
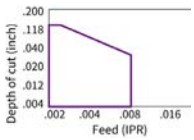
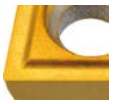
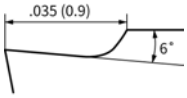
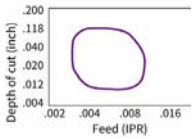
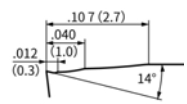
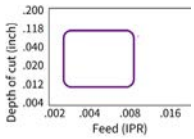
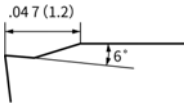
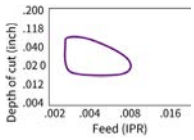
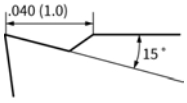
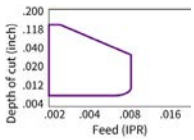
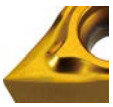
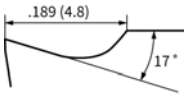
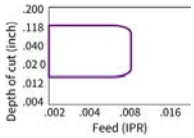
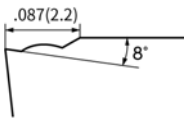
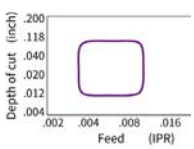
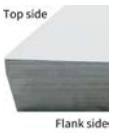
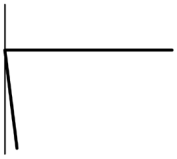
Negative inserts - Chipbreaker Overview

Application	Type	Chipbreaker design	Features	Applicable range
Finishing	**DA**	 	• Excellent chip control and sharp cutting edge	
	D1	 	• Excellent chip control and sharp cutting edge	
	AG		• Resolve chip entanglement, which is likely to occur during machining of low-hardness layer	
Light cut	**UL**		• Negative insert with a positive insert's chipbreaker • Reduced burr • Improved microfinish formation • Superb advantage in cost formation corner over positive inserts	
Middle Cut	**U2**	 	• Reduces burrs and work hardening due to high rake design	
	ZP		• Double-positive rake and sharp cutting edge • Low tool pressure even at heavy depth of cut	
	C	 	• General-purpose chipbreaker with excellent toughness and chip control	
Rough Cut	**Z5**	 	• Very tough insert • Designed for machining through heavy interruption	
	AM1		• Tough chipbreaker for roughing with exceptional stability	
	G		• Tough chipbreaker for roughing with exceptional stability	

ID turning positive inserts - Chipbreaker Overview

Application	Type	Chipbreaker design		Features	Applicable range
Internal Finishing	**A2**		 ERGP52Y shown	• Control chips at light feed and light depth of cut • Sharp cutting edge due to large rake angle	
	B1		 TCGP5208 shown	• Stable cutting thanks to sharp and tough cutting edge	
	K		 TPGHP7308 shown	• Superb chip control on finishing applications • Sharp cutting edge with the high rake angle	
	KHG		 DCET32.508 shown	• For super high-precision machining • Precision tolerance in corner radius: ±.0004"	
	FG		 TPGH221 shown	• Evacuates chips BACKWARD at light depth of cut • Sharp cutting edge with high rake angle 	
	F05		 TPGP5208 shown	• Evacuates chips BACKWARD • Excellent choice for blind hole machining 	
	F1		TPGP2208 shown	• Evacuates chips BACKWARD • Excellent choice for blind hole machining 	
	AZ7		 DCGT32.508M shown	• Excellent chip control at light feed and light depth of cut	

ID turning positive inserts - Chipbreaker Overview

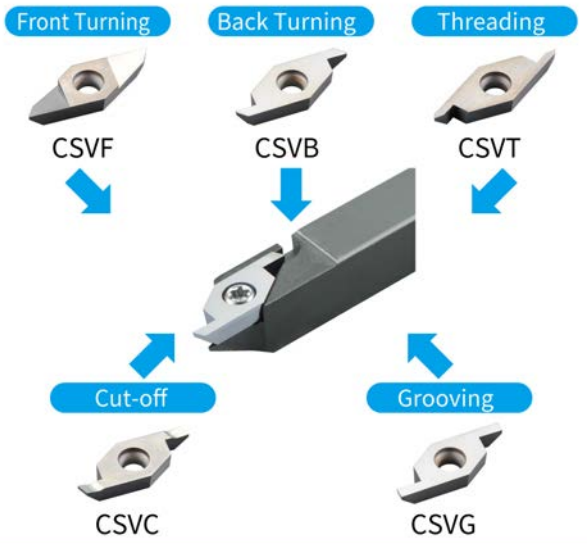
Application	Type	Chipbreaker design		Features	Applicable range
Internal Light cut	**A1**		 CPGP8308 shown	• Tough cutting edge and good chip control • General-purpose ID chipbreaker	
	A		 CPGP0308 shown	• Tough cutting edge and good chip control • General-purpose ID chipbreaker	
	B2		 TPGP7308 shown	• Stable cutting thanks to sharp and tough cutting edge	
	B3		 TPGP6308 shown	• Stable cutting thanks to sharp and tough cutting edge	
	U **U1**		DCGT32.508 shown	• Sharp cutting edge prevents materials from work hardening [chipbreaker width] U →.043" U1→.063"	
	AM5		 CPGH21.508 shown	• Provides both good cutting performance and chip control	
	YL		 DCGT11T302MYL	• Great combination of sharpness and toughness • Covers extremely wide range • Excellent chip control	
Internal Middle Cut	**AM3**		 DCGT32.508 shown	• All purpose chipbreaker • Sharp edge with toughness	
	S		 DCGT32.508 shown	• Standard ground chipbreaker with wide cutting condition coverage	
	CL		 DCGT32.508M shown	• Sharpest molded chipbreaker • Less tool pressure	
	AZ8		 ※DCMT32.508 shown	• CVD coated chip breaker with excellent sharpness and high versatility.	
Non-ferrous	**V** **P** **H**			• Very up-sharp edge with mirror finish • V: Mirror finish on Top and Flank side with R0 nose radius • P: Mirror finish on Top and Flank side • H: Mirror finish on Top side	–

Multi-purpose holders

All the inserts can use the same toolholder

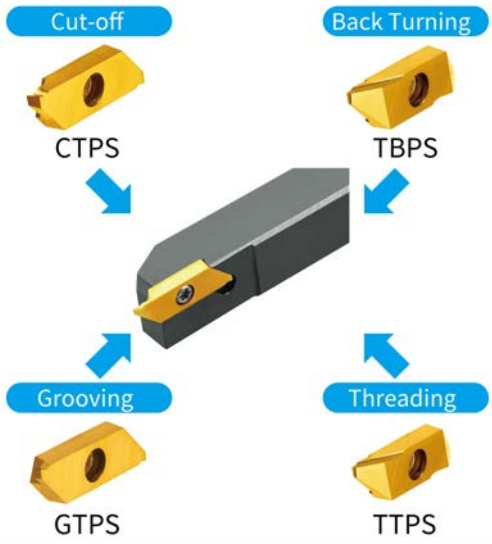
CSV series

Able to use in Cam-style machine lathe

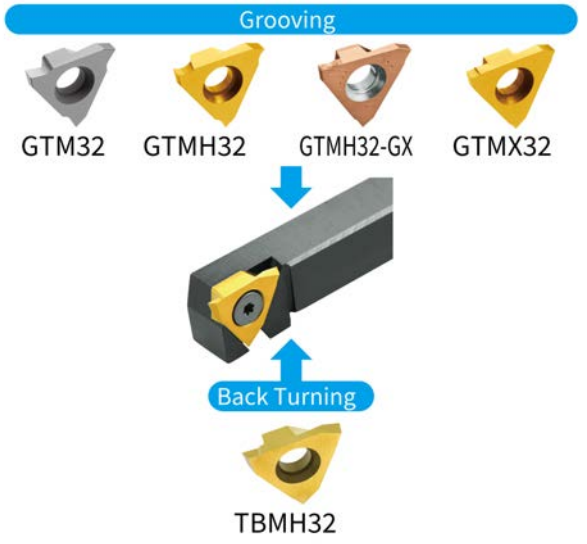


CTPS series

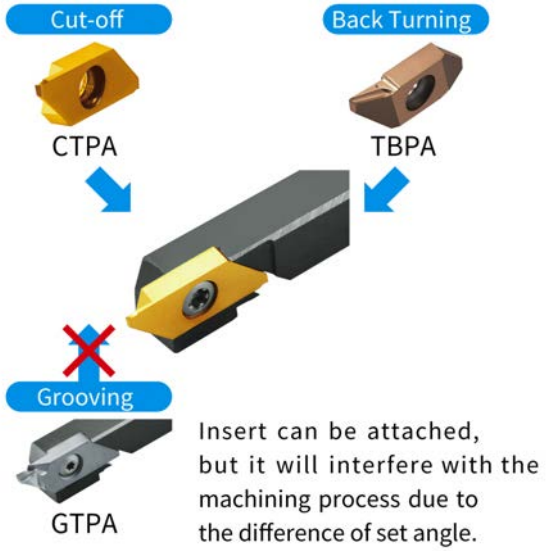
Best for



GTT type



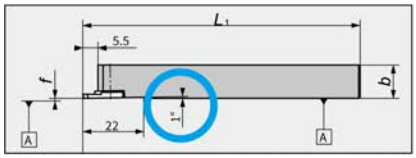
CTPA type



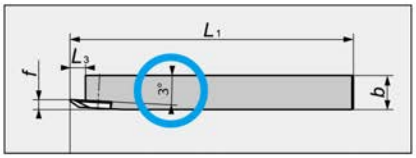
*** CTP (cut-off), TBP (back turning), and TTP (threading) tools are not interchangeable.**

The inserts may fit in the holders, but because the set angle is different there will be an interference during machining.

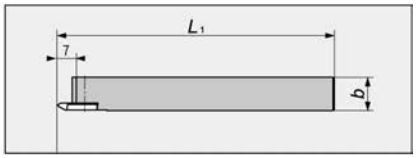
Cut-off CTP ✕ Back Turning TBP ✕ Threading TTP



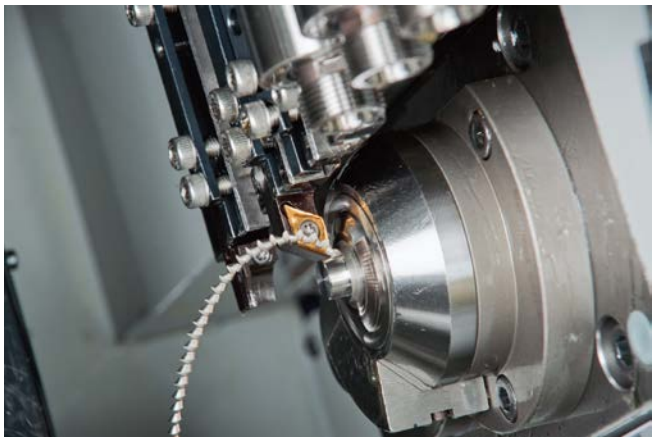
Set angle : 1°



Set angle : −3°



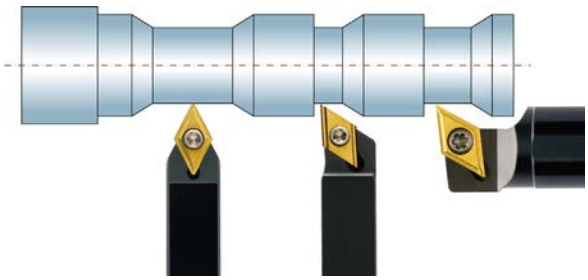
Set angle : 0°

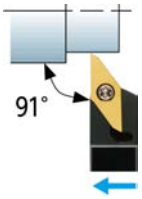
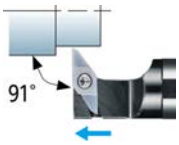


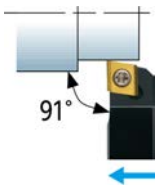
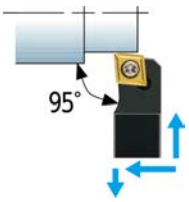
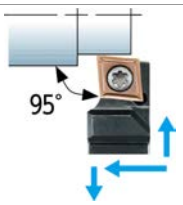
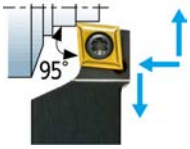
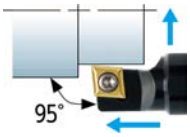
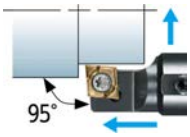
Front Turning

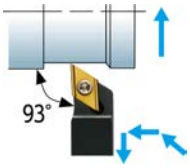
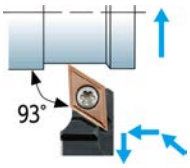
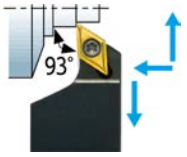
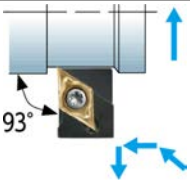
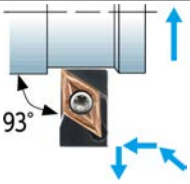
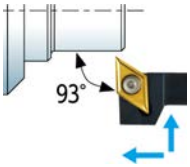
Product Lines	Q02
Recommended Cutting Conditions	Q04
General Information	Q05
TF.. series	Q07
CSV.. series	Q10
CC.. series	Q14
DC.. series	Q25
VB.. series	Q40
VC.. series	Q42
VP.. series	Q53
TC.. series	Q57
TN.. series	Q59
CN.. series	Q65
DN.. series	Q67

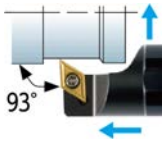
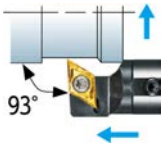
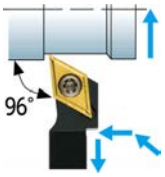
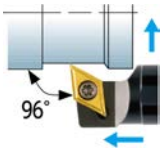
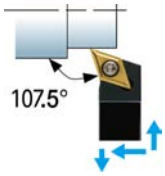
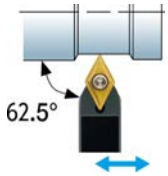
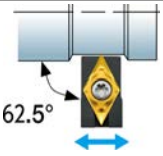
Product Lines

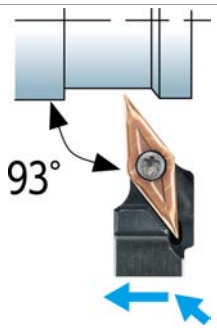


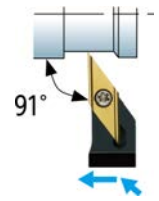
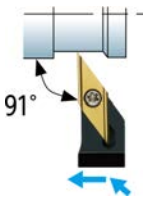
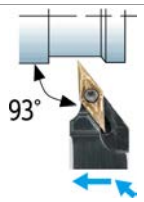
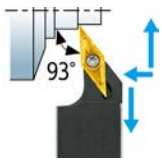
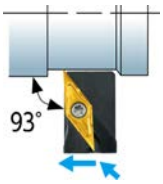
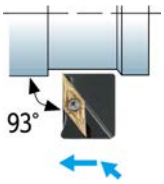
Insert	CSVF →Q13	
	CSV	DS-CSVL
Holder	 →Q11	 →Q12

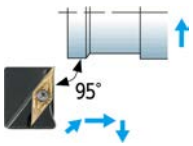
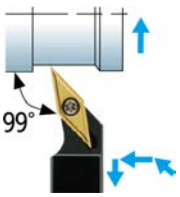
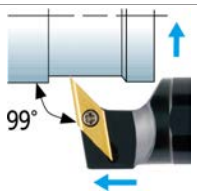
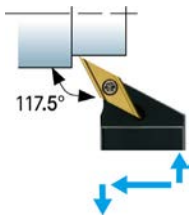
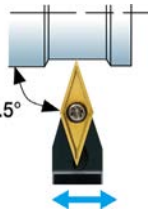
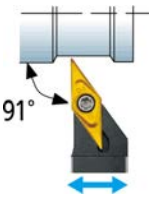
Insert	CC..21/32.5.. →Q24					
	SCAC	SCLC	SCLC-OH3/OH2/OH	SCLC-F	DS-SCLL	DS-SCLL-ACH
Holder	 →Q21	 →Q16,Q17	 →Q15	 →Q17	 →Q19-20	 →Q18
			Coolant through	Shifted	DS	DS-ACH

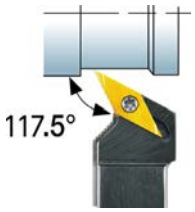
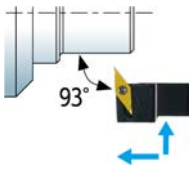
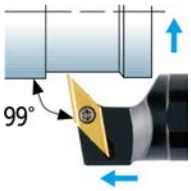
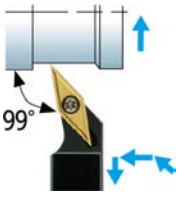
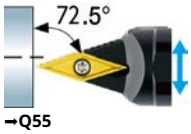
Insert	DC..21/32.5.. →Q37-39					
	SDJC	SDJC-OH3/OH2/OH	SDJC-F	Y-SDJC	Y-SDJC-OH2/OH	CH-SDUC
Holder	 →Q27-28	 →Q25-26	 →Q28	 →Q30	 →Q29	 →Q33
		Coolant through	Shifted	Y-axis	Y-axis Coolant through	

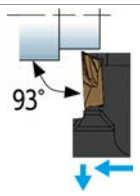
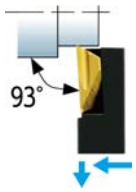
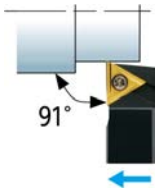
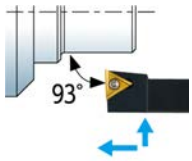
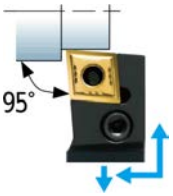
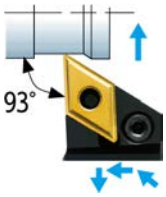
Insert	DC..21/32.5.. →Q37-39						
	DC..21/32.5..-WP →Q37,Q38						
	DS-SDUL	DS-SDUL-ACH/OH	SDXC	DS-SDX	SDQC	SDNC	Y-SDNC
Holder	 →Q32	 →Q31	 →Q33	 →Q34	 →Q35	 →Q36	 →Q36
	DS	DS-ACH		DS			Y-axis

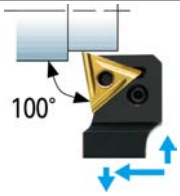
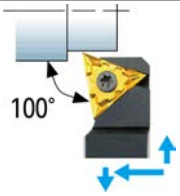
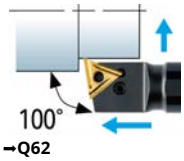
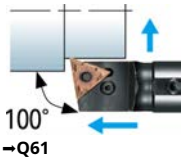
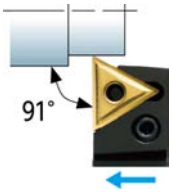
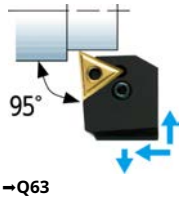
Insert	VB..33 →Q41
	SVJB-OH2/OH
Holder	 → Q40
	Coolant through

Insert	VC.22.. →Q52						
	VC..22..-WP →Q52	VC..2.52..2M →Q52					
Holder	SVAC	SVAC-NW,W	SVJC	SVJC-OH2/OH	SVJC-F	Y-SVJC	Y-SVJC-OH2/OH
	 →Q46-47	 →Q48	→Q43	 →Q42	 →Q44	 →Q45	 →Q44-45
			-	Coolant through	Shifted	Y-axis	Y-axis Coolant through

Insert	VC.22.. →Q52					VC..21.5.. →Q52
	Y-SVXCL	SVXC	DS-SVX	SVQC	SVVCN	SVAC-1L
Holder	 →Q49	 →Q49	 →Q50	 →Q51	 →Q50-51	 →Q47
	Y-axis		DS			

Insert	VP..1.51.5.. →Q56			VP..22.. →Q56		
	SVQP	CH-SVUP	DS-SVXP	SVXP	DS-SVVPN	DS-SVVPN-ACH
Holder	 →Q54	 →Q55	 →Q53	 →Q53	 →Q55	→Q54
			DS		DS	DS-ACH

Insert	TFX33.. TF33.. →Q9		TC..73.. →Q58		CN..43.. →Q66	DN..43.. →Q68
			TC..73/21..-WP →Q61			
	TFX-OH3/OH2	TFT	STAC	CH-STUC	PCLN	PDJN
Holder	 →Q7-8	 →Q8	 →Q57	 →Q57	 →Q65	 →Q67
	Coolant through					

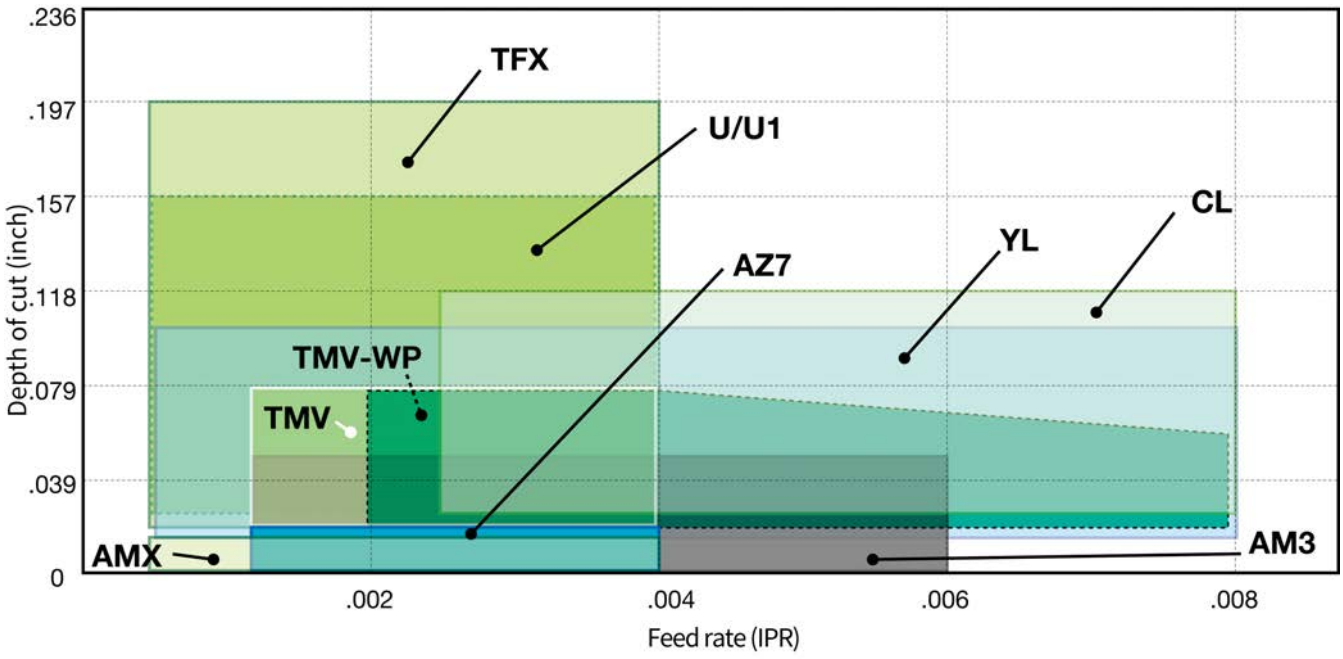
Insert	TN..33.. →Q64					
	PTXN-OH3/OH2/PTXN	STXN	DS-PTX	DS-PTX-ACH/OH	PTAN	PTLN
Holder	 →Q59-60	 →Q60	 →Q62	 →Q61	 →Q63	 →Q63
			DS	DS-ACH		

Recommended Cutting Conditions

Front Turning

CSVF / CC.. / DC.. / VC.. / VB.. / TN.. / TF

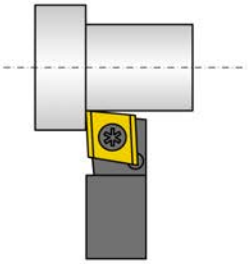
ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**650 / DM4**		**DT4 / DM4**	**650 / ST4**		**650 / QM3**	
	2nd choice	DT4 / QM3		TM4	DT4 / DM4		TM4 / DM4	
Cutting speed (SFM)		65 - 130 - 195	100 - 195 - 260	100 - 195 - 260	130 - 230 - 330	130 - 360 - 590	130 - 295 - 490	130 - 295 - 490
Feed rate (IPR)		Please refer to the chip control range below and set the feed rate according to the cutting amount.						



General Turning Inserts Explained

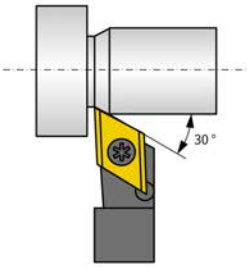
Advantage for each geometry

CC.. Style (80°)



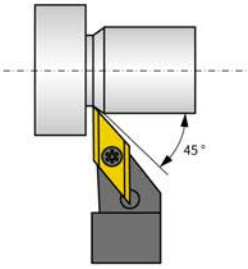
- Increased toughness. Cutting edge is close to insert pocket.
- Not applicable to undercut

DC.. Style (55°)



- Versatile geometry. Toughness of CC.. with flexibility of VC..
- Up to 30 deg. undercuts

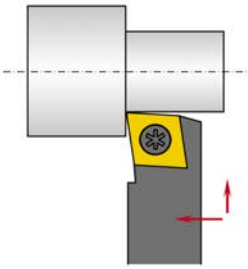
VB / VC / VP Style (35°)



- Wide coverage in work geometry.
- Up to 45 deg. undercuts

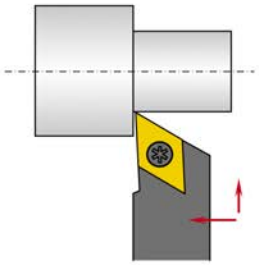
Chip Control and Finish

SCLCR



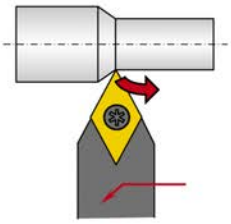
Rigid clamping
High dimensional repeatability

SDJCR



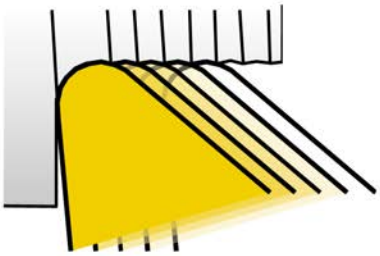
Increased room for chip evacuation creates better surface finish

SDNCN

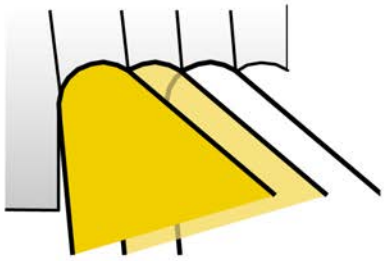


Chips flow away from the work

Surface Finish in General Front Turning Operations Using Inserts with Wiper Flat

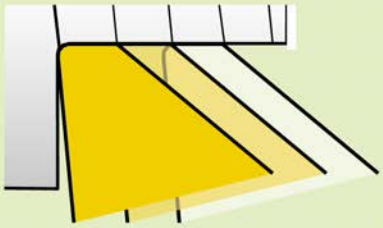


Slower feed rates create better finishes but sacrifices cycle time, chip control, and tool life.



Fast feed rates improve chip control but produce a bad surface finish.

Inserts with wiper



Inserts with a wiper flat create good chip control and surface finish when feed rates are increased.

Wiper Flat Insert - WP series

DCGT.. -WP

for SDJC toolholders

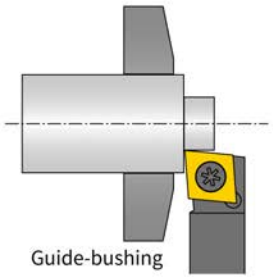
TCGT.. -WP

for STAC toolholders

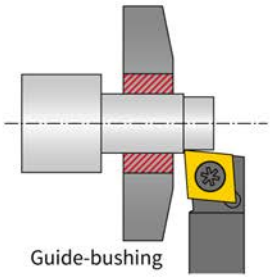
VCGT.. -WP

for SVAC toolholders

Roughing and Finishing Long Work on Swiss Lathes

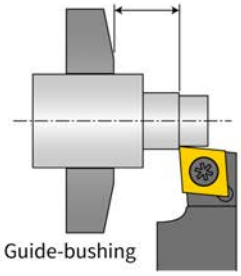


Single pass machining is common in Swiss front turning operations.



Conventional toolholders are not suitable for roughing or finishing of long parts. The guide-bushing cannot hold machined bar stock.

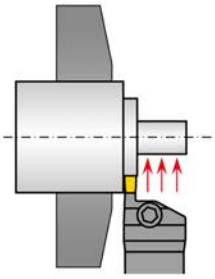
●Shifted Holders



Shifted Holders make a finishing process possible without worrying about the bar stock coming out of the guide-bushing.
Coolant flows effectively which improves chip control thanks to the increased room between the tools and guide-bushing.

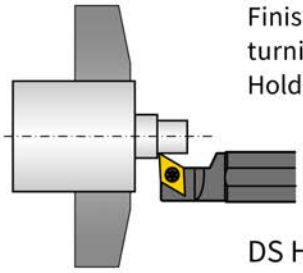
SCLC-N-F
SDJC-N-F
SVJC-N-F

●Combination of Grooving Tool and DS Holders



Rough with grooving tool for good chip control

GTWP Holders

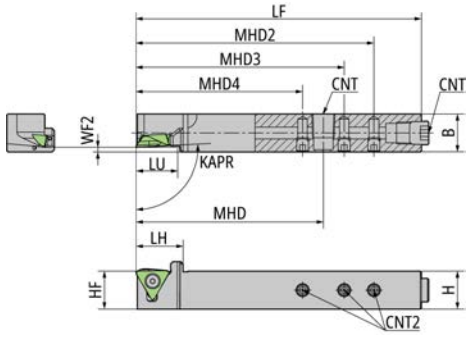


Finish by using general turning inserts with DS Holders

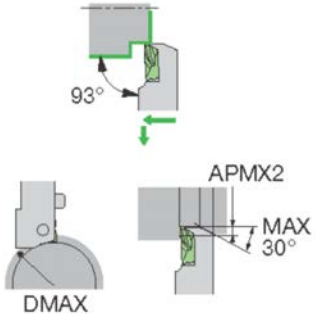
DS Holders

Front Turning Operations
TF.. series/Toolholder

TFT-OH3 [93 °] Direct connect coolant port 3-hole type　The Front Max.



● Diagram shows right-hand tool



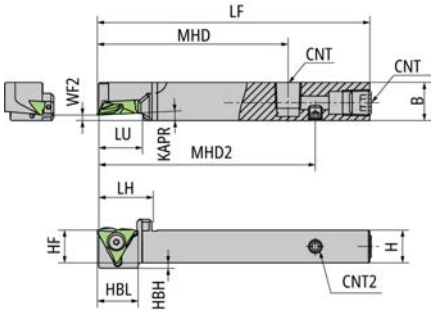
[Workpiece shape restrictions during machining]
DMAX: Max. bar stock diameter during APMX2 max DOC
APMX2: Max depth of cut

Item Number	Hand	DMAX	APMX2	B	CNT	CNT2	H	HF	KAPR	LF	LH	LU	MHD	MHD2	MHD3	MHD4	WF2	Insert Gage	
		inch	inch	inch			inch	inch	°	inch	inch	inch	inch	inch	inch	inch	inch		
TFTR10X-IN-OH3	R	1.575	.098	5/8	NPT1/8	M5	5/8	5/8	93	4.724	.778	.709	3.100	3.937	3.445	2.756	.079	TFX33..	TF33..
TFTR1616X-OH3	R	1.575	.098	.630	Rc1/8	M5	.630	.630	93	4.724	.778	.709	3.100	3.937	3.445	2.756	.079	TFX33..	TF33..

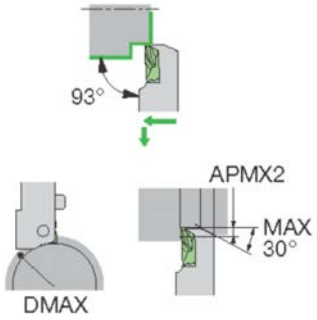
Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
TFTR10X-IN-OH3	LR-S-4*10PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
TFTR1616X-OH3	LR-S-4*10PW	SPR1/8L	SS0505SC	CLR-15S	LW-2.5

TFT-OH2 [93°] Direct connect coolant port 1-hole type The Front Max.



● Diagram shows right-hand tool



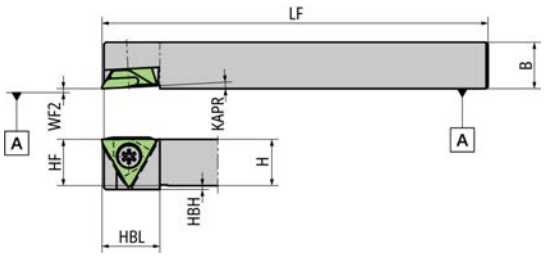
[Workpiece shape restrictions during machining]
DMAX: Max. bar stock diameter during APMX2 max DOC
APMX2: Max depth of cut

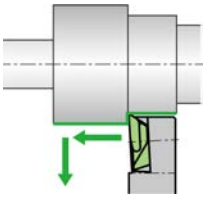
Item Number	Hand	DMAX	APMX2	B	CNT	CNT2	H	HBH	HBL	HF	KAPR	LF	LH	LU	MHD	MHD2	WF2	Insert Gage	
		inch	inch	inch			inch	inch	inch	inch	°	inch	inch	inch	inch	inch	inch		
TFTR06H-IN-OH2	R	.787	.098	.551	M6*1	M5	3/8	.157	.591	3/8	93	3.937	.787	.591	2.756	3.150	.079	TFX33..	TF33..
TFTR08H-IN-OH2	R	1.181	.098	.551	NPT1/8	M5	1/2	.079	.591	1/2	93	3.937	.787	.591	2.756	3.150	.079	TFX33..	TF33..
TFTR10X-IN-OH2	R	1.575	.098	5/8	NPT1/8	M5	5/8	–	–	5/8	93	4.724	.787	.689	2.756	3.937	.079	TFX33..	TF33..
TFTR1014H-OH2	R	.787	.098	.551	M6*1	M5	.394	.157	.591	.394	93	3.937	.787	.591	2.756	3.150	.079	TFX33..	TF33..
TFTR1214H-OH2	R	1.181	.098	.551	Rc1/8	M5	.472	.079	.591	.472	93	3.937	.787	.591	2.756	3.150	.079	TFX33..	TF33..
TFTR1616X-OH2	R	1.575	.098	.630	Rc1/8	M5	.630	–	–	.630	93	4.724	.787	.689	2.756	3.150	.079	TFX33..	TF33..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
TFTR06H-IN-OH2	LR-S-4*10PW	SS0605SC	SS0505SC	CLR-15S	LW-2.5
TFTR08H-IN-OH2	LR-S-4*10PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
TFTR10X-IN-OH2	LR-S-4*10PW	SPNPT1/8L	SS0505SC	CLR-15S	LW-2.5
TFTR1014H-OH2	LR-S-4*10PW	SS0605SC	SS0505SC	CLR-15S	LW-2.5
TFTR1214H-OH2	LR-S-4*10PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5
TFTR1616X-OH2	LR-S-4*10PW	SPR1/8L	SS0505SC	CLR-15S	LW-2.5

TFT [93°]





● Diagram shows right-hand tool

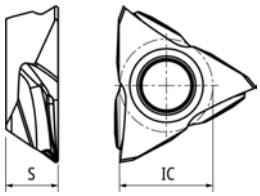
Item Number	Hand	B	H	HBH	HBL	HF	KAPR	LF	WF2	Insert Gage	
		inch	inch	inch	inch	inch	°	inch	inch		
TFTR06-IN	R	3/8	3/8	.118	.591	3/8	93	4.724	.000	TFX33..	TF33..
TFTR08-IN	R	1/2	1/2	.039	.591	1/2	93	4.724	.000	TFX33..	TF33..
TFTR10	R	.394	.394	.118	.591	.394	93	4.724	.000	TFX33..	TF33..
TFTR12	R	.472	.472	.039	.591	.472	93	4.724	.000	TFX33..	TF33..
TFTR16	R	.630	.630	–	–	.630	93	4.724	.000	TFX33..	TF33..
TFTR20	R	.787	.787	–	–	.787	93	4.724	.000	TFX33..	TF33..

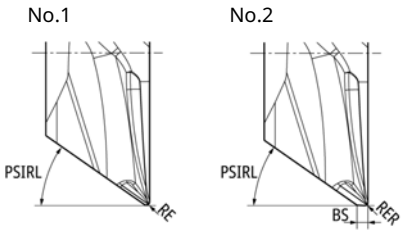
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
TFTR06-IN	LR-S-4*10PW	CLR-15S
TFTR08-IN	LR-S-4*10PW	CLR-15S
TFTR10	LR-S-4*10PW	CLR-15S
TFTR12	LR-S-4*10PW	CLR-15S
TFTR16	LR-S-4*10PW	CLR-15S
TFTR20	LR-S-4*10PW	CLR-15S

TF.. series/Inserts

TFX The Front Max



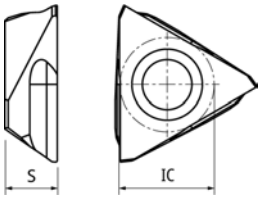


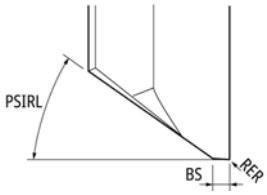
● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

Figure	Item Number	Hand	Wiper	APMX	IC	S	BS	PSIRL	RE	RER	Carbide		
											PVD		
				inch	inch	inch	inch	°	inch	inch	DM4	ST4	ZM3
1	**TFX3301MR**	R	No	.197	3/8	3/16	–	32	.003	–	●	●	
1	**TFX3302MR**	R	No	.197	3/8	3/16	–	32	.007	–	●	●	
1	**TFX3304MR**	R	No	.197	3/8	3/16	–	32	.015	–	●	●	
2	**TFX3301MRW**	R	Straight	.197	3/8	3/16	.020	32	–	.003	●	●	
2	**TFX3302MRW**	R	Straight	.197	3/8	3/16	.020	32	–	.007	●	●	
2	**TFX3304MRW**	R	Straight	.197	3/8	3/16	.020	32	–	.015	●	●	

Note: Initial dimensional adjustments may be required depending on the machining condition.

TF



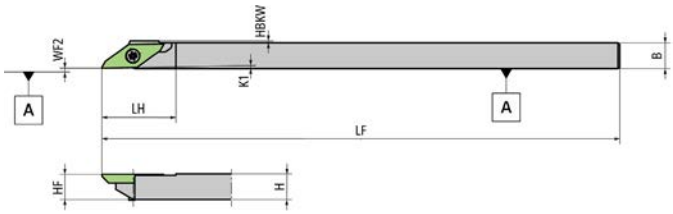


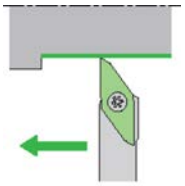
● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

Item Number	Hand	Wiper	APMX	IC	S	BS	PSIRL	RER	Carbide		
									PVD		
			inch	inch	inch	inch	°	inch	DT4	VM1	ZM3
TF3300R	R	Straight	.157	3/8	3/16	.020	32	.000			●
TF3305R	R	Straight	.157	3/8	3/16	.020	32	.002			●
TF3315R	R	Straight	.157	3/8	3/16	.020	32	.006			●
TF3320R	R	Straight	.157	3/8	3/16	.020	32	.008			●

CSVF.. series/Toolholder

CSV [91°] For Cam-style machine





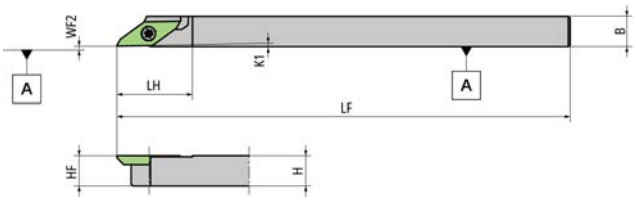
● Diagram shows right-hand tool

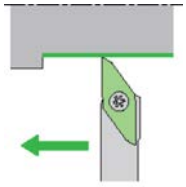
Item Number	Hand	B	H	HBKW	HF	K1	LF	LH	WF2	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
CSVR07	R	.276	.276	.020	.276	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR07GX	R	.276	.276	.020	.276	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08	R	.315	.315	.000	.315	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08GX	R	.315	.315	.000	.315	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR095	R	.374	.374	.000	.374	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR10	R	.394	.394	.000	.394	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR12	R	.472	.472	.000	.472	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR12GX	R	.472	.472	.000	.472	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL07	L	.276	.276	.020	.276	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL08	L	.315	.315	.000	.315	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL10	L	.394	.394	.000	.394	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CSVR07	LRIS-2.5*7	CLR-15S
CSVR07GX	LRIS-2.5*7	CLR-15S
CSVR08	LRIS-2.5*7	CLR-15S
CSVR08GX	LRIS-2.5*7	CLR-15S
CSVR095	LRIS-2.5*7	CLR-15S
CSVR10	LRIS-2.5*7	CLR-15S
CSVR12	LRIS-2.5*7	CLR-15S
CSVR12GX	LRIS-2.5*7	CLR-15S
CSVL07	LRIS-2.5*7	CLR-15S
CSVL08	LRIS-2.5*7	CLR-15S
CSVL10	LRIS-2.5*7	CLR-15S

CSV-NC [91°] For Gang-style machine





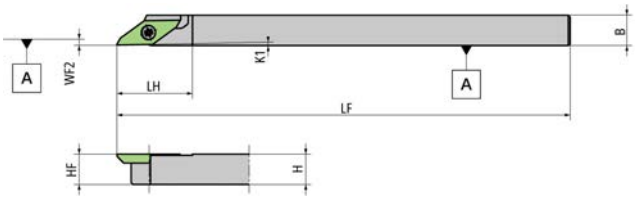
● Diagram shows right-hand tool

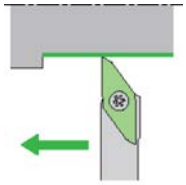
Item Number	Hand	B	H	HF	K1	LF	LH	WF2	Insert Gage	
		inch	inch	inch	°	inch	inch	inch		
CSVR06-IN-NC	R	3/8	3/8	3/8	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08-IN-NC	R	1/2	1/2	1/2	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL06-IN-NC	L	3/8	3/8	3/8	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL08-IN-NC	L	1/2	1/2	1/2	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08NC	R	.315	.315	.315	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR10GXNC	R	.394	.394	.394	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR10NC	R	.394	.394	.394	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR12NC	R	.472	.472	.472	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL08NC	L	.315	.315	.315	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL10NC	L	.394	.394	.394	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL12NC	L	.472	.472	.472	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CSVR06-IN-NC	LRIS-2.5*7	CLR-15S
CSVR08-IN-NC	LRIS-2.5*7	CLR-15S
CSVL06-IN-NC	LRIS-2.5*7	CLR-15S
CSVL08-IN-NC	LRIS-2.5*7	CLR-15S
CSVR08NC	LRIS-2.5*7	CLR-15S
CSVR10GXNC	LRIS-2.5*7	CLR-15S
CSVR10NC	LRIS-2.5*7	CLR-15S
CSVR12NC	LRIS-2.5*7	CLR-15S
CSVL08NC	LRIS-2.5*7	CLR-15S
CSVL10NC	LRIS-2.5*7	CLR-15S
CSVL12NC	LRIS-2.5*7	CLR-15S

CSV-NC-F [91°] For Gang-style machine





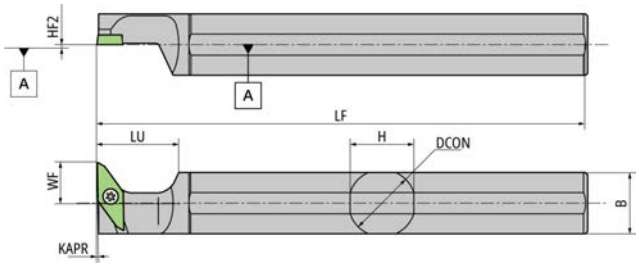
● Diagram shows right-hand tool

Item Number	Hand	B	H	HBKW	HF	K1	LF	LH	WF2	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
CSVR08NC-F	R	.315	.315	.000	.315	1	4.724	.787	.000-.004	CSVF../CSVB../CSVC..	CSVG../CSVT..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CSVR08NC-F	LRIS-2.5*7	CLR-15S

DS-CSVL [91°] DS Toolholders



● Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

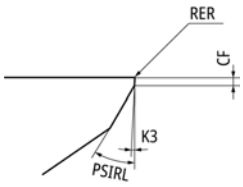
Item Number	Hand	B	DCON	H	HF2	KAPR	LF	LU	WF	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
DS-CSVL15	L	.591	5/8	.591	.000	91	4.724	.787	.394	CSVF../CSVB..	CSVG../CSVT..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-CSVL15	LRIS-2.5*7	CLR-15S

CSVF.. series/Inserts Carbide

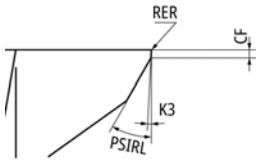
CSVF-V



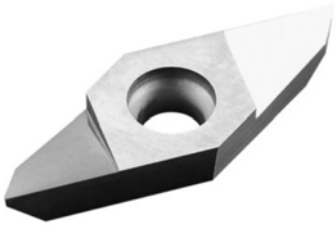
● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

Item Number	Hand	Chipbreaker	APMX	EPSR	IC	S	AN	CF	K3	PSIRL	RER	Carbide		
												PVD		
			inch	°	inch	inch	°	inch	°	°	inch	DT4	VM1	ZM3
CSVF11FRV Ⓜ	R	No	.118	35	1/4	3/32	7	.012	5	30	.000		●	
CSVF11FRV-A Ⓜ	R	No	.118	35	1/4	3/32	7	.012	2	30	.000		●	
CSVF11FRV-C Ⓜ	R	No	.118	35	1/4	3/32	7	.006	5	30	.000		●	
CSVF11FRV-M Ⓜ	R	No	.118	35	1/4	3/32	7	.006	2	30	.000	●	●	●
CSVF11FLV Ⓜ	L	No	.118	35	1/4	3/32	7	.012	5	30	.000		●	
CSVF11FLV-M Ⓜ	L	No	.118	35	1/4	3/32	7	.006	2	30	.000		●	

CSVF-VB

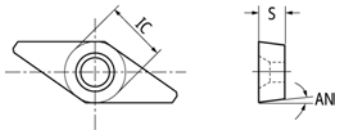


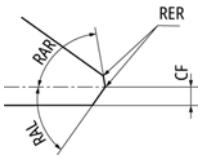
● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.



Item Number	Hand	Chipbreaker	APMX	EPSR	IC	S	AN	CF	K3	PSIRL	RER	Carbide		
												PVD		
			inch	°	inch	inch	°	inch	°	°	inch	DT4	VM1	ZM3
CSVF11FRVB Ⓜ	R	Yes	.118	35	1/4	3/32	7	.012	5	30	.000		●	
CSVF11FRVB-A Ⓜ	R	Yes	.118	35	1/4	3/32	7	.012	2	30	.000		●	
CSVF11FRVB-C Ⓜ	R	Yes	.118	35	1/4	3/32	7	.006	5	30	.000		●	
CSVF11FRVB-M Ⓜ	R	Yes	.118	35	1/4	3/32	7	.006	2	30	.000	●	●	●
CSVF11FLVB Ⓜ	L	Yes	.118	35	1/4	3/32	7	.012	5	30	.000		●	
CSVF11FLVB-M Ⓜ	L	Yes	.118	35	1/4	3/32	7	.006	2	30	.000		●	

CSVF-VX For Profiling



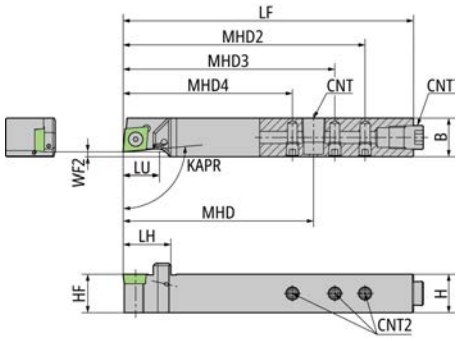


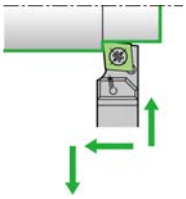
● Diagram shows left-hand tool
All angles shown are obtained when insert is set in the holder.

Item Number	Hand	Chipbreaker	APMX	EPSR	IC	S	AN	CF	RAL	RAR	RER	Carbide		
												PVD		
			inch	°	inch	inch	°	inch	°	°	inch	DT4	VM1	ZM3
CSVF11FLVX Ⓜ	L	No	.118	35	1/4	3/32	7	.028	45	80	.000		●	

CC.. Series/Toolholder

SCLC-N-OH3 [95 °] Direct connect coolant port 3-hole type





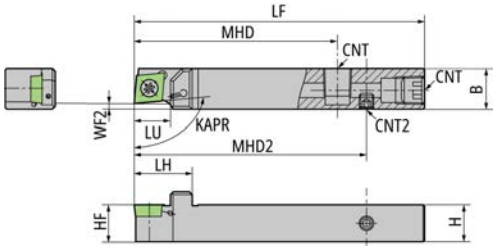
● Diagram shows right-hand tool

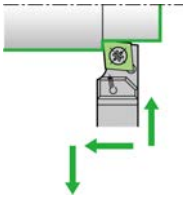
Item Number	Hand	B	CNT	CNT2	H	HF	KAPR	LF	LH	LU	MHD	MHD2	MHD3	MHD4	WF2	Insert Gage
		inch			inch	inch	°	inch	inch	inch	inch	inch	inch	inch	inch	
SCLCR103XL-F079-OH3	R	5/8	NPT1/8	M5	5/8	5/8	95	4.724	.787	.697	3.100	3.937	3.445	2.756	.079	CC..32.5..
SCLCR1012H09N-OH3	R	.472	M6*1	M5	.394	.394	95	3.937	.669	.472	2.461	3.150	2.756	2.165	.000	CC..32.5..
SCLCR1616X09N-F02OH3	R	.630	Rc1/8	M5	.630	.630	95	4.724	.787	.697	3.100	3.937	3.445	2.756	.079	CC..32.5..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
SCLCR103XL-F079-OH3	LRIS-4*10	SPNPT1/8	SS0505SC	LLR-25S	LW-2.5
SCLCR1012H09N-OH3	LRIS-4*10	SS0605SC	SS0505SC	LLR-25S	LW-2.5
SCLCR1616X09N-F02OH3	LRIS-4*10	SPR1/8	SS0505SC	LLR-25S	LW-2.5

SCLC-N-OH2 [95 °] Direct connect coolant port 1-hole type





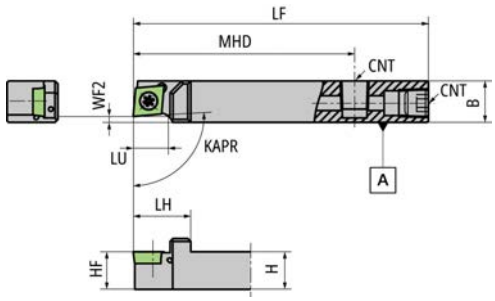
● Diagram shows right-hand tool

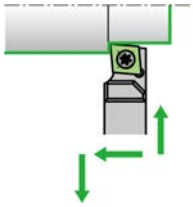
Item Number	Hand	B	CNT	CNT2	H	HF	KAPR	LF	LH	LU	MHD	MHD2	WF2	Insert Gage
		inch			inch	inch	°	inch	inch	inch	inch	inch	inch	
SCLCR083H-F079-OH2	R	.551	NPT1/8	M5	1/2	1/2	95	3.937	.787	.472	2.756	3.150	.079	CC..32.5..
SCLCR103XL-F079-OH2	R	.551	NPT1/8	M5	5/8	5/8	95	4.724	.787	.697	2.756	3.937	.079	CC..32.5..
SCLCR1214H09N-F02OH2	R	.551	Rc1/8	M5	.472	.472	95	3.937	.768	.472	2.756	3.150	.079	CC..32.5..
SCLCR1616X09N-F02OH2	R	.630	Rc1/8	M5	.630	.630	95	4.724	.768	.697	2.756	3.937	.079	CC..32.5..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
SCLCR083H-F079-OH2	LRIS-4*10	SPNPT1/8	SS0505SC	LLR-25S	LW-2.5
SCLCR103XL-F079-OH2	LRIS-4*10	SPNPT1/8L	SS0505SC	LLR-25S	LW-2.5
SCLCR1214H09N-F02OH2	LRIS-4*10	SPR1/8	SS0505SC	LLR-25S	LW-2.5
SCLCR1616X09N-F02OH2	LRIS-4*10	SPR1/8	SS0505SC	LLR-25S	LW-2.5

SCLC-N-OH [95 °] Coolant hose connection type





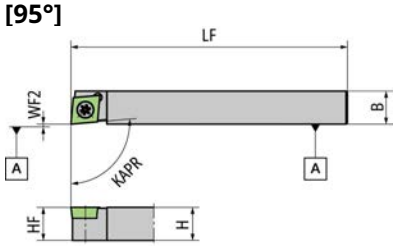
● Diagram shows right-hand tool

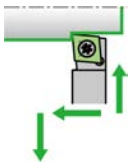
Item Number	Hand	B	CNT	H	HF	KAPR	LF	LH	LU	MHD	WF2	Insert Gage
		inch			inch	inch	°	inch	inch	inch	inch	
SCLCR082H-F079-OH	R	.551	NPT1/8	1/2	1/2	95	3.937	.768	.472	2.953	.079	CC..21.5..
SCLCR083H-F079-OH	R	.551	NPT1/8	1/2	1/2	95	3.937	.768	.472	2.953	.079	CC..32.5..
SCLCR103HL-F079-OH	R	.551	NPT1/8	5/8	5/8	95	3.937	.768	.697	2.953	.079	CC..32.5..
SCLCR1014F09N-F02OH	R	.551	M6*1	.394	.394	95	3.150	.768	.472	2.165	.079	CC..32.5..
SCLCR1214H09N-F02OH	R	.551	Rc1/8	.472	.472	95	3.937	.768	.472	2.953	.079	CC..32.5..
SCLCR1616H09N-F02OH	R	.630	Rc1/8	.630	.630	95	3.937	.768	.697	2.953	.079	CC..32.5..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)	Wrench (for CNT)
SCLCR082H-F079-OH	LRIS-2.5*7	SPNPT1/8	CLR-15S	–
SCLCR083H-F079-OH	LRIS-4*10	SPNPT1/8	LLR-25S	–
SCLCR103HL-F079-OH	LRIS-4*10	SPR1/8	LLR-25S	–
SCLCR1014F09N-F02OH	LRIS-4*10	SS0605SC	LLR-25S	LW-3
SCLCR1214H09N-F02OH	LRIS-4*10	SPR1/8	LLR-25S	–
SCLCR1616H09N-F02OH	LRIS-4*10	SPR1/8	LLR-25S	–

SCLC-N [95°]





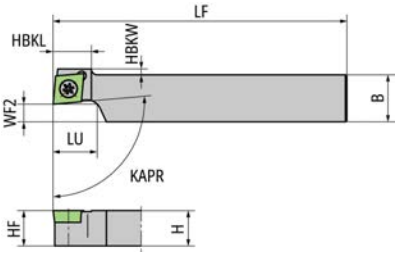
● Diagram shows right-hand tool

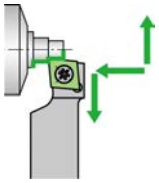
Item Number	Hand	B	H	HF	KAPR	LF	WF2	Insert Gage
		inch	inch	inch	°	inch	inch	
SCLCR062C	R	3/8	3/8	3/8	95	4.724	.000	CC..21.5..
SCLCR082C	R	1/2	1/2	1/2	95	4.724	.000	CC..21.5..
SCLCR083C	R	1/2	1/2	1/2	95	4.724	.000	CC..32.5..
SCLCR103C	R	5/8	5/8	5/8	95	4.724	.000	CC..32.5..
SCLCL062C	L	3/8	3/8	3/8	95	4.724	.000	CC..21.5..
SCLCL082C	L	1/2	1/2	1/2	95	4.724	.000	CC..21.5..
SCLCL083C	L	1/2	1/2	1/2	95	4.724	.000	CC..32.5..
SCLCL103C	L	5/8	5/8	5/8	95	4.724	.000	CC..32.5..
SCLCR0808X06N	R	.315	.315	.315	95	4.724	.000	CC..21.5..
SCLCR1010H09N	R	.394	.394	.394	95	3.937	.000	CC..32.5..
SCLCR1010X06N	R	.394	.394	.394	95	4.724	.000	CC..21.5..
SCLCR1010X09N	R	.394	.394	.394	95	4.724	.000	CC..32.5..
SCLCR1212GX09N	R	.472	.472	.472	95	3.346	.000	CC..32.5..
SCLCR1212X09N	R	.472	.472	.472	95	4.724	.000	CC..32.5..
SCLCR1616X09N	R	.630	.630	.630	95	4.724	.000	CC..32.5..
SCLCL0808X06N	L	.315	.315	.315	95	4.724	.000	CC..21.5..
SCLCL1010X06N	L	.394	.394	.394	95	4.724	.000	CC..21.5..
SCLCL1010X09N	L	.394	.394	.394	95	4.724	.000	CC..32.5..
SCLCL1212GX09N	L	.472	.472	.472	95	3.346	.000	CC..32.5..
SCLCL1212X09N	L	.472	.472	.472	95	4.724	.000	CC..32.5..
SCLCL1616X09N	L	.630	.630	.630	95	4.724	.000	CC..32.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SCLCR062C	LRIS-2.5*7	CLR-15S
SCLCR082C	LRIS-2.5*7	CLR-15S
SCLCR083C	LRIS-4*10	LLR-25S
SCLCR103C	LRIS-4*10	LLR-25S
SCLCL062C	LRIS-2.5*7	CLR-15S
SCLCL082C	LRIS-2.5*7	CLR-15S
SCLCL083C	LRIS-4*10	LLR-25S
SCLCL103C	LRIS-4*10	LLR-25S
SCLCR0808X06N	LRIS-2.5*7	CLR-15S
SCLCR1010H09N	LRIS-4*10	LLR-25S
SCLCR1010X06N	LRIS-2.5*7	CLR-15S
SCLCR1010X09N	LRIS-4*10	LLR-25S
SCLCR1212GX09N	LRIS-4*10	LLR-25S
SCLCR1212X09N	LRIS-4*10	LLR-25S
SCLCR1616X09N	LRIS-4*10	LLR-25S
SCLCL0808X06N	LRIS-2.5*7	CLR-15S
SCLCL1010X06N	LRIS-2.5*7	CLR-15S
SCLCL1010X09N	LRIS-4*10	LLR-25S
SCLCL1212GX09N	LRIS-4*10	LLR-25S
SCLCL1212X09N	LRIS-4*10	LLR-25S
SCLCL1616X09N	LRIS-4*10	LLR-25S

SCLC-N-F [95°] Shifted





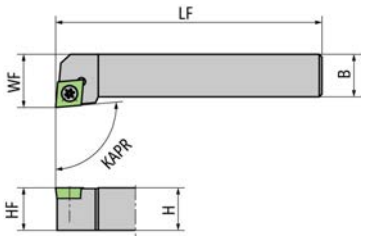
● Diagram shows right-hand tool

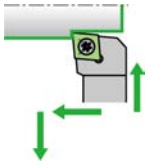
Item Number	Hand	B	H	HBKW	HF	KAPR	LF	LU	WF2	Insert Gage
		inch	inch	inch	inch	°	inch	inch	inch	
SCLCR083C-F250	R	.728	1/2	–	1/2	95	4.724	.591	1/4	CC..32.5..
SCLCR083C-F500	R	.984	1/2	–	1/2	95	4.724	.591	1/2	CC..32.5..
SCLCR1015X09N-F05	R	.591	.394	.079	.394	95	4.724	.472	.197	CC..32.5..
SCLCR1020X09N-F10	R	.787	.394	.079	.394	95	4.724	.472	.394	CC..32.5..
SCLCR1218X09N-F06	R	.709	.472	–	.472	95	4.724	.472	.236	CC..32.5..
SCLCR1224X09N-F12	R	.945	.472	–	.472	95	4.724	.472	.472	CC..32.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SCLCR083C-F250	LRIS-4*10	LLR-25S
SCLCR083C-F500	LRIS-4*10	LLR-25S
SCLCR1015X09N-F05	LRIS-4*10	LLR-25S
SCLCR1020X09N-F10	LRIS-4*10	LLR-25S
SCLCR1218X09N-F06	LRIS-4*10	LLR-25S
SCLCR1224X09N-F12	LRIS-4*10	LLR-25S

SCLC [95°]





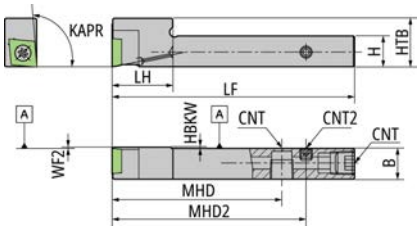
● Diagram shows right-hand tool

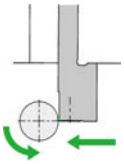
Item Number	Hand	B	H	HF	KAPR	LF	WF	Insert Gage
		inch	inch	inch	°	inch	inch	
SCLCR20-X09	R	.787	.787	.787	95	4.724	.945	CC..32.5..
SCLCL20-X09	L	.787	.787	.787	95	4.724	.945	CC..32.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SCLCR20-X09	LRIS-4*10	LLR-25S
SCLCL20-X09	LRIS-4*10	LLR-25S

Y-SCLC-OH2 [93 °] Y-axis Direct connect coolant port 1-hole type





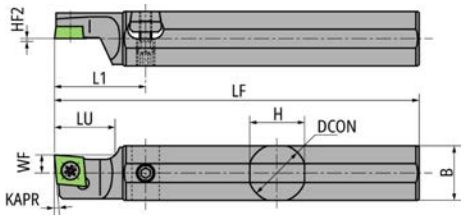
● Diagram shows right-hand tool
NOTE: Use a right-handed (R) or non-handed insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

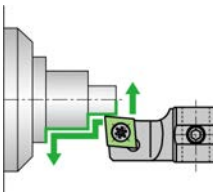
Item Number	Hand	B	CNT	CNT2	H	HBKW	HTB	KAPR	LF	LH	MHD	MHD2	WF2	Insert Gage
		inch			inch	inch	inch	°	inch	inch	inch	inch	inch	
Y-SCLCR083H-IN-OH2	R	1/2	NPT1/8	M5	1/2	.020	.787	95	3.937	.984	2.756	3.150	.000	CC..32.5..
Y-SCLCR103H-IN-OH2	R	5/8	NPT1/8	M5	5/8	.020	.787	95	3.937	.984	2.756	3.150	.000	CC..32.5..
Y-SCLCR1212H09S-OH2	R	.472	Rc1/8	M5	.472	.020	.787	95	3.937	.787	2.756	3.150	.000	CC..32.5..
Y-SCLCR1616H09S-OH2	R	.630	Rc1/8	M5	.630	.020	.787	95	3.937	.787	2.756	3.150	.000	CC..32.5..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
Y-SCLCR083H-IN-OH2	LRIS-4*8	SPNPT1/8	SS0505SC	LLR25S-20*65	LW-2.5
Y-SCLCR103H-IN-OH2	LRIS-4*8	SPNPT1/8	SS0505SC	LLR25S-20*65	LW-2.5
Y-SCLCR1212H09S-OH2	LRIS-4*8	SPR1/8	SS0505SC	LLR25S-20*65	LW-2.5
Y-SCLCR1616H09S-OH2	LRIS-4*8	SPR1/8	SS0505SC	LLR25S-20*65	LW-2.5

DS-SCL-ACH [95°] Adjustable centerline height





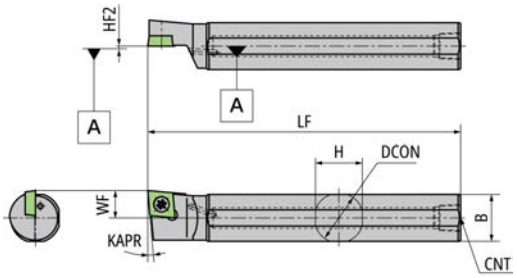
● Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

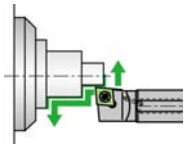
Item Number	Hand	B	DCON	H	HF2	KAPR	LF	LU	L1	WF	Insert Gage
		inch	inch	inch	inch	°	inch	inch	inch	inch	
DS-SCLL16F-09-ACH	L	.610	.630	.610	Type B(0~+.012)	95	3.150	.787	1.181	.236	CC..32.5..
DS-SCLL19-09-ACH	L	.709	3/4	.709	Type A(0~+.008)	95	4.724	.787	1.181	.236	CC..32.5..
DS-SCLL20-09-ACH	L	.748	.787	.748	Type A(0~+.008)	95	4.724	.787	1.181	.236	CC..32.5..
DS-SCLL22-09-ACH	L	.827	.866	.827	Type A(0~+.008)	95	4.724	.787	1.181	.236	CC..32.5..
DS-SCLL25-09-ACH	L	.945	1.000	.945	Type A(0~+.008)	95	5.906	.787	1.181	.236	CC..32.5..
DS-SCLL25-09MET-ACH	L	.945	.984	.945	Type A(0~+.008)	95	5.906	.787	1.181	.236	CC..32.5..

Spare Parts

Item Number	Clamp screw	Screw (for Wedge)	Wedge	Wrench (for Clamp screw)	Wrench (for Wedge)
DS-SCLL16F-09-ACH	LRIS-4*8	WS060415-003	ACH-W18	LLR-25S-20*65	LW-3
DS-SCLL19-09-ACH	LRIS-4*8	WS060415-003	ACH-W18	LLR-25S-20*65	LW-3
DS-SCLL20-09-ACH	LRIS-4*8	WS060419-004	ACH-W18	LLR-25S-20*65	LW-3
DS-SCLL22-09-ACH	LRIS-4*8	WS060419-004	ACH-W18	LLR-25S-20*65	LW-3
DS-SCLL25-09-ACH	LRIS-4*8	WS060419-004	ACH-W24	LLR-25S-20*65	LW-3
DS-SCLL25-09MET-ACH	LRIS-4*8	WS060419-004	ACH-W24	LLR-25S-20*65	LW-3

DS-SCL-004,005 [95°] DS Toolholders Coolant hose connection type





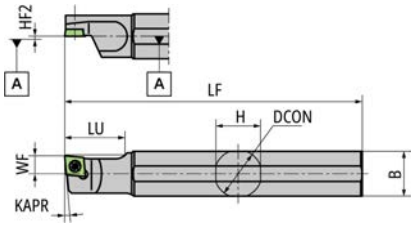
● Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

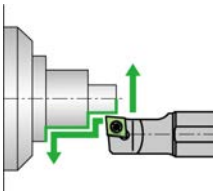
Item Number	Hand	B	CNT	DCON	H	HF2	KAPR	LF	LU	WF	Insert Gage
		inch		inch	inch	inch	°	inch	inch	inch	
DS-SCLL19-09-004	L	.709	NPT1/8	3/4	.709	.000	95	4.724	.787	.413	CC..32.5..
DS-SCLL22-09-005	L	.827	NPT1/8	.866	.827	.000	95	4.724	.787	.472	CC..32.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-SCLL19-09-004	LRIS-4*8	LLR-25S-20*65
DS-SCLL22-09-005	LRIS-4*8	LLR-25S-20*65

DS-SCL [95°] DS Toolholders





● Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

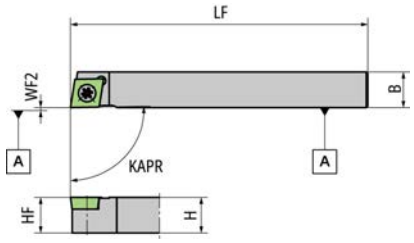
Item Number	Hand	B	DCON	H	HF2	KAPR	LF	LU	WF	Insert Gage
		inch	inch	inch	inch	°	inch	inch	inch	
DS-SCLL14F-06	L	.512	.551	.512	.000	95	3.150	.787	.236	CC..21.5..
DS-SCLL14F-09	L	.512	.551	.512	.000	95	3.150	.787	.236	CC..32.5..
DS-SCLL15H-06	L	.591	5/8	.591	.000	95	3.937	.787	.236	CC..21.5..
DS-SCLL15H-09	L	.591	5/8	.591	.000	95	3.937	.787	.236	CC..32.5..
DS-SCLL16F-06	L	.591	.630	.591	.000	95	3.150	.787	.236	CC..21.5..
DS-SCLL16F-09	L	.591	.630	.591	.000	95	3.150	.787	.236	CC..32.5..
DS-SCLL19-06	L	.709	3/4	.709	.000	95	4.724	.787	.236	CC..21.5..
DS-SCLL19-09	L	.709	3/4	.709	.000	95	4.724	.787	.236	CC..32.5..
DS-SCLL19GX-09	L	.709	3/4	.709	.000	95	3.346	.787	.236	CC..32.5..
DS-SCLL20-06	L	.748	.787	.748	.000	95	4.724	.787	.236	CC..21.5..
DS-SCLL20-09	L	.748	.787	.748	.000	95	4.724	.787	.236	CC..32.5..
DS-SCLL20X-06	L	.748	.787	.748	.000	95	3.740	.787	.236	CC..21.5..
DS-SCLL20X-09	L	.748	.787	.748	.000	95	3.740	.787	.236	CC..32.5..
DS-SCLL22-06	L	.827	.866	.827	.000	95	4.724	.787	.236	CC..21.5..
DS-SCLL22-09	L	.827	.866	.827	.000	95	4.724	.787	.236	CC..32.5..
DS-SCLL25-06	L	.945	1.000	.945	.000	95	4.724	.787	.236	CC..21.5..
DS-SCLL25-06MET	L	.945	.984	.945	.000	95	4.724	.787	.236	CC..21.5..
DS-SCLL25-09	L	.945	1.000	.945	.000	95	5.906	.787	.236	CC..32.5..
DS-SCLL25-09MET	L	.945	.984	.945	.000	95	4.724	.787	.236	CC..32.5..
DS-SCLL32-09	L	1.181	1.260	1.181	.000	95	5.906	.787	.236	CC..32.5..

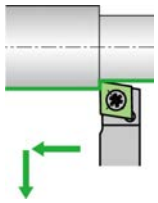
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-SCLL14F-06	LRIS-2.5*7	CLR-15S
DS-SCLL14F-09	LRIS-4*8	LLR-25S-20*65
DS-SCLL15H-06	LRIS-2.5*7	CLR-15S
DS-SCLL15H-09	LRIS-4*8	LLR-25S-20*65
DS-SCLL16F-06	LRIS-2.5*7	CLR-15S
DS-SCLL16F-09	LRIS-4*8	LLR-25S-20*65
DS-SCLL19-06	LRIS-2.5*7	CLR-15S
DS-SCLL19-09	LRIS-4*8	LLR-25S-20*65
DS-SCLL19GX-09	LRIS-4*8	LLR-25S-20*65
DS-SCLL20-06	LRIS-2.5*7	CLR-15S
DS-SCLL20-09	LRIS-4*8	LLR-25S-20*65
DS-SCLL20X-06	LRIS-2.5*7	CLR-15S
DS-SCLL20X-09	LRIS-4*8	LLR-25S-20*65
DS-SCLL22-06	LRIS-2.5*7	CLR-15S
DS-SCLL22-09	LRIS-4*8	LLR-25S-20*65
DS-SCLL25-06	LRIS-2.5*7	CLR-15S
DS-SCLL25-06MET	LRIS-2.5*7	CLR-15S
DS-SCLL25-09	LRIS-4*8	LLR-25S-20*65
DS-SCLL25-09MET	LRIS-4*8	LLR-25S-20*65
DS-SCLL32-09	LRIS-4*8	LLR-25S-20*65

CC.. Series/Toolholder

SCAC [91°]





● Diagram shows right-hand tool

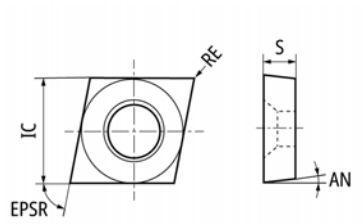
Item Number	Hand	B	H	HF	KAPR	LF	WF2	Insert Gage
		inch	inch	inch	°	inch	inch	
SCACR083C	R	.500	.500	.500	91	4.724	.000	CC..32.5..
SCACR0808X06N	R	.315	.315	.315	91	4.724	.000	CC..21.5..
SCACR1010X06N	R	.394	.394	.394	91	4.724	.000	CC..21.5..
SCACR1212GX09N	R	.472	.472	.472	91	3.346	.000	CC..32.5..
SCACR1212X09N	R	.472	.472	.472	91	4.724	.000	CC..32.5..
SCACL0808X06N	L	.315	.315	.315	91	4.724	.000	CC..21.5..
SCACL1010X06N	L	.394	.394	.394	91	4.724	.000	CC..21.5..
SCACL1212X09N	L	.472	.472	.472	91	4.724	.000	CC..32.5..

Spare Parts

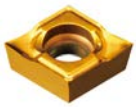
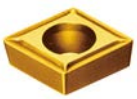
Item Number	Clamp screw	Wrench (for Clamp screw)
SCACR083C	LRIS-4*10	LLR-25S
SCACR0808X06N	LRIS-2.5*7	CLR-15S
SCACR1010X06N	LRIS-2.5*7	CLR-15S
SCACR1212GX09N	LRIS-4*10	LLR-25S
SCACR1212X09N	LRIS-4*10	LLR-25S
SCACL0808X06N	LRIS-2.5*7	CLR-15S
SCACL1010X06N	LRIS-2.5*7	CLR-15S
SCACL1212X09N	LRIS-4*10	LLR-25S

CC.. series/Inserts Carbide

CC..



Steel	○ ○ ● ● ● ● ● ● ●
Stainless Steel	○ ● ○ ○ ○ ● ○ ● ●
Cast Iron	●
Non-Ferrous Material	○ ○ ●
Heat Resistant Alloy	● ● ○ ○
Hardened Material	○ ○ ○
Others (non-metallic)	●

Shape	Item Number (Inch)	Item Number (Metric)	EPSR	IC	S	AN	RE	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
			°	inch	inch	°	inch											
	CCGT 32.504M R TMV	CCGT 09T301M R TMV	80	3/8	5/32	7	.003	●	●	●			●					
	CCGT 32.508M R TMV	CCGT 09T302M R TMV	80	3/8	5/32	7	.007	●	●	●			●					
	CCGT 32.51M R TMV	CCGT 09T304M R TMV	80	3/8	5/32	7	.015	●	●	●			●					
	CCGT 32.501 YL	CCGT 09T300 YL	80	3/8	5/32	7	.001				●		●					
	CCGT 32.504M YL	CCGT 09T301M YL	80	3/8	5/32	7	.003	●	●	●	●	●	●					
	CCGT 32.508M YL	CCGT 09T302M YL	80	3/8	5/32	7	.007	●	●	●	●	●	●					
	CCGT 32.51M YL	CCGT 09T304M YL	80	3/8	5/32	7	.015	●	●	●	●	●	●					
	CCGT 32.52M YL	CCGT 09T308M YL	80	3/8	5/32	7	.031		●	●	●	●	●					
	CCGT 21.504M CL	CCGT 060201M CL	80	1/4	3/32	7	.003		●	●	●	●	●					
	CCGT 21.508M CL	CCGT 060202M CL	80	1/4	3/32	7	.007		●	●	●	●	●					
	CCGT 32.501 CL	CCGT 09T300 CL	80	3/8	5/32	7	.001				●		●					
	CCGT 32.504M CL	CCGT 09T301M CL	80	3/8	5/32	7	.003	●	●	●	●	●	●					
	CCGT 32.508M CL	CCGT 09T302M CL	80	3/8	5/32	7	.007	●	●	●	●	●	●					
	CCGT 32.51M CL	CCGT 09T304M CL	80	3/8	5/32	7	.015	●	●	●	●	●	●					
	CCGT 21.501 FN AM3	CCGT 060200 FN AM3	80	1/4	3/32	7	.001				●	●	●	●				
	CCGT 21.504M FN AM3	CCGT 060201M FN AM3	80	1/4	3/32	7	.003		●		●	●	●					
	CCGT 21.508 FN AM3	CCGT 060202 FN AM3	80	1/4	3/32	7	.008							●	●			
	CCGT 21.508M FN AM3	CCGT 060202M FN AM3	80	1/4	3/32	7	.007		●		●	●	●					
	CCGT 21.51 FN AM3	CCGT 060204 FN AM3	80	1/4	3/32	7	.016								●			
	CCGT 21.51M FN AM3	CCGT 060204M FN AM3	80	1/4	3/32	7	.015		●		●	●	●					
	CCGT 32.501 FN AM3	CCGT 09T300 FN AM3	80	3/8	5/32	7	.001				●	●	●	●				
	CCGT 32.504M FN AM3	CCGT 09T301M FN AM3	80	3/8	5/32	7	.003	●	●		●	●	●	●	●			
	CCGT 32.508 FN AM3	CCGT 09T302 FN AM3	80	3/8	5/32	7	.008					●		●				
	CCGT 32.508M FN AM3	CCGT 09T302M FN AM3	80	3/8	5/32	7	.007	●	●		●	●	●	●	●			
	CCGT 32.51 FN AM3	CCGT 09T304 FN AM3	80	3/8	5/32	7	.016					●		●				
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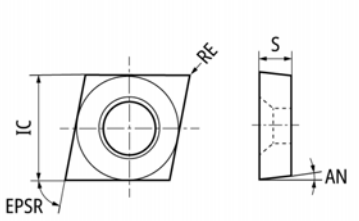
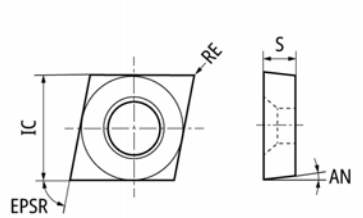
	CCMT 21.51 FN AM3	CCMT 060204 FN AM3	80	1/4	3/32	7	.016			●								
	CCMT 32.508 FN AM3	CCMT 09T302 FN AM3	80	3/8	5/32	7	.008			●								
	CCMT 32.51 FN AM3	CCMT 09T304 FN AM3	80	3/8	5/32	7	.016			●								
	CCMT 32.52 FN AM3	CCMT 09T308 FN AM3	80	3/8	5/32	7	.031			●								
	CCGT 21.501 AZ7	CCGT 060200 AZ7	80	1/4	3/32	7	.001					●						
	CCGT 21.504M AZ7	CCGT 060201M AZ7	80	1/4	3/32	7	.003					●						
	CCGT 21.508M AZ7	CCGT 060202M AZ7	80	1/4	3/32	7	.007					●						
	CCGT 32.501 AZ7	CCGT 09T300 AZ7	80	3/8	5/32	7	.001				●	●	●		●			
	CCGT 32.504M AZ7	CCGT 09T301M AZ7	80	3/8	5/32	7	.003				●	●	●		●			
	CCGT 32.508M AZ7	CCGT 09T302M AZ7	80	3/8	5/32	7	.007				●	●	●		●			
	CCGT 32.51M AZ7	CCGT 09T304M AZ7	80	3/8	5/32	7	.015				●	●	●		●			
	CCMT 21.508 E01 AZ8	CCMT 060202 E002 AZ8	80	1/4	3/32	7	.008										●	
	CCMT 21.51 E02 AZ8	CCMT 060204 E004 AZ8	80	1/4	3/32	7	.016										●	
	CCMT 21.52 E02 AZ8	CCMT 060208 E004 AZ8	80	1/4	3/32	7	.031										●	
	CCMT 32.508 E01 AZ8	CCMT 09T302 E002 AZ8	80	3/8	5/32	7	.008										●	
	CCMT 32.51 E02 AZ8	CCMT 09T304 E004 AZ8	80	3/8	5/32	7	.016										●	
	CCMT 32.52 E02 AZ8	CCMT 09T308 E004 AZ8	80	3/8	5/32	7	.031										●	

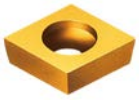


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

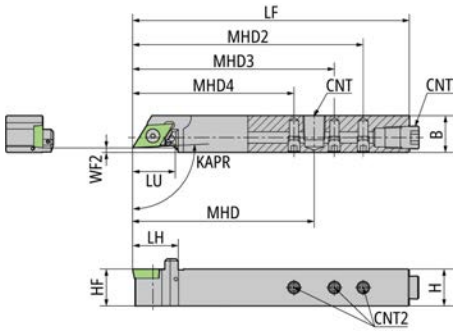
Shape	Item Number		EPSR	IC	S	AN	RE	Carbide										
								PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	CCGT 21.501 R S	CCGT 060200 R S	80	1/4	3/32	7	.001				●	●		●	●			
	CCGT 21.501 L S	CCGT 060200 L S	80	1/4	3/32	7	.001							●	●			
	CCGT 21.504M R S	CCGT 060201M R S	80	1/4	3/32	7	.003				●	●						
	CCGT 21.504 R S	CCGT 060201 R S	80	1/4	3/32	7	.004							●	●			
	CCGT 21.504 L S	CCGT 060201 L S	80	1/4	3/32	7	.004							●	●			
	CCGT 21.508M R S	CCGT 060202M R S	80	1/4	3/32	7	.007				●	●						
	CCGT 21.508 R S	CCGT 060202 R S	80	1/4	3/32	7	.008							●	●			
	CCGT 21.508 L S	CCGT 060202 L S	80	1/4	3/32	7	.008							●	●			
	CCGT 21.51 R S	CCGT 060204 R S	80	1/4	3/32	7	.016					●						
	CCGT 32.501 R S	CCGT 09T300 R S	80	3/8	5/32	7	.001				●	●	●	●	●			
	CCGT 32.501 L S	CCGT 09T300 L S	80	3/8	5/32	7	.001							●				
	CCGT 32.504M R S	CCGT 09T301M R S	80	3/8	5/32	7	.003				●	●	●					
	CCGT 32.504 R S	CCGT 09T301 R S	80	3/8	5/32	7	.004					●		●	●			
	CCGT 32.504 L S	CCGT 09T301 L S	80	3/8	5/32	7	.004							●	●			
	CCGT 32.508M R S	CCGT 09T302M R S	80	3/8	5/32	7	.007				●	●	●					
	CCGT 32.508 R S	CCGT 09T302 R S	80	3/8	5/32	7	.008					●		●	●			
	CCGT 32.508 L S	CCGT 09T302 L S	80	3/8	5/32	7	.008							●				
	CCGT 32.51M R S	CCGT 09T304M R S	80	3/8	5/32	7	.015				●	●	●					
	CCGT 32.51 R S	CCGT 09T304 R S	80	3/8	5/32	7	.016					●						
	CCGT 21.501 R U	CCGT 060200 R U	80	1/4	3/32	7	.001				●				●			
	CCGT 21.504 R U	CCGT 060201 R U	80	1/4	3/32	7	.004				●				●			
	CCGT 21.504 L U	CCGT 060201 L U	80	1/4	3/32	7	.004								●			
	CCGT 21.508 R U	CCGT 060202 R U	80	1/4	3/32	7	.008				●				●			
	CCGT 21.508 L U	CCGT 060202 L U	80	1/4	3/32	7	.008								●			
	CCGT 32.501 R U1	CCGT 09T300 R U1	80	3/8	5/32	7	.001				●		●		●			
	CCGT 32.501 L U1	CCGT 09T300 L U1	80	3/8	5/32	7	.001								●			
	CCGT 32.504 R U1	CCGT 09T301 R U1	80	3/8	5/32	7	.004				●		●		●			
	CCGT 32.504 L U1	CCGT 09T301 L U1	80	3/8	5/32	7	.004								●			
	CCGT 32.508 R U1	CCGT 09T302 R U1	80	3/8	5/32	7	.008				●		●		●			
	CCGT 32.508 L U1	CCGT 09T302 L U1	80	3/8	5/32	7	.008								●			
	CCGT 32.51 R U1	CCGT 09T304 R U1	80	3/8	5/32	7	.016				●		●		●			
	CCGT 32.51 L U1	CCGT 09T304 L U1	80	3/8	5/32	7	.016								●			
	CCET 21.502 R KHG	CCET 0602005 R KHG	80	1/4	3/32	7	.002							●				
	CCET 21.502 L KHG	CCET 0602005 L KHG	80	1/4	3/32	7	.002							●				
	CCET 21.503 R KHG	CCET 0602008 R KHG	80	1/4	3/32	7	.003							●				
	CCET 21.503 L KHG	CCET 0602008 L KHG	80	1/4	3/32	7	.003							●				
	CCET 21.507 R KHG	CCET 0602018 R KHG	80	1/4	3/32	7	.007							●				
	CCET 21.507 L KHG	CCET 0602018 L KHG	80	1/4	3/32	7	.007							●				
	CCET 21.508 R KHG	CCET 060202 R KHG	80	1/4	3/32	7	.008							●				
	CCET 21.508 L KHG	CCET 060202 L KHG	80	1/4	3/32	7	.008							●				
	CCET 32.502 R KHG	CCET 09T3005 R KHG	80	3/8	5/32	7	.002						●	●				
	CCET 32.502 L KHG	CCET 09T3005 L KHG	80	3/8	5/32	7	.002							●				
	CCET 32.503 R KHG	CCET 09T3008 R KHG	80	3/8	5/32	7	.003						●	●				
	CCET 32.503 L KHG	CCET 09T3008 L KHG	80	3/8	5/32	7	.003							●				
	CCET 32.507 R KHG	CCET 09T3018 R KHG	80	3/8	5/32	7	.007						●	●				
	CCET 32.507 L KHG	CCET 09T3018 L KHG	80	3/8	5/32	7	.007							●				
	CCET 32.508 R KHG	CCET 09T302 R KHG	80	3/8	5/32	7	.008						●	●				
	CCET 32.508 L KHG	CCET 09T302 L KHG	80	3/8	5/32	7	.008							●				
	CCGT 21.504 FR F1	CCGT 060201 FR F1	80	1/4	3/32	7	.004		●			●	●					
	CCGT 21.508 FR F1	CCGT 060202 FR F1	80	1/4	3/32	7	.008		●			●	●					
	CCGT 21.51 FR F1	CCGT 060204 FR F1	80	1/4	3/32	7	.016		●			●	●					
	CCGT 32.508 FR F1	CCGT 09T302 FR F1	80	3/8	3/32	7	.008		●			●	●					
	CCGT 32.51 FR F1	CCGT 09T304 FR F1	80	3/8	3/32	7	.016		●			●	●					

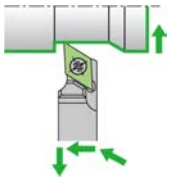


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number (Inch)	Item Number (Metric)	EPSR	IC	S	AN	RE	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
			°	inch	inch	°	inch											
	CCGW 21.501 FN	CCGW 060200 FN	80	1/4	3/32	7	.001								●			
	CCGW 21.501 H Ⓜ	CCGW 060200 H Ⓜ	80	1/4	3/32	7	.001											●
	CCGW 21.504 FN	CCGW 060201 FN	80	1/4	3/32	7	.004								●			
	CCGW 21.504 H Ⓜ	CCGW 060201 H Ⓜ	80	1/4	3/32	7	.004											●
	CCGW 21.508 H Ⓜ	CCGW 060202 H Ⓜ	80	1/4	3/32	7	.008											●
	CCGW 32.500 V Ⓜ	CCGW 09T30 V Ⓜ	80	3/8	5/32	7	.000							●				
	CCGW 32.501 FN	CCGW 09T300 FN	80	3/8	5/32	7	.001								●			
	CCGW 32.501 H Ⓜ	CCGW 09T300 H Ⓜ	80	3/8	5/32	7	.001											●
	CCGW 32.504 FN	CCGW 09T301 FN	80	3/8	5/32	7	.004								●			
	CCGW 32.504 H Ⓜ	CCGW 09T301 H Ⓜ	80	3/8	5/32	7	.004											●
	CCGW 32.504 P Ⓜ	CCGW 09T301 P Ⓜ	80	3/8	5/32	7	.004							●				
	CCGW 32.508 H Ⓜ	CCGW 09T302 H Ⓜ	80	3/8	5/32	7	.008											●
	CCGW 32.508M P	CCGW 09T302M P	80	3/8	5/32	7	.007				●							
	CCGW 32.508 P Ⓜ	CCGW 09T302 P Ⓜ	80	3/8	5/32	7	.008							●				

SDJC-N-OH3 [93 °] Direct connect coolant port 3-hole type





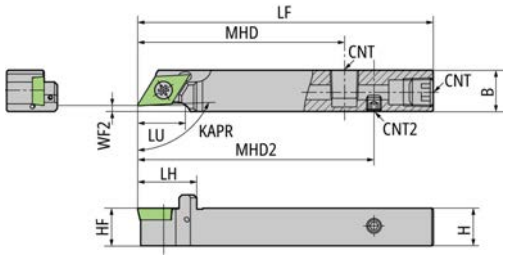
● Diagram shows right-hand tool

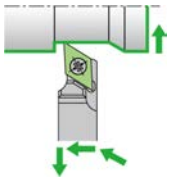
Item Number	Hand	B	CNT	CNT2	H	HF	KAPR	LF	LH	LU	MHD	MHD2	MHD3	MHD4	WF2	Insert Gage	
		inch			inch	inch	°	inch	inch	inch	inch	inch	inch	inch	inch		
SDJCR103XL-F079-OH3	R	5/8	NPT1/8	M5	5/8	5/8	93	4.724	.780	.724	3.100	3.937	3.445	2.756	.079	DC..32.5..	DC..32.5..WP
SDJCR1012H11N-OH3	R	.472	M6*1	M5	.394	.394	93	3.937	.661	.630	2.461	3.150	2.756	2.165	.000	DC..32.5..	DC..32.5..WP
SDJCR1616X11N-F02OH3	R	.630	Rc1/8	M5	.630	.630	93	4.724	.780	.724	3.100	3.937	3.445	2.756	.079	DC..32.5..	DC..32.5..WP

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
SDJCR103XL-F079-OH3	LRIS-4*10	SPNPT1/8	SS0505SC	LLR-25S	LW-2.5
SDJCR1012H11N-OH3	LRIS-4*10	SS0605SC	SS0505SC	LLR-25S	LW-2.5
SDJCR1616X11N-F02OH3	LRIS-4*10	SPR1/8	SS0505SC	LLR-25S	LW-2.5

SDJC-N-OH2 [93 °] Direct connect coolant port 1-hole type





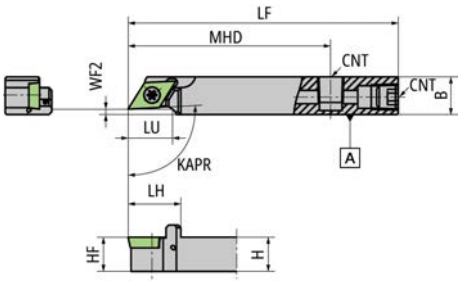
● Diagram shows right-hand tool

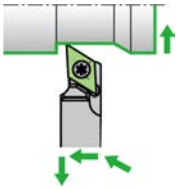
Item Number	Hand	B	CNT	CNT2	H	HF	KAPR	LF	LH	LU	MHD	MHD2	WF2	Insert Gage	
		inch			inch	inch	°	inch	inch	inch	inch	inch	inch		
SDJCR083H-F079-OH2	R	.551	NPT1/8	M5	1/2	1/2	93	3.937	.787	.630	2.756	3.150	.079	DC..32.5..	DC..32.5..WP
SDJCR083H-F500-OH2	R	.972	NPT1/8	M5	1/2	1/2	93	3.937	.787	.630	2.559	3.150	.500	DC..32.5..	DC..32.5..WP
SDJCR103XL-F079-OH2	R	5/8	NPT1/8	M5	5/8	5/8	93	4.724	.787	.724	2.756	3.937	.079	DC..32.5..	DC..32.5..WP
SDJCR1214H11N-F02OH2	R	.551	Rc1/8	M5	.472	.472	93	3.937	.768	.630	2.756	3.150	.079	DC..32.5..	DC..32.5..WP
SDJCR1616X11N-F02OH2	R	.630	Rc1/8	M5	.630	.630	93	4.724	.768	.724	2.756	3.937	.079	DC..32.5..	DC..32.5..WP

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
SDJCR083H-F079-OH2	LRIS-4*10	SPNPT1/8	SS0505SC	LLR-25S	LW-2.5
SDJCR083H-F500-OH2	LRIS-4*10	SPNPT1/8	SS0505SC	LLR-25S	LW-2.5
SDJCR103XL-F079-OH2	LRIS-4*10	SPNPT1/8L	SS0505SC	LLR-25S	LW-2.5
SDJCR1214H11N-F02OH2	LRIS-4*10	SPR1/8	SS0505SC	LLR-25S	LW-2.5
SDJCR1616X11N-F02OH2	LRIS-4*10	SPNPT1/8L	SS0505SC	LLR-25S	LW-2.5

SDJC-N-OH [93 °] Coolant hose connection type





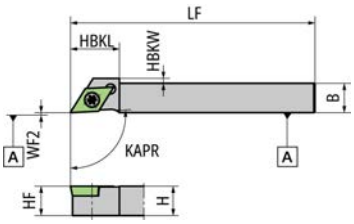
● Diagram shows right-hand tool

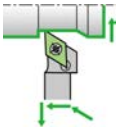
Item Number	Hand	B	CNT	H	HF	KAPR	LF	LH	LU	MHD	WF2	Insert Gage	
		inch		inch	inch	°	inch	inch	inch	inch	inch		
SDJCR082H-F079-OH	R	.551	NPT1/8	1/2	1/2	93	3.937	.768	.630	2.953	.079	DC..21.5..	DC..21.5..WP
SDJCR083H-F079-OH	R	.551	NPT1/8	1/2	1/2	93	3.937	.768	.630	2.953	.079	DC..32.5..	DC..32.5..WP
SDJCR103HL-F079-OH	R	5/8	NPT1/8	5/8	5/8	93	3.937	.768	.724	2.953	.079	DC..32.5..	DC..32.5..WP
SDJCR1014F11N-F02OH	R	.551	M6*1	.394	.394	93	3.150	.768	.630	2.165	.079	DC..32.5..	DC..32.5..WP
SDJCR1214H11N-F02OH	R	.551	Rc1/8	.472	.472	93	3.937	.768	.630	2.953	.079	DC..32.5..	DC..32.5..WP
SDJCR1616H11N-F02OH	R	.630	Rc1/8	.630	.630	93	3.937	.768	.724	2.953	.079	DC..32.5..	DC..32.5..WP

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)	Wrench (for CNT)
SDJCR082H-F079-OH	LRIS-2.5*7	SPNPT1/8	CLR-15S	–
SDJCR083H-F079-OH	LRIS-4*10	SPNPT1/8	LLR-25S	–
SDJCR103HL-F079-OH	LRIS-4*10	SPNPT1/8	LLR-25S	–
SDJCR1014F11N-F02OH	LRIS-4*10	SS0605SC	LLR-25S	LW-3
SDJCR1214H11N-F02OH	LRIS-4*10	SPR1/8	LLR-25S	–
SDJCR1616H11N-F02OH	LRIS-4*10	SPR1/8	LLR-25S	–

SDJC-N [93°]





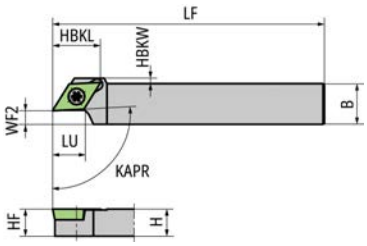
● Diagram shows right-hand tool

Item Number	Hand	B	H	HBKL	HBKW	HF	KAPR	LF	WF2	Insert Gage	
		inch	inch	inch	inch	inch	°	inch	inch		
SDJCR-062C	R	3/8	3/8	–	–	3/8	93	4.724	.000	DC..21.5..	DC..21.5..WP
SDJCR-082C	R	1/2	1/2	–	–	1/2	93	4.724	.000	DC..21.5..	DC..21.5..WP
SDJCR-083C	R	1/2	1/2	–	–	1/2	93	4.724	.000	DC..32.5..	DC..32.5..WP
SDJCR-103C	R	5/8	5/8	–	–	5/8	93	4.724	.000	DC..32.5..	DC..32.5..WP
SDJCL-062C	L	3/8	3/8	–	–	3/8	93	4.724	.000	DC..21.5..	DC..21.5..WP
SDJCL-082C	L	1/2	1/2	–	–	1/2	93	4.724	.000	DC..21.5..	DC..21.5..WP
SDJCL-083C	L	1/2	1/2	–	–	1/2	93	4.724	.000	DC..32.5..	DC..32.5..WP
SDJCL-103C	L	5/8	5/8	–	–	5/8	93	4.724	.000	DC..32.5..	DC..32.5..WP
SDJCR0808X07N	R	.315	.315	–	–	.315	93	4.724	.000	DC..21.5..	DC..21.5..WP
SDJCR1010GX07N	R	.394	.394	–	–	.394	93	3.346	.000	DC..21.5..	DC..21.5..WP
SDJCR1010H11N	R	.394	.394	.748	.079	.394	93	3.937	.000	DC..32.5..	DC..32.5..WP
SDJCR1010X07N	R	.394	.394	–	–	.394	93	4.724	.000	DC..21.5..	DC..21.5..WP
SDJCR1010X11N	R	.394	.394	.748	.079	.394	93	4.724	.000	DC..32.5..	DC..32.5..WP
SDJCR1012X11N	R	.472	.394	–	–	.472	93	4.724	.000	DC..32.5..	DC..32.5..WP
SDJCR1212GX11N	R	.472	.472	–	–	.472	93	3.346	.000	DC..32.5..	DC..32.5..WP
SDJCR1212X07N	R	.472	.472	–	–	.472	93	4.724	.000	DC..21.5..	DC..21.5..WP
SDJCR1212X11N	R	.472	.472	–	–	.472	93	4.724	.000	DC..32.5..	DC..32.5..WP
SDJCR1216GX11N	R	.630	.472	–	–	.472	93	3.346	.000	DC..32.5..	DC..32.5..WP
SDJCR1616X11N	R	.630	.630	–	–	.630	93	4.724	.000	DC..32.5..	DC..32.5..WP
SDJCL0808X07N	L	.315	.315	–	–	.315	93	4.724	.000	DC..21.5..	DC..21.5..WP
SDJCL1010X07N	L	.394	.394	–	–	.394	93	4.724	.000	DC..21.5..	DC..21.5..WP
SDJCL1010X11N	L	.394	.394	.748	.079	.394	93	4.724	.000	DC..32.5..	DC..32.5..WP
SDJCL1212GX11N	L	.472	.472	–	–	.472	93	3.346	.000	DC..32.5..	DC..32.5..WP
SDJCL1212X11N	L	.472	.472	–	–	.472	93	4.724	.000	DC..32.5..	DC..32.5..WP
SDJCL1616X11N	L	.630	.630	–	–	.630	93	4.724	.000	DC..32.5..	DC..32.5..WP

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SDJCR-062C	LRIS-2.5*7	CLR-15S
SDJCR-082C	LRIS-2.5*7	CLR-15S
SDJCR-083C	LRIS-4*10	LLR-25S
SDJCR-103C	LRIS-4*10	LLR-25S
SDJCL-062C	LRIS-2.5*7	CLR-15S
SDJCL-082C	LRIS-2.5*7	CLR-15S
SDJCL-083C	LRIS-4*10	LLR-25S
SDJCL-103C	LRIS-4*10	LLR-25S
SDJCR0808X07N	LRIS-2.5*7	CLR-15S
SDJCR1010GX07N	LRIS-2.5*7	CLR-15S
SDJCR1010H11N	LRIS-4*10	LLR-25S
SDJCR1010X07N	LRIS-2.5*7	CLR-15S
SDJCR1010X11N	LRIS-4*10	LLR-25S
SDJCR1212GX11N	LRIS-4*10	LLR-25S
SDJCR1212X07N	LRIS-2.5*7	CLR-15S
SDJCR1212X11N	LRIS-4*10	LLR-25S
SDJCR1216GX11N	LRIS-4*10	LLR-25S
SDJCR1616X11N	LRIS-4*10	LLR-25S
SDJCL0808X07N	LRIS-2.5*7	CLR-15S
SDJCL1010X07N	LRIS-2.5*7	CLR-15S
SDJCL1010X11N	LRIS-4*10	LLR-25S
SDJCL1212GX11N	LRIS-4*10	LLR-25S
SDJCL1212X11N	LRIS-4*10	LLR-25S
SDJCL1616X11N	LRIS-4*10	LLR-25S

SDJC-N-F [93°] Shifted



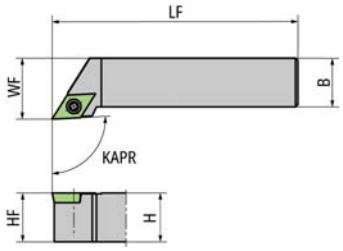
● Diagram shows right-hand tool

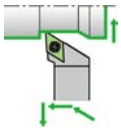
Item Number	Hand	B	H	HBKL	HBKW	HF	KAPR	LF	LU	WF2	Insert Gage	
		inch	inch	inch	inch	inch	°	inch	inch	inch		
SDJCR083C-F250	R	.728	1/2	–	–	1/2	93	4.724	.472	.250	DC..32.5..	DC..32.5..WP
SDJCR083C-F500	R	.984	1/2	–	–	1/2	93	4.724	.472	.500	DC..32.5..	DC..32.5..WP
SDJCR1015X07N-F05	R	.591	.394	.512	.000	.394	93	4.724	.472	.197	DC..21.5..	DC..21.5..WP
SDJCR1015X11N-F05	R	.591	.394	.748	.079	.394	93	4.724	.472	.197	DC..32.5..	DC..32.5..WP
SDJCR1020X07N-F10	R	.787	.394	.512	.000	.394	93	4.724	.472	.394	DC..21.5..	DC..21.5..WP
SDJCR1020X11N-F10	R	.787	.394	.748	.079	.394	93	4.724	.472	.394	DC..32.5..	DC..32.5..WP
SDJCR1218X11N-F06	R	.709	.472	.787	.000	.472	93	4.724	.472	.236	DC..32.5..	DC..32.5..WP
SDJCR1224X11N-F12	R	.945	.472	.787	.000	.472	93	4.724	.472	.472	DC..32.5..	DC..32.5..WP
SDJCR1620X11N-F08	R	.787	.630	.787	.000	.630	93	4.724	.728	.315	DC..32.5..	DC..32.5..WP
SDJCR1628X11N-F16	R	1.102	.630	.787	.000	.630	93	4.724	.728	.630	DC..32.5..	DC..32.5..WP

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SDJCR083C-F250	LRIS-4*10	LLR-25S
SDJCR083C-F500	LRIS-4*10	LLR-25S
SDJCR1015X07N-F05	LRIS-2.5*7	CLR-15S
SDJCR1015X11N-F05	LRIS-4*10	LLR-25S
SDJCR1020X07N-F10	LRIS-2.5*7	CLR-15S
SDJCR1020X11N-F10	LRIS-4*10	LLR-25S
SDJCR1218X11N-F06	LRIS-4*10	LLR-25S
SDJCR1224X11N-F12	LRIS-4*10	LLR-25S
SDJCR1620X11N-F08	LRIS-4*10	LLR-25S
SDJCR1628X11N-F16	LRIS-4*10	LLR-25S

SDJC [93°]





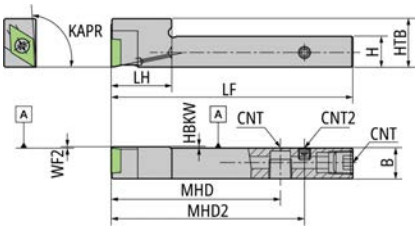
● Diagram shows right-hand tool

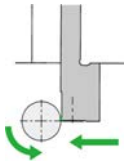
Item Number	Hand	B	H	HF	KAPR	LF	WF	Insert Gage	
		inch	inch	inch	°	inch	inch		
SDJCR20-X11	R	.787	.787	.787	93	4.724	.984	DC..32.5..	DC..32.5..WP
SDJCL20-X11	L	.787	.787	.787	93	4.724	.984	DC..32.5..	DC..32.5..WP

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SDJCR20-X11	LRIS-4*10	LLR-25S
SDJCL20-X11	LRIS-4*10	LLR-25S

Y-SDJC-N-OH2 [93 °] Y-axis Direct connect coolant port 1-hole type





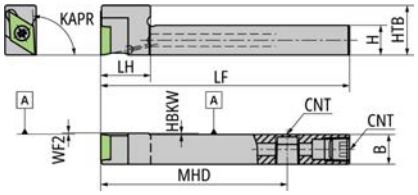
● Diagram shows right-hand tool
NOTE: Use a right-handed (R) or non-handed insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

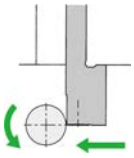
Item Number	Hand	B	CNT	CNT2	H	HBKW	HTB	KAPR	LF	LH	MHD	MHD2	WF2	Insert Gage	
		inch			inch	inch	inch	°	inch	inch	inch	inch	inch		
Y-SDJCR083H-IN-OH2	R	1/2	NPT1/8	M5	1/2	.020	.787	93	3.937	.984	2.756	3.150	.000	DC..32.5..	DC..32.5..WP
Y-SDJCR1212H11S-OH2	R	.472	Rc1/8	M5	.472	.020	.787	93	3.937	.787	2.756	3.150	.000	DC..32.5..	DC..32.5..WP

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
Y-SDJCR083H-IN-OH2	LRIS-4*10	SPNPT1/8	SS0505SC	LLR25S-20*65	LW-2.5
Y-SDJCR1212H11S-OH2	LRIS-4*10	SPR1/8	SS0505SC	LLR-25S-20*65	LW-2.5

Y-SDJC-N-OH [93 °] Y-axis Coolant hose connection type





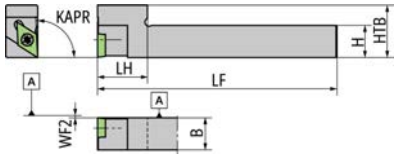
● Diagram shows right-hand tool
NOTE: Use a right-handed (R) or non-handed insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

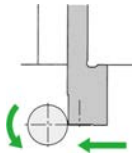
Item Number	Hand	B	CNT	H	HBKW	HTB	KAPR	LF	LH	MHD	WF2	Insert Gage	
		inch		inch	inch	inch	°	inch	inch	inch	inch		
Y-SDJCR062H-IN-OH	R	3/8	M6*1	3/8	.020	.787	93	3.937	.984	2.953	.000	DC..21.5..	DC..21.5..WP
Y-SDJCR082H-IN-OH	R	1/2	NPT1/8	1/2	.020	.787	93	3.937	.984	2.953	.000	DC..21.5..	DC..21.5..WP
Y-SDJCR083H-IN-OH	R	1/2	NPT1/8	1/2	.020	.787	93	3.937	.984	2.953	.000	DC..32.5..	DC..32.5..WP
Y-SDJCR103H-IN-OH	R	5/8	NPT1/8	5/8	.020	.787	93	3.937	.984	2.953	.000	DC..32.5..	DC..32.5..WP
Y-SDJCR1212H11S-OH	R	.472	Rc1/8	.472	.020	.787	93	3.937	.787	2.953	.000	DC..32.5..	DC..32.5..WP
Y-SDJCR1616H11-OH	R	.630	Rc1/8	.630	.020	.787	93	3.937	.984	2.953	.000	DC..32.5..	DC..32.5..WP

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
Y-SDJCR062H-IN-OH	LRIS-2.5*7	SS0605SC	CLR-15S
Y-SDJCR082H-IN-OH	LRIS-2.5*7	SPNPT1/8	CLR-15S
Y-SDJCR083H-IN-OH	LRIS-4*10	SPNPT1/8	LLR25S-20*65
Y-SDJCR103H-IN-OH	LRIS-4*10	SPNPT1/8	LLR25S-20*65
Y-SDJCR1212H11S-OH	LRIS-4*10	SPR1/8	LLR-25S-20*65
Y-SDJCR1616H11-OH	LRIS-4*10	SPR1/8	LLR-25S-20*65

Y-SDJC [93°] Y-axis





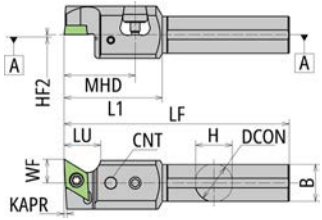
● Diagram shows right-hand tool
NOTE: Use a right-handed (R) or non-handed insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

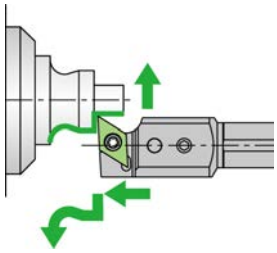
Item Number	Hand	B	H	HTB	KAPR	LF	LH	WF2	Insert Gage	
		inch	inch	inch	°	inch	inch	inch		
Y-SDJCR062-IN	R	3/8	3/8	.787	93	4.724	.984	.000	DC..21.5..	DC..21.5..WP
Y-SDJCR082-IN	R	1/2	1/2	.787	93	4.724	.984	.000	DC..21.5..	DC..21.5..WP
Y-SDJCR083-IN	R	1/2	1/2	.787	93	4.724	.984	.000	DC..32.5..	DC..32.5..WP
Y-SDJCR103-IN	R	5/8	5/8	.787	93	4.724	.984	.000	DC..32.5..	DC..32.5..WP
Y-SDJCR10-07S	R	.394	.394	.787	93	4.724	.787	.000	DC..21.5..	DC..21.5..WP
Y-SDJCR10-11MS	R	.394	.394	.787	93	4.724	.866	.000	DC..32.5..	DC..32.5..WP
Y-SDJCR10-11S	R	.394	.394	.787	93	4.724	.787	.000	DC..32.5..	DC..32.5..WP
Y-SDJCR12-07S	R	.472	.472	.787	93	4.724	.787	.000	DC..21.5..	DC..21.5..WP
Y-SDJCR12-11MS	R	.472	.472	.787	93	4.724	.866	.000	DC..32.5..	DC..32.5..WP
Y-SDJCR12-11S	R	.472	.472	.787	93	4.724	.787	.000	DC..32.5..	DC..32.5..WP
Y-SDJCR16-11S	R	.630	.630	.787	93	4.724	.787	.000	DC..32.5..	DC..32.5..WP

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
Y-SDJCR062-IN	LRIS-2.5*7	CLR-15S
Y-SDJCR082-IN	LRIS-2.5*7	CLR-15S
Y-SDJCR083-IN	LRIS-4*10	LLR25S-20*65
Y-SDJCR103-IN	LRIS-4*10	LLR25S-20*65
Y-SDJCR10-07S	LRIS-2.5*7	CLR-15S
Y-SDJCR10-11MS	LRIS-4*10	LLR-25S-20*65
Y-SDJCR10-11S	LRIS-4*10	LLR-25S-20*65
Y-SDJCR12-07S	LRIS-2.5*7	CLR-15S
Y-SDJCR12-11MS	LRIS-4*10	LLR-25S-20*65
Y-SDJCR12-11S	LRIS-4*10	LLR-25S-20*65
Y-SDJCR16-11S	LRIS-4*10	LLR-25S-20*65

DS-SDU-ACH-OH [93°] Adjustable Centerline Height DS toolholder (Internal coolant type)





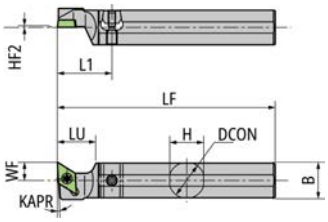
● Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

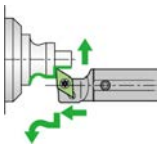
Item Number	Hand	B	CNT	DCON	H	HF2	KAPR	LF	LU	L1	MHD	WF	Insert Gage	
		inch		inch	inch	inch	°	inch	inch	inch	inch	inch		
DS-SDUL16-11-ACH-OH	L	.610	M6	.630	.610	Type A(0~+.008)	93	3.740	.669	1.634	1.181	.394	DC..32.5..	DC..32.5..WP
DS-SDUL19-11-ACH-OH	L	.709	M6	.750	.709	Type A(0~+.008)	93	4.724	.669	1.634	1.181	.394	DC..32.5..	DC..32.5..WP
DS-SDUL20-11-ACH-OH	L	.748	M6	.787	.748	Type A(0~+.008)	93	4.724	.669	1.634	1.181	.394	DC..32.5..	DC..32.5..WP
DS-SDUL22-11-ACH-OH	L	.827	M6	.866	.827	Type A(0~+.008)	93	4.724	.669	1.634	1.181	.394	DC..32.5..	DC..32.5..WP
DS-SDUL25-11MET-ACH-OH	L	.945	M6	.984	.945	Type A(0~+.008)	93	5.906	.669	1.634	1.181	.394	DC..32.5..	DC..32.5..WP
DS-SDUL25-11-ACH-OH	L	.945	M6	1.000	.945	Type A(0~+.008)	93	5.906	.669	1.634	1.181	.394	DC..32.5..	DC..32.5..WP

Spare Parts

Item Number	Clamp screw	Screw (for Wedge)	Wedge	Wrench (for Clamp screw)	Wrench (for Wedge)
DS-SDUL16-11-ACH-OH	LRIS-4*10	WS060419-004	ACH-W18	LLR-25S-20*65	LW-3
DS-SDUL19-11-ACH-OH	LRIS-4*10	WS060419-004	ACH-W18	LLR-25S-20*65	LW-3
DS-SDUL20-11-ACH-OH	LRIS-4*10	WS060419-004	ACH-W18	LLR-25S-20*65	LW-3
DS-SDUL22-11-ACH-OH	LRIS-4*10	WS060419-004	ACH-W18	LLR-25S-20*65	LW-3
DS-SDUL25-11MET-ACH-OH	LRIS-4*10	WS060419-004	ACH-W18	LLR-25S-20*65	LW-3
DS-SDUL25-11-ACH-OH	LRIS-4*10	WS060419-004	ACH-W18	LLR-25S-20*65	LW-3

DS-SDU-ACH [93°] Adjustable centerline height





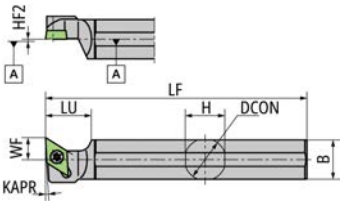
● Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

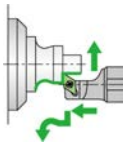
Item Number	Hand	B	DCON	H	HF2	KAPR	LF	LU	L1	WF	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch	inch		
DS-SDUR16F-11-ACH	R	.591	.630	.610	Type B(0~+.012)	93	3.150	.669	1.181	.394	DC..32.5..	DC..32.5..WP
DS-SDUL16F-11-ACH	L	.591	.630	.610	Type B(0~+.012)	93	3.150	.669	1.181	.394	DC..32.5..	DC..32.5..WP
DS-SDUL19-11-ACH	L	.709	3/4	.709	Type A(0~+.008)	93	4.724	.787	1.181	.394	DC..32.5..	DC..32.5..WP
DS-SDUL20-11-ACH	L	.748	.787	.748	Type B(0~+.012)	93	4.724	.787	1.181	.394	DC..32.5..	DC..32.5..WP
DS-SDUL22-11-ACH	L	.827	.866	.827	Type B(0~+.012)	93	4.724	.787	1.181	.394	DC..32.5..	DC..32.5..WP
DS-SDUL25-11-ACH	L	.945	1.000	.945	Type A(0~+.008)	93	5.906	.787	1.181	.394	DC..32.5..	DC..32.5..WP
DS-SDUL25-11MET-ACH	L	.945	.984	.945	Type A(0~+.008)	93	5.906	.787	1.181	.394	DC..32.5..	DC..32.5..WP

Spare Parts

Item Number	Clamp screw	Screw (for Wedge)	Wedge	Wrench (for Clamp screw)	Wrench (for Wedge)
DS-SDUR16F-11-ACH	LRIS-4*10	–	–	LLR-25S-20*65	–
DS-SDUL16F-11-ACH	LRIS-4*10	WS060415-003	ACH-W18	LLR-25S-20*65	LW-3
DS-SDUL19-11-ACH	LRIS-4*10	WS060415-003	ACH-W18	LLR-25S-20*65	LW-3
DS-SDUL20-11-ACH	LRIS-4*10	WS060419-004	ACH-W18	LLR-25S-20*65	LW-3
DS-SDUL22-11-ACH	LRIS-4*10	WS060419-004	ACH-W18	LLR-25S-20*65	LW-3
DS-SDUL25-11-ACH	LRIS-4*10	WS060419-004	ACH-W24	LLR-25S-20*65	LW-3
DS-SDUL25-11MET-ACH	LRIS-4*10	WS060419-004	ACH-W24	LLR-25S-20*65	LW-3

DS-SDU [93°] DS Toolholders





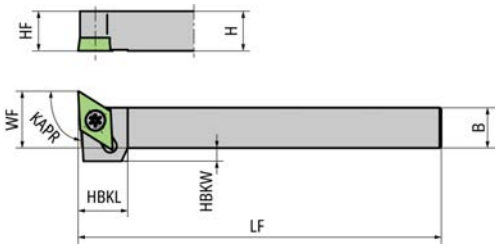
● Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

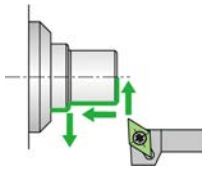
Item Number	Hand	B	DCON	H	HF2	KAPR	LF	LU	WF	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
DS-SDUL14F-07	L	.512	.551	.512	.000	93	3.150	.787	.236	DC..21.5..	DC..21.5..WP
DS-SDUL14F-11	L	.512	.551	.512	.000	93	3.150	.787	.394	DC..32.5..	DC..32.5..WP
DS-SDUL15H-07	L	.591	5/8	.591	.000	93	3.937	.787	.236	DC..21.5..	DC..21.5..WP
DS-SDUL16F-07	L	.591	.630	.591	.000	93	3.150	.787	.236	DC..21.5..	DC..21.5..WP
DS-SDUL16F-11	L	.591	.630	.591	.000	93	3.150	.787	.394	DC..32.5..	DC..32.5..WP
DS-SDUL16X-07	L	.591	.630	.591	.000	93	3.740	.787	.236	DC..21.5..	DC..21.5..WP
DS-SDUL19-07	L	.709	3/4	.709	.000	93	4.724	.787	.236	DC..21.5..	DC..21.5..WP
DS-SDUL19-11	L	.709	3/4	.709	.000	93	4.724	.787	.394	DC..32.5..	DC..32.5..WP
DS-SDUL19-11SPL	L	.709	3/4	.709	.000	93	6.299	.787	.433	DC..32.5..	DC..32.5..WP
DS-SDUL20-07	L	.748	.787	.748	.000	93	4.724	.787	.236	DC..21.5..	DC..21.5..WP
DS-SDUL20-11	L	.748	.787	.748	.000	93	4.724	.787	.394	DC..32.5..	DC..32.5..WP
DS-SDUL20X-07	L	.748	.787	.748	.000	93	3.740	.787	.236	DC..21.5..	DC..21.5..WP
DS-SDUL20X-11	L	.748	.787	.748	.000	93	3.740	.787	.394	DC..32.5..	DC..32.5..WP
DS-SDUL22-07	L	.827	.866	.827	.000	93	4.724	.787	.236	DC..21.5..	DC..21.5..WP
DS-SDUL22-11	L	.827	.866	.827	.000	93	4.724	.787	.394	DC..32.5..	DC..32.5..WP
DS-SDUL23-11-007	L	.866	.906	.866	.000	93	2.756	.787	.394	DC..32.5..	DC..32.5..WP
DS-SDUL25-11	L	.945	1.000	.945	.000	93	5.906	.787	.394	DC..32.5..	DC..32.5..WP
DS-SDUL25-11MET	L	.945	.984	.945	.000	93	4.724	.787	.394	DC..32.5..	DC..32.5..WP
DS-SDUL25-11SPL	L	.945	1.000	.945	.000	93	5.906	.787	.492	DC..32.5..	DC..32.5..WP

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-SDUL14F-07	LRIS-2.5*7	CLR-15S
DS-SDUL14F-11	LRIS-4*10	LLR-25S-20*65
DS-SDUL15H-07	LRIS-2.5*7	CLR-15S
DS-SDUL16F-07	LRIS-2.5*7	CLR-15S
DS-SDUL16F-11	LRIS-4*10	LLR-25S-20*65
DS-SDUL16X-07	LRIS-2.5*7	CLR-15S
DS-SDUL19-07	LRIS-2.5*7	CLR-15S
DS-SDUL19-11	LRIS-4*10	LLR-25S-20*65
DS-SDUL19-11SPL	LRIS-4*10	LLR-25S-20*65
DS-SDUL20-07	LRIS-2.5*7	CLR-15S
DS-SDUL20-11	LRIS-4*10	LLR-25S-20*65
DS-SDUL20X-07	LRIS-2.5*7	CLR-15S
DS-SDUL20X-11	LRIS-4*10	LLR-25S-20*65
DS-SDUL22-07	LRIS-2.5*7	CLR-15S
DS-SDUL22-11	LRIS-4*10	LLR-25S-20*65
DS-SDUL23-11-007	LRIS-4*10	LLR-25S-20*65
DS-SDUL25-11	LRIS-4*10	LLR-25S-20*65
DS-SDUL25-11MET	LRIS-4*10	LLR-25S-20*65
DS-SDUL25-11SPL	LRIS-4*10	LLR-25S-20*65

CH-SDUC [93°] for horizontal gang style tool post





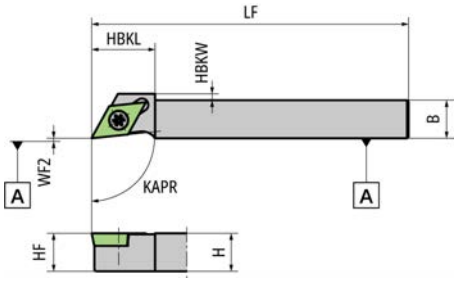
● Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

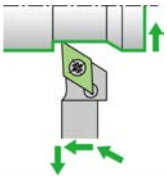
Item Number	Hand	B	H	HBKL	HBKW	HF	KAPR	LF	WF	Insert Gage	
		inch	inch	inch	inch	inch	°	inch	inch		
CH-SDUCL1010H11	L	.394	.394	.591	.236	.394	93	3.937	.591	DC..32.5..	DC..32.5..WP
CH-SDUCL1212H11	L	.472	.472	.591	.157	.472	93	3.937	.669	DC..32.5..	DC..32.5..WP
CH-SDUCL1616H11	L	.630	.630	–	–	.630	93	3.937	.827	DC..32.5..	DC..32.5..WP
CH-SDUCL2020H11	L	.787	.787	–	–	.787	93	3.937	.984	DC..32.5..	DC..32.5..WP

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CH-SDUCL1010H11	LRIS-4*12PW	CLR-15S
CH-SDUCL1212H11	LRIS-4*12PW	CLR-15S
CH-SDUCL1616H11	LRIS-4*12PW	CLR-15S
CH-SDUCL2020H11	LRIS-4*12PW	CLR-15S

SDXC-N [96°]





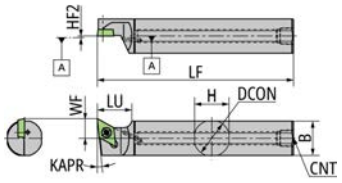
● Diagram shows right-hand tool

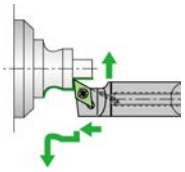
Item Number	Hand	B	H	HBKL	HBKW	HF	KAPR	LF	WF2	Insert Gage
		inch	inch	inch	inch	inch	°	inch	inch	
SDXCR1010X11N	R	.394	.394	.787	.118	.394	96	4.724	.000	DC..32.5..
SDXCR1016X11N	R	.630	.394	–	–	.394	96	4.724	.000	DC..32.5..
SDXCR1212X11N	R	.472	.472	.787	.039	.472	96	4.724	.000	DC..32.5..
SDXCR1216X11N	R	.630	.472	–	–	.472	96	4.724	.000	DC..32.5..
SDXCR1616X11N	R	.630	.630	–	–	.630	96	4.724	.000	DC..32.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SDXCR1010X11N	LRIS-4*10	LLR-25S
SDXCR1016X11N	LRIS-4*10	LLR-25S
SDXCR1212X11N	LRIS-4*10	LLR-25S
SDXCR1216X11N	LRIS-4*10	LLR-25S
SDXCR1616X11N	LRIS-4*10	LLR-25S

DS-SDX-006 [96°] DS Toolholders Coolant hose connection type





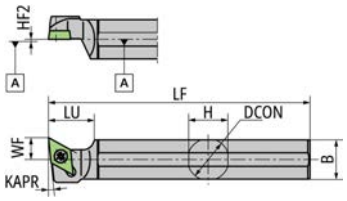
● Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

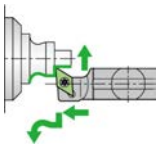
Item Number	Hand	B	CNT	DCON	H	HF2	KAPR	LF	LU	WF	Insert Gage
		inch		inch	inch	inch	°	inch	inch	inch	
DS-SDXL22-11-006	L	.827	NPT1/8	.866	.827	.000	96	4.724	.787	.472	DC..32.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-SDXL22-11-006	LRIS-4*10	LLR-25S-20*65

DS-SDX [96°] DS Toolholders





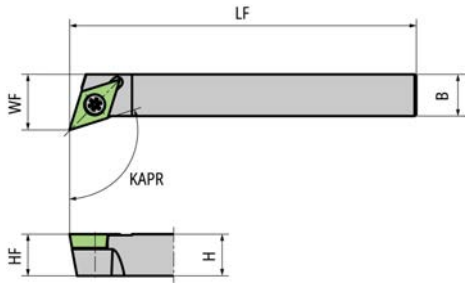
● Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

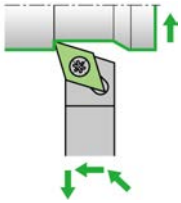
Item Number	Hand	B	DCON	H	HF2	KAPR	LF	LU	WF	Insert Gage
		inch	inch	inch	inch	°	inch	inch	inch	
DS-SDXL19-11	L	.709	3/4	.709	.000	96	4.724	.787	.394	DC..32.5..
DS-SDXL20-11	L	.748	.787	.748	.000	96	4.724	.787	.394	DC..32.5..
DS-SDXL20X-11	L	.748	.787	.748	.000	96	3.740	.787	.394	DC..32.5..
DS-SDXL25-11MET	L	.945	.984	.945	.000	96	4.724	.787	.394	DC..32.5..
DS-SDXL32-11	L	1.181	1.260	1.181	.000	96	5.906	.787	.394	DC..32.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-SDXL19-11	LRIS-4*10	LLR-25S
DS-SDXL20-11	LRIS-4*10	LLR-25S
DS-SDXL20X-11	LRIS-4*10	LLR-25S
DS-SDXL25-11MET	LRIS-4*10	LLR-25S
DS-SDXL32-11	LRIS-4*10	LLR-25S

SDQC [107.5°]





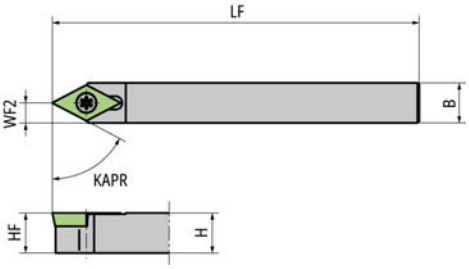
● Diagram shows right-hand tool

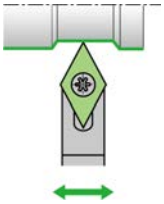
Item Number	Hand	B	H	HF	KAPR	LF	WF	Insert Gage
		inch	inch	inch	°	inch	inch	
SDQCR10-X07	R	.394	.394	.394	107.5	4.724	.472	DC..21.5..
SDQCR12-X11	R	.472	.472	.472	107.5	4.724	.630	DC..32.5..
SDQCR16-X11	R	.630	.630	.630	107.5	4.724	.787	DC..32.5..
SDQCR20-X11	R	.787	.787	.787	107.5	4.724	.984	DC..32.5..
SDQCL10-X07	L	.394	.394	.394	107.5	4.724	.472	DC..21.5..
SDQCL12-X11	L	.472	.472	.472	107.5	4.724	.630	DC..32.5..
SDQCL16-X11	L	.630	.630	.630	107.5	4.724	.787	DC..32.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SDQCR10-X07	LRIS-2.5*7	CLR-15S
SDQCR12-X11	LRIS-4*10	LLR-25S
SDQCR16-X11	LRIS-4*10	LLR-25S
SDQCR20-X11	LRIS-4*10	LLR-25S
SDQCL10-X07	LRIS-2.5*7	CLR-15S
SDQCL12-X11	LRIS-4*10	LLR-25S
SDQCL16-X11	LRIS-4*10	LLR-25S

SDNC [62.5°]



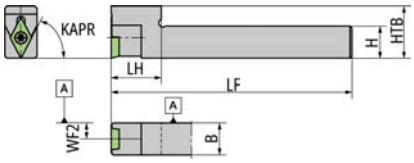


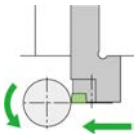
Item Number	Hand	B	H	HF	KAPR	LF	WF2	Insert Gage
		inch	inch	inch	°	inch	inch	
SDNCN-062	N	3/8	3/8	3/8	62.5	2.500	3/16	DC..21.5..
SDNCN-082	N	1/2	1/2	1/2	62.5	3.500	1/4	DC..21.5..
SDNCN-083	N	1/2	1/2	1/2	62.5	3.937	1/4	DC..32.5..
SDNCN-103	N	5/8	5/8	5/8	62.5	3.937	5/16	DC..32.5..
SDNCN08-X07	N	.315	.315	.315	62.5	4.724	.157	DC..21.5..
SDNCN10-X07	N	.394	.394	.394	62.5	4.724	.197	DC..21.5..
SDNCN12-X11	N	.472	.472	.472	62.5	4.724	.236	DC..32.5..
SDNCN16-X11	N	.630	.630	.630	62.5	4.724	.315	DC..32.5..
SDNCN20-X11	N	.787	.787	.787	62.5	4.724	.394	DC..32.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SDNCN-062	LRIS-2.5*7	CLR-15S
SDNCN-082	LRIS-2.5*7	CLR-15S
SDNCN-083	LRIS-4*10	LLR-25S
SDNCN-103	LRIS-4*10	LLR-25S
SDNCN08-X07	LRIS-2.5*7	CLR-15S
SDNCN10-X07	LRIS-2.5*7	CLR-15S
SDNCN12-X11	LRIS-4*10	LLR-25S
SDNCN16-X11	LRIS-4*10	LLR-25S
SDNCN20-X11	LRIS-4*10	LLR-25S

Y-SDNC [62.5°] Y-axis





NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

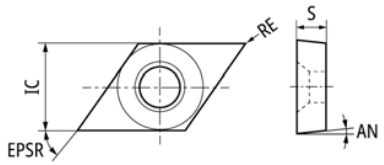
Item Number	Hand	B	H	HTB	KAPR	LF	LH	WF2	Insert Gage
		inch	inch	inch	°	inch	inch	inch	
Y-SDNCN083-IN	N	1/2	1/2	.827	62.5	4.724	.984	1/4	DC..32.5..
Y-SDNCN12-11S	N	.472	.472	.827	62.5	4.724	.787	.236	DC..32.5..
Y-SDNCN16-11S	N	.630	.630	.827	62.5	4.724	.787	.315	DC..32.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
Y-SDNCN083-IN	LRIS-4*10	LLR25S-20*65
Y-SDNCN12-11S	LRIS-4*10	LLR-25S-20*65
Y-SDNCN16-11S	LRIS-4*10	LLR-25S-20*65

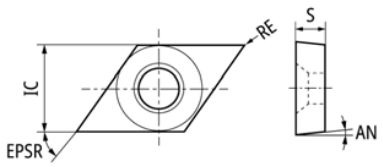
DC.. series/Inserts Carbide

DC..

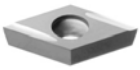
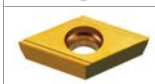
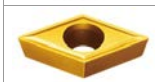


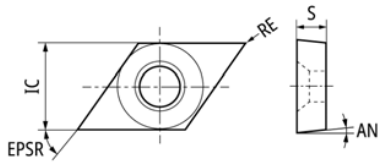
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	AN	RE	BS	Carbide										
									PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	DCGT 32.504M R TMV	DCGT 11T301M R TMV	55	1/4	3/32	7	.003	–	●	●	●			●					
	DCGT 32.508M R TMV	DCGT 11T302M R TMV	55	1/4	3/32	7	.007	–	●	●	●			●					
	DCGT 32.51M R TMV	DCGT 11T304M R TMV	55	1/4	3/32	7	.015	–	●	●	●			●					
	DCGT 21.504M YL	DCGT 070201M YL	55	1/4	3/32	7	.003	–			●		●						
	DCGT 21.508M YL	DCGT 070202M YL	55	1/4	3/32	7	.007	–			●		●						
	DCGT 21.51M YL	DCGT 070204M YL	55	1/4	3/32	7	.015	–			■		■						
	DCGT 32.501 YL	DCGT 11T300 YL	55	3/8	5/32	7	.001	–				●		●					
	DCGT 32.504M YL	DCGT 11T301M YL	55	3/8	5/32	7	.003	–	●	●	●	●	●	●					
	DCGT 32.508M YL	DCGT 11T302M YL	55	3/8	5/32	7	.007	–	●	●	●	●	●	●					
	DCGT 32.51M YL	DCGT 11T304M YL	55	3/8	5/32	7	.015	–	●	●	●	●	●	●					
	DCGT 32.52M YL	DCGT 11T308M YL	55	3/8	5/32	7	.031	–		●	●	●	●	●					
	DCGT 21.504M CL	DCGT 070201M CL	55	1/4	3/32	7	.003	–		●	●	●	●	●					
	DCGT 21.508M CL	DCGT 070202M CL	55	1/4	3/32	7	.007	–		●	●	●	●	●					
	DCGT 21.51M CL	DCGT 070204M CL	55	1/4	3/32	7	.015	–		●	●	●	●	●					
	DCGT 32.504M CL	DCGT 11T301M CL	55	3/8	5/32	7	.003	–	●	●	●	●	●	●					
	DCGT 32.508M CL	DCGT 11T302M CL	55	3/8	5/32	7	.007	–	●	●	●	●	●	●					
	DCGT 32.51M CL	DCGT 11T304M CL	55	3/8	5/32	7	.015	–	●	●	●	●	●	●					
	DCGT 21.501 FN AM3	DCGT 070200 FN AM3	55	1/4	3/32	7	.001	–				●	●	●	●	●			
	DCGT 21.504 FN AM3	DCGT 070201 FN AM3	55	1/4	3/32	7	.004	–							●	●			
	DCGT 21.508 FN AM3	DCGT 070202 FN AM3	55	1/4	3/32	7	.008	–							●	●			
	DCGT 21.51 FN AM3	DCGT 070204 FN AM3	55	1/4	3/32	7	.016	–							●	●			
	DCGT 21.504M FN AM3	DCGT 070201M FN AM3	55	1/4	3/32	7	.003	–		●		●	●	●					
	DCGT 21.508M FN AM3	DCGT 070202M FN AM3	55	1/4	3/32	7	.007	–		●		●	●	●					
	DCGT 21.51M FN AM3	DCGT 070204M FN AM3	55	1/4	3/32	7	.015	–		●		●	●	●					
	DCGT 32.501 FN AM3	DCGT 11T300 FN AM3	55	3/8	5/32	7	.001	–				●	●	●	●	●			
	DCGT 32.504M FN AM3	DCGT 11T301M FN AM3	55	3/8	5/32	7	.003	–	●	●		●	●	●	●	●			
	DCGT 32.508 FN AM3	DCGT 11T302 FN AM3	55	3/8	5/32	7	.008	–					●		●	●			
	DCGT 32.508M FN AM3	DCGT 11T302M FN AM3	55	3/8	5/32	7	.007	–	●	●		●	●	●	●	●			
	DCGT 32.51 FN AM3	DCGT 11T304 FN AM3	55	3/8	5/32	7	.016	–					●		●	●			
	DCGT 32.51M FN AM3	DCGT 11T304M FN AM3	55	3/8	5/32	7	.015	–	●	●		●	●	●	●	●			
	DCGT 32.52 FN AM3	DCGT 11T308 FN AM3	55	3/8	5/32	7	.031	–					●						
	DCMT 21.508 FN AM3	DCMT 070202 FN AM3	55	1/4	3/32	7	.008	–			●								
	DCMT 21.51 FN AM3	DCMT 070204 FN AM3	55	1/4	3/32	7	.016	–			●								
	DCMT 32.508 FN AM3	DCMT 11T302 FN AM3	55	3/8	5/32	7	.008	–			●								
	DCMT 32.51 FN AM3	DCMT 11T304 FN AM3	55	3/8	5/32	7	.016	–			●								
	DCMT 32.52 FN AM3	DCMT 11T308 FN AM3	55	3/8	5/32	7	.031	–			●								
	DCGT 21.501 AMX	DCGT 070200 AMX	55	1/4	3/32	7	.001	–			●			●					
	DCGT 21.504M AMX	DCGT 070201M AMX	55	1/4	3/32	7	.003	–		●	●	●		●					
	DCGT 21.508M AMX	DCGT 070202M AMX	55	1/4	3/32	7	.007	–		●	●	●		●					
	DCGT 21.51M AMX	DCGT 070204M AMX	55	1/4	3/32	7	.015	–			●	●		●					
	DCGT 32.501 AMX	DCGT 11T300 AMX	55	3/8	5/32	7	.001	–			●			●					
	DCGT 32.504M AMX	DCGT 11T301M AMX	55	3/8	5/32	7	.003	–	●	●	●	●		●					
	DCGT 32.508M AMX	DCGT 11T302M AMX	55	3/8	5/32	7	.007	–	●	●	●	●		●					
	DCGT 32.51M AMX	DCGT 11T304M AMX	55	3/8	5/32	7	.015	–	●	●	●	●		●					
	DCGT 21.501 AZ7	DCGT 070200 AZ7	55	1/4	3/32	7	.001	–					●						
	DCGT 21.504M AZ7	DCGT 070201M AZ7	55	1/4	3/32	7	.003	–					●						
	DCGT 21.508M AZ7	DCGT 070202M AZ7	55	1/4	3/32	7	.007	–					●						
	DCGT 32.501 AZ7	DCGT 11T300 AZ7	55	3/8	5/32	7	.001	–				●	●	●		●			
	DCGT 32.504M AZ7	DCGT 11T301M AZ7	55	3/8	5/32	7	.003	–				●	●	●		●			
	DCGT 32.508M AZ7	DCGT 11T302M AZ7	55	3/8	5/32	7	.007	–				●	●	●		●			
	DCGT 32.51M AZ7	DCGT 11T304M AZ7	55	3/8	5/32	7	.015	–				●	●	●		●			
	DCGT 32.52 AZ7	DCGT 11T308 AZ7	55	3/8	5/32	7	.031	–				●	●			●			
	DCMT 32.51 E02 AZ8	DCMT 11T304 E004 AZ8	55	3/8	5/32	7	.016	–										●	
	DCMT 32.52 E02 AZ8	DCMT 11T308 E004 AZ8	55	3/8	5/32	7	.031	–										●	

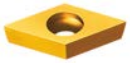
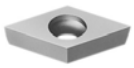


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

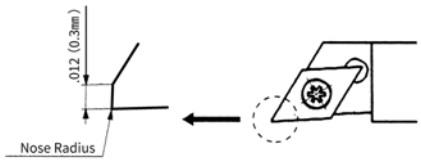
Shape	Item Number		EPSR	IC	S	AN	RE	BS	Carbide										
									PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	DCGT 21.501 R S	DCGT 070200 R S	55	1/4	3/32	7	.001	–				●	●		●	●			
	DCGT 21.501 L S	DCGT 070200 L S	55	1/4	3/32	7	.001	–							●	●			
	DCGT 21.504M R S	DCGT 070201M R S	55	1/4	3/32	7	.003	–				●	●						
	DCGT 21.504 R S	DCGT 070201 R S	55	1/4	3/32	7	.004	–							●	●			
	DCGT 21.504 L S	DCGT 070201 L S	55	1/4	3/32	7	.004	–							●	●			
	DCGT 21.508M R S	DCGT 070202M R S	55	1/4	3/32	7	.007	–				●	●						
	DCGT 21.508 R S	DCGT 070202 R S	55	1/4	3/32	7	.008	–							●	●			
	DCGT 21.508 L S	DCGT 070202 L S	55	1/4	3/32	7	.008	–							●	●			
	DCGT 21.51 R S	DCGT 070204 R S	55	1/4	3/32	7	.016	–					●		●				
	DCGT 32.501 R S	DCGT 11T300 R S	55	3/8	5/32	7	.001	–				●	●	●	●	●			
	DCGT 32.501 L S	DCGT 11T300 L S	55	3/8	5/32	7	.001	–							●				
	DCGT 32.504M R S	DCGT 11T301M R S	55	3/8	5/32	7	.003	–				●	●	●					
	DCGT 32.504 R S	DCGT 11T301 R S	55	3/8	5/32	7	.004	–					●		●	●			
	DCGT 32.504 L S	DCGT 11T301 L S	55	3/8	5/32	7	.004	–							●				
	DCGT 32.508M R S	DCGT 11T302M R S	55	3/8	5/32	7	.007	–				●	●	●					
	DCGT 32.508 R S	DCGT 11T302 R S	55	3/8	5/32	7	.008	–					●		●	●			
	DCGT 32.508 L S	DCGT 11T302 L S	55	3/8	5/32	7	.008	–							●				
	DCGT 32.51M R S	DCGT 11T304M R S	55	3/8	5/32	7	.015	–				●	●	●					
	DCGT 32.51 R S	DCGT 11T304 R S	55	3/8	5/32	7	.016	–					●						
	DCGT 21.501 R U	DCGT 070200 R U	55	1/4	3/32	7	.001	–							●	●			
	DCGT 21.504 R U	DCGT 070201 R U	55	1/4	3/32	7	.004	–							●	●			
	DCGT 21.508 R U	DCGT 070202 R U	55	1/4	3/32	7	.008	–							●	●			
	DCGT 21.508 L U	DCGT 070202 L U	55	1/4	3/32	7	.008	–								●			
	DCGT 32.501 R U1	DCGT 11T300 R U1	55	3/8	5/32	7	.001	–				●		●	●	●			
	DCGT 32.501 L U1	DCGT 11T300 L U1	55	3/8	5/32	7	.001	–								●			
	DCGT 32.504 R U1	DCGT 11T301 R U1	55	3/8	5/32	7	.004	–				●		●	●	●			
	DCGT 32.504 L U1	DCGT 11T301 L U1	55	3/8	5/32	7	.004	–								●			
	DCGT 32.508 R U1	DCGT 11T302 R U1	55	3/8	5/32	7	.008	–				●		●	●	●			
	DCGT 32.508 L U1	DCGT 11T302 L U1	55	3/8	5/32	7	.008	–								●			
	DCGT 32.51 R U1	DCGT 11T304 R U1	55	3/8	5/32	7	.016	–				●		●	●	●			
	DCGT 32.51 L U1	DCGT 11T304 L U1	55	3/8	5/32	7	.016	–								●			
	DCET 21.502 R KHG	DCET 0702005 R KHG	55	1/4	3/32	7	.002	–							●				
	DCET 21.502 L KHG	DCET 0702005 L KHG	55	1/4	3/32	7	.002	–							●				
	DCET 21.503 R KHG	DCET 0702008 R KHG	55	1/4	3/32	7	.003	–							●				
	DCET 21.503 L KHG	DCET 0702008 L KHG	55	1/4	3/32	7	.003	–							●				
	DCET 21.507 R KHG	DCET 0702018 R KHG	55	1/4	3/32	7	.007	–							●				
	DCET 21.507 L KHG	DCET 0702018 L KHG	55	1/4	3/32	7	.007	–							●				
	DCET 21.508 R KHG	DCET 070202 R KHG	55	1/4	3/32	7	.008	–							●				
	DCET 21.508 L KHG	DCET 070202 L KHG	55	1/4	3/32	7	.008	–							●				
	DCET 32.502 R KHG	DCET 11T3005 R KHG	55	3/8	5/32	7	.002	–						●	●				
	DCET 32.502 L KHG	DCET 11T3005 L KHG	55	3/8	5/32	7	.002	–							●				
	DCET 32.503 R KHG	DCET 11T3008 R KHG	55	3/8	5/32	7	.003	–						●	●				
	DCET 32.503 L KHG	DCET 11T3008 L KHG	55	3/8	5/32	7	.003	–							●				
	DCET 32.507 R KHG	DCET 11T3018 R KHG	55	3/8	5/32	7	.007	–						●	●				
	DCET 32.507 L KHG	DCET 11T3018 L KHG	55	3/8	5/32	7	.007	–							●				
	DCET 32.508 R KHG	DCET 11T302 R KHG	55	3/8	5/32	7	.008	–						●	●				
	DCET 32.508 L KHG	DCET 11T302 L KHG	55	3/8	5/32	7	.008	–							●				
	DCET 21.503 R UHG	DCET 0702008 R UHG	55	1/4	3/32	7	.003	–							●				
	DCET 32.503 R UHG	DCET 11T3008 R UHG	55	3/8	5/32	7	.003	–							●				
	DCET 32.504M R AT Ⓜ	DCET 11T301M R AT Ⓜ	55	3/8	5/32	7	.003	–						●					
	DCET 32.508M R AT Ⓜ	DCET 11T302M R AT Ⓜ	55	3/8	5/32	7	.007	–						●					
	DCGT 32.504M R TMV -WP	DCGT 11T301M R TMV -WP	55	3/8	5/32	7	.003	(.012)	●	●									
	DCGT 32.508M R TMV -WP	DCGT 11T302M R TMV -WP	55	3/8	5/32	7	.007	(.012)	●	●									
	DCGT 32.502 AM3 -WP	DCGT 11T3005 AM3 -WP	55	3/8	5/32	7	.002	(.012)	●	●	●	●	●						
	DCGT 32.506 AM3 -WP	DCGT 11T3015 AM3 -WP	55	3/8	5/32	7	.006	(.012)	●	●	●	●	●						



Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number (Inch)	Item Number (Metric)	EPSR	IC	S	AN	RE	BS	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
			°	inch	inch	°	inch	inch											
	DCGT 21.502 R S -WP	DCGT 0702005 R S -WP	55	1/4	3/32	7	.002	(.012)					●		●	●			
	DCGT 21.502 L S -WP	DCGT 0702005 L S -WP	55	1/4	3/32	7	.002	(.012)								●			
	DCGT 21.506 R S -WP	DCGT 0702015 R S -WP	55	1/4	3/32	7	.006	(.012)					●			●			
	DCGT 21.506 L S -WP	DCGT 0702015 L S -WP	55	1/4	3/32	7	.006	(.012)								●			
	DCGT 32.502 R S -WP	DCGT 11T3005 R S -WP	55	3/8	5/32	7	.002	(.012)					●		●	●			
	DCGT 32.506 R S -WP	DCGT 11T3015 R S -WP	55	3/8	5/32	7	.006	(.012)					●			●			
	DCGT 21.502 R U -WP	DCGT 0702005 R U -WP	55	1/4	3/32	7	.002	(.012)					●		●	●			
	DCGT 21.506 R U -WP	DCGT 0702015 R U -WP	55	1/4	3/32	7	.006	(.012)					●			●			
	DCGT 32.502 R U1 -WP	DCGT 11T3005 R U1 -WP	55	3/8	5/32	7	.002	(.012)					●		●	●			
	DCGT 32.506 R U1 -WP	DCGT 11T3015 R U1 -WP	55	3/8	5/32	7	.006	(.012)					●			●			
	DCGW 21.500 V Ⓜ	DCGW 07020 V Ⓜ	55	1/4	3/32	7	.000	–							●				
	DCGW 21.501 FN	DCGW 070200 FN	55	1/4	3/32	7	.001	–								●			
	DCGW 21.501 H Ⓜ	DCGW 070200 H Ⓜ	55	1/4	3/32	7	.001	–											●
	DCGW 21.504 FN	DCGW 070201 FN	55	1/4	3/32	7	.004	–								●			
	DCGW 21.504 H Ⓜ	DCGW 070201 H Ⓜ	55	1/4	3/32	7	.004	–											●
	DCGW 21.508 H Ⓜ	DCGW 070202 H Ⓜ	55	1/4	3/32	7	.008	–											●
	DCGW 32.500 V Ⓜ	DCGW 11T30 V Ⓜ	55	3/8	5/32	7	.000	–							●				
	DCGW 32.501 FN	DCGW 11T300 FN	55	3/8	5/32	7	.001	–								●			
	DCGW 32.501 H Ⓜ	DCGW 11T300 H Ⓜ	55	3/8	5/32	7	.001	–											●
	DCGW 32.504 FN	DCGW 11T301 FN	55	3/8	5/32	7	.004	–								●			
	DCGW 32.504 H Ⓜ	DCGW 11T301 H Ⓜ	55	3/8	5/32	7	.004	–											●
	DCGW 32.508 H Ⓜ	DCGW 11T302 H Ⓜ	55	3/8	5/32	7	.008	–											●
	DCGW 21.502 RH -WP Ⓜ	DCGW 0702005 RH -WP Ⓜ	55	1/4	3/32	7	.002	(.012)											●
	DCGW 32.502 RH -WP Ⓜ	DCGW 11T3005 RH -WP Ⓜ	55	3/8	5/32	7	.002	(.012)											●

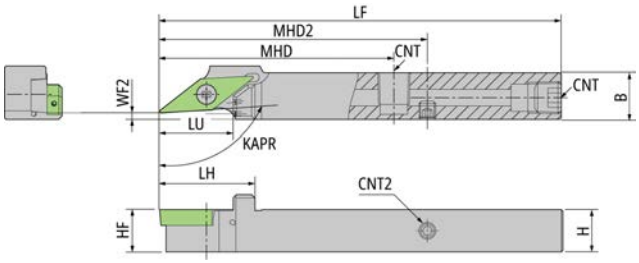
Features of DC.T-WP insert

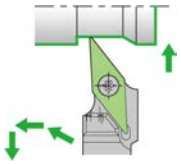


NTK WP style inserts have a wiper facet design.
The insert has a 0.3mm(.012") flat on the cutting edge when the insert is set into the toolholder.
The flat on the cutting edge ensures a superior surface when feed rates are increased.
WP style inserts can be used in toolholders: SDJC, CH-SDUL and DS-SDUL.

VB.. Series/Toolholder

SVJB-OH2 Direct connect coolant port 1-hole type





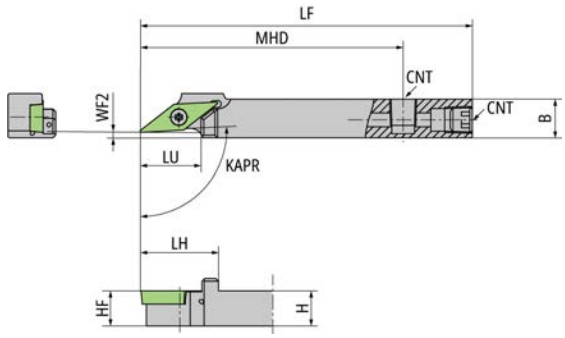
● Diagram shows right-hand tool

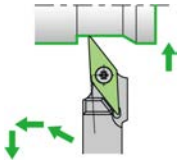
Item Number	Hand	B	CNT	CNT2	H	HF	KAPR	LF	LH	LU	MHD	MHD2	WF2	Insert Gage
		inch			inch	inch	°	inch	inch	inch	inch	inch	inch	
SVJBR083C-F079-OH2	R	.551	NPT1/8	M5	1/2	1/2	93	4.724	1.102	.846	2.756	3.937	.079	VB..33..
SVJBR103C-F079-OH2	R	5/8	NPT1/8	M5	5/8	5/8	93	4.724	1.102	.846	2.756	3.937	.079	VB..33..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
SVJBR083C-F079-OH2	LRIS-4*10	SPNPT1/8	SS0505SC	LLR-25S	LW-2.5
SVJBR103C-F079-OH2	LRIS-4*10	SPNPT1/8L	SS0505SC	LLR-25S	LW-2.5

SVJB-OH Coolant hose connection type





● Diagram shows right-hand tool

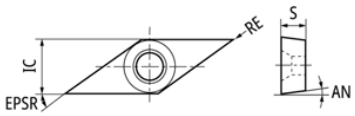
Item Number	Hand	B	CNT	H	HF	KAPR	LF	LH	LU	MHD	WF2	Insert Gage
		inch		inch	inch	°	inch	inch	inch	inch	inch	
SVJBR083C-F079-OH	R	.551	NPT1/8	1/2	1/2	93	4.724	1.102	.846	3.740	.079	VB..33..
SVJBR103C-F079-OH	R	5/8	NPT1/8	5/8	5/8	93	4.724	1.102	.846	3.740	.079	VB..33..
SVJBL083C-F079-OH	L	.551	NPT1/8	1/2	1/2	93	4.724	1.102	.846	3.740	.079	VB..33..
SVJBL103C-F079-OH	L	5/8	NPT1/8	5/8	5/8	93	4.724	1.102	.846	3.740	.079	VB..33..
SVJBR1214X16N-F02OH	R	.551	NPT1/8	.472	.472	93	4.724	1.102	.846	3.740	.079	VB..33..
SVJBR1616X16N-F02OH	R	.630	NPT1/8	.630	.630	93	4.724	1.102	.846	3.740	.079	VB..33..
SVJBL1214X16N-F02OH	L	.551	NPT1/8	.472	.472	93	4.724	1.102	.846	3.740	.079	VB..33..
SVJBL1616X16N-F02OH	L	.630	NPT1/8	.630	.630	93	4.724	1.102	.846	3.740	.079	VB..33..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
SVJBR083C-F079-OH	LRIS-4*10	SPNPT1/8	LLR-25S
SVJBR103C-F079-OH	LRIS-4*10	SPNPT1/8	LLR-25S
SVJBL083C-F079-OH	LRIS-4*10	SPNPT1/8	LLR-25S
SVJBL103C-F079-OH	LRIS-4*10	SPNPT1/8	LLR-25S
SVJBR1214X16N-F02OH	LRIS-4*10	–	LLR-25S
SVJBR1616X16N-F02OH	LRIS-4*10	–	LLR-25S
SVJBL1214X16N-F02OH	LRIS-4*10	–	LLR-25S
SVJBL1616X16N-F02OH	LRIS-4*10	–	LLR-25S

VB.. series/Inserts Carbide

VB..

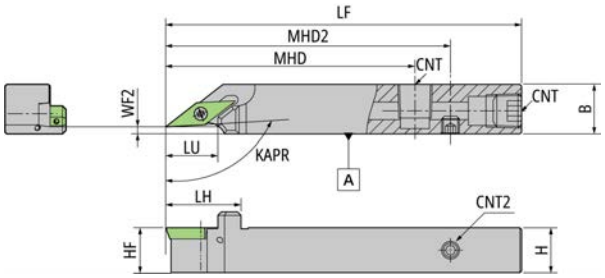


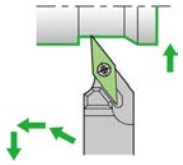
Steel	○ ○ ● ● ● ● ● ● ● ●
Stainless Steel	○ ● ○ ○ ○ ● ○ ● ●
Cast Iron	●
Non-Ferrous Material	○ ○ ●
Heat Resistant Alloy	● ● ○ ○
Hardened Material	○ ○ ○
Others (non-metallic)	●

Shape	Item Number		EPSR	IC	S	AN	RE	Carbide										
								PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(ISO)	°	inch	inch	°	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	VBGT 3308 FN YL	VBGT 160402 FN YL	35	3/8	3/16	5	.008		●	●		●	●					
	VBGT 331 FN YL	VBGT 160404 FN YL	35	3/8	3/16	5	.016		●	●		●	●					
	VBGT 332 FN YL	VBGT 160408 FN YL	35	3/8	3/16	5	.031		●	●		●	●					

VC.. series/Toolholder

SVJC-OH2 Direct connect coolant port 1-hole type





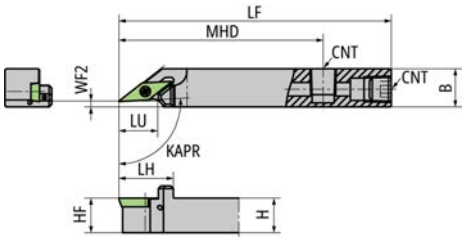
● Diagram shows right-hand tool

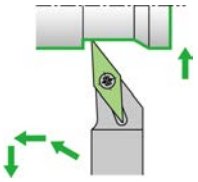
Item Number	Hand	B	CNT	CNT2	H	HF	KAPR	LF	LH	LU	MHD	MHD2	WF2	Insert Gage	
		inch			inch	inch	°	inch	inch	inch	inch	inch	inch		
SVJCR082H-F079-OH2	R	.551	NPT1/8	M5	1/2	1/2	93	3.937	.787	.571	2.756	3.150	.079	VC..22..	VC..22..WP
SVJCR082H-F500-OH2	R	.972	NPT1/8	M5	1/2	1/2	93	3.937	.787	.571	2.756	3.150	.500	VC..22..	VC..22..WP
SVJCR102X-F079-OH2	R	5/8	NPT1/8	M5	5/8	5/8	93	4.724	.787	.571	2.756	3.937	.079	VC..22..	VC..22..WP

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
SVJCR082H-F079-OH2	LRIS-2.5*7	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
SVJCR082H-F500-OH2	LRIS-2.5*7	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
SVJCR102X-F079-OH2	LRIS-2.5*7	SPNPT1/8L	SS0505SC	CLR-15S	LW-2.5

SVJC-N-OH [93 °] Coolant hose connection type





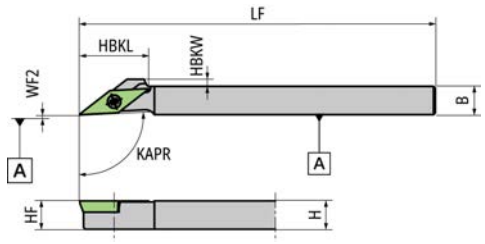
・Diagram shows right-hand tool

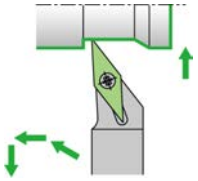
Item Number	Hand	B	CNT	H	HF	KAPR	LF	LH	LU	MHD	WF2	Insert Gage	
		inch		inch	inch	°	inch	inch	inch	inch	inch		
SVJCR082H-F079-OH	R	.551	NPT1/8	1/2	1/2	93	3.937	.787	.571	2.953	.079	VC..22..	VC..22..WP
SVJCR102H-F079-OH	R	5/8	NPT1/8	5/8	5/8	93	3.937	.787	.571	2.953	.079	VC..22..	VC..22..WP
SVJCR1014F11N-F02OH	R	.551	M6*1	.394	.394	93	3.150	.827	.709	2.165	.079	VC..22..	VC..22..WP
SVJCR1214H11N-F02OH	R	.551	Rc1/8	.472	.472	93	3.937	.827	.709	2.953	.079	VC..22..	VC..22..WP
SVJCR1616H11N-F02OH	R	.630	Rc1/8	.630	.630	93	3.937	.827	.709	2.953	.079	VC..22..	VC..22..WP

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)	Wrench (for CNT)
SVJCR082H-F079-OH	LRIS-2.5*7	SPNPT1/8	CLR-15S	–
SVJCR102H-F079-OH	LRIS-2.5*7	SPNPT1/8	CLR-15S	–
SVJCR1014F11N-F02OH	LRIS-2.5*7	SS0605SC	CLR-15S	LW-3
SVJCR1214H11N-F02OH	LRIS-2.5*7	SPR1/8	CLR-15S	–
SVJCR1616H11N-F02OH	LRIS-2.5*7	SPR1/8	CLR-15S	–

SVJC [93°]





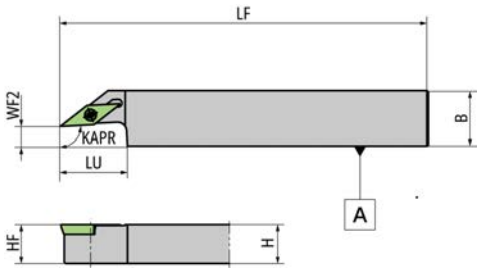
・Diagram shows right-hand tool

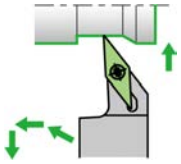
Item Number	Hand	B	H	HBKL	HBKW	HF	KAPR	LF	WF2	Insert Gage	
		inch	inch	inch	inch	inch	°	inch	inch		
SVJCR-062C	R	3/8	3/8	–	–	3/8	93	4.724	.000	VC..22..	VC..22..WP
SVJCR-082C	R	1/2	1/2	–	–	1/2	93	4.724	.000	VC..22..	VC..22..WP
SVJCR-102C	R	5/8	5/8	–	–	5/8	93	4.724	.000	VC..22..	VC..22..WP
SVJCL-062C	L	3/8	3/8	–	–	3/8	93	4.724	.000	VC..22..	VC..22..WP
SVJCL-082C	L	1/2	1/2	–	–	1/2	93	4.724	.000	VC..22..	VC..22..WP
SVJCL-102C	L	5/8	5/8	–	–	5/8	93	4.724	.000	VC..22..	VC..22..WP
SVJCR0808H11N	R	.315	.315	.748	.079	.315	93	3.937	.000	VC..22..	VC..22..WP
SVJCR1010X11N	R	.394	.394	–	–	.394	93	4.724	.000	VC..22..	VC..22..WP
SVJCR1212X11N	R	.472	.472	–	–	.472	93	4.724	.000	VC..22..	VC..22..WP
SVJCR1616X11N	R	.630	.630	–	–	.630	93	4.724	.000	VC..22..	VC..22..WP
SVJCL1010X11N	L	.394	.394	–	–	.394	93	4.724	.000	VC..22..	VC..22..WP
SVJCL1212X11N	L	.472	.472	–	–	.472	93	4.724	.000	VC..22..	VC..22..WP
SVJCL1616X11N	L	.630	.630	–	–	.630	93	4.724	.000	VC..22..	VC..22..WP

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SVJCR-062C	LRIS-2.5*7	CLR-15S
SVJCR-082C	LRIS-2.5*7	CLR-15S
SVJCR-102C	LRIS-2.5*7	CLR-15S
SVJCL-062C	LRIS-2.5*7	CLR-15S
SVJCL-082C	LRIS-2.5*7	CLR-15S
SVJCL-102C	LRIS-2.5*7	CLR-15S
SVJCR0808H11N	LRIS-2.5*7	CLR-15S
SVJCR1010X11N	LRIS-2.5*7	CLR-15S
SVJCR1212X11N	LRIS-2.5*7	CLR-15S
SVJCR1616X11N	LRIS-2.5*7	CLR-15S
SVJCL1010X11N	LRIS-2.5*7	CLR-15S
SVJCL1212X11N	LRIS-2.5*7	CLR-15S
SVJCL1616X11N	LRIS-2.5*7	CLR-15S

SVJC-F [93°] Shifted





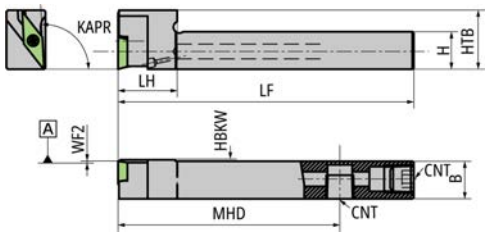
● Diagram shows right-hand tool

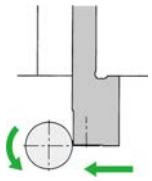
Item Number	Hand	B	H	HF	KAPR	LF	LU	WF2	Insert Gage	
		inch	inch	inch	°	inch	inch	inch		
SVJCR082C-F250	R	.709	1/2	1/2	93	4.724	.827	1/4	VC..22..	VC..22..WP
SVJCR082C-F500	R	.984	1/2	1/2	93	4.724	.827	1/2	VC..22..	VC..22..WP

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SVJCR082C-F250	LRIS-2.5*7	CLR-15S
SVJCR082C-F500	LRIS-2.5*7	CLR-15S

Y-SVJC-OH2 Direct connect coolant port 1-hole type Y-Axis





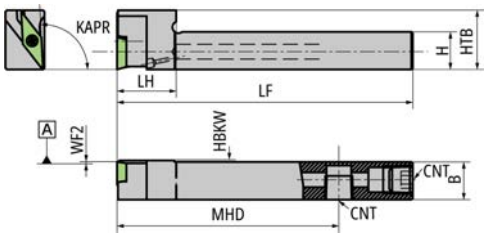
● Diagram shows right-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

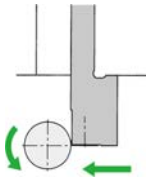
Item Number	Hand	B	CNT	CNT2	H	HBKW	HTB	KAPR	LF	LH	MHD	MHD2	WF2	Insert Gage	
		inch			inch	inch	inch	°	inch	inch	inch	inch	inch		
Y-SVJCR082HS-IN-OH2	R	1/2	NPT1/8	M5	1/2	.020	.787	93	3.937	.787	2.756	3.150	.000	VC..22..	VC..22..WP
Y-SVJCR1212H11S-OH2	R	.472	Rc1/8	M5	.472	.020	.787	93	3.937	.787	2.756	3.150	.000	VC..22..	VC..22..WP

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
Y-SVJCR082HS-IN-OH2	LRIS-2.5*7	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
Y-SVJCR1212H11S-OH2	LRIS-2.5*7	SPR1/8	SS0505SC	CLR-15S	LW-2.5

Y-SVJC-OH [93 °] Y-Axis Coolant hose connection type





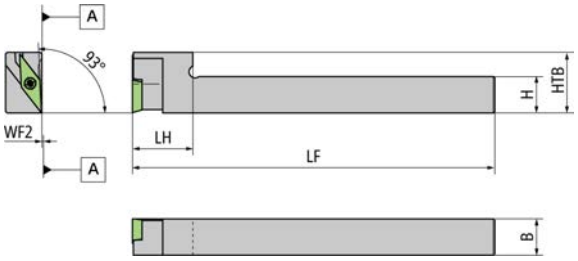
・Diagram shows right-hand tool
NOTE: Use a right-handed (R) or non-handed insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

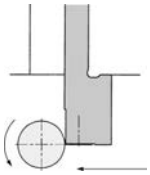
Item Number	Hand	B	CNT	H	HBKW	HTB	KAPR	LF	LH	MHD	WF2	Insert Gage	
		inch		inch	inch	inch	°	inch	inch	inch	inch		
Y-SVJCR082HS-IN-OH	R	1/2	NPT1/8	1/2	.020	.787	93	3.937	.787	2.953	.000	VC..22..	VC..22..WP
Y-SVJCR102H-IN-OH	R	5/8	NPT1/8	5/8	.020	.787	93	3.937	.984	2.953	.000	VC..22..	VC..22..WP
Y-SVJCR1212H11S-OH	R	.472	Rc1/8	.472	.020	.787	93	3.937	.787	2.953	.000	VC..22..	VC..22..WP
Y-SVJCR1616H11S-OH	R	.630	Rc1/8	.630	.020	.787	93	3.937	.787	2.953	.000	VC..22..	VC..22..WP

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
Y-SVJCR082HS-IN-OH	LRIS-2.5*7	SPNPT1/8	CLR-15S
Y-SVJCR102H-IN-OH	LRIS-2.5*7	SPNPT1/8	CLR-15S
Y-SVJCR1212H11S-OH	LRIS-2.5*7	SPR1/8	CLR-15S
Y-SVJCR1616H11S-OH	LRIS-2.5*7	SPR1/8	CLR-15S

Y-SVJC [93°] Y-axis





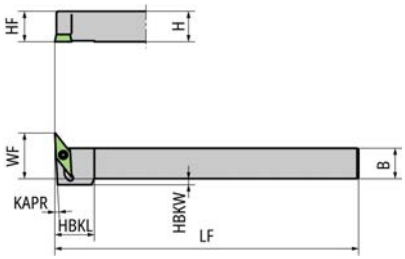
● Diagram shows right-hand tool
NOTE: Use a right-handed (R) or non-handed insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

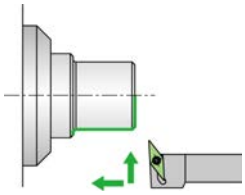
Item Number	Hand	B	H	HTB	KAPR	LF	LH	WF2	Insert Gage	
		inch	inch	inch	°	inch	inch	inch		
Y-SVJCR062-IN	R	3/8	3/8	.787	93	4.724	.787	.000	VC..22..	VC..22..WP
Y-SVJCR082-IN	R	1/2	1/2	.787	93	4.724	.787	.000	VC..22..	VC..22..WP
Y-SVJCR102-IN	R	5/8	5/8	.787	93	4.724	.984	.000	VC..22..	VC..22..WP

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
Y-SVJCR062-IN	LRIS-2.5*7	CLR-15S
Y-SVJCR082-IN	LRIS-2.5*7	CLR-15S
Y-SVJCR102-IN	LRIS-2.5*7	CLR-15S

CH-SVUC [93°] for horizontal gang style tool post





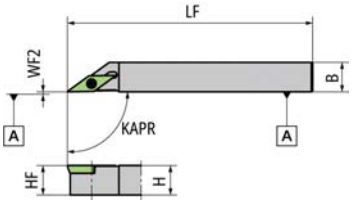
・Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

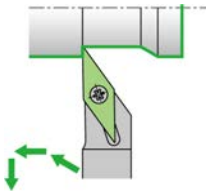
Item Number	Hand	B	H	HBKL	HBKW	HF	KAPR	LF	WF	Insert Gage
		inch	inch	inch	inch	inch	°	inch	inch	
CH-SVUCL1010H11	L	.394	.394	.591	.079	.394	93	3.937	.709	VC..22..
CH-SVUCL1212H11	L	.472	.472	–	–	.472	93	3.937	.787	VC..22..
CH-SVUCL1616H11	L	.630	.630	–	–	.630	93	3.937	.945	VC..22..
CH-SVUCL2020H11	L	.787	.787	–	–	.787	93	3.937	1.102	VC..22..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CH-SVUCL1010H11	LRIS-2.5*7	CLR-15S
CH-SVUCL1212H11	LRIS-2.5*7	CLR-15S
CH-SVUCL1616H11	LRIS-2.5*7	CLR-15S
CH-SVUCL2020H11	LRIS-2.5*7	CLR-15S

SVAC-N [91°]





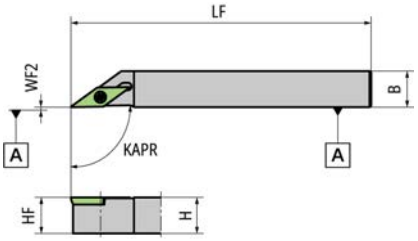
・Diagram shows right-hand tool

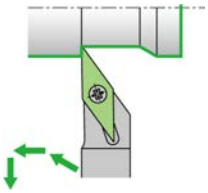
Item Number	Hand	B	H	HF	KAPR	LF	WF2	Insert Gage
		inch	inch	inch	°	inch	inch	
SVACR0808X11N	R	.315	.315	.315	91	4.724	.000	VC..22..
SVACR1010X11N	R	.394	.394	.394	91	4.724	.000	VC..22..
SVACR1212X11N	R	.472	.472	.472	91	4.724	.000	VC..22..
SVACR1616X11N	R	.630	.630	.630	91	4.724	.000	VC..22..
SVACL0808X11N	L	.315	.315	.315	91	4.724	.000	VC..22..
SVACL1010X11N	L	.394	.394	.394	91	4.724	.000	VC..22..
SVACL1212X11N	L	.472	.472	.472	91	4.724	.000	VC..22..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SVACR0808X11N	LRIS-2.5*7	CLR-15S
SVACR1010X11N	LRIS-2.5*7	CLR-15S
SVACR1212X11N	LRIS-2.5*7	CLR-15S
SVACR1616X11N	LRIS-2.5*7	CLR-15S
SVACL0808X11N	LRIS-2.5*7	CLR-15S
SVACL1010X11N	LRIS-2.5*7	CLR-15S
SVACL1212X11N	LRIS-2.5*7	CLR-15S

SVAC-N-1L [91°]





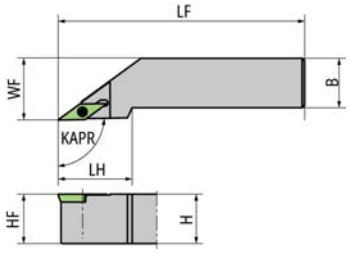
・Diagram shows right-hand tool

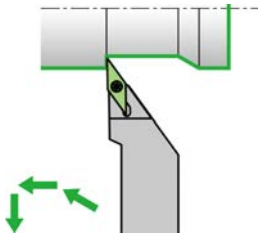
Item Number	Hand	B	H	HF	KAPR	LF	WF2	Insert Gage
		inch	inch	inch	°	inch	inch	
SVACR1010X11N-1L	R	.394	.394	.394	91	4.724	.000	VC..21.5..
SVACR1212X11N-1L	R	.472	.472	.472	91	4.724	.000	VC..21.5..
SVACL1010X11N-1L	L	.394	.394	.394	91	4.724	.000	VC..21.5..
SVACL1212X11N-1L	L	.472	.472	.472	91	4.724	.000	VC..21.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SVACR1010X11N-1L	LRIS-2.5*7	CLR-15S
SVACR1212X11N-1L	LRIS-2.5*7	CLR-15S
SVACL1010X11N-1L	LRIS-2.5*7	CLR-15S
SVACL1212X11N-1L	LRIS-2.5*7	CLR-15S

SVAC [91°]





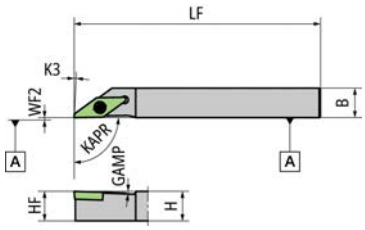
・Diagram shows right-hand tool

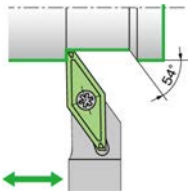
Item Number	Hand	B	H	HF	KAPR	LF	LH	WF	Insert Gage
		inch	inch	inch	°	inch	inch	inch	
SVACR20-X11	R	.787	.787	.787	91	4.724	1.181	.984	VC..22..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SVACR20-X11	LRIS-2.5*7	CLR-15S

SVAC-NW [91°] for VCGT2.52





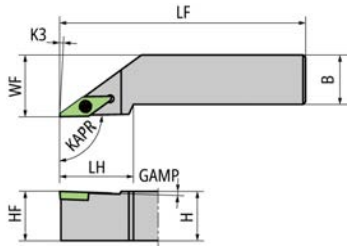
・Diagram shows right-hand tool

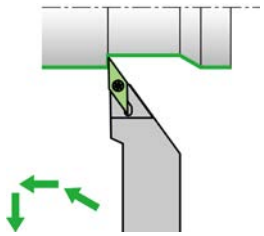
Item Number	Hand	B	GAMP	H	HF	KAPR	K3	LF	WF2	Insert Gage
		inch	°	inch	inch	°	°	inch	inch	
SVACR1010L13NW	R	.394	1	.394	.394	91	3	5.512	.000	VC..2.52..2M
SVACR1212L13NW	R	.472	1	.472	.472	91	3	5.512	.000	VC..2.52..2M
SVACR1616M13NW	R	.630	1	.630	.630	91	3	5.512	.000	VC..2.52..2M
SVACL1010L13NW	L	.394	1	.394	.394	91	3	5.512	.000	VC..2.52..2M
SVACL1212L13NW	L	.472	1	.472	.472	91	3	5.512	.000	VC..2.52..2M
SVACL1616M13NW	L	.630	1	.630	.630	91	3	5.512	.000	VC..2.52..2M

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SVACR1010L13NW	LRIS-3*8	RLR-20S
SVACR1212L13NW	LRIS-3*8	RLR-20S
SVACR1616M13NW	LRIS-3*8	RLR-20S
SVACL1010L13NW	LRIS-3*8	RLR-20S
SVACL1212L13NW	LRIS-3*8	RLR-20S
SVACL1616M13NW	LRIS-3*8	RLR-20S

SVAC-W [91°] for VCGT2.52





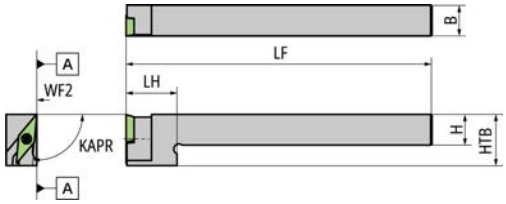
・Diagram shows right-hand tool

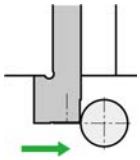
Item Number	Hand	B	GAMP	H	HF	KAPR	K3	LF	LH	WF	Insert Gage
		inch	°	inch	inch	°	°	inch	inch	inch	
SVACR2020M13W	R	.787	1	.787	.787	91	3	5.906	1.181	.984	VC..2.52..2M

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SVACR2020M13W	LRIS-3*8	RLR-20S

Y-SVXC [95°] Y-axis





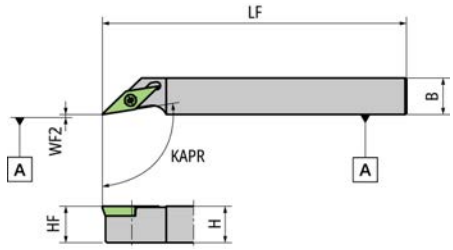
・Diagram shows left-hand tool
NOTE: Use a left-handed (L) or non-handed insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

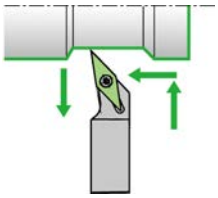
Item Number	Hand	B	H	KAPR	LF	LH	WF2	Insert Gage
		inch	inch	°	inch	inch	inch	
Y-SVXCL12-11S	L	.472	.472	95	4.724	.787	.000	VC..22..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
Y-SVXCL12-11S	LRIS-2.5*7	CLR-15S

SVXC-N [99°]





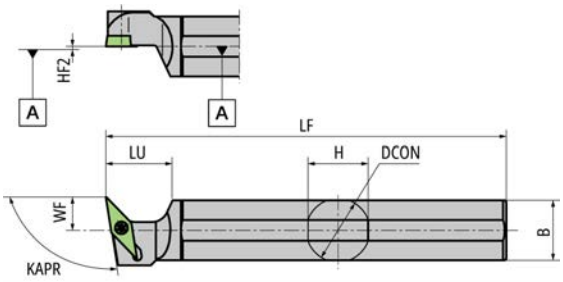
・Diagram shows right-hand tool

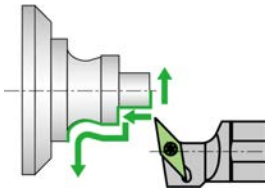
Item Number	Hand	B	H	HF	KAPR	LF	WF2	Insert Gage
		inch	inch	inch	°	inch	inch	
SVXCR1012X11N	R	.472	.394	.394	99	4.724	.000	VC..22..
SVXCR1212X11N	R	.472	.472	.472	99	4.724	.000	VC..22..
SVXCL1012X11N	L	.472	.394	.394	99	4.724	.000	VC..22..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SVXCR1012X11N	LRIS-2.5*7	CLR-15S
SVXCR1212X11N	LRIS-2.5*7	CLR-15S
SVXCL1012X11N	LRIS-2.5*7	CLR-15S

DS-SVX [99°] DS Toolholders





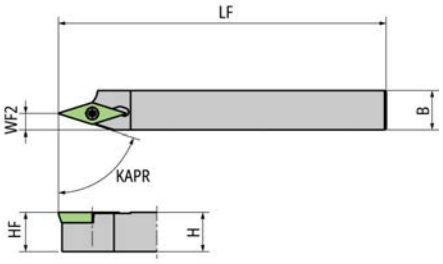
・Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

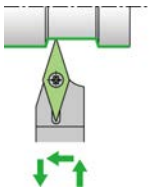
Item Number	Hand	B	DCON	H	HF2	KAPR	LF	LU	WF	Insert Gage
		inch	inch	inch	inch	°	inch	inch	inch	
DS-SVXL14F-11	L	.512	.551	.512	.000	99	3.150	.807	.394	VC..22..
DS-SVXL15H-11	L	.591	5/8	.591	.000	99	3.937	.807	.394	VC..22..
DS-SVXL16F-11	L	.591	.630	.591	.000	99	3.150	.807	.394	VC..22..
DS-SVXL19-11	L	.709	3/4	.709	.000	99	4.724	.787	.394	VC..22..
DS-SVXL19-11SPL	L	.709	3/4	.709	.000	99	6.299	.787	.433	VC..22..
DS-SVXL20-11	L	.748	.787	.748	.000	99	4.724	.787	.394	VC..22..
DS-SVXL20X-11	L	.748	.787	.748	.000	99	3.740	.787	.394	VC..22..
DS-SVXL22-11	L	.827	.866	.827	.000	99	4.724	.787	.394	VC..22..
DS-SVXL25-11	L	.945	1.000	.945	.000	99	5.906	.787	.394	VC..22..
DS-SVXL25-11MET	L	.945	.984	.945	.000	99	5.906	.787	.394	VC..22..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-SVXL14F-11	LRIS-2.5*7	CLR-15S
DS-SVXL15H-11	LRIS-2.5*7	CLR-15S
DS-SVXL16F-11	LRIS-2.5*7	CLR-15S
DS-SVXL19-11	LRIS-2.5*7	CLR-15S
DS-SVXL19-11SPL	LRIS-2.5*7	CLR-15S
DS-SVXL20-11	LRIS-2.5*7	CLR-15S
DS-SVXL20X-11	LRIS-2.5*7	CLR-15S
DS-SVXL22-11	LRIS-2.5*7	CLR-15S
DS-SVXL25-11	LRIS-2.5*7	CLR-15S
DS-SVXL25-11MET	LRIS-2.5*7	CLR-15S

SVVC-N [72.5°]





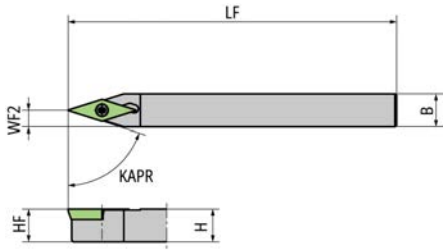
・Diagram shows right-hand tool

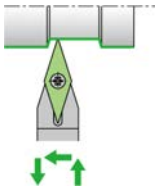
Item Number	Hand	B	H	HF	KAPR	LF	WF2	Insert Gage
		inch	inch	inch	°	inch	inch	
SVVCR1212X11N	R	.472	.472	.472	72.5	4.724	.197	VC..22..
SVVCR1616X11N	R	.630	.630	.630	72.5	4.724	.197	VC..22..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SVVCR1212X11N	LRIS-2.5*7	CLR-15S
SVVCR1616X11N	LRIS-2.5*7	CLR-15S

SVVCN [72.5°]



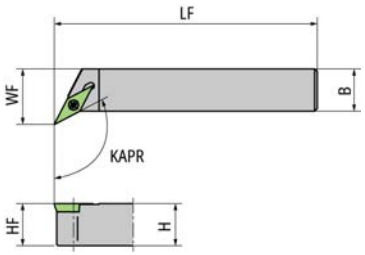


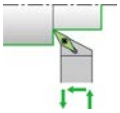
Item Number	Hand	B	H	HF	KAPR	LF	WF2	Insert Gage
		inch	inch	inch	°	inch	inch	
SVVCN0808H11N	N	.315	.315	.315	72.5	3.937	.157	VC..22..
SVVCN1010X11N	N	.394	.394	.394	72.5	4.724	.197	VC..22..
SVVCN20-X11	N	.787	.787	.787	72.5	4.724	.394	VC..22..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SVVCN0808H11N	LRIS-2.5*7	CLR-15S
SVVCN1010X11N	LRIS-2.5*7	CLR-15S
SVVCN20-X11	LRIS-2.5*7	CLR-15S

SVQC [117.5°]





・Diagram shows right-hand tool

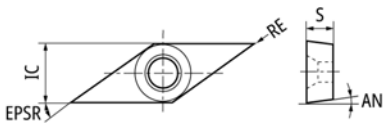
Item Number	Hand	B	H	HF	KAPR	LF	WF	Insert Gage
		inch	inch	inch	°	inch	inch	
SVQCR20-X11	R	.787	.787	.787	117.5	4.724	.984	VC..22..

Spare Parts

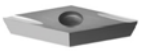
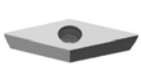
Item Number	Clamp screw	Wrench (for Clamp screw)
SVQCR20-X11	LRIS-2.5*7	CLR-15S

VC.. series/Inserts Carbide

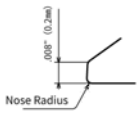
VC..

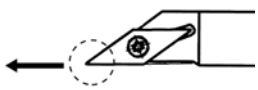


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number (Inch)	Item Number (Metric)	EPSR	IC	S	AN	RE	BS	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM1	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
			°	inch	inch	°	inch	inch											
	VCGT 2208M R TMV	VCGT 110302M R TMV	35	1/4	1/8	7	.007	–	●	●									
	VCGT 221M R TMV	VCGT 110304M R TMV	35	1/4	1/8	7	.015	–	●	●									
	VCGT 2204M YL	VCGT 110301M YL	35	1/4	1/8	7	.003	–	●	●	●	●	●	●					
	VCGT 2208M YL	VCGT 110302M YL	35	1/4	1/8	7	.007	–	●	●	●	●	●	●					
	VCGT 221M YL	VCGT 110304M YL	35	1/4	1/8	7	.015	–	●	●	●	●	●	●					
	VCGT 21.508M CL	VCGT 110202M CL	35	1/4	3/32	7	.007	–			●	●	●	●					
	VCGT 2204M CL	VCGT 110301M CL	35	1/4	1/8	7	.003	–	●	●	●	●	●	●					
	VCGT 2208M CL	VCGT 110302M CL	35	1/4	1/8	7	.007	–	●	●	●	●	●	●					
	VCGT 2201 FN AM3	VCGT 110300 FN AM3	35	1/4	1/8	7	.001	–				●	●	●	●				
	VCGT 2204M FN AM3	VCGT 110301M FN AM3	35	1/4	1/8	7	.003	–	●	●		●	●	●	●				
	VCGT 2204 FN AM3	VCGT 110301 FN AM3	35	1/4	1/8	7	.004	–							●	●			
	VCGT 2208M FN AM3	VCGT 110302M FN AM3	35	1/4	1/8	7	.007	–	●	●		●	●	●	●				
	VCGT 2208 FN AM3	VCGT 110302 FN AM3	35	1/4	1/8	7	.008	–							●	●			
	VCGT 221M FN AM3	VCGT 110304M FN AM3	35	1/4	1/8	7	.015	–	●	●		●	●	●	●				
	VCMT 2208 FN AM3	VCMT 110302 FN AM3	35	1/4	1/8	7	.008	–			●								
	VCMT 221 FN AM3	VCMT 110304 FN AM3	35	1/4	1/8	7	.016	–			●								
	VCGT 2201 AZ7	VCGT 110300 AZ7	35	1/4	1/8	7	.001	–					●			●			
	VCGT 2204M AZ7	VCGT 110301M AZ7	35	1/4	1/8	7	.003	–					●			●			
	VCGT 2208M AZ7	VCGT 110302M AZ7	35	1/4	1/8	7	.007	–					●			●			
	VCGT 221M AZ7	VCGT 110304M AZ7	35	1/4	1/8	7	.015	–					●			●			
	VCGT 2.5201 FR 2M	VCGT 130300 FR 2M	35	5/16	1/8	7	–	–			●								
	VCGT 2.5201 FL 2M	VCGT 130300 FL 2M	35	5/16	1/8	7	–	–			●								
	VCGT 2.5204 FR 2M	VCGT 130301 FR 2M	35	5/16	1/8	7	–	–			●								
	VCGT 2.5204 FL 2M	VCGT 130301 FL 2M	35	5/16	1/8	7	–	–			●								
	VCGT 2201 R U	VCGT 110300 R U	35	1/4	1/8	7	.001	–							●	●			
	VCGT 2204M R U	VCGT 110301M R U	35	1/4	1/8	7	.003	–				●							
	VCGT 2204 R U	VCGT 110301 R U	35	1/4	1/8	7	.004	–							●	●			
	VCGT 2208M R U	VCGT 110302M R U	35	1/4	1/8	7	.007	–				●							
	VCGT 2208 R U	VCGT 110302 R U	35	1/4	1/8	7	.008	–							●	●			
	VCET 2203 R UHG	VCET 1103008 R UHG	35	1/4	1/8	7	.003	–							●				
	VCGT 2202 R U -WP	VCGT 1103005 R U -WP	35	1/4	1/8	7	.002	(.008)							●	●			
	VCGT 2204 R U -WP	VCGT 110301 R U -WP	35	1/4	1/8	7	.004	(.008)							●	●			
	VCGT 2202 R SX -WP Ⓜ	VCGT 1103005 R SX -WP Ⓜ	35	1/4	1/8	7	.002	(.008)							●	●			
	VCGT 2204 R SX -WP Ⓜ	VCGT 110301 R SX -WP Ⓜ	35	1/4	1/8	7	.004	(.008)							●	●			
	VCGW 2201 H Ⓜ	VCGW 110300 H Ⓜ	35	1/4	1/8	7	.001	–											●
	VCGW 2204 H Ⓜ	VCGW 110301 H Ⓜ	35	1/4	1/8	7	.004	–											●
	VCGW 2208 H Ⓜ	VCGW 110302 H Ⓜ	35	1/4	1/8	7	.008	–											●

Features of VCGT-WP insert

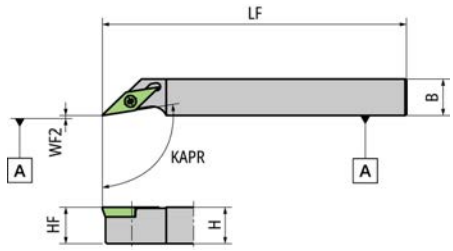


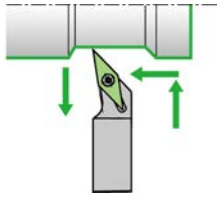


NTK WP style inserts have a wiper facet design.
The insert has a 0.2mm(.008") flat on the cutting edge when the insert is set into the toolholder.
The flat on the cutting edge ensures a superior surface when feed rates are increased.
WP style inserts can be used in toolholders: SVAC

VP.. series/Toolholder

SVXP-N [99°]





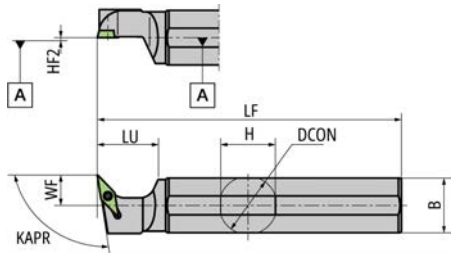
● Diagram shows right-hand tool

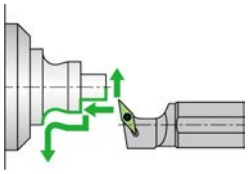
Item Number	Hand	B	H	HF	KAPR	LF	WF2	Insert Gage
		inch	inch	inch	°	inch	inch	
SVXPR1012X11N	R	.472	.394	.394	99	4.724	.000	VP..22..
SVXPR1212X11N	R	.472	.472	.472	99	4.724	.000	VP..22..
SVXPL1012X11N	L	.472	.394	.394	99	4.724	.000	VP..22..
SVXPL1212X11N	L	.472	.472	.472	99	4.724	.000	VP..22..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SVXPR1012X11N	LRIS-2.5*7	CLR-15S
SVXPR1212X11N	LRIS-2.5*7	CLR-15S
SVXPL1012X11N	LRIS-2.5*7	CLR-15S
SVXPL1212X11N	LRIS-2.5*7	CLR-15S

DS-SVXP [99°] DS Toolholders





● Diagram shows left-hand tool

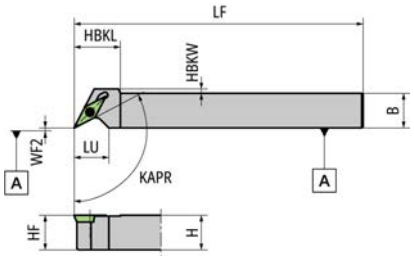
NOTE: Use a right-handed (R) or non-handed insert.

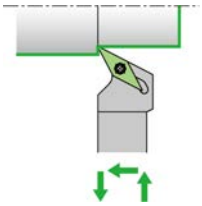
Item Number	Hand	B	DCON	H	HF2	KAPR	LF	LU	WF	Insert Gage
		inch	inch	inch	inch	°	inch	inch	inch	
DS-SVXPL19-08	L	.709	3/4	.709	.000	99	4.724	.787	.394	VP..1.51.5..
DS-SVXPL20-08	L	.748	.787	.748	.000	99	4.724	.787	.394	VP..1.51.5..
DS-SVXPL22-08	L	.827	.866	.827	.000	99	4.724	.787	.394	VP..1.51.5..
DS-SVXPL25-08	L	.945	1.000	.945	.000	99	5.906	.787	.394	VP..1.51.5..

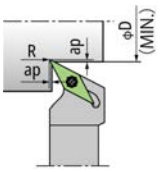
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-SVXPL19-08	LRIS-2*6	CLR-13S
DS-SVXPL20-08	LRIS-2*6	CLR-13S
DS-SVXPL22-08	LRIS-2*6	CLR-13S
DS-SVXPL25-08	LRIS-2*6	CLR-13S

SVQP-N [117.5°]







R	ap	ϕD(Min)
.002	.008	.098
	.020	.177
.003	.008	.098
	.020	.177
.007	.008	.138
	.020	.217
.008	.008	.138
	.020	.177

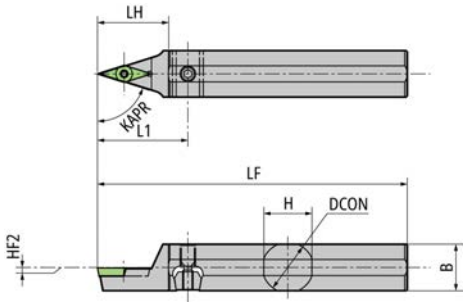
● Diagram shows right-hand tool

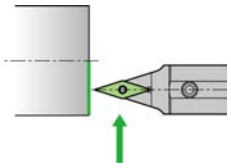
Item Number	Hand	B	H	HBKL	HBKW	HF	KAPR	LF	LU	WF2	Insert Gage
		inch	inch	inch	inch	inch	°	inch	inch	inch	
SVQPR1010X08N	R	.394	.394	.630	.138	.394	117.5	4.724	.472	.000	VP..1.51.5..
SVQPR1212X08N	R	.472	.472	.630	.059	.472	117.5	4.724	.472	.000	VP..1.51.5..
SVQPR1616X08N	R	.630	.630	–	–	.630	117.5	4.724	.472	.000	VP..1.51.5..
SVQPL1010X08N	L	.394	.394	.630	.138	.394	117.5	4.724	.472	.000	VP..1.51.5..
SVQPL1212X08N	L	.472	.472	.630	.059	.472	117.5	4.724	.472	.000	VP..1.51.5..
SVQPL1616X08N	L	.630	.630	–	–	.630	117.5	4.724	.472	.000	VP..1.51.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SVQPR1010X08N	LRIS-2*6	CLR-13S
SVQPR1212X08N	LRIS-2*6	CLR-13S
SVQPR1616X08N	LRIS-2*6	CLR-13S
SVQPL1010X08N	LRIS-2*6	CLR-13S
SVQPL1212X08N	LRIS-2*6	CLR-13S
SVQPL1616X08N	LRIS-2*6	CLR-13S

DS-SVVPN-ACH [72.5°] Adjustable centerline height



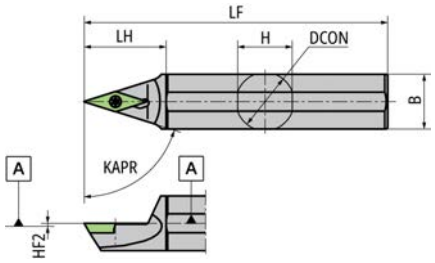


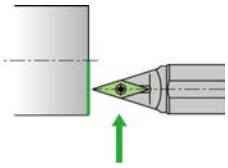
Item Number	Hand	B	DCON	H	HF2	KAPR	LF	L1	Insert Gage
		inch	inch	inch	inch	°	inch	inch	
DS-SVVPN16-11-ACH	N	.591	.630	.610	Type B(0~+.012)	72.5	4.724	1.220	VP..22..
DS-SVVPN19-11-ACH	N	.709	3/4	.709	Type B(0~+.012)	72.5	4.724	1.378	VP..22..
DS-SVVPN20-11-ACH	N	.748	.787	.748	Type B(0~+.012)	72.5	4.724	1.378	VP..22..
DS-SVVPN22-11-ACH	N	.827	.866	.827	Type A(0~+.008)	72.5	4.724	1.378	VP..22..
DS-SVVPN25-11-ACH	N	.945	1.000	.945	Type A(0~+.008)	72.5	5.906	1.378	VP..22..

Spare Parts

Item Number	Clamp screw	Screw (for Wedge)	Wedge	Wrench (for Clamp screw)	Wrench (for Wedge)
DS-SVVPN16-11-ACH	LRIS-2.5*7	WS060415-003	ACH-W18	CLR-15S	LW-3
DS-SVVPN19-11-ACH	LRIS-2.5*7	WS060415-003	ACH-W18	CLR-15S	LW-3
DS-SVVPN20-11-ACH	LRIS-2.5*7	WS060419-004	ACH-W18	CLR-15S	LW-3
DS-SVVPN22-11-ACH	LRIS-2.5*7	WS060419-004	ACH-W18	CLR-15S	LW-3
DS-SVVPN25-11-ACH	LRIS-2.5*7	WS060419-004	ACH-W24	CLR-15S	LW-3

DS-SVVPN [72.5°] DS Toolholders



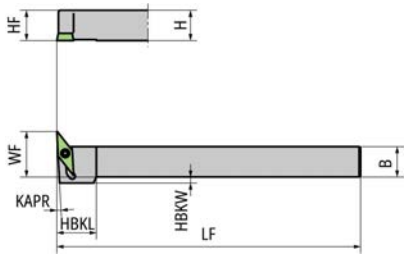


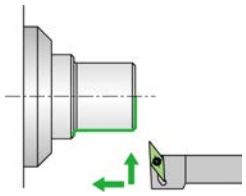
Item Number	Hand	B	DCON	H	HF2	KAPR	LF	Insert Gage
		inch	inch	inch	inch	°	inch	
DS-SVVPN19-11	N	.709	3/4	.709	.000	72.5	4.724	VP..22..
DS-SVVPN22-11	N	.827	.866	.827	.000	72.5	4.724	VP..22..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-SVVPN19-11	LRIS-2.5*7	CLR-15S
DS-SVVPN22-11	LRIS-2.5*7	CLR-15S

CH-SVUP [93°] for horizontal gang style tool post





● Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

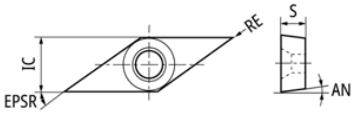
Item Number	Hand	B	H	HBKL	HBKW	HF	KAPR	LF	WF	Insert Gage
		inch	inch	inch	inch	inch	°	inch	inch	
CH-SVUPL1010H08	L	.394	.394	.512	.079	.394	93	3.937	.591	VP..1.51.5..
CH-SVUPL1212H08	L	.472	.472	–	–	.472	93	3.937	.669	VP..1.51.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CH-SVUPL1010H08	LRIS-2*6	CLR-13S
CH-SVUPL1212H08	LRIS-2*6	CLR-13S

VP.. series/Inserts Carbide

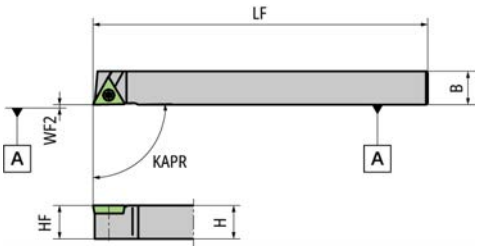
VP..

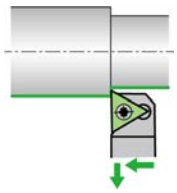


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	AN	RE	Carbide										
								PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	VPEP 6302 R KHG	VPET 0802005 R KHG	35	3/16	3/32	11	.002						●	●				
	VPEP 6302 L KHG	VPET 0802005 L KHG	35	3/16	3/32	11	.002							●				
	VPEP 6303 R KHG	VPET 0802008 R KHG	35	3/16	3/32	11	.003				●		●	●				
	VPEP 6303 L KHG	VPET 0802008 L KHG	35	3/16	3/32	11	.003							●				
	VPEP 6307 R KHG	VPET 0802018 R KHG	35	3/16	3/32	11	.007						●	●				
	VPEP 6307 L KHG	VPET 0802018 L KHG	35	3/16	3/32	11	.007							●				
	VPEP 6308 R KHG	VPET 080202 R KHG	35	3/16	3/32	11	.008						●	●				
	VPEP 6308 L KHG	VPET 080202 L KHG	35	3/16	3/32	11	.008							●				
	VPET 2202 R KHG	VPET 1103005 R KHG	35	1/4	1/8	11	.002						●	●				
	VPET 2202 L KHG	VPET 1103005 L KHG	35	1/4	1/8	11	.002							●				
	VPET 2203 R KHG	VPET 1103008 R KHG	35	1/4	1/8	11	.003						●	●				
	VPET 2203 L KHG	VPET 1103008 L KHG	35	1/4	1/8	11	.003							●				
	VPET 2207 R KHG	VPET 1103018 R KHG	35	1/4	1/8	11	.007						●	●				
	VPET 2207 L KHG	VPET 1103018 L KHG	35	1/4	1/8	11	.007							●				
	VPET 2208 R KHG	VPET 110302 R KHG	35	1/4	1/8	11	.008						●	●				
	VPET 2208 L KHG	VPET 110302 L KHG	35	1/4	1/8	11	.008							●				
	VPEP 6303 L UHG	VPET 0802008 L UHG	35	3/16	3/32	11	.003				●							
	VPEP 6303 R UHG	VPET 0802008 R UHG	35	3/16	3/32	11	.003				●							
	VPGT 2201 FN AM3	VPGT 110300 FN AM3	35	1/4	1/8	11	.001				●		●					
	VPGT 2204M FN AM3	VPGT 110301M FN AM3	35	1/4	1/8	11	.003		●		●	●	●					
	VPGT 2208M FN AM3	VPGT 110302M FN AM3	35	1/4	1/8	11	.007		●		●	●	●					

STAC-N [91°]





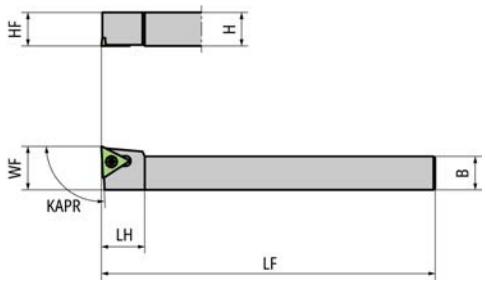
● Diagram shows right-hand tool

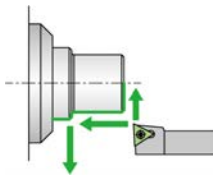
Item Number	Hand	B	H	HF	KAPR	LF	WF2	Insert Gage	
		inch	inch	inch	°	inch	inch		
STACR0808X09N	R	.315	.315	.315	91	4.724	.000	TC..73..	TC..73..WP
STACR1010X09N	R	.394	.394	.394	91	4.724	.000	TC..73..	TC..73..WP
STACR1212X11N	R	.472	.472	.472	91	4.724	.000	TC..21.5..	TC..21.5..WP
STACL1010X09N	L	.394	.394	.394	91	4.724	.000	TC..73..	TC..73..WP
STACL1212X11N	L	.472	.472	.472	91	4.724	.000	TC..21.5..	TC..21.5..WP

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
STACR0808X09N	LRIS-2.2*6	CLR-13S
STACR1010X09N	LRIS-2.2*6	CLR-13S
STACR1212X11N	LRIS-2.5*7	CLR-15S
STACL1010X09N	LRIS-2.2*6	CLR-13S
STACL1212X11N	LRIS-2.5*7	CLR-15S

CH-STUC [93°] for horizontal gang style tool post





● Diagram shows left-hand tool

NOTE: Use a right-handed (R) or non-handed insert.

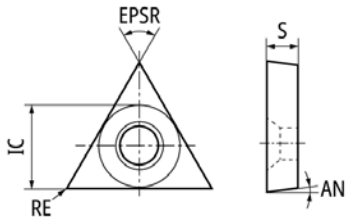
Item Number	Hand	B	H	HF	KAPR	LF	LH	WF	Insert Gage
		inch	inch	inch	°	inch	inch	inch	
CH-STUCL1010H09	L	.394	.394	.394	93	3.937	.512	.512	TC..73..
CH-STUCL1212H09	L	.472	.472	.472	93	3.937	.512	.591	TC..73..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CH-STUCL1010H09	LRIS-2.2*6	CLR-13S
CH-STUCL1212H09	LRIS-2.2*6	CLR-13S

TC.. series/Inserts Carbide

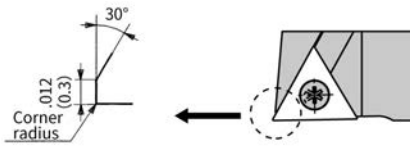
TC..



Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

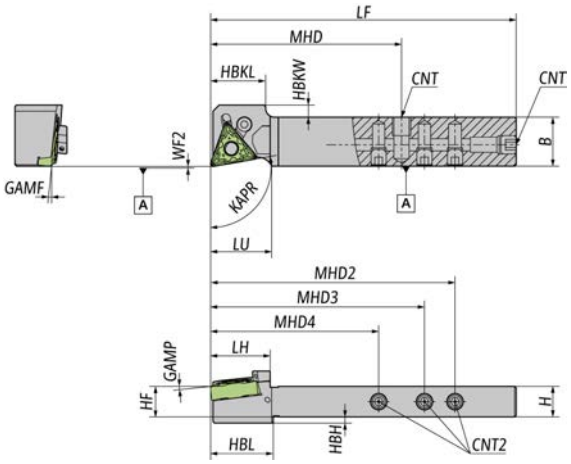
Shape	Item Number		EPSR	IC	S	AN	RE	BS	Carbide										
									PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	TCGP 5204 FR F05	TCGH 060101 FR F05	60	–	–	7	–	–		●			●	●					
	TCGP 5208 FL F05	TCGH 060102 FL F05	60	5/32	1/16	7	.008	–						●		●			
	TCGP 5208 FR F05	TCGH 060102 FR F05	60	5/32	1/16	7	.008	–		●			●	●		●			
	TCGP 521 FR F05	TCGH 060104 FR F05	60	5/32	1/16	7	.016	–		●			●	●		●			
	TCGP 7304 R S	TCGT 090201 R S	60	7/32	3/32	7	.004	–							●	●			
	TCGP 7304 L S	TCGT 090201 L S	60	7/32	3/32	7	.004	–							●				
	TCGP 7308 R S	TCGT 090202 R S	60	7/32	3/32	7	.008	–								●			
	TCGT 21.504 R S	TCGT 110201 R S	60	1/4	3/32	7	.004	–							●	●			
	TCGT 21.504 L S	TCGT 110201 L S	60	1/4	3/32	7	.004	–							●				
	TCGP 7304 R U	TCGT 090201 R U	60	7/32	3/32	7	.004	–								●			
	TCGP 7308 R U	TCGT 090202 R U	60	7/32	3/32	7	.008	–								●			
	TCGP 5208 FL K	TCGH 060102 FL K	60	5/32	1/16	7	.008	–						●					
	TCGP 521 FL K	TCGH 060104 FL K	60	5/32	1/16	7	.016	–						●					
	TCGP 5208 FL B1	TCGH 060102 FL B1	60	5/32	1/16	7	.008	–						●		●			
	TCGP 521 FL B1	TCGH 060104 FL B1	60	5/32	1/16	7	.016	–						●		●			
	TCGP 7302 R S -WP	TCGT 0902005 R S -WP	60	7/32	3/32	7	.002	(.012)								●			
	TCGP 7302 L S -WP	TCGT 0902005 L S -WP	60	7/32	3/32	7	.002	(.012)								●			
	TCGP 7306 R S -WP	TCGT 0902015 R S -WP	60	7/32	3/32	7	.006	(.012)								●			
	TCGP 7306 L S -WP	TCGT 0902015 L S -WP	60	7/32	3/32	7	.006	(.012)								●			
	TCGT 21.502 R S -WP	TCGT 1102005 R S -WP	60	1/4	3/32	7	.002	(.012)								●			
	TCGT 21.506 R S -WP	TCGT 1102015 R S -WP	60	1/4	3/32	7	.006	(.012)								●			
	TCGP 7302 R U -WP	TCGT 0902005 R U -WP	60	7/32	3/32	7	.002	(.012)								●			
	TCGP 7306 R U -WP	TCGT 0902015 R U -WP	60	7/32	3/32	7	.006	(.012)								●			
	TCGT 21.502 R U1 -WP	TCGT 1102005 R U1 -WP	60	1/4	3/32	7	.002	(.012)								●			
	TCGT 21.506 R U1 -WP	TCGT 1102015 R U1 -WP	60	1/4	3/32	7	.006	(.012)								●			
	TCGD 52.52 FN	TCGW 06T108 FN	60	5/32	.078	7	.031	–								●			
	TCGD 7301 FN	TCGW 090200 FN	60	7/32	3/32	7	.001	–								●			
	TCGD 7304 FN	TCGW 090201 FN	60	7/32	3/32	7	.004	–								●			
	TCGW 21.501 FN	TCGW 110200 FN	60	1/4	3/32	7	.001	–								●			
	TCGW 21.504 FN	TCGW 110201 FN	60	1/4	3/32	7	.004	–								●			

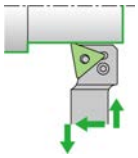
Features of TCGT-WP insert



NTK WP style inserts have a wiper facet design.
The insert has a 0.3mm(.012") flat on the cutting edge when the insert is set into the toolholder.
The flat on the cutting edge ensures a superior surface when feed rates are increased.
WP style inserts can be used in toolholders: STAC

PTXN-OH3 [100°] Direct connect coolant port 3-hole type





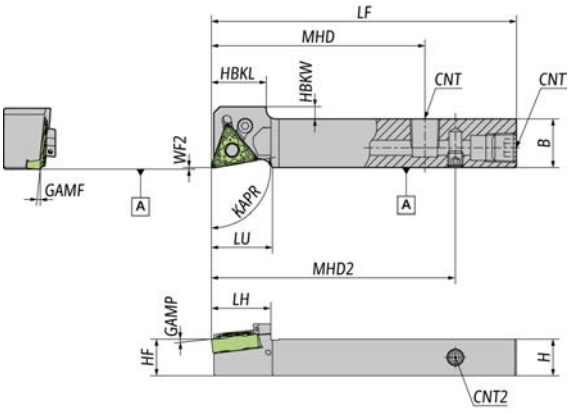
・Diagram shows right-hand tool

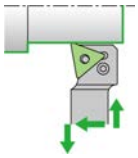
Item Number	Hand	B	CNT	CNT2	GAMF	GAMP	H	HBH	HBKL	HBKW	HBL	HF	KAPR	LF	LH	LU	MHD	MHD2	MHD3	MHD4	WF2	I
		inch			°	°	inch	inch	inch	inch	inch	inch	°	inch	inch	inch	inch	inch	inch	inch	inch	
PTXNR1016X33N-OH3	R	.630	M6*1	M5	6	6	.394	.079	.709	.157	.807	.394	100	3.937	.768	.787	2.461	3.150	2.756	2.165	.000	T
PTXNR1616X33N-OH3	R	.630	Rc1/8	M5	6	6	.630	–	.709	.157	–	.630	100	4.724	.768	.787	3.100	3.937	3.445	2.756	.000	T

Spare Parts

Item Number	Clamp screw	Clamp Pin	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)
PTXNR1016X33N-OH3	LCS33	LCL33N	SS0605SC	SS0505SC	LW-2.5
PTXNR1616X33N-OH3	LCS33	LCL33N	SPR1/8	SS0505SC	LW-2.5

PTXN-OH2 [100°] Direct connect coolant port 1-hole type





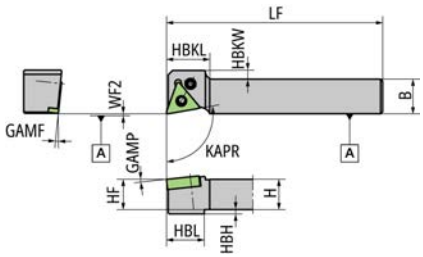
・Diagram shows right-hand tool

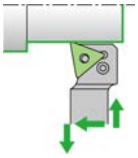
Item Number	Hand	B	CNT	CNT2	GAMF	GAMP	H	HBKL	HBKW	HF	KAPR	LF	LH	LU	MHD	MHD2	WF2	Insert Gage
		inch			°	°	inch	inch	inch	inch	°	inch	inch	inch	inch	inch	inch	
PTXNR1216X33N-OH2	R	.630	Rc1/8	M5	6	6	.472	.709	.157	.472	100	3.937	.768	.787	2.756	3.150	.000	TN..33..

Spare Parts

Item Number	Clamp screw	Clamp Pin	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)
PTXNR1216X33N-OH2	LCS33	LCL33N	SPR1/8	SS0505SC	LW-2.5

PTXN-N [100°]





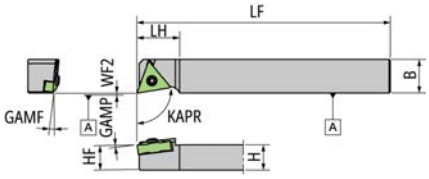
・Diagram shows right-hand tool

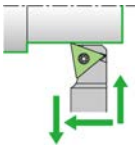
Item Number	Hand	B	GAMF	GAMP	H	HBH	HBKL	HBKW	HBL	HF	KAPR	LF	WF2	Insert Gage
		inch	°	°	inch	inch	inch	inch	inch	inch	°	inch	inch	
PTXNR063C	R	3/8	6	6	3/8	.097	.709	.162	.689	3/8	100	4.724	.000	TN..33..
PTXNR083C	R	1/2	6	6	1/2	–	.709	.162	–	1/2	100	4.724	.000	TN..33..
PTXNR103C	R	5/8	6	6	5/8	–	.709	.162	–	5/8	100	4.724	.000	TN..33..
PTXNR1016X33N	R	.630	6	6	.394	.079	.709	.157	.689	.394	100	4.724	.000	TN..33..
PTXNR1216X33N	R	.630	6	6	.472	–	.709	.157	–	.472	100	4.724	.000	TN..33..
PTXNR1216X33NGX	R	.630	6	6	.472	–	.709	.157	–	.472	100	3.346	.000	TN..33..
PTXNR1616X33N	R	.630	6	6	.630	–	.709	.157	–	.630	100	4.724	.000	TN..33..
PTXNR2020X33N	R	.787	6	6	.787	–	.709	–	–	.787	100	4.724	.000	TN..33..

Spare Parts

Item Number	Clamp screw	Clamp Pin	Wrench (for Clamp screw)
PTXNR063C	LCS33	LCL33N	LW-2
PTXNR083C	LCS33	LCL33N	LW-2
PTXNR103C	LCS33	LCL33N	LW-2
PTXNR1016X33N	LCS33	LCL33N	LW-2
PTXNR1216X33N	LCS33	LCL33N	LW-2
PTXNR1216X33NGX	LCS33	LCL33N	LW-2
PTXNR1616X33N	LCS33	LCL33N	LW-2
PTXNR2020X33N	LCS33	LCL33N	LW-2

STXN-N [100°] For Screw-on Toolholders





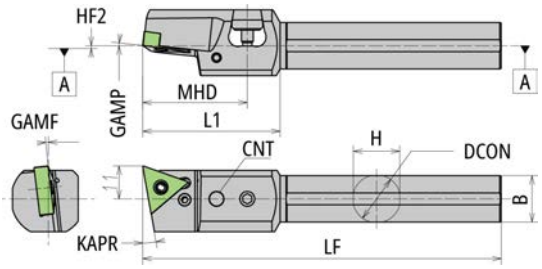
・Diagram shows right-hand tool

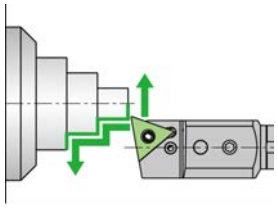
Item Number	Hand	B	GAMF	GAMP	H	HF	KAPR	LF	LH	WF2	Insert Gage
		inch	°	°	inch	inch	°	inch	inch	inch	
STXNR1016X33N	R	.630	6	6	.394	.394	100	4.724	.709	.000	TN..33..UL
STXNR1216X33N	R	.630	6	6	.472	.472	100	4.724	.709	.000	TN..33..UL
STXNR1216GX33N	R	.630	6	6	.472	.472	100	3.346	.709	.000	TN..33..UL
STXNR1616X33N	R	.630	6	6	.630	.630	100	4.724	.709	.000	TN..33..UL

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
STXNR1016X33N	LR-S-3.5*10.6	RLR-20S
STXNR1216X33N	LR-S-3.5*10.6	RLR-20S
STXNR1216GX33N	LR-S-3.5*10.6	RLR-20S
STXNR1616X33N	LR-S-3.5*10.6	RLR-20S

DS-PTX-ACH-OH [100°] Adjustable Centerline Height DS toolholder (Internal coolant type)





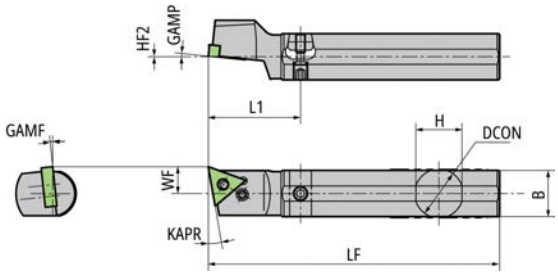
・Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

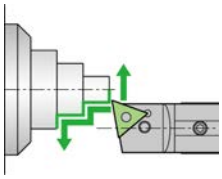
Item Number	Hand	B	CNT	DCON	GAMF	GAMP	H	HF2	KAPR	LF	L1	MHD	WF	Insert Gage
		inch		inch	°	°	inch	inch	°	°	inch	inch	inch	
DS-PTXL16-33-ACH-OH	L	.610	M6	.630	6	6	.610	Type A(0~+.008)	100	4.724	1.811	1.378	.433	TN..33..
DS-PTXL19-33-ACH-OH	L	.709	M6	.750	6	6	.709	Type A(0~+.008)	100	4.724	1.811	1.378	.433	TN..33..
DS-PTXL20-33-ACH-OH	L	.748	M6	.787	6	6	.748	Type A(0~+.008)	100	4.724	1.811	1.378	.433	TN..33..
DS-PTXL22-33-ACH-OH	L	.827	M6	.866	6	6	.827	Type A(0~+.008)	100	4.724	1.811	1.378	.433	TN..33..
DS-PTXL25-33MET-ACH-OH	L	.945	M6	.984	6	6	.945	Type A(0~+.008)	100	5.906	1.811	1.378	.433	TN..33..
DS-PTXL25-33-ACH-OH	L	.945	M6	1.000	6	6	.945	Type A(0~+.008)	100	5.906	1.811	1.378	.433	TN..33..

Spare Parts

Item Number	Clamp screw	Screw (for Wedge)	Clamp Pin	Wedge	Wrench (for Wedge)
DS-PTXL16-33-ACH-OH	LCS33	WS060419-004	LCL33N	ACH-W18	LW-2
DS-PTXL19-33-ACH-OH	LCS33	WS060419-004	LCL33N	ACH-W18	LW-2
DS-PTXL20-33-ACH-OH	LCS33	WS060419-004	LCL33N	ACH-W18	LW-2
DS-PTXL22-33-ACH-OH	LCS33	WS060419-004	LCL33N	ACH-W18	LW-2
DS-PTXL25-33MET-ACH-OH	LCS33	WS060419-004	LCL33N	ACH-W18	LW-2
DS-PTXL25-33-ACH-OH	LCS33	WS060419-004	LCL33N	ACH-W18	LW-2

DS-PTX-ACH [100°] Adjustable centerline height





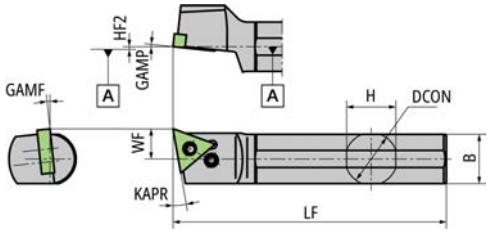
・Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

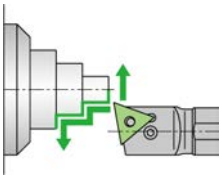
Item Number	Hand	B	DCON	GAMF	GAMP	H	HF2	KAPR	LF	L1	WF	Insert Gage
		inch	inch	°	°	inch	inch	°	°	inch	inch	
DS-PTXL16-33-ACH	L	.591	.630	6	6	.610	Type B(0~+.012)	100	4.724	1.496	.433	TN..33..
DS-PTXL19-33-ACH	L	.709	3/4	6	6	.709	Type B(0~+.012)	100	4.724	1.496	.433	TN..33..
DS-PTXL20-33-ACH	L	.748	.787	6	6	.748	Type B(0~+.012)	100	4.724	1.496	.433	TN..33..
DS-PTXL22-33-ACH	L	.827	.866	6	6	.827	Type B(0~+.012)	100	4.724	1.496	.472	TN..33..
DS-PTXL25-33-ACH	L	.945	1.000	6	6	.945	Type A(0~+.008)	100	5.906	1.496	.512	TN..33..
DS-PTXL25-33MET-ACH	L	.945	.984	6	6	.945	Type A(0~+.008)	100	5.906	1.496	.512	TN..33..

Spare Parts

Item Number	Clamp screw	Screw (for Wedge)	Clamp Pin	Wedge	Wrench (for Wedge)
DS-PTXL16-33-ACH	LCS33	WS060415-003	LCL33N	ACH-W18	LW-2
DS-PTXL19-33-ACH	LCS33	WS060415-003	LCL33N	ACH-W18	LW-2
DS-PTXL20-33-ACH	LCS33	WS060419-004	LCL33N	ACH-W18	LW-2
DS-PTXL22-33-ACH	LCS33	WS060419-004	LCL33N	ACH-W18	LW-2
DS-PTXL25-33-ACH	LCS33	WS060419-004	LCL33N	ACH-W24	LW-2
DS-PTXL25-33MET-ACH	LCS33	WS060419-004	LCL33N	ACH-W24	LW-2

DS-PTX [100°] DS Toolholders





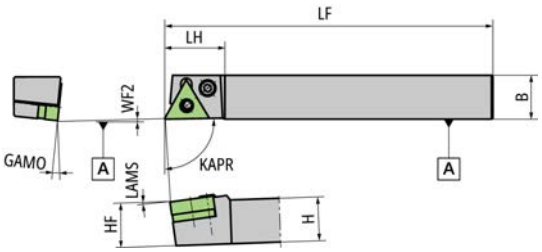
・Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

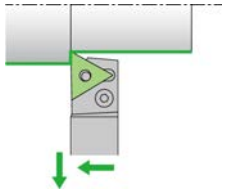
Item Number	Hand	B	DCON	GAMF	GAMP	H	HF2	KAPR	LF	WF	Insert Gage
		inch	inch	°	°	inch	inch	°	inch	inch	
DS-PTXL16-33	L	.591	.630	6	6	.591	.000	100	4.724	.433	TN..33..
DS-PTXL19-33	L	.709	3/4	6	6	.709	.000	100	4.724	.433	TN..33..
DS-PTXL20-33	L	.748	.787	6	6	.748	.000	100	4.724	.433	TN..33..
DS-PTXL22-33	L	.827	.866	6	6	.827	.000	100	4.724	.472	TN..33..
DS-PTXL25M-33	L	.945	1.000	6	6	.945	.000	100	5.906	.512	TN..33..

Spare Parts

Item Number	Clamp screw	Clamp Pin	Wrench (for Clamp screw)
DS-PTXL16-33	LCS33	LCL33N	LW-2
DS-PTXL19-33	LCS33	LCL33N	LW-2
DS-PTXL20-33	LCS33	LCL33N	LW-2
DS-PTXL22-33	LCS33	LCL33N	LW-2
DS-PTXL25M-33	LCS33	LCL33N	LW-2

PTAN-N [91°]





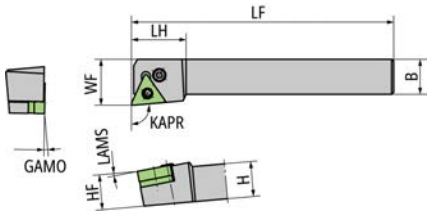
・Diagram shows right-hand tool

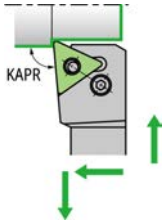
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF2	Insert Gage
		inch	°	inch	inch	°	°	inch	inch	inch	
PTANR1616X33N	R	.630	6	.630	.630	91	6	4.724	.866	.000	TN..33..

Spare Parts

Item Number	Shim	Clamp screw	Clamp Pin	Spring	Wrench (for Clamp screw)
PTANR1616X33N	LST317	LCS3	LCL3	LSP3	LW-2.5

PTLN [95°]





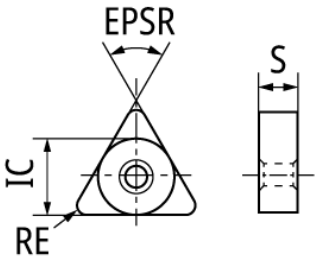
・Diagram shows right-hand tool

Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage
		inch	°	inch	inch	°	°	inch	inch	inch	
PTLNR2020L33	R	.787	6	.787	.787	95	6	5.512	.984	.984	TN..33..
PTLNL2020L33	L	.787	6	.787	.787	95	6	5.512	.984	.984	TN..33..

Spare Parts

Item Number	Shim	Clamp screw	Clamp Pin	Spring	Wrench (for Clamp screw)
PTLNR2020L33	LST317	LCS3	LCL3	LSP3	LW-2.5
PTLNL2020L33	LST317	LCS3	LCL3	LSP3	LW-2.5

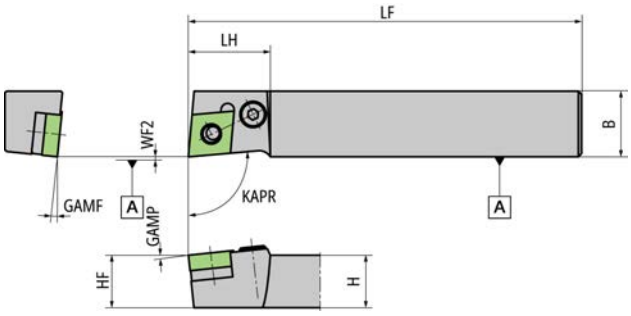
TN..

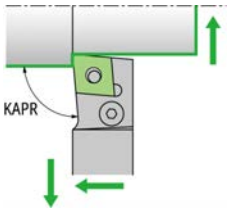


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	RE	Carbide										
							PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	TNGG 3308M R TMV	TNGG 160402M R TMV	60	3/8	3/16	.007	●	●	●			●					
	TNGG 331M R TMV	TNGG 160404M R TMV	60	3/8	3/16	.015	●	●	●			●					
	TNGG 3304M FN UL	TNGG 160401M FN UL	60	3/8	3/16	.003	●	●	●		●	●					
	TNGG 3308M FN UL	TNGG 160402M FN UL	60	3/8	3/16	.007	●	●	●		●	●					
	TNGG 331M FN UL	TNGG 160404M FN UL	60	3/8	3/16	.015	●	●	●		●	●					
	TNGG 332M FN UL	TNGG 160408M FN UL	60	3/8	3/16	.031		●	●		●	●					
	TNGG 3308 FN ZP	TNGG 160402 FN ZP	60	3/8	3/16	.008			●		●	●	●	●			
	TNGG 331 FN ZP	TNGG 160404 FN ZP	60	3/8	3/16	.016			●		●	●	●	●			
	TNGG 332 FN ZP	TNGG 160408 FN ZP	60	3/8	3/16	.031			●		●		●	●			
	TNMG 332 G	TNMG 160408 G	60	3/8	3/16	.031									●		
	TNMG 333 G	TNMG 160412 G	60	3/8	3/16	.047									●		
	TNMG 331 T0225 Z5	TNMG 160404 T00525 Z5	60	3/8	3/16	.016			●		●						
	TNMG 332 T0225 Z5	TNMG 160408 T00525 Z5	60	3/8	3/16	.031			●		●						
	TNEG 3308 FL D1	TNEG 160402 FL D1	60	3/8	3/16	.008						●					
	TNEG 3308 FR D1	TNEG 160402 FR D1	60	3/8	3/16	.008						●					
	TNEG 331 FL D1	TNEG 160404 FL D1	60	3/8	3/16	.016						●					
	TNEG 331 FR D1	TNEG 160404 FR D1	60	3/8	3/16	.016						●					
	TNEG 332 FL D1	TNEG 160408 FL D1	60	3/8	3/16	.031						●					
	TNEG 332 FR D1	TNEG 160408 FR D1	60	3/8	3/16	.031						●					
	TNGG 3304 FR U2	TNGG 160401 FR U2	60	3/8	3/16	.004							●	●			
	TNGG 3308 FL U2	TNGG 160402 FL U2	60	3/8	3/16	.008			●					●			
	TNGG 3308 FR U2	TNGG 160402 FR U2	60	3/8	3/16	.008			●					●			
	TNGG 331 FL U2	TNGG 160404 FL U2	60	3/8	3/16	.016			●					●			
	TNGG 331 FR U2	TNGG 160404 FR U2	60	3/8	3/16	.016			●					●			
	TNGG 332 FL U2	TNGG 160408 FL U2	60	3/8	3/16	.031								●			
	TNGG 332 FR U2	TNGG 160408 FR U2	60	3/8	3/16	.031								●			
	TNGG 3308 FR C	TNGG 160402 FR C	60	3/8	3/16	.008								●			
	TNGG 3304 FR DA	TNGG 160401 FR DA	60	3/8	3/16	.004							●	●			

PCLN-N [95°]





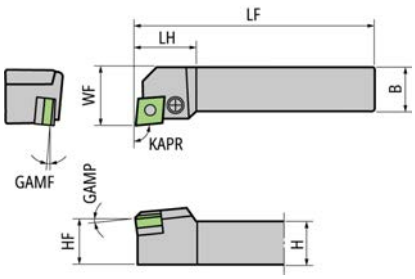
● Diagram shows right-hand tool

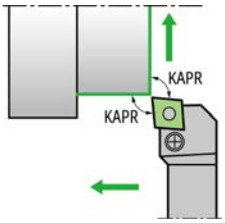
Item Number	Hand	B	GAMF	GAMP	H	HF	KAPR	LF	LH	WF2	Insert Gage
		inch	°	inch	inch	inch	°	inch	inch	inch	
PCLNR1620X43N	R	.787	6	6	.630	.630	95	4.724	.984	.000	CN..43..

Spare Parts

Item Number	Shim	Clamp screw	Clamp Pin	Spring	Wrench (for Clamp screw)
PCLNR1620X43N	LSC42	LCS4CA	LCL4	LSP4	LW-3

PCLN [95°]





● Diagram shows right-hand tool

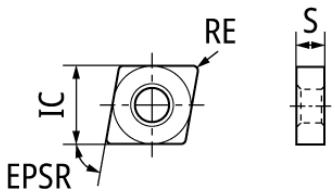
Item Number	Hand	B	GAMF	GAMP	H	HF	KAPR	LF	LH	WF	Insert Gage
		inch	°	inch	inch	inch	°	inch	inch	inch	
PCLNR2020K43	R	.787	6	6	.787	.787	95	4.921	1.102	.984	CN..43..
PCLNR2525M43	R	.984	6	6	.984	.984	95	5.906	1.102	1.260	CN..43..
PCLNL2020K43	L	.787	6	6	.787	.787	95	4.921	1.102	.984	CN..43..
PCLNL2525M43	L	.984	6	6	.984	.984	95	5.906	1.102	1.260	CN..43..

Spare Parts

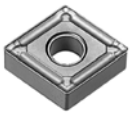
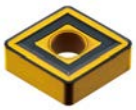
Item Number	Shim	Clamp screw	Clamp Pin	Spring	Wrench (for Clamp screw)
PCLNR2020K43	LSC42	LCS4	LCL4	LSP4	LW-3
PCLNR2525M43	LSC42	LCS4	LCL4	LSP4	LW-3
PCLNL2020K43	LSC42	LCS4	LCL4	LSP4	LW-3
PCLNL2525M43	LSC42	LCS4	LCL4	LSP4	LW-3

CN.. series/Inserts Carbide

CN..

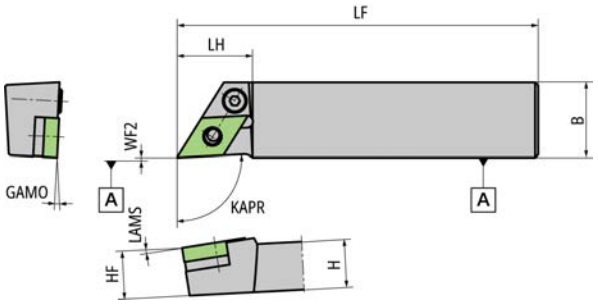


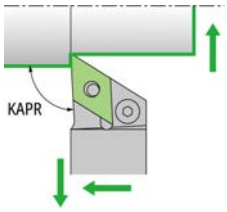
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	RE	Carbide										
							PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	CNGG 431 FN UL	CNGG 120404 FN UL	80	1/2	3/16	.016			●		●	●					
	CNGG 432 FN UL	CNGG 120408 FN UL	80	1/2	3/16	.031			●		●	●					
	CNGG 431 FN ZP	CNGG 120404 FN ZP	80	1/2	3/16	.016			●		●			●			
	CNGG 432 FN ZP	CNGG 120408 FN ZP	80	1/2	3/16	.031			●		●			●			
	CNMG 432 T0225 Z5	CNMG 120408 T00525 Z5	80	1/2	3/16	.031			●		●						
	CNMG 432 G	CNMG 120408 G	80	1/2	3/16	.031									●		
	CNMG 433 G	CNMG 120412 G	80	1/2	3/16	.047									●		
	CNMG 434 G	CNMG 120416 G	80	1/2	3/16	.063									●		

DN.. series/Toolholder

PDJN-N [93°]





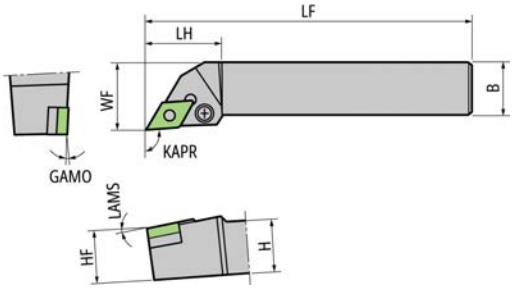
● Diagram shows right-hand tool

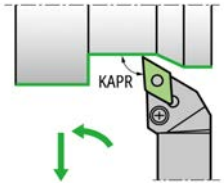
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF2	Insert Gage
		inch	°	inch	inch	°	°	inch	inch	inch	
PDJNR1625X43N	R	.984	6	.630	.630	93	6	4.724	.984	.000	DN..43..

Spare Parts

Item Number	Shim	Clamp screw	Clamp Pin	Spring	Wrench (for Clamp screw)
PDJNR1625X43N	LSD42	LCS4CA	LCL4	LSP4	LW-3

PDJN [93°]





● Diagram shows right-hand tool

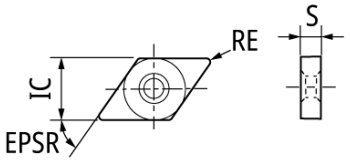
Item Number	Hand	B	GAMO	H	HF	KAPR	LAMS	LF	LH	WF	Insert Gage
		inch	°	inch	inch	°	°	inch	inch	inch	
PDJNR2020K43	R	.787	6	.787	.787	93	6	4.921	1.260	.984	DN..43..
PDJNR2525M43	R	.984	6	.984	.984	93	6	5.906	1.260	1.260	DN..43..
PDJNL2020K43	L	.787	6	.787	.787	93	6	4.921	1.260	.984	DN..43..

Spare Parts

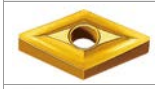
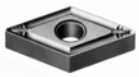
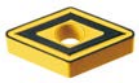
Item Number	Shim	Clamp screw	Clamp Pin	Spring	Wrench (for Clamp screw)
PDJNR2020K43	LSD42	LCS4	LCL4	LSP4	LW-3
PDJNR2525M43	LSD42	LCS4	LCL4	LSP4	LW-3
PDJNL2020K43	LSD42	LCS4	LCL4	LSP4	LW-3

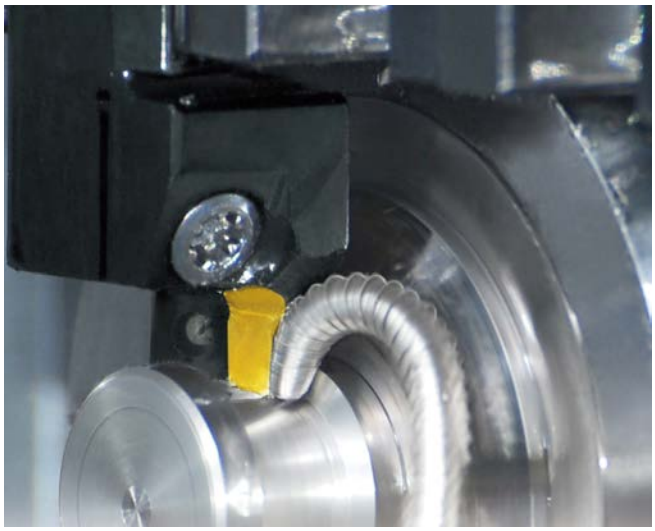
DN.. series/Inserts Carbide

DN..



Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

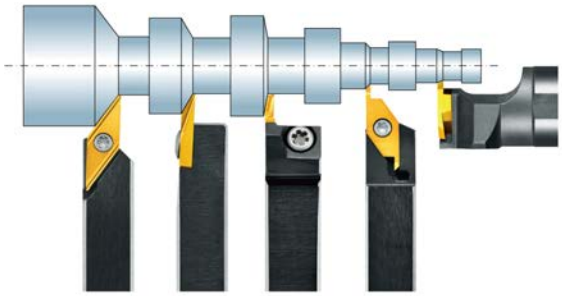
Shape	Item Number		EPSR	IC	S	RE	Carbide										
							PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	DNGG 431 FN ZP	DNGG 150404 FN ZP	55	1/2	3/16	.016		●	●		●			●			
	DNGG 432 FN ZP	DNGG 150408 FN ZP	55	1/2	3/16	.031		●	●		●			●			
	DNMG 432 T0225 Z5	DNMG 150408 T00525 Z5	55	1/2	3/16	.031			●		●						
	DNMG 431 G	DNMG 150404 TN G	55	1/2	3/16	.016					●						
	DNMG 431 G	DNMG 150404 G	55	1/2	3/16	.016									●		
	DNMG 432 G	DNMG 150408 G	55	1/2	3/16	.031									●		
	DNMG 433 G	DNMG 150412 G	55	1/2	3/16	.047									●		

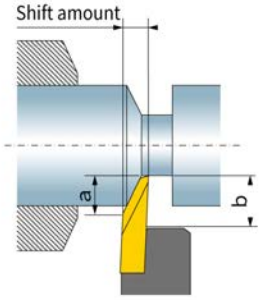


Back Turning

Product Lines	**R02**
Recommended Cutting Conditions	**R03**
General Information	**R04**
CSV.. series	**R06**
TBPS.. series	**R10**
TBP.. series	**R11**
TBPA.. series	**R17**
TBDP.. series	**R22**
TB.. series	**R24**
TBMH.. series	**R27**
TBVC.. series	**R36**
VC.. series	**R37**
VC..2M series	**R39**
ID Back Turning	**R41**
SBB.. series	**R41**
MBL.. series	**R44**
TP.. series	**R45**
TC.. series	**R47**

Product Lines





a: Length of Blade
b: Max Depth of Cut

Insert	CSVB →R9	
	CSV	DS-CSVL
Holder	→R6	→R8
a	-.039"	
b	-.079"	
Shift amount	.043 - .055"	

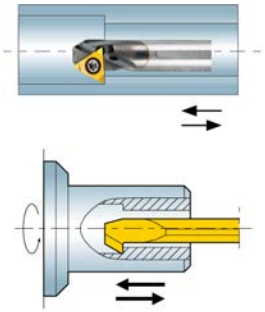
Insert	TBPS →R10	TBP →R16				
	CTPS	TBP	TBP-OH3/OH2/OH	Y-TBP	Y-TBP-OH2/OH	DS-TBP
Holder	→R10	→R12	→R11	→R14	→R13-14	→R15
			Coolant through	Y-axis	Y-axis Coolant through	DS
a	-.189"	-.189"				
b	-.189"	-.209"				
Shift amount	.094"	.138"				

Insert	TBPA →R21				
	CTPA-OH2/OH	CTPA	TBPA-OH	CH-TBPA	Y-CTPA
Holder	→R17-18	→R19	→R17	→R20	→R20
	Coolant through		Coolant through		Y-axis
a	-.248"				
b	-.268"				
Shift amount	.134"				

Insert	TBDP →R23		TB →R26	VC..22.. →R38 / TBVC →R36		VC..2.52..2M →R40
	TBDP	Y-TBDP	TB	TBVC	CH-SVXCL	SVAC..(N)W
Holder	→R22	→R22	→R24-25	→R36	→R37	→R39
		Y-axis				
a	.138"		-.157"	-.315"	–	–
b	-.204"		-.335"	-.315"	–	–
Shift amount	.081"		.157"	.295"/.394"	.394"	–

Insert	TBMH →R35					
	GTT	GTT-OH3/OH2/OH	Y-GTT	Y-GTT..-OH2/OH	DS-GTT	CH-GTT
Holder	→R29	→R27-28	→R33	→R32	→33	→R34
		Coolant through	Y-axis	Y-axis Coolant through		
a	-.051"					
b	-.106"					
Shift amount	.039"/.059"					

ID Back Turning



Insert	SBB →R43	TP/TC →R46,R48	MBL →R44
Holder	NBH	C-STZP/C (Carbide shank)	C-MSBR (Carbide shank)
	→R41-42	→R45,R47	→R44
Min. Bore Dia.	ø.118"	ø.394"	ø.224" / ø.303"

Recommended Cutting Conditions

CSVB / TBPS

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	VM1						
	2nd choice	DT4					ZM3	
Cutting speed (SFM)		65 - 130 - 195	100 - 195 - 260		100 - 195 - 295			
Feed rate (IPR) X Direction		.0004 - .0008 - .0012						
Feed rate (IPR) Z Direction		.0004 - .0012 - .0016						

TBDP / TBMH / TBP / TBPA / TBVC

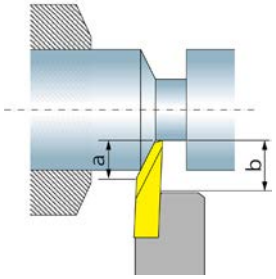
ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	650 / DT4			ST4 / 650		650 / QM3	
	2nd choice	TM4 / DM4			QM3 / TM4		TM4 / DM4	
Cutting speed (SFM)		65 - 130 - 195	100 - 200 - 260		100 - 195 - 295	130 - 295 - 490		
Feed rate (IPR) X Direction		.0004 - .0008 - .0012				.0004 - .0008 - .0016		
Feed rate (IPR) Z Direction		.0008 - .0016 - .0024				.0008 - .0016 - .0024		

TB32 / TB43

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	ZM3						
Cutting speed (SFM)		50 - 100 - 150				130 - 295 - 430		
Feed rate (IPR) X Direction		.0004 - .0012 - .002						
Feed rate (IPR) Z Direction		.0016 - .002 - .003			.0016 - .003 - .006			

General Information

Recommended max. depth of cut for each pass

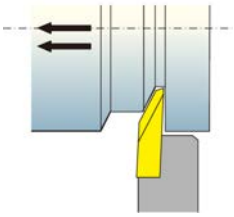


Multiply this ratio by the length of blade (a) to obtain the max. depth of cut for each pass

Work material / Grade	PVD Carbide 650, ST4, QM3, DT4, DM4, TM4, VM1, ZM3
Steel	0.7
Stainless Steel	0.6
Non-ferrous material	0.9
Plastic	0.9

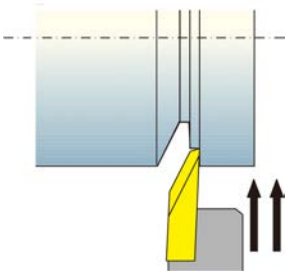
a) Length of Blade **b) Max. Depth of Cut**

When the length of blade (a) is not long enough

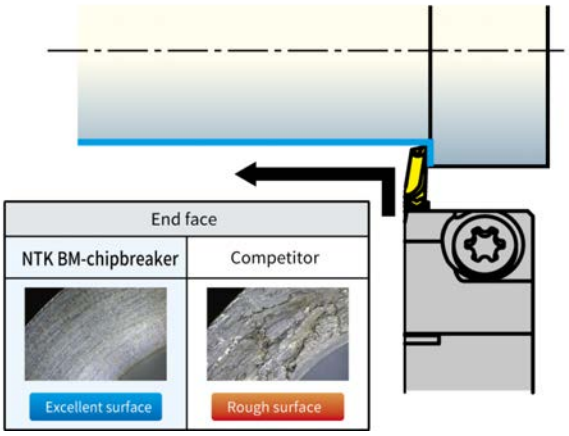


Back turning can be performed multiple times until the total depth of cut reaches dimension (b).

When experiencing rough finish on shoulder



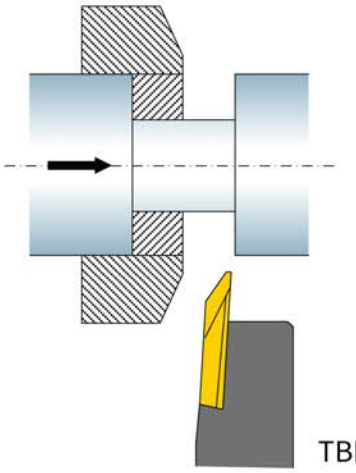
Turning the shoulder twice can improve the finish.
This problem can be solved by using TBP-BM, TBPA-BM, TBDP inserts without increasing the number of passes



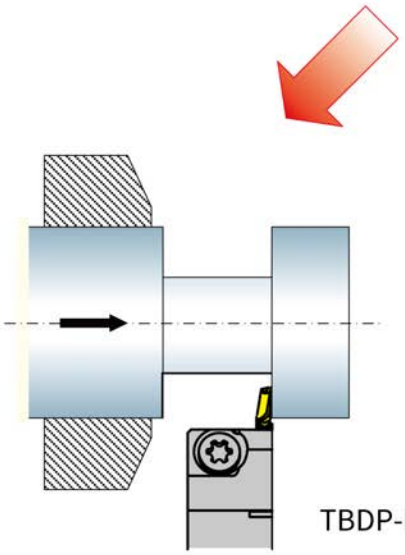
TBP-BM, TBPA-BM, TBDP come with NTK's uniquely designed molded chipbreaker providing single pass machining. These inserts can provide excellent surface finish.

TBDP	**➡R23**
TBP-BM	**➡R16**
TBPA-BM	**➡R21**

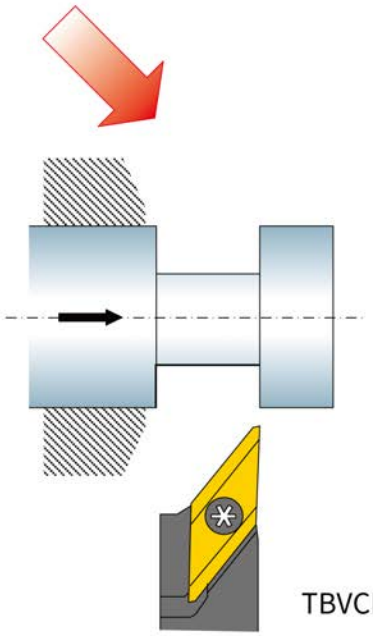
Finishing cut



Roughed section goes into the guide bushing when performing finish cuts. (Deburring may be required after roughing)

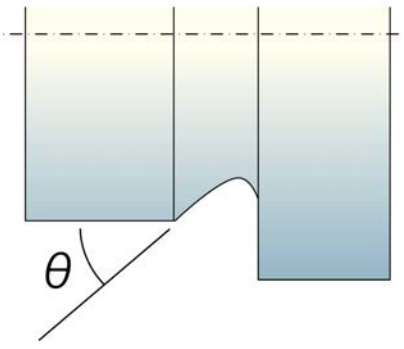


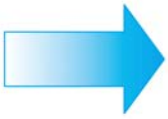
TBDP Left-hand toolholder will eliminate the risky process of pulling back the turned bar stock into the guide-bushing for finishing process, because its cutting point is away from the guide-bushing.

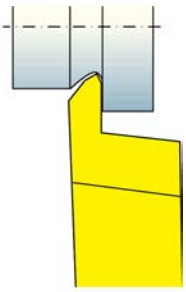


Cutting edge is located away from the guide-bushing. Roughing can be performed without retracting roughed part into the guide-bushing.

Undercut







If an undercut exists on the back turning area

θ=22° type

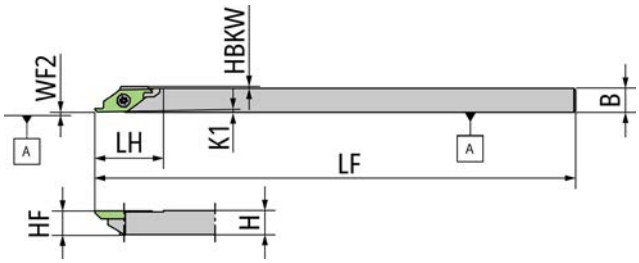
θ=45° type

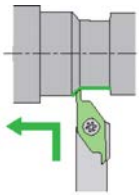
TBMH style inserts should be used to generate the undercut

Insert	TBMH32	➡**R35**
Holder	GTTR	➡**R27**
	DS-GTTL	➡**R33**

CSVB.. series/Toolholder

CSV [91°] For Cam-style machine





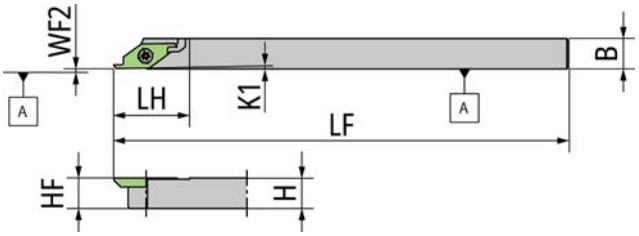
● Diagram shows right-hand tool

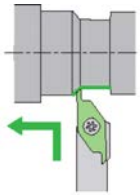
Item Number	Hand	B	H	HBKW	HF	K1	LF	LH	WF2	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
CSVR07	R	.276	.276	.020	.276	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR07GX	R	.276	.276	.020	.276	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08	R	.315	.315	.000	.315	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08GX	R	.315	.315	.000	.315	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR095	R	.374	.374	.000	.374	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR10	R	.394	.394	.000	.394	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR12	R	.472	.472	.000	.472	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR12GX	R	.472	.472	.000	.472	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL07	L	.276	.276	.020	.276	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL08	L	.315	.315	.000	.315	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL10	L	.394	.394	.000	.394	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CSVR07	LRIS-2.5*7	CLR-15S
CSVR07GX	LRIS-2.5*7	CLR-15S
CSVR08	LRIS-2.5*7	CLR-15S
CSVR08GX	LRIS-2.5*7	CLR-15S
CSVR095	LRIS-2.5*7	CLR-15S
CSVR10	LRIS-2.5*7	CLR-15S
CSVR12	LRIS-2.5*7	CLR-15S
CSVR12GX	LRIS-2.5*7	CLR-15S
CSVL07	LRIS-2.5*7	CLR-15S
CSVL08	LRIS-2.5*7	CLR-15S
CSVL10	LRIS-2.5*7	CLR-15S

CSV-NC [91°] For Gang-style machine





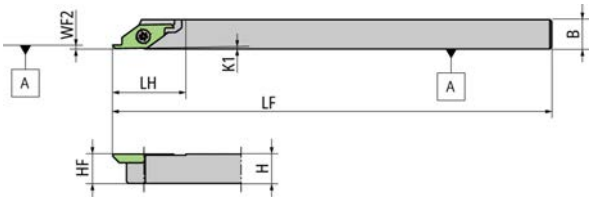
● Diagram shows right-hand tool

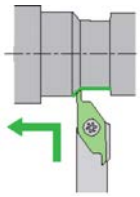
Item Number	Hand	B	H	HF	K1	LF	LH	WF2	Insert Gage	
		inch	inch	inch	°	inch	inch	inch		
CSVR06-IN-NC	R	3/8	3/8	3/8	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08-IN-NC	R	1/2	1/2	1/2	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL06-IN-NC	L	3/8	3/8	3/8	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL08-IN-NC	L	1/2	1/2	1/2	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08NC	R	.315	.315	.315	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR10GXNC	R	.394	.394	.394	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR10NC	R	.394	.394	.394	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR12NC	R	.472	.472	.472	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL08NC	L	.315	.315	.315	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL10NC	L	.394	.394	.394	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL12NC	L	.472	.472	.472	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CSVR06-IN-NC	LRIS-2.5*7	CLR-15S
CSVR08-IN-NC	LRIS-2.5*7	CLR-15S
CSVL06-IN-NC	LRIS-2.5*7	CLR-15S
CSVL08-IN-NC	LRIS-2.5*7	CLR-15S
CSVR08NC	LRIS-2.5*7	CLR-15S
CSVR10GXNC	LRIS-2.5*7	CLR-15S
CSVR10NC	LRIS-2.5*7	CLR-15S
CSVR12NC	LRIS-2.5*7	CLR-15S
CSVL08NC	LRIS-2.5*7	CLR-15S
CSVL10NC	LRIS-2.5*7	CLR-15S
CSVL12NC	LRIS-2.5*7	CLR-15S

CSV-NC-F [91°] For Gang-style machine





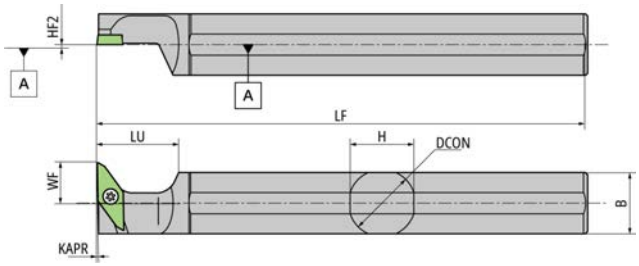
● Diagram shows right-hand tool

Item Number	Hand	B	H	HBKW	HF	K1	LF	LH	WF2	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
CSVR08NC-F	R	.315	.315	.000	.315	1	4.724	.787	.000-.004	CSVF../CSVB../CSVC..	CSVG../CSVT..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CSVR08NC-F	LRIS-2.5*7	CLR-15S

DS-CSVL [91°] DS Toolholders



● Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

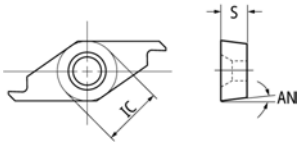
Item Number	Hand	B	DCON	H	HF2	KAPR	LF	LU	WF	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
DS-CSVL15	L	.591	5/8	.591	.000	91	4.724	.787	.394	CSVF../CSVB..	CSVG../CSVT..

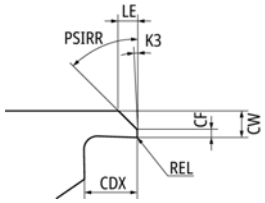
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-CSVL15	LRIS-2.5*7	CLR-15S

CSVB.. series/Inserts Carbide

CSVB-V

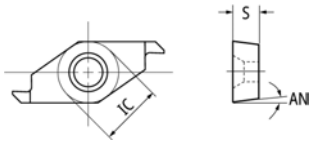


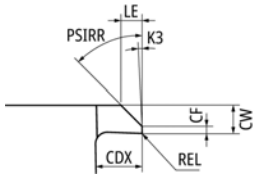


● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

Item Number	Hand	Chipbreaker	AN	CDX	CF	CW	EPSR	IC	K3	LE	PSIRR	REL	S	Carbide		
														PVD		
			°	inch	inch	inch	°	inch	°	inch	°	inch	inch	DT4	VM1	ZM3
CSVB11FRV Ⓜ	R	No	7	.079	.012	.039	35	1/4	5	.028	45	.000	3/32		●	
CSVB11FRV12 Ⓜ	R	No	7	.079	.012	.047	35	1/4	5	.031	45	.000	3/32		●	
CSVB11FRV14 Ⓜ	R	No	7	.079	.012	.055	35	1/4	5	.039	45	.000	3/32		●	
CSVB11FRV-A Ⓜ	R	No	7	.079	.012	.039	35	1/4	2	.028	45	.000	3/32		●	
CSVB11FRV-C Ⓜ	R	No	7	.079	.006	.039	35	1/4	5	.028	45	.000	3/32		●	
CSVB11FRV-M Ⓜ	R	No	7	.079	.006	.039	35	1/4	2	.028	45	.000	3/32	●	●	●
CSVB11FLV Ⓜ	L	No	7	.079	.012	.039	35	1/4	5	.028	45	.000	3/32		●	
CSVB11FLV-M Ⓜ	L	No	7	.079	.006	.039	35	1/4	2	.028	45	.000	3/32		●	

CSVB-VB

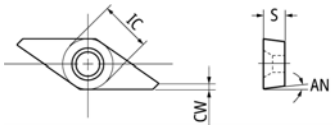


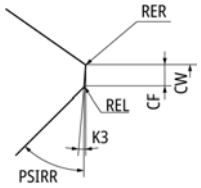


● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

Item Number	Hand	Chipbreaker	AN	CDX	CF	CW	EPSR	IC	K3	LE	PSIRR	REL	S	Carbide		
														PVD		
			°	inch	inch	inch	°	inch	°	inch	°	inch	inch	DT4	VM1	ZM3
CSVB11FRVB Ⓜ	R	Yes	7	.079	.012	.039	35	1/4	5	.028	45	.000	3/32		●	
CSVB11FRVB12 Ⓜ	R	Yes	7	.079	.012	.047	35	1/4	5	.031	45	.000	3/32		●	
CSVB11FRVB14 Ⓜ	R	Yes	7	.079	.012	.055	35	1/4	5	.039	45	.000	3/32		●	
CSVB11FRVB-A Ⓜ	R	Yes	7	.079	.012	.039	35	1/4	2	.028	45	.000	3/32		●	
CSVB11FRVB-C Ⓜ	R	Yes	7	.079	.006	.039	35	1/4	5	.028	45	.000	3/32		●	
CSVB11FRVB-M Ⓜ	R	Yes	7	.079	.006	.039	35	1/4	2	.028	45	.000	3/32	●	●	●
CSVB11FLVB-M Ⓜ	L	Yes	7	.079	.006	.039	35	1/4	2	.028	45	.000	3/32		●	

CSVB-VX For Profiling



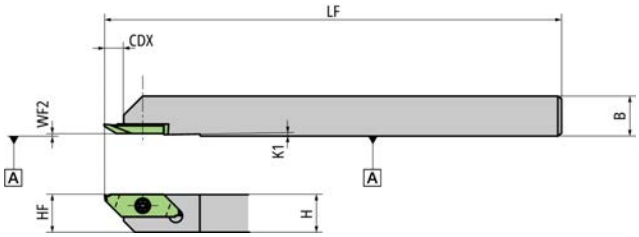


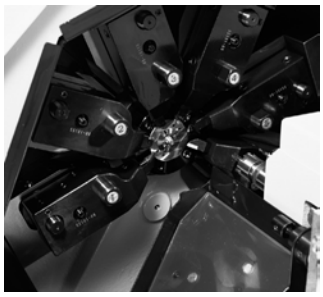
● Diagram shows left-hand tool
All angles shown are obtained when insert is set in the holder.

Item Number	Hand	Chipbreaker	AN	CF	CW	EPSR	IC	K3	PSIRL	REL	RER	S	Carbide		
													PVD		
			°	inch	inch	°	inch	°	°	inch	inch	inch	DT4	VM1	ZM3
CSVB11FLVX Ⓜ	L	No	7	.001	.028	35	1/4	5	45	.000	.000	3/32		●	

TBPS.. series/Toolholder

CTPS





● Diagram shows right-hand tool

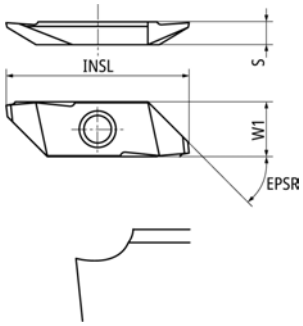
Item Number	Hand	B	CDX	H	HF	K1	LF	WF2	Insert Gage	
		inch	inch	inch	inch	°	inch	inch		
CTPSR06-IN	R	3/8	.197	3/8	3/8	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..
CTPSR08-IN	R	1/2	.197	1/2	1/2	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..
CTPSR10	R	.394	.197	.394	.394	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..
CTPSR12	R	.472	.197	.472	.472	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..

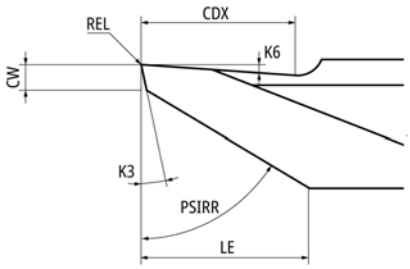
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTPSR06-IN	LRIS-2.5*7	CLR-15S
CTPSR08-IN	LRIS-2.5*7	CLR-15S
CTPSR10	LRIS-2.5*7	CLR-15S
CTPSR12	LRIS-2.5*7	CLR-15S

TBPS.. series/Inserts Carbide

TBPS

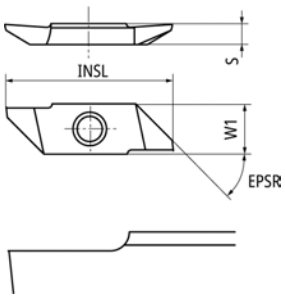


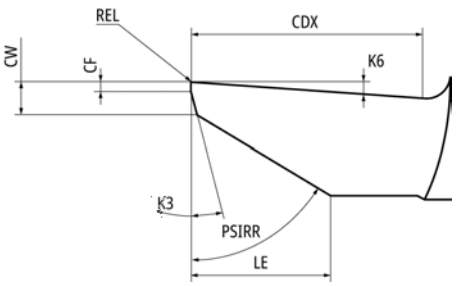


● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

Item Number	Hand	Chipbreaker	LE	CDX	CW	EPSR	INSL	K3	K6	PSIRR	REL	S	W1	Carbide	
														PVD	
			inch	inch	inch	°	inch	°	°	°	inch	inch	inch	VM1	ZM3
TBPS60FR00	R	Yes	.122	.138	.020	45	.787	12	3	60	.000	.098	.236	●	●
TBPS60FR10	R	Yes	.122	.138	.020	45	.787	12	3	60	.004	.098	.236	●	●

TBPS-V



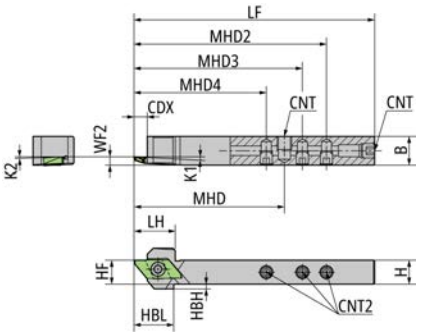


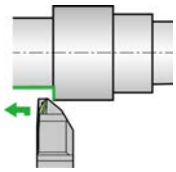
● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

Item Number	Hand	Chipbreaker	LE	CDX	CF	CW	EPSR	INSL	K3	K6	PSIRR	REL	S	W1	Carbide	
															PVD	
			inch	inch	inch	inch	°	inch	°	°	°	inch	inch	inch	VM1	ZM3
TBPS60FRV Ⓜ	R	No	.122	.189	.008	.028	45	.787	15	3	60	.000	.098	.236	●	●

TBP.. series/Toolholder

TBP-OH3 Direct connect coolant port 3-hole type





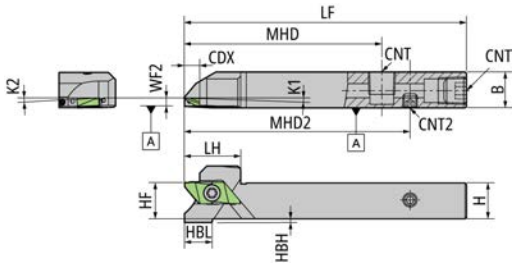
・Diagram shows right-hand tool

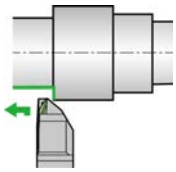
Item Number	Hand	B	CDX	CNT	CNT2	H	HBH	HBL	HF	K1	K2	LF	LH	MHD	MHD2	MHD3	MHD4	WF2	Insert Gage
		inch	inch			inch	inch	inch	inch	°	°	inch	inch	inch	inch	inch	inch	inch	
TBPR10X-IN-OH3	R	5/8	.217	NPT1/8	M5	5/8	–	–	5/8	3	2	4.724	.787	3.100	3.937	3.449	2.760	.138	TBP..
TBPR1012H-OH3	R	.472	.217	M6*1	M5	.394	.079	.650	.394	3	2	3.937	.682	2.461	3.157	2.763	2.172	.138	TBP..
TBPR16X-OH3	R	.630	.217	Rc1/8	M5	.630	–	–	.630	3	2	4.724	.787	3.100	3.937	3.445	2.756	.138	TBP..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
TBPR10X-IN-OH3	LRIS-4*12PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
TBPR1012H-OH3	LRIS-4*10PW	SS0605SC	SS0505SC	CLR-15S	LW-2.5
TBPR16X-OH3	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5

TBP-OH2 Direct connect coolant port 1-hole type





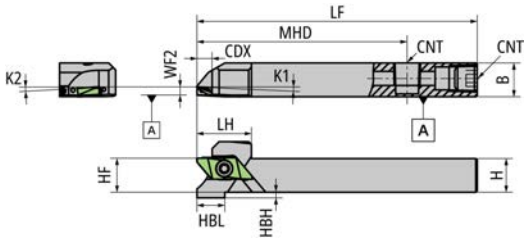
・Diagram shows right-hand tool

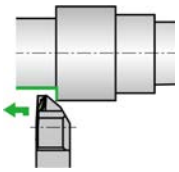
Item Number	Hand	B	CDX	CNT	CNT2	H	HBH	HBL	HF	K1	K2	LF	LH	MHD	MHD2	WF2	Insert Gage
		inch	inch			inch	inch	inch	inch	°	°	inch	inch	inch	inch	inch	
TBPR08H-IN-OH2	R	.500	.217	NPT1/8	M5	.500	.051	.394	.500	3	2	3.937	.787	2.756	3.150	.138	TBP..
TBPR10X-IN-OH2	R	.625	.217	NPT1/8	M5	.625	–	–	.625	3	2	4.724	.787	2.756	3.937	.138	TBP..
TBPR12H-OH2	R	.472	.217	Rc1/8	M5	.472	.079	.394	.472	3	2	3.937	.768	2.756	3.150	.138	TBP..
TBPR16X-OH2	R	.630	.217	Rc1/8	M5	.630	–	–	.630	3	2	4.724	.768	2.756	3.937	.138	TBP..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
TBPR08H-IN-OH2	LRIS-4*12PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
TBPR10X-IN-OH2	LRIS-4*12PW	SPNPT1/8L	SS0505SC	CLR-15S	LW-2.5
TBPR12H-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5
TBPR16X-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5

TBP-OH Coolant hose connection type





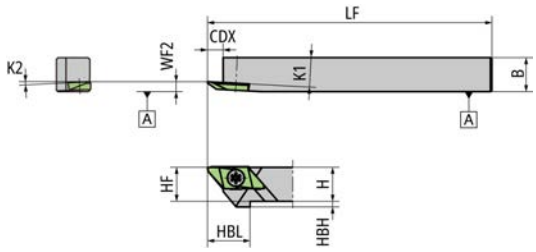
・Diagram shows right-hand tool

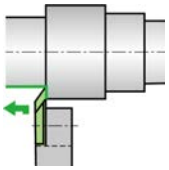
Item Number	Hand	B	CDX	CNT	H	HBH	HBL	HF	K1	K2	LF	MHD	WF2	Insert Gage
		inch	inch		inch	inch	inch	inch	°	°	inch	inch	inch	
TBPR06H-IN-OH	R	.472	.217	M6*1	.375	.176	.748	.375	3	2	3.937	2.953	.138	TBP..
TBPR08H-IN-OH	R	.500	.217	NPT1/8	.500	.051	.394	.500	3	2	3.937	2.953	.138	TBP..
TBPR10H-IN-OH	R	.625	.217	NPT1/8	.625	–	–	.625	3	2	3.937	2.953	.138	TBP..
TBPR1012H-OH	R	.472	.217	M6*1	.394	.157	.748	.394	3	2	3.937	2.953	.138	TBP..
TBPR12H-OH	R	.472	.217	Rc1/8	.472	.079	.394	.472	3	2	3.937	2.953	.138	TBP..
TBPR16H-OH	R	.630	.217	Rc1/8	.630	–	–	.630	3	2	3.937	2.953	.138	TBP..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
TBPR06H-IN-OH	LRIS-4*12PW	SS0605SC	CLR-15S
TBPR08H-IN-OH	LRIS-4*12PW	SPNPT1/8	CLR-15S
TBPR10H-IN-OH	LRIS-4*12PW	SPNPT1/8	CLR-15S
TBPR1012H-OH	LRIS-4*10PW	SS0605SC	CLR-15S
TBPR12H-OH	LRIS-4*12PW	SPR1/8	CLR-15S
TBPR16H-OH	LRIS-4*12PW	SPR1/8	CLR-15S

TBP





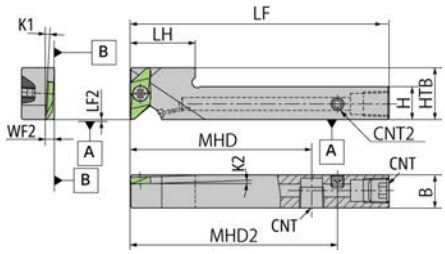
・Diagram shows right-hand tool

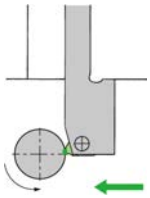
Item Number	Hand	B	CDX	H	HBH	HBL	HF	K1	K2	LF	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	°	°	inch	inch	
TBPR06-IN	R	.375	.217	.375	.079	.591	.375	3	2	4.724	.138	TBP..
TBPR08-IN	R	.500	.217	.500	–	–	.500	3	2	4.724	.138	TBP..
TBPR10-IN	R	.625	.217	.625	–	–	.625	3	2	4.724	.138	TBP..
TBPR08	R	.394	.217	.315	.157	.591	.315	3	2	4.724	.138	TBP..
TBPR10	R	.394	.217	.394	.079	.591	.394	3	2	4.724	.138	TBP..
TBPR10H	R	.394	.217	.394	.079	.591	.394	3	2	3.937	.138	TBP..
TBPR12	R	.472	.217	.472	–	–	.472	3	2	4.724	.138	TBP..
TBPR12GX	R	.472	.217	.472	–	–	.472	3	2	3.346	.138	TBP..
TBPR13	R	.512	.217	.512	–	–	.512	3	2	4.724	.138	TBP..
TBPR16	R	.630	.217	.630	–	–	.630	3	2	4.724	.138	TBP..
TBPR16H	R	.630	.217	.630	–	–	.630	3	2	3.937	.138	TBP..
TBPL08	L	.394	.217	.315	.157	.591	.315	3	2	4.724	.138	TBP..
TBPL10	L	.394	.217	.394	.079	.591	.394	3	2	4.724	.138	TBP..
TBPL12	L	.472	.217	.472	–	–	.472	3	2	4.724	.138	TBP..
TBPL16	L	.630	.217	.630	–	–	.630	3	2	4.724	.138	TBP..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
TBPR06-IN	LRIS-4*10PW	CLR-15S
TBPR08-IN	LRIS-4*12PW	CLR-15S
TBPR10-IN	LRIS-4*12PW	CLR-15S
TBPR08	LRIS-4*10PW	CLR-15S
TBPR10	LRIS-4*10PW	CLR-15S
TBPR10H	LRIS-4*10PW	CLR-15S
TBPR12	LRIS-4*12PW	CLR-15S
TBPR12GX	LRIS-4*12PW	CLR-15S
TBPR13	LRIS-4*12PW	CLR-15S
TBPR16	LRIS-4*12PW	CLR-15S
TBPR16H	LRIS-4*12PW	CLR-15S
TBPL08	LRIS-4*10PW	CLR-15S
TBPL10	LRIS-4*10PW	CLR-15S
TBPL12	LRIS-4*12PW	CLR-15S
TBPL16	LRIS-4*12PW	CLR-15S

Y-TBP-OH2　Direct connect coolant port 1-hole type　Y-axis





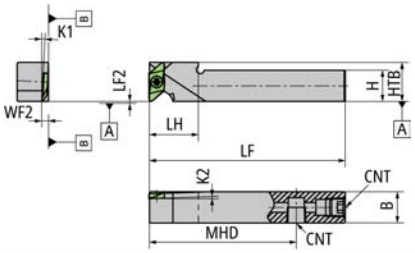
● Diagram shows right-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

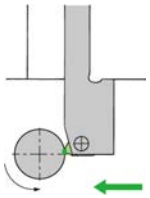
Item Number	Hand	B	CNT	CNT2	H	HTB	K1	K2	LF	LF2	LH	MHD	MHD2	WF2	Insert Gage
		inch			inch	inch	°	°	inch	inch	inch	inch	inch	inch	
Y-TBPR08H-IN-OH2	R	1/2	NPT1/8	M5	1/2	.787	3	2	3.937	.000	.984	2.756	3.150	.138	TBP..
Y-TBPR12HS-OH2	R	.472	Rc1/8	M5	.472	.787	3	2	3.937	.000	.787	2.756	3.150	.138	TBP..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
Y-TBPR08H-IN-OH2	LRIS-4*12PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
Y-TBPR12HS-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5

Y-TBP-OH Y-axis Coolant hose connection type





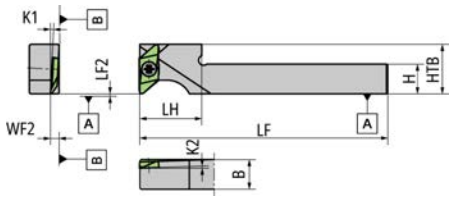
・Diagram shows right-hand tool
NOTE: Use a right-handed (R) insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

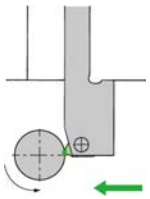
Item Number	Hand	B	CNT	H	HTB	K1	K2	LF	LF2	LH	MHD	WF2	Insert Gage
		inch		inch	inch	°	°	inch	inch	inch	inch	inch	
Y-TBPR08H-IN-OH	R	1/2	NPT1/8	1/2	.787	3	2	3.937	.000	.984	2.953	.138	TBP..
Y-TBPR12HS-OH	R	.472	Rc1/8	.472	.787	3	2	3.937	.000	.787	2.953	.138	TBP..
Y-TBPR16H-OH	R	.630	Rc1/8	.630	.787	3	2	3.937	.000	.984	2.953	.138	TBP..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
Y-TBPR08H-IN-OH	LRIS-4*12PW	SPNPT1/8	CLR-15S
Y-TBPR12HS-OH	LRIS-4*12PW	SPR1/8	CLR-15S
Y-TBPR16H-OH	LRIS-4*12PW	SPR1/8	CLR-15S

Y-TBP Y-axis





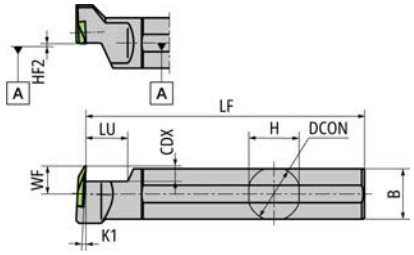
・Diagram shows right-hand tool
NOTE: Use a right-handed (R) insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

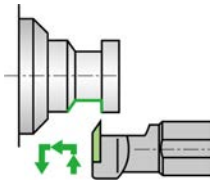
Item Number	Hand	B	H	HTB	K1	K2	LF	LF2	LH	WF2	Insert Gage
		inch	inch	inch	°	°	inch	inch	inch	inch	
Y-TBPR06-IN	R	3/8	3/8	.787	3	2	2.756	.000	.984	.138	TBP..
Y-TBPR08-IN	R	1/2	1/2	.787	3	2	2.756	.000	.984	.138	TBP..
Y-TBPR10-IN	R	5/8	5/8	.787	3	2	2.756	.000	.984	.138	TBP..
Y-TBPR10MS	R	.394	.394	.787	3	2	4.724	.000	.866	.138	TBP..
Y-TBPR10S	R	.394	.394	.787	3	2	4.724	.000	.787	.138	TBP..
Y-TBPR12MS	R	.472	.472	.787	3	2	4.724	.000	.866	.138	TBP..
Y-TBPR12S	R	.472	.472	.787	3	2	4.724	.000	.787	.138	TBP..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
Y-TBPR06-IN	LRIS-4*10PW	CLR-15S
Y-TBPR08-IN	LRIS-4*12PW	CLR-15S
Y-TBPR10-IN	LRIS-4*12PW	CLR-15S
Y-TBPR10MS	LRIS-4*10PW	CLR-15S
Y-TBPR10S	LRIS-4*10PW	CLR-15S
Y-TBPR12MS	LRIS-4*10PW	CLR-15S
Y-TBPR12S	LRIS-4*12PW	CLR-15S

DS-TBP DS Toolholders





・Diagram shows left-hand tool
NOTE: Use a right-handed (R) insert.

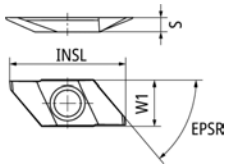
Item Number	Hand	B	CDX	DCON	H	HF2	K1	K2	LF	LU	WF	Insert Gage
		inch	inch	inch	inch	inch	°	°	inch	inch	inch	
DS-TBPL19	L	.709	.217	3/4	.709	.000	3	2	4.724	.551	.394	TBP..
DS-TBPL20	L	.748	.217	.787	.748	.000	3	2	4.724	.551	.394	TBP..
DS-TBPL25	L	.945	.217	1.000	.945	.000	3	2	5.906	.551	.394	TBP..

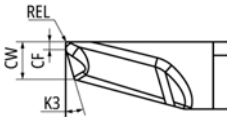
Spare Parts

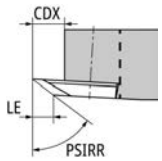
Item Number	Clamp screw	Wrench (for Clamp screw)
DS-TBPL19	LRIS-4*10	LLR-25S-20*65
DS-TBPL20	LRIS-4*10	LLR-25S-20*65
DS-TBPL25	LRIS-4*10	LLR-25S-20*65

TBP.. series/Inserts Carbide

TBP-BM with BM-Chipbreaker



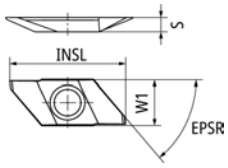


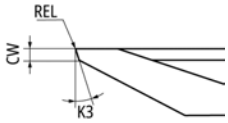


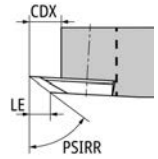
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	LE	CDX	CF	CW	EPSR	INSL	K3	PSIRR	REL	S	W1	Carbide			
														PVD			
			inch	inch	inch	inch	°	inch	°	°	inch	inch	inch	650	DM4	ST4	TM4
TBP72FR05-BM	**R**	Yes	.138	.209	.012	.055	50	.787	16	72	.002	.098	.315	●	●	●	●
TBP72FR10M-BM	**R**	Yes	.138	.209	.012	.055	50	.787	16	72	.003	.098	.315	●	●	●	●
TBP72FR20M-BM	**R**	Yes	.138	.209	.012	.055	50	.787	16	72	.007	.098	.315	●	●	●	●

TBP with Chipbreaker



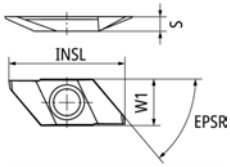


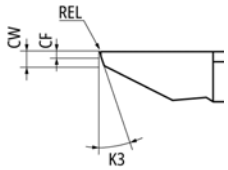


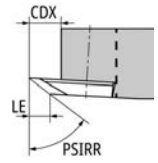
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	LE	CDX	CF	CW	EPSR	INSL	K3	PSIRR	REL	S	W1	Carbide				
														PVD				
			inch	inch	inch	inch	°	inch	°	°	inch	inch	inch	DT4	QM3	TM4	VM1	ZM3
TBP55FR00	**R**	Yes	.118	.209	–	.020	50	.787	15	55	.000	.098	.315				●	●
TBP55FR10	**R**	Yes	.118	.209	–	.020	50	.787	15	55	.004	.098	.315				●	●
TBP60FR00	**R**	Yes	.146	.209	–	.020	50	.787	15	60	.000	.098	.315	●	●	●	●	●
TBP60FR10	**R**	Yes	.146	.209	–	.020	50	.787	15	60	.004	.098	.315		●	●	●	●
TBP60FR10M	**R**	Yes	.146	.209	–	.020	50	.787	15	60	.003	.098	.315	●	●		●	
TBP60FR20	**R**	Yes	.146	.209	–	.020	50	.787	15	60	.008	.098	.315			●		
TBP55FL00	**L**	Yes	.118	.209	–	.020	50	.787	15	55	.000	.098	.315					●
TBP55FL10	**L**	Yes	.118	.209	–	.020	50	.787	15	55	.004	.098	.315					●
TBP60FL00	**L**	Yes	.146	.209	–	.020	50	.787	15	60	.000	.098	.315					●
TBP60FL10	**L**	Yes	.146	.209	–	.020	50	.787	15	60	.004	.098	.315					●

TBP-V without Chipbreaker





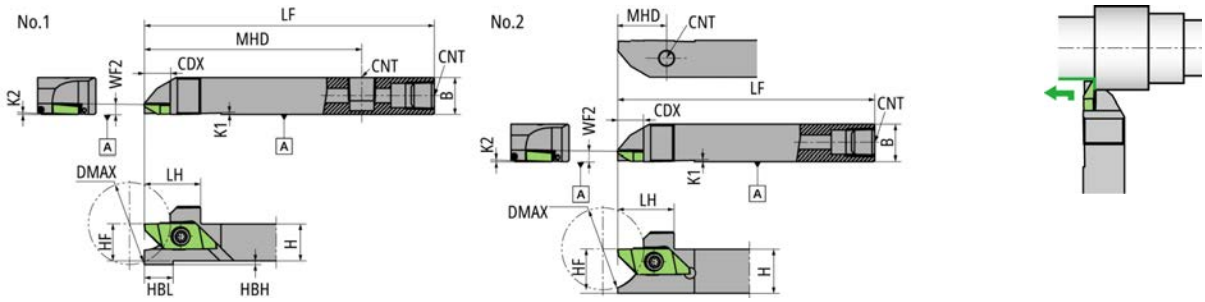


● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	LE	CDX	CF	CW	EPSR	INSL	K3	PSIRR	REL	S	W1	Carbide		
														PVD		
			inch	inch	inch	inch	°	inch	°	°	inch	inch	inch	VM1	ZM3	KM1
TBP60FRV Ⓜ	**R**	No	.189	.209	.008	.028	50	.787	15	60	.000	.098	.315	●	●	●
TBP60FRV05 Ⓜ	**R**	No	.189	.209	.008	.028	50	.787	15	60	.002	.098	.315	●		●
TBP60FRV10 Ⓜ	**R**	No	.189	.209	.008	.028	50	.787	15	60	.004	.098	.315	●	●	●
TBP60FLV Ⓜ	**L**	No	.189	.209	.008	.028	50	.787	15	60	.000	.098	.315	●		

TBPA.. series/Toolholder

TBPA-OH Coolant hose connection type



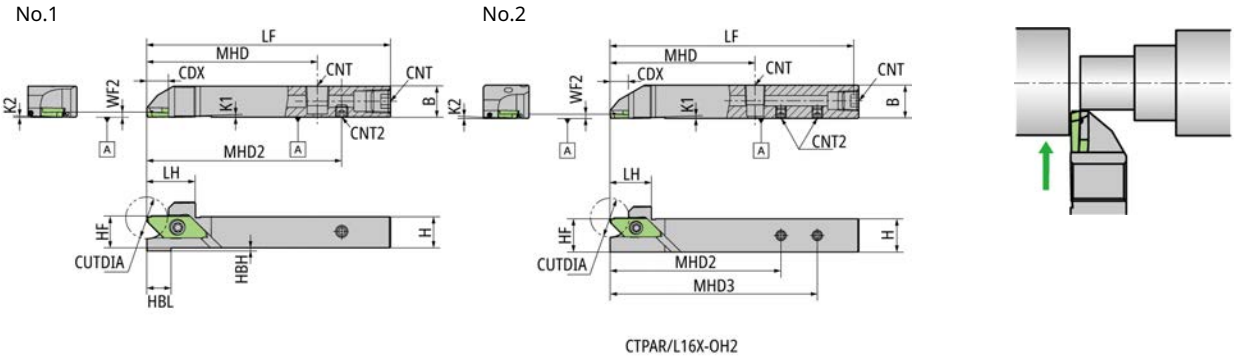
● Diagram shows right-hand tool

Figure	Item Number	Hand	DMAX	B	CDX	CNT	H	HBH	HBL	HF	K1	K2	LF	LH	MHD	WF2	Insert Gage
			inch	inch	inch		inch	inch	inch	inch	°	°	inch	inch	inch	inch	
1	**TBPAR12H-OH**	R	.984	.472	.268	Rc1/8	.472	.157	.394	.472	1	2	3.937	.768	2.953	(.134)	TBPA..
1	**TBPAR16H-OH**	R	1.378	.630	.268	Rc1/8	.630	.079	.394	.630	1	2	3.937	.768	2.953	(.134)	TBPA..
2	**TBPAR20H-OH**	R	1.969	.787	.268	Rc1/8	.787	–	–	.787	1	2	3.937	.768	2.953	(.134)	TBPA..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
TBPAR12H-OH	LRIS-4*12PW	SPR1/8	CLR-15S
TBPAR16H-OH	LRIS-4*12PW	SPR1/8	CLR-15S
TBPAR20H-OH	LRIS-4*12PW	SPR1/8	CLR-15S

CTPA-OH2 Direct connect coolant port 1~2-hole type



CTPAR/L16X-OH2

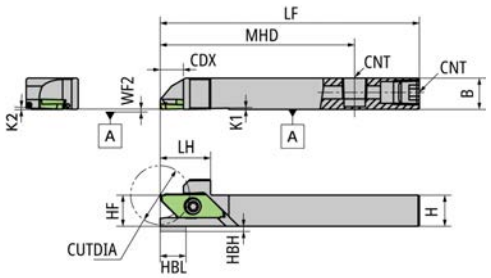
● Diagram shows right-hand tool

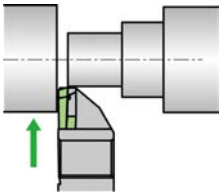
Figure	Item Number	Hand	CUTDIA	B	CNT	CNT2	H	HBH	HBL	HF	K1	K2	LF	LH	MHD	MHD2	MHD3	WF2	Insert Gage	
			inch	inch			inch	inch	inch	inch	°	°	inch	inch	inch	inch	inch	inch		
1	**CTPAR08H-IN-OH2**	R	.630	1/2	NPT1/8	M5	1/2	.051	.394	1/2	1	2	3.937	.787	2.756	3.150	–	.079	CTPA..	TBPA..
2	**CTPAR10X-IN-OH2**	R	.630	5/8	NPT1/8	M5	5/8	–	–	5/8	1	2	4.724	.787	2.756	3.248	3.937	.079	CTPA..	TBPA..
1	**CTPAL08H-IN-OH2**	L	.630	1/2	NPT1/8	M5	1/2	.051	.394	1/2	1	2	3.937	.787	2.756	3.150	–	.079	CTPA..	TBPA..
2	**CTPAL10X-IN-OH2**	L	.630	5/8	NPT1/8	M5	5/8	–	–	5/8	1	2	4.724	.787	2.756	3.248	3.937	.079	CTPA..	TBPA..
1	**CTPAR12H-OH2**	R	.630	.472	Rc1/8	M5	.472	.079	.394	.472	1	2	3.937	.768	2.756	3.150	–	.079	CTPA..	TBPA..
2	**CTPAR16X-OH2**	R	.630	.630	Rc1/8	M5	.630	–	–	.630	1	2	4.724	.768	2.756	3.248	3.937	.079	CTPA..	TBPA..
1	**CTPAL12H-OH2**	L	.630	.472	Rc1/8	M5	.472	.079	.394	.472	1	2	3.937	.768	2.756	3.150	–	.079	CTPA..	TBPA..
2	**CTPAL16X-OH2**	L	.630	.630	Rc1/8	M5	.630	–	–	.630	1	2	4.724	.768	2.756	3.248	3.937	.079	CTPA..	TBPA..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
CTPAR08H-IN-OH2	LRIS-4*12PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
CTPAR10X-IN-OH2	LRIS-4*12PW	SPNPT1/8L	SS0505SC	CLR-15S	LW-2.5
CTPAL08H-IN-OH2	LRIS-4*12PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
CTPAL10X-IN-OH2	LRIS-4*12PW	SPNPT1/8L	SS0505SC	CLR-15S	LW-2.5
CTPAR12H-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5
CTPAR16X-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5
CTPAL12H-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5
CTPAL16X-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5

CTPA-OH Coolant hose connection type





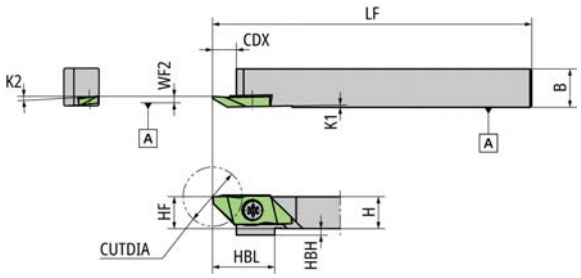
● Diagram shows right-hand tool

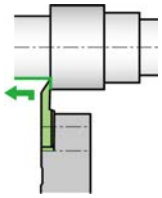
Item Number	Hand	CUTDIA	B	CNT	H	HBH	HBL	HF	K1	K2	LF	LH	MHD	WF2	Insert Gage	
		inch	inch		inch	inch	inch	inch	°	°	inch	inch	inch	inch		
CTPAR06H-IN-OH	R	.630	3/8	M6*1	3/8	.176	.787	3/8	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAR08H-IN-OH	R	.630	1/2	NPT1/8	1/2	.051	.394	1/2	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAR10H-IN-OH	R	.630	5/8	NPT1/8	5/8	–	–	5/8	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAL06H-IN-OH	L	.630	3/8	M6*1	3/8	.176	.787	3/8	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAL08H-IN-OH	L	.630	1/2	NPT1/8	1/2	.051	.394	1/2	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAL10H-IN-OH	L	.630	5/8	NPT1/8	5/8	–	–	5/8	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAR12H-OH	R	.630	.472	Rc1/8	.472	.079	.394	.472	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAR16H-OH	R	.630	.630	Rc1/8	.630	–	–	.630	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAL12H-OH	L	.630	.472	Rc1/8	.472	.079	.394	.472	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAL16H-OH	L	.630	.630	Rc1/8	.630	–	–	.630	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTPAR06H-IN-OH	LRIS-4*12PW	CLR-15S
CTPAR08H-IN-OH	LRIS-4*12PW	CLR-15S
CTPAR10H-IN-OH	LRIS-4*12PW	CLR-15S
CTPAL06H-IN-OH	LRIS-4*12PW	CLR-15S
CTPAL08H-IN-OH	LRIS-4*12PW	CLR-15S
CTPAL10H-IN-OH	LRIS-4*12PW	CLR-15S
CTPAR12H-OH	LRIS-4*12PW	CLR-15S
CTPAR16H-OH	LRIS-4*12PW	CLR-15S
CTPAL12H-OH	LRIS-4*12PW	CLR-15S
CTPAL16H-OH	LRIS-4*12PW	CLR-15S

CTPA





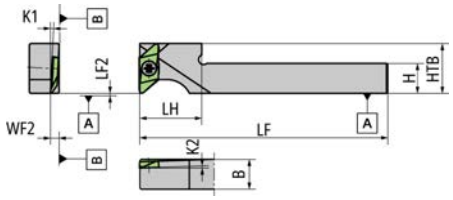
● Diagram shows right-hand tool

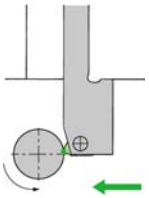
Item Number	Hand	CUTDIA	B	CDX	H	HBH	HBL	HF	K1	K2	LF	WF2	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch	°	°	inch	inch		
CTPAR06-IN	R	.630	3/8	.295	3/8	.079	.768	3/8	1	2	4.724	.000	CTPA..	TBPA..
CTPAR08-IN	R	.630	1/2	.295	1/2	–	–	1/2	1	2	4.724	.000	CTPA..	TBPA..
CTPAR10-IN	R	.630	5/8	.295	5/8	–	–	5/8	1	2	4.724	.000	CTPA..	TBPA..
CTPAL06-IN	L	.630	3/8	.295	3/8	.079	.768	3/8	1	2	4.724	.000	CTPA..	TBPA..
CTPAL08-IN	L	.630	1/2	.295	1/2	–	–	1/2	1	2	4.724	.000	CTPA..	TBPA..
CTPAL10-IN	L	.630	5/8	.295	5/8	–	–	5/8	1	2	4.724	.000	CTPA..	TBPA..
CTPAR10	R	.630	.394	.295	.394	.079	.768	.394	1	2	4.724	.000	CTPA..	TBPA..
CTPAR12	R	.630	.472	.295	.472	–	–	.472	1	2	4.724	.000	CTPA..	TBPA..
CTPAR12GX	R	.630	.472	.295	.472	–	–	.472	1	2	3.346	.000	CTPA..	TBPA..
CTPAR16	R	.630	.630	.295	.630	–	–	.630	1	2	4.724	.000	CTPA..	TBPA..
CTPAR20F	R	.630	.787	.295	.787	–	–	.787	1	2	3.150	.000	CTPA..	TBPA..
CTPAL10	L	.630	.394	.295	.394	.079	.768	.394	1	2	4.724	.000	CTPA..	TBPA..
CTPAL12	L	.630	.472	.295	.472	–	–	.472	1	2	4.724	.000	CTPA..	TBPA..
CTPAL12GX	L	.630	.472	.295	.472	–	–	.472	1	2	3.346	.000	CTPA..	TBPA..
CTPAL16	L	.630	.630	.295	.630	–	–	.630	1	2	4.724	.000	CTPA..	TBPA..
CTPAL20F	L	.630	.787	.295	.787	–	–	.787	1	2	3.150	.000	CTPA..	TBPA..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTPAR06-IN	LRIS-4*10PW	CLR-15S
CTPAR08-IN	LRIS-4*12PW	CLR-15S
CTPAR10-IN	LRIS-4*12PW	CLR-15S
CTPAL06-IN	LRIS-4*10PW	CLR-15S
CTPAL08-IN	LRIS-4*12PW	CLR-15S
CTPAL10-IN	LRIS-4*12PW	CLR-15S
CTPAR10	LRIS-4*10PW	CLR-15S
CTPAR12	LRIS-4*12PW	CLR-15S
CTPAR12GX	LRIS-4*12PW	CLR-15S
CTPAR16	LRIS-4*12PW	CLR-15S
CTPAR20F	LRIS-4*10	LLR-25S
CTPAL10	LRIS-4*10PW	CLR-15S
CTPAL12	LRIS-4*12PW	CLR-15S
CTPAL12GX	LRIS-4*12PW	CLR-15S
CTPAL16	LRIS-4*12PW	CLR-15S
CTPAL20F	LRIS-4*10	LLR-25S

Y-CTPA Y-axis





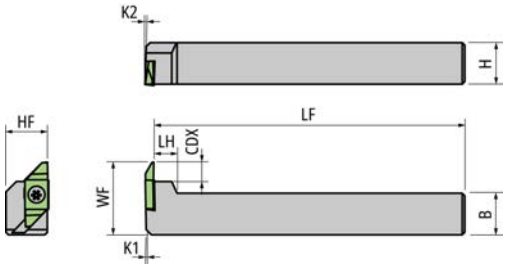
・Diagram shows right-hand tool
NOTE: Use a right-handed (R) insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

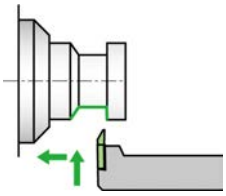
Item Number	Hand	B	H	HTB	K1	K2	LF	LF2	LH	WF2	Insert Gage	
		inch	inch	inch	°	°	inch	inch	inch	inch		
Y-CTPAR08L-IN	R	1/2	1/2	.984	1	2	4.724	.000	1.181	.134	CTPA..	TBPA..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
Y-CTPAR08L-IN	LRIS-4*12PW	CLR-15S

CH-TBPA for horizontal gang style tool post





● Diagram shows left-hand tool
NOTE: Use a right-handed insert.

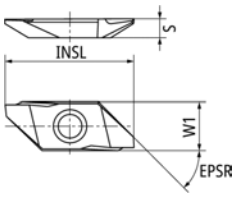
Item Number	Hand	B	CDX	H	HF	K1	K2	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	°	°	inch	inch	inch	
CH-TBPAL16	L	.630	.295	.630	.630	1	2	4.724	.354	1.102	TBPA..
CH-TBPAL20	L	.787	.295	.787	.787	1	2	4.724	.354	1.260	TBPA..

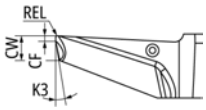
Spare Parts

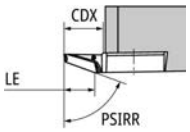
Item Number	Clamp screw	Wrench (for Clamp screw)
CH-TBPAL16	LRIS-4*10	LLR-25S
CH-TBPAL20	LRIS-4*10	LLR-25S

TBPA.. series/Inserts Carbide

TBPA-BM with BM-Chipbreaker



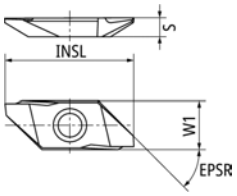


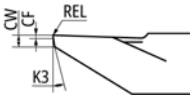


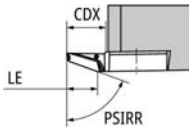
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	LE	CDX	CF	CW	EPSR	INSL	K3	PSIRR	REL	S	W1	Carbide		
														PVD		
			inch	inch	inch	inch	°	inch	°	°	inch	inch	inch	DM4	ST4	TM4
TBPA70FR05-BM	**R**	Yes	.217	.256	.012	.053	45	.984	12	70	.002	.138	.370	●	●	●
TBPA70FR10M-BM	**R**	Yes	.217	.256	.012	.053	45	.984	12	70	.003	.138	.370	●	●	●
TBPA70FR20M-BM	**R**	Yes	.217	.256	.012	.053	45	.984	12	70	.007	.138	.370	●	●	●

TBPA with Chipbreaker



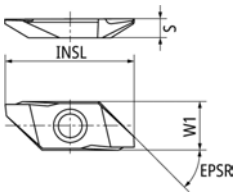


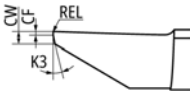


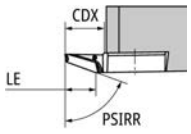
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	LE	CDX	CF	CW	EPSR	INSL	K3	PSIRR	REL	S	W1	Carbide			
														PVD			
			inch	inch	inch	inch	°	inch	°	°	inch	inch	inch	DT4	QM3	VM1	ZM3
TBPA60FR10M	**R**	Yes	.177	.209	.012	.028	45	.984	15	60	.003	.138	.370		●		
TBPA60FRPB10 Ⓜ	**R**	Yes	.177	.209	.012	.028	45	.984	15	60	.004	.138	.370			●	●
TBPA60FRPB10M Ⓜ	**R**	Yes	.177	.209	.012	.028	45	.984	15	60	.003	.138	.370	●		●	
TBPA60FRPB20M Ⓜ	**R**	Yes	.177	.209	.012	.028	45	.984	15	60	.007	.138	.370	●			
TBPA60FRVB Ⓜ	**R**	Yes	.177	.209	.008	.028	45	.984	15	60	.000	.138	.370	●		●	●
TBPA60FLPB10 Ⓜ	**L**	Yes	.177	.209	.012	.028	45	.984	15	60	.004	.138	.370				●
TBPA60FLVB Ⓜ	**L**	Yes	.177	.209	.008	.028	45	.984	15	60	.000	.138	.370				●

TBPA-V without Chipbreaker





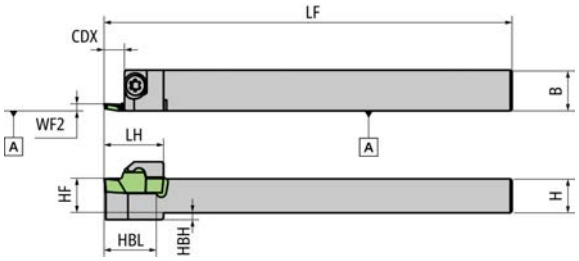


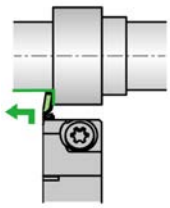
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	LE	CDX	CF	CW	EPSR	INSL	K3	PSIRR	REL	S	W1	Carbide	
														PVD	
			inch	inch	inch	inch	°	mm	°	°	inch	inch	inch	VM1	ZM3
TBPA60FRV Ⓜ	**R**	No	.248	.268	.008	.028	45	.984	15	60	.000	.138	.370	●	●
TBPA60FLV Ⓜ	**L**	No	.248	.268	.008	.028	45	.984	15	60	.000	.138	.370		●

BACK DUO
TBDP.. series/Toolholder

TBDP





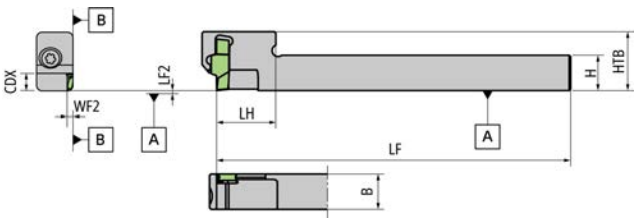
・Diagram shows right-hand tool

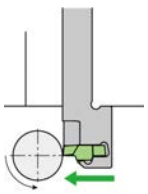
Item Number	Hand	B	CDX	H	HBH	HBL	HF	LF	LH	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	inch	inch	
TBDPR06-IN	R	.472	.118	3/8	.079	.571	3/8	4.724	.571	.081	TBDP..
TBDPR08-IN	R	1/2	.197	1/2	–	–	1/2	4.724	.689	.081	TBDP..
TBDPR10-IN	R	5/8	.197	5/8	–	–	5/8	4.724	.768	.081	TBDP..
TBDPR1012	R	.472	.118	.394	.079	.571	.394	4.724	.591	.081	TBDP..
TBDPR1012H	R	.472	.118	.394	.079	.571	.394	3.937	.591	.081	TBDP..
TBDPR12	R	.472	.197	.472	–	–	.472	4.724	.709	.081	TBDP..
TBDPR16	R	.630	.197	.630	–	–	.630	4.724	.768	.081	TBDP..
TBDPR20	R	.787	.197	.787	–	–	.787	4.724	.768	.081	TBDP..
TBDPL1012	L	.472	.118	.394	.079	.571	.394	4.724	.591	.081	TBDP..
TBDPL12	L	.472	.197	.472	–	–	.472	4.724	.709	.081	TBDP..
TBDPL16	L	.630	.197	.630	–	–	.630	4.724	.768	.081	TBDP..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
TBDPR06-IN	LRIS-4*12	LLR-25S
TBDPR08-IN	LRIS-4*12	LLR-25S
TBDPR10-IN	LRIS-4*12	LLR-25S
TBDPR1012	LRIS-4*12	LLR-25S
TBDPR1012H	LRIS-4*12	LLR-25S
TBDPR12	LRIS-4*12	LLR-25S
TBDPR16	LRIS-4*12	LLR-25S
TBDPR20	LRIS-4*12	LLR-25S
TBDPL1012	LRIS-4*12	LLR-25S
TBDPL12	LRIS-4*12	LLR-25S
TBDPL16	LRIS-4*12	LLR-25S

Y-TBDP Y-axis





・Diagram shows right-hand tool
NOTE: Use a right-handed (R) insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

Item Number	Hand	B	CDX	H	HTB	LF	LF2	LH	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	inch	
Y-TBDPR12S	R	.472	.197	.472	.787	4.724	.000	.787	.081	TBDP..

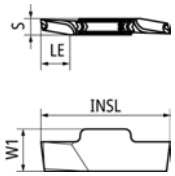
Spare Parts

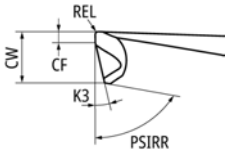
Item Number	Clamp screw	Wrench (for Clamp screw)
Y-TBDPR12S	LRIS-4*12	LLR-25S

BACK DUO

TBDP.. series/Inserts Carbide

TBDP



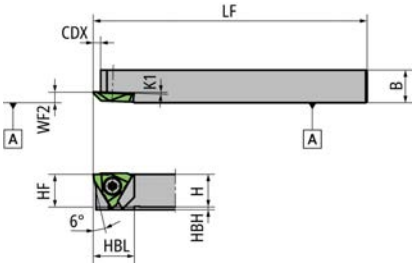


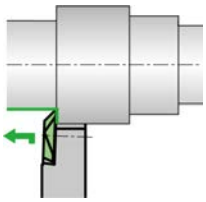
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	LE	CF	CW	INSL	K3	PSIRR	REL	S	W1	Carbide			
												PVD			
			inch	inch	inch	inch	°	°	inch	inch	inch	ST4	DM4	QM3	TM4
TBDP22005R	R	Yes	.138	.012	.055	.688	13	80	.002	.087	.236	●	●	●	●
TBDP2201MR	R	Yes	.138	.012	.055	.688	13	80	.003	.087	.236	●	●	●	●
TBDP2202MR	R	Yes	.138	.012	.055	.688	13	80	.007	.087	.236	●	●	●	●

TB.. series/Toolholder

TBT





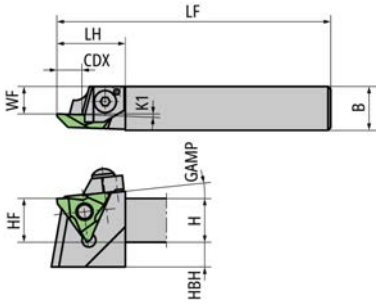
● Diagram shows right-hand tool

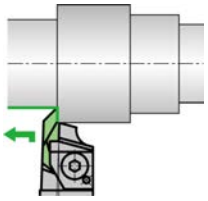
Item Number	Hand	B	CDX	H	HBH	HBL	HF	K1	LF	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	°	inch	inch	
TBTR06-IN	R	3/8	.197	3/8	.118	.591	3/8	2	4.724	.157	TB32..
TBTR08-IN	R	1/2	.197	1/2	.039	.591	1/2	2	4.724	.157	TB32..
TBTR08F	R	.315	.197	.315	.197	.591	.315	2	3.150	.157	TB32..
TBTR08K	R	.315	.197	.315	.197	.591	.315	2	4.724	.157	TB32..
TBTR10F	R	.394	.197	.394	.118	.591	.394	2	3.150	.157	TB32..
TBTR10K	R	.394	.197	.394	.118	.591	.394	2	4.724	.157	TB32..
TBTR12F	R	.472	.197	.472	.039	.591	.472	2	3.150	.157	TB32..
TBTR12K	R	.472	.197	.472	.039	.591	.472	2	4.724	.157	TB32..
TBTL08F	L	.315	.197	.315	.197	.591	.315	2	3.150	.157	TB32..
TBTL08K	L	.315	.197	.315	.197	.591	.315	2	4.724	.157	TB32..
TBTL10F	L	.394	.197	.394	.118	.591	.394	2	3.150	.157	TB32..
TBTL10K	L	.394	.197	.394	.118	.591	.394	2	4.724	.157	TB32..
TBTL12F	L	.472	.197	.472	.039	.591	.472	2	3.150	.157	TB32..
TBTL12K	L	.472	.197	.472	.039	.591	.472	2	4.724	.157	TB32..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
TBTR06-IN	LR-S-4*10PW	CLR-15S
TBTR08-IN	LR-S-4*10PW	CLR-15S
TBTR08F	LR-S-4*10PW	CLR-15S
TBTR08K	LR-S-4*10PW	CLR-15S
TBTR10F	LR-S-4*10PW	CLR-15S
TBTR10K	LR-S-4*10PW	CLR-15S
TBTR12F	LR-S-4*10PW	CLR-15S
TBTR12K	LR-S-4*10PW	CLR-15S
TBTL08F	LR-S-4*10PW	CLR-15S
TBTL08K	LR-S-4*10PW	CLR-15S
TBTL10F	LR-S-4*10PW	CLR-15S
TBTL10K	LR-S-4*10PW	CLR-15S
TBTL12F	LR-S-4*10PW	CLR-15S
TBTL12K	LR-S-4*10PW	CLR-15S

TB-N





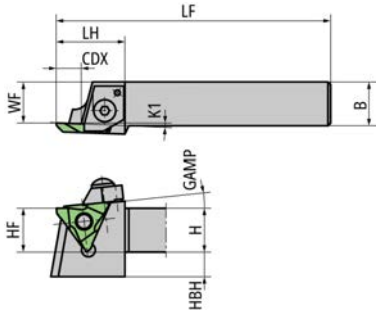
● Diagram shows right-hand tool

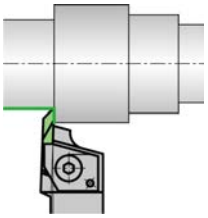
Item Number	Hand	B	CDX	GAMP	H	HBH	HF	K1	LF	LH	WF	Insert Gage
		inch	inch	°	inch	inch	inch	°	inch	inch	inch	
TBR16N	R	.630	.354	6	.630	.354	.630	2	3.071	.984	.394	TB43..
TBR16N-42	R	.630	.354	6	.630	.354	.630	2	3.071	.984	.453	TB42..
TBR16N-H	R	.630	.354	6	.630	.354	.630	2	3.937	.984	.394	TB43..
TBR16N-K	R	.630	.354	6	.630	.354	.630	2	4.921	.984	.394	TB43..
TBR16NS	R	.630	.197	6	.630	.354	.630	2	3.071	.984	.394	TB43..
TBR20N	R	.787	.354	6	.787	.197	.787	2	3.937	.984	.551	TB43..
TBL16N	L	.630	.354	6	.630	.354	.630	2	3.071	.984	.394	TB43..
TBL20N	L	.787	.354	6	.787	.197	.787	2	3.937	.984	.551	TB43..
TBL25N	L	.984	.354	6	.984	–	.984	2	5.906	.984	.748	TB43..

Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
TBR16N	CPR5S	AOS-5*25	ASG-5	LW-2.5
TBR16N-42	CPR5S	AOS-5*25	ASG-5	LW-2.5
TBR16N-H	CPR5S	AOS-5*25	ASG-5	LW-2.5
TBR16N-K	CPR5S	AOS-5*25	ASG-5	LW-2.5
TBR16NS	CPR5S	AOS-5*25	ASG-5	LW-2.5
TBR20N	CPR5S	AOS-5*25	ASG-5	LW-2.5
TBL16N	CPL5S	AOS-5*25	ASG-5	LW-2.5
TBL20N	CPL5S	AOS-5*25	ASG-5	LW-2.5
TBL25N	CPL5S	AOS-5*25	ASG-5	LW-2.5

TB-F





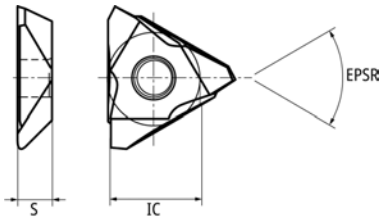
● Diagram shows right-hand tool

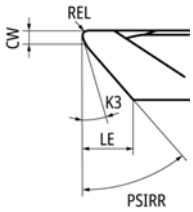
Item Number	Hand	B	CDX	GAMP	H	HBH	HF	K1	LF	LH	WF	Insert Gage
		inch	inch	°	inch	inch	inch	°	inch	inch	inch	
TBR16F	R	.630	.354	6	.630	.354	.630	2	3.937	.984	.591	TB43..
TBR16FS	R	.630	.197	6	.630	.354	.630	2	3.937	.984	.591	TB43..
TBR20F	R	.787	.354	6	.787	.197	.787	2	3.937	.984	.787	TB43..
TBR20FS	R	.787	.197	6	.787	.197	.787	2	3.937	.984	.787	TB43..
TBR25F	R	.984	.354	6	.984	–	.984	2	5.906	.984	.984	TB43..

Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
TBR16F	CPR5	AOS-5*25	ASG-5	LW-2.5
TBR16FS	CPR5	AOS-5*25	ASG-5	LW-2.5
TBR20F	CPR5	AOS-5*25	ASG-5	LW-2.5
TBR20FS	CPR5	AOS-5*25	ASG-5	LW-2.5
TBR25F	CPR5	AOS-5*25	ASG-5	LW-2.5

TB



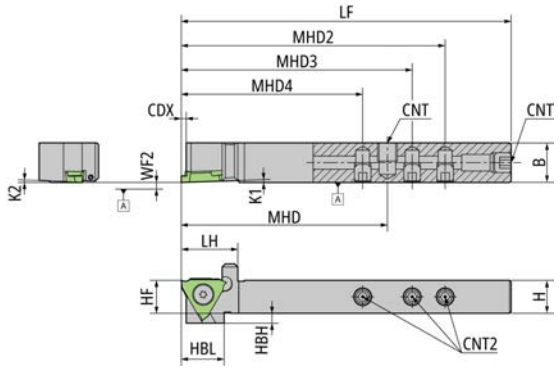


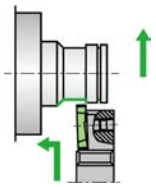
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	LE	CW	EPSR	IC	K3	PSIRR	REL	S	Carbide
											PVD
			inch	inch	°	inch	°	°	inch	inch	ZM3
TB3200R	**R**	Yes	.106	.020	60	3/8	13	45	.000	1/8	●
TB3205R	**R**	Yes	.106	.020	60	3/8	13	45	.002	1/8	●
TB3215R	**R**	Yes	.106	.020	60	3/8	13	45	.006	1/8	●
TB3220R	**R**	Yes	.106	.020	60	3/8	13	45	.008	1/8	●
TB3205L	**L**	Yes	.106	.020	60	3/8	13	45	.002	1/8	●
TB3215L	**L**	Yes	.106	.020	60	3/8	13	45	.006	1/8	●
TB4215R	**R**	Yes	.091	.039	60	1/2	13	45	.006	1/8	●
TB4305R	**R**	Yes	.157	.039	60	1/2	13	45	.002	3/16	●
TB4315R	**R**	Yes	.157	.039	60	1/2	13	45	.006	3/16	●
TB4340R	**R**	Yes	.154	.039	60	1/2	13	45	.016	3/16	●

TBMH.. Series/Toolholder

GTT-OH3 Coolant through (direct connect compatible)





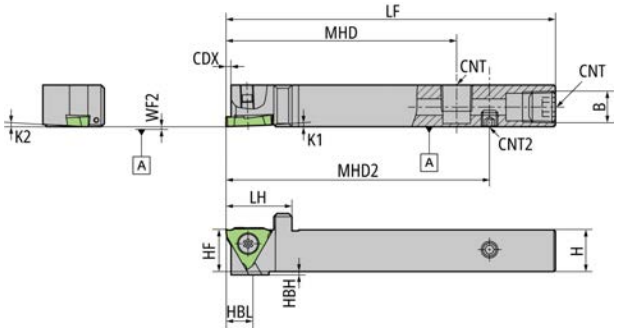
● Diagram shows right-hand tool

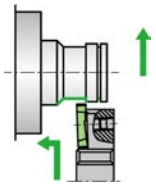
Item Number	Hand	B	CDX	CNT	CNT2	H	HBH	HBL	HF	K1	K2	LF	LH	MHD	MHD2	MHD3	MHD4	WF2	Insert Gage	
		inch	inch			inch	inch	inch	inch	°	°	inch	inch	inch	inch	inch	inch	inch		
GTTR10XB-IN-OH3	R	5/8	.106	NPT1/8	M5	5/8	–	–	5/8	2	2	4.724	.787	3.100	3.937	3.445	2.756	.000	GT..32..	TBMH32..
GTTR1012H00-OH3	R	.472	.071	Rc1/8	M5	.394	.118	.512	.394	2	2	3.937	.675	2.461	3.150	2.756	2.165	.000	GT..32..	TBMH32..
GTTR16X00-OH3	R	.630	.106	Rc1/8	M5	.630	–	–	.630	2	2	4.724	.787	3.100	3.937	3.445	2.756	.000	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
GTTR10XB-IN-OH3	LR-S-4*10PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
GTTR1012H00-OH3	LR-S-4*10PW	SS0605SC	SS0505SC	CLR-15S	LW-2.5
GTTR16X00-OH3	LR-S-4*10PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5

GTT-OH2 Coolant through (direct connect compatible)





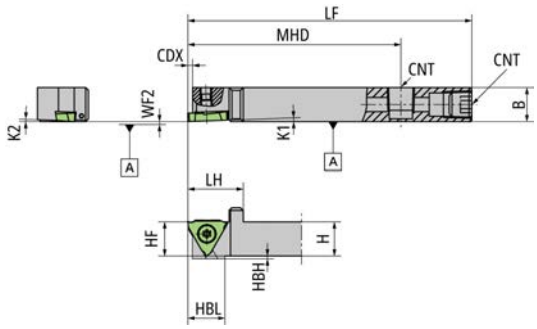
● Diagram shows right-hand tool

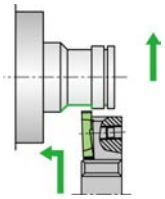
Item Number	Hand	B	CDX	CNT	CNT2	H	HBH	HBL	HF	K1	K2	LF	LH	MHD	MHD2	WF2	Insert Gage	
		inch	inch			inch	inch	inch	inch	°	°	inch	inch	inch	inch	inch		
GTTR08HA-IN-OH2	R	1/2	.071	NPT1/8	M5	1/2	.039	.512	1/2	2	2	3.937	.787	2.756	3.150	.000	GT..32..	TBMH32..
GTTR08HB-IN-OH2	R	1/2	.106	NPT1/8	M5	1/2	.039	.512	1/2	2	2	3.937	.787	2.756	3.150	.000	GT..32..	TBMH32..
GTTR10XA-IN-OH2	R	5/8	.071	NPT1/8	M5	5/8	–	–	5/8	2	2	3.937	.787	2.756	3.937	.000	GT..32..	TBMH32..
GTTR10XB-IN-OH2	R	5/8	.106	NPT1/8	M5	5/8	–	–	5/8	2	2	4.724	.787	2.756	3.937	.000	GT..32..	TBMH32..
GTTR12H00-OH2	R	.472	.071	Rc1/8	M5	.472	.039	.512	.472	2	2	3.937	.768	2.756	3.150	.000	GT..32..	TBMH32..
GTTR16X00-OH2	R	.630	.071	Rc1/8	M5	.630	–	–	.630	2	2	4.724	.768	2.756	3.937	.000	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
GTTR08HA-IN-OH2	LR-S-4*10PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
GTTR08HB-IN-OH2	LR-S-4*10PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
GTTR10XA-IN-OH2	LR-S-4*10PW	SPNPT1/8L	SS0505SC	CLR-15S	LW-2.5
GTTR10XB-IN-OH2	LR-S-4*10PW	SPNPT1/8L	SS0505SC	CLR-15S	LW-2.5
GTTR12H00-OH2	LR-S-4*10PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5
GTTR16X00-OH2	LR-S-4*10PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5

GTT-OH Coolant through





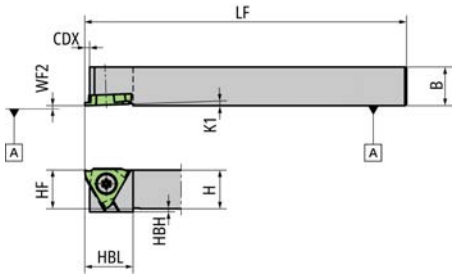
● Diagram shows right-hand tool

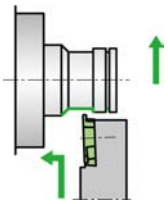
Item Number	Hand	B	CDX	CNT	H	HBH	HBL	HF	K1	K2	LF	LH	MHD	WF2	Insert Gage	
		inch	inch		inch	inch	inch	inch	°	°	inch	inch	inch	inch		
GTTR08HA-IN-OH	R	1/2	.071	NPT1/8	1/2	.039	.512	1/2	2	2	3.937	.768	2.953	.000	GT..32..	TBMH32..
GTTR08HB-IN-OH	R	1/2	.106	NPT1/8	1/2	.039	.512	1/2	2	2	3.937	.768	2.953	.000	GT..32..	TBMH32..
GTTR10HA-IN-OH	R	5/8	.071	NPT1/8	5/8	–	–	5/8	2	2	3.937	.768	2.953	.000	GT..32..	TBMH32..
GTTR10HB-IN-OH	R	5/8	.106	NPT1/8	5/8	–	–	5/8	2	2	4.724	.768	2.953	.000	GT..32..	TBMH32..
GTTR1012H00-OH	R	.472	.063	M6*1	.394	.039	.512	.394	2	2	3.937	.768	2.756	.000	GT..32..	TBMH32..
GTTR12H00-OH	R	.472	.063	Rc1/8	.472	.039	.512	.472	2	2	3.937	.768	2.756	.000	GT..32..	TBMH32..
GTTR16H00-OH	R	.630	.063	Rc1/8	.630	–	–	.630	2	2	3.937	.768	2.756	.000	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
GTTR08HA-IN-OH	LR-S-4*10PW	SPNPT1/8	CLR-15S
GTTR08HB-IN-OH	LR-S-4*10PW	SPNPT1/8	CLR-15S
GTTR10HA-IN-OH	LR-S-4*10PW	SPNPT1/8	CLR-15S
GTTR10HB-IN-OH	LR-S-4*10PW	SPNPT1/8	CLR-15S
GTTR1012H00-OH	LR-S-4*10PW	SS0605SC	CLR-15S
GTTR12H00-OH	LR-S-4*10PW	SPR1/8	CLR-15S
GTTR16H00-OH	LR-S-4*10PW	SPR1/8	CLR-15S

GTT





● Diagram shows right-hand tool

Item Number	Hand	B	CDX	H	HBH	HBL	HF	K1	K2	LF	WF2	Insert Gage	
		inch	inch	inch	inch	inch	inch	°	°	inch	inch		
GTTR06A-IN	R	3/8	.071	3/8	.118	.591	3/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTR06B-IN	R	3/8	.106	3/8	.118	.591	3/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTR08A-IN	R	1/2	.071	1/2	.039	.591	1/2	2	2	4.724	.000	GT..32..	TBMH32..
GTTR08B-IN	R	1/2	.106	1/2	.039	.591	1/2	2	2	4.724	.000	GT..32..	TBMH32..
GTTR10A-IN	R	5/8	.071	5/8	–	–	5/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTR10B-IN	R	5/8	.106	5/8	–	–	5/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTR12A-IN	R	3/4	.071	3/4	–	–	3/4	2	2	4.724	.000	GT..32..	TBMH32..
GTTR12B-IN	R	3/4	.106	3/4	–	–	3/4	2	2	4.724	.000	GT..32..	TBMH32..
GTTL06A-IN	L	3/8	.071	3/8	.118	.591	3/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTL06B-IN	L	3/8	.106	3/8	.118	.591	3/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTL08A-IN	L	1/2	.071	1/2	.039	.591	1/2	2	2	4.724	.000	GT..32..	TBMH32..
GTTL08B-IN	L	1/2	.106	1/2	.039	.591	1/2	2	2	4.724	.000	GT..32..	TBMH32..
GTTL10A-IN	L	5/8	.071	5/8	–	–	5/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTL10B-IN	L	5/8	.106	5/8	–	–	5/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTR0810F00	R	.394	.063	.315	.197	.591	.315	2	2	3.150	.000	GT..32..	TBMH32..
GTTR0810K00	R	.394	.063	.315	.197	.591	.315	2	2	4.724	.000	GT..32..	TBMH32..
GTTR08F00	R	.315	.063	.315	.197	.591	.315	2	2	3.150	.000	GT..32..	TBMH32..
GTTR08K00	R	.315	.063	.315	.197	.591	.315	2	2	4.724	.000	GT..32..	TBMH32..
GTTR10F00	R	.394	.063	.394	.118	.591	.394	2	2	3.150	.000	GT..32..	TBMH32..
GTTR10F15	R	.394	.106	.394	.118	.591	.394	2	2	3.150	.000	GT..32..	TBMH32..
GTTR10F25	R	.394	.106	.394	.118	.591	.394	2	2	3.150	.000	GT..32..	TBMH32..
GTTR10K00	R	.394	.063	.394	.118	.591	.394	2	2	4.724	.000	GT..32..	TBMH32..
GTTR10K15	R	.394	.106	.394	.118	.591	.394	2	2	4.724	.000	GT..32..	TBMH32..
GTTR10K25	R	.394	.106	.394	.118	.591	.394	2	2	4.724	.000	GT..32..	TBMH32..
GTTR12F00	R	.472	.063	.472	.039	.591	.472	2	2	3.150	.000	GT..32..	TBMH32..
GTTR12F15	R	.472	.106	.472	.039	.591	.472	2	2	3.150	.000	GT..32..	TBMH32..
GTTR12F25	R	.472	.106	.472	.039	.591	.472	2	2	3.150	.000	GT..32..	TBMH32..
GTTR12K00	R	.472	.063	.472	.039	.591	.472	2	2	4.724	.000	GT..32..	TBMH32..
GTTR12K15	R	.472	.106	.472	.039	.591	.472	2	2	4.724	.000	GT..32..	TBMH32..
GTTR12K25	R	.472	.106	.472	.039	.591	.472	2	2	4.724	.000	GT..32..	TBMH32..
GTTR16H00	R	.630	.063	.630	–	–	.630	2	2	3.937	.000	GT..32..	TBMH32..
GTTR16H15	R	.630	.106	.630	–	–	.630	2	2	3.937	.000	GT..32..	TBMH32..
GTTR16H25	R	.630	.106	.630	–	–	.630	2	2	3.937	.000	GT..32..	TBMH32..
GTTR16K00	R	.630	.063	.630	–	–	.630	2	2	4.724	.000	GT..32..	TBMH32..
GTTR16K15	R	.630	.106	.630	–	–	.630	2	2	4.724	.000	GT..32..	TBMH32..
GTTR16K25	R	.630	.106	.630	–	–	.630	2	2	4.724	.000	GT..32..	TBMH32..
GTTR20K00	R	.787	.063	.787	–	–	.787	2	2	4.921	.000	GT..32..	TBMH32..
GTTR25M00	R	.984	.063	.984	–	–	.984	2	2	5.906	.000	GT..32..	TBMH32..
GTTL08F00	L	.315	.063	.315	.197	.591	.315	2	2	3.150	.000	GT..32..	TBMH32..
GTTL08K00	L	.315	.063	.315	.197	.591	.315	2	2	4.724	.000	GT..32..	TBMH32..
GTTL10F00	L	.394	.063	.394	.118	.591	.394	2	2	3.150	.000	GT..32..	TBMH32..
GTTL10F15	L	.394	.106	.394	.118	.591	.394	2	2	3.150	.000	GT..32..	TBMH32..
GTTL10F25	L	.394	.106	.394	.118	.591	.394	2	2	3.150	.000	GT..32..	TBMH32..
GTTL10K00	L	.394	.063	.394	.118	.591	.394	2	2	4.724	.000	GT..32..	TBMH32..
GTTL10K15	L	.394	.106	.394	.118	.591	.394	2	2	4.724	.000	GT..32..	TBMH32..
GTTL10K25	L	.394	.106	.394	.118	.591	.394	2	2	4.724	.000	GT..32..	TBMH32..
GTTL12F00	L	.472	.063	.472	.039	.591	.472	2	2	3.150	.000	GT..32..	TBMH32..
GTTL12F15	L	.472	.106	.472	.039	.591	.472	2	2	3.150	.000	GT..32..	TBMH32..
GTTL12F25	L	.472	.106	.472	.039	.591	.472	2	2	3.150	.000	GT..32..	TBMH32..
GTTL12K00	L	.472	.063	.472	.039	.591	.472	2	2	4.724	.000	GT..32..	TBMH32..
GTTL12K15	L	.472	.106	.472	.039	.591	.472	2	2	4.724	.000	GT..32..	TBMH32..
GTTL12K25	L	.472	.106	.472	.039	.591	.472	2	2	4.724	.000	GT..32..	TBMH32..
GTTL16H00	L	.630	.063	.630	–	–	.630	2	2	3.937	.000	GT..32..	TBMH32..
GTTL16H15	L	.630	.106	.630	–	–	.630	2	2	3.937	.000	GT..32..	TBMH32..

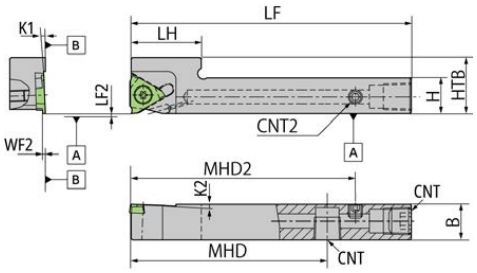
Item Number	Hand	B	CDX	H	HBH	HBL	HF	K1	K2	LF	WF2	Insert Gage	
		inch	inch	inch	inch	inch	inch	°	°	inch	inch		
GTTL16H25	L	.630	.106	.630	–	–	.630	2	2	3.937	.000	GT..32..	TBMH32..
GTTL16K00	L	.630	.063	.630	–	–	.630	2	2	4.724	.000	GT..32..	TBMH32..
GTTL16K15	L	.630	.106	.630	–	–	.630	2	2	4.724	.000	GT..32..	TBMH32..
GTTL16K25	L	.630	.106	.630	–	–	.630	2	2	4.724	.000	GT..32..	TBMH32..
GTTL20K00	L	.787	.063	.787	–	–	.787	2	2	4.921	.000	GT..32..	TBMH32..
GTTL25M00	L	.984	.063	.984	–	–	.984	2	2	5.906	.000	GT..32..	TBMH32..

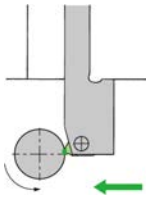
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
GTTR06A-IN	LR-S-4*10PW	CLR-15S
GTTR06B-IN	LR-S-4*10PW	CLR-15S
GTTR08A-IN	LR-S-4*10PW	CLR-15S
GTTR08B-IN	LR-S-4*10PW	CLR-15S
GTTR10A-IN	LR-S-4*10PW	CLR-15S
GTTR10B-IN	LR-S-4*10PW	CLR-15S
GTTR12A-IN	LR-S-4*10PW	CLR-15S
GTTR12B-IN	LR-S-4*10PW	CLR-15S
GTTL06A-IN	LR-S-4*10PW	CLR-15S
GTTL06B-IN	LR-S-4*10PW	CLR-15S
GTTL08A-IN	LR-S-4*10PW	CLR-15S
GTTL08B-IN	LR-S-4*10PW	CLR-15S
GTTL10A-IN	LR-S-4*10PW	CLR-15S
GTTL10B-IN	LR-S-4*10PW	CLR-15S
GTTR0810F00	LR-S-4*10PW	CLR-15S
GTTR0810K00	LR-S-4*10PW	CLR-15S
GTTR08F00	LR-S-4*10PW	CLR-15S
GTTR08K00	LR-S-4*10PW	CLR-15S
GTTR10F00	LR-S-4*10PW	CLR-15S
GTTR10F15	LR-S-4*10PW	CLR-15S
GTTR10F25	LR-S-4*10PW	CLR-15S
GTTR10K00	LR-S-4*10PW	CLR-15S
GTTR10K15	LR-S-4*10PW	CLR-15S
GTTR10K25	LR-S-4*10PW	CLR-15S
GTTR12F00	LR-S-4*10PW	CLR-15S
GTTR12F15	LR-S-4*10PW	CLR-15S
GTTR12F25	LR-S-4*10PW	CLR-15S
GTTR12K00	LR-S-4*10PW	CLR-15S
GTTR12K15	LR-S-4*10PW	CLR-15S
GTTR12K25	LR-S-4*10PW	CLR-15S
GTTR16H00	LR-S-4*10PW	CLR-15S
GTTR16H15	LR-S-4*10PW	CLR-15S
GTTR16H25	LR-S-4*10PW	CLR-15S
GTTR16K00	LR-S-4*10PW	CLR-15S
GTTR16K15	LR-S-4*10PW	CLR-15S
GTTR16K25	LR-S-4*10PW	CLR-15S
GTTR20K00	LR-S-4*10PW	CLR-15S
GTTR25M00	LR-S-4*10PW	CLR-15S
GTTL08F00	LR-S-4*5.8	CLR-15S
GTTL08K00	LR-S-4*5.8	CLR-15S
GTTL10F00	LR-S-4*10PW	CLR-15S
GTTL10F15	LR-S-4*10PW	CLR-15S
GTTL10F25	LR-S-4*10PW	CLR-15S
GTTL10K00	LR-S-4*10PW	CLR-15S
GTTL10K15	LR-S-4*10PW	CLR-15S
GTTL10K25	LR-S-4*10PW	CLR-15S
GTTL12F00	LR-S-4*10PW	CLR-15S
GTTL12F15	LR-S-4*10PW	CLR-15S
GTTL12F25	LR-S-4*10PW	CLR-15S
GTTL12K00	LR-S-4*10PW	CLR-15S
GTTL12K15	LR-S-4*10PW	CLR-15S
GTTL12K25	LR-S-4*10PW	CLR-15S
GTTL16H00	LR-S-4*10PW	CLR-15S
GTTL16H15	LR-S-4*10PW	CLR-15S
GTTL16H25	LR-S-4*10PW	CLR-15S
GTTL16K00	LR-S-4*10PW	CLR-15S

Item Number	Clamp screw	Wrench (for Clamp screw)
GTTL16K15	LR-S-4*10PW	CLR-15S
GTTL16K25	LR-S-4*10PW	CLR-15S
GTTL20K00	LR-S-4*10PW	CLR-15S
GTTL25M00	LR-S-4*10PW	CLR-15S

Y-GTT-OH2 Direct connect coolant port 1-hole type Y-axis





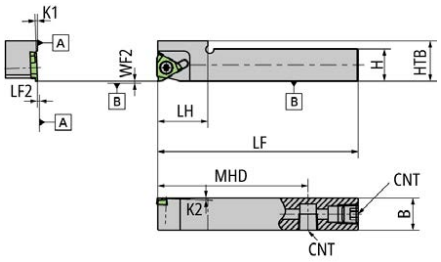
● Diagram shows right-hand tool
NOTE: Use a right-handed (R) insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

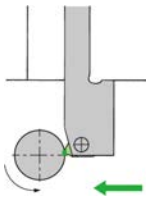
Item Number	Hand	B	CNT	CNT2	H	HTB	K1	K2	LF	LF2	LH	MHD	MHD2	WF2	Insert Gage	
		inch			inch	inch	°	°	inch	inch	inch	inch	inch	inch		
Y-GTTR08H-IN-OH2	R	1/2	NPT1/8	M5	1/2	.787	2	2	3.937	.000	.984	2.756	3.150	.000	GT..32..	TBMH32..
Y-GTTR12H00S-OH2	R	.472	Rc1/8	M5	.472	.787	2	2	3.937	.000	.787	2.756	3.150	.000	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
Y-GTTR08H-IN-OH2	LR-S-4*10PW	SPNPT1/8	CLR-15S
Y-GTTR12H00S-OH2	LR-S-4*10PW	SPR1/8	CLR-15S

Y-GTT-OH Y-axis coolant through holders





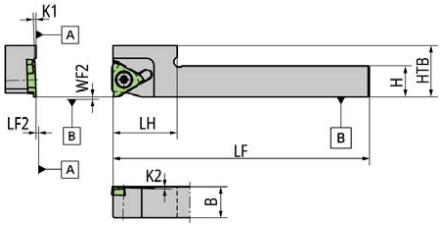
● Diagram shows right-hand tool
NOTE: Use a right-handed (R) insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

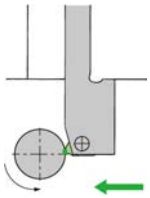
Item Number	Hand	B	CNT	H	HTB	K1	K2	LF	LF2	LH	MHD	WF2	Insert Gage	
		inch		inch	inch	°	°	inch	inch	inch	inch	inch		
Y-GTTR08H-IN-OH	R	1/2	NPT1/8	1/2	.787	2	2	3.937	.000	.984	2.953	.000	GT..32..	TBMH32..
Y-GTTR12H00S-OH	R	.472	Rc1/8	.472	.787	2	2	3.937	.000	.787	2.953	.000	GT..32..	TBMH32..
Y-GTTR16H00-OH	R	.630	Rc1/8	.630	.787	2	2	3.937	.000	.984	2.953	.000	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
Y-GTTR08H-IN-OH	LR-S-4*10PW	SPNPT1/8	CLR-15S
Y-GTTR12H00S-OH	LR-S-4*10PW	SPR1/8	CLR-15S
Y-GTTR16H00-OH	LR-S-4*10PW	SPR1/8	CLR-15S

Y-GTT Y-axis





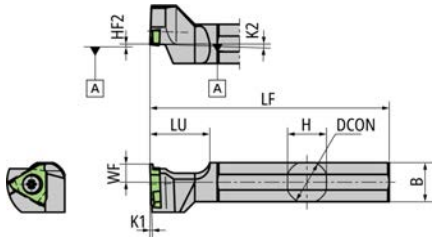
● Diagram shows right-hand tool
NOTE: Use a right-handed (R) insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

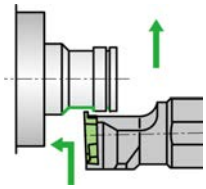
Item Number	Hand	B	H	HTB	K1	K2	LF	LF2	LH	WF2	Insert Gage	
		inch	inch	inch	°	°	inch	inch	inch	inch		
Y-GTTR06-IN	R	3/8	3/8	.787	2	2	4.724	.000	.984	.000	GT..32..	TBMH32..
Y-GTTR08-IN	R	1/2	1/2	.787	2	2	4.724	.000	.984	.000	GT..32..	TBMH32..
Y-GTTR10-IN	R	5/8	5/8	.787	2	2	4.724	.000	.984	.000	GT..32..	TBMH32..
Y-GTTR10MS	R	.394	.394	.787	2	2	4.724	.000	.866	.000	GT..32..	TBMH32..
Y-GTTR10S	R	.394	.394	.787	2	2	4.724	.000	.787	.000	GT..32..	TBMH32..
Y-GTTR12MS	R	.472	.472	.787	2	2	4.724	.000	.866	.000	GT..32..	TBMH32..
Y-GTTR12S	R	.472	.472	.787	2	2	4.724	.000	.787	.000	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
Y-GTTR06-IN	LR-S-4*10PW	CLR-15S
Y-GTTR08-IN	LR-S-4*10PW	CLR-15S
Y-GTTR10-IN	LR-S-4*10PW	CLR-15S
Y-GTTR10MS	LR-S-4*10PW	CLR-15S
Y-GTTR10S	LR-S-4*10PW	CLR-15S
Y-GTTR12MS	LR-S-4*10PW	CLR-15S
Y-GTTR12S	LR-S-4*10PW	CLR-15S

DS-GTT DS Toolholders





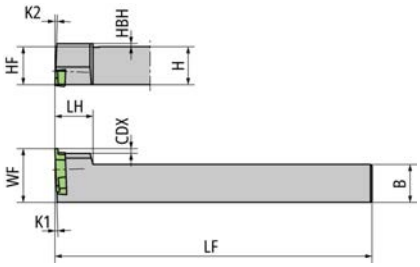
・Diagram shows left-hand tool
NOTE: Use a right-handed (R) insert.

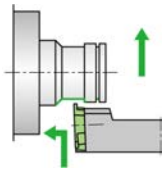
Item Number	Hand	B	DCON	H	HF2	K1	K2	LF	LU	WF	Insert Gage	
		inch	inch	inch	inch	°	°	inch	inch	inch		
DS-GTTL14F	L	.512	.551	.512	.000	2	2	3.150	.748	.236	GT..32..	TBMH32..
DS-GTTL15H	L	.591	5/8	.591	.000	2	2	3.937	.748	.236	GT..32..	TBMH32..
DS-GTTL16X	L	.591	.630	.591	.000	2	2	3.740	.748	.236	GT..32..	TBMH32..
DS-GTTL19	L	.709	3/4	.709	.000	2	2	4.724	.748	.236	GT..32..	TBMH32..
DS-GTTL20	L	.748	.787	.748	.000	2	2	4.724	.748	.236	GT..32..	TBMH32..
DS-GTTL22	L	.827	.866	.827	.000	2	2	4.724	.748	.236	GT..32..	TBMH32..
DS-GTTL25	L	.945	1.000	.945	.000	2	2	4.724	.748	.394	GT..32..	TBMH32..
DS-GTTL25-MET	L	.945	.984	.945	.000	2	2	5.906	.748	.394	GT..32..	TBMH32..
DS-GTTL32	L	1.181	1.260	1.181	.000	2	2	5.906	.748	.394	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-GTTL14F	LR-S-4*9	RLR-20S
DS-GTTL15H	LR-S-4*9	RLR-20S
DS-GTTL16X	LR-S-4*9	RLR-20S
DS-GTTL19	LR-S-4*9	RLR-20S
DS-GTTL20	LR-S-4*9	RLR-20S
DS-GTTL22	LR-S-4*9	RLR-20S
DS-GTTL25	LR-S-4*9	RLR-20S
DS-GTTL25-MET	LR-S-4*9	RLR-20S
DS-GTTL32	LR-S-4*9	RLR-20S

CH-GTT for horizontal gang style tool post





・Diagram shows left-hand tool
NOTE: Use a right-handed (R) insert.

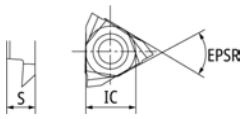
Item Number	Hand	B	CDX	H	HBH	HF	K1	K2	LF	LH	WF	Insert Gage	
		inch	inch	inch	inch	inch	°	°	inch	inch	inch		
CH-GTTL10H00	L	.394	.063	.394	.118	.394	2	2	3.937	.472	.591	GT..32..	TBMH32..
CH-GTTL12H00	L	.472	.063	.472	.039	.472	2	2	3.937	.472	.669	GT..32..	TBMH32..
CH-GTTL16H00	L	.630	.063	.630	–	.630	2	2	3.937	.472	.827	GT..32..	TBMH32..

Spare Parts

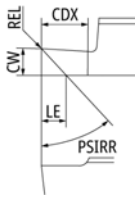
Item Number	Clamp screw	Wrench (for Clamp screw)
CH-GTTL10H00	LR-S-4*9	RLR-20S
CH-GTTL12H00	LR-S-4*9	RLR-20S
CH-GTTL16H00	LR-S-4*9	RLR-20S

TBMH.. series/Inserts Carbide

TBMH



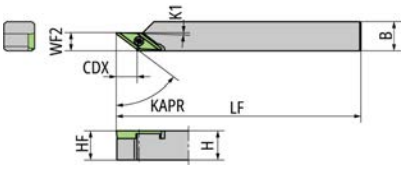
● Diagram shows right-hand tool

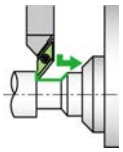


Item Number	Hand	Chipbreaker	LE	CDX	CW	EPSR	IC	PSIRR	REL	S	Carbide
											PVD
			inch	inch	°	inch	inch	°	inch	inch	ZM3
TBMH32100R05-22	R	Yes	.012	.071	.039	60	3/8	22	.002	1/8	●
TBMH32100R05-45	R	Yes	.035	.071	.039	60	3/8	45	.002	1/8	●
TBMH32150R05-22	R	Yes	.020	.106	.059	60	3/8	22	.002	1/8	●
TBMH32150R05-45	R	Yes	.051	.102	.059	60	3/8	45	.002	1/8	●

TBVC.. series/Toolholder

TBVC For non-metallic





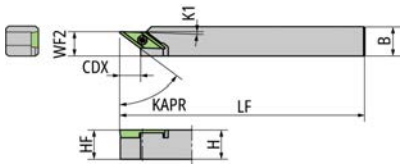
● Diagram shows right-hand tool

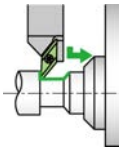
Item Number	Hand	B	CDX	H	HF	KAPR	K1	LF	WF2	Insert Gage	
		inch	inch	inch	inch	°	°	inch	inch		
TBVCR10	R	.394	.335	.394	.394	53	2	4.724	.295	TBVC11FR..	VC..22..
TBVCR12	R	.472	.335	.472	.472	53	2	4.724	.295	TBVC11FR..	VC..22..
TBVCR16	R	.630	.335	.630	.630	53	2	4.724	.295	TBVC11FR..	VC..22..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
TBVCR10	LRIS-2.5*7	CLR-15S
TBVCR12	LRIS-2.5*7	CLR-15S
TBVCR16	LRIS-2.5*7	CLR-15S

TBVC-F For Steel





● Diagram shows right-hand tool

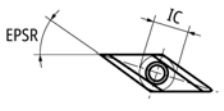
Item Number	Hand	B	CDX	H	HF	KAPR	K1	LF	WF2	Insert Gage	
		inch	inch	inch	inch	°	°	inch	inch		
TBVCR08-F10-IN	R	1/2	.335	1/2	1/2	53	2	4.724	.394	TBVC11FR..	VC..22..
TBVCR10-F10	R	.394	.335	.394	.394	53	2	4.724	.394	TBVC11FR..	VC..22..
TBVCR12-F10	R	.472	.335	.472	.472	53	2	4.724	.394	TBVC11FR..	VC..22..
TBVCR12GX-F10	R	.472	.335	.472	.472	53	2	3.346	.394	TBVC11FR..	VC..22..
TBVCR16-F10	R	.630	.335	.630	.630	53	2	4.724	.394	TBVC11FR..	VC..22..
TBVCR16H-F10	R	.630	.335	.630	.630	53	2	3.937	.394	TBVC11FR..	VC..22..
TBVCR20F-F10	R	.787	.335	.787	.787	53	2	3.150	.394	TBVC11FR..	VC..22..

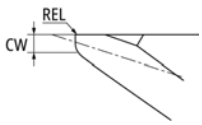
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
TBVCR08-F10-IN	LRIS-2.5*7	CLR-15S
TBVCR10-F10	LRIS-2.5*7	CLR-15S
TBVCR12-F10	LRIS-2.5*7	CLR-15S
TBVCR12GX-F10	LRIS-2.5*7	CLR-15S
TBVCR16-F10	LRIS-2.5*7	CLR-15S
TBVCR16H-F10	LRIS-2.5*7	CLR-15S
TBVCR20F-F10	LRIS-2.5*7	CLR-15S

TBVC.. series/Inserts Carbide

TBVC..



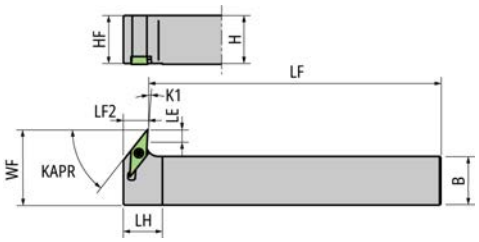


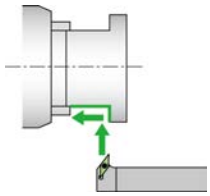
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	AN	CW	EPSR	IC	REL	S	Carbide	
									PVD	
			°	inch	°	inch	inch	inch	VM1	ZM3
TBVC11FR05U	R	Yes	7	.020	35	1/4	.002	1/8		●
TBVC11FR10S	R	Yes	7	.020	35	1/4	.004	1/8		●
TBVC11FR10U	R	Yes	7	.020	35	1/4	.004	1/8	●	●

VC.. series/Toolholder

CH-SVXC for horizontal gang style tool post





● Diagram shows left-hand tool

NOTE: Use a right-handed (R) or non-handed insert.

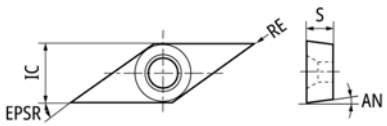
Item Number	Hand	B	H	HF	KAPR	K1	LE	LF	LF2	LH	WF	Insert Gage
		inch	inch	inch	°	°	inch	inch	inch	inch	inch	
CH-SVXCL1616X11	L	.630	.630	.630	52	3	.276	4.724	.394	.630	1.063	VC..22..
CH-SVXCL2020X11	L	.787	.787	.787	52	3	.276	4.724	.394	.630	1.220	VC..22..

Spare Parts

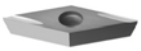
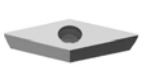
Item Number	Clamp screw	Wrench (for Clamp screw)
CH-SVXCL1616X11	LRIS-2.5*7	CLR-15S
CH-SVXCL2020X11	LRIS-2.5*7	CLR-15S

VC.. series/Inserts Carbide

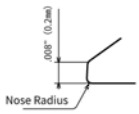
VC..

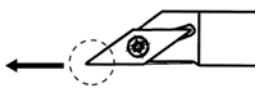


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number (Inch)	Item Number (Metric)	EPSR	IC	S	AN	RE	BS	Carbide PVD 650	PVD ST4	PVD DM4	PVD DT4	PVD QM3	PVD TM4	PVD VM11	PVD ZM3	CVD CP1	CVD CP7	Uncoated KM1
			°	inch	inch	°	inch	inch											
	VCGT 2208M R TMV	VCGT 110302M R TMV	35	1/4	1/8	7	.007	–	●	●									
	VCGT 221M R TMV	VCGT 110304M R TMV	35	1/4	1/8	7	.015	–	●	●									
	VCGT 2204M YL	VCGT 110301M YL	35	1/4	1/8	7	.003	–	●	●	●	●	●	●					
	VCGT 2208M YL	VCGT 110302M YL	35	1/4	1/8	7	.007	–	●	●	●	●	●	●					
	VCGT 221M YL	VCGT 110304M YL	35	1/4	1/8	7	.015	–	●	●	●	●	●	●					
	VCGT 21.508M CL	VCGT 110202M CL	35	1/4	3/32	7	.007	–			●	●	●	●					
	VCGT 2204M CL	VCGT 110301M CL	35	1/4	1/8	7	.003	–	●	●	●	●	●	●					
	VCGT 2208M CL	VCGT 110302M CL	35	1/4	1/8	7	.007	–	●	●	●	●	●	●					
	VCGT 2201 FN AM3	VCGT 110300 FN AM3	35	1/4	1/8	7	.001	–				●	●	●	●				
	VCGT 2204M FN AM3	VCGT 110301M FN AM3	35	1/4	1/8	7	.003	–	●	●		●	●	●	●				
	VCGT 2204 FN AM3	VCGT 110301 FN AM3	35	1/4	1/8	7	.004	–							●	●			
	VCGT 2208M FN AM3	VCGT 110302M FN AM3	35	1/4	1/8	7	.007	–	●	●		●	●	●	●				
	VCGT 2208 FN AM3	VCGT 110302 FN AM3	35	1/4	1/8	7	.008	–							●	●			
	VCGT 221M FN AM3	VCGT 110304M FN AM3	35	1/4	1/8	7	.015	–	●	●		●	●	●	●				
	VCMT 2208 FN AM3	VCMT 110302 FN AM3	35	1/4	1/8	7	.008	–			●								
	VCMT 221 FN AM3	VCMT 110304 FN AM3	35	1/4	1/8	7	.016	–			●								
	VCGT 2201 AZ7	VCGT 110300 AZ7	35	1/4	1/8	7	.001	–					●			●			
	VCGT 2204M AZ7	VCGT 110301M AZ7	35	1/4	1/8	7	.003	–					●			●			
	VCGT 2208M AZ7	VCGT 110302M AZ7	35	1/4	1/8	7	.007	–					●			●			
	VCGT 221M AZ7	VCGT 110304M AZ7	35	1/4	1/8	7	.015	–					●			●			
	VCGT 2.5201 FR 2M	VCGT 130300 FR 2M	35	5/16	1/8	7	–	–			●								
	VCGT 2.5201 FL 2M	VCGT 130300 FL 2M	35	5/16	1/8	7	–	–			●								
	VCGT 2.5204 FR 2M	VCGT 130301 FR 2M	35	5/16	1/8	7	–	–			●								
	VCGT 2.5204 FL 2M	VCGT 130301 FL 2M	35	5/16	1/8	7	–	–			●								
	VCGT 2201 R U	VCGT 110300 R U	35	1/4	1/8	7	.001	–							●	●			
	VCGT 2204M R U	VCGT 110301M R U	35	1/4	1/8	7	.003	–				●							
	VCGT 2204 R U	VCGT 110301 R U	35	1/4	1/8	7	.004	–							●	●			
	VCGT 2208M R U	VCGT 110302M R U	35	1/4	1/8	7	.007	–				●							
	VCGT 2208 R U	VCGT 110302 R U	35	1/4	1/8	7	.008	–							●	●			
	VCET 2203 R UHG	VCET 1103008 R UHG	35	1/4	1/8	7	.003	–							●				
	VCGT 2202 R U -WP	VCGT 1103005 R U -WP	35	1/4	1/8	7	.002	(.008)							●	●			
	VCGT 2204 R U -WP	VCGT 110301 R U -WP	35	1/4	1/8	7	.004	(.008)							●	●			
	VCGT 2202 R SX -WP Ⓜ	VCGT 1103005 R SX -WP Ⓜ	35	1/4	1/8	7	.002	(.008)							●	●			
	VCGT 2204 R SX -WP Ⓜ	VCGT 110301 R SX -WP Ⓜ	35	1/4	1/8	7	.004	(.008)							●	●			
	VCGW 2201 H Ⓜ	VCGW 110300 H Ⓜ	35	1/4	1/8	7	.001	–											●
	VCGW 2204 H Ⓜ	VCGW 110301 H Ⓜ	35	1/4	1/8	7	.004	–											●
	VCGW 2208 H Ⓜ	VCGW 110302 H Ⓜ	35	1/4	1/8	7	.008	–											●

Features of VCGT-WP insert

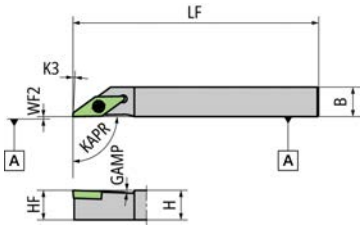


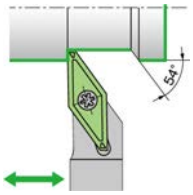


NTK WP style inserts have a wiper facet design.
The insert has a 0.2mm(.008") flat on the cutting edge when the insert is set into the toolholder.
The flat on the cutting edge ensures a superior surface when feed rates are increased.
WP style inserts can be used in toolholders: SVAC

VC..2M series/Toolholder

SVAC-NW for Front and Back Turning





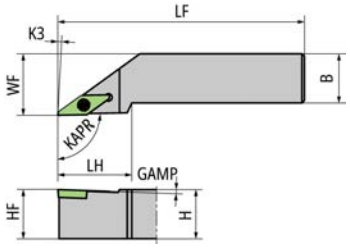
● Diagram shows right-hand tool

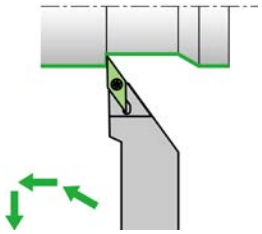
Item Number	Hand	B	GAMP	H	HF	KAPR	K3	LF	WF2	Insert Gage
		inch	°	inch	inch	°	°	inch	inch	
SVACR1010L13NW	R	.394	1	.394	.394	91	3	5.512	.000	VC..2.52..2M
SVACR1212L13NW	R	.472	1	.472	.472	91	3	5.512	.000	VC..2.52..2M
SVACR1616M13NW	R	.630	1	.630	.630	91	3	5.512	.000	VC..2.52..2M
SVACL1010L13NW	L	.394	1	.394	.394	91	3	5.512	.000	VC..2.52..2M
SVACL1212L13NW	L	.472	1	.472	.472	91	3	5.512	.000	VC..2.52..2M
SVACL1616M13NW	L	.630	1	.630	.630	91	3	5.512	.000	VC..2.52..2M

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
SVACR1010L13NW	LRIS-3*8	RLR-20S
SVACR1212L13NW	LRIS-3*8	RLR-20S
SVACR1616M13NW	LRIS-3*8	RLR-20S
SVACL1010L13NW	LRIS-3*8	RLR-20S
SVACL1212L13NW	LRIS-3*8	RLR-20S
SVACL1616M13NW	LRIS-3*8	RLR-20S

SVAC-W for Front and Back Turning





● Diagram shows right-hand tool

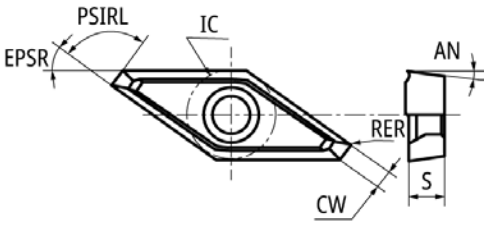
Item Number	Hand	B	GAMP	H	HF	KAPR	K3	LF	LH	WF	Insert Gage
		inch	°	inch	inch	°	°	inch	inch	inch	
SVACR2020M13W	R	.787	1	.787	.787	91	3	5.906	1.181	.984	VC..2.52..2M

Spare Parts

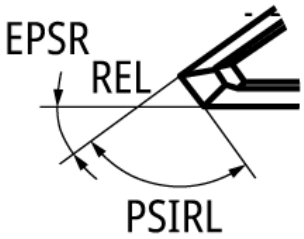
Item Number	Clamp screw	Wrench (for Clamp screw)
SVACR2020M13W	LRIS-3*8	RLR-20S

VC..2M series/Inserts Carbide

VC..2M



● Diagram shows right-hand tool



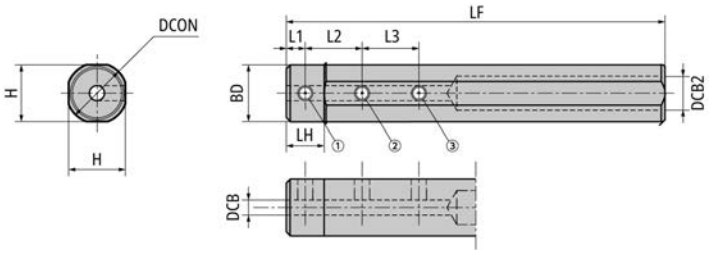
Left-hand

Item Number	AN	CW	EPSR	IC	S	PSIRL	REL	RER	Carbide
									PVD
(inch)	°	inch	°	inch	inch	°	inch	inch	DM4
VCGT 2.5201 FL 2M	7	.059	35	5/16	1/8	94	.000	–	●
VCGT 2.5201 FR 2M	7	.059	35	5/16	1/8	–	–	.000	●
VCGT 2.5204 FL 2M	7	.059	35	5/16	1/8	94	.004	–	●
VCGT 2.5204 FR 2M	7	.059	35	5/16	1/8	–	–	.004	●

ID Back Turning
STICK DUO

SBB.. series/Sleeve

NBH Shank diameter ⌀5/8" - ⌀3/4"



Item Number	Hand	BD	DCB	DCB2	DCON	H	LF	LH	L1	L2	L3	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
NBH03015H	N	.591	.118	.354	5/8	.591	3.937	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04015H	N	.591	.157	.354	5/8	.591	3.937	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03016H	N	.591	.118	.354	.630	.591	3.937	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04016H	N	.591	.157	.354	.630	.591	3.937	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03019K	N	.709	.118	.433	3/4	.709	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04019K	N	.709	.157	.433	3/4	.709	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..

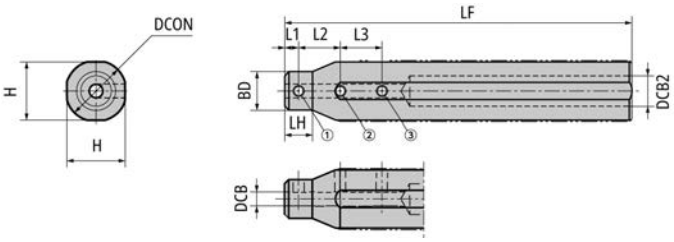
Spare Parts

Item Number	Clamp screw			Wrench (for Clamp screw)
	①	②	③	①②
NBH03015H	SS0404F	SS0404F	SS0404F	LW-2
NBH04015H	SS0404F	SS0404F	SS0404F	LW-2
NBH03016H	SS0404F	SS0404F	SS0404F	LW-2
NBH04016H	SS0404F	SS0404F	SS0404F	LW-2
NBH03019K	SS0406F	SS0406F	SS0406F	LW-2
NBH04019K	SS0406F	SS0406F	SS0406F	LW-2

ID Back Turning
STICK DUO

SBB.. series/Sleeve

NBH Shank diameter ⌀.787" - ⌀1.260"



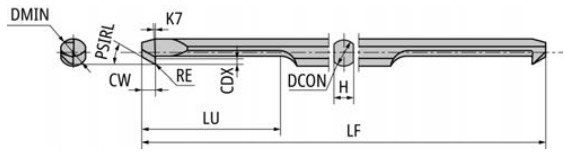
Item Number	Hand	BD	DCB	DCB2	DCON	H	LF	LH	L1	L2	L3	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
NBH03020K	N	.472	.118	.433	.787	.748	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04020K	N	.512	.157	.433	.787	.748	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03022K	N	.472	.118	.433	.866	.827	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04022K	N	.512	.157	.433	.866	.827	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03023K	N	.472	.118	.433	.906	.827	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04023K	N	.512	.157	.433	.906	.827	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03025K-MET	N	.472	.118	.433	.984	.945	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04025K-MET	N	.512	.157	.433	.984	.945	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03025K	N	.472	.118	.433	1.000	.945	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04025K	N	.512	.157	.433	1.000	.945	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..

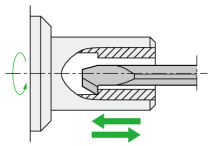
Spare Parts

Item Number	Clamp screw			Wrench (for Clamp screw)
	①	②	③	①②
NBH03020K	SS0404F	SS0404F	SS0406F	LW-2
NBH04020K	SS0404F	SS0406F	SS0406F	LW-2
NBH03022K	SS0404F	SS0406F	SS0408F	LW-2
NBH04022K	SS0404F	SS0406F	SS0406F	LW-2
NBH03023K	SS0404F	SS0406F	SS0408F	LW-2
NBH04023K	SS0404F	SS0406F	SS0406F	LW-2
NBH03025K-MET	SS0404F	SS0406F	SS0408F	LW-2
NBH04025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH03025K	SS0404F	SS0406F	SS0408F	LW-2
NBH04025K	SS0404F	SS0408F	SS0408F	LW-2

SBB.. series/Insert bar Carbide for ID Back Turning

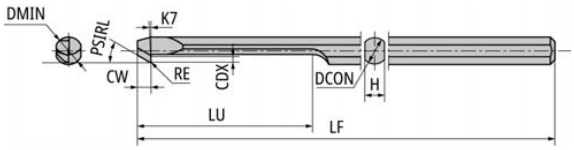
SBB-S Short type / Two-sided

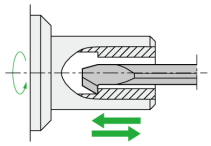




Item Number	Hand	Chipbreaker	DMIN	CDX	CW	DCON	H	K7	LF	LU	PSIRL	RE	WF	Carbide
														PVD
			inch	inch	inch	inch	inch	°	inch	inch	°	inch	inch	ZM3
SBB030RB005-S	R	Yes	.118	.020	.059	.118	.106	3	1.969	.591	30	.002	.051	●
SBB030RB010-S	R	Yes	.118	.020	.059	.118	.106	3	1.969	.591	30	.004	.051	●
SBB040RB005-S	R	Yes	.157	.031	.059	.157	.142	3	2.362	.709	30	.002	.071	●
SBB040RB015-S	R	Yes	.157	.031	.059	.157	.142	3	2.362	.709	30	.006	.071	●

SBB Long type / Single-sided



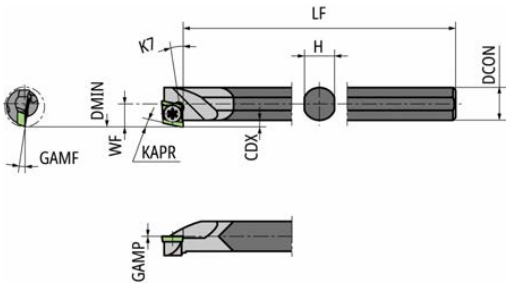


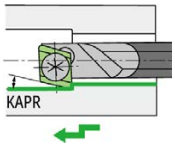
Item Number	Hand	Chipbreaker	DMIN	CDX	CW	DCON	H	K7	LF	LU	PSIRL	RE	WF	Carbide
														PVD
			inch	inch	inch	inch	inch	°	inch	inch	°	inch	inch	ZM3
SBB030RB005	R	Yes	.118	.020	.059	.118	.106	3	1.969	.748	30	.002	.051	●
SBB030RB010	R	Yes	.118	.020	.059	.118	.106	3	1.969	.748	30	.004	.051	●
SBB040RB005	R	Yes	.157	.031	.059	.157	.142	3	2.362	.945	30	.002	.071	●
SBB040RB015	R	Yes	.157	.031	.059	.157	.142	3	2.362	.945	30	.006	.071	●

ID Back Turning

MBL.. series/Toolholder

C-MSBR Carbide shank





●Diagram shows right-hand tool
●For F1 chipbreaker, right-hand inserts fit to right-hand toolholder
●F1 chipbreaker evacuates chips BACKWARD

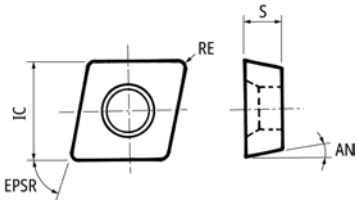
Item Number	Hand	DMIN	CDX	DCON	GAMF	GAMP	H	KAPR	LF	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	
C04J-MSBR	R	.224	.039	.157	10	0	.138	13	4.331	.006	.126	MBL..
C06J-MSBR	R	.303	.039	.236	4	0	.217	13	4.331	.006	.165	MBL..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C04J-MSBR	LR-S-2*3.5	CLR-13S
C06J-MSBR	LR-S-2*3.5	CLR-13S

MBL.. series/Inserts Carbide

MBL



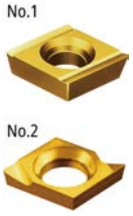
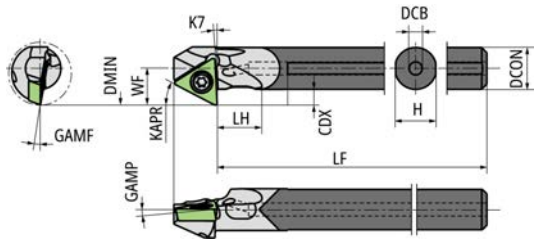
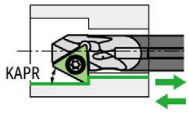


Figure	Item Number	Hand	Chipbreaker	AN	EPSR	IC	RE	S	Carbide			
									PVD			
				°	°	inch	inch	inch	QM3	ST4	TM4	ZM3
1	**MBL 005 FL**	L	Yes	9	75	.142	.002	.039	●		●	●
1	**MBL 015 FL**	L	Yes	9	75	.142	.006	.039	●		●	●
2	**MBL 005 FR F1**	R	Yes	9	75	.142	.002	.039	●	●	●	
2	**MBL 015 FR F1**	R	Yes	9	75	.142	.006	.039	●	●	●	

ID Back Turning
TP.. series/Toolholder

C-STZP-OH Mogul Bar Coolant through Carbide shank





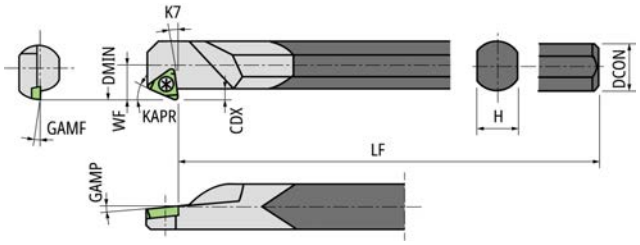
- Diagram shows right-hand tool
- Use right-hand inserts for machining backward
- Use left-hand inserts for machining forward

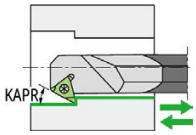
Item Number	Hand	DMIN	CDX	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	RE	WF	Insert Gage
		inch	inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	
C08K-STZPR09D12-OH	R	.472	.118	.098	.315	10	5	.303	27	4.921	.335	.016	.276	TP..73..
C10M-STZPR09D14-OH	R	.551	.118	.098	.394	7	5	.378	27	5.906	.472	.016	.315	TP..73..
C12M-STZPR11D175-OH	R	.689	.177	.118	.472	5	5	.453	27	5.906	.571	.016	.413	TP..22..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C08K-STZPR09D12-OH	LR-S-2.5*4.8	CLR-15S
C10M-STZPR09D14-OH	LR-S-2.5*4.8	CLR-15S
C12M-STZPR11D175-OH	LR-S-3*5.8	RLR-20S

B-STZP-N Carbide shank





- Diagram shows right-hand tool
- Use right-hand inserts for machining backward
- Use left-hand inserts for machining forward

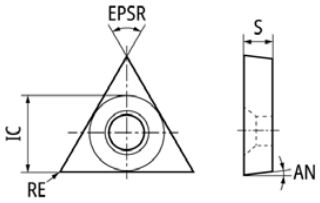
Item Number	Hand	DMIN	CDX	DCON	GAMF	GAMP	H	KAPR	LF	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	
B12Q-STZPR-09-N	R	.630	.118	.472	5	5	.433	27	7.087	.008	.354	TP..73..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
B12Q-STZPR-09-N	LR-S-2.5*6.8	CLR-15S

TP.. series/Inserts Carbide

TPG.

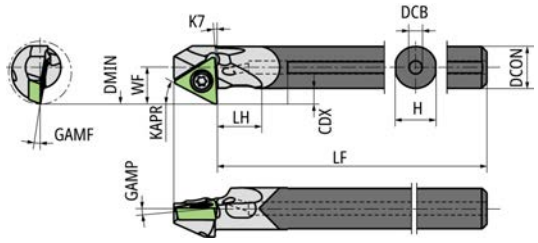


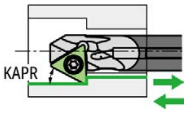
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	AN	RE	Carbide										
								PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	TPGP 7308 R FG	TPGH 090202 R FG	60	7/32	3/32	11	.008		●			●	●					
	TPGP 731 R FG	TPGH 090204 R FG	60	7/32	3/32	11	.016		●			●	●					
	TPGH 2208 R FG	TPGH 110302 R FG	60	1/4	1/8	11	.008	●	●			●	●					
	TPGH 221 R FG	TPGH 110304 R FG	60	1/4	1/8	11	.016	●	●			●	●					
	TPGP 6308 FR F1	TPGH 080202 FR F1	60	3/16	3/32	11	.008						●	●	●			
	TPGP 631 FR F1	TPGH 080204 FR F1	60	3/16	3/32	11	.016						●	●	●			
	TPGP 7304 FR F1	TPGH 090201 FR F1	60	7/32	3/32	11	.004		●			●	●					
	TPGP 7308 FR F1	TPGH 090202 FR F1	60	7/32	3/32	11	.008		●			●	●	●	●			
	TPGP 731 FR F1	TPGH 090204 FR F1	60	7/32	3/32	11	.016		●			●	●	●	●			
	TPGP 732 FR F1	TPGH 090208 FR F1	60	7/32	3/32	11	.031		●			●	●		●			
	TPGH 2208 FR F1	TPGH 110302 FR F1	60	1/4	1/8	11	.008		●			●	●	●	●			
	TPGH 221 FR F1	TPGH 110304 FR F1	60	1/4	1/8	11	.016		●			●	●	●	●			
	TPGH 222 FR F1	TPGH 110308 FR F1	60	1/4	1/8	11	.031		●			●	●		●			
	TPGP 7308 FL K	TPGH 090202 FL K	60	7/32	3/32	11	.008						●					
	TPGP 731 FL K	TPGH 090204 FL K	60	7/32	3/32	11	.016						●					
	TPGP 732 FL K	TPGH 090208 FL K	60	7/32	3/32	11	.031						●					
	TPGP 7308 FL B2	TPGH 090202 FL B2	60	7/32	3/32	11	.008						●		●			
	TPGP 731 FL B2	TPGH 090204 FL B2	60	7/32	3/32	11	.016						●		●			
	TPGP 732 FL B2	TPGH 090208 FL B2	60	7/32	3/32	11	.031						●		●			
	TPGP 6308 FL B3	TPGH 080202 FL B3	60	3/16	3/32	11	.008						●		●			
	TPGP 631 FL B3	TPGH 080204 FL B3	60	3/16	3/32	11	.016						●		●			

ID Back Turning
TC.. series/Toolholder

C-STZC-OH Mogul Bar Coolant through Carbide shank





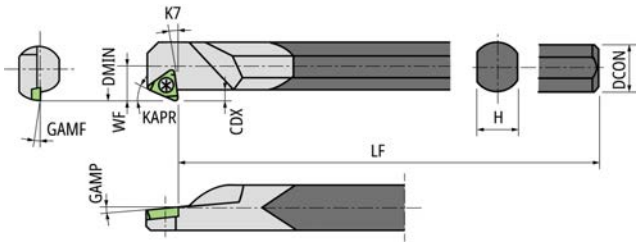
- Diagram shows right-hand tool
- Use right-hand inserts for machining backward
- Use left-hand inserts for machining forward

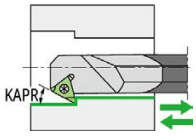
Item Number	Hand	DMIN	CDX	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	RE	WF	Insert Gage
		inch	inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	
C06H-STZCR06D10-OH	R	.394	.098	.079	.236	10	0	.228	27	3.937	.236	.008	.217	TC..52..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C06H-STZCR06D10-OH	LR-S-2*4.4	CLR-13S

B-STZC-N Carbide shank





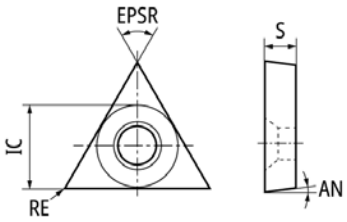
- Diagram shows right-hand tool
- Use right-hand inserts for machining backward
- Use left-hand inserts for machining forward

Item Number	Hand	DMIN	CDX	DCON	GAMF	GAMP	H	KAPR	LF	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	
B06J-STZCR-06-N	R	.394	.098	.236	10	0	.205	27	4.331	.008	.217	TC..52..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
B06J-STZCR-06-N	LR-S-2*4.4	CLR-13S

TCGP



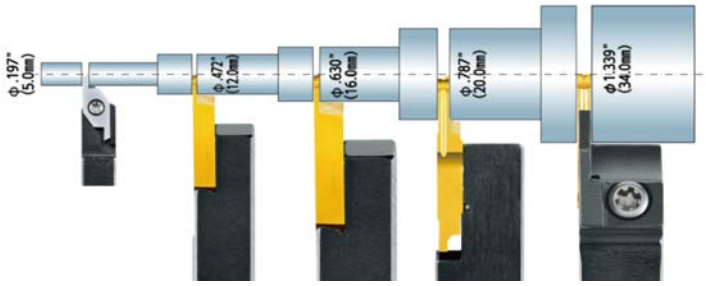
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

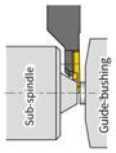
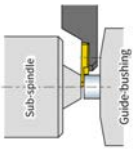
Shape	Item Number		EPSR	IC	S	AN	RE	BS	Carbide										
									PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	TCGP 5204 FR F05	TCGH 060101 FR F05	60	–	–	7	–	–		●			●	●					
	TCGP 5208 FL F05	TCGH 060102 FL F05	60	5/32	1/16	7	.008	–						●		●			
	TCGP 5208 FR F05	TCGH 060102 FR F05	60	5/32	1/16	7	.008	–		●			●	●		●			
	TCGP 521 FR F05	TCGH 060104 FR F05	60	5/32	1/16	7	.016	–		●			●	●		●			
	TCGP 5208 FL K	TCGH 060102 FL K	60	5/32	1/16	7	.008	–						●					
	TCGP 521 FL K	TCGH 060104 FL K	60	5/32	1/16	7	.016	–						●					
	TCGP 5208 FL B1	TCGH 060102 FL B1	60	5/32	1/16	7	.008	–						●		●			
	TCGP 521 FL B1	TCGH 060104 FL B1	60	5/32	1/16	7	.016	–						●		●			

Cut-off

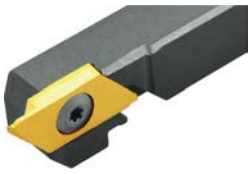
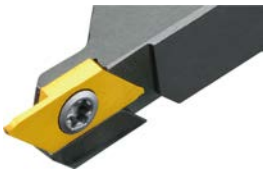
Product Lines	S02
Recommended Cutting Conditions	S03
General Information	S04
CSV.. series	S06
CTPS.. series	S09
CTP.. series	S11
CTPA.. series	S20
CTPW.. series	S27
CTV-S.. series	S29
CTDP.. series	S31
CTWP.. series	S37
CTV.. series	S39

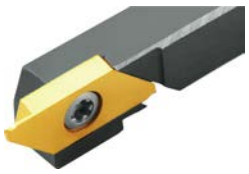
Product Lines



CTP.R-SUB	CTP.L-SUB
	

Insert	CSVC →S8	CTPS →S9	CTPS-001 →S10
Holder	CSV-NC	CTPS	CTPSR-SUB
	→S6-7	→S9	→S10
Max. Cut-off Dia.	-ø.197"	-ø.394"	-ø.157"
Blade width	.024" - .059"	.047" - .079"	.028"

Insert	CTP →S16-19			
Holder	CTP	CTP-OH2/OH	CTPR-SUB-OH3/CTPR-SUB	CTPL-SUB-OH3/CTPL-SUB
	 →S13	→S11-12 Coolant through	 →S14-15	→S14-15
Max. Cut-off Dia.	-ø.472"			
Blade width	.020" - .079"			

Insert	CTPA →S24-26			
Holder	CTPA	CTPA-OH2/OH	CTPAR-SUB	CTPAL-SUB
	 →S22	→S120-21 Coolant through	→S23	→S23
Max. Cut-off Dia.	-ø.630"			
Blade width	.028" - .118"			

Insert	CTPW →S28	CTDP →S36		GWPFM →S38
Holder	CTPW	CTDP	CTDP-OH3/OH2/OH	CTWP
	→S27	→S34-35	→S31-33	CUT DUO EXTRA →S37
Max. Cut-off Dia.	-ø.787"	-ø1.339"	-ø1.000"	-ø1.653"
Blade width	.098"	.079" , .098"	.079" , .098"	.118"

Insert	CTV-S →S30		CTV →S41		
Holder	CTV-K2	CTVN-K2	CTV-S	CTV-M(B)	CTV-X
	→S29	→S29	→S39	→S40	→S40
Max. Cut-off Dia.	-ø.787"		-ø1.378"	-ø1.722"	-ø1.378"
Blade width	.087" - .098"		.098" , .118"	.098" , .118"	.118"

Recommended Cutting Conditions

CSVC / CTPS

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**ZM3**					**VM1**	
	2nd choice	VM1					ZM3	
Cutting speed (SFM)		100 - 165 - 230				100 - 195 - 295		
Feed rate (IPR)		.0004 - .0008 - .0012				.0004 - .0012 - .002		

CTP / CTPA / CTPW

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**650 / DT4**		**DT4**	**650 / ST4**		**650 / QM3**	
	2nd choice	TM4 / DM4			QM3 / TM4		TM4 / DM4	
Cutting speed (SFM)		100 - 165 - 230				100 - 195 - 295		
Feed rate (IPR)		.0008 - .0012 - .002				.0008 - .0016 - .0024		

CTDP / CTWP / CTV

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**DM4**			**ST4 / DM4**		**QM3**	
	2nd choice	TM4 / QM3					TM4 / DM4	
Cutting speed (SFM)		100 - 165 - 230				100 - 2195 - 295		
Feed rate (IPR)		.0012 - .002 - .003				.0016 - .003 - .0047		

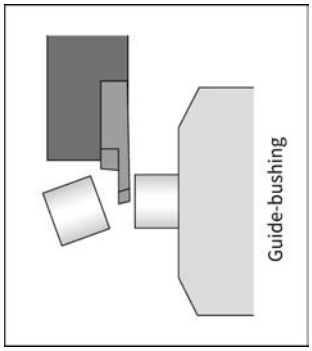
Recommendation for cut-off item

Max. Cut-off Dia.			
-ø.197"	CSV	**➡S6**	
ø.197" - .472"	CTP	**➡S11**	
ø.472" - .630"	CTPA	**➡S20**	
	CTDP	**➡S31**	
ø630" - 1.340"	CTDP	**➡S31**	
ø1.340" - 1.653"	CTWP	**➡S37**	

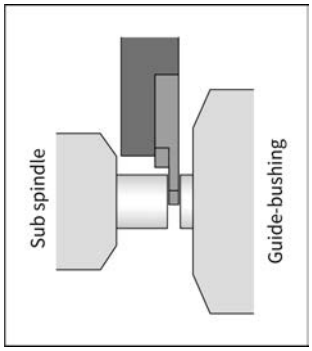
Cut-off Tool Selection Guide

Right-hand combination

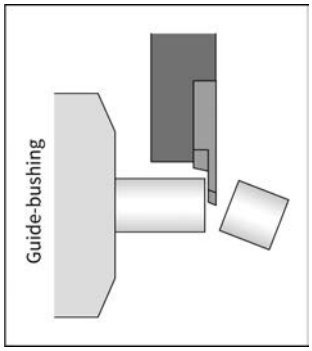
●FR/FRV/FRX



●FRN/FRS/FRNV/FRNX

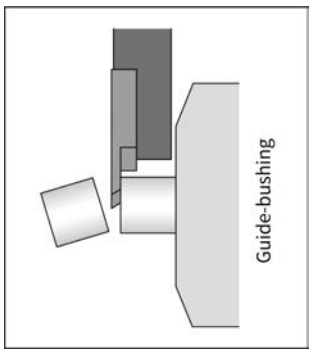


●FRK

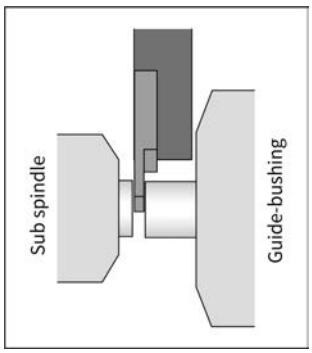


Left-hand combination

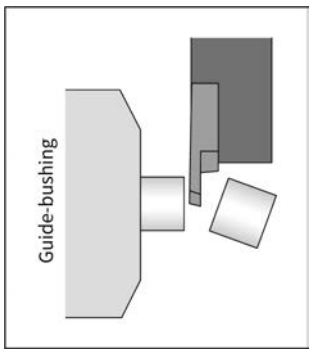
●FLK/FLKV



●FLN/FLNV

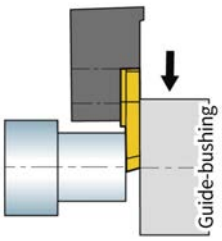


●FL/FLV



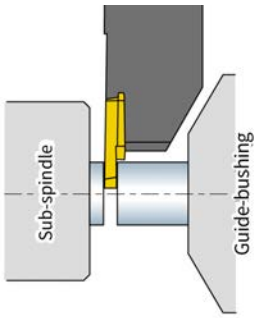
CTP/CTPA/CTPS/CTPW selection guide : Right hand? or Left hand?

Right-hand recommended



R-hand Toolholder using a R-hand insert with lead angle

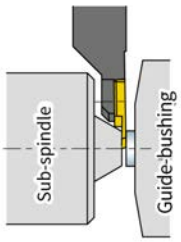
Left-hand recommended



L-hand Toolholder with a non-lead angle insert when the bar stock is held by sub-spindle

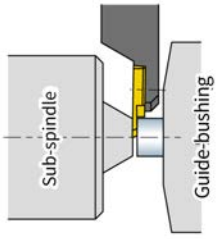
CTP/CTPA-SUB selection guide Right hand? or Left hand?

Right-hand recommended



R-hand Toolholder with R-hand insert with lead angle for longer parts or small diameter part. When part length is too short for sub-spindle to hold, use L-hand with slower speed.

Left-hand recommended



L-hand with L-hand insert with lead angle for short part

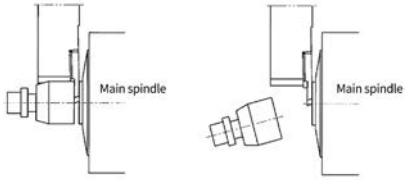
Notification about max cut-off diameter

※Max cut-off diameter in the catalog shows when the X end point location is 0.0.

①When cut-off

When X end point is past X0.0, the work material will fall away and no interference will occur. (Fig 1)

Fig 1



②When performing cut-off operation while sub-spindle holds the part (Using a neutral insert)

Max cut-off diameter will change depending on the X end point, so please confirm the max cut-off diameter based on X end point.
※Please refer to the formula below.

[Calculation formula]
Possible machining diameter = Max cut-off diameter - X end point
(Note value in the catalog) (Optional)

[Example]
When machining until X - .039" using CTP15FRN
.472" - .039" = .433"(11mm) (Max machinable diameter)

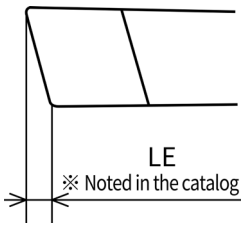
③When performing cut-off operation while sub-spindle holds the part (Using insert with lead angle)

Max cut-off diameter will change depending on X end point, so please confirm the max cut-off diameter based on "dimension LE" below (Fig.2) and X end point.
※Please refer to the formula below.

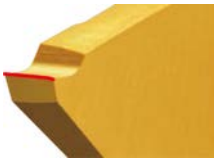
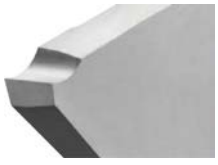
[Calculation formula]
Possible machining diameter = Max cut-off diameter - X end point
(Note value in the catalog)

[How to decide X end point]
X end point ≧ dimension LE (Fig.2) × 2
[Example]
When using CTP15FR
X end point : .018" × 2 = .036"
(dimension LE)
.472" - .036 = .436"(11.08mm) (Max machinable diameter)

Fig 2

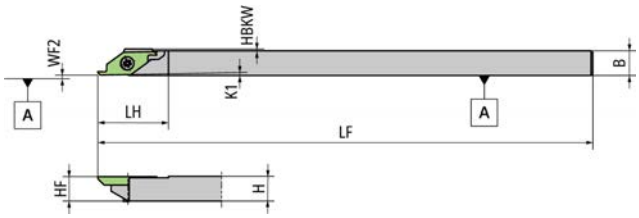


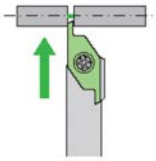
CTP type insert

	CTP	CTP-CX	CTP-TH	CTPX	CTP-SH
					
Features	Extensive lineup	Excellent chip control and straight-line stability	Strong edge with land	Cost advantage	For small diameter
Max. Cut-off Diameter	-ø.472"	-ø.472"	-ø.472"	-ø.472"	-ø.197"/-ø.276"
Blade width	.020" / .028" / .039" / .059 / .079"	.039" / .051" / .059"	.059" / .079"	.059" / .079"	.020" / .039"
Corner radius	0 / .001" / .002"	.002" / .008"	.002"	.002"	.001" / .002"
Hand	Right / Left	Right / Left	Right / Left	Right / Left	Right / Left
Chip-breaker	Yes / No (Mirror finish)	Yes (3D Molded)	Yes	Yes	Yes

CSVC.. series/Toolholder

CSV [91°] For Cam-style machine





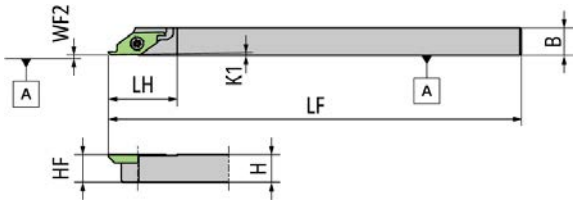
● Diagram shows right-hand tool

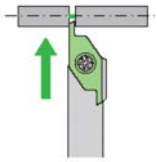
Item Number	Hand	CUTDIA	B	H	HBKW	HF	K1	LF	LH	WF2	Insert Gage	
		inch	inch	inch	inch	inch	°	inch	inch	inch		
CSVR07	R	.197	.276	.276	.020	.276	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR07GX	R	.197	.276	.276	.020	.276	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08	R	.197	.315	.315	.000	.315	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08GX	R	.197	.315	.315	.000	.315	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR095	R	.197	.374	.374	.000	.374	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR10	R	.197	.394	.394	.000	.394	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR12	R	.197	.472	.472	.000	.472	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR12GX	R	.197	.472	.472	.000	.472	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL07	L	.197	.276	.276	.020	.276	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL08	L	.197	.315	.315	.000	.315	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL10	L	.197	.394	.394	.000	.394	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CSVR07	LRIS-2.5*7	CLR-15S
CSVR07GX	LRIS-2.5*7	CLR-15S
CSVR08	LRIS-2.5*7	CLR-15S
CSVR08GX	LRIS-2.5*7	CLR-15S
CSVR095	LRIS-2.5*7	CLR-15S
CSVR10	LRIS-2.5*7	CLR-15S
CSVR12	LRIS-2.5*7	CLR-15S
CSVR12GX	LRIS-2.5*7	CLR-15S
CSVL07	LRIS-2.5*7	CLR-15S
CSVL08	LRIS-2.5*7	CLR-15S
CSVL10	LRIS-2.5*7	CLR-15S

CSV-NC [91°] For Gang-style machine





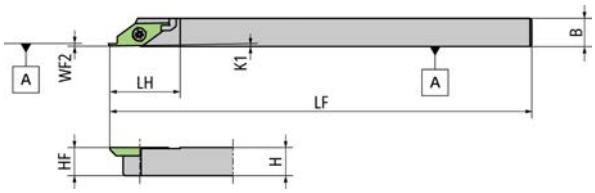
● Diagram shows right-hand tool

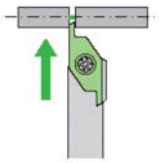
Item Number	Hand	CUTDIA	B	H	HF	K1	LF	LH	WF2	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
CSVR06-IN-NC	R	.197	3/8	3/8	3/8	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08-IN-NC	R	.197	1/2	1/2	1/2	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL06-IN-NC	L	.197	3/8	3/8	3/8	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL08-IN-NC	L	.197	1/2	1/2	1/2	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08NC	R	.197	.315	.315	.315	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR10GXNC	R	.197	.394	.394	.394	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR10NC	R	.197	.394	.394	.394	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR12NC	R	.197	.472	.472	.472	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL08NC	L	.197	.315	.315	.315	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL10NC	L	.197	.394	.394	.394	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL12NC	L	.197	.472	.472	.472	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CSVR06-IN-NC	LRIS-2.5*7	CLR-15S
CSVR08-IN-NC	LRIS-2.5*7	CLR-15S
CSVL06-IN-NC	LRIS-2.5*7	CLR-15S
CSVL08-IN-NC	LRIS-2.5*7	CLR-15S
CSVR08NC	LRIS-2.5*7	CLR-15S
CSVR10GXNC	LRIS-2.5*7	CLR-15S
CSVR10NC	LRIS-2.5*7	CLR-15S
CSVR12NC	LRIS-2.5*7	CLR-15S
CSVL08NC	LRIS-2.5*7	CLR-15S
CSVL10NC	LRIS-2.5*7	CLR-15S
CSVL12NC	LRIS-2.5*7	CLR-15S

CSV-NC-F [91°] For Gang-style machine





● Diagram shows right-hand tool

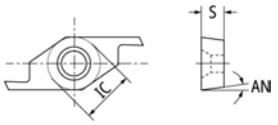
Item Number	Hand	CUTDIA	B	H	HF	K1	LF	LH	WF2	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
CSVR08NC-F	R	.197	.315	.315	.315	1	4.724	.787	.000-.004	CSVF../CSVB../CSVC..	CSVG../CSVT..

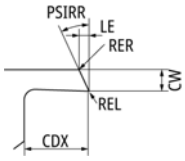
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CSVR08NC-F	LRIS-2.5*7	CLR-15S

CSVC.. series/Inserts Carbide

CSVC-V

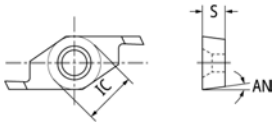


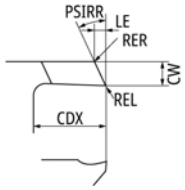


● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

Item Number	Hand	Chipbreaker	CUTDIA	AN	CDX	CW	EPSR	IC	LE	PSIRR	REL	RER	S	Carbide
														PVD
			inch	°	inch	inch	°	inch	inch	°	inch	inch	inch	VM1
CSVC11FRV06 Ⓜ	R	No	.118	7	.079	.024	35	1/4	.012	25	.000	.000	3/32	●
CSVC11FRV07 Ⓜ	R	No	.157	7	.098	.028	35	1/4	.014	25	.000	.000	3/32	●
CSVC11FRV08 Ⓜ	R	No	.157	7	.098	.031	35	1/4	.016	25	.000	.000	3/32	●
CSVC11FRV09 Ⓜ	R	No	.157	7	.098	.035	35	1/4	.018	25	.000	.000	3/32	●
CSVC11FRV10 Ⓜ	R	No	.197	7	.118	.039	35	1/4	.020	25	.000	.000	3/32	●
CSVC11FRV13 Ⓜ	R	No	.197	7	.118	.051	35	1/4	.026	25	.000	.000	3/32	●
CSVC11FRV15 Ⓜ	R	No	.197	7	.118	.059	35	1/4	.029	25	.000	.000	3/32	●
CSVC11FLV07 Ⓜ	L	No	.157	7	.098	.028	35	1/4	.014	25	.000	.000	3/32	●
CSVC11FLV08 Ⓜ	L	No	.157	7	.098	.031	35	1/4	.016	25	.000	.000	3/32	●
CSVC11FLV10 Ⓜ	L	No	.197	7	.118	.039	35	1/4	.020	25	.000	.000	3/32	●
CSVC11FLV13 Ⓜ	L	No	.197	7	.118	.051	35	1/4	.026	25	.000	.000	3/32	●
CSVC11FLV15 Ⓜ	L	No	.197	7	.118	.059	35	1/4	.029	25	.000	.000	3/32	●

CSVC-VB



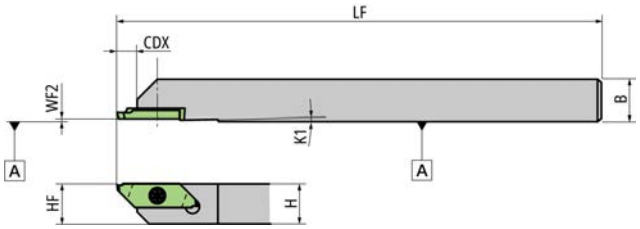


● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

Item Number	Hand	Chipbreaker	CUTDIA	AN	CDX	CW	EPSR	IC	LE	PSIRR	REL	RER	S	Carbide
														PVD
			inch	°	inch	inch	°	inch	inch	°	inch	inch	inch	VM1
CSVC11FRVB06 Ⓜ	R	Yes	.118	7	.079	.024	35	1/4	.012	25	.000	.000	3/32	●
CSVC11FRVB07 Ⓜ	R	Yes	.157	7	.098	.028	35	1/4	.014	25	.000	.000	3/32	●
CSVC11FRVB08 Ⓜ	R	Yes	.157	7	.098	.031	35	1/4	.016	25	.000	.000	3/32	●
CSVC11FRVB09 Ⓜ	R	Yes	.157	7	.098	.035	35	1/4	.018	25	.000	.000	3/32	●
CSVC11FRVB10 Ⓜ	R	Yes	.197	7	.118	.039	35	1/4	.020	25	.000	.000	3/32	●
CSVC11FRVB13 Ⓜ	R	Yes	.197	7	.118	.051	35	1/4	.026	25	.000	.000	3/32	●
CSVC11FRVB15 Ⓜ	R	Yes	.197	7	.118	.059	35	1/4	.029	25	.000	.000	3/32	●

CTPS.. series/Toolholder

CTPS



● Diagram shows right-hand tool

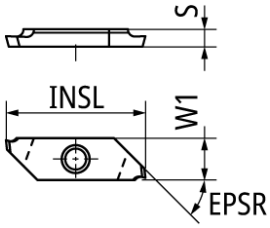
Item Number	Hand	CUTDIA	B	CDX	H	HF	K1	LF	WF2	Insert Gage	
		inch	inch	inch	inch	inch	°	inch	inch		
CTPSR06-IN	R	.394	3/8	.197	3/8	3/8	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..
CTPSR08-IN	R	.394	1/2	.197	1/2	1/2	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..
CTPSR10	R	.394	.394	.197	.394	.394	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..
CTPSR12	R	.394	.472	.197	.472	.472	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..

Spare Parts

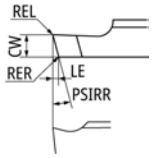
Item Number	Clamp screw	Wrench (for Clamp screw)
CTPSR06-IN	LRIS-2.5*7	CLR-15S
CTPSR08-IN	LRIS-2.5*7	CLR-15S
CTPSR10	LRIS-2.5*7	CLR-15S
CTPSR12	LRIS-2.5*7	CLR-15S

CTPS.. series/Inserts Carbide

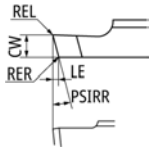
CTPS-FR



No.1



No.2

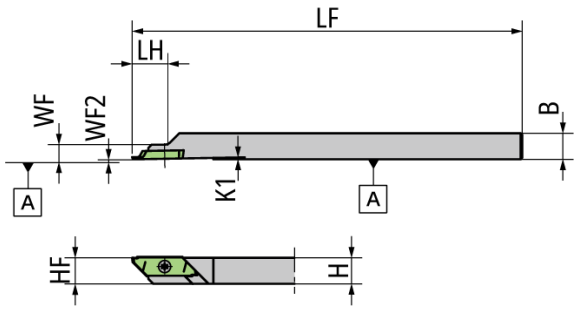


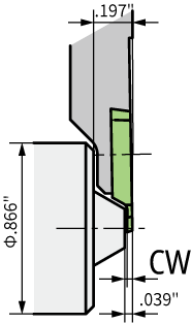
● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

Figure	Item Number	Hand	Chipbreaker	CUTDIA	CW	EPSR	INSL	LE	PSIRR	REL	RER	S	W1	Carbide	
														PVD	
				inch	inch	°	inch	inch	°	inch	inch	inch	inch	VM1	ZM3
1	**CTPS12FR**	R	Yes	.157	.047	45	.787	.015	16	.002	.002	.098	.236	●	●
1	**CTPS15FR**	R	Yes	.197	.059	45	.787	.018	16	.002	.002	.098	.236	●	●
1	**CTPS18FR**	R	Yes	.335	.071	45	.787	.022	16	.002	.002	.098	.236	●	●
1	**CTPS20FR**	R	Yes	.394	.079	45	.787	.024	16	.002	.002	.098	.236	●	●
2	**CTPS12FRV** Ⓜ	R	No	.157	.047	45	.787	.019	20	.000	.000	.098	.236	●	●
2	**CTPS15FRV** Ⓜ	R	No	.197	.059	45	.787	.023	20	.000	.000	.098	.236	●	●
2	**CTPS18FRV** Ⓜ	R	No	.335	.071	45	.787	.028	20	.000	.000	.098	.236	●	●
2	**CTPS20FRV** Ⓜ	R	No	.394	.079	45	.787	.030	20	.000	.000	.098	.236	●	●

CTPS..001 series/Toolholder

CTPS-SUB for Sub-spindle





● Diagram shows right-hand tool

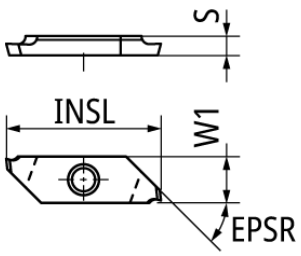
Item Number	Hand	CUTDIA	B	CDX	H	HF	K1	LF	LH	WF	WF2	Insert Gage
		inch	inch	inch	inch	inch	°	inch	inch	inch	inch	
CTPSR08-SUB04	R	.157	.315	.197	.315	.315	1	4.724	.433	.177	.000	CTPS..-001

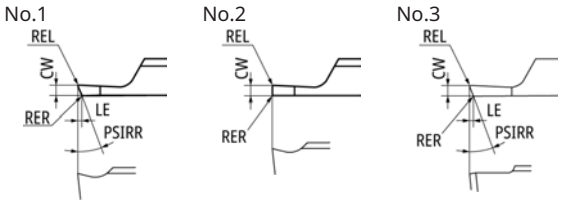
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTPSR08-SUB04	LRIS-2.5*4.5	CLR-15S

CTPS..001 series/Inserts Carbide

CTPS-001



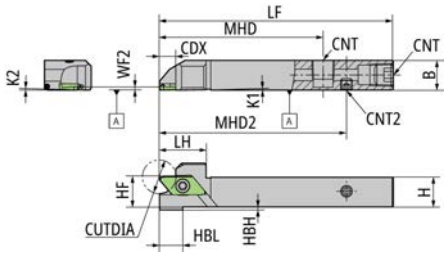


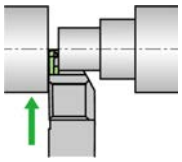
● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

Figure	Item Number	Hand	Chipbreaker	CUTDIA	CW	EPSR	INSL	LE	PSIR	PSIRR	REL	RER	S	W1	Carbide
															PVD
				inch	inch	°	inch	inch	°	°	inch	inch	inch	inch	ZM3
1	**CTPS07FR-001**	R	Yes	.157	.028	45	.787	.009	–	16	.002	.002	.098	.236	●
2	**CTPS07FRN-001**	R	Yes	.157	.028	45	.787	–	0	–	.002	.002	.098	.236	●
3	**CTPS07FRV-001** Ⓜ	R	No	.157	.028	45	.787	.011	–	20	.000	.000	.098	.236	●

CTP.. series/Toolholder

CTP-OH2 Direct connect coolant port 1-hole type





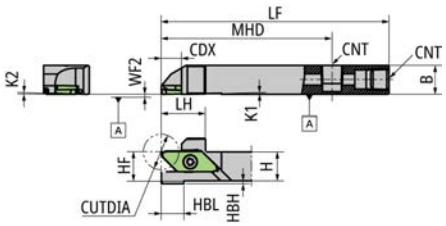
● Diagram shows right-hand tool

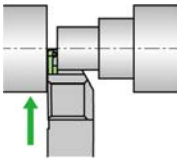
Item Number	Hand	CUTDIA	B	CDX	CNT	CNT2	H	HBH	HBL	HF	K1	K2	LF	LH	MHD	MHD2	WF2	Insert Gage
		inch	inch	inch			inch	inch	inch	inch	°	°	inch	inch	inch	inch	inch	
CTPR08H-IN-OH2	R	.472	.500	.276	NPT1/8	M5	.500	.051	.394	.500	1	2	3.937	.787	2.756	3.150	.059	CTP..
CTPL08H-IN-OH2	L	.472	.500	.276	NPT1/8	M5	.500	.051	.394	.500	1	2	3.937	.787	2.756	3.150	.059	CTP..
CTPR12H-OH2	R	.472	.472	.276	Rc1/8	M5	.472	.079	.394	.472	1	2	3.937	.768	2.756	3.150	.059	CTP..
CTPL12H-OH2	L	.472	.472	.276	Rc1/8	M5	.472	.079	.394	.472	1	2	3.937	.768	2.756	3.150	.059	CTP..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
CTPR08H-IN-OH2	LRIS-4*12PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
CTPL08H-IN-OH2	LRIS-4*12PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
CTPR12H-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5
CTPL12H-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5

CTP-OH Coolant hose connection type





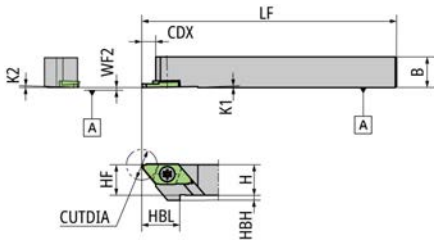
● Diagram shows right-hand tool

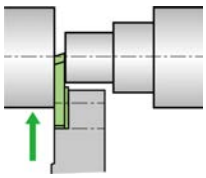
Item Number	Hand	CUTDIA	B	CDX	CNT	H	HBH	HBL	HF	K1	K2	LF	LH	MHD	WF2	Insert Gage
		inch	inch	inch		inch	inch	inch	inch	°	°	inch	inch	inch	inch	
CTPR06H-IN-OH	R	.472	.375	.276	M6*1	.375	.176	.748	.375	1	2	3.937	.768	2.953	.000	CTP..
CTPR08H-IN-OH	R	.472	.500	.276	NPT1/8	.500	.051	.394	.500	1	2	3.937	.768	2.953	.000	CTP..
CTPL06H-IN-OH	L	.472	.375	.276	M6*1	.375	.176	.748	.375	1	2	3.937	.768	2.953	.000	CTP..
CTPL08H-IN-OH	L	.472	.500	.276	NPT1/8	.500	.051	.394	.500	1	2	3.937	.768	2.953	.000	CTP..
CTPR1012H-OH	R	.472	.472	.276	M6*1	.394	.157	.748	.394	1	2	3.937	.768	2.953	.000	CTP..
CTPR12H-OH	R	.472	.472	.276	Rc1/8	.472	.079	.394	.472	1	2	3.937	.768	2.953	.000	CTP..
CTPR16H-OH	R	.472	.630	.276	Rc1/8	.630	–	–	.630	1	2	3.937	.768	2.953	.000	CTP..
CTPL1012H-OH	L	.472	.472	.276	M6*1	.394	.157	.748	.394	1	2	3.937	.768	2.953	.000	CTP..
CTPL12H-OH	L	.472	.472	.276	Rc1/8	.472	.079	.394	.472	1	2	3.937	.768	2.953	.000	CTP..
CTPL16H-OH	L	.472	.630	.276	Rc1/8	.630	–	–	.630	1	2	3.937	.768	2.953	.000	CTP..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)	Wrench (for CNT)
CTPR06H-IN-OH	LRIS-4*12PW	SS0605SC	CLR-15S	LW-3
CTPR08H-IN-OH	LRIS-4*12PW	SPNPT1/8	CLR-15S	–
CTPL06H-IN-OH	LRIS-4*12PW	SS0605SC	CLR-15S	LW-3
CTPL08H-IN-OH	LRIS-4*12PW	SPNPT1/8	CLR-15S	–
CTPR1012H-OH	LRIS-4*12PW	SS0605SC	CLR-15S	LW-3
CTPR12H-OH	LRIS-4*12PW	SPR1/8	CLR-15S	–
CTPR16H-OH	LRIS-4*12PW	SPR1/8	CLR-15S	–
CTPL1012H-OH	LRIS-4*12PW	SS0605SC	CLR-15S	LW-3
CTPL12H-OH	LRIS-4*12PW	SPR1/8	CLR-15S	–
CTPL16H-OH	LRIS-4*12PW	SPR1/8	CLR-15S	–

CTP





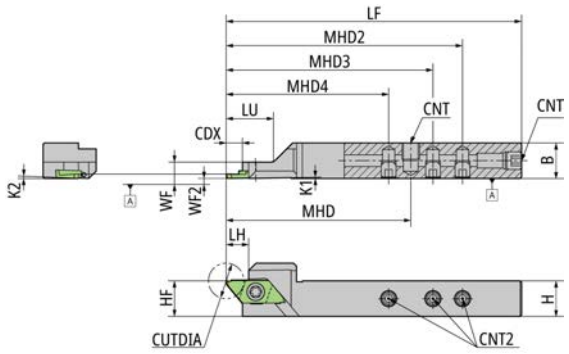
● Diagram shows right-hand tool

Item Number	Hand	CUTDIA	B	CDX	H	HBH	HBL	HF	K1	K2	LF	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	°	°	inch	inch	
CTPR06-IN	R	.472	.375	.217	.375	.079	.591	.375	1	2	4.724	.000	CTP..
CTPR08-IN	R	.472	.500	.217	.500	–	–	.500	1	2	4.724	.000	CTP..
CTPR10-IN	R	.472	.625	.217	.625	–	–	.625	1	2	4.724	.000	CTP..
CTPL06-IN	L	.472	.375	.217	.375	.079	.591	.375	1	2	4.724	.000	CTP..
CTPL08-IN	L	.472	.500	.217	.500	–	–	.500	1	2	4.724	.000	CTP..
CTPL10-IN	L	.472	.625	.217	.625	–	–	.625	1	2	4.724	.000	CTP..
CTPR08	R	.472	.394	.217	.315	.157	.591	.315	1	2	4.724	.000	CTP..
CTPR10	R	.472	.394	.217	.394	.079	.591	.394	1	2	4.724	.000	CTP..
CTPR10H	R	.472	.394	.217	.394	.079	.591	.394	1	2	3.937	.000	CTP..
CTPR12	R	.472	.472	.217	.472	–	–	.472	1	2	4.724	.000	CTP..
CTPR12GX	R	.472	.472	.217	.472	–	–	.472	1	2	3.346	.000	CTP..
CTPR13	R	.472	.512	.217	.512	–	–	.512	1	2	4.724	.000	CTP..
CTPR16	R	.472	.630	.217	.630	–	–	.630	1	2	4.724	.000	CTP..
CTPR16H	R	.472	.630	.217	.630	–	–	.630	1	2	3.937	.000	CTP..
CTPL08	L	.472	.394	.217	.315	.157	.591	.315	1	2	4.724	.000	CTP..
CTPL10	L	.472	.394	.217	.394	.079	.591	.394	1	2	4.724	.000	CTP..
CTPL10H	L	.472	.394	.217	.394	.079	.591	.394	1	2	3.937	.000	CTP..
CTPL12	L	.472	.472	.217	.472	–	–	.472	1	2	4.724	.000	CTP..
CTPL12GX	L	.472	.472	.217	.472	–	–	.472	1	2	3.346	.000	CTP..
CTPL13	L	.472	.512	.217	.512	–	–	.512	1	2	4.724	.000	CTP..
CTPL16	L	.472	.630	.217	.630	–	–	.630	1	2	4.724	.000	CTP..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTPR06-IN	LRIS-4*10PW	CLR-15S
CTPR08-IN	LRIS-4*12PW	CLR-15S
CTPR10-IN	LRIS-4*12PW	CLR-15S
CTPL06-IN	LRIS-4*10PW	CLR-15S
CTPL08-IN	LRIS-4*12PW	CLR-15S
CTPL10-IN	LRIS-4*12PW	CLR-15S
CTPR08	LRIS-4*10PW	CLR-15S
CTPR10	LRIS-4*10PW	CLR-15S
CTPR10H	LRIS-4*10PW	CLR-15S
CTPR12	LRIS-4*12PW	CLR-15S
CTPR12GX	LRIS-4*12PW	CLR-15S
CTPR13	LRIS-4*12PW	CLR-15S
CTPR16	LRIS-4*12PW	CLR-15S
CTPR16H	LRIS-4*12PW	CLR-15S
CTPL08	LRIS-4*10PW	CLR-15S
CTPL10	LRIS-4*10PW	CLR-15S
CTPL10H	LRIS-4*10PW	CLR-15S
CTPL12	LRIS-4*12PW	CLR-15S
CTPL12GX	LRIS-4*12PW	CLR-15S
CTPL13	LRIS-4*12PW	CLR-15S
CTPL16	LRIS-4*12PW	CLR-15S

CTPR-SUB-OH3 Direct connect coolant port 3-hole type for Sub-Spindle



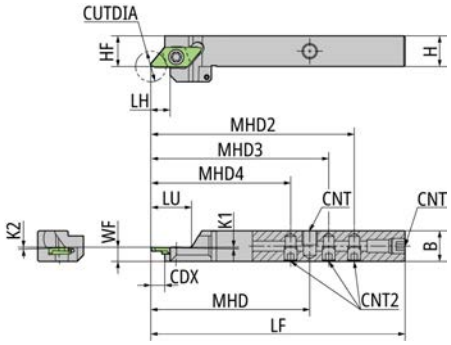
● Diagram shows right-hand tool

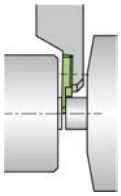
Item Number	Hand	CUTDIA	B	CDX	CNT	CNT2	H	HF	K1	K2	LF	LH	LU	MHD	MHD2	MHD3	MHD4	WF	WF2	Insert Gage
		inch	inch	inch			inch	inch	°	°	inch	inch	inch	inch	inch	inch	inch	inch	inch	
CTPR12H-SUB-OH3	R	.472	.472	.217	M6*1	M5	.472	.472	1	2	3.937	.299	.630	2.461	3.150	2.756	2.165	.217	.000	CTP..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
CTPR12H-SUB-OH3	LRIS-4*5	SS0605SC	SS0505SC	LLR-25S	LW-2.5

CTPL-SUB-OH3 Direct connect coolant port 3-hole type for Sub-spindle





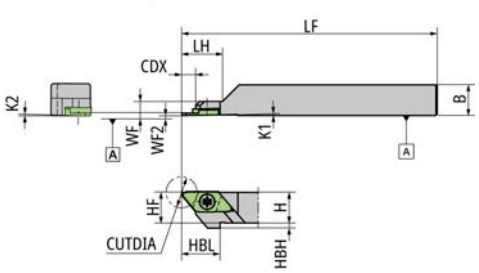
● Diagram shows left-hand tool

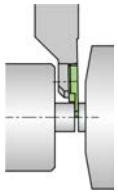
Item Number	Hand	CUTDIA	B	CDX	CNT	CNT2	H	HF	K1	K2	LF	LH	LU	MHD	MHD2	MHD3	MHD4	WF	WF2	Insert Gage
		inch	inch	inch			inch	inch	°	°	inch	inch	inch	inch	inch	inch	inch	inch		
CTPL12H-SUB-OH3	L	.472	.472	.217	M6*1	M5	.472	.472	1	2	3.937	.299	.630	2.461	3.150	2.756	2.165	.217	.000	CTP..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
CTPL12H-SUB-OH3	LRIS-4*5	SS0605SC	SS0505SC	LLR-25S	LW-2.5

CTPR-SUB for Sub-Spindle





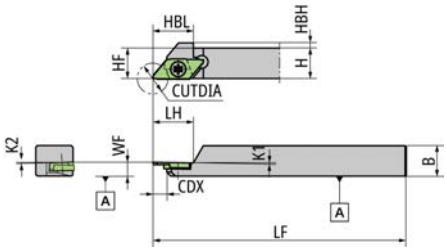
● Diagram shows right-hand tool

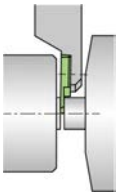
Item Number	Hand	CUTDIA	B	CDX	H	HBH	HBL	HF	K1	K2	LF	LH	WF	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	°	°	inch	inch	inch	inch	
CTPR06-IN-SUB	R	.472	.375	.217	.375	.097	.591	.375	1	2	4.724	.630	.217	.000	CTP..
CTPR08-IN-SUB	R	.472	.500	.217	.500	–	–	.500	1	2	4.724	.630	.217	.000	CTP..
CTPR10-IN-SUB	R	.472	.625	.217	.625	–	–	.625	1	2	4.724	.630	.217	.000	CTP..
CTPR08J-SUB	R	.472	.315	.217	.315	.157	.591	.315	1	2	4.331	.630	.217	.000	CTP..
CTPR08-SUB	R	.472	.315	.217	.315	.157	.591	.315	1	2	4.724	.630	.217	.000	CTP..
CTPR10F-SUB	R	.472	.394	.217	.394	.079	.591	.394	1	2	3.150	.630	.217	.000	CTP..
CTPR10KX-SUB	R	.472	.394	.217	.394	.079	.591	.394	1	2	4.724	.630	.217	.000	CTP..
CTPR12GX-SUB	R	.472	.472	.217	.472	–	–	.472	1	2	3.346	.630	.217	.000	CTP..
CTPR12-SUB	R	.472	.472	.217	.472	–	–	.472	1	2	4.724	.630	.217	.000	CTP..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTPR06-IN-SUB	LRIS-4*5	LLR-25S
CTPR08-IN-SUB	LRIS-4*5	LLR-25S
CTPR10-IN-SUB	LRIS-4*5	LLR-25S
CTPR08J-SUB	LRIS-4*5	LLR-25S
CTPR08-SUB	LRIS-4*5	LLR-25S
CTPR10F-SUB	LRIS-4*5	LLR-25S
CTPR10KX-SUB	LRIS-4*5	LLR-25S
CTPR12GX-SUB	LRIS-4*5	LLR-25S
CTPR12-SUB	LRIS-4*5	LLR-25S

CTPL-SUB for Sub-Spindle





● Diagram shows left-hand tool

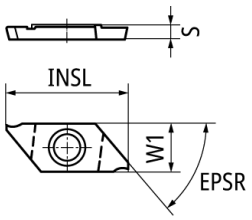
Item Number	Hand	CUTDIA	B	CDX	H	HBH	HBL	HF	K1	K2	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	°	°	inch	inch	inch	
CTPL08J-SUB	L	.472	.315	.217	.315	.157	.591	.315	1	2	4.331	.630	.217	CTP..
CTPL08-SUB	L	.472	.315	.217	.315	.157	.591	.315	1	2	4.724	.630	.217	CTP..
CTPL10GX-SUB	L	.472	.394	.217	.394	.079	.591	.394	1	2	3.346	.630	.217	CTP..
CTPL12GX-SUB	L	.472	.472	.217	.472	–	–	.472	1	2	3.346	.630	.217	CTP..

Spare Parts

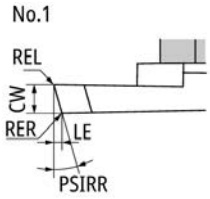
Item Number	Clamp screw	Wrench (for Clamp screw)
CTPL08J-SUB	LRIS-4*5	LLR-25S
CTPL08-SUB	LRIS-4*5	LLR-25S
CTPL10GX-SUB	LRIS-4*5	LLR-25S
CTPL12GX-SUB	LRIS-4*5	LLR-25S

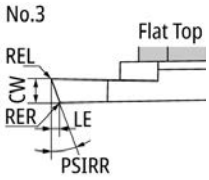
CTP.. series/Inserts Carbide Right-Hand

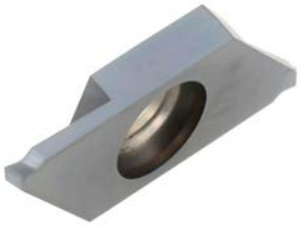
CTP-FR



●All angles shown are obtained when insert is set in the holder.







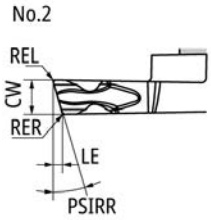
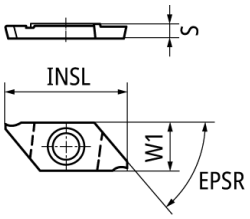
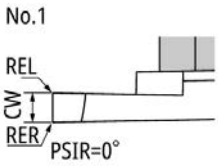
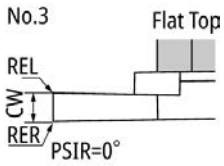


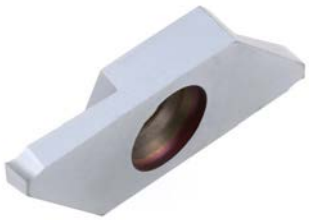
Figure	Item Number	CUTDIA	CW	EPSR	INSL	LE	PSIRR	REL	RER	S	W1	Carbide								
												PVD								
		inch	inch	°	inch	inch	°	inch	inch	inch	inch	650	DM4	DT4	QM3	ST4	TM4	VM1	ZM3	KM1
1	**CTP05FR-SH**	.197	.020	50	.787	.007	16	.002	.002	.098	.315								●	
1	**CTP07FR**	.315	.028	50	.787	.009	16	.002	.002	.098	.315								●	
1	**CTP10FR**	.472	.039	50	.787	.013	16	.002	.002	.098	.315	●		●				●	●	
2	**CTP10FR-CX**	.472	.039	50	.787	.013	16	.002	.002	.098	.315		●			●				
1	**CTP10FR-SH**	.276	.039	50	.787	.013	16	.002	.002	.098	.315			●					●	
1	**CTP10FR-TH**	.472	.039	50	.787	.013	16	.002	.002	.098	.315					●				
3	**CTP10FRV** Ⓜ	.472	.039	50	.787	.016	20	.000	–	.098	.315			●				●	●	●
1	**CTP13FR**	.472	.051	50	.787	.016	16	.002	.002	.098	.315			●					●	
2	**CTP13FR-CX**	.472	.051	50	.787	.016	16	.002	.002	.098	.315	●	●			●				
1	**CTP15FR**	.472	.059	50	.787	.018	16	.002	.002	.098	.315	●						●	●	
2	**CTP15FR-CX**	.472	.059	50	.787	.018	16	.002	.002	.098	.315	●	●			●				
1	**CTP15FR-TH**	.472	.059	50	.787	.018	16	.002	.002	.098	.315					●				
3	**CTP15FRV** Ⓜ	.472	.059	50	.787	.023	20	.000	–	.098	.315							●	●	●
1	**CTP15FRX**	.472	.059	50	.787	.018	16	.002	.002	.098	.315								●	
1	**CTP20FR**	.472	.079	50	.787	.024	16	.002	.002	.098	.315	●						●	●	
1	**CTP20FR-TH**	.472	.079	50	.787	.024	16	.002	.002	.098	.315					●				
3	**CTP20FRV** Ⓜ	.472	.079	50	.787	.030	20	.000	–	.098	.315							●	●	●
1	**CTP20FRX**	.472	.079	50	.787	.024	16	.002	.002	.098	.315								●	
1	**CTPX15FR**	.472	.059	50	.787	.018	16	.002	.002	.098	.315			●	●				●	
1	**CTPX20FR**	.472	.079	50	.787	.024	16	.002	.002	.098	.315			●	●				●	

CTP-FRN









●All angles shown are obtained when insert is set in the holder.

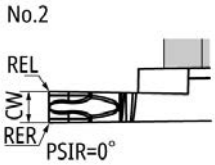
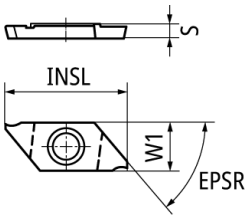
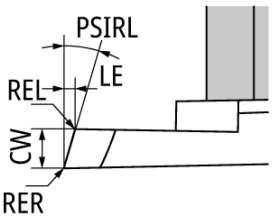
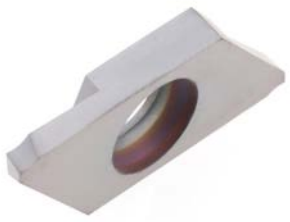


Figure	Item Number	CUTDIA	CW	EPSR	INSL	PSIR	REL	RER	S	W1	Carbide								
											PVD								
		inch	inch	°	inch	°	inch	inch	inch	inch	650	DM4	DT4	QM3	ST4	TM4	VM1	ZM3	KM1
1	CTP05FRN-SH	.197	.020	50	.787	0	.002	.002	.098	.315								●	
1	CTP10FRN	.472	.039	50	.787	0	.002	.002	.098	.315	●		●					●	
2	CTP10FRN-CX	.472	.039	50	.787	0	.002	.002	.098	.315	●	●			●				
1	CTP10FRN-SH	.276	.039	50	.787	0	.002	.002	.098	.315			●					●	
1	CTP10FRN-TH	.472	.039	50	.787	0	.002	.002	.098	.315					●				
1	CTP13FRN	.472	.051	50	.787	0	.002	.002	.098	.315			●					●	
2	CTP13FRN02-CX	.472	.051	50	.787	0	.008	.008	.098	.315		●			●				
2	CTP13FRN-CX	.472	.051	50	.787	0	.002	.002	.098	.315		●			●				
1	CTP15FRN	.472	.059	50	.787	0	.002	.002	.098	.315	●						●	●	
1	CTP15FRN02	.472	.059	50	.787	0	.008	.008	.098	.315	●								
2	CTP15FRN02-CX	.472	.059	50	.787	0	.008	.008	.098	.315		●			●				
2	CTP15FRN-CX	.472	.059	50	.787	0	.002	.002	.098	.315	●	●			●				
1	CTP15FRN-TH	.472	.059	50	.787	0	.002	.002	.098	.315					●				
3	CTP15FRNV Ⓜ	.472	.059	50	.787	0	.000	.000	.098	.315									●
1	CTP15FRNX	.472	.059	50	.787	0	.002	.002	.098	.315								●	
1	CTP20FRN	.472	.079	50	.787	0	.002	.002	.098	.315	●						●	●	
1	CTP20FRN02	.472	.079	50	.787	0	.008	.008	.098	.315	●								
1	CTP20FRN-TH	.472	.079	50	.787	0	.002	.002	.098	.315					●				
3	CTP20FRNV Ⓜ	.472	.079	50	.787	0	.000	.000	.098	.315									●
1	CTP20FRNX	.472	.079	50	.787	0	.002	.002	.098	.315								●	
1	CTPX15FRN	.472	.059	50	.787	0	.002	.002	.098	.315			●	●					
1	CTPX20FRN	.472	.079	50	.787	0	.002	.002	.098	.315			●	●					

CTP-FRK





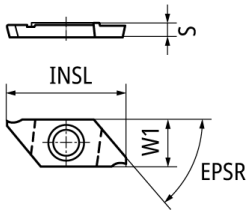


●All angles shown are obtained when insert is set in the holder.

Item Number	CUTDIA	CW	EPSR	INSL	LE	PSIRL	REL	RER	S	W1	Carbide							
											PVD							
	inch	inch	°	inch	inch	°	inch	inch	inch	inch	DM4	DT4	QM3	ST4	TM4	VM1	ZM3	KM1
CTP10FRK	.433	.039	50	.787	.013	16	.002	.002	.098	.315							●	
CTP13FRK	.472	.051	50	.787	.016	16	.002	.002	.098	.315		●					●	
CTP15FRK	.433	.059	50	.787	.018	16	.002	.002	.098	.315							●	
CTP20FRK	.433	.079	50	.787	.024	16	.002	.002	.098	.315							●	

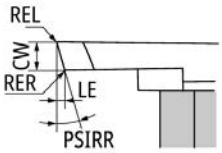
CTP.. series/Inserts Carbide Left-Hand

CTP-FLK

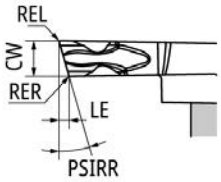


●All angles shown are obtained when insert is set in the holder.

No.1



No.2



No.3

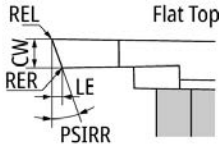
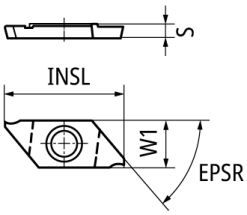
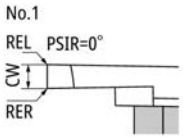


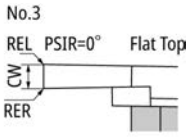
Figure	Item Number	CUTDIA	CW	EPSR	INSL	LE	PSIRR	REL	RER	S	W1	Carbide								
												PVD								
		inch	inch	°	inch	inch	°	inch	inch	inch	inch	650	DM4	DT4	QM3	ST4	TM4	VM1	ZM3	KM1
1	**CTP05FLK-SH**	.197	.020	50	.787	.007	16	.002	.002	.098	.315								●	
1	**CTP10FLK**	.433	.039	50	.787	.013	16	.002	.002	.098	.315	●		●					●	
2	**CTP10FLK-CX**	.433	.039	50	.787	.013	16	.002	.002	.098	.315		●			●				
1	**CTP10FLK-SH**	.276	.039	50	.787	.013	16	.002	.002	.098	.315			●					●	
1	**CTP10FLK-TH**	.433	.039	50	.787	.013	16	.002	.002	.098	.315					●				
1	**CTP10FLK-211**	.472	.039	50	.787	.013	16	.002	.002	.098	.315							●		
1	**CTP13FLK**	.433	.051	50	.787	.016	16	.002	.002	.098	.315			●					●	
2	**CTP13FLK-CX**	.433	.051	50	.787	.016	16	.002	.002	.098	.315		●			●				
1	**CTP15FLK**	.433	.059	50	.787	.018	16	.002	.002	.098	.315	●						●	●	
1	**CTP15FLKB**	.433	.059	50	.787	.018	16	.002	.002	.098	.315								●	
2	**CTP15FLK-CX**	.433	.059	50	.787	.018	16	.002	.002	.098	.315	●	●			●				
1	**CTP15FLK-TH**	.433	.059	50	.787	.018	16	.002	.002	.098	.315					●				
3	**CTP15FLKV** Ⓜ	.433	.059	50	.787	.023	20	.000	.000	.098	.315							●		●
1	**CTP20FLK**	.433	.079	50	.787	.024	16	.002	.002	.098	.315							●	●	
1	**CTP20FLK-TH**	.433	.079	50	.787	.024	16	.002	.002	.098	.315					●				
3	**CTP20FLKV** Ⓜ	.433	.079	50	.787	.030	20	.000	.000	.098	.315							●		
1	**CTPX15FLK**	.433	.059	50	.787	.018	16	.002	.002	.098	.315			●	●					
1	**CTPX20FLK**	.433	.079	50	.787	.024	16	.002	.002	.098	.315			●	●					

CTP-FLN



●All angles shown are obtained when insert is set in the holder.





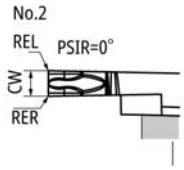
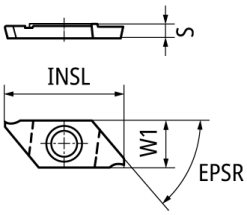
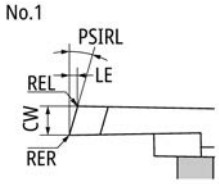


Figure	Item Number	CUTDIA	CW	EPSR	INSL	PSIR	REL	RER	S	W1	Carbide								
											PVD								
		inch	inch	°	inch	°	inch	inch	inch	inch	650	DM4	DT4	QM3	ST4	TM4	VM1	ZM3	KM1
1	CTP05FLN-SH	.197	.020	50	.787	0	.002	.002	.098	.315								●	
1	CTP10FLN	.472	.039	50	.787	0	.002	.002	.098	.315	●		●					●	
2	CTP10FLN-CX	.472	.039	50	.787	0	.002	.002	.098	.315	●	●			●				
1	CTP10FLN-SH	.276	.039	50	.787	0	.002	.002	.098	.315			●					●	
1	CTP10FLN-TH	.472	.039	50	.787	0	.002	.002	.098	.315					●				
1	CTP13FLN	.472	.051	50	.787	0	.002	.002	.098	.315			●					●	
2	CTP13FLN02-CX	.472	.051	50	.787	0	.008	.008	.098	.315		●			●				
2	CTP13FLN-CX	.472	.051	50	.787	0	.002	.002	.098	.315		●			●				
1	CTP15FLN	.472	.059	50	.787	0	.002	.002	.098	.315	●						●	●	
1	CTP15FLN02	.472	.059	50	.787	0	.008	.008	.098	.315	●								
2	CTP15FLN02-CX	.472	.059	50	.787	0	.008	.008	.098	.315	●	●			●				
2	CTP15FLN-CX	.472	.059	50	.787	0	.002	.002	.098	.315	●	●			●				
1	CTP15FLN-TH	.472	.059	50	.787	0	.002	.002	.098	.315					●				
3	CTP15FLNV Ⓜ	.472	.059	50	.787	0	.000	.000	.098	.315									●
1	CTP20FLN	.472	.079	50	.787	0	.002	.002	.098	.315	●						●	●	
1	CTP20FLN02	.472	.079	50	.787	0	.008	.008	.098	.315	●								
1	CTP20FLN-TH	.472	.079	50	.787	0	.002	.002	.098	.315					●				
3	CTP20FLNV Ⓜ	.472	.079	50	.787	0	.000	.000	.098	.315									●
1	CTPX15FLN	.472	.059	50	.787	0	.002	.002	.098	.315			●	●					
1	CTPX20FLN	.472	.079	50	.787	0	.002	.002	.098	.315			●	●					

CTP-FL



●All angles shown are obtained when insert is set in the holder.



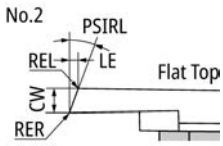
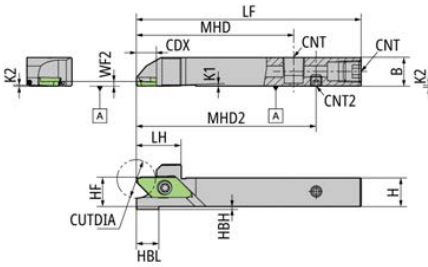


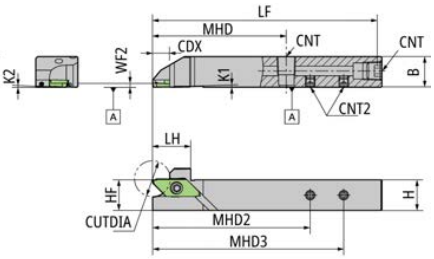
Figure	Item Number	CUTDIA	CW	EPSR	INSL	LE	PSIRL	REL	RER	S	W1	Carbide							
												PVD							
		inch	inch	°	inch	inch	°	inch	inch	inch	inch	DM4	DT4	QM3	ST4	TM4	VM1	ZM3	KM1
1	CTP07FL	.315	.028	50	.787	.009	16	.002	.002	.098	.315							●	
1	CTP10FL	.472	.039	50	.787	.013	16	.002	.002	.098	.315							●	
2	CTP10FLV Ⓜ	.472	.039	50	.787	.016	20	.000	.000	.098	.315						●	●	
1	CTP13FL	.472	.051	50	.787	.016	16	.002	.002	.098	.315		●					●	
1	CTP15FL	.472	.059	50	.787	.018	16	.002	.002	.098	.315							●	
2	CTP15FLV Ⓜ	.472	.059	50	.787	.023	20	.000	.000	.098	.315						●	●	
1	CTP20FL	.472	.079	50	.787	.024	16	.002	.002	.098	.315							●	
2	CTP20FLV Ⓜ	.472	.079	50	.787	.030	20	.000	.000	.098	.315						●	●	
1	CTPX15FL	.472	.059	50	.787	.018	16	.002	.002	.098	.315		●						
1	CTPX20FL	.472	.079	50	.787	.024	16	.002	.002	.098	.315		●						

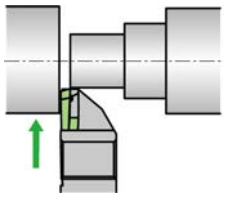
CTPA-OH2 Direct connect coolant port 1~2-hole type

No.1



No.2





CTPAR/L16X-OH2

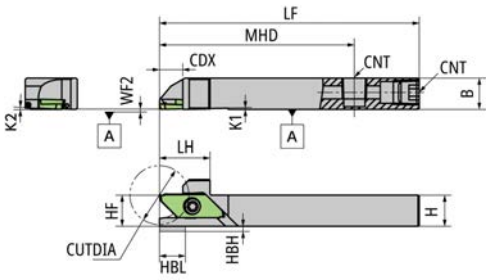
● Diagram shows right-hand tool

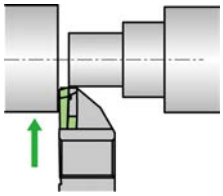
Figure	Item Number	Hand	CUTDIA	DMAX	B	CDX	CNT	CNT2	H	HBH	HBL	HF	K1	K2	LF	LH	MHD	MHD2	MHD3	WF2	Insert Gage	
			inch	inch	inch	inch			inch	inch	inch	inch	°	°	inch	inch	inch	inch	inch	inch		
1	**CTPAR08H-IN-OH2**	R	.630	.630	1/2	.354	NPT1/8	M5	1/2	.051	.394	1/2	1	2	3.937	.787	2.756	3.150	–	.079	CTPA..	TBPA..
2	**CTPAR10X-IN-OH2**	R	.630	.630	5/8	.354	NPT1/8	M5	5/8	–	–	5/8	1	2	4.724	.787	2.756	3.248	3.937	.079	CTPA..	TBPA..
1	**CTPAL08H-IN-OH2**	L	.630	.630	1/2	.354	NPT1/8	M5	1/2	.051	.394	1/2	1	2	3.937	.787	2.756	3.150	–	.079	CTPA..	TBPA..
2	**CTPAL10X-IN-OH2**	L	.630	.630	5/8	.354	NPT1/8	M5	5/8	–	–	5/8	1	2	4.724	.787	2.756	3.248	3.937	.079	CTPA..	TBPA..
1	**CTPAR12H-OH2**	R	.630	.630	.472	.354	Rc1/8	M5	.472	.079	.394	.472	1	2	3.937	.768	2.756	3.150	–	.079	CTPA..	TBPA..
2	**CTPAR16X-OH2**	R	.630	.630	.630	.354	Rc1/8	M5	.630	–	–	.630	1	2	4.724	.768	2.756	3.248	3.937	.079	CTPA..	TBPA..
1	**CTPAL12H-OH2**	L	.630	.630	.472	.354	Rc1/8	M5	.472	.079	.394	.472	1	2	3.937	.768	2.756	3.150	–	.079	CTPA..	TBPA..
2	**CTPAL16X-OH2**	L	.630	.630	.630	.354	Rc1/8	M5	.630	–	–	.630	1	2	4.724	.768	2.756	3.248	3.937	.079	CTPA..	TBPA..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
CTPAR08H-IN-OH2	LRIS-4*12PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
CTPAR10X-IN-OH2	LRIS-4*12PW	SPNPT1/8L	SS0505SC	CLR-15S	LW-2.5
CTPAL08H-IN-OH2	LRIS-4*12PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
CTPAL10X-IN-OH2	LRIS-4*12PW	SPNPT1/8L	SS0505SC	CLR-15S	LW-2.5
CTPAR12H-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5
CTPAR16X-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5
CTPAL12H-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5
CTPAL16X-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5

CTPA-OH Coolant hose connection type





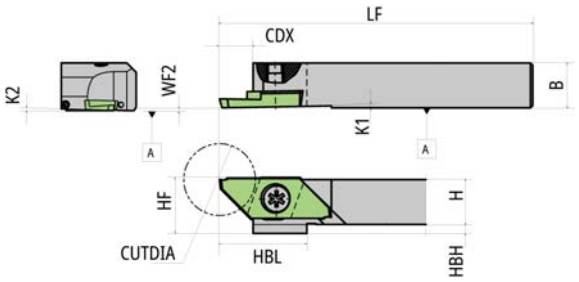
● Diagram shows right-hand tool

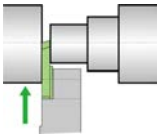
Item Number	Hand	CUTDIA	DMAX	B	CDX	CNT	H	HBH	HBL	HF	K1	K2	LF	LH	MHD	WF2	Insert Gage	
		inch	inch	inch	inch		inch	inch	inch	inch	°	°	inch	inch	inch	inch		
CTPAR06H-IN-OH	R	.630	.630	3/8	.354	M6*1	3/8	.176	.787	3/8	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAR08H-IN-OH	R	.630	.630	1/2	.354	NPT1/8	1/2	.051	.394	1/2	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAR10H-IN-OH	R	.630	.630	5/8	.354	NPT1/8	5/8	–	–	5/8	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAL06H-IN-OH	L	.630	.630	3/8	.354	M6*1	3/8	.176	.787	3/8	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAL08H-IN-OH	L	.630	.630	1/2	.354	NPT1/8	1/2	.051	.394	1/2	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAL10H-IN-OH	L	.630	.630	5/8	.354	NPT1/8	5/8	–	–	5/8	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAR12H-OH	R	.630	.630	.472	.354	Rc1/8	.472	.079	.394	.472	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAR16H-OH	R	.630	.630	.630	.354	Rc1/8	.630	–	–	.630	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAL12H-OH	L	.630	.630	.472	.354	Rc1/8	.472	.079	.394	.472	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..
CTPAL16H-OH	L	.630	.630	.630	.354	Rc1/8	.630	–	–	.630	1	2	3.937	.768	2.953	.000	CTPA..	TBPA..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
CTPAR06H-IN-OH	LRIS-4*12PW	SS0605SC	CLR-15S
CTPAR08H-IN-OH	LRIS-4*12PW	SPNPT1/8	CLR-15S
CTPAR10H-IN-OH	LRIS-4*12PW	SPNPT1/8	CLR-15S
CTPAL06H-IN-OH	LRIS-4*12PW	SS0605SC	CLR-15S
CTPAL08H-IN-OH	LRIS-4*12PW	SPNPT1/8	CLR-15S
CTPAL10H-IN-OH	LRIS-4*12PW	SPNPT1/8	CLR-15S
CTPAR12H-OH	LRIS-4*12PW	SPR1/8	CLR-15S
CTPAR16H-OH	LRIS-4*12PW	SPR1/8	CLR-15S
CTPAL12H-OH	LRIS-4*12PW	SPR1/8	CLR-15S
CTPAL16H-OH	LRIS-4*12PW	SPR1/8	CLR-15S

CTPA





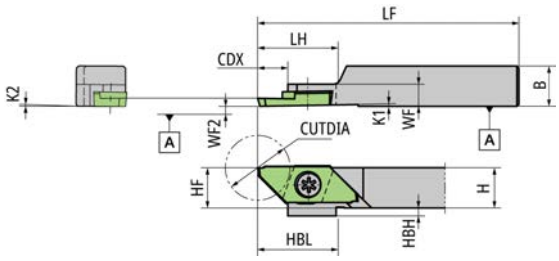
● Diagram shows right-hand tool

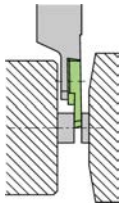
Item Number	Hand	CUTDIA	B	CDX	H	HBH	HBL	HF	K1	K2	LF	WF2	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch	°	°	inch	inch		
CTPAR06-IN	R	.630	3/8	.295	3/8	.079	.768	3/8	1	2	4.724	.000	CTPA..	TBPA..
CTPAR08-IN	R	.630	1/2	.295	1/2	–	–	1/2	1	2	4.724	.000	CTPA..	TBPA..
CTPAR10-IN	R	.630	5/8	.295	5/8	–	–	5/8	1	2	4.724	.000	CTPA..	TBPA..
CTPAL06-IN	L	.630	3/8	.295	3/8	.079	.768	3/8	1	2	4.724	.000	CTPA..	TBPA..
CTPAL08-IN	L	.630	1/2	.295	1/2	–	–	1/2	1	2	4.724	.000	CTPA..	TBPA..
CTPAL10-IN	L	.630	5/8	.295	5/8	–	–	5/8	1	2	4.724	.000	CTPA..	TBPA..
CTPAR10	R	.630	.394	.295	.394	.079	.768	.394	1	2	4.724	.000	CTPA..	TBPA..
CTPAR12	R	.630	.472	.295	.472	–	–	.472	1	2	4.724	.000	CTPA..	TBPA..
CTPAR12GX	R	.630	.472	.295	.472	–	–	.472	1	2	3.346	.000	CTPA..	TBPA..
CTPAR16	R	.630	.630	.295	.630	–	–	.630	1	2	4.724	.000	CTPA..	TBPA..
CTPAR20F	R	.630	.787	.295	.787	–	–	.787	1	2	3.150	.000	CTPA..	TBPA..
CTPAL10	L	.630	.394	.295	.394	.079	.768	.394	1	2	4.724	.000	CTPA..	TBPA..
CTPAL12	L	.630	.472	.295	.472	–	–	.472	1	2	4.724	.000	CTPA..	TBPA..
CTPAL12GX	L	.630	.472	.295	.472	–	–	.472	1	2	3.346	.000	CTPA..	TBPA..
CTPAL16	L	.630	.630	.295	.630	–	–	.630	1	2	4.724	.000	CTPA..	TBPA..
CTPAL20F	L	.630	.787	.295	.787	–	–	.787	1	2	3.150	.000	CTPA..	TBPA..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTPAR06-IN	LRIS-4*10PW	CLR-15S
CTPAR08-IN	LRIS-4*12PW	CLR-15S
CTPAR10-IN	LRIS-4*12PW	CLR-15S
CTPAL06-IN	LRIS-4*10PW	CLR-15S
CTPAL08-IN	LRIS-4*12PW	CLR-15S
CTPAL10-IN	LRIS-4*12PW	CLR-15S
CTPAR10	LRIS-4*10PW	CLR-15S
CTPAR12	LRIS-4*12PW	CLR-15S
CTPAR12GX	LRIS-4*12PW	CLR-15S
CTPAR16	LRIS-4*12PW	CLR-15S
CTPAR20F	LRIS-4*10	LLR-25S
CTPAL10	LRIS-4*10PW	CLR-15S
CTPAL12	LRIS-4*12PW	CLR-15S
CTPAL12GX	LRIS-4*12PW	CLR-15S
CTPAL16	LRIS-4*12PW	CLR-15S
CTPAL20F	LRIS-4*10	LLR-25S

CTPAR-SUB for Sub-Spindle





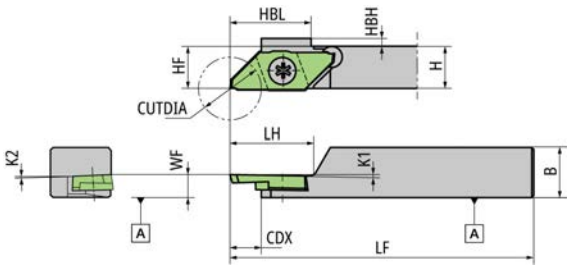
● Diagram shows right-hand tool

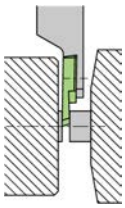
Item Number	Hand	CUTDIA	B	CDX	H	HBH	HBL	HF	K1	K2	LF	LH	WF	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	°	°	inch	inch	inch	inch	
CTPAR06-IN-SUB	R	.630	3/8	.295	3/8	.079	.768	3/8	1	2	4.724	.787	.217	.000	CTPA..
CTPAR08-IN-SUB	R	.630	1/2	.295	1/2	–	–	1/2	1	2	4.724	.787	.217	.000	CTPA..
CTPAR10-IN-SUB	R	.630	5/8	.295	5/8	–	–	5/8	1	2	4.724	.787	.217	.000	CTPA..
CTPAR10GX-SUB	R	.630	.394	.295	.394	.079	.768	.394	1	2	3.346	.787	.217	.000	CTPA..
CTPAR12GX-SUB	R	.630	.472	.295	.472	–	–	.472	1	2	3.346	.787	.217	.000	CTPA..
CTPAR12KX-SUB	R	.630	.472	.295	.472	–	–	.472	1	2	4.724	.787	.217	.000	CTPA..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTPAR06-IN-SUB	LRIS-4*5	LLR-25S
CTPAR08-IN-SUB	LRIS-4*5	LLR-25S
CTPAR10-IN-SUB	LRIS-4*5	LLR-25S
CTPAR10GX-SUB	LRIS-4*5	LLR-25S
CTPAR12GX-SUB	LRIS-4*5	LLR-25S
CTPAR12KX-SUB	LRIS-4*5	LLR-25S

CTPAL-SUB for Sub-Spindle





● Diagram shows left-hand tool

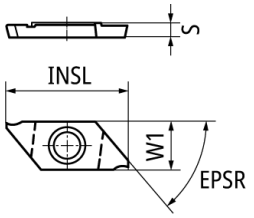
Item Number	Hand	CUTDIA	B	CDX	H	HBH	HBL	HF	K1	K2	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	°	°	inch	inch	inch	
CTPAL06-IN-SUB	L	.630	3/8	.295	3/8	.079	.768	3/8	1	2	4.724	.787	.217	CTPA..
CTPAL08-IN-SUB	L	.630	1/2	.295	1/2	–	–	1/2	1	2	4.724	.787	.217	CTPA..
CTPAL10-IN-SUB	L	.630	5/8	.295	5/8	–	–	5/8	1	2	4.724	.787	.217	CTPA..
CTPAL10GX-SUB	L	.630	.394	.295	.394	.079	.768	.394	1	2	3.346	.787	.217	CTPA..
CTPAL12GX-SUB	L	.630	.472	.295	.472	–	–	.472	1	2	3.346	.787	.217	CTPA..
CTPAL12KX-SUB	L	.630	.472	.295	.472	–	–	.472	1	2	4.724	.787	.217	CTPA..
CTPAL16GX-SUB	L	.630	.630	.295	.630	–	–	.630	1	2	3.346	1.102	.217	CTPA..
CTPAL16KX-SUB	L	.630	.630	.295	.630	–	–	.630	1	2	4.724	1.102	.217	CTPA..

Spare Parts

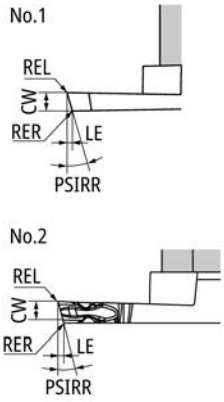
Item Number	Clamp screw	Wrench (for Clamp screw)
CTPAL06-IN-SUB	LRIS-4*5	LLR-25S
CTPAL08-IN-SUB	LRIS-4*5	LLR-25S
CTPAL10-IN-SUB	LRIS-4*5	LLR-25S
CTPAL10GX-SUB	LRIS-4*5	LLR-25S
CTPAL12GX-SUB	LRIS-4*5	LLR-25S
CTPAL12KX-SUB	LRIS-4*5	LLR-25S
CTPAL16GX-SUB	LRIS-4*5	LLR-25S
CTPAL16KX-SUB	LRIS-4*5	LLR-25S

CTPA.. series/Inserts Carbide Right-Hand

CTPA-FR



●All angles shown are obtained when insert is set in the holder.



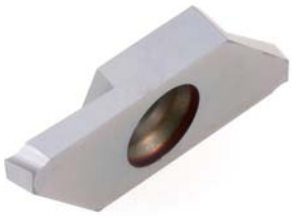
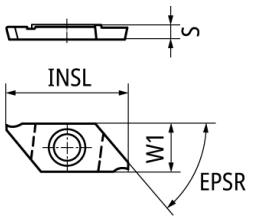
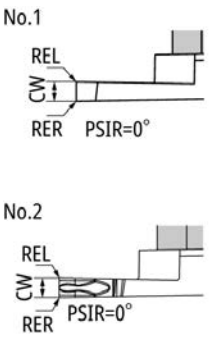


Figure	Item Number	Hand	Chipbreaker	CUTDIA	CW	EPSR	INSL	LE	PSIRR	REL	RER	S	W1	Carbide							
														PVD							
				inch	inch	°	inch	inch	°	inch	inch	inch	inch	DM4	DT4	QM3	ST4	TM4	VM1	ZM3	KM1
1	**CTPA07FR**	R	Yes	.315	.028	45	.984	.009	16	.002	.002	.138	.370							●	
1	**CTPA10FR**	R	Yes	.472	.039	45	.984	.013	16	.002	.002	.138	.370			●			●	●	
1	**CTPA15FR**	R	Yes	.630	.059	45	.984	.018	16	.002	.002	.138	.370		●	●			●	●	
2	**CTPA15FR-CX**	R	Yes	.630	.059	45	.984	.018	16	.002	.002	.138	.370	●			●				
1	**CTPA15FR-TH**	R	Yes	.630	.059	45	.984	.018	16	.002	.002	.138	.370				●				
1	**CTPA20FR**	R	Yes	.630	.079	45	.984	.024	16	.002	.002	.138	.370		●	●			●	●	
1	**CTPA20FR-TH**	R	Yes	.630	.079	45	.984	.024	16	.002	.002	.138	.370				●				
3	**CTPA20FRV** Ⓜ	R	No	.630	.079	45	.984	.030	20	.000	.000	.138	.370						●		●

CTPA-FRN



●All angles shown are obtained when insert is set in the holder.



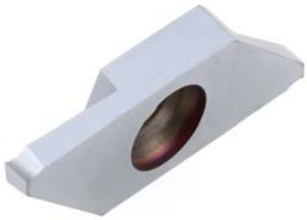
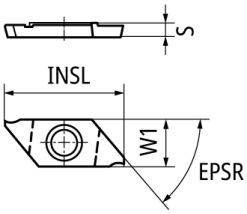


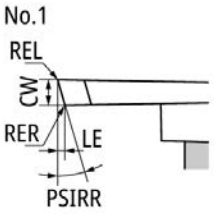
Figure	Item Number	Hand	Chipbreaker	CUTDIA	CW	EPSR	INSL	PSIR	REL	RER	S	W1	Carbide							
													PVD							
				inch	inch	°	inch	°	inch	inch	inch	inch	DM4	DT4	QM3	ST4	TM4	VM1	ZM3	KM1
1	**CTPA07FRN**	R	Yes	.315	.028	45	.984	0	.002	.002	.138	.370							●	
1	**CTPA10FRN**	R	Yes	.472	.039	45	.984	0	.002	.002	.138	.370			●				●	
3	**CTPA10FRS**	R	No	.630	.039	45	.984	0	.002	.002	.138	.370			●					
1	**CTPA15FRN**	R	Yes	.630	.059	45	.984	0	.002	.002	.138	.370		●	●			●	●	
2	**CTPA15FRN-CX**	R	Yes	.630	.059	45	.984	0	.002	.002	.138	.370	●			●				
1	**CTPA15FRN-TH**	R	Yes	.630	.059	45	.984	0	.002	.002	.138	.370				●				
3	**CTPA15FRS**	R	No	.630	.059	45	.984	0	.002	.002	.138	.370			●					
1	**CTPA20FRN**	R	Yes	.630	.079	45	.984	0	.002	.002	.138	.370		●	●			●	●	
1	**CTPA20FRN-TH**	R	Yes	.630	.079	45	.984	0	.002	.002	.138	.370				●				
3	**CTPA20FRNV** Ⓜ	R	No	.630	.079	45	.984	0	.000	.000	.138	.370								●
3	**CTPA20FRS**	R	No	.630	.079	45	.984	0	.002	.002	.138	.370			●				●	
1	**CTPA30FRN**	R	Yes	.630	.118	45	.984	0	.002	.002	.138	.370			●					

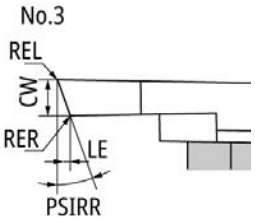
CTPA.. series/Inserts Carbide Left-Hand

CTPA-FLK



●All angles shown are obtained when insert is set in the holder.





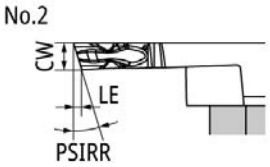
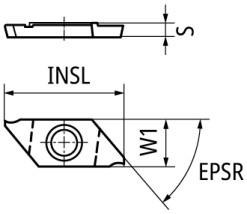
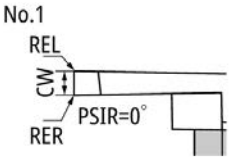


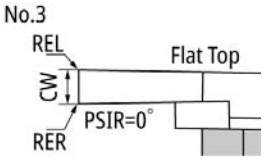
Figure	Item Number	Hand	Chipbreaker	CUTDIA	CW	EPSR	INSL	LE	PSIRR	REL	RER	S	W1	Carbide							
														PVD							
				inch	inch	°	inch	inch	°	inch	inch	inch	inch	DM4	DT4	QM3	ST4	TM4	VM1	ZM3	KM1
1	**CTPA07FLK**	L	Yes	.256	.028	45	.984	.009	16	.002	.002	.138	.370							●	
1	**CTPA10FLK**	L	Yes	.433	.039	45	.984	.013	16	.002	.002	.138	.370			●			●	●	
1	**CTPA10FLKD**	L	Yes	.630	.039	45	.984	.013	16	.002	.002	.138	.370							●	
3	**CTPA10FLKFT**	L	Yes	.472	.039	45	.984	.013	16	.000	.000	.138	.370			●					
1	**CTPA15FLK**	L	Yes	.571	.059	45	.984	.018	16	.002	.002	.138	.370		●	●			●	●	
2	**CTPA15FLK-CX**	L	Yes	.571	.059	45	.984	.018	16	.002	.002	.138	.370	●			●				
1	**CTPA15FLK-TH**	L	Yes	.571	.059	45	.984	.018	16	.002	.002	.138	.370				●				
3	**CTPA15FLKFT**	L	Yes	.630	.059	45	.984	.018	16	.000	.000	.138	.370			●					
3	**CTPA15FLKV** Ⓜ	L	No	.571	.059	45	.984	.018	20	.000	.000	.138	.370			●					
1	**CTPA20FLK**	L	Yes	.571	.079	45	.984	.024	16	.002	.002	.138	.370		●	●			●	●	
1	**CTPA20FLK-TH**	L	Yes	.571	.079	45	.984	.024	16	.002	.002	.138	.370				●				
3	**CTPA20FLKV** Ⓜ	L	No	.571	.079	45	.984	.030	20	.000	.000	.138	.370						●		●

CTPA-FLN



●All angles shown are obtained when insert is set in the holder.





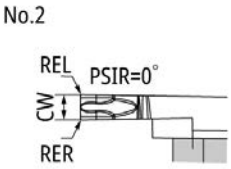
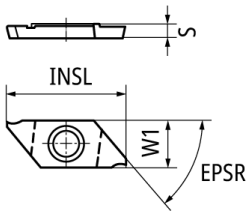
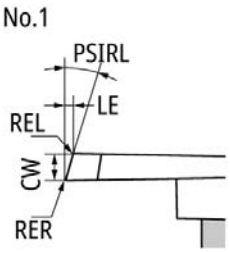


Figure	Item Number	Hand	Chipbreaker	CUTDIA	CW	EPSR	INSL	PSIR	REL	RER	S	W1	Carbide							
													PVD							
				inch	inch	°	inch	°	inch	inch	inch	inch	DM4	DT4	QM3	ST4	TM4	VM1	ZM3	KM1
1	**CTPA10FLN**	L	Yes	.472	.039	45	.984	0	.002	.002	.138	.370			●				●	
1	**CTPA10FLND**	L	Yes	.630	.039	45	.984	0	.002	.002	.138	.370							●	
3	**CTPA10FLS**	L	No	.630	.039	45	.984	0	.002	.002	.138	.370			●					
1	**CTPA15FLN**	L	Yes	.630	.059	45	.984	0	.002	.002	.138	.370		●	●			●	●	
2	**CTPA15FLN-CX**	L	Yes	.630	.059	45	.984	0	.002	.002	.138	.370	●			●				
1	**CTPA15FLN-TH**	L	Yes	.630	.059	45	.984	0	.002	.002	.138	.370				●				
3	**CTPA15FLS**	L	No	.630	.059	45	.984	0	.002	.002	.138	.370			●					
1	**CTPA20FLN**	L	Yes	.630	.079	45	.984	0	.002	.002	.138	.370		●	●			●	●	
1	**CTPA20FLN-TH**	L	Yes	.630	.079	45	.984	0	.002	.002	.138	.370				●				
3	**CTPA20FLNV** Ⓜ	L	No	.630	.079	45	.984	0	.000	.000	.138	.370								●
3	**CTPA20FLS**	L	No	.630	.079	45	.984	0	.002	.002	.138	.370			●				●	
1	**CTPA30FLN**	L	Yes	.630	.118	45	.984	0	.002	.002	.138	.370			●					

CTPA-FL



●All angles shown are obtained when insert is set in the holder.



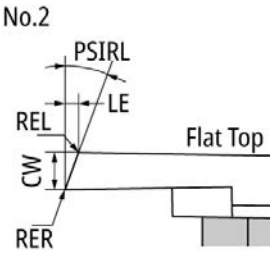
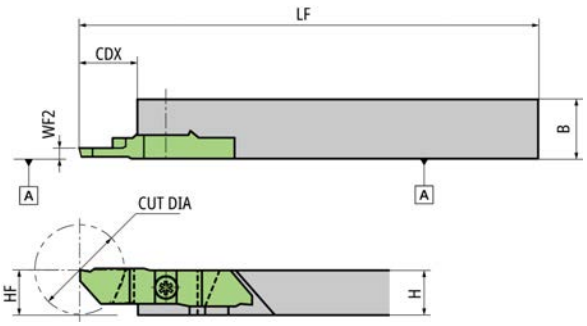
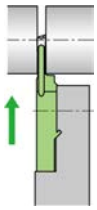


Figure	Item Number	Hand	Chipbreaker	CUTDIA	CW	EPSR	INSL	LE	PSIRL	REL	RER	S	W1	Carbide							
														PVD							
				inch	inch	°	inch	inch	°	inch	inch	inch	inch	DM4	DT4	QM3	ST4	TM4	VM1	ZM3	KM1
1	**CTPA07FL**	L	Yes	.315	.028	45	.984	.009	16	.002	.002	.138	.370							●	
1	**CTPA10FL**	L	Yes	.472	.039	45	.984	.013	16	.002	.002	.138	.370							●	
1	**CTPA15FL**	L	Yes	.630	.059	45	.984	.018	16	.002	.002	.138	.370		●					●	
1	**CTPA20FL**	L	Yes	.630	.079	45	.984	.024	16	.002	.002	.138	.370		●					●	
2	**CTPA20FLV**Ⓜ	L	No	.630	.079	45	.984	.030	20	.000	.000	.138	.370						●		

CTPW.. series/Toolholder

CTPW





● Diagram shows right-hand tool

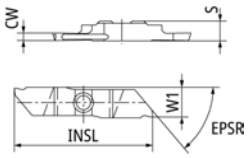
Item Number	Hand	CUTDIA	B	CDX	H	HF	LF	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	
CTPWR08-IN	R	.787	.630	.591	1/2	.498	4.724	.024	CTPW..
CTPWR10-IN	R	.787	.630	.591	5/8	.623	4.724	.024	CTPW..
CTPWL08-IN	L	.787	.630	.591	1/2	.498	4.724	.024	CTPW..
CTPWL10-IN	L	.787	.630	.591	5/8	.623	4.724	.024	CTPW..
CTPWR10	R	.787	.630	.591	.394	.392	4.724	.024	CTPW..
CTPWR12	R	.787	.630	.591	.472	.470	4.724	.024	CTPW..
CTPWR16	R	.787	.630	.591	.630	.628	4.724	.024	CTPW..
CTPWR20	R	.787	.787	.591	.787	.785	4.724	.024	CTPW..
CTPWL10A	L	.787	.472	.591	.394	.392	4.724	.024	CTPW..
CTPWL12A	L	.787	.472	.591	.472	.470	4.724	.024	CTPW..
CTPWL16	L	.787	.630	.591	.630	.628	4.724	.024	CTPW..
CTPWL20	L	.787	.787	.591	.787	.785	4.724	.024	CTPW..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTPWR08-IN	LRIS-4*10	LLR-25S
CTPWR10-IN	LRIS-4*10	LLR-25S
CTPWL08-IN	LRIS-4*10	LLR-25S
CTPWL10-IN	LRIS-4*10	LLR-25S
CTPWR10	LRIS-4*10	LLR-25S
CTPWR12	LRIS-4*10	LLR-25S
CTPWR16	LRIS-4*10	LLR-25S
CTPWR20	LRIS-4*10	LLR-25S
CTPWL10A	LRIS-4*10	LLR-25S
CTPWL12A	LRIS-4*10	LLR-25S
CTPWL16	LRIS-4*10	LLR-25S
CTPWL20	LRIS-4*10	LLR-25S

CTPW.. series/Inserts Carbide Right-Hand

CTPW25-R



●All angles shown are obtained when insert is set in the holder.

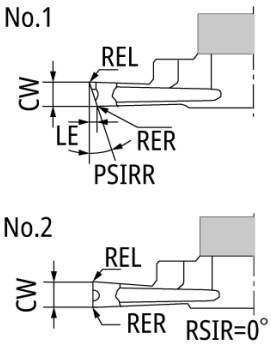
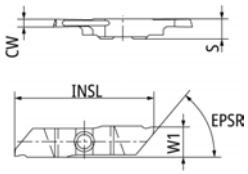


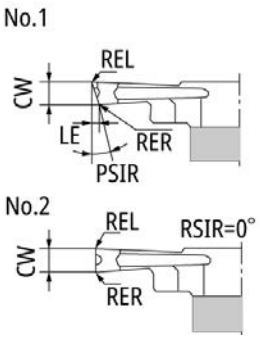
Figure	Item Number	Hand	Chipbreaker	CUTDIA	CW	EPSR	INSL	LE	PSIR	PSIRL	PSIRR	REL	RER	S	W1	Carbide
																PVD
				inch	inch	°	inch	inch	°	°	°	inch	inch	inch	inch	ZM3
1	**CTPW25FR**	R	Yes	.787	.098	50	(1.772)	.032	–	–	17	.008	.002	.256	.382	●
1	**CTPW25FRP** Ⓜ	R	No	.787	.098	50	(1.772)	.032	–	17	–	.008	.002	.256	.382	●
2	**CTPW25FRN**	R	Yes	.787	.098	50	(1.772)	–	0	–	–	.002	.002	.256	.382	●
2	**CTPW25FRNV** Ⓜ	R	No	.787	.098	50	(1.772)	–	0	–	–	.000	.000	.256	.382	●

CTPW.. series/Inserts Carbide Left-Hand

CTPW25-L



●All angles shown are obtained when insert is set in the holder.



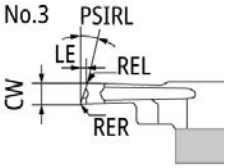
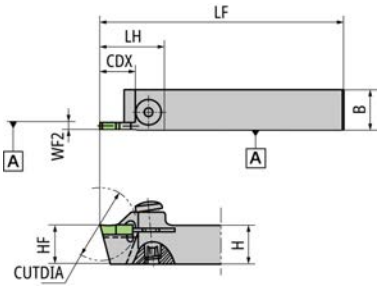
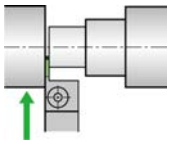


Figure	Item Number	Hand	Chipbreaker	CUTDIA	CW	EPSR	INSL	LE	PSIR	PSIRL	PSIRR	REL	RER	S	W1	Carbide
																PVD
				inch	inch	°	inch	inch	°	°	°	inch	inch	inch	inch	ZM3
1	**CTPW25FLK**	L	Yes	.787	.098	50	(1.772)	.032	–	–	17	.008	.002	.256	.382	●
2	**CTPW25FLN**	L	Yes	.787	.098	50	(1.772)	–	0	–	–	.002	.002	.256	.382	●
2	**CTPW25FLNV** Ⓜ	L	No	.787	.098	50	(1.772)	–	0	–	–	.000	.000	.256	.382	●
3	**CTPW25FL**	L	Yes	.787	.098	50	(1.772)	.032	–	17	–	.008	.002	.256	.382	●
3	**CTPW25FLP** Ⓜ	L	No	.787	.098	50	(1.772)	.032	–	–	17	.008	.002	.256	.382	●

CTV-S.. series/Toolholder

CTV-K2





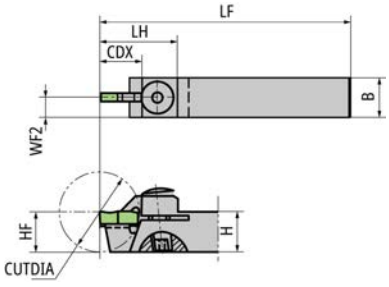
● Diagram shows right-hand tool

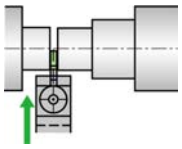
Item Number	Hand	CUTDIA	B	CDX	H	HF	LF	LH	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	inch	
CTVR10K2	R	.787	.394	.433	.394	.394	4.724	.787	.000	CTV..S
CTVR12K2	R	.787	.472	.433	.472	.472	4.724	.787	.000	CTV..S
CTVL10K2	L	.787	.394	.433	.394	.394	4.724	.787	.000	CTV..S
CTVL12GX2	L	.787	.472	.433	.472	.472	3.346	.787	.000	CTV..S
CTVL12K2	L	.787	.472	.433	.472	.472	4.724	.787	.000	CTV..S

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTVR10K2	AOS-5*16	LW-2.5S
CTVR12K2	AOS-5*16	LW-2.5S
CTVL10K2	AOS-5*16	LW-2.5S
CTVL12GX2	AOS-5*16	LW-2.5S
CTVL12K2	AOS-5*16	LW-2.5S

CTVN-K2





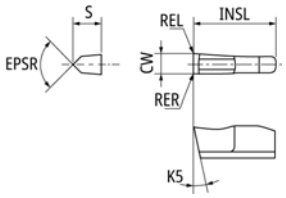
Item Number	Hand	CUTDIA	B	CDX	H	HF	LF	LH	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	inch	
CTVN10K2	N	.787	.394	.433	.394	.394	4.724	.768	.197	CTV..S
CTVN12K2	N	.787	.472	.433	.472	.472	4.724	.768	.236	CTV..S

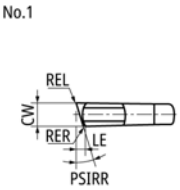
Spare Parts

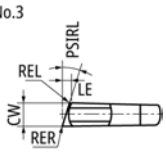
Item Number	Clamp screw	Wrench (for Clamp screw)
CTVN10K2	AOS-5*16	LW-2.5S
CTVN12K2	AOS-5*16	LW-2.5S

CTV-S.. series/Inserts Carbide

CTV-S







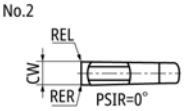
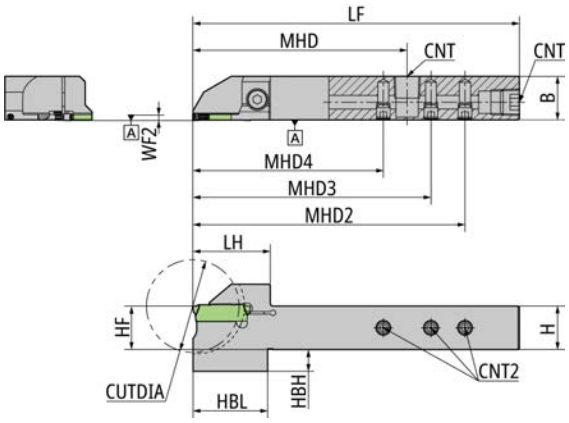
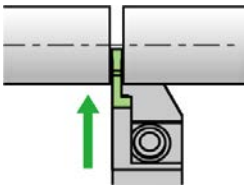


Figure	Item Number	Hand	Chipbreaker	CW	EPSR	INSL	K5	LE	PSIR	PSIRL	PSIRR	REL	RER	S	Carbide
															PVD
				inch	°	inch	°	inch	°	°	°	inch	inch	inch	ZM3
1	**CTV22R05S**	R	Yes	.087	90	.394	12	.029	–	–	17	.002	.002	.157	●
1	**CTV22R10S**	R	Yes	.087	90	.394	12	.029	–	–	17	.004	.004	.157	●
1	**CTV25R05S**	R	Yes	.098	90	.394	12	.033	–	–	17	.002	.002	.157	●
1	**CTV25R10S**	R	Yes	.098	90	.394	12	.033	–	–	17	.004	.004	.157	●
2	**CTV22N05S**	N	Yes	.087	90	.394	12	–	0	–	–	.002	.002	.157	●
2	**CTV22N10S**	N	Yes	.087	90	.394	12	–	0	–	–	.004	.004	.157	●
2	**CTV25N05S**	N	Yes	.098	90	.394	12	–	0	–	–	.002	.002	.157	●
2	**CTV25N10S**	N	Yes	.098	90	.394	12	–	0	–	–	.004	.004	.157	●
3	**CTV22L05S**	L	Yes	.087	90	.394	12	.029	–	17	–	.002	.002	.157	●
3	**CTV22L10S**	L	Yes	.087	90	.394	12	.029	–	17	–	.004	.004	.157	●
3	**CTV25L05S**	L	Yes	.098	90	.394	12	.033	–	17	–	.002	.002	.157	●
3	**CTV25L10S**	L	Yes	.098	90	.394	12	.033	–	17	–	.004	.004	.157	●

CTDP.. series/Toolholder

CTDP-OH3 Direct connect coolant port 3-hole type CUT DUO SPLASH





・Diagram shows right-hand tool

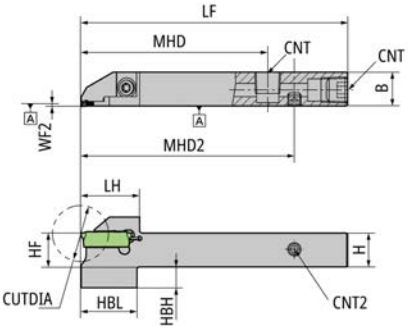
Item Number	Hand	CUTDIA	B	CNT	CNT2	H	HBH	HBL	HF	LF	LH	MHD	MHD2	MHD3	MHD4	WF2	Insert Gage
		inch	inch			inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	
CTDPR10-IN-20D25-OH3	R	1.000	5/8	NPT1/8	M5	5/8	.182	.866	.605	4.724	.866	3.100	3.937	3.445	2.756	.008	CTDP20..
CTDPR10-IN-25D34AOH3	R	1.339	5/8	NPT1/8	M5	5/8	.320	1.083	.605	4.724	1.122	3.102	3.937	3.445	2.756	.008	CTDP25..
CTDPL10-IN-20D25-OH3	L	1.000	5/8	NPT1/8	M5	5/8	.182	.866	.605	4.724	.866	3.100	3.937	3.445	2.756	.008	CTDP20..
CTDPL10-IN-25D34AOH3	L	1.339	5/8	NPT1/8	M5	5/8	.320	1.083	.605	4.724	1.122	3.102	3.937	3.445	2.756	.008	CTDP25..
CTDPR16-20D25-OH3	R	1.000	.630	Rc1/8	M5	.630	.177	.827	.610	4.724	.866	3.100	3.937	3.445	2.756	.008	CTDP20..
CTDPR16-25D34A-OH3	R	1.339	.630	Rc1/8	M5	.630	.315	1.083	.610	4.724	1.122	3.102	3.937	3.445	2.756	.008	CTDP25..
CTDPL16-20D25-OH3	L	1.000	.630	Rc1/8	M5	.630	.177	.827	.630	4.724	.866	3.100	3.937	3.445	2.756	.008	CTDP20..
CTDPL16-25D34A-OH3	L	1.339	.630	Rc1/8	M5	.630	.315	1.083	.630	4.724	1.122	3.102	3.937	3.445	2.756	.008	CTDP25..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
CTDPR10-IN-20D25-OH3	LRIS-4*12	SPNPT1/8	SS0505SC	LLR-25S	LW-2.5
CTDPR10-IN-25D34AOH3	CS0516LSH	SPNPT1/8	SS0505SC	LW-3	LW-2.5
CTDPL10-IN-20D25-OH3	LRIS-4*12	SPNPT1/8	SS0505SC	LLR-25S	LW-2.5
CTDPL10-IN-25D34AOH3	CS0516LSH	SPNPT1/8	SS0505SC	LW-3	LW-2.5
CTDPR16-20D25-OH3	LRIS-4*12	SPR1/8L	SS0505SC	LLR-25S	LW-2.5
CTDPR16-25D34A-OH3	CS0516LSH	SPR1/8L	SS0505SC	LW-3	LW-2.5
CTDPL16-20D25-OH3	LRIS-4*12	SPR1/8L	SS0505SC	LLR-25S	LW-2.5
CTDPL16-25D34A-OH3	CS0516LSH	SPR1/8L	SS0505SC	LW-3	LW-2.5

CTDP-OH2 Direct connect coolant port 1~2-hole type CUT DUO SPLASH

No.1



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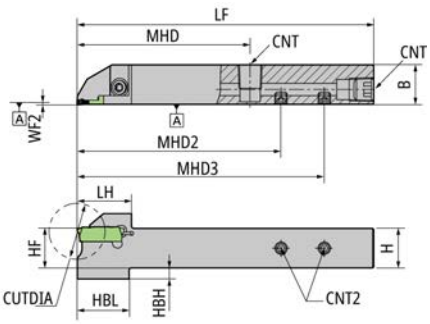
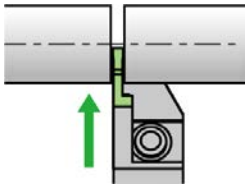




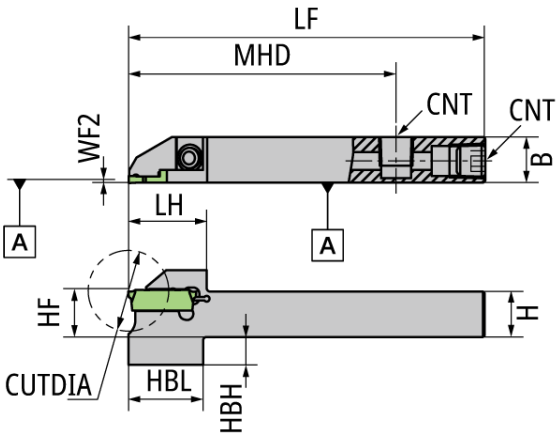
・Diagram shows right-hand tool

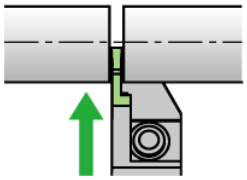
Figure	Item Number	Hand	CUTDIA	B	CNT	CNT2	H	HBH	HBL	HF	LF	LH	MHD	MHD2	MHD3	WF2	Insert Gage
			inch	inch			inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	
1	**CTDPR08-IN-20D25-OH2**	R	1.000	.500	NPT1/8	M5	1/2	.307	.827	1/2	3.937	.866	2.756	3.150	–	.008	CTDP20..
2	**CTDPR10-IN-20D25-OH2**	R	1.000	.625	NPT1/8	M5	5/8	.182	1.083	5/8	4.724	.866	2.756	3.248	3.937	.008	CTDP20..
1	**CTDPR12-IN-25D32-OH2**	R	1.260	.750	–	–	3/4	.157	1.083	3/4	4.724	1.122	2.953	3.937	–	.008	CTDP25..
1	**CTDPL08-IN-20D25-OH2**	L	1.000	.500	NPT1/8	M5	1/2	.307	.827	1/2	3.937	.866	2.756	3.150	–	.008	CTDP20..
2	**CTDPL10-IN-20D25-OH2**	L	1.000	.625	NPT1/8	M5	5/8	.182	1.083	5/8	4.724	.866	2.756	3.248	3.937	.008	CTDP20..
1	**CTDPL12-IN-25D32-OH2**	L	1.260	.750	–	M5	3/4	.157	1.083	3/4	4.724	1.122	2.953	3.937	–	.008	CTDP25..
1	**CTDPR12-20D25-OH2**	R	1.000	.472	Rc1/8	M5	.472	.335	.827	.472	3.937	.866	2.756	3.150	–	.008	CTDP20..
2	**CTDPR16-20D25-OH2**	R	1.000	.630	Rc1/8	M5	.630	.177	.827	.630	4.724	.866	2.756	3.248	3.937	.008	CTDP20..
1	**CTDPR20-25D34A-OH2**	R	1.339	.787	Rc1/8	M5	.787	.157	1.083	.787	4.724	1.122	2.953	3.937	–	.008	CTDP25..
1	**CTDPL12-20D25-OH2**	L	1.000	.472	Rc1/8	M5	.472	.335	.827	.472	3.937	.866	2.756	3.150	–	.008	CTDP20..
2	**CTDPL16-20D25-OH2**	L	1.000	.630	Rc1/8	M5	.630	.177	.827	.630	4.724	.866	2.756	3.248	3.937	.008	CTDP20..
1	**CTDPL20-25D34A-OH2**	L	1.339	.787	Rc1/8	M5	.787	.157	1.083	.787	4.724	1.122	2.953	3.937	–	.008	CTDP25..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
CTDPR08-IN-20D25-OH2	LRIS-4*12	SPNPT1/8	SS0505SC	LLR-25S	LW-2.5
CTDPR10-IN-20D25-OH2	LRIS-4*12	SPNPT1/8	SS0505SC	LLR-25S	LW-2.5
CTDPR12-IN-25D32-OH2	CS0516LSH	SPNPT1/8	SS0505SC	LW-3	LW-2.5
CTDPL08-IN-20D25-OH2	LRIS-4*12	SPNPT1/8	SS0505SC	LLR-25S	LW-2.5
CTDPL10-IN-20D25-OH2	LRIS-4*12	SPNPT1/8	SS0505SC	LLR-25S	LW-2.5
CTDPL12-IN-25D32-OH2	CS0516LSH	SPNPT1/8	SS0505SC	LW-3	LW-2.5
CTDPR12-20D25-OH2	LRIS-4*12	SPR1/8	SS0505SC	LLR-25S	LW-2.5
CTDPR16-20D25-OH2	LRIS-4*12	SPR1/8L	SS0505SC	LLR-25S	LW-2.5
CTDPR20-25D34A-OH2	CS0516LSH	SPR1/8	SS0505SC	LW-3	LW-2.5
CTDPL12-20D25-OH2	LRIS-4*12	SPR1/8	SS0505SC	LLR-25S	LW-2.5
CTDPL16-20D25-OH2	LRIS-4*12	SPR1/8L	SS0505SC	LLR-25S	LW-2.5
CTDPL20-25D34A-OH2	CS0516LSH	SPR1/8	SS0505SC	LW-3	LW-2.5

CTDP-OH　Coolant hose connection type　CUT DUO SPLASH





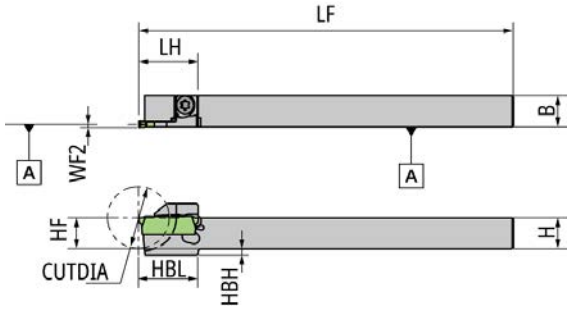
・Diagram shows right-hand tool

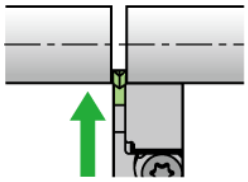
Item Number	Hand	CUTDIA	B	CNT	H	HBH	HBL	HF	LF	LH	MHD	WF2	Insert Gage
		inch	inch		inch	inch	inch	inch	inch	inch	inch	inch	
CTDPR08-IN-20D25-OH	R	1.000	.500	NPT1/8	1/2	.307	.827	1/2	3.937	.866	2.756	.008	CTDP20..
CTDPR10-IN-20D25-OH	R	1.000	.625	NPT1/8	5/8	.182	.827	5/8	3.937	.866	2.756	.008	CTDP20..
CTDPL08-IN-20D25-OH	L	1.000	.500	NPT1/8	1/2	.307	.827	1/2	3.937	.866	2.756	.008	CTDP20..
CTDPL10-IN-20D25-OH	L	1.000	.625	NPT1/8	5/8	.182	.827	5/8	3.937	.866	2.756	.008	CTDP20..
CTDPR12-20D25-OH	R	1.000	.472	Rc1/8	.472	.335	.827	.472	3.937	.866	2.953	.008	CTDP20..
CTDPR16-20D25-OH	R	1.000	.630	Rc1/8	.630	.177	.827	.630	3.937	.866	2.953	.008	CTDP20..
CTDPL12-20D25-OH	L	1.000	.472	Rc1/8	.472	.335	.827	.472	3.937	.866	2.953	.008	CTDP20..
CTDPL16-20D25-OH	L	1.000	.630	Rc1/8	.630	.177	.827	.630	3.937	.866	2.953	.008	CTDP20..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
CTDPR08-IN-20D25-OH	LRIS-4*12	SPNPT1/8	LLR-25S
CTDPR10-IN-20D25-OH	LRIS-4*12	SPNPT1/8	LLR-25S
CTDPL08-IN-20D25-OH	LRIS-4*12	SPNPT1/8	LLR-25S
CTDPL10-IN-20D25-OH	LRIS-4*12	SPNPT1/8	LLR-25S
CTDPR12-20D25-OH	LRIS-4*12	SPR1/8	LLR-25S
CTDPR16-20D25-OH	LRIS-4*12	SPR1/8	LLR-25S
CTDPL12-20D25-OH	LRIS-4*12	SPR1/8	LLR-25S
CTDPL16-20D25-OH	LRIS-4*12	SPR1/8	LLR-25S

CTDP CUT DUO





· Diagram shows right-hand tool

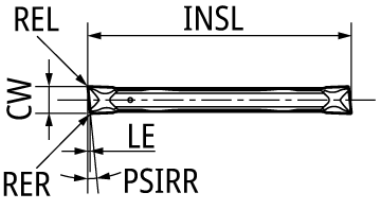
Item Number	Hand	CUTDIA	B	H	HBH	HBL	HF	LF	LH	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	inch	inch	
CTDPR06-IN-20D20	R	.787	.394	3/8	.020	.748	3/8	4.724	.748	.008	CTDP20..
CTDPR08-IN-20D25	R	1.000	.500	1/2	–	–	1/2	4.724	.866	.008	CTDP20..
CTDPR10-IN-20D32	R	1.260	.625	5/8	–	–	5/8	4.724	1.083	.008	CTDP20..
CTDPR12-IN-20D32	R	1.260	.750	3/4	–	–	3/4	4.724	1.083	.008	CTDP20..
CTDPL06-IN-20D20	L	.787	.394	3/8	.020	.748	3/8	4.724	.748	.008	CTDP20..
CTDPL08-IN-20D25	L	1.000	.500	1/2	–	–	1/2	4.724	.866	.008	CTDP20..
CTDPL10-IN-20D32	L	1.260	.625	5/8	–	–	5/8	4.724	1.083	.008	CTDP20..
CTDPL12-IN-20D32	L	1.260	.750	3/4	–	–	3/4	4.724	1.083	.008	CTDP20..
CTDPR10-20D20	R	.787	.394	.394	.079	.748	.394	4.724	.748	.008	CTDP20..
CTDPR12-20D20	R	.787	.472	.472	–	–	.472	4.724	.748	.008	CTDP20..
CTDPR12-20D25	R	1.000	.472	.472	–	–	.472	4.724	.866	.008	CTDP20..
CTDPR16-20D25	R	1.000	.630	.630	–	–	.630	4.724	.866	.008	CTDP20..
CTDPR16-20D32A	R	1.260	.630	.630	–	–	.630	4.724	1.083	.008	CTDP20..
CTDPR16-25D34A	R	1.339	.630	.630	–	–	.630	4.724	1.122	.008	CTDP25..
CTDPR2012-20D32A	R	1.260	.472	.787	–	–	.787	4.724	1.161	.008	CTDP20..
CTDPR2012-25D34A	R	1.339	.472	.787	–	–	.787	4.724	1.161	.008	CTDP25..
CTDPR20-20D32A	R	1.260	.787	.787	–	–	.787	4.724	1.161	.008	CTDP20..
CTDPR20-25D34A	R	1.339	.787	.787	–	–	.787	4.724	1.161	.008	CTDP25..
CTDPL10-20D20	L	.787	.394	.394	.079	.748	.394	4.724	.748	.008	CTDP20..
CTDPL12-20D20	L	.787	.472	.472	–	–	.472	4.724	.748	.008	CTDP20..
CTDPL12-20D25	L	1.000	.472	.472	–	–	.472	4.724	.866	.008	CTDP20..
CTDPL16-20D25	L	1.000	.630	.630	–	–	.630	4.724	.866	.008	CTDP20..
CTDPL16-20D32A	L	1.260	.630	.630	–	–	.630	4.724	1.083	.008	CTDP20..
CTDPL16-25D34A	L	1.339	.630	.630	–	–	.630	4.724	1.122	.008	CTDP25..
CTDPL2012-20D32A	L	1.260	.472	.787	–	–	.787	4.724	1.161	.008	CTDP20..
CTDPL2012-25D34A	L	1.339	.472	.787	–	–	.787	4.724	1.161	.008	CTDP25..
CTDPL20-20D32A	L	1.260	.787	.787	–	–	.787	4.724	1.161	.008	CTDP20..
CTDPL20-25D34A	L	1.339	.787	.787	–	–	.787	4.724	1.161	.008	CTDP25..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTDPR06-IN-20D20	LRIS-4*12	LLR-25S
CTDPR08-IN-20D25	LRIS-4*12	LLR-25S
CTDPR10-IN-20D32	LRIS-5*10	LLR-28S
CTDPR12-IN-20D32	LRIS-5*10	LLR-28S
CTDPL06-IN-20D20	LRIS-4*12	LLR-25S
CTDPL08-IN-20D25	LRIS-4*12	LLR-25S
CTDPL10-IN-20D32	LRIS-5*10	LLR-28S
CTDPL12-IN-20D32	LRIS-5*10	LLR-28S
CTDPR10-20D20	LRIS-4*12	LLR-25S
CTDPR12-20D20	LRIS-4*12	LLR-25S
CTDPR12-20D25	LRIS-4*12	LLR-25S
CTDPR16-20D25	LRIS-4*12	LLR-25S
CTDPR16-20D32A	LRIS-5*10	LLR-28S
CTDPR16-25D34A	CS0516LSH	LW-3
CTDPR2012-20D32A	LRIS-5*10	LLR-28S
CTDPR2012-25D34A	CS0516LSH	LW-3
CTDPR20-20D32A	LRIS-5*10	LLR-28S
CTDPR20-25D34A	CS0516LSH	LW-3
CTDPL10-20D20	LRIS-4*12	LLR-25S
CTDPL12-20D20	LRIS-4*12	LLR-25S
CTDPL12-20D25	LRIS-4*12	LLR-25S
CTDPL16-20D25	LRIS-4*12	LLR-25S
CTDPL16-20D32A	LRIS-5*10	LLR-28S
CTDPL16-25D34A	CS0516LSH	LW-3
CTDPL2012-20D32A	LRIS-5*10	LLR-28S
CTDPL2012-25D34A	CS0516LSH	LW-3
CTDPL20-20D32A	LRIS-5*10	LLR-28S
CTDPL20-25D34A	CS0516LSH	LW-3

CTDP.. series/Inserts Carbide

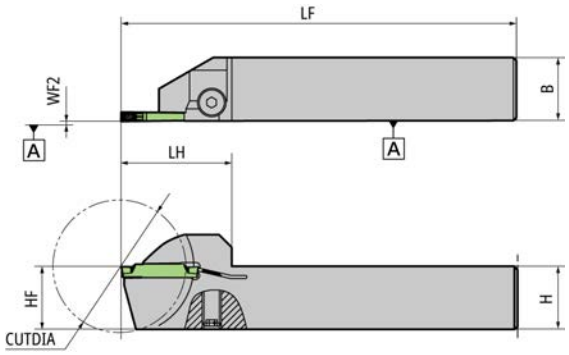
CTDP20/25 CUT DUO

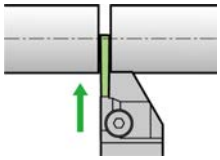


Item Number	Hand	Chipbreaker	CW	INSL	LE	PSIRR	REL	RER	Carbide			
									PVD			
			inch	inch	inch	°	inch	inch	DM4	QM3	ST4	TM4
CTDP20N	N	Yes	.079	.752	.000	–	.002	.002	●	●	●	●
CTDP20N02	N	Yes	.079	.752	.000	–	.008	.008	●	●	●	●
CTDP25N	N	Yes	.098	.835	.000	–	.002	.002	●	●		●
CTDP25N02	N	Yes	.098	.835	.000	–	.008	.008	●	●	●	●
CTDP20R6	R	Yes	.079	.752	.009	6	.002	.002	●	●	●	●
CTDP25R6	R	Yes	.098	.835	.011	6	.002	.002	●	●	●	●
CTDP20R15	R	Yes	.079	.752	.022	15	.002	.002	●	●	●	●
CTDP25R15	R	Yes	.098	.835	.028	15	.002	.002	●	●		●

CTWP.. series/Toolholder CUT MAX

CTWP





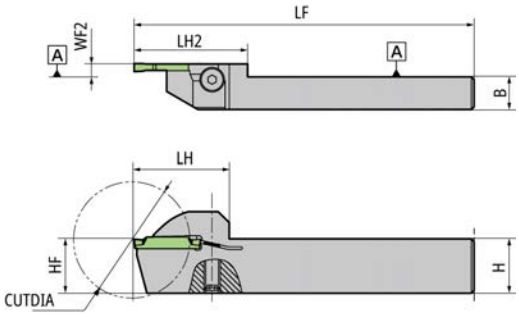
● Diagram shows right-hand tool

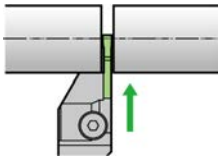
Item Number	Hand	CUTDIA	B	H	HF	LF	LH	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	
CTWPR12-IN-3D42	R	1.654	3/4	3/4	3/4	5.000	1.378	.010	GWPFM300..
CTWPR16-IN-3D42	R	1.654	1.000	1.000	1.000	6.000	1.378	.010	GWPFM300..
CTWPL12-IN-3D42	L	1.654	3/4	3/4	3/4	5.000	1.378	.010	GWPFM300..
CTWPL16-IN-3D42	L	1.654	1.000	1.000	1.000	6.000	1.378	.010	GWPFM300..
CTWPR2012K-3D42	R	1.654	.472	.787	.787	4.921	1.378	.010	GWPFM300..
CTWPR2020K-3D42	R	1.654	.787	.787	.787	4.921	1.378	.010	GWPFM300..
CTWPR2525M-3D42	R	1.654	.984	.984	.984	5.906	1.378	.010	GWPFM300..
CTWPL2012K-3D42	L	1.654	.472	.787	.787	4.921	1.378	.010	GWPFM300..
CTWPL2020K-3D42	L	1.654	.787	.787	.787	4.921	1.378	.010	GWPFM300..
CTWPL2525M-3D42	L	1.654	.984	.984	.984	5.906	1.378	.010	GWPFM300..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTWPR12-IN-3D42	CS0619LSHW	LW-3
CTWPR16-IN-3D42	CS0623LSHW	LW-4
CTWPL12-IN-3D42	CS0619LSHW	LW-3
CTWPL16-IN-3D42	CS0623LSHW	LW-4
CTWPR2012K-3D42	CS0623LSHW	LW-3
CTWPR2020K-3D42	CS0623LSHW	LW-3
CTWPR2525M-3D42	CS0623LSHW	LW-3
CTWPL2012K-3D42	CS0623LSHW	LW-3
CTWPL2020K-3D42	CS0623LSHW	LW-3
CTWPL2525M-3D42	CS0623LSHW	LW-3

CTWP-003





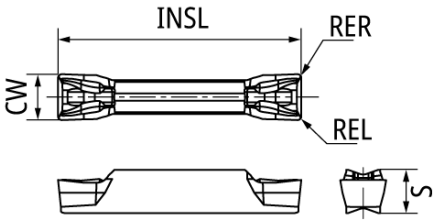
● Diagram shows left-hand tool

Item Number	Hand	CUTDIA	B	H	HF	LF	LH	LH2	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	inch	
CTWPL2012K-3D42-003	L	1.654	.472	.787	.787	4.921	1.732	1.929	.197	GWPFM300..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTWPL2012K-3D42-003	CS0623LSHW	LW-3

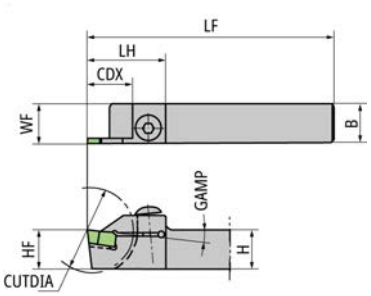
GWPFM

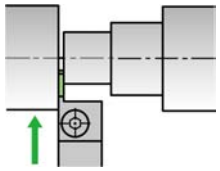


Item Number	Hand	Chipbreaker	CW	INSL	REL	RER	S	Carbide
								PVD
			inch	inch	inch	inch	inch	DM4
GWPFM300N02-GT	N	Yes	.118	.965	.008	.008	.165	●
GWPFM300N04-GT	N	Yes	.118	.965	.016	.016	.165	●

CTV.. series/Toolholder

CTV (-S)





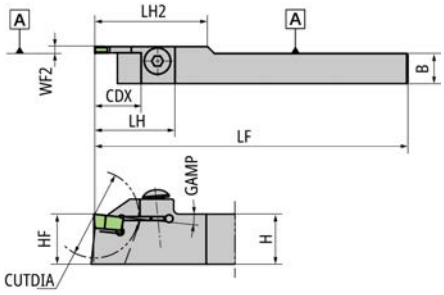
● Diagram shows right-hand tool

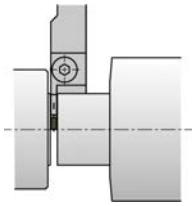
Item Number	Hand	CUTDIA	B	CDX	GAMP	H	LF	LH	WF	Insert Gage
		inch	inch	inch	°	inch	inch	inch	inch	
CTVR08B	R	.900	1/2	.480	6	1/2	4.500	.945	.520	CTV25..
CTVR16K25S	R	.906	.630	.480	6	.630	4.921	.945	.650	CTV25..
CTVR16K30S	R	.906	.630	.480	6	.630	4.921	.945	.650	CTV30..
CTVR20K25S	R	.906	.787	.480	6	.787	4.921	.945	.807	CTV25..
CTVR20K30S	R	.906	.787	.480	6	.787	4.921	.945	.807	CTV30..
CTVR16K25	R	1.378	.630	.728	6	.630	4.921	1.260	.650	CTV25..
CTVR16K30	R	1.378	.630	.728	6	.630	4.921	1.260	.650	CTV30..
CTVR1913L25	R	1.378	.512	.728	6	.748	5.512	1.260	.512	CTV25..
CTVR1913L30	R	1.378	.512	.728	6	.748	5.512	1.260	.512	CTV30..
CTVR20K25	R	1.378	.787	.728	6	.787	4.921	1.260	.807	CTV25..
CTVR20K30	R	1.378	.787	.728	6	.787	4.921	1.260	.807	CTV30..
CTVL16K25	L	1.378	.630	.728	6	.630	4.921	1.260	.650	CTV25..
CTVL16K30	L	1.378	.630	.728	6	.630	4.921	1.260	.650	CTV30..
CTVL1913L25	L	1.378	.512	.728	6	.748	5.512	1.260	.512	CTV25..
CTVL1913L30	L	1.378	.512	.728	6	.748	5.512	1.260	.512	CTV30..
CTVL20K25	L	1.378	.787	.728	6	.787	4.921	1.260	.807	CTV25..
CTVL20K30	L	1.378	.787	.728	6	.787	4.921	1.260	.807	CTV30..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTVR08B	BS0620	LW-4
CTVR16K25S	BS0620	LW-4
CTVR16K30S	BS0620	LW-4
CTVR20K25S	BS0620	LW-4
CTVR20K30S	BS0620	LW-4
CTVR16K25	BS0620	LW-4
CTVR16K30	BS0620	LW-4
CTVR1913L25	BS0620	LW-4
CTVR1913L30	BS0620	LW-4
CTVR20K25	BS0620	LW-4
CTVR20K30	BS0620	LW-4
CTVL16K25	BS0620	LW-4
CTVL16K30	BS0620	LW-4
CTVL1913L25	BS0620	LW-4
CTVL1913L30	BS0620	LW-4
CTVL20K25	BS0620	LW-4
CTVL20K30	BS0620	LW-4

CTV-X





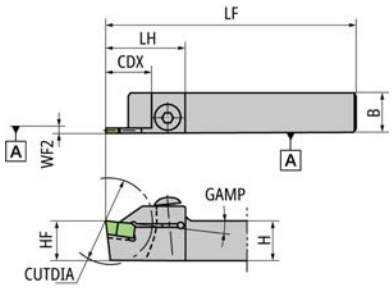
● Diagram shows right-hand tool

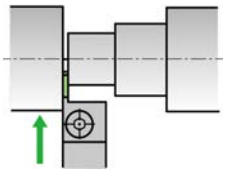
Item Number	Hand	CUTDIA	B	CDX	GAMP	H	LF	LH	WF2	Insert Gage
		inch	inch	inch	°	inch	inch	inch	inch	
CTVL2012K30X-1	L	1.378	.472	.728	6	.787	4.921	1.260	.118	CTV30..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTVL2012K30X-1	BS0620	LW-4

CTV-M (B)





● Diagram shows left-hand tool

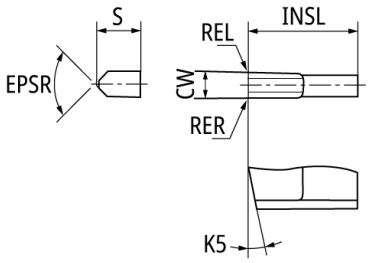
Item Number	Hand	CUTDIA	B	CDX	GAMP	H	LF	LH	WF2	Insert Gage
		inch	inch	inch	°	inch	inch	inch	inch	
CTVR16-25M	R	1.102	.630	.591	6	.630	4.724	1.004	.020	CTV25..
CTVR16-30M	R	1.102	.630	.591	6	.630	4.724	1.004	.020	CTV30..
CTVR20-25M	R	1.102	.787	.591	6	.787	4.724	1.004	.020	CTV25..
CTVR20-30M	R	1.102	.787	.591	6	.787	4.724	1.004	.020	CTV30..
CTVR25-30B	R	1.772	.984	.925	6	.984	5.906	1.358	.020	CTV30..
CTVL25-30B	L	1.772	.984	.925	6	.984	5.906	1.358	.020	CTV30..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTVR16-25M	BS0520	LW-3
CTVR16-30M	BS0520	LW-3
CTVR20-25M	BS0520	LW-3
CTVR20-30M	BS0520	LW-3
CTVR25-30B	BS0625	LW-4
CTVL25-30B	BS0625	LW-4

CTV.. series/Inserts Carbide

CTV-R/N/L



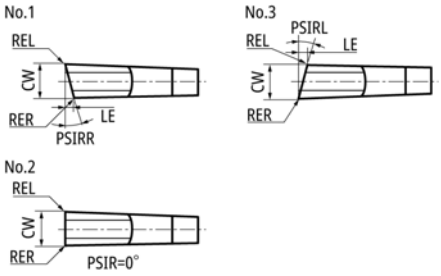
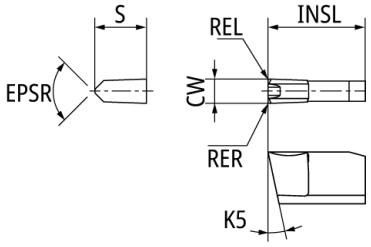


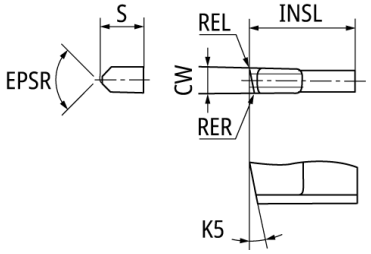
Figure	Item Number	Hand	Chipbreaker	CW	EPSR	INSL	K5	LE	PSIR	PSIRL	PSIRR	REL	RER	S	Carbide	
															PVD	
				inch	°	inch	°	inch	°	°	°	inch	inch	inch	QM3	ZM3
1	**CTV25R**	R	Yes	.098	90	.472	12	.016	–	–	8	.008	.008	.252		●
1	**CTV30R**	R	Yes	.118	90	.472	12	.019	–	–	8	.008	.008	.252		●
2	**CTV25N**	N	Yes	.098	90	.472	12	–	0	–	–	.008	.008	.252		●
2	**CTV30N**	N	Yes	.118	90	.472	12	–	0	–	–	.008	.008	.252	●	●
3	**CTV30L**	L	Yes	.118	90	.472	12	.019	–	8	–	.008	.008	.252		●

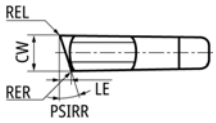
CTV-038



Item Number	Hand	Chipbreaker	CW	EPSR	INSL	K5	PSIR	REL	RER	S	Carbide	
											PVD	
			inch	°	inch	°	°	inch	inch	inch	QM3	ZM3
CTV30N038	N	Yes	.118	90	.472	12	0	.008	.008	.252		●

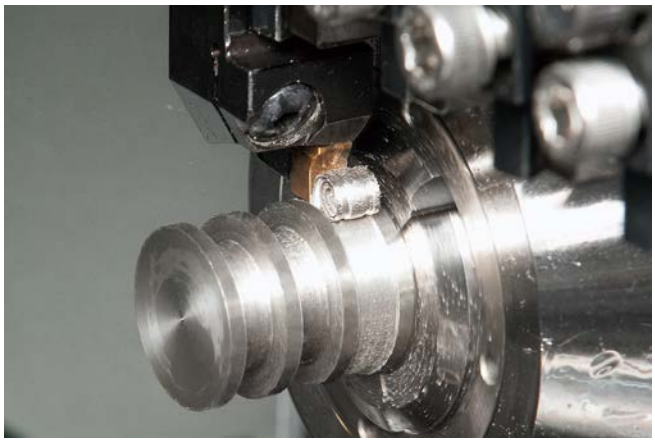
CTV-A/B





Item Number	Hand	Chipbreaker	CW	EPSR	INSL	K5	LE	PSIRR	REL	RER	S	Carbide	
												PVD	
			inch	°	inch	°	inch	°	inch	inch	inch	QM3	ZM3
CTV25R00A	R	Yes	.098	90	.472	12	.016	8	.002MAX	.002MAX	.252		●
CTV25R00B	R	Yes	.098	90	.472	12	.033	17	.002MAX	.002MAX	.252		●
CTV30R00A	R	Yes	.118	90	.472	12	.019	8	.002MAX	.002MAX	.252		●
CTV30R00B	R	Yes	.118	90	.472	12	.039	17	.002MAX	.002MAX	.252		●

MEMO



Grooving/Side-Turning

Product Lines **T02**

Recommended Cutting Conditions **T04**

General Information **T07**

OD Grooving

- **CSVG.. series** **T08**
- **GTPS.. series** **T12**
- **GTPA.. series** **T13**
- **GTMH(X)32.. series** **T15**
- **GTMT(A)43.. series** **T30**
- **GWPG(M).. series** **T33**

ID Grooving

- **SBG.. series** **T36**
- **GTG.. series** **T40**

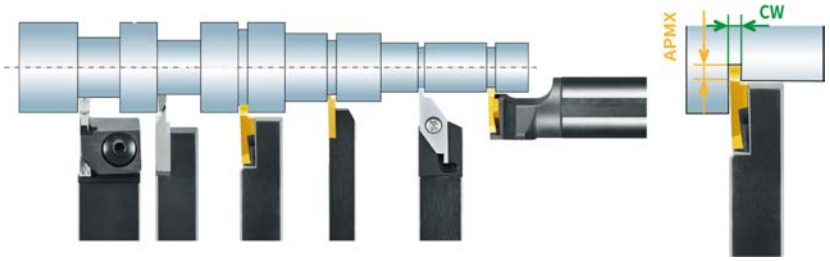
Face Grooving

- **FGV_FBV.. series** **T42**

ID Face Grooving

- **SFG.. series** **T45**

OD Grooving

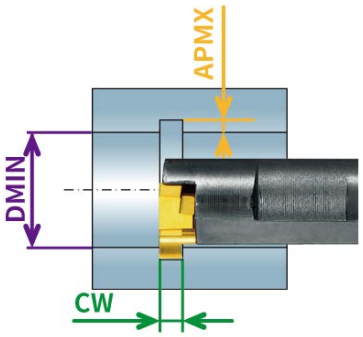


Insert	CSVG →T11		GTPS →T12	GTPA →T14			
Holder	CSV	DS-CSV	CTPS	GTPA	GTPA-OH	Y-GTPA	Y-GTPA-OH
	→T8-9	→T10	→T12	→T13	→T13	→T14	→T13
					Coolant through	Y-axis	Y-axis Coolant through
CW : Blade width	.010" - .059"		.030" - .079"	.079" - .098"			
APMX : Depth of cut	- .102"		-.098"	-.236"			

Insert	GTMH32 / GTMX32 →T25-29					
Holder	GTT	GTT-OH3/OH2/OH	Y-GTT	Y-GTT-OH2/OH	DS-GTT	CH-GTT
	→T17-19	→T15-17	→T21	→T20	→T22	→T22
		Coolant through	Y-axis	Y-axis Coolant through	DS	
CW: Blade width	.012" - .118"					
APMX : Depth of cut	-.106"					

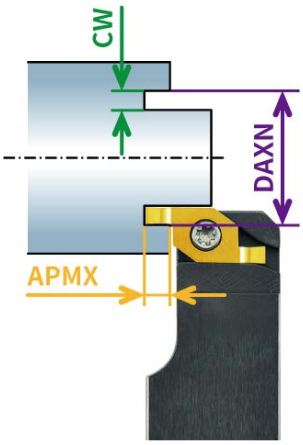
Insert	GTMH32 / GTMX32 →T25-29		GWPG(M) →T35	GTMA43 / GTMT43 →T32	
Holder	NGTN(B)	NGTA	GTWP	NGTN(B)	NGTA
	→T23	→T24	→T33-34	→T30	→T31
CW : Blade width	.012" - .118"		.118" - .236"	.039" - .216"	
APMX : Depth of cut	.106"		-.354"	.177"	

ID Grooving



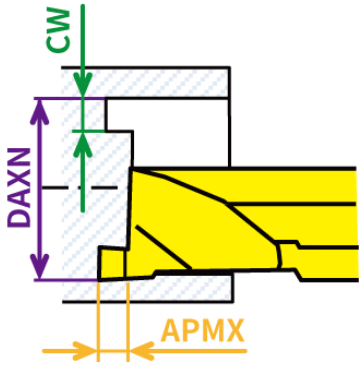
Insert	SBG →T39	GTG →T41
Holder	NBH	S-BG / BG
	→T36-38	→T40
CW : Blade width	.020" - .079"	.020" - .079"
APMX : Depth of cut	-.079"	-.118"
DMIN : Min. Bore Dia.	.118"/.157"/.197"/.236"/.315	.394"/.472"/.551"/.630"/.787"/.984"

Face Grooving



Insert	FGV →T44		
		FBV →T44	
Holder	FGV	DS-FGV	CH-FGV
	→T42	→T43	→T42
		DS	
CW : Blade width	.039" - .079"		
APMX : Depth of cut	-.118"	FGV: -.118"	
		FBV: -.157"	
DAXN : Min. Bore Dia.	FGV: .236" FBV: .315"		

ID Face Grooving



Insert	SFG →T47
Holder	NBH
	→T45-46
CW : Blade width	.039" - .118"
APMX : Depth of cut	-.110"
DAXN : Min. Bore Dia.	.236"/.315"

Recommended Cutting Conditions

CSV / GTPS

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**ZM3**					**VM1**	
	2nd choice	VM1					ZM3	
Cutting speed (SFM)		65 - 130 - 195	100 - 195 - 260		130 - 230 - 330	130 - 295 - 590	130 - 295 - 490	
Feed rate (IPR) a: X Direction b: Z Direction	Groove width .010 - .020	a: .0002 - .0012						
		b: .0001 - .0002						
	Groove width .020 - .039	a: .002 - .0024					a: .0008 - .0028	
		b: .0002 - .0004					b: .0002 - .0004	
	Groove width .039 - .079	a: .0012 - .0028					a: .0012 - .003	
		b: .0008 - .002					b: .0012 - .0024	

*MAX DOC when side turning (Under 0.4 width side turning impossible)

- MAX .0079" CSV/GTPS
- MAX .079" GTMH/GTMX/GTMT/GTMA
- MAX .0039" SBG/GTG

GTMH / GTMX / SBG / GTG

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**DM4 / DT4**			**ST4 / 650**	**ST4 / TM4**	**650 / QM3**	
	2nd choice	TM4 / QM3 / VM1					TM4 / VM1	
Cutting speed (SFM)		65 - 130 - 195	100 - 195 - 260		130 - 230 - 330	130 - 295 - 590	130 - 295 - 490	
Feed rate (IPR) a: X Direction b: Z Direction	Groove width .010 - .020	a: .0002 - .0012						
		b: .0001 - .0002						
	Groove width .020 - .039	a: .002 - .0024					a: .0008 - .0028	
		b: .0002 - .0004					b: .0002 - .0004	
	Groove width .039 - .079	a: .0012 - .0028					a: .0012 - .003	
		b: .0008 - .002					b: .0012 - .0024	
	Groove width .079 <	a: .0012 - .0079						
		b: .0012 - .0024						

*Max DOC when side turning
Groove width × 0.5 inch

GTPA

ISO Classification		N
Work Material		Aluminum alloys
Common Name		A5056 A6061
Grade	1st choice	**KM1**
Cutting speed (SFM)	PD1	330 - 660 - 990
	KM1	165 - 330 - 660
Feed rate (IPR)	a: X Direction	a: .002 - .0079
	b: Z Direction	b: .0039 - .0079

*Max DOC when side turning
Groove width × 0.8 inch

GWPG / GWPM

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**650**		**DM4**			**650**	
	2nd choice	DM4		650			DM4	
Cutting speed (SFM)		65 - 130 - 195	100 - 195 - 260		130 - 230 - 330	130 - 295 - 590	130 - 295 - 490	
Feed rate (IPR) a: X Direction b: Z Direction	Groove width .010 - .020	a: .002 - .006						
		b: .0012 - .006						
	Groove width .020 - .039	a: .0039 - .0079						
		b: .0012 - .006						
	Groove width .039 - .079	a: .006 - .0138						
		b: .0012 - .006						

*Max DOC when side turning Groove width × 0.5 inch

GTMT/GTMA

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**DM4**			**QM3**		**DM4**	
	2nd choice	**QM3**			**DM4**		**QM3**	
Cutting speed (SFM)		100 - 195 - 260			165 - 230 - 330	165 - 330 - 560	165 - 260 - 430	
Feed rate (IPR) a: X Direction b: Z Direction	Groove width .039 - .079	a: .0012 - .0028			a: .0004 - .0012	a: .0004 - .0012	a: .0008 - .003	
		b: .0008 - .002			b: .0004 - .0008	b: .0004 - .0008	b: .0008 - .002	
	Groove width .079 - .118	a: .0012 - .0079			a: .0004 - .0012	a: .0004 - .0016	a: .0012 - .0039	
		b: .0012 - .0024			b: .0004 - .0008	b: .0004 - .0008	b: .0012 - .0028	
	Groove width .118 - .217	a: .0012 - .0079			a: .0004 - .0012	a: .0004 - .002	a: .002 - .006	
		b: .0012 - .0024			b: .0004 - .0008	b: .0004 - .0008	b: .0016 - .0039	

*DOC when side turning .008"

FGV

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	TM4						
Cutting speed (SFM)		100 - 195 - 260			165 - 230 - 330	165 - 330 - 560	165 - 260 - 430	
Feed rate (IPR) a: X Direction b: Z Direction	Groove width .039	a: .0004 - .0012			a: .0004 - .0012	a: .0004 - .0012	a: .0004 - .0012	
		b: .0004 - .0008			b: .0004 - .0008	b: .0004 - .0008	b: .0004 - .0008	
	Groove width .059	a : 0.01 - 0.04			a: .0004 - .0012	a: .0004 - .0016	a: .0004 - .0016	
		b: .0004 - .0008			b: .0004 - .0008	b: .0004 - .0008	b: .0004 - .0008	
	Groove width .079	a : 0.01 - 0.04			a: .0004 - .0012	a: .0004 - .002	a: .0004 - .002	
		b: .0004 - .0008			b: .0004 - .0008	b: .0004 - .0008	b: .0004 - .0008	

*DOC when side turning .004"

Key points of processing: please reference page **O38**

FBV

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	TM4						
Cutting speed (SFM)		100 - 195 - 260			130 (100 - 195)	195 (100 - 260)	165 (100 - 230)	
Feed rate (IPR) a: Longitudinal feed : Z Direction b: Cross feed : X Direction (mm/rev)	Groove depth .039	a: .0006 / b: .002			a: .0006 / b: .0024	a: .0012 / b: .0024	a: .0006 / b: .0024	
	Groove depth .079	a: .0006 / b: .0012			※	a: .0006 / b: .0012	a: .0004 / b: .0016	
	Groove depth .118	a: .0006 / b: .0012			※	a: .0006 / b: .0012	※	
	Groove depth .157	a: .0006 / b: .0012			※	a: .0006 / b: .0012	※	

If burrs occur on the ID surface, it is recommended to perform cutting in two stages: rough machining and finishing machining.

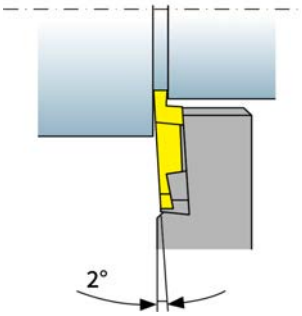
Key points of processing: please reference page **O38**

SFG

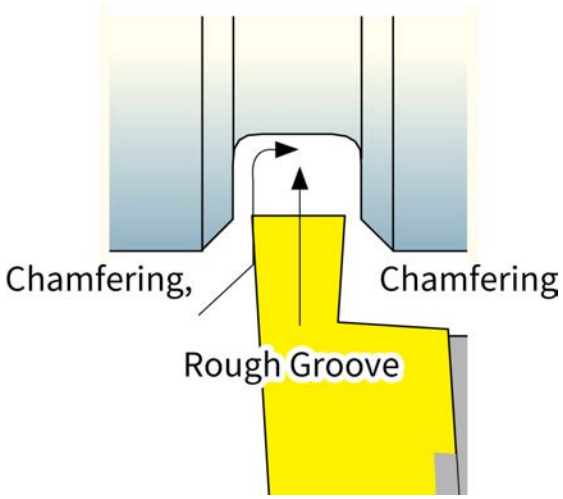
ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	TM4						
Cutting speed (SFM)		100 - 195 - 260			165 - 230 - 330	165 - 330 - 560	165 - 260 - 430	
Feed rate (IPR) a: X Direction b: Z Direction	Shank diameter ϕ.236	a: .0004 - .002			a: .0004 - .002	a: .0004 - .0024	a: .0004 - .0024	
		b: .0004 - .0008			b: .0004 - .0008	b: .0004 - .0008	b: .0004 - .0008	
	Shank diameter ϕ.315	a: .0004 - .0028			a: .0004 - .0028	a: .0004 - .003	a: .0004 - .0028	
		b: .0004 - .0008			b: .0004 - .0008	b: .0004 - .0008	b: .0004 - .0008	

*DOC when side turning .004"

General Information

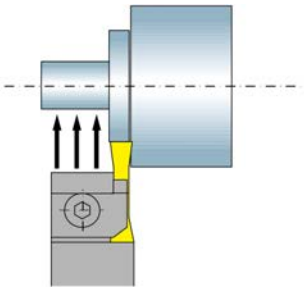


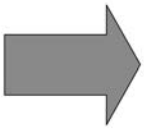
NTK GTMT / GTMH series can be used for uneven diameter grooving thanks to the 2 degree mounting angle designed on the toolholder



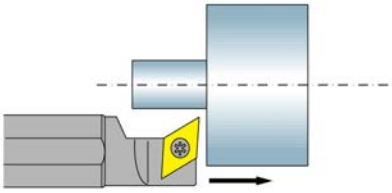
Chamfering and radius machining can be done after the rough grooving operation at the center of the groove

Rough Plunging for OD Turning

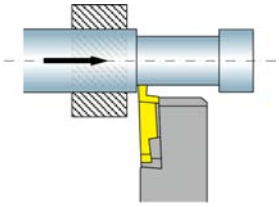




ISO insert on a DS Toolholder for finishing process

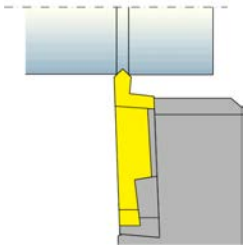


Side Turning



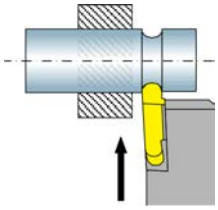
GTMX32□□□RT
GTMH32□□□RVT

90 Degree V-style



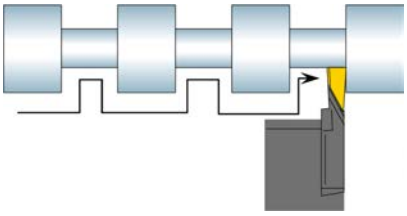
GTMX32V90R□□□

Full Radius

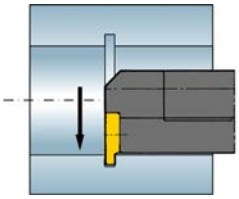


GTMH32□□□RE□□
GTMA43□□□R□□

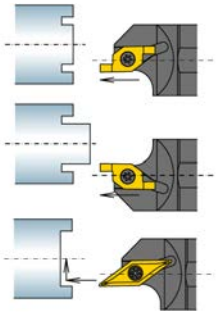
Spool Grooving



ID Grooving

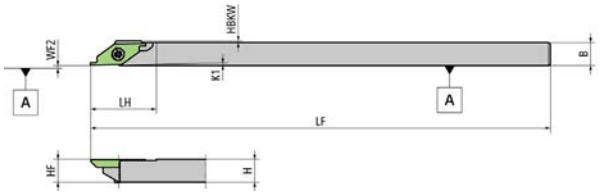


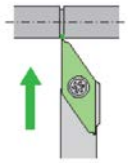
Face Grooving



OD Grooving
CSVG.. series/Toolholder

CSV [91°] For Cam-style machine





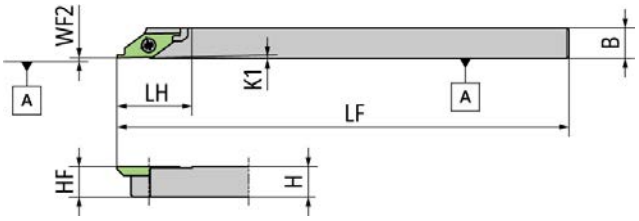
● Diagram shows right-hand tool

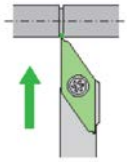
Item Number	Hand	B	H	HBKW	HF	K1	LF	LH	WF2	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
CSVR07	R	.276	.276	.020	.276	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR07GX	R	.276	.276	.020	.276	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08	R	.315	.315	.000	.315	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08GX	R	.315	.315	.000	.315	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR095	R	.374	.374	.000	.374	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR10	R	.394	.394	.000	.394	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR12	R	.472	.472	.000	.472	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR12GX	R	.472	.472	.000	.472	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL07	L	.276	.276	.020	.276	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL08	L	.315	.315	.000	.315	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL10	L	.394	.394	.000	.394	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CSVR07	LRIS-2.5*7	CLR-15S
CSVR07GX	LRIS-2.5*7	CLR-15S
CSVR08	LRIS-2.5*7	CLR-15S
CSVR08GX	LRIS-2.5*7	CLR-15S
CSVR095	LRIS-2.5*7	CLR-15S
CSVR10	LRIS-2.5*7	CLR-15S
CSVR12	LRIS-2.5*7	CLR-15S
CSVR12GX	LRIS-2.5*7	CLR-15S
CSVL07	LRIS-2.5*7	CLR-15S
CSVL08	LRIS-2.5*7	CLR-15S
CSVL10	LRIS-2.5*7	CLR-15S

CSV-NC [91°] For Gang-style machine





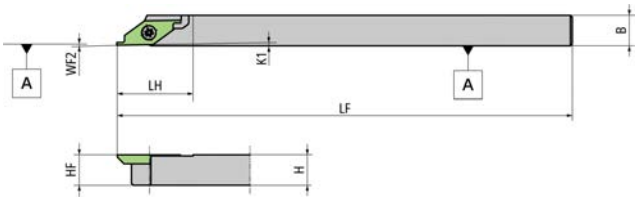
● Diagram shows right-hand tool

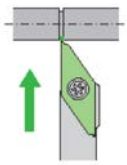
Item Number	Hand	B	H	HF	K1	LF	LH	WF2	Insert Gage	
		inch	inch	inch	°	inch	inch	inch		
CSVR06-IN-NC	R	3/8	3/8	3/8	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08-IN-NC	R	1/2	1/2	1/2	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL06-IN-NC	L	3/8	3/8	3/8	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL08-IN-NC	L	1/2	1/2	1/2	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08NC	R	.315	.315	.315	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR10GXNC	R	.394	.394	.394	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR10NC	R	.394	.394	.394	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR12NC	R	.472	.472	.472	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL08NC	L	.315	.315	.315	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL10NC	L	.394	.394	.394	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL12NC	L	.472	.472	.472	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CSVR06-IN-NC	LRIS-2.5*7	CLR-15S
CSVR08-IN-NC	LRIS-2.5*7	CLR-15S
CSVL06-IN-NC	LRIS-2.5*7	CLR-15S
CSVL08-IN-NC	LRIS-2.5*7	CLR-15S
CSVR08NC	LRIS-2.5*7	CLR-15S
CSVR10GXNC	LRIS-2.5*7	CLR-15S
CSVR10NC	LRIS-2.5*7	CLR-15S
CSVR12NC	LRIS-2.5*7	CLR-15S
CSVL08NC	LRIS-2.5*7	CLR-15S
CSVL10NC	LRIS-2.5*7	CLR-15S
CSVL12NC	LRIS-2.5*7	CLR-15S

CSV-NC-F [91°] For Gang-style machine





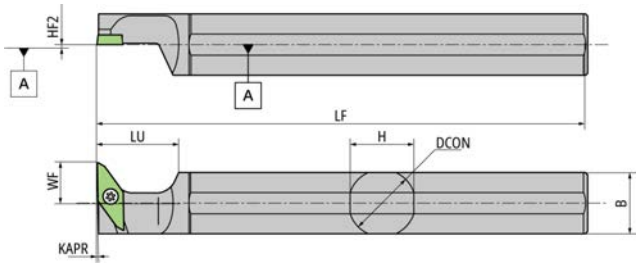
● Diagram shows right-hand tool

Item Number	Hand	B	H	HBKW	HF	K1	LF	LH	WF2	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
CSVR08NC-F	R	.315	.315	.000	.315	1	4.724	.787	.000-.004	CSVF../CSVB../CSVC..	CSVG../CSVT..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CSVR08NC-F	LRIS-2.5*7	CLR-15S

DS-CSVL [91°] DS Toolholders



● Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

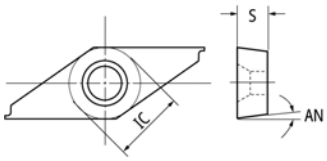
Item Number	Hand	B	DCON	H	HF2	KAPR	LF	LU	WF	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
DS-CSVL15	L	.591	5/8	.591	.000	91	4.724	.787	.394	CSVF../CSVB..	CSVG../CSVT..

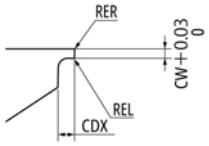
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-CSVL15	LRIS-2.5*7	CLR-15S

CSVG.. series/Inserts Carbide

CSVG





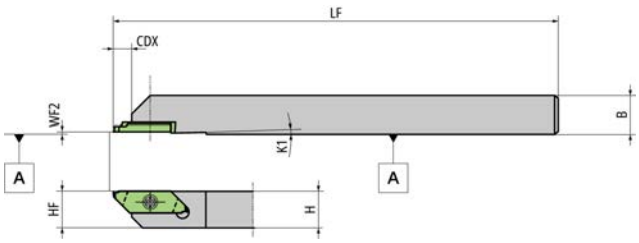
● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

Item Number	Hand	Chipbreaker	APMX	CDX	AN	CW	EPSR	IC	REL	RER	S	Carbide
												PVD
			inch	inch	°	inch	°	inch	inch	inch	inch	VM1
CSVG11FRV025 Ⓜ	R	No	.006	.020	7	.010	35	1/4	.000	.000	3/32	●
CSVG11FRV030 Ⓜ	R	No	.006	.020	7	.012	35	1/4	.000	.000	3/32	●
CSVG11FRV035 Ⓜ	R	No	.006	.020	7	.014	35	1/4	.000	.000	3/32	●
CSVG11FRV040 Ⓜ	R	No	.006	.020	7	.016	35	1/4	.000	.000	3/32	●
CSVG11FRV045 Ⓜ	R	No	.018	.039	7	.018	35	1/4	.000	.000	3/32	●
CSVG11FRV050 Ⓜ	R	No	.018	.039	7	.020	35	1/4	.000	.000	3/32	●
CSVG11FRV055 Ⓜ	R	No	.018	.039	7	.022	35	1/4	.000	.000	3/32	●
CSVG11FRV060 Ⓜ	R	No	.018	.039	7	.024	35	1/4	.000	.000	3/32	●
CSVG11FRV065 Ⓜ	R	No	.018	.039	7	.026	35	1/4	.000	.000	3/32	●
CSVG11FRV070 Ⓜ	R	No	.018	.039	7	.028	35	1/4	.000	.000	3/32	●
CSVG11FRV075 Ⓜ	R	No	.055	.079	7	.030	35	1/4	.000	.000	3/32	●
CSVG11FRV080 Ⓜ	R	No	.055	.079	7	.031	35	1/4	.000	.000	3/32	●
CSVG11FRV085 Ⓜ	R	No	.055	.079	7	.033	35	1/4	.000	.000	3/32	●
CSVG11FRV090 Ⓜ	R	No	.055	.079	7	.035	35	1/4	.000	.000	3/32	●
CSVG11FRV095 Ⓜ	R	No	.055	.079	7	.037	35	1/4	.000	.000	3/32	●
CSVG11FRV100 Ⓜ	R	No	.055	.079	7	.039	35	1/4	.000	.000	3/32	●
CSVG11FRV110 Ⓜ	R	No	.102	.118	7	.043	35	1/4	.000	.000	3/32	●
CSVG11FRV120 Ⓜ	R	No	.102	.118	7	.047	35	1/4	.000	.000	3/32	●
CSVG11FRV130 Ⓜ	R	No	.102	.118	7	.051	35	1/4	.000	.000	3/32	●
CSVG11FRV140 Ⓜ	R	No	.102	.118	7	.055	35	1/4	.000	.000	3/32	●
CSVG11FRV150 Ⓜ	R	No	.102	.118	7	.059	35	1/4	.000	.000	3/32	●
CSVG11FLV075 Ⓜ	L	No	.055	.079	7	.030	35	1/4	.000	.000	3/32	●
CSVG11FLV095 Ⓜ	L	No	.055	.079	7	.037	35	1/4	.000	.000	3/32	●
CSVG11FLV120 Ⓜ	L	No	.102	.118	7	.047	35	1/4	.000	.000	3/32	●

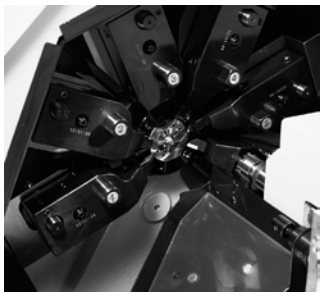
OD Grooving

GTPS.. series/Toolholder

CTPS



● Diagram shows right-hand tool



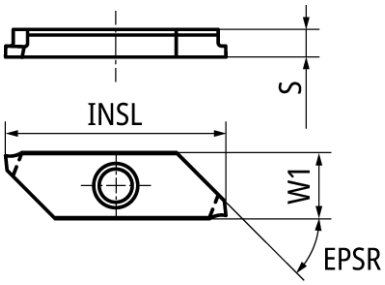
Item Number	Hand	B	CDX	H	HF	K1	LF	WF2	Insert Gage	
		inch	inch	inch	inch	°	inch	inch		
CTPSR06-IN	R	3/8	.197	3/8	3/8	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..
CTPSR08-IN	R	1/2	.197	1/2	1/2	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..
CTPSR10	R	.394	.197	.394	.394	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..
CTPSR12	R	.472	.197	.472	.472	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..

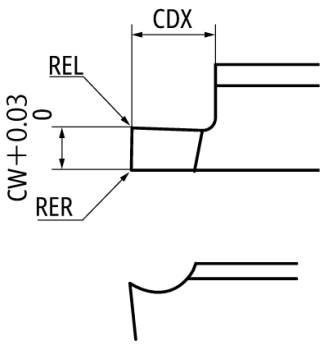
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTPSR06-IN	LRIS-2.5*7	CLR-15S
CTPSR08-IN	LRIS-2.5*7	CLR-15S
CTPSR10	LRIS-2.5*7	CLR-15S
CTPSR12	LRIS-2.5*7	CLR-15S

GTPS.. series/Inserts Carbide

GTPS



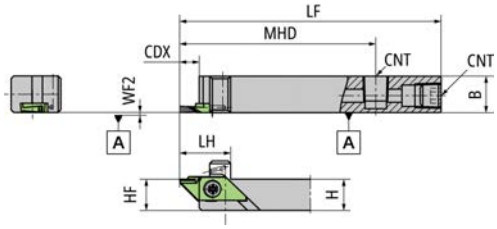


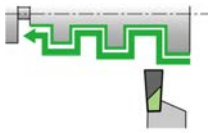
● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

Item Number	Hand	Chipbreaker	APMX	CDX	CW	EPSR	INSL	REL	RER	S	W1	Carbide	
												PVD	
			inch	inch	inch	°	inch	inch	inch	inch	inch	VM1	ZM3
GTPS075FR	R	Yes	.039	.059	.030	45	.787	.000	.000	.098	.236	●	●
GTPS095FR	R	Yes	.059	.079	.037	45	.787	.000	.000	.098	.236	●	●
GTPS100FR	R	Yes	.059	.079	.039	45	.787	.000	.000	.098	.236	●	●
GTPS120FR	R	Yes	.098	.118	.047	45	.787	.000	.000	.098	.236	●	●
GTPS150FR	R	Yes	.098	.118	.059	45	.787	.000	.000	.098	.236	●	●
GTPS200FR	R	Yes	.098	.118	.079	45	.787	.000	.000	.098	.236	●	●

OD Grooving Side-Turning | GTPA.. series/Toolholder

GTPA-OH Coolant hose connection type





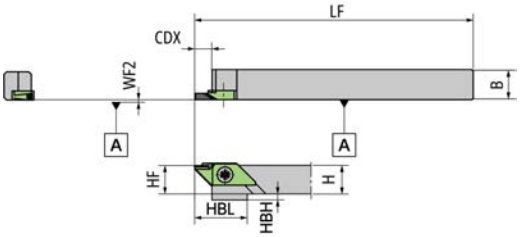
・Diagram shows right-hand tool

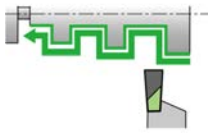
Item Number	Hand	B	CDX	CNT	H	HF	LF	LH	MHD	WF2	Insert Gage
		inch	inch		inch	inch	inch	inch	inch	inch	
GTPAR1214H-OH	R	.551	.295	Rc1/8	.472	.472	3.937	.768	2.953	.004	GTPA..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
GTPAR1214H-OH	LRIS-4*12PW	SPR1/8	CLR-15S

GTPA





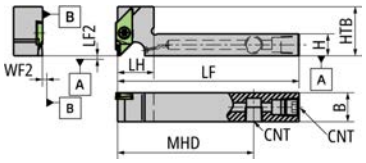
・Diagram shows right-hand tool

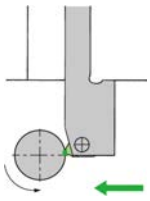
Item Number	Hand	B	CDX	H	HBH	HBL	HF	LF	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	inch	
GTPAR1010	R	.394	.295	.394	.079	.768	.394	4.724	.004	GTPA..
GTPAR1212	R	.472	.295	.472	–	–	.472	4.724	.004	GTPA..
GTPAR1616	R	.630	.295	.630	–	–	.630	4.724	.004	GTPA..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
GTPAR1010	LRIS-4*10PW	CLR-15S
GTPAR1212	LRIS-4*12PW	CLR-15S
GTPAR1616	LRIS-4*12PW	CLR-15S

Y-GTPA-OH Y-axis Coolant hose connection type





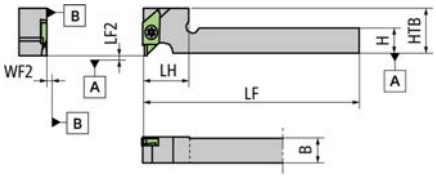
・Diagram shows right-hand tool
NOTE: Use a right-handed (R) insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

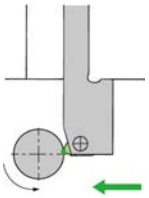
Item Number	Hand	B	CNT	H	HTB	LF	LF2	LH	MHD	WF2	Insert Gage
		inch		inch	inch	inch	inch	inch	inch	inch	
Y-GTPAR1014FSS-OH	R	.551	M6*1	.394	1.063	3.150	.000	.591	2.165	.004	GTPA..
Y-GTPAR1216HS-OH	R	.630	Rc1/8	.472	1.063	3.937	.000	.787	2.953	.004	GTPA..
Y-GTPAR1616H-OH	R	.630	Rc1/8	.630	1.063	3.937	.000	.984	2.953	.004	GTPA..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
Y-GTPAR1014FSS-OH	LRIS-4*12PW	SS0605SC	CLR-15S
Y-GTPAR1216HS-OH	LRIS-4*12PW	SPR1/8	CLR-15S
Y-GTPAR1616H-OH	LRIS-4*12PW	SPR1/8	CLR-15S

Y-GTPA Y-axis





・Diagram shows right-hand tool
NOTE: Use a right-handed (R) insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

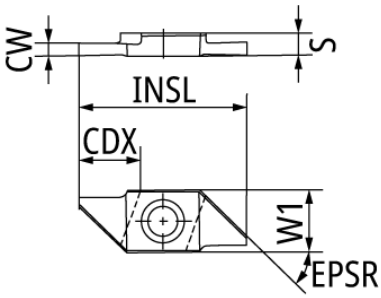
Item Number	Hand	B	H	HTB	LF	LF2	LH	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	
Y-GTPAR1216	R	.630	.472	1.063	4.724	.000	.787	.004	GTPA..

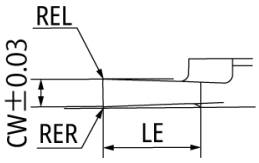
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
Y-GTPAR1216	LRIS-4*12PW	CLR-15S

GTPA.. series/Inserts Carbide

GTPA.. Carbide





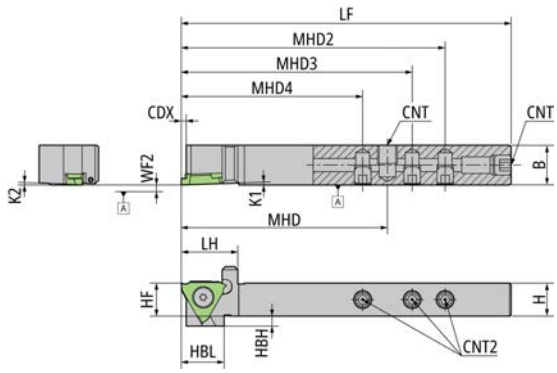
・Diagram shows right-hand tool

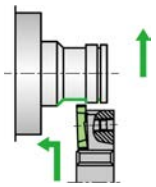
Item Number	Hand	Chipbreaker	APMX	CDX	CW	EPSR	INSL	LE	REL	RER	S	W1	Carbide
			inch	inch	inch	°	inch	inch	inch	inch	inch	inch	KM1
GTPA20FRN01	R	Yes	.236	.362	.079	45	(.984)	.276	.004MAX	.004MAX	.138	.370	●
GTPA25FRN01	R	Yes	.236	.362	.098	45	(.984)	.276	.004MAX	.004MAX	.138	.370	●

OD Grooving

GTMH(X)32.. series/Toolholder

GTT-OH3 Direct connect coolant port 3-hole type





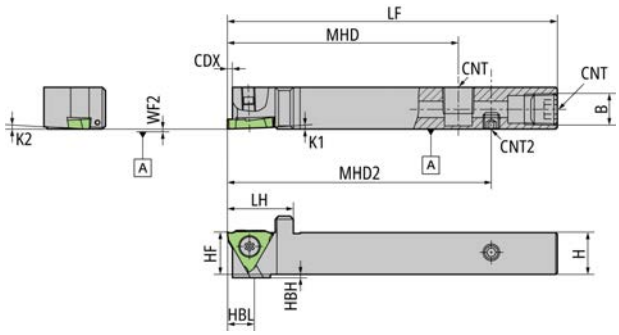
・Diagram shows right-hand tool

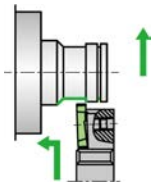
Item Number	Hand	B	CDX	CNT	CNT2	H	HBH	HBL	HF	K1	K2	LF	LH	MHD	MHD2	MHD3	MHD4	WF2	Insert Gage	
		inch	inch			inch	inch	inch	inch	°	°	inch	inch	inch	inch	inch	inch	inch		
GTTR10XB-IN-OH3	R	5/8	.106	NPT1/8	M5	5/8	–	–	5/8	2	2	4.724	.787	3.100	3.937	3.445	2.756	.000	GT..32..	TBMH32..
GTTR1012H00-OH3	R	.472	.071	Rc1/8	M5	.394	.118	.512	.394	2	2	3.937	.675	2.461	3.150	2.756	2.165	.000	GT..32..	TBMH32..
GTTR16X00-OH3	R	.630	.106	Rc1/8	M5	.630	–	–	.630	2	2	4.724	.787	3.100	3.937	3.445	2.756	.000	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
GTTR10XB-IN-OH3	LR-S-4*10PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
GTTR1012H00-OH3	LR-S-4*10PW	SS0605SC	SS0505SC	CLR-15S	LW-2.5
GTTR16X00-OH3	LR-S-4*10PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5

GTT-OH2 Direct connect coolant port 1-hole type





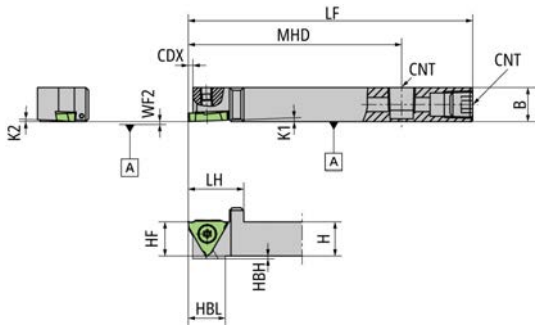
・Diagram shows right-hand tool

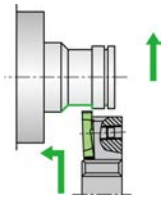
Item Number	Hand	B	CDX	CNT	CNT2	H	HBH	HBL	HF	K1	K2	LF	LH	MHD	MHD2	WF2	Insert Gage	
		inch	inch			inch	inch	inch	inch	°	°	inch	inch	inch	inch	inch		
GTTR08HA-IN-OH2	R	1/2	.071	NPT1/8	M5	1/2	.039	.512	1/2	2	2	3.937	.787	2.756	3.150	.000	GT..32..	TBMH32..
GTTR08HB-IN-OH2	R	1/2	.106	NPT1/8	M5	1/2	.039	.512	1/2	2	2	3.937	.787	2.756	3.150	.000	GT..32..	TBMH32..
GTTR10XA-IN-OH2	R	5/8	.071	NPT1/8	M5	5/8	–	–	5/8	2	2	3.937	.787	2.756	3.937	.000	GT..32..	TBMH32..
GTTR10XB-IN-OH2	R	5/8	.106	NPT1/8	M5	5/8	–	–	5/8	2	2	4.724	.787	2.756	3.937	.000	GT..32..	TBMH32..
GTTR12H00-OH2	R	.472	.071	Rc1/8	M5	.472	.039	.512	.472	2	2	3.937	.768	2.756	3.150	.000	GT..32..	TBMH32..
GTTR16X00-OH2	R	.630	.071	Rc1/8	M5	.630	–	–	.630	2	2	4.724	.768	2.756	3.937	.000	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
GTTR08HA-IN-OH2	LR-S-4*10PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
GTTR08HB-IN-OH2	LR-S-4*10PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
GTTR10XA-IN-OH2	LR-S-4*10PW	SPNPT1/8L	SS0505SC	CLR-15S	LW-2.5
GTTR10XB-IN-OH2	LR-S-4*10PW	SPNPT1/8L	SS0505SC	CLR-15S	LW-2.5
GTTR12H00-OH2	LR-S-4*10PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5
GTTR16X00-OH2	LR-S-4*10PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5

GTT-OH Coolant hose connection type





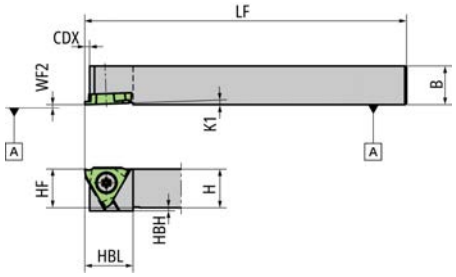
・Diagram shows right-hand tool

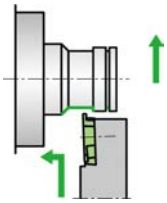
Item Number	Hand	B	CDX	CNT	H	HBH	HBL	HF	K1	K2	LF	LH	MHD	WF2	Insert Gage	
		inch	inch		inch	inch	inch	inch	°	°	inch	inch	inch	inch		
GTTR08HA-IN-OH	R	1/2	.071	NPT1/8	1/2	.039	.512	1/2	2	2	3.937	.768	2.953	.000	GT..32..	TBMH32..
GTTR08HB-IN-OH	R	1/2	.106	NPT1/8	1/2	.039	.512	1/2	2	2	3.937	.768	2.953	.000	GT..32..	TBMH32..
GTTR10HA-IN-OH	R	5/8	.071	NPT1/8	5/8	–	–	5/8	2	2	3.937	.768	2.953	.000	GT..32..	TBMH32..
GTTR10HB-IN-OH	R	5/8	.106	NPT1/8	5/8	–	–	5/8	2	2	4.724	.768	2.953	.000	GT..32..	TBMH32..
GTTR1012H00-OH	R	.472	.063	M6*1	.394	.039	.512	.394	2	2	3.937	.768	2.756	.000	GT..32..	TBMH32..
GTTR12H00-OH	R	.472	.063	Rc1/8	.472	.039	.512	.472	2	2	3.937	.768	2.756	.000	GT..32..	TBMH32..
GTTR16H00-OH	R	.630	.063	Rc1/8	.630	–	–	.630	2	2	3.937	.768	2.756	.000	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
GTTR08HA-IN-OH	LR-S-4*10PW	SPNPT1/8	CLR-15S
GTTR08HB-IN-OH	LR-S-4*10PW	SPNPT1/8	CLR-15S
GTTR10HA-IN-OH	LR-S-4*10PW	SPNPT1/8	CLR-15S
GTTR10HB-IN-OH	LR-S-4*10PW	SPNPT1/8	CLR-15S
GTTR1012H00-OH	LR-S-4*10PW	SS0605SC	CLR-15S
GTTR12H00-OH	LR-S-4*10PW	SPR1/8	CLR-15S
GTTR16H00-OH	LR-S-4*10PW	SPR1/8	CLR-15S

GTT





・Diagram shows right-hand tool

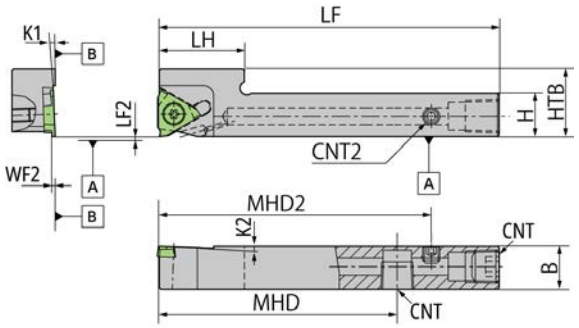
Item Number	Hand	B	CDX	H	HBH	HBL	HF	K1	K2	LF	WF2	Insert Gage	
		inch	inch	inch	inch	inch	inch	°	°	inch	inch		
GTTR06A-IN	R	3/8	.071	3/8	.118	.591	3/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTR06B-IN	R	3/8	.106	3/8	.118	.591	3/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTR08A-IN	R	1/2	.071	1/2	.039	.591	1/2	2	2	4.724	.000	GT..32..	TBMH32..
GTTR08B-IN	R	1/2	.106	1/2	.039	.591	1/2	2	2	4.724	.000	GT..32..	TBMH32..
GTTR10A-IN	R	5/8	.071	5/8	–	–	5/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTR10B-IN	R	5/8	.106	5/8	–	–	5/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTR12A-IN	R	3/4	.071	3/4	–	–	3/4	2	2	4.724	.000	GT..32..	TBMH32..
GTTR12B-IN	R	3/4	.106	3/4	–	–	3/4	2	2	4.724	.000	GT..32..	TBMH32..
GTTL06A-IN	L	3/8	.071	3/8	.118	.591	3/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTL06B-IN	L	3/8	.106	3/8	.118	.591	3/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTL08A-IN	L	1/2	.071	1/2	.039	.591	1/2	2	2	4.724	.000	GT..32..	TBMH32..
GTTL08B-IN	L	1/2	.106	1/2	.039	.591	1/2	2	2	4.724	.000	GT..32..	TBMH32..
GTTL10A-IN	L	5/8	.071	5/8	–	–	5/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTL10B-IN	L	5/8	.106	5/8	–	–	5/8	2	2	4.724	.000	GT..32..	TBMH32..
GTTR0810F00	R	.394	.063	.315	.197	.591	.315	2	2	3.150	.000	GT..32..	TBMH32..
GTTR0810K00	R	.394	.063	.315	.197	.591	.315	2	2	4.724	.000	GT..32..	TBMH32..
GTTR08F00	R	.315	.063	.315	.197	.591	.315	2	2	3.150	.000	GT..32..	TBMH32..
GTTR08K00	R	.315	.063	.315	.197	.591	.315	2	2	4.724	.000	GT..32..	TBMH32..

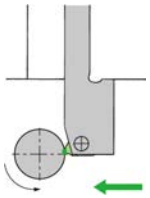
Item Number	Hand	B	CDX	H	HBH	HBL	HF	K1	K2	LF	WF2	Insert Gage	
		inch	inch	inch	inch	inch	inch	°	°	inch	inch		
GTTR10F00	R	.394	.063	.394	.118	.591	.394	2	2	3.150	.000	GT..32..	TBMH32..
GTTR10F15	R	.394	.106	.394	.118	.591	.394	2	2	3.150	.000	GT..32..	TBMH32..
GTTR10F25	R	.394	.106	.394	.118	.591	.394	2	2	3.150	.000	GT..32..	TBMH32..
GTTR10K00	R	.394	.063	.394	.118	.591	.394	2	2	4.724	.000	GT..32..	TBMH32..
GTTR10K15	R	.394	.106	.394	.118	.591	.394	2	2	4.724	.000	GT..32..	TBMH32..
GTTR10K25	R	.394	.106	.394	.118	.591	.394	2	2	4.724	.000	GT..32..	TBMH32..
GTTR12F00	R	.472	.063	.472	.039	.591	.472	2	2	3.150	.000	GT..32..	TBMH32..
GTTR12F15	R	.472	.106	.472	.039	.591	.472	2	2	3.150	.000	GT..32..	TBMH32..
GTTR12F25	R	.472	.106	.472	.039	.591	.472	2	2	3.150	.000	GT..32..	TBMH32..
GTTR12K00	R	.472	.063	.472	.039	.591	.472	2	2	4.724	.000	GT..32..	TBMH32..
GTTR12K15	R	.472	.106	.472	.039	.591	.472	2	2	4.724	.000	GT..32..	TBMH32..
GTTR12K25	R	.472	.106	.472	.039	.591	.472	2	2	4.724	.000	GT..32..	TBMH32..
GTTR16H00	R	.630	.063	.630	–	–	.630	2	2	3.937	.000	GT..32..	TBMH32..
GTTR16H15	R	.630	.106	.630	–	–	.630	2	2	3.937	.000	GT..32..	TBMH32..
GTTR16H25	R	.630	.106	.630	–	–	.630	2	2	3.937	.000	GT..32..	TBMH32..
GTTR16K00	R	.630	.063	.630	–	–	.630	2	2	4.724	.000	GT..32..	TBMH32..
GTTR16K15	R	.630	.106	.630	–	–	.630	2	2	4.724	.000	GT..32..	TBMH32..
GTTR16K25	R	.630	.106	.630	–	–	.630	2	2	4.724	.000	GT..32..	TBMH32..
GTTR20K00	R	.787	.063	.787	–	–	.787	2	2	4.921	.000	GT..32..	TBMH32..
GTTR25M00	R	.984	.063	.984	–	–	.984	2	2	5.906	.000	GT..32..	TBMH32..
GTTL08F00	L	.315	.063	.315	.197	.591	.315	2	2	3.150	.000	GT..32..	TBMH32..
GTTL08K00	L	.315	.063	.315	.197	.591	.315	2	2	4.724	.000	GT..32..	TBMH32..
GTTL10F00	L	.394	.063	.394	.118	.591	.394	2	2	3.150	.000	GT..32..	TBMH32..
GTTL10F15	L	.394	.106	.394	.118	.591	.394	2	2	3.150	.000	GT..32..	TBMH32..
GTTL10F25	L	.394	.106	.394	.118	.591	.394	2	2	3.150	.000	GT..32..	TBMH32..
GTTL10K00	L	.394	.063	.394	.118	.591	.394	2	2	4.724	.000	GT..32..	TBMH32..
GTTL10K15	L	.394	.106	.394	.118	.591	.394	2	2	4.724	.000	GT..32..	TBMH32..
GTTL10K25	L	.394	.106	.394	.118	.591	.394	2	2	4.724	.000	GT..32..	TBMH32..
GTTL12F00	L	.472	.063	.472	.039	.591	.472	2	2	3.150	.000	GT..32..	TBMH32..
GTTL12F15	L	.472	.106	.472	.039	.591	.472	2	2	3.150	.000	GT..32..	TBMH32..
GTTL12F25	L	.472	.106	.472	.039	.591	.472	2	2	3.150	.000	GT..32..	TBMH32..
GTTL12K00	L	.472	.063	.472	.039	.591	.472	2	2	4.724	.000	GT..32..	TBMH32..
GTTL12K15	L	.472	.106	.472	.039	.591	.472	2	2	4.724	.000	GT..32..	TBMH32..
GTTL12K25	L	.472	.106	.472	.039	.591	.472	2	2	4.724	.000	GT..32..	TBMH32..
GTTL16H00	L	.630	.063	.630	–	–	.630	2	2	3.937	.000	GT..32..	TBMH32..
GTTL16H15	L	.630	.106	.630	–	–	.630	2	2	3.937	.000	GT..32..	TBMH32..
GTTL16H25	L	.630	.106	.630	–	–	.630	2	2	3.937	.000	GT..32..	TBMH32..
GTTL16K00	L	.630	.063	.630	–	–	.630	2	2	4.724	.000	GT..32..	TBMH32..
GTTL16K15	L	.630	.106	.630	–	–	.630	2	2	4.724	.000	GT..32..	TBMH32..
GTTL16K25	L	.630	.106	.630	–	–	.630	2	2	4.724	.000	GT..32..	TBMH32..
GTTL20K00	L	.787	.063	.787	–	–	.787	2	2	4.921	.000	GT..32..	TBMH32..
GTTL25M00	L	.984	.063	.984	–	–	.984	2	2	5.906	.000	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
GTTR06A-IN	LR-S-4*10PW	CLR-15S
GTTR06B-IN	LR-S-4*10PW	CLR-15S
GTTR08A-IN	LR-S-4*10PW	CLR-15S
GTTR08B-IN	LR-S-4*10PW	CLR-15S
GTTR10A-IN	LR-S-4*10PW	CLR-15S
GTTR10B-IN	LR-S-4*10PW	CLR-15S
GTTR12A-IN	LR-S-4*10PW	CLR-15S
GTTR12B-IN	LR-S-4*10PW	CLR-15S
GTTL06A-IN	LR-S-4*10PW	CLR-15S
GTTL06B-IN	LR-S-4*10PW	CLR-15S
GTTL08A-IN	LR-S-4*10PW	CLR-15S
GTTL08B-IN	LR-S-4*10PW	CLR-15S
GTTL10A-IN	LR-S-4*10PW	CLR-15S
GTTL10B-IN	LR-S-4*10PW	CLR-15S
GTTR0810F00	LR-S-4*10PW	CLR-15S
GTTR0810K00	LR-S-4*10PW	CLR-15S
GTTR08F00	LR-S-4*10PW	CLR-15S
GTTR08K00	LR-S-4*10PW	CLR-15S
GTTR10F00	LR-S-4*10PW	CLR-15S
GTTR10F15	LR-S-4*10PW	CLR-15S
GTTR10F25	LR-S-4*10PW	CLR-15S
GTTR10K00	LR-S-4*10PW	CLR-15S
GTTR10K15	LR-S-4*10PW	CLR-15S
GTTR10K25	LR-S-4*10PW	CLR-15S
GTTR12F00	LR-S-4*10PW	CLR-15S
GTTR12F15	LR-S-4*10PW	CLR-15S
GTTR12F25	LR-S-4*10PW	CLR-15S
GTTR12K00	LR-S-4*10PW	CLR-15S
GTTR12K15	LR-S-4*10PW	CLR-15S
GTTR12K25	LR-S-4*10PW	CLR-15S
GTTR16H00	LR-S-4*10PW	CLR-15S
GTTR16H15	LR-S-4*10PW	CLR-15S
GTTR16H25	LR-S-4*10PW	CLR-15S
GTTR16K00	LR-S-4*10PW	CLR-15S
GTTR16K15	LR-S-4*10PW	CLR-15S
GTTR16K25	LR-S-4*10PW	CLR-15S
GTTR20K00	LR-S-4*10PW	CLR-15S
GTTR25M00	LR-S-4*10PW	CLR-15S
GTTL08F00	LR-S-4*5.8	CLR-15S
GTTL08K00	LR-S-4*5.8	CLR-15S
GTTL10F00	LR-S-4*10PW	CLR-15S
GTTL10F15	LR-S-4*10PW	CLR-15S
GTTL10F25	LR-S-4*10PW	CLR-15S
GTTL10K00	LR-S-4*10PW	CLR-15S
GTTL10K15	LR-S-4*10PW	CLR-15S
GTTL10K25	LR-S-4*10PW	CLR-15S
GTTL12F00	LR-S-4*10PW	CLR-15S
GTTL12F15	LR-S-4*10PW	CLR-15S
GTTL12F25	LR-S-4*10PW	CLR-15S
GTTL12K00	LR-S-4*10PW	CLR-15S
GTTL12K15	LR-S-4*10PW	CLR-15S
GTTL12K25	LR-S-4*10PW	CLR-15S
GTTL16H00	LR-S-4*10PW	CLR-15S
GTTL16H15	LR-S-4*10PW	CLR-15S
GTTL16H25	LR-S-4*10PW	CLR-15S
GTTL16K00	LR-S-4*10PW	CLR-15S
GTTL16K15	LR-S-4*10PW	CLR-15S
GTTL16K25	LR-S-4*10PW	CLR-15S
GTTL20K00	LR-S-4*10PW	CLR-15S
GTTL25M00	LR-S-4*10PW	CLR-15S

Y-GTT-OH2 Direct connect coolant port 1-hole type Y-axis





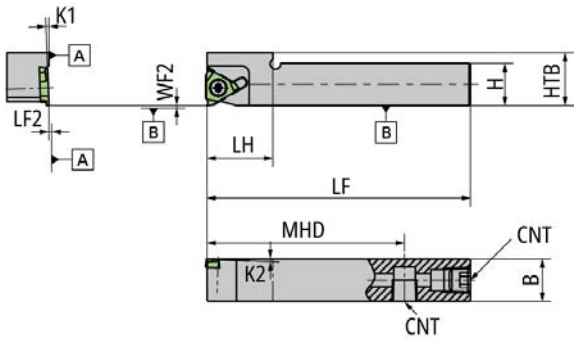
● Diagram shows right-hand tool
NOTE: Use a right-handed (R) or non-handed insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

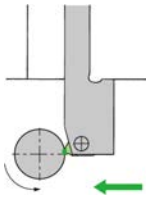
Item Number	Hand	B	CNT	CNT2	H	HTB	K1	K2	LF	LF2	LH	MHD	MHD2	WF2	Insert Gage	
		inch			inch	inch	°	°	inch	inch	inch	inch	inch	inch		
Y-GTTR08H-IN-OH2	R	1/2	NPT1/8	M5	1/2	.787	2	2	3.937	.000	.984	2.756	3.150	.000	GT..32..	TBMH32..
Y-GTTR12H00S-OH2	R	.472	Rc1/8	M5	.472	.787	2	2	3.937	.000	.787	2.756	3.150	.000	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
Y-GTTR08H-IN-OH2	LR-S-4*10PW	SPNPT1/8	CLR-15S
Y-GTTR12H00S-OH2	LR-S-4*10PW	SPR1/8	CLR-15S

Y-GTT-OH Y-axis Coolant hose connection type





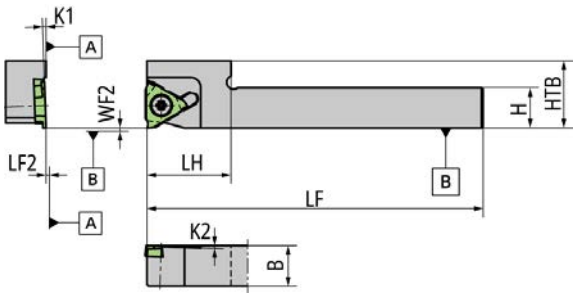
・Diagram shows right-hand tool
NOTE: Use a right-handed (R) insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

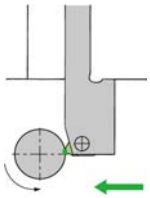
Item Number	Hand	B	CNT	H	HTB	K1	K2	LF	LF2	LH	MHD	WF2	Insert Gage	
		inch		inch	inch	°	°	inch	inch	inch	inch	inch		
Y-GTTR08H-IN-OH	R	1/2	NPT1/8	1/2	.787	2	2	3.937	.000	.984	2.953	.000	GT..32..	TBMH32..
Y-GTTR12H00S-OH	R	.472	Rc1/8	.472	.787	2	2	3.937	.000	.787	2.953	.000	GT..32..	TBMH32..
Y-GTTR16H00-OH	R	.630	Rc1/8	.630	.787	2	2	3.937	.000	.984	2.953	.000	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Wrench (for Clamp screw)
Y-GTTR08H-IN-OH	LR-S-4*10PW	SPNPT1/8	CLR-15S
Y-GTTR12H00S-OH	LR-S-4*10PW	SPR1/8	CLR-15S
Y-GTTR16H00-OH	LR-S-4*10PW	SPR1/8	CLR-15S

Y-GTT Y-axis





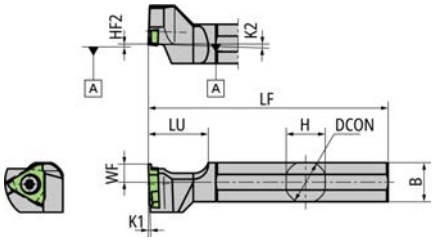
・Diagram shows right-hand tool
NOTE: Use a right-handed (R) insert.
NOTE: There is a risk of interference with the Y-axis holder depending on the combination of the maximum workpiece diameter and machining diameter.
→O27

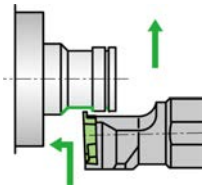
Item Number	Hand	B	H	HTB	K1	K2	LF	LF2	LH	WF2	Insert Gage	
		inch	inch	inch	°	°	inch	inch	inch	inch		
Y-GTTR06-IN	R	3/8	3/8	.787	2	2	4.724	.000	.984	.000	GT..32..	TBMH32..
Y-GTTR08-IN	R	1/2	1/2	.787	2	2	4.724	.000	.984	.000	GT..32..	TBMH32..
Y-GTTR10-IN	R	5/8	5/8	.787	2	2	4.724	.000	.984	.000	GT..32..	TBMH32..
Y-GTTR10MS	R	.394	.394	.787	2	2	4.724	.000	.866	.000	GT..32..	TBMH32..
Y-GTTR10S	R	.394	.394	.787	2	2	4.724	.000	.787	.000	GT..32..	TBMH32..
Y-GTTR12MS	R	.472	.472	.787	2	2	4.724	.000	.866	.000	GT..32..	TBMH32..
Y-GTTR12S	R	.472	.472	.787	2	2	4.724	.000	.787	.000	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
Y-GTTR06-IN	LR-S-4*10PW	CLR-15S
Y-GTTR08-IN	LR-S-4*10PW	CLR-15S
Y-GTTR10-IN	LR-S-4*10PW	CLR-15S
Y-GTTR10MS	LR-S-4*10PW	CLR-15S
Y-GTTR10S	LR-S-4*10PW	CLR-15S
Y-GTTR12MS	LR-S-4*10PW	CLR-15S
Y-GTTR12S	LR-S-4*10PW	CLR-15S

DS-GTT DS Toolholders





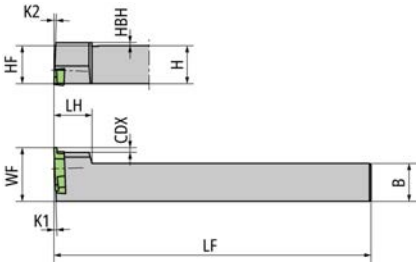
・Diagram shows left-hand tool
NOTE: Use a right-handed (R) insert.

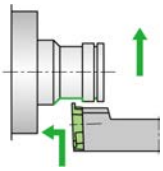
Item Number	Hand	B	DCON	H	HF2	K1	K2	LF	LU	WF	Insert Gage	
		inch	inch	inch	inch	°	°	inch	inch	inch		
DS-GTTL14F	L	.512	.551	.512	.000	2	2	3.150	.748	.236	GT..32..	TBMH32..
DS-GTTL15H	L	.591	5/8	.591	.000	2	2	3.937	.748	.236	GT..32..	TBMH32..
DS-GTTL16X	L	.591	.630	.591	.000	2	2	3.740	.748	.236	GT..32..	TBMH32..
DS-GTTL19	L	.709	3/4	.709	.000	2	2	4.724	.748	.236	GT..32..	TBMH32..
DS-GTTL20	L	.748	.787	.748	.000	2	2	4.724	.748	.236	GT..32..	TBMH32..
DS-GTTL22	L	.827	.866	.827	.000	2	2	4.724	.748	.236	GT..32..	TBMH32..
DS-GTTL25	L	.945	1.000	.945	.000	2	2	4.724	.748	.394	GT..32..	TBMH32..
DS-GTTL25-MET	L	.945	.984	.945	.000	2	2	5.906	.748	.394	GT..32..	TBMH32..
DS-GTTL32	L	1.181	1.260	1.181	.000	2	2	5.906	.748	.394	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-GTTL14F	LR-S-4*9	RLR-20S
DS-GTTL15H	LR-S-4*9	RLR-20S
DS-GTTL16X	LR-S-4*9	RLR-20S
DS-GTTL19	LR-S-4*9	RLR-20S
DS-GTTL20	LR-S-4*9	RLR-20S
DS-GTTL22	LR-S-4*9	RLR-20S
DS-GTTL25	LR-S-4*9	RLR-20S
DS-GTTL25-MET	LR-S-4*9	RLR-20S
DS-GTTL32	LR-S-4*9	RLR-20S

CH-GTT for horizontal gang style tool post





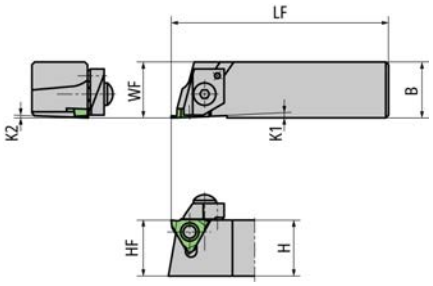
・Diagram shows left-hand tool
NOTE: Use a right-handed (R) insert.

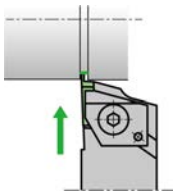
Item Number	Hand	B	CDX	H	HBH	HF	K1	K2	LF	LH	WF	Insert Gage	
		inch	inch	inch	inch	inch	°	°	inch	inch	inch		
CH-GTTL10H00	L	.394	.063	.394	.118	.394	2	2	3.937	.472	.591	GT..32..	TBMH32..
CH-GTTL12H00	L	.472	.063	.472	.039	.472	2	2	3.937	.472	.669	GT..32..	TBMH32..
CH-GTTL16H00	L	.630	.063	.630	–	.630	2	2	3.937	.472	.827	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CH-GTTL10H00	LR-S-4*9	RLR-20S
CH-GTTL12H00	LR-S-4*9	RLR-20S
CH-GTTL16H00	LR-S-4*9	RLR-20S

NGTN





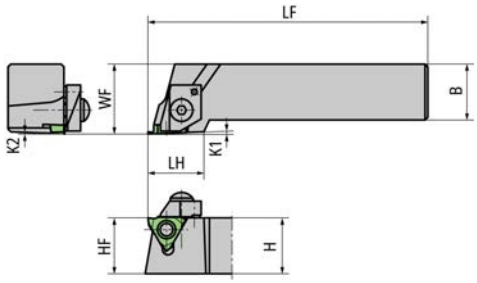
・Diagram shows right-hand tool

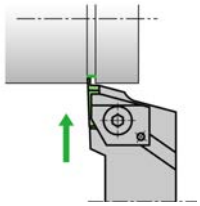
Item Number	Hand	B	CDX	CW	H	HF	K1	K2	LF	WF	Insert Gage	
		inch	inch	inch	inch	inch	°	°	inch	inch		
NGTNR161632-00	R	.630	.063	.012-.118	.630	.630	2	2	3.071	.630	GT..32..	TBMH32..
NGTNR161632-15	R	.630	.106	.057-.118	.630	.630	2	2	3.071	.630	GT..32..	TBMH32..
NGTNR161632-25	R	.630	.106	.098-.118	.630	.630	2	2	3.071	.630	GT..32..	TBMH32..
NGTNL161632-00	L	.630	.063	.012-.118	.630	.630	2	2	3.071	.630	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
NGTNR161632-00	CPR5S	AOS-5*20	ASG-5	LW-2.5
NGTNR161632-15	CPR5S	AOS-5*20	ASG-5	LW-2.5
NGTNR161632-25	CPR5S	AOS-5*20	ASG-5	LW-2.5
NGTNL161632-00	CPL5S	AOS-5*20	ASG-5	LW-2.5

NGTB





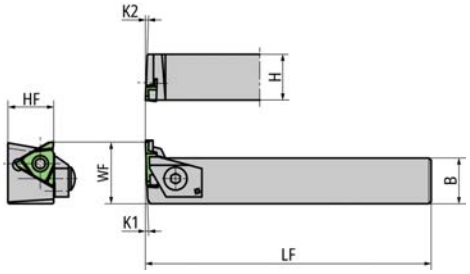
・Diagram shows right-hand tool

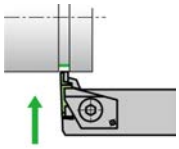
Item Number	Hand	B	CDX	CW	H	HF	K1	K2	LF	LH	WF	Insert Gage	
		inch	inch	inch	inch	inch	°	°	inch	inch	inch		
NGTBR202032-00S	R	.787	.063	.012-.118	.787	.787	2	2	4.921	.984	.984	GT..32..	TBMH32..
NGTBR202032-15S	R	.787	.106	.057-.118	.787	.787	2	2	4.921	.984	.984	GT..32..	TBMH32..
NGTBR202032-25S	R	.787	.106	.098-.118	.787	.787	2	2	4.921	.984	.984	GT..32..	TBMH32..
NGTBR252532-00S	R	.984	.063	.012-.118	.984	.984	2	2	5.906	.984	1.181	GT..32..	TBMH32..
NGTBR252532-15S	R	.984	.106	.057-.118	.984	.984	2	2	5.906	.984	1.181	GT..32..	TBMH32..
NGTBR252532-25S	R	.984	.106	.098-.118	.984	.984	2	2	5.906	.984	1.181	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
NGTBR202032-00S	CPR5	AOS-5*25	ASG-5	LW-2.5
NGTBR202032-15S	CPR5	AOS-5*25	ASG-5	LW-2.5
NGTBR202032-25S	CPR5	AOS-5*25	ASG-5	LW-2.5
NGTBR252532-00S	CPR5	AOS-5*25	ASG-5	LW-2.5
NGTBR252532-15S	CPR5	AOS-5*25	ASG-5	LW-2.5
NGTBR252532-25S	CPR5	AOS-5*25	ASG-5	LW-2.5

NGTA for horizontal gang style tool post





・Diagram shows left-hand tool
NOTE: Use a right-handed (R) insert.

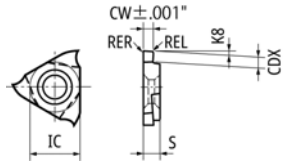
Item Number	Hand	B	CDX	CW	H	HF	K1	K2	LF	WF	Insert Gage	
		inch	inch	inch	inch	inch	°	°	inch	inch		
NGTAL202032-00S	L	.787	.063	.012-.118	.787	.787	2	2	4.921	.984	GT..32..	TBMH32..
NGTAL202032-15S	L	.787	.106	.057-.118	.787	.787	2	2	4.921	.984	GT..32..	TBMH32..

Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
NGTAL202032-00S	CPR5	AOS-5*25	ASG-5	LW-2.5
NGTAL202032-15S	CPR5	AOS-5*25	ASG-5	LW-2.5

OD Grooving | GTMH(X)32.. series/Inserts Carbide

GTMH32-GX Side Turning / 3D mold chipbreaker

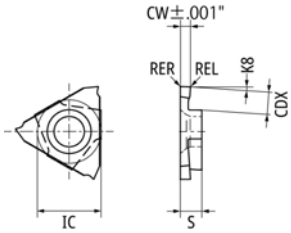


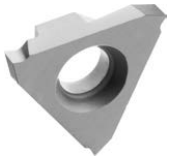
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	APMX※	CDX	CW	EPSR	GAN	IC	K8	REL	RER	S	Carbide			
													PVD			
			inch	inch	inch	°	°	inch	°	inch	inch	inch	650	DM4	ST4	TM4
GTMH32033RGX	R	Yes	.010	.024	.013	60	17	3/8	2	.002	.002	1/8		●	●	●
GTMH32043RGX	R	Yes	.035	.047	.017	60	17	3/8	2	.002	.002	1/8		●	●	●
GTMH32050RGX	R	Yes	.035	.047	.020	60	17	3/8	2	.002	.002	1/8	●	●	●	●
GTMH32053RGX	R	Yes	.035	.047	.021	60	17	3/8	2	.002	.002	1/8		●	●	●
GTMH32075RGX	R	Yes	.063	.079	.030	60	17	3/8	2	.002	.002	1/8	●	●	●	●
GTMH32095RGX	R	Yes	.063	.079	.037	60	17	3/8	2	.002	.002	1/8		●	●	●
GTMH32100RGX	R	Yes	.063	.079	.039	60	17	3/8	2	.002	.002	1/8	●	●	●	●
GTMH32100RGX01	R	Yes	.063	.079	.039	60	17	3/8	2	.004	.004	1/8	●	●	●	●
GTMH32150RGX	R	Yes	.106	.118	.059	60	17	3/8	2	.002	.002	1/8	●	●	●	●
GTMH32150RGX01	R	Yes	.106	.118	.059	60	17	3/8	2	.004	.004	1/8	●	●	●	●
GTMH32150RGX02	R	Yes	.106	.118	.059	60	17	3/8	2	.008	.008	1/8	●	●	●	●
GTMH32200RGX	R	Yes	.106	.118	.079	60	17	3/8	2	.002	.002	1/8	●	●	●	●
GTMH32200RGX01	R	Yes	.106	.118	.079	60	17	3/8	2	.004	.004	1/8	●	●	●	●
GTMH32200RGX02	R	Yes	.106	.118	.079	60	17	3/8	2	.008	.008	1/8	●	●	●	●
GTMH32300RGX	R	Yes	.106	.118	.118	60	17	3/8	2	.002	.002	1/8	●	●	●	●
GTMH32300RGX02	R	Yes	.106	.118	.118	60	17	3/8	2	.008	.008	1/8	●	●	●	●

※APMX : Depth of cut maximum

GTMX32-T Side Turning



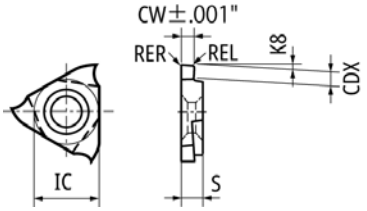


● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	APMX※	CDX	CW	EPSR	GAN	IC	K8	REL	RER	S	Carbide		
													PVD		
			inch	inch	inch	°	°	inch	°	inch	inch	inch	650	QM3	DT4
GTMX32030RT	R	Yes	.010	.024	.012	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32033RT	R	Yes	.010	.024	.013	60	14	3/8	2	.002	.002	1/8		●	
GTMX32043RT	R	Yes	.035	.047	.017	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32050RT	R	Yes	.035	.047	.020	60	14	3/8	2	.002	.002	1/8	●	●	●
GTMX32053RT	R	Yes	.035	.047	.021	60	14	3/8	2	.002	.002	1/8		●	
GTMX32065RT	R	Yes	.035	.047	.026	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32075RT	R	Yes	.063	.079	.030	60	14	3/8	2	.002	.002	1/8	●	●	●
GTMX32080RT	R	Yes	.063	.079	.031	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32095RT	R	Yes	.063	.079	.037	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32100RT	R	Yes	.063	.079	.039	60	14	3/8	2	.002	.002	1/8	●	●	●
GTMX32110RT	R	Yes	.063	.079	.043	60	14	3/8	2	.002	.002	1/8		●	
GTMX32120RT	R	Yes	.063	.079	.047	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32125RT	R	Yes	.063	.079	.049	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32130RT	R	Yes	.063	.079	.051	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32140RT	R	Yes	.063	.079	.055	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32145RT	R	Yes	.106	.118	.057	60	14	3/8	2	.002	.002	1/8		●	
GTMX32150RT	R	Yes	.106	.118	.059	60	14	3/8	2	.002	.002	1/8	●	●	●
GTMX32160RT	R	Yes	.106	.118	.063	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32175RT	R	Yes	.106	.118	.069	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32180RT	R	Yes	.106	.118	.071	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32200RT	R	Yes	.106	.118	.079	60	14	3/8	2	.002	.002	1/8	●	●	●
GTMX32250RT	R	Yes	.106	.118	.098	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32300RT	R	Yes	.106	.118	.118	60	14	3/8	2	.002	.002	1/8	●	●	●
GTMX32100RT01	R	Yes	.063	.079	.039	60	14	3/8	2	.004	.004	1/8	●	●	●
GTMX32120RT01	R	Yes	.063	.079	.047	60	14	3/8	2	.004	.004	1/8		●	●
GTMX32150RT01	R	Yes	.106	.118	.059	60	14	3/8	2	.004	.004	1/8		●	●
GTMX32200RT01	R	Yes	.106	.118	.079	60	14	3/8	2	.004	.004	1/8		●	●
GTMX32250RT01	R	Yes	.106	.118	.098	60	14	3/8	2	.004	.004	1/8		●	●
GTMX32150RT02	R	Yes	.106	.118	.059	60	14	3/8	2	.008	.008	1/8	●	●	●
GTMX32200RT02	R	Yes	.106	.118	.079	60	14	3/8	2	.008	.008	1/8	●	●	●
GTMX32250RT02	R	Yes	.106	.118	.098	60	14	3/8	2	.008	.008	1/8		●	●
GTMX32300RT02	R	Yes	.106	.118	.118	60	14	3/8	2	.008	.008	1/8	●	●	●
GTMX32075LT	L	Yes	.063	.079	.030	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32095LT	L	Yes	.063	.079	.037	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32150LT	L	Yes	.106	.118	.059	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32200LT	L	Yes	.106	.118	.079	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32250LT	L	Yes	.106	.118	.098	60	14	3/8	2	.002	.002	1/8		●	●
GTMX32200LT01	L	Yes	.106	.118	.079	60	14	3/8	2	.004	.004	1/8		●	●

※APMX : Depth of cut maximum

GTMH32-E

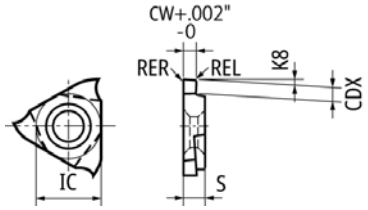


● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	APMX※	CDX	CW	EPSR	GAN	IC	K8	REL	RER	S	Carbide
													PVD
			inch	inch	inch	°	°	inch	°	inch	inch	inch	ZM3
GTMH32033RE	R	Yes	.012	.024	.013	60	20	3/8	2	.001	.001	1/8	●
GTMH32043RE	R	Yes	.035	.047	.017	60	20	3/8	2	.001	.001	1/8	●
GTMH32053RE	R	Yes	.035	.047	.021	60	20	3/8	2	.002	.002	1/8	●
GTMH32075RE	R	Yes	.063	.079	.030	60	20	3/8	2	.002	.002	1/8	●
GTMH32077RE	R	Yes	.063	.079	.030	60	20	3/8	2	.002	.002	1/8	●
GTMH32095RE	R	Yes	.063	.079	.037	60	20	3/8	2	.002	.002	1/8	●
GTMH32097RE	R	Yes	.063	.079	.038	60	20	3/8	2	.002	.002	1/8	●
GTMH32100RE	R	Yes	.063	.079	.039	60	20	3/8	2	.002	.002	1/8	●
GTMH32103RE	R	Yes	.063	.079	.041	60	20	3/8	2	.002	.002	1/8	●
GTMH32120RE	R	Yes	.063	.079	.047	60	20	3/8	2	.002	.002	1/8	●
GTMH32125RE	R	Yes	.063	.079	.049	60	20	3/8	2	.002	.002	1/8	●
GTMH32140RE	R	Yes	.063	.079	.055	60	20	3/8	2	.002	.002	1/8	●
GTMH32145RE	R	Yes	.106	.118	.057	60	20	3/8	2	.002	.002	1/8	●
GTMH32150RE	R	Yes	.106	.118	.059	60	20	3/8	2	.002	.002	1/8	●
GTMH32175RE	R	Yes	.106	.118	.069	60	20	3/8	2	.002	.002	1/8	●
GTMH32180RE	R	Yes	.106	.118	.071	60	20	3/8	2	.002	.002	1/8	●
GTMH32200RE	R	Yes	.106	.118	.079	60	20	3/8	2	.002	.002	1/8	●
GTMH32225RE	R	Yes	.106	.118	.089	60	20	3/8	2	.002	.002	1/8	●
GTMH32250RE	R	Yes	.106	.118	.098	60	20	3/8	2	.002	.002	1/8	●
GTMH32275RE	R	Yes	.106	.118	.108	60	20	3/8	2	.002	.002	1/8	●
GTMH32300RE	R	Yes	.106	.118	.118	60	20	3/8	2	.002	.002	1/8	●
GTMH32100RE01	R	Yes	.063	.079	.039	60	20	3/8	2	.004	.004	1/8	●
GTMH32120RE01	R	Yes	.063	.079	.047	60	20	3/8	2	.004	.004	1/8	●
GTMH32150RE01	R	Yes	.106	.118	.059	60	20	3/8	2	.004	.004	1/8	●
GTMH32200RE01	R	Yes	.106	.118	.079	60	20	3/8	2	.004	.004	1/8	●
GTMH32033LE	L	Yes	.012	.024	.013	60	20	3/8	2	.001	.001	1/8	●
GTMH32043LE	L	Yes	.035	.047	.017	60	20	3/8	2	.001	.001	1/8	●
GTMH32053LE	L	Yes	.035	.047	.021	60	20	3/8	2	.002	.002	1/8	●
GTMH32075LE	L	Yes	.063	.079	.030	60	20	3/8	2	.002	.002	1/8	●
GTMH32077LE	L	Yes	.063	.079	.030	60	20	3/8	2	.002	.002	1/8	●
GTMH32095LE	L	Yes	.063	.079	.037	60	20	3/8	2	.002	.002	1/8	●
GTMH32097LE	L	Yes	.063	.079	.038	60	20	3/8	2	.002	.002	1/8	●
GTMH32100LE	L	Yes	.063	.079	.039	60	20	3/8	2	.002	.002	1/8	●
GTMH32103LE	L	Yes	.063	.079	.041	60	20	3/8	2	.002	.002	1/8	●
GTMH32120LE	L	Yes	.063	.079	.047	60	20	3/8	2	.002	.002	1/8	●
GTMH32140LE	L	Yes	.063	.079	.055	60	20	3/8	2	.002	.002	1/8	●
GTMH32150LE	L	Yes	.106	.118	.059	60	20	3/8	2	.002	.002	1/8	●
GTMH32180LE	L	Yes	.106	.118	.071	60	20	3/8	2	.002	.002	1/8	●
GTMH32200LE	L	Yes	.106	.118	.079	60	20	3/8	2	.002	.002	1/8	●
GTMH32225LE	L	Yes	.106	.118	.089	60	20	3/8	2	.002	.002	1/8	●
GTMH32250LE	L	Yes	.106	.118	.098	60	20	3/8	2	.002	.002	1/8	●
GTMH32275LE	L	Yes	.106	.118	.108	60	20	3/8	2	.002	.002	1/8	●
GTMH32300LE	L	Yes	.106	.118	.118	60	20	3/8	2	.002	.002	1/8	●
GTMH32100LE01	L	Yes	.063	.079	.039	60	20	3/8	2	.004	.004	1/8	●
GTMH32120LE01	L	Yes	.063	.079	.047	60	20	3/8	2	.004	.004	1/8	●
GTMH32150LE01	L	Yes	.106	.118	.059	60	20	3/8	2	.004	.004	1/8	●
GTMH32200LE01	L	Yes	.106	.118	.079	60	20	3/8	2	.004	.004	1/8	●

※APMX : Depth of cut maximum

TMG32-E

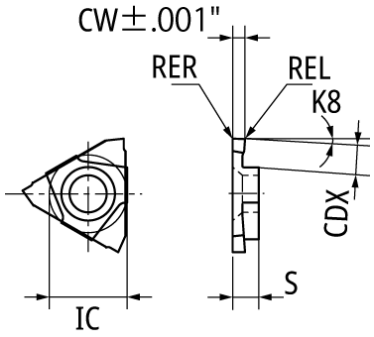


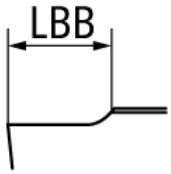
● Diagram shows right-hand tool

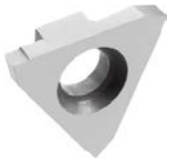
Item Number	Hand	Chipbreaker	APMX※	CDX	CW	EPSR	GAN	IC	K8	REL	RER	S	Carbide
													PVD
			inch	inch	inch	°	°	inch	°	inch	inch	inch	ZM3
TMG32031RE01	R	Yes	.063	.079	.031	60	20	3/8	2	.004	.004	1/8	●
TMG32039RE01	R	Yes	.063	.079	.039	60	20	3/8	2	.004	.004	1/8	●
TMG32049RE01	R	Yes	.063	.079	.049	60	20	3/8	2	.004	.004	1/8	●
TMG32062RE02	R	Yes	.106	.118	.062	60	20	3/8	2	.008	.008	1/8	●
TMG32079RE02	R	Yes	.106	.118	.079	60	20	3/8	2	.008	.008	1/8	●
TMG32094RE02	R	Yes	.106	.118	.094	60	20	3/8	2	.008	.008	1/8	●
TMG32125RE02	R	Yes	.106	.118	.125	60	20	3/8	2	.008	.008	1/8	●
TMG32039LE01	L	Yes	.063	.079	.039	60	20	3/8	2	.004	.004	1/8	●

※APMX : Depth of cut maximum

GTMH32-SSH Short type / Flat top chipbreaker





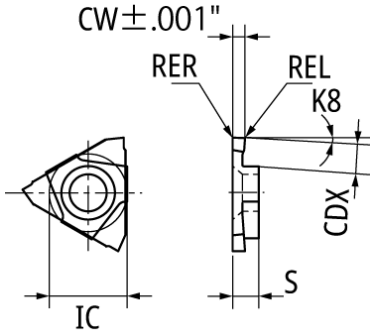


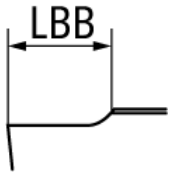
● Diagram shows right-hand tool

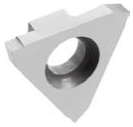
Item Number	Hand	Chipbreaker	APMX※	CDX	CW	EPSR	GAN	IC	K8	LBB	REL	RER	S	Carbide
														KM1
			inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	
GTMH32100RSSH Ⓜ	R	Yes	.063	.079	.039	60	0	3/8	2	.059	.002	.002	1/8	●
GTMH32150RSSH Ⓜ	R	Yes	.106	.118	.059	60	0	3/8	2	.059	.002	.002	1/8	●
GTMH32200RSSH Ⓜ	R	Yes	.106	.118	.079	60	0	3/8	2	.059	.002	.002	1/8	●

※APMX : Depth of cut maximum

GTMX32-SS Short type / Flat top chipbreaker





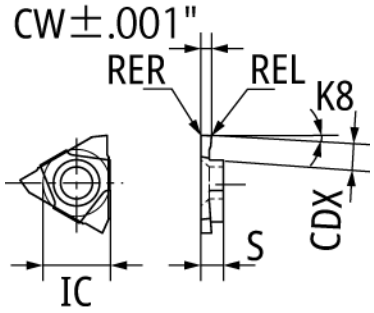


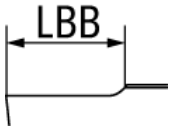
● Diagram shows right-hand tool

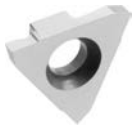
Item Number	Hand	Chipbreaker	APMX※	CDX	CW	EPSR	GAN	IC	K8	LBB	REL	RER	S	Carbide
														PVD
			inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	ZM3
GTMX32100RSS	R	Yes	.063	.079	.039	60	0	3/8	2	.059	.002	0.05	1/8	●
GTMX32150RSS	R	Yes	.106	.118	.059	60	0	3/8	2	.059	.002	0.05	1/8	●
GTMX32200RSS	R	Yes	.106	.118	.079	60	0	3/8	2	.059	.002	0.05	1/8	●

※APMX : Depth of cut maximum

GTMX32-LS Long type / Flat top chipbreaker





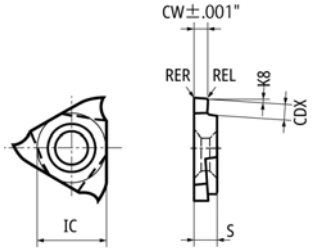


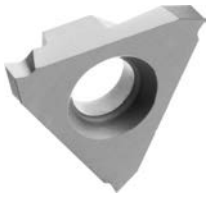
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	APMX※	CDX	CW	EPSR	GAN	IC	K8	LBB	REL	RER	S	Carbide
														PVD
			inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	ZM3
GTMX32100RLS	R	Yes	.063	.079	.039	60	0	3/8	2	.118	.002	.002	1/8	●
GTMX32150RLS	R	Yes	.106	.118	.059	60	0	3/8	2	.118	.002	.002	1/8	●
GTMX32200RLS	R	Yes	.106	.118	.079	60	0	3/8	2	.118	.002	.002	1/8	●

※APMX : Depth of cut maximum

GTMH32-VT Side Turning



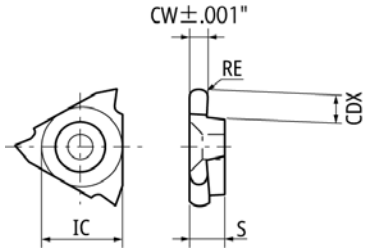


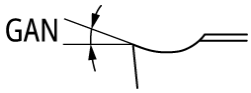
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	APMX※	CDX	CW	EPSR	GAN	IC	K8	REL	RER	S	Carbide
													PVD
			inch	inch	inch	°	°	inch	°	inch	inch	inch	VM1
GTMH32033RVT Ⓜ	R	Yes	.010	.024	.013	60	14	3/8	2	.000	.000	1/8	●
GTMH32043RVT Ⓜ	R	Yes	.035	.047	.017	60	14	3/8	2	.000	.000	1/8	●
GTMH32053RVT Ⓜ	R	Yes	.063	.079	.021	60	14	3/8	2	.000	.000	1/8	●
GTMH32065RVT Ⓜ	R	Yes	.063	.079	.026	60	14	3/8	2	.000	.000	1/8	●
GTMH32075RVT Ⓜ	R	Yes	.063	.079	.030	60	14	3/8	2	.000	.000	1/8	●
GTMH32080RVT Ⓜ	R	Yes	.063	.079	.031	60	14	3/8	2	.000	.000	1/8	●
GTMH32085RVT Ⓜ	R	Yes	.063	.079	.033	60	14	3/8	2	.000	.000	1/8	●
GTMH32095RVT Ⓜ	R	Yes	.063	.079	.037	60	14	3/8	2	.000	.000	1/8	●
GTMH32100RVT Ⓜ	R	Yes	.063	.079	.039	60	14	3/8	2	.000	.000	1/8	●
GTMH32110RVT Ⓜ	R	Yes	.063	.079	.043	60	14	3/8	2	.000	.000	1/8	●
GTMH32120RVT Ⓜ	R	Yes	.063	.079	.047	60	14	3/8	2	.000	.000	1/8	●
GTMH32130RVT Ⓜ	R	Yes	.063	.079	.051	60	14	3/8	2	.000	.000	1/8	●
GTMH32140RVT Ⓜ	R	Yes	.063	.079	.055	60	14	3/8	2	.000	.000	1/8	●
GTMH32150RVT Ⓜ	R	Yes	.106	.118	.059	60	14	3/8	2	.000	.000	1/8	●
GTMH32200RVT Ⓜ	R	Yes	.106	.118	.079	60	14	3/8	2	.000	.000	1/8	●

※APMX : Depth of cut maximum

GTMH32 Full radius style



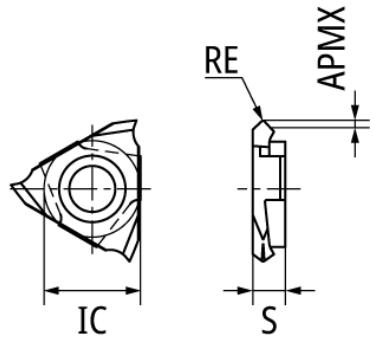


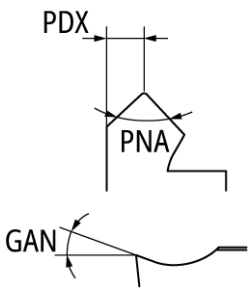
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	APMX※	CDX	CW	EPSR	GAN	IC	RE	S	Carbide
											PVD
			inch	inch	inch	°	°	inch	inch	inch	ZM3
GTMH32050RE025	R	Yes	.035	.047	.020	60	20	3/8	.010	1/8	●
GTMH32070RE035	R	Yes	.063	.079	.028	60	20	3/8	.014	1/8	●
GTMH32100RE05	R	Yes	.063	.079	.039	60	20	3/8	.020	1/8	●
GTMH32150RE075	R	Yes	.106	.118	.059	60	20	3/8	.030	1/8	●
GTMH32200RE10	R	Yes	.106	.118	.079	60	20	3/8	.039	1/8	●
GTMH32250RE125	R	Yes	.106	.118	.098	60	20	3/8	.049	1/8	●
GTMH32300RE15	R	Yes	.106	.118	.118	60	20	3/8	.059	1/8	●

※APMX : Depth of cut maximum

GTMX32-V90 90 Degree V-style



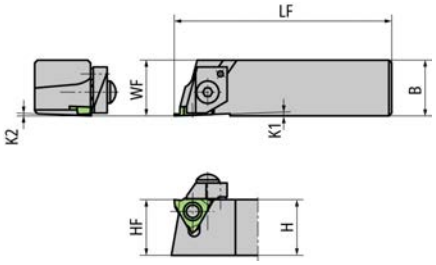


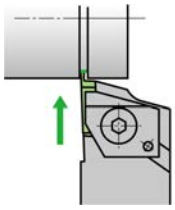
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	APMX	EPSR	GAN	IC	PDX	PNA	RE	S	Carbide
											PVD
			inch	°	°	inch	inch	°	inch	inch	TM4
GTMX32V90R005	R	Yes	.014	60	20	3/8	.020	90	.002	1/8	●
GTMX32V90R010	R	Yes	.028	60	20	3/8	.039	90	.004	1/8	●

OD Grooving
GTMT(A)43.. series/Toolholder

NGTN





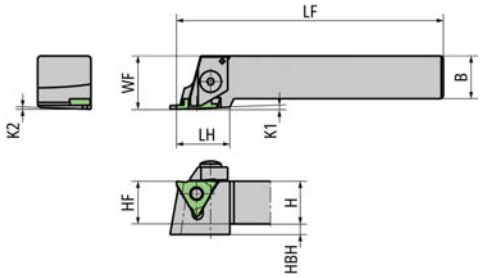
● Diagram shows right-hand tool

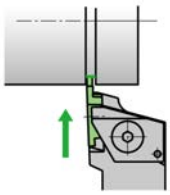
Item Number	Hand	B	CDX	CW	H	HF	K1	K2	LF	WF	Insert Gage
		inch	inch	inch	inch	inch	°	°	inch	inch	
NGTNR161643-20	R	.630	.177	.079-.217	.630	.630	2	2	3.071	.630	GT..43..
NGTNR161643-35	R	.630	.177	.138-.217	.630	.630	2	2	3.071	.630	GT..43..
NGTNL161643-20	L	.630	.177	.079-.217	.630	.630	2	2	3.071	.630	GT..43..
NGTNL161643-35	L	.630	.177	.138-.217	.630	.630	2	2	3.071	.630	GT..43..

Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
NGTNR161643-20	CPR5S	AOS-5*25	ASG-5	LW-2.5
NGTNR161643-35	CPR5S	AOS-5*25	ASG-5	LW-2.5
NGTNL161643-20	CPL5S	AOS-5*25	ASG-5	LW-2.5
NGTNL161643-35	CPL5S	AOS-5*25	ASG-5	LW-2.5

NGTB





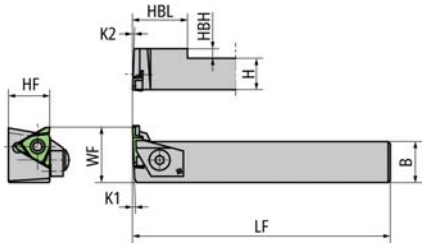
● Diagram shows right-hand tool

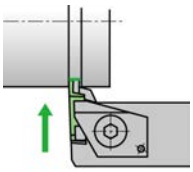
Item Number	Hand	B	CDX	CW	H	HBH	HF	K1	K2	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	°	°	inch	inch	inch	
NGTBR161643-00S	R	.630	.118	.039-.217	.630	.354	.630	2	2	3.937	.984	.787	GT..43..
NGTBR161643-20S	R	.630	.177	.079-.217	.630	.354	.630	2	2	3.937	.984	.787	GT..43..
NGTBR161643-35S	R	.630	.177	.138-.217	.630	.354	.630	2	2	3.937	.984	.787	GT..43..
NGTBR202043-00S	R	.787	.118	.039-.217	.787	.197	.787	2	2	4.921	.984	.984	GT..43..
NGTBR202043-20S	R	.787	.177	.079-.217	.787	.197	.787	2	2	4.921	.984	.984	GT..43..
NGTBR202043-35S	R	.787	.177	.138-.217	.787	.197	.787	2	2	4.921	.984	.984	GT..43..
NGTBR252543-00S	R	.984	.138	.039-.217	.984	–	.984	2	2	5.906	.984	1.181	GT..43..
NGTBR252543-20S	R	.984	.217	.079-.217	.984	–	.984	2	2	5.906	.984	1.181	GT..43..
NGTBR252543-35S	R	.984	.217	.138-.217	.984	–	.984	2	2	5.906	.984	1.181	GT..43..
NGTBR322543-20S	R	.984	.217	.079-.217	1.260	–	1.260	2	2	6.693	.984	1.181	GT..43..
NGTBR322543-35S	R	.984	.217	.138-.217	1.260	–	1.260	2	2	6.693	.984	1.181	GT..43..
NGTBL161643-00S	L	.630	.118	.039-.217	.630	.354	.630	2	2	3.937	.984	.787	GT..43..
NGTBL161643-20S	L	.630	.177	.079-.217	.630	.354	.630	2	2	3.937	.984	.787	GT..43..
NGTBL161643-35S	L	.630	.177	.138-.217	.630	.354	.630	2	2	3.937	.984	.787	GT..43..
NGTBL202043-00S	L	.787	.118	.039-.217	.787	.197	.787	2	2	4.921	.984	.984	GT..43..
NGTBL202043-20S	L	.787	.177	.079-.217	.787	.197	.787	2	2	4.921	.984	.984	GT..43..
NGTBL202043-35S	L	.787	.177	.138-.217	.787	.197	.787	2	2	4.921	.984	.984	GT..43..
NGTBL252543-00S	L	.984	.138	.039-.217	.984	–	.984	2	2	5.906	.984	1.181	GT..43..
NGTBL252543-20S	L	.984	.217	.079-.217	.984	–	.984	2	2	5.906	.984	1.181	GT..43..
NGTBL252543-35S	L	.984	.217	.138-.217	.984	–	.984	2	2	5.906	.984	1.181	GT..43..
NGTBL322543-20S	L	.984	.217	.079-.217	1.260	–	1.260	2	2	6.693	.984	1.181	GT..43..
NGTBL322543-35S	L	.984	.217	.138-.217	1.260	–	1.260	2	2	6.693	.984	1.181	GT..43..

Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
NGTBR161643-00S	CPR5	AOS-5*25	ASG-5	LW-2.5
NGTBR161643-20S	CPR5	AOS-5*25	ASG-5	LW-2.5
NGTBR161643-35S	CPR5	AOS-5*25	ASG-5	LW-2.5
NGTBR202043-00S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBR202043-20S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBR202043-35S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBR252543-00S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBR252543-20S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBR252543-35S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBR322543-20S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBR322543-35S	CPR6	AOS-6*30	ASG-6	LW-3
NGTBL161643-00S	CPL5	AOS-5*25	ASG-5	LW-2.5
NGTBL161643-20S	CPL5	AOS-5*25	ASG-5	LW-2.5
NGTBL161643-35S	CPL5	AOS-5*25	ASG-5	LW-2.5
NGTBL202043-00S	CPL6	AOS-6*30	ASG-6	LW-3
NGTBL202043-20S	CPL6	AOS-6*30	ASG-6	LW-3
NGTBL202043-35S	CPL6	AOS-6*30	ASG-6	LW-3
NGTBL252543-00S	CPL6	AOS-6*30	ASG-6	LW-3
NGTBL252543-20S	CPL6	AOS-6*30	ASG-6	LW-3
NGTBL252543-35S	CPL6	AOS-6*30	ASG-6	LW-3
NGTBL322543-20S	CPL6	AOS-6*30	ASG-6	LW-3
NGTBL322543-35S	CPL6	AOS-6*30	ASG-6	LW-3

NGTA for horizontal gang style tool post





● Diagram shows left-hand tool
NOTE: Use a right-handed (R) insert.

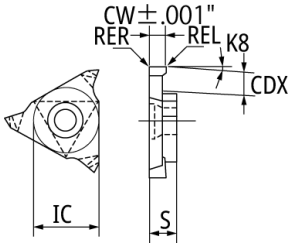
Item Number	Hand	B	CDX	CW	H	HBH	HBL	HF	K1	K2	LF	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	°	°	inch	inch	
NGTAL161643-00S	L	.630	.118	.039-.217	.630	.157	.787	.630	2	2	3.937	.906	GT..43..
NGTAL202043-00S	L	.787	.118	.039-.217	.787	–	–	.787	2	2	4.921	1.063	GT..43..

Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
NGTAL161643-00S	CPL5S	AOS-5*20	ASG-5	LW-2.5
NGTAL202043-00S	CPL6	AOS-6*30	ASG-6	LW-3

OD Grooving
GTMT(A)43.. series/Inserts Carbide

GTMT43

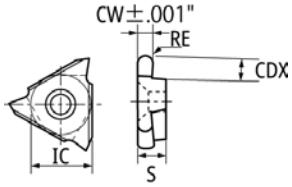


● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	APMX※	CDX	CW	EPSR	GAN	IC	K8	REL	RER	S	Carbide	
													PVD	
			inch	inch	inch	°	°	inch	°	inch	inch	inch	DM4	QM3
GTMT43145R	R	Yes	.118	.138	.057	60	11	1/2	2	.008	.008	3/16	●	●
GTMT43150R	R	Yes	.118	.138	.059	60	11	1/2	2	.008	.008	3/16	●	●
GTMT43175R	R	Yes	.118	.138	.069	60	11	1/2	2	.008	.008	3/16	●	●
GTMT43185R	R	Yes	.118	.138	.073	60	11	1/2	2	.008	.008	3/16	●	●
GTMT43200R	R	Yes	.118	.138	.079	60	11	1/2	2	.008	.008	3/16	●	●
GTMT43230R	R	Yes	.118	.138	.091	60	11	1/2	2	.008	.008	3/16	●	●
GTMT43250R	R	Yes	.169	.217	.098	60	11	1/2	2	.012	.012	3/16	●	●
GTMT43265R	R	Yes	.169	.217	.104	60	11	1/2	2	.012	.012	3/16	●	●
GTMT43280R	R	Yes	.169	.217	.110	60	11	1/2	2	.012	.012	3/16	●	●
GTMT43300R	R	Yes	.169	.217	.118	60	11	1/2	2	.012	.012	3/16	●	●
GTMT43330R	R	Yes	.169	.217	.130	60	11	1/2	2	.012	.012	3/16		●
GTMT43350R	R	Yes	.169	.217	.138	60	11	1/2	2	.012	.012	3/16	●	●
GTMT43400R	R	Yes	.169	.217	.157	60	11	1/2	2	.016	.016	3/16	●	●
GTMT43450R	R	Yes	.169	.217	.177	60	11	1/2	2	.016	.016	3/16	●	●
GTMT43500R	R	Yes	.169	.217	.197	60	11	1/2	2	.016	.016	.227	●	●
GTMT43550R	R	Yes	.169	.217	.217	60	11	1/2	2	.016	.016	.227	●	●
GTMT43145L	L	Yes	.118	.138	.057	60	11	1/2	2	.008	.008	3/16	●	●
GTMT43150L	L	Yes	.118	.138	.059	60	11	1/2	2	.008	.008	3/16	●	●
GTMT43175L	L	Yes	.118	.138	.069	60	11	1/2	2	.008	.008	3/16	●	●
GTMT43185L	L	Yes	.118	.138	.073	60	11	1/2	2	.008	.008	3/16	●	●
GTMT43200L	L	Yes	.118	.138	.079	60	11	1/2	2	.008	.008	3/16	●	●
GTMT43230L	L	Yes	.118	.138	.091	60	11	1/2	2	.008	.008	3/16	●	●
GTMT43280L	L	Yes	.169	.217	.110	60	11	1/2	2	.012	.012	3/16	●	●
GTMT43300L	L	Yes	.169	.217	.118	60	11	1/2	2	.012	.012	3/16	●	●
GTMT43330L	L	Yes	.169	.217	.130	60	11	1/2	2	.012	.012	3/16		●
GTMT43350L	L	Yes	.169	.217	.138	60	11	1/2	2	.012	.012	3/16	●	●
GTMT43400L	L	Yes	.169	.217	.157	60	11	1/2	2	.016	.016	3/16	●	●
GTMT43450L	L	Yes	.169	.217	.177	60	11	1/2	2	.016	.016	3/16	●	●
GTMT43500L	L	Yes	.169	.217	.197	60	11	1/2	2	.016	.016	.227	●	●
GTMT43550L	L	Yes	.169	.217	.217	60	11	1/2	2	.016	.016	.227	●	●

※APMX : Depth of cut maximum

GTMA43 Full radius style



● Diagram shows right-hand tool

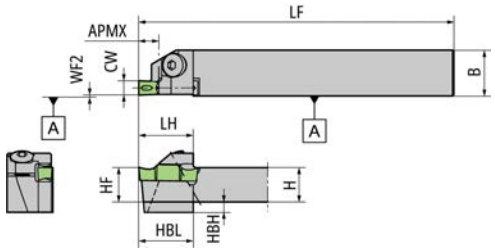
Item Number	Hand	Chipbreaker	APMX※	CDX	CW	EPSR	GAN	IC	RE	S	Carbide
											PVD
			inch	inch	inch	°	°	inch	inch	inch	QM3
GTMA43200R10R	R	Yes	.118	.138	.079	60	11	1/2	.039	3/16	●
GTMA43300R15R	R	Yes	.177	.217	.118	60	11	1/2	.059	3/16	●
GTMA43400R20R	R	Yes	.177	.217	.157	60	11	1/2	.079	3/16	●

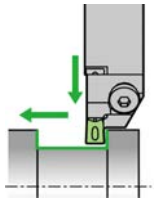
※APMX : Depth of cut maximum

OD Grooving
GROOVE DUO

GWPG(M).. series/Toolholder

GTWP





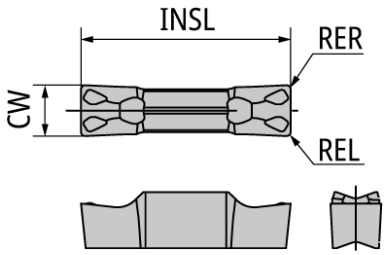
● Diagram shows right-hand tool
Note: Max. Bar Dia. ø1.654"

Item Number	Hand	APMX	B	CW	H	HBH	HBL	HF	LF	LH	WF2	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
GTWPR08-IN-3D07	R	.276	.630	.118	1/2	–	–	1/2	4.724	.748	.012	GWPG300..	GWPM300..
GTWPR08-IN-4E07	R	.276	.630	.157	1/2	–	–	1/2	4.724	.748	.012	GWPG400..	GWPM400..
GTWPR10-IN-3D09	R	.354	.630	.118	5/8	–	–	5/8	4.724	.866	.012	GWPG300..	GWPM300..
GTWPR10-IN-4E09	R	.354	.630	.157	5/8	–	–	5/8	4.724	.866	.012	GWPG400..	GWPM400..
GTWPR1016-3D07	R	.276	.630	.118	.394	.079	.709	.394	4.724	.748	.012	GWPG300..	GWPM300..
GTWPR1216-3D07	R	.276	.630	.118	.472	–	–	.472	4.724	.768	.012	GWPG300..	GWPM300..
GTWPR1616-3D09	R	.354	.630	.118	.630	–	–	.630	4.724	.866	.012	GWPG300..	GWPM300..
GTWPR1016-4E07	R	.276	.630	.157	.394	.079	.709	.394	4.724	.748	.012	GWPG400..	GWPM400..
GTWPR1216-4E07	R	.276	.630	.157	.472	–	–	.472	4.724	.768	.012	GWPG400..	GWPM400..
GTWPR1616-4E09	R	.354	.630	.157	.630	–	–	.630	4.724	.866	.012	GWPG400..	GWPM400..
GTWPR1016-5F07	R	.276	.630	.197	.394	.079	.709	.394	4.724	.748	.012	GWPG500..	GWPM500..
GTWPR1216-5F07	R	.276	.630	.197	.472	–	–	.472	4.724	.768	.012	GWPG500..	GWPM500..
GTWPR1616-5F09	R	.354	.630	.197	.630	–	–	.630	4.724	.866	.012	GWPG500..	GWPM500..
GTWPR1020-6G07	R	.276	.787	.236	.394	.079	.827	.394	4.724	.866	.012	GWPG600..	GWPM600..
GTWPR1220-6G07	R	.276	.787	.236	.472	–	–	.472	4.724	.886	.012	GWPG600..	GWPM600..
GTWPR1620-6G09	R	.354	.787	.236	.630	–	–	.630	4.724	.984	.012	GWPG600..	GWPM600..
GTWPL1216-3D07	L	.276	.630	.118	.472	–	–	.472	4.724	.768	.012	GWPG300..	GWPM300..
GTWPL1616-3D09	L	.354	.630	.118	.630	–	–	.630	4.724	.866	.012	GWPG300..	GWPM300..
GTWPL1216-4E07	L	.276	.630	.157	.472	–	–	.472	4.724	.768	.012	GWPG400..	GWPM400..
GTWPL1616-4E09	L	.354	.630	.157	.630	–	–	.630	4.724	.866	.012	GWPG400..	GWPM400..
GTWPL1216-5F07	L	.276	.630	.197	.472	–	–	.472	4.724	.768	.012	GWPG500..	GWPM500..
GTWPL1616-5F09	L	.354	.630	.197	.630	–	–	.630	4.724	.866	.012	GWPG500..	GWPM500..
GTWPL1620-6G09	L	.354	.787	.236	.630	–	–	.630	4.724	.984	.012	GWPG600..	GWPM600..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
GTWPR08-IN-3D07	AOB-5*14	LW-3S
GTWPR08-IN-4E07	AOB-5*14	LW-3S
GTWPR10-IN-3D09	AOB-5*16	LW-3S
GTWPR10-IN-4E09	AOB-5*16	LW-3S
GTWPR1016-3D07	AOB-5*14	LW-3S
GTWPR1216-3D07	AOB-5*16	LW-3S
GTWPR1616-3D09	AOB-5*16	LW-3S
GTWPR1016-4E07	AOB-5*14	LW-3S
GTWPR1216-4E07	AOB-5*16	LW-3S
GTWPR1616-4E09	AOB-5*16	LW-3S
GTWPR1016-5F07	AOB-5*14	LW-3S
GTWPR1216-5F07	AOB-5*16	LW-3S
GTWPR1616-5F09	AOB-5*16	LW-3S
GTWPR1020-6G07	AOB-5*14	LW-3S
GTWPR1220-6G07	AOB-5*16	LW-3S
GTWPR1620-6G09	AOB-5*16	LW-3S
GTWPL1216-3D07	AOB-5*16	LW-3S
GTWPL1616-3D09	AOB-5*16	LW-3S
GTWPL1216-4E07	AOB-5*16	LW-3S
GTWPL1616-4E09	AOB-5*16	LW-3S
GTWPL1216-5F07	AOB-5*16	LW-3S
GTWPL1616-5F09	AOB-5*16	LW-3S
GTWPL1620-6G09	AOB-5*16	LW-3S

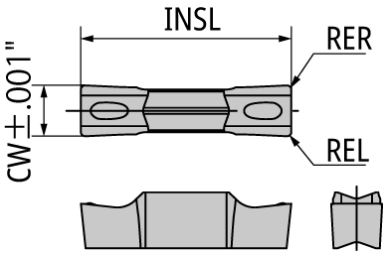
GWPG(M)-GW Best for side turning



Item Number	Hand	Chipbreaker	CW	INSL	REL	RER	Carbide
							PVD
			inch	inch	inch	inch	DM4
GWPG300N02D-GW	N	Yes	.118	.811	.008	.008	●
GWPG300N04D-GW	N	Yes	.118	.811	.016	.016	●
GWPG400N02E-GW	N	Yes	.157	.811	.008	.008	●
GWPG400N04E-GW	N	Yes	.157	.811	.016	.016	●
GWPG400N08E-GW	N	Yes	.157	.811	.031	.031	●
GWPG500N02F-GW	N	Yes	.197	.811	.008	.008	●
GWPG500N04F-GW	N	Yes	.197	.811	.016	.016	●
GWPG500N08F-GW	N	Yes	.197	.811	.031	.031	●
GWPG600N02G-GW	N	Yes	.236	1.008	.008	.008	●
GWPG600N04G-GW	N	Yes	.236	1.008	.016	.016	●
GWPG600N08G-GW	N	Yes	.236	1.008	.031	.031	●
GWPM300N04D-GW	N	Yes	.118	.811	.016	.016	●
GWPM400N04E-GW	N	Yes	.157	.811	.016	.016	●
GWPM500N04F-GW	N	Yes	.197	.811	.016	.016	●
GWPM600N04G-GW	N	Yes	.236	1.008	.016	.016	●

GWPG.. : Outside ground
Width tolerance ±.001
GWPM.. : Full-molded
Width tolerance ±.002

GWPG-GV Less tool pressure design

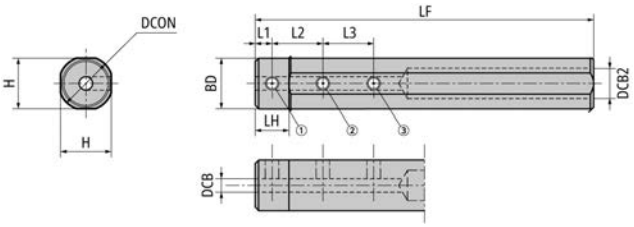


Item Number	Hand	Chipbreaker	CW	INSL	REL	RER	Carbide
							PVD
			inch	inch	inch	inch	DM4
GWPG300N02D-GV	N	Yes	.118	.811	.008	.008	●
GWPG300N04D-GV	N	Yes	.118	.811	.016	.016	●
GWPG400N02E-GV	N	Yes	.157	.811	.008	.008	●
GWPG400N04E-GV	N	Yes	.157	.811	.016	.016	●
GWPG500N02F-GV	N	Yes	.197	.811	.008	.008	●
GWPG500N04F-GV	N	Yes	.197	.811	.016	.016	●
GWPG600N02G-GV	N	Yes	.236	1.008	.008	.008	●
GWPG600N04G-GV	N	Yes	.236	1.008	.016	.016	●

ID Grooving
STICK DUO

SBG.. series/Sleeve

NBH Shank diameter ø5/8" - ø3/4"

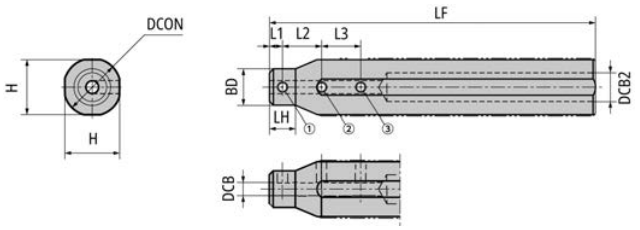


Item Number	Hand	BD	DCB	DCB2	DCON	H	LF	LH	L1	L2	L3	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
NBH03015H	N	.591	.118	.354	5/8	.591	3.937	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04015H	N	.591	.157	.354	5/8	.591	3.937	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05015H	N	.591	.197	.354	5/8	.591	3.937	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06015H	N	.591	.236	.354	5/8	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08015H	N	.591	.315	.354	5/8	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH03016H	N	.591	.118	.354	.630	.591	3.937	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04016H	N	.591	.157	.354	.630	.591	3.937	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05016H	N	.591	.197	.354	.630	.591	3.937	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06016H	N	.591	.236	.354	.630	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08016H	N	.591	.315	.354	.630	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH03019K	N	.709	.118	.433	3/4	.709	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04019K	N	.709	.157	.433	3/4	.709	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05019K	N	.709	.197	.433	3/4	.709	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06019K	N	.709	.236	.433	3/4	.709	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08019K	N	.709	.315	.433	3/4	.709	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..

Spare Parts

Item Number	Clamp screw			Wrench (for Clamp screw)
	①	②	③	①②
NBH03015H	SS0404F	SS0404F	SS0404F	LW-2
NBH04015H	SS0404F	SS0404F	SS0404F	LW-2
NBH05015H	SS0404F	SS0404F	SS0404F	LW-2
NBH06015H	SS0404F	SS0404F	SS0404F	LW-2
NBH08015H	SS0403F	SS0403F	SS0403F	LW-2
NBH03016H	SS0404F	SS0404F	SS0404F	LW-2
NBH04016H	SS0404F	SS0404F	SS0404F	LW-2
NBH05016H	SS0404F	SS0404F	SS0404F	LW-2
NBH06016H	SS0404F	SS0404F	SS0404F	LW-2
NBH08016H	SS0403F	SS0403F	SS0403F	LW-2
NBH03019K	SS0406F	SS0406F	SS0406F	LW-2
NBH04019K	SS0406F	SS0406F	SS0406F	LW-2
NBH05019K	SS0406F	SS0406F	SS0406F	LW-2
NBH06019K	SS0406F	SS0406F	SS0406F	LW-2
NBH08019K	SS0404F	SS0404F	SS0404F	LW-2

NBH Shank diameter ø.787" - ø1.260"



Item Number	Hand	BD	DCB	DCB2	DCON	H	LF	LH	L1	L2	L3	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
NBH03020K	N	.472	.118	.433	.787	.748	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04020K	N	.512	.157	.433	.787	.748	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05020K	N	.551	.197	.433	.787	.748	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06020K	N	.591	.236	.433	.787	.748	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08020K	N	.669	.315	.433	.787	.748	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH03022K	N	.472	.118	.433	.866	.827	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04022K	N	.512	.157	.433	.866	.827	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05022K	N	.551	.197	.433	.866	.827	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06022K	N	.591	.236	.433	.866	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08022K	N	.669	.315	.433	.866	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH03023K	N	.472	.118	.433	.906	.827	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04023K	N	.512	.157	.433	.906	.827	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05023K	N	.551	.197	.433	.906	.827	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06023K	N	.591	.236	.433	.906	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08023K	N	.669	.315	.433	.906	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH03025K-MET	N	.472	.118	.433	.984	.945	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04025K-MET	N	.512	.157	.433	.984	.945	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05025K-MET	N	.551	.197	.433	.984	.945	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06025K-MET	N	.591	.236	.433	.984	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08025K-MET	N	.669	.315	.433	.984	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH03025K	N	.472	.118	.433	1.000	.945	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04025K	N	.512	.157	.433	1.000	.945	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05025K	N	.551	.197	.433	1.000	.945	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06025K	N	.591	.236	.433	1.000	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08025K	N	.669	.315	.433	1.000	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH05032K	N	.551	.197	.433	1.260	1.181	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06032K	N	.591	.236	.433	1.260	1.181	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08032K	N	.669	.315	.433	1.260	1.181	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..

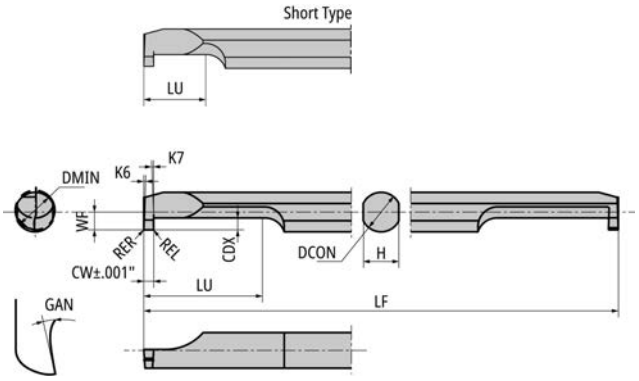
Spare Parts

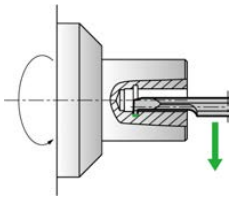
Item Number	Clamp screw			Wrench (for Clamp screw)
	①	②	③	①②
NBH03020K	SS0404F	SS0404F	SS0406F	LW-2
NBH04020K	SS0404F	SS0406F	SS0406F	LW-2
NBH05020K	SS0404F	SS0406F	SS0406F	LW-2
NBH06020K	SS0404F	SS0406F	SS0406F	LW-2
NBH08020K	SS0404F	SS0404F	SS0404F	LW-2
NBH03022K	SS0404F	SS0406F	SS0408F	LW-2
NBH04022K	SS0404F	SS0406F	SS0406F	LW-2
NBH05022K	SS0404F	SS0406F	SS0406F	LW-2
NBH06022K	SS0404F	SS0406F	SS0406F	LW-2
NBH08022K	SS0404F	SS0406F	SS0406F	LW-2
NBH03023K	SS0404F	SS0406F	SS0408F	LW-2
NBH04023K	SS0404F	SS0406F	SS0406F	LW-2
NBH05023K	SS0404F	SS0406F	SS0406F	LW-2
NBH06023K	SS0404F	SS0406F	SS0406F	LW-2
NBH08023K	SS0404F	SS0406F	SS0406F	LW-2
NBH03025K-MET	SS0404F	SS0406F	SS0408F	LW-2
NBH04025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH05025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH06025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH08025K-MET	SS0404F	SS0406F	SS0406F	LW-2
NBH03025K	SS0404F	SS0406F	SS0408F	LW-2
NBH04025K	SS0404F	SS0408F	SS0408F	LW-2
NBH05025K	SS0404F	SS0408F	SS0408F	LW-2
NBH06025K	SS0404F	SS0408F	SS0408F	LW-2

Item Number	Clamp screw			Wrench (for Clamp screw)
	①	②	③	①②
NBH08025K	SS0404F	SS0406F	SS0406F	LW-2
NBH05032K	SS0404F	SS0408F	SS0408F	LW-2
NBH06032K	SS0404F	SS0408F	SS0408F	LW-2
NBH08032K	SS0404F	SS0408F	SS0408F	LW-2

ID Grooving | STICK DUO
SBG.. series/Insert bar Carbide

SBG-S Short type / Two-sided

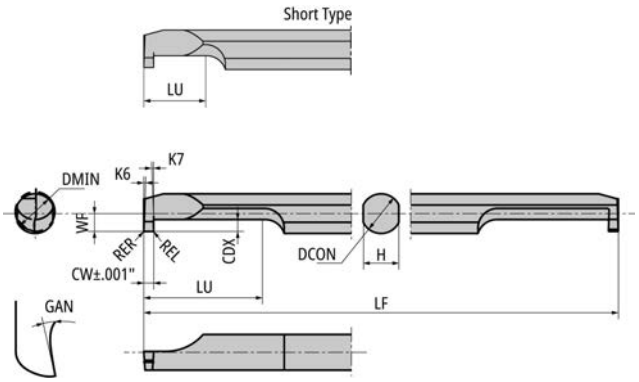


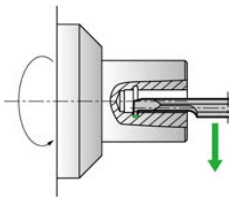


● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	DMIN	APMX	CDX	CW	DCON	GAN	H	K6	K7	LF	LU	REL	RER	WF	Carbide PVD ZM3
			inch	inch	inch	inch	inch	°	inch	°	°	inch	inch	inch	inch	inch	
SBG030050RB-S	R	Yes	.118	.031	.039	.020	.118	8	.106	2	2	1.969	.177	.002	.002	.051	●
SBG030075RB-S	R	Yes	.118	.031	.039	.030	.118	8	.106	2	2	1.969	.177	.002	.002	.051	●
SBG030100RB-S	R	Yes	.118	.031	.039	.039	.118	8	.106	2	2	1.969	.177	.002	.002	.051	●
SBG030150RB-S	R	Yes	.118	.031	.039	.059	.118	8	.106	2	2	1.969	.177	.002	.002	.051	●
SBG040050RB-S	R	Yes	.157	.039	.047	.020	.157	8	.142	2	2	2.362	.236	.002	.002	.071	●
SBG040075RB-S	R	Yes	.157	.039	.047	.030	.157	8	.142	2	2	2.362	.236	.002	.002	.071	●
SBG040100RB-S	R	Yes	.157	.039	.047	.039	.157	8	.142	2	2	2.362	.236	.002	.002	.071	●
SBG040150RB-S	R	Yes	.157	.039	.047	.059	.157	8	.142	2	2	2.362	.236	.002	.002	.071	●
SBG050050RB-S	R	Yes	.197	.047	.055	.020	.197	8	.177	2	2	2.756	.295	.002	.002	.091	●
SBG050100RB-S	R	Yes	.197	.047	.055	.039	.197	8	.177	2	2	2.756	.295	.002	.002	.091	●
SBG050150RB-S	R	Yes	.197	.047	.055	.059	.197	8	.177	2	2	2.756	.295	.002	.002	.091	●
SBG050200RB-S	R	Yes	.197	.047	.055	.079	.197	8	.177	2	2	2.756	.295	.002	.002	.091	●
SBG060100RB-S	R	Yes	.236	.071	.079	.039	.236	8	.213	2	2	3.150	.295	.002	.002	.110	●
SBG060150RB-S	R	Yes	.236	.071	.079	.059	.236	8	.213	2	2	3.150	.295	.002	.002	.110	●
SBG060200RB-S	R	Yes	.236	.071	.079	.079	.236	8	.213	2	2	3.150	.295	.002	.002	.110	●
SBG080100RB-S	R	Yes	.315	.087	.094	.039	.315	8	.287	2	2	3.150	.335	.002	.002	.150	●
SBG080150RB-S	R	Yes	.315	.087	.094	.059	.315	8	.287	2	2	3.150	.335	.002	.002	.150	●
SBG080200RB-S	R	Yes	.315	.087	.094	.079	.315	8	.287	2	2	3.150	.335	.002	.002	.150	●

SBG Long type / Two-sided



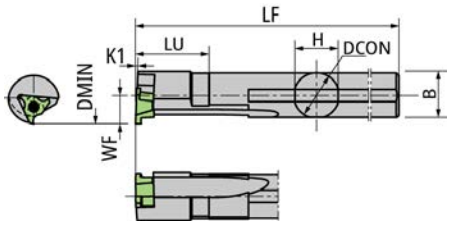


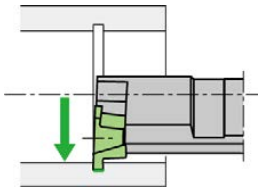
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	DMIN	APMX	CDX	CW	DCON	GAN	H	K6	K7	LF	LU	REL	RER	WF	Carbide PVD ZM3
			inch	inch	inch	inch	inch	°	inch	°	°	inch	inch	inch	inch	inch	
SBG030050RB	R	Yes	.118	.031	.039	.020	.118	8	.106	2	2	1.969	.354	.002	.002	.051	●
SBG030075RB	R	Yes	.118	.031	.039	.030	.118	8	.106	2	2	1.969	.354	.002	.002	.051	●
SBG030100RB	R	Yes	.118	.031	.039	.039	.118	8	.106	2	2	1.969	.354	.002	.002	.051	●
SBG040050RB	R	Yes	.157	.039	.047	.020	.157	8	.142	2	2	2.362	.472	.002	.002	.071	●
SBG040075RB	R	Yes	.157	.039	.047	.030	.157	8	.142	2	2	2.362	.472	.002	.002	.071	●
SBG040100RB	R	Yes	.157	.039	.047	.039	.157	8	.142	2	2	2.362	.472	.002	.002	.071	●
SBG050050RB	R	Yes	.197	.047	.055	.020	.197	8	.177	2	2	2.756	.787	.002	.002	.091	●
SBG050100RB	R	Yes	.197	.047	.055	.039	.197	8	.177	2	2	2.756	.787	.002	.002	.091	●
SBG050150RB	R	Yes	.197	.047	.055	.059	.197	8	.177	2	2	2.756	.787	.002	.002	.091	●
SBG060100RB	R	Yes	.236	.071	.079	.039	.236	8	.213	2	2	3.150	.787	.002	.002	.110	●
SBG060150RB	R	Yes	.236	.071	.079	.059	.236	8	.213	2	2	3.150	.787	.002	.002	.110	●
SBG060200RB	R	Yes	.236	.071	.079	.079	.236	8	.213	2	2	3.150	.787	.002	.002	.110	●
SBG080100RB	R	Yes	.315	.087	.094	.039	.315	8	.287	2	2	3.150	.787	.002	.002	.150	●
SBG080150RB	R	Yes	.315	.087	.094	.059	.315	8	.287	2	2	3.150	.787	.002	.002	.150	●
SBG080200RB	R	Yes	.315	.087	.094	.079	.315	8	.287	2	2	3.150	.787	.002	.002	.150	●

ID Grooving
GTG.. series/Toolholders

S-BG Mogul Bar / Steel shank





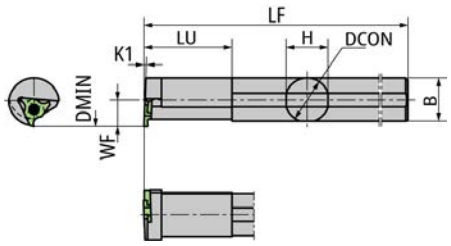
●Diagram shows right-hand tool
NOTE: Use a left-handed insert.

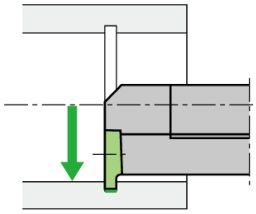
Item Number	Hand	DMIN	APMX	B	CW	DCON	H	K1	LF	LU	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	°	inch	inch	inch	
S08H-BGR10D10	R	.394	.039	.309	.020-.079	.315	.303	2	4.724	.787	.197	GTG10..
S10K-BGR10D12	R	.472	.039	.386	.020-.079	.394	.378	2	4.724	.984	.236	GTG10..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
S08H-BGR10D10	LR-S-2.5*6.8	CLR-15S
S10K-BGR10D12	LR-S-2.5*6.8	CLR-15S

BG Steel shank





●Diagram shows right-hand tool
NOTE: Use a left-handed insert.

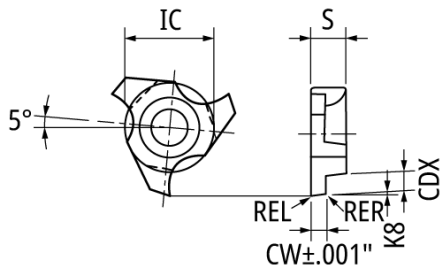
Item Number	Hand	DMIN	APMX	B	CW	DCON	H	K1	LF	LU	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	°	inch	inch	inch	
BGR08-00S	R	.394	.039	.295	.020-.079	.315	.276	2	4.921	.787	.197	GTG10..
BGR08-10S	R	.394	.039	.295	.059-.079	.315	.276	2	4.921	.787	.197	GTG10..
BGR10-00S	R	.472	.039	.374	.020-.079	.394	.354	2	5.906	.984	.236	GTG10..
BGR10-10S	R	.472	.039	.374	.059-.079	.394	.354	2	5.906	.984	.236	GTG10..
BGR12-00S	R	.551	.079	.453	.039-.079	.472	.433	2	7.087	1.181	.276	GTG14..
BGR12-12S	R	.551	.079	.453	.069-.079	.472	.433	2	7.087	1.181	.276	GTG14..
BGR14-00S	R	.630	.079	.531	.039-.079	.551	.512	2	7.087	1.378	.315	GTG14..
BGR14-12S	R	.630	.079	.531	.069-.079	.551	.512	2	7.087	1.378	.315	GTG14..
BGR16	R	.787	.118	.610	.059-.079	.630	.591	2	7.874	1.575	.394	GTG20..
BGR20	R	.984	.118	.768	.059-.079	.787	.748	2	7.874	1.575	.472	GTG20..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
BGR08-00S	LR-S-2.5*6.8	CLR-15S
BGR08-10S	LR-S-2.5*6.8	CLR-15S
BGR10-00S	LR-S-2.5*6.8	CLR-15S
BGR10-10S	LR-S-2.5*6.8	CLR-15S
BGR12-00S	LR-S-3*7.8	RLR-20S
BGR12-12S	LR-S-3*7.8	RLR-20S
BGR14-00S	LR-S-3*7.8	RLR-20S
BGR14-12S	LR-S-3*7.8	RLR-20S
BGR16	LR-S-3*7.8	RLR-20S
BGR20	LR-S-3*7.8	RLR-20S

GTG.. series/Inserts Carbide

GTG..005

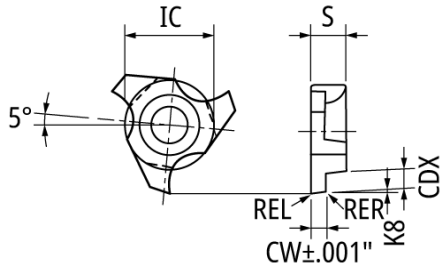


● Diagram shows left-hand tool

Item Number	Hand	Chipbreaker	APMX※	CDX	CW	EPSR	IC	K8	REL	RER	S	Carbide
												PVD
			inch	inch	inch	°	inch	°	inch	inch	inch	TM4
GTG10050FL005	L	Yes	.039	.047	.020	60	7/32	2	.002	.002	1/8	●
GTG10075FL005	L	Yes	.039	.047	.030	60	7/32	2	.002	.002	1/8	●
GTG10100FL005	L	Yes	.039	.047	.039	60	7/32	2	.002	.002	1/8	●
GTG10150FL005	L	Yes	.039	.047	.059	60	7/32	2	.002	.002	1/8	●
GTG10200FL005	L	Yes	.039	.047	.079	60	7/32	2	.002	.002	1/8	●

※APMX : Depth of cut maximum

GTG..



● Diagram shows left-hand tool

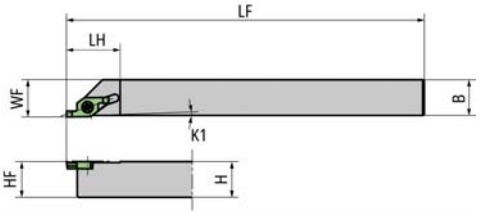
Item Number	Hand	Chipbreaker	APMX※	CDX	CW	EPSR	IC	K8	REL	RER	S	Carbide	
												PVD	
			inch	inch	inch	°	mm	°	inch	inch	inch	QM3	ZM3
GTG10050FL00	L	Yes	.039	.047	.020	60	7/32	2	.002	.002	1/8		●
GTG10065FL00	L	Yes	.039	.047	.026	60	7/32	2	.002	.002	1/8		●
GTG10075FL00	L	Yes	.039	.047	.030	60	7/32	2	.002	.002	1/8		●
GTG10100FL00	L	Yes	.039	.047	.039	60	7/32	2	.002	.002	1/8		●
GTG10150FL00	L	Yes	.039	.047	.059	60	7/32	2	.002	.002	1/8		●
GTG10200FL01	L	Yes	.039	.047	.079	60	7/32	2	.004	.004	1/8		●
GTG14100FL00	L	Yes	.079	.087	.039	60	5/16	2	.002	.002	1/8		●
GTG14150FL00	L	Yes	.079	.087	.059	60	5/16	2	.002	.002	1/8		●
GTG14200FL01	L	Yes	.079	.087	.079	60	5/16	2	.004	.004	1/8		●
GTG20150FL	L	Yes	.118	.126	.059	60	3/8	2	.008	.008	1/8	●	
GTG20200FL	L	Yes	.118	.126	.079	60	3/8	2	.008	.008	1/8	●	

※APMX : Depth of cut maximum

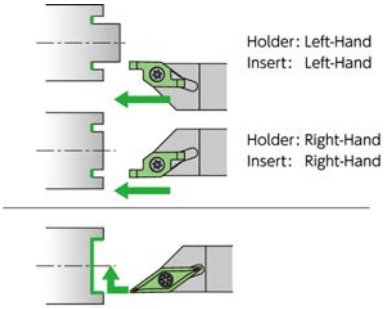
Face Grooving
SATURN DUO

FGV/FBV.. series/Toolholders

CH-FGV for horizontal gang style tool post



●Diagram shows right-hand tool



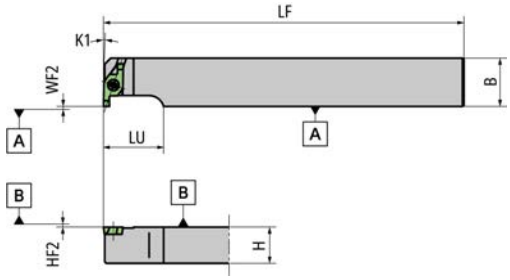
Only right hand holder is available when using FBV insert

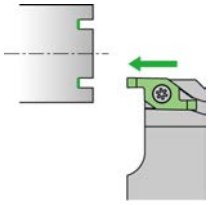
Item Number	Hand	B	H	K1	LF	LH	WF	Insert Gage	
		inch	inch	°	inch	inch	inch		
CH-FGVR1010	R	.394	.394	1	4.724	.709	.413	FGV..	FBV..
CH-FGVR1212	R	.472	.472	1	4.724	.709	.492	FGV..	FBV..
CH-FGVR1616	R	.630	.630	1	4.724	.709	.650	FGV..	FBV..
CH-FGVL1010	L	.394	.394	1	4.724	.709	.413	FGV..	–
CH-FGVL1212	L	.472	.472	1	4.724	.709	.492	FGV..	–
CH-FGVL1616	L	.630	.630	1	4.724	.709	.650	FGV..	–

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CH-FGVR1010	LRIS-2.5*7	CLR-15S
CH-FGVR1212	LRIS-2.5*7	CLR-15S
CH-FGVR1616	LRIS-2.5*7	CLR-15S
CH-FGVL1010	LRIS-2.5*7	CLR-15S
CH-FGVL1212	LRIS-2.5*7	CLR-15S
CH-FGVL1616	LRIS-2.5*7	CLR-15S

FGV for Gang-style machine





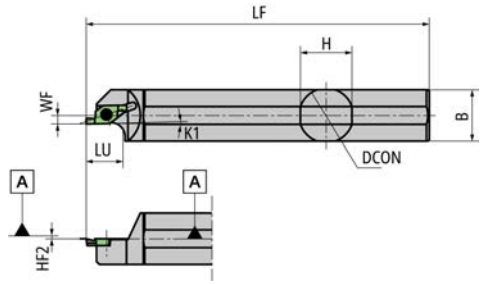
●Diagram shows right-hand tool
NOTE: Use a left-handed insert.

Item Number	Hand	B	H	HF2	K1	LF	LU	WF2	Insert Gage
		inch	inch	inch	°	inch	inch	inch	
FGVR1016	R	.630	.394	.000	1	4.724	.787	.000	FGV..
FGVR1216	R	.630	.472	.000	1	4.724	.787	.000	FGV..
FGVR1616	R	.630	.630	.000	1	4.724	.787	.000	FGV..

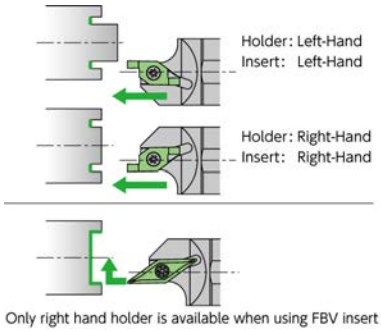
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
FGVR1016	LRIS-2.5*7	CLR-15S
FGVR1216	LRIS-2.5*7	CLR-15S
FGVR1616	LRIS-2.5*7	CLR-15S

DS-FGV DS Toolholders



●Diagram shows right-hand tool



Only right hand holder is available when using FBV insert

Item Number	Hand	B	DCON	H	HF2	K1	LF	LU	WF	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
DS-FGVR16-012	R	.591	.630	.591	.000	1	3.150	.433	.118	FGV..	FBV..
DS-FGVR19	R	.709	3/4	.709	.000	1	4.724	.433	.118	FGV..	FBV..
DS-FGVR20	R	.748	.787	.748	.000	1	4.724	.433	.118	FGV..	FBV..
DS-FGVR22	R	.827	.866	.827	.000	1	4.724	.433	.118	FGV..	FBV..
DS-FGVR22M	R	.827	.866	.827	.000	1	5.906	.433	.118	FGV..	FBV..
DS-FGVR25	R	.965	1.000	.965	.000	1	4.724	.433	.118	FGV..	FBV..
DS-FGVR25-MET	R	.945	.984	.945	.000	1	5.906	.433	.118	FGV..	FBV..
DS-FGVL16-012	L	.591	.630	.591	.000	1	3.150	.433	.118	FGV..	–
DS-FGVL19	L	.709	3/4	.709	.000	1	4.724	.433	.118	FGV..	–
DS-FGVL20	L	.748	.787	.748	.000	1	4.724	.433	.118	FGV..	–
DS-FGVL22	L	.827	.866	.827	.000	1	4.724	.433	.118	FGV..	–
DS-FGVL22M	L	.827	.866	.827	.000	1	5.906	.433	.118	FGV..	–
DS-FGVL25	L	.965	1.000	.965	.000	1	4.724	.433	.118	FGV..	–
DS-FGVL25-MET	L	.945	.984	.945	.000	1	5.906	.433	.118	FGV..	–

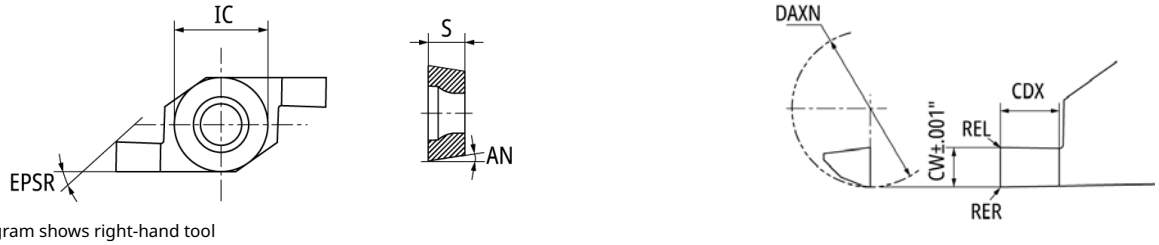
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-FGVR16-012	LRIS-2.5*7	CLR-15S
DS-FGVR19	LRIS-2.5*7	CLR-15S
DS-FGVR20	LRIS-2.5*7	CLR-15S
DS-FGVR22	LRIS-2.5*7	CLR-15S
DS-FGVR22M	LRIS-2.5*7	CLR-15S
DS-FGVR25	LRIS-2.5*7	CLR-15S
DS-FGVR25-MET	LRIS-2.5*7	CLR-15S
DS-FGVL16-012	LRIS-2.5*7	CLR-15S
DS-FGVL19	LRIS-2.5*7	CLR-15S
DS-FGVL20	LRIS-2.5*7	CLR-15S
DS-FGVL22	LRIS-2.5*7	CLR-15S
DS-FGVL22M	LRIS-2.5*7	CLR-15S
DS-FGVL25	LRIS-2.5*7	CLR-15S
DS-FGVL25-MET	LRIS-2.5*7	CLR-15S

Face Grooving
SATURN DUO

FGV_FBV.. series/Inserts Carbide

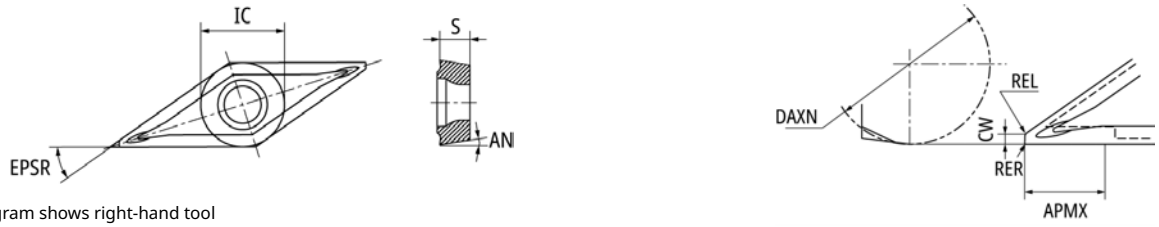
FGV



● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	DAXN	APMX	CDX	AN	CW	EPSR	IC	REL	RER	S	Carbide
													PVD
			°	inch	inch	inch	inch	°	inch	inch	inch	inch	TM4
FGV100RB00D6	R	Yes	.236	.059	.069	7	.039	35	1/4	.000	.000	3/32	●
FGV100RB05D6	R	Yes	.236	.059	.071	7	.039	35	1/4	.002	.002	3/32	●
FGV150RB00D6	R	Yes	.236	.079	.087	7	.059	35	1/4	.000	.000	3/32	●
FGV150RB05D6	R	Yes	.236	.079	.091	7	.059	35	1/4	.002	.002	3/32	●
FGV200RB00D6	R	Yes	.236	.118	.126	7	.079	35	1/4	.000	.000	3/32	●
FGV200RB05D6	R	Yes	.236	.118	.130	7	.079	35	1/4	.002	.002	3/32	●
FGV100LB00D6	L	Yes	.236	.059	.069	7	.039	35	1/4	.000	.000	3/32	●
FGV100LB05D6	L	Yes	.236	.059	.071	7	.039	35	1/4	.002	.002	3/32	●
FGV150LB00D6	L	Yes	.236	.079	.087	7	.059	35	1/4	.000	.000	3/32	●
FGV150LB05D6	L	Yes	.236	.079	.091	7	.059	35	1/4	.002	.002	3/32	●
FGV200LB00D6	L	Yes	.236	.118	.126	7	.079	35	1/4	.000	.000	3/32	●
FGV200LB05D6	L	Yes	.236	.118	.130	7	.079	35	1/4	.002	.002	3/32	●

FBV



● Diagram shows right-hand tool

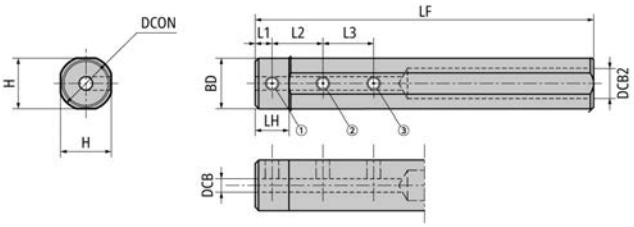
Note: Only CH-FGVR and DS-FGVR can take FBV Right hand insert.

Item Number	Hand	Chipbreaker	DAXN	APMX	AN	CW	EPSR	IC	REL	RER	S	Carbide
												PVD
			inch	inch	°	inch	°	inch	inch	inch	inch	TM4
FBV40R05D8AM3	R	Yes	.315	.157	7	(.020)	35	1/4	.008	.002	3/32	●
FBV40R15D8AM3	R	Yes	.315	.157	7	(.020)	35	1/4	.008	.006	3/32	●

ID Face Grooving
STICK DUO

SFG.. series/Sleeve

NBH Shank diameter ø5/8" - ø3/4"

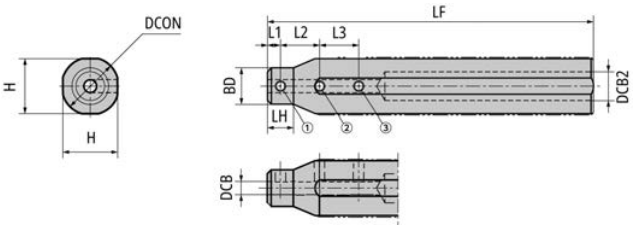


Item Number	Hand	BD	DCB	DCB2	DCON	H	LF	LH	L1	L2	L3	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
NBH06015H	N	.591	.236	.354	5/8	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08015H	N	.591	.315	.354	5/8	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH06016H	N	.591	.236	.354	.630	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08016H	N	.591	.315	.354	.630	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH06019K	N	.709	.236	.433	3/4	.709	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08019K	N	.709	.315	.433	3/4	.709	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..

Spare Parts

Item Number	Clamp screw			Wrench (for Clamp screw)
	①	②	③	
NBH06015H	SS0404F	SS0404F	SS0404F	LW-2
NBH08015H	SS0403F	SS0403F	SS0403F	LW-2
NBH06016H	SS0404F	SS0404F	SS0404F	LW-2
NBH08016H	SS0403F	SS0403F	SS0403F	LW-2
NBH06019K	SS0406F	SS0406F	SS0406F	LW-2
NBH08019K	SS0404F	SS0404F	SS0404F	LW-2

NBH Shank diameter ⌀.787" - ⌀1.260"



Item Number	Hand	BD	DCB	DCB2	DCON	H	LF	LH	L1	L2	L3	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
NBH06020K	N	.591	.236	.433	.787	.748	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08020K	N	.669	.315	.433	.787	.748	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH06022K	N	.591	.236	.433	.866	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08022K	N	.669	.315	.433	.866	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH06023K	N	.591	.236	.433	.906	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08023K	N	.669	.315	.433	.906	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH06025K-MET	N	.591	.236	.433	.984	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08025K-MET	N	.669	.315	.433	.984	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH06025K	N	.591	.236	.433	1.000	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08025K	N	.669	.315	.433	1.000	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH06032K	N	.591	.236	.433	1.260	1.181	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08032K	N	.669	.315	.433	1.260	1.181	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..

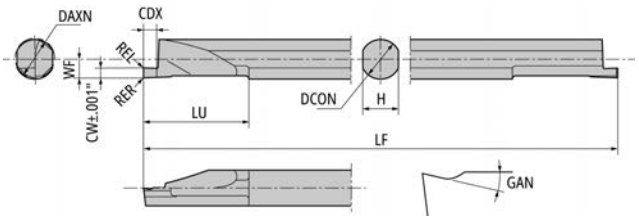
Spare Parts

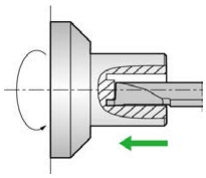
Item Number	Clamp screw			Wrench (IDfor Clamp screw)
	①	②	③	
NBH06020K	SS0404F	SS0406F	SS0406F	LW-2
NBH08020K	SS0404F	SS0404F	SS0404F	LW-2
NBH06022K	SS0404F	SS0406F	SS0406F	LW-2
NBH08022K	SS0404F	SS0406F	SS0406F	LW-2
NBH06023K	SS0404F	SS0406F	SS0406F	LW-2
NBH08023K	SS0404F	SS0406F	SS0406F	LW-2
NBH06025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH08025K-MET	SS0404F	SS0406F	SS0406F	LW-2
NBH06025K	SS0404F	SS0408F	SS0408F	LW-2
NBH08025K	SS0404F	SS0406F	SS0406F	LW-2
NBH06032K	SS0404F	SS0408F	SS0408F	LW-2
NBH08032K	SS0404F	SS0408F	SS0408F	LW-2

ID Face Grooving
STICK DUO

SFG.. series/Insert bar Carbide

SFG





● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	DAXN	APMX	CDX	CW	DCON	GAN	H	LF	LU	REL	RER	WF	Carbide
															PVD
			inch	inch	inch	inch	inch	°	inch	inch	inch	inch	inch	inch	TM4
SFG060R100B	R	Yes	.236	.059	.067	.039	.236	14	.213	3.150	.630	.002	.002	.110	●
SFG060R150B	R	Yes	.236	.079	.087	.059	.236	14	.213	3.150	.630	.002	.002	.110	●
SFG060R200B	R	Yes	.236	.118	.126	.079	.236	14	.213	3.150	.630	.002	.002	.110	●
SFG080R100B	R	Yes	.315	.059	.067	.039	.315	14	.287	3.150	.630	.002	.002	.150	●
SFG080R150B	R	Yes	.315	.079	.087	.059	.315	14	.287	3.150	.630	.002	.002	.150	●
SFG080R200B	R	Yes	.315	.118	.126	.079	.315	14	.287	3.150	.630	.002	.002	.150	●
SFG080R300B	R	Yes	.315	.118	.126	.118	.315	14	.287	3.150	.630	.002	.002	.150	●

MEMO

Threading

Product Lines U02

Recommended Cutting Conditions U03

General Information U05

Tools and Thread Standards U06

External Thread

- CSVT.. series U12
- TTPS.. series U16
- TTP.. series U17
- TTMH.. series U22

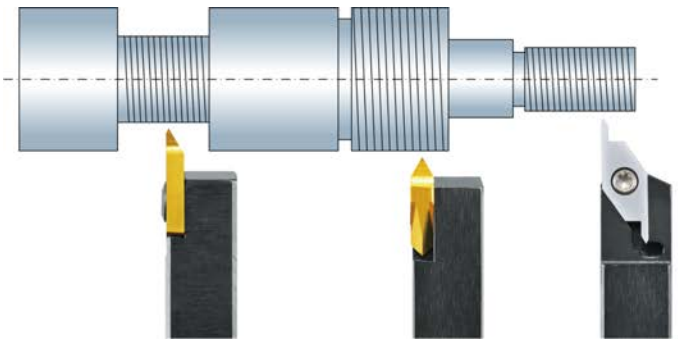
Internal Thread

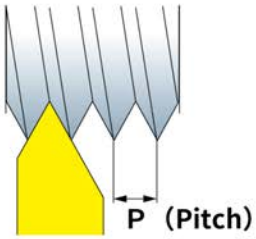
- SBT.. series U25
- TMN.. series U28

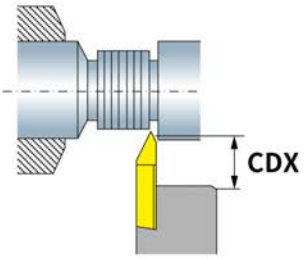
Thread Whirling U30

Product Lines

External Thread





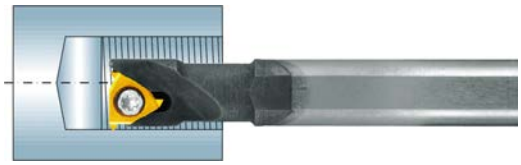


Insert	CSVT →U15		TTPS →U16
Holder	CSV	DS-CSV	CTPS
	→U12-13	→U14	→U16
Thread Angle	60°		60°
Pitch	127 - 51 TPI		127 - 17 TPI
CDX	.118"		.197"

Thread Whirling
→U30-38
Insert : Shapes are special
Highly efficient single pass machining

Insert	TTP →U21				TTMH32 →U24		
Holder	TTP-OH3/OH2	TTP	DS-TTP	CH-TTP	STTN	DS-STT	NTTB
	→U17	→U18-19	→U20	→U20	→U22	→U23	→U22
	Coolant through		DS			DS	
Thread Angle	60°/55°				60°		
Pitch	127 - 13 TPI				31 - 9 TPI		
CDX	.217"				.157"	.118"	.157"

Internal Thread



Insert	SBT →U27	TMN →U29
Holder	NBH	TGC / HN
	→U25-26	→U28
Thread Angle	60°	60°
Pitch	51 - 15 TPI	63 - 34 TPI
CDX	.024" - .071"	.028" - .039"

Recommended Cutting Conditions

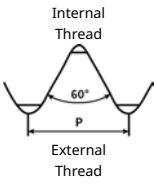
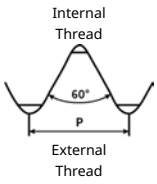
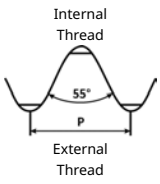
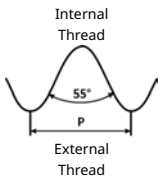
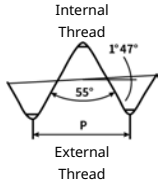
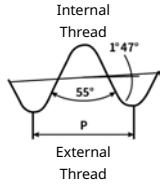
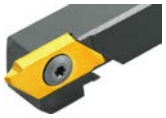
ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**650**		**ZM3**	**650 / ST4**		**650 / QM3**	
	2nd choice	ZM3		QM3	QM3 / ZM3		VM1	
Cutting speed (SFM)		65 - 130 - 195	100 - 165 - 260		130 - 230 - 330	130 - 295 - 590	130 - 295 - 490	

*Please set the feed rate to 80 IPM or lower to prevent making incomplete threads
(Unless your machine is equipped with high speed threading program)

Calculation ①Calculating the revolution speed $n = \frac{Vc \times 1000}{\pi \times \text{Screw nominal diameter}}$

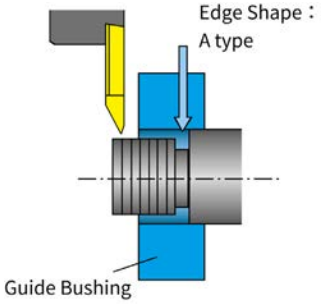
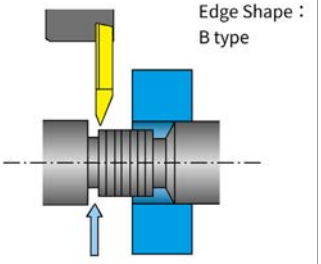
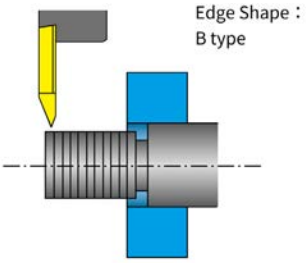
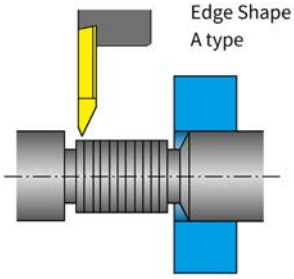
②Calculating the feeding speed F = n (Revolution speed) × P (Pitch)

Tools and Thread Standards

Thread Type		ISO Metric	American Unified	Whitworth	Parallel Pipe	American Tapered Pipe	Tapered Pipe
		M	UNC UNE	W	G (PF)	NPT	R (PT)
							
Thread Angle		60°	60°	55°	55°	60°	55°
Pitch		mm	TPI	TPI	TPI	TPI	TPI
External Thread	CSVT	0.2 - 0.5	80 - 56	-	-	-	-
	TTPS	0.2 - 1.5	80 - 18	-	-	(18)	-
	 TTP	0.2 - 2.0	80 - 13	40/24/20/18/16	(28/19)	(18/14)	(28/19)
	TTMH	0.8 - 3.0	24 - 9	-	-	18/14/11.5	-
Internal Thread	SBT	0.5 - 1.75	36 - 16	-	-	(18)	-
	TGC/HN	0.4 - 0.75	56 - 36	-	-	-	-

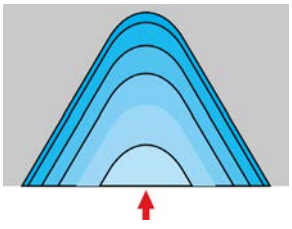
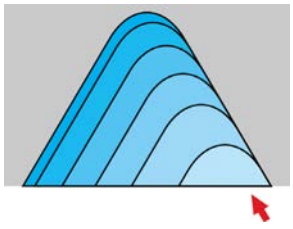
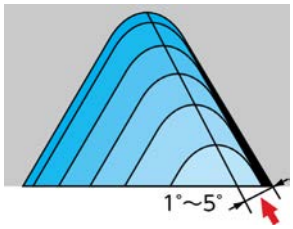
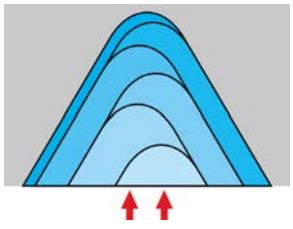
General Information

TTP.. series/Insert

Right Hand Toolholders				Left Hand Toolholders			
Guide bushing side		**Sub spindle side / Part shoulder**		**Guide bushing side**		**Sub spindle side / Part shoulder**	
							
Toolholder	TTPR	Toolholder	TTPR	Toolholder	TTPL	Toolholder	TTPL
Insert	TTP..FR..A	Insert	TTP..FR..B	Insert	TTP..FL..B	Insert	TTP..FL..A
Common tooling often used when the thread goes to the end of the part. The right hand A type insert can machine a thread close to the guide bushing. The space indicated by the arrow can be narrow.		The right hand B type insert is often used when the thread is located in the middle or towards the end of the part; up to a shoulder. Using the right-hand B type, the tip of the threading insert is closer to the sub-spindle side. The space indicated by the arrow can be narrow. Such as working up to a shoulder.		By using a left hand holder and insert, the insert edge position provides sufficient cutting distance from the guide bushing. The left-hand operation of A and B type inserts is reversed from right-hand version.			

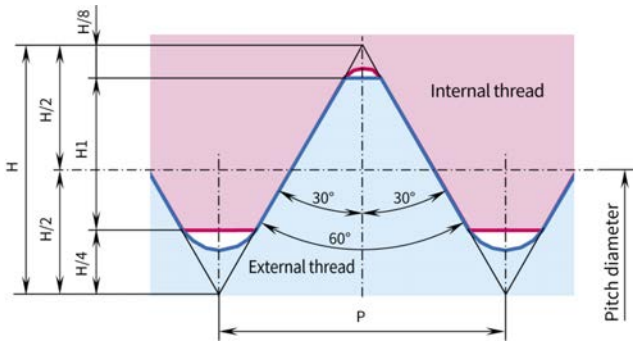
- For left-hand operation, the selection of A and B type inserts is reversed.(Guide bush side is B, and sub-spindle side is A.)
- In addition, if you do not want to retract the machined workpiece to the guide bushing, you may select the left hand holder. (Burrs protrude on the outside diameter, scratching the guide bushing.)
- For A and B inserts, the cutting edge length is designed to be .016" or .031" and the pitch is 127-34 TPI or 63-21 TPI.
- A and B type inserts are best applied when either entering or exiting near a shoulder.

Infeed Threading Method

	Radial Infeed	**Flank Infeed**	**Modified Flank Infeed**	**Incremental Infeed**
Features				
Advantage	• Most popular and easiest method • Easy to change parameter • Uniform wear on both sides of insert	• 2nd most popular and easy method • Effective for larger pitch and gummy material thanks to lower cutting force • Excellent chip evacuation	• Reduce flank wear on right side • Effective for larger pitch and gummy material thanks to lower cutting force • Excellent chip evacuation	• Uniform flank wear • Effective for larger pitch and gummy material thanks to lower cutting force
Disadvantage	• Chip evacuation • Vibration due to higher cutting force • Ineffective for large pitch threading	• Larger flank wear on right side of the insert • Difficult to change cutting depth per cut	• Difficult to program • Difficult to change cutting depth per cut	• Difficult to program • Difficult to change cutting depth per cut • Chip evacuation

Tools and Thread Standards

ISO Metric (M)



External thread

Coarse	Fine	Applicable inserts			
		CSVT	TTPS	TTP	TTMH
	M1×0.2	**CSVT11F$^{R}_{L}$P60-035$^{A}_{B}$**	**TTPS60F $^{R}_{L}$ 4 $^{A}_{B}$**	**TTP60F$^{R}_{L}$4$^{A}_{B}$(S)**	–
M1×0.25	M2×0.25	**CSVT11F$^{R}_{L}$P60-035$^{A}_{B}$**	**TTPS60F$^{R}_{L}$4$^{A}_{B}$**	**TTP60F$^{R}_{L}$4$^{A}_{B}$(S)**	–
	M3×0.35	**CSVT11F$^{R}_{L}$P60-035$^{A}_{B}$**	**TTPS60F$^{R}_{L}$4$^{A}_{B}$**	**TTP60F$^{R}_{L}$4$^{A}_{B}$(S)**	–
M2×0.4		**CSVT11F$^{R}_{L}$P60-035$^{A}_{B}$**	**TTPS60F$^{R}_{L}$8$^{A}_{B}$**	**TTP60F$^{R}_{L}$8$^{A}_{B}$(S)**	–
M3×0.5	M4×0.5	**CSVT11F$^{R}_{L}$P60-035$^{A}_{B}$**	**TTPS60F$^{R}_{L}$8$^{A}_{B}$**	**TTP60F$^{R}_{L}$8$^{A}_{B}$(S)**	–
M4×0.7		–	**TTPS60F$^{R}_{L}$8$^{A}_{B}$**	**TTP60F$^{R}_{L}$8$^{A}_{B}$(S)**	–
	M6×0.75	–	**TTPS60F$^{R}_{L}$8$^{A}_{B}$**	**TTP60F$^{R}_{L}$8$^{A}_{B}$(S)**	–
M5×0.8		–	**TTPS60F$^{R}_{L}$-N**	**TTP60F$^{R}_{L}$-N**	**TTMH3260R010**
M6×1.0		–	**TTPS60F$^{R}_{L}$-N**	**TTP60F$^{R}_{L}$-N**	**TTMH3260R010**
M8×1.25		–	**TTPS60F$^{R}_{L}$-N**	**TTP60F$^{R}_{L}$-N**	**TTMH3260R015**
M10×1.5	M12×1.5	–	–	–	**TTMH3260R020**
M12×1.75		–	–	–	**TTMH3260R020**
M16×2.0	M20×2.0	–	–	–	**TTMH3260R025**
M20×2.5		–	–	–	**TTMH3260R025**
M24×3.0	M30×3.0	–	–	–	**TTMH3260R025**

Internal thread

Coarse	Fine	Applicable inserts
	M3×0.35	**SBT025M3R**
M2×0.4		–
M3×0.5		**SBT025M3R**
	M4×0.5	**SBT030M4R(B)**
M4×0.7		**SBT030M4R(B)**
	M6×0.75	**SBT040M6RB**
M5×0.8		**SBT035M5RB**
M6×1.0		**SBT040M6RB**
M8×1.25		**SBT050M8RB**
M10×1.5	M12×1.5	**SBT060M10RB**
M12×1.75		**SBT060M10RB**

Recommended Depth of Cut (mm) and number of passes

ISO Metric (M)

External thread

CSVT

Item Number	Edge radius	Pitch	Total DOC	No. of pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CSVT11FR/LP60-035A(B)	0.03 MAX	0.20	0.25	4	0.08	0.07	0.06	0.04																
		0.25	0.32	5	0.09	0.07	0.07	0.05	0.04															
		0.35	0.48	6	0.12	0.10	0.09	0.07	0.06	0.04														
		0.40	0.55	6	0.15	0.12	0.10	0.08	0.06	0.04														
		0.50	0.70	7	0.16	0.14	0.12	0.10	0.08	0.06	0.04													

TTP/TTPS

Item Number	Edge radius	Pitch	Total DOC	No. of pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
TTP60FR/L2A/B TTP(S)60FR/L4A/B	0.05 Max Fiat	0.20	0.22	4	0.07	0.06	0.05	0.04																
		0.25	0.29	5	0.08	0.07	0.06	0.04	0.04															
		0.35	0.44	5	0.14	0.11	0.09	0.06	0.04															
TTP(S)60FR/L8A/B	R0.05	0.40	0.50	6	0.13	0.10	0.09	0.08	0.06	0.04														
		0.50	0.66	6	0.20	0.16	0.12	0.08	0.06	0.04														
		0.70	0.96	7	0.22	0.20	0.18	0.14	0.10	0.08	0.04													
		0.75	1.04	8	0.22	0.20	0.20	0.14	0.10	0.08	0.06	0.04												
TTP(S)60FR/L-N	R0.1	0.80	1.01	8	0.25	0.20	0.16	0.12	0.10	0.08	0.06	0.04												
		1.00	1.32	8	0.30	0.24	0.20	0.18	0.16	0.12	0.08	0.04												
		1.25	1.69	9	0.31	0.30	0.30	0.24	0.18	0.14	0.10	0.08	0.04											
TTPFR/L-N02	R0.20	1.50	1.87	10	0.33	0.32	0.28	0.24	0.20	0.16	0.12	0.10	0.08	0.04										
		1.75	2.25	11	0.36	0.35	0.32	0.28	0.24	0.20	0.16	0.12	0.10	0.08	0.04									
		2.00	2.63	12	0.36	0.34	0.32	0.30	0.28	0.26	0.22	0.18	0.14	0.12	0.07	0.04								

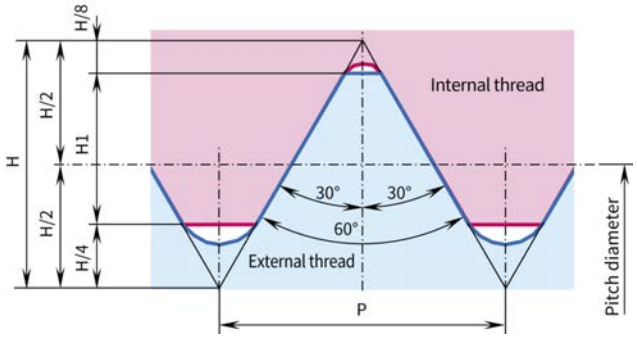
TTMH

Item Number	Edge radius	Pitch	Total DOC	No. of pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
TTMH3260R010	R0.1	0.8	1.01	8	0.25	0.20	0.16	0.12	0.10	0.08	0.06	0.04												
		1.0	1.32	8	0.30	0.24	0.20	0.18	0.16	0.12	0.08	0.04												
TTMH3260R015	R0.15	1.3	1.59	9	0.33	0.30	0.26	0.20	0.16	0.12	0.10	0.08	0.04											
TTMH3260R020	R0.20	1.5	1.90	10	0.36	0.32	0.28	0.24	0.20	0.16	0.12	0.10	0.08	0.04										
		1.8	2.25	11	0.36	0.35	0.32	0.28	0.24	0.20	0.16	0.12	0.10	0.08	0.04									
TTMH3260R025	R0.25	2.0	2.53	12	0.36	0.36	0.32	0.30	0.28	0.24	0.20	0.16	0.12	0.09	0.06	0.04								
		2.5	3.29	14	0.45	0.40	0.40	0.36	0.32	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.08	0.04						
		3.0	4.07	15	0.50	0.50	0.45	0.40	0.36	0.32	0.30	0.28	0.24	0.20	0.18	0.12	0.10	0.08	0.04					

Internal thread

SBT

Item Number	Edge radius	Pitch	Total DOC	No. of pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
SBT025M3R	0.05 MAX Flat	0.35	0.37	6	0.11	0.09	0.07	0.05	0.03	0.02														
		0.50	0.56	7	0.12	0.12	0.1	0.08	0.07	0.05	0.02													
SBT030M4R(B)		0.70	0.82	9	0.14	0.14	0.12	0.12	0.1	0.08	0.06	0.04	0.02											
SBT035M5RB		0.80	0.95	10	0.14	0.14	0.14	0.12	0.12	0.1	0.08	0.06	0.03	0.02										
SBT040M6RB	R0.05	1.00	1.20	12	0.14	0.14	0.14	0.12	0.12	0.12	0.12	0.1	0.08	0.06	0.04	0.02								
SBT050M8RB		1.25	1.52	15	0.14	0.14	0.14	0.12	0.12	0.12	0.12	0.12	0.1	0.1	0.1	0.08	0.06	0.04	0.02					
SBT060M10RB		1.50	1.85	18	0.15	0.14	0.14	0.14	0.12	0.12	0.12	0.12	0.12	0.1	0.1	0.1	0.1	0.08	0.08	0.06	0.04	0.02		
		1.75	2.17	20	0.15	0.14	0.14	0.14	0.14	0.12	0.12	0.12	0.12	0.12	0.12	0.1	0.1	0.1	0.1	0.08	0.08	0.08	0.06	0.04



External thread

Coarse (UNC)		Fine (UNF)		Pitch (inch) (Reference)	Applicable inserts		
Thread type	(Reference)	Thread type	(Reference)		CSVT	TTP/TTPS	TTMH
		No.0-80 UNF	0.0600-80 UNF	.013	**CSVT11FR/LP60-035A/B**	**TTP(S)6FR/L4A/B**	–
		No.1-72 UNF	0.0730-72 UNF	.014	**CSVT11FR/LP60-035A/B**	**TTP(S)6FR/L4A/B**	–
No.1-64 UNC	0.0730-64 UNC	No.2-64 UNF	0.0860-64 UNF	.016	**CSVT11FR/LP60-035A/B**	**TTP(S)6FR/L4A/B**	–
No.2-56 UNC	0.0860-56 UNC	No.3-56 UNF	0.0990-56 UNF	.018	**CSVT11FR/LP60-035A/B**	**TTP(S)60FR/L8A/B**	–
No.3-48 UNC	0.0990-48 UNC	No 4-48 UNF	0.1120-48 UNF	.021	**CSVT11FR/LP60-035A/B**	**TTP(S)60FR/L8A/B**	–
		No.5-44 UNF	0.1250-44 UNF	.023	–	**TTP(S)60FR/L8A/B**	–
No.440 UNC	0.1120-40 UNC	No.6-40 UNF	0.1380-40 UNF	.025	–	**TTP(S)60FR/L8A/B**	–
No.5-40 UNC	0.1250-40 UNC			.025	–	**TTP(S)60FR/L8A/B**	–
		No.8-36 UNF	0.1640-36 UNF	.028	–	**TTP(S)60FR/L8A/B**	–
No.6-32 UNC	0.1380-32 UNC	No.10-32 UNF	0.1900-32 UNF	.031	–	**TTP(S)60FR/L-N(S)**	**TTMH3260R010**
No.8-32 UNC	0.1640-32 UNC			.031	–	**TTP(S)60FR/L-N(S)**	**TTMH3260R010**
		No.12-28 UNF	0.2160-28 UNF	.036	–	**TTP(S)60FR/L-N(S)**	**TTMH3260R010**
		1/4-28 UNF	0.2500-28 UNF	.036	–	**TTP(S)60FR/L-N(S)**	**TTMH3260R010**
No.10-24 UNC	0.1900-24 UNC	5/16-24 UNF	0.3125-24 UNF	.042	–	**TTP(S)60FR/L-N(S)**	**TTMH3260R010**
No.12-24 UNC	0.2160-24 UNC	3/8-24 UNF	0.3750-24 UNF	.042	–	**TTP(S)60FR/L-N(S)**	**TTMH3260R010**
1/4-20 UNC	0.2500-20 UNC	7/16-20 UNF	0.4375-20 UNF	.050	–	**TTP(S)60FR/L-N(S)**	**TTMH3260R015**
		1/2-20 UNF	0.5000-20 UNF	.050	–	**TTP(S)60FR/L-N(S)**	**TTMH3260R015**
5/16-18 UNC	0.3125-18 UNC	9/16-18 UNF	0.5625-18 UNF	.056	–	**TTP(S)60FR/L-N(S)**	**TTMH3260R015**
		5/8-18 UNF	0.6250-18 UNF	.056	–	**TTP(S)60FR/L-N(S)**	**TTMH3260R015**
3/8-16 UNC	0.3750-16 UNC	3/4-16 UNF	0.7500-16 UNF	.063	–	**TTP60FR/L -N02**	**TTMH3260R020**
7/16-14 UNC	0.4375-14 UNC	7/8-14 UNF	0.8750-14 UNF	.071	–	**TTP60FR/L -N02**	**TTMH3260R020**
1/2-13 UNC	0.5000-13 UNC			.077	–	**TTP60FR/L -N02**	**TTMH3260R020**
9/16-12 UNC	0.5625-12 UNC	1-12 UNF	1.0000-12 UNF	.083	–	**TTP60FR/L -N02**	**TTMH3260R025**
		11/8-12 UNF	1.1250-12 UNF	.083	–	**TTP60FR/L -N02**	**TTMH3260R025**
		11/4-12 UNF	1.2500-12 UNF	.083	–	**TTP60FR/L -N02**	**TTMH3260R025**
		13/8-12 UNF	1.3750-12 UNF	.083	–	**TTP60FR/L -N02**	**TTMH3260R025**
		11/2-12 UNF	1.5000-12 UNF	.083	–	**TTP60FR/L -N02**	**TTMH3260R025**
5/8-11 UNC	0.6250-11 UNC			.091	–	–	**TTMH3260R025**
3/4-10 UNC	0.7500-10 UNC			.100	–	–	**TTMH3260R025**
7/8-9 UNC	0.8750- 9 UNC			.111	–	–	**TTMH3260R025**

Internal thread

Coarse (UNC)		Fine (UNF)		Pitch (inch) (Reference)	Pilot Bore Dia. (inch)	Applicable inserts
Thread type	(Reference)	Thread type	(Reference)			
		No.8-36 UNF	0.1640-36 UNF	.028	.138	**SBT030M4R(B)**
No.8-32 UNC	0.1640-32 UNC			.031	.135	**SBT030M4R(B)**
		No.10-32 UNF	0.1900-32 UNF	.031	.160	**SBT035M5RB**
		No.12-28 UNF	0.2160-28 UNF	.036	.181	**SBT040M6RB**
		1/4-28 UNF	0.2500-28 UNF	.036	.215	**SBT040M6RB**
No.10-24 UNC	0.1900-24 UNC			.042	.151	**SBT035M5RB**
No.12-24 UNC	0.2160-24 UNC			.042	.176	**SBT035M5RB**
		5/16-24 UNF	0.3125-24 UNF	.042	.272	**SBT050M8RB**
		3/8-24 UNF	0.3750-24 UNF	.042	.335	**SBT060M10RB**
1/4-20 UNC	0.2500-20 UNC			.050	.202	**SBT040M6RB**
		7/16-20 UNF	0.4375-20 UNF	.050	.389	**SBT060M10RB**
		1/2-20 UNF	0.5000-20 UNF	.050	.452	**SBT060M10RB**
5/16-18 UNC	0.3125-18 UNC			.056	.259	**SBT050M8RB**
		9/16-18 UNF	0.5625-18 UNF	.056	.508	**SBT060M10RB**
		5/8-18 UNF	0.6250-18 UNF	.056	.571	**SBT060M10RB**
3/8-16 UNC	0.3750-16 UNC			.063	.314	**SBT060M10RB**
		3/4-16 UNF	0.7500-16 UNF	.063	.689	**SBT060M10RB**

Recommended Depth of Cut (inch) and number of passes
American Unified UNC/UNF

External thread

CSVT

Item Number	Edge radius	TPI	Total DOC	No. of pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CSVT11FRP60-035A(B)	.762 Max	80	.017	6	.0039	.0039	.0031	.0024	.0020	.0016														
		72	.019	6	.0047	.0039	.0035	.0028	.0024	.0016														
		64	.022	6	.0055	.0051	0.0039	.0031	.0024	.0016														
		56	.025	7	.0055	.0047	.0039	.0035	.0031	.0024	.0016													
		48	.030	7	.0063	.0063	.0055	.0043	.0031	.0024	.0016													

TTP/TTPS

Item Number	Edge radius	TPI	Total DOC	No. of pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
TTPS60FR/L2A(B) TTP(S)60FR/L4A(B)	.002 Max Flat	80	.015	5	.0043	.0039	.0031	.0024	.0016															
		72	.017	5	.0051	.0051	.0035	.0024	.0016															
		64	.019	6	.0051	.0043	.0039	.0028	.0024	.0016														
TTP(S)60FR/L8A(B)	R.002	56	.021	6	.0063	.0055	.0043	.0031	.0024	.0016														
		48	.024	6	.0079	.0063	.0055	.0035	.0028	.0016														
		44	.025	7	.0079	.0063	.0051	.0039	.0031	.0024	.0016													
		40	.027	7	.0079	.0071	.0063	.0047	.0039	.0024	.0016													
		36	.030	8	.0079	.0071	.0063	.0055	.0043	.0031	.0024	.0016												
TTP(S)60FR/L -N	R.004	32	.030	8	.0094	.0079	.0063	.0047	.0039	.0031	.0024	.0016												
		28	.034	8	.0102	.0091	.0075	.0059	.0047	.0039	.0031	.0016												
		24	.040	9	.0110	.0094	.0087	.0071	.0055	.0047	.0039	.0031	.0016											
		20	.047	9	.0126	.0114	.0106	.0094	.0079	.0063	.0047	.0031	.0016											
		18	.052	10	.0134	.0118	.0110	.0102	.0087	.0071	.0055	.0039	.0031	.0016										
TTP60FR/L -N02	R.008	16	.052	10	.0138	.0134	.0118	.0102	.0087	.0071	.0055	.0039	.0031	.0016										
		14	.060	11	.0142	.0138	.0126	.0118	.0102	.0087	.0071	.0055	.0039	.0031	.0016									
		13	.063	12	.0142	.0134	.0126	.0118	.0102	.0087	.0079	.0071	.0063	.0039	.0031	.0016								
		12	.068	13	.0142	.0138	.0126	.0118	.0110	.0102	.0094	.0079	.0063	.0047	.0039	.0031	.0016							

TTMH

Item Number	Edge radius	TPI	Total DOC	No. of pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
TTMH3260R010	R.004	32	.0299	8	.0094	.0079	.0047	.0047	.0039	.0031	.0024	.0016												
		28	.0340	8	.0102	.0091	.0059	.0059	.0047	.0039	.0031	.0016												
		24	.0395	9	.0110	.0094	.0071	.0071	.0055	.0047	.0039	.0031	.0016											
TTMH3260R015	R.006	20	.0458	9	.0126	.0110	.0079	.0079	.0071	.0063	.0047	.0031	.0016											
		18	.0505	10	.0126	.0118	.0094	.0094	.0079	.0063	.0047	.0039	.0031	.0016										
TTMH3260R020	R.008	16	.0523	10	.0138	.0134	.0102	.0102	.0087	.0071	.0055	.0039	.0031	.0016										
		14	.0596	11	.0142	.0138	.0118	.0118	.0102	.0087	.0071	.0055	.0039	.0031	.0016									
		13	.0634	12	.0142	.0134	.0118	.0118	.0102	.0087	.0079	.0071	.0063	.0039	.0031	.0016								
TTMH3260R025	R.010	12	.0671	12	.0142	.0138	.0130	.0122	.0114	.0098	.0087	.0079	.0063	.0047	.0031	.0016								
		11	.0725	13	.0157	.0142	.0118	.0118	.0110	.0102	.0094	.0087	.0079	.0063	.0047	.0031	.0016							
		10	.0809	14	.0169	.0157	.0142	.0142	.0126	.0110	.0094	.0079	.0071	.0063	.0055	.0047	.0031	.0016						
		9	.0913	15	.0177	.0169	.0154	.0154	.0142	.0126	.0110	.0094	.0079	.0071	.0063	.0055	.0039	.0031	.0016					

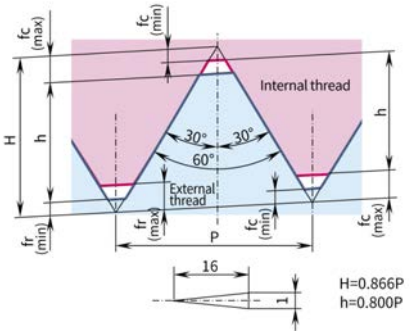
Internal thread

SBT

Item Number	Edge radius	TPI	Total DOC	No. of pass	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
SBT030M4R(B)	.002 Max Flat	36	.0264	9	.0055	.0055	.0047	.0043	.0039	.0031	.0024	.0016	.0008											
SBT030M4R(B) SBT035M5RB	.002 Max Flat	32	.0290	10	.0055	.0055	.0051	.0047	.0043	.0039	.0031	.0024	.0016	.0008										
SBT040M6RB	R.002	28	.0314	12	.0055	.0055	.0047	.0047	.0043	.0039	.0035	.0031	.0028	.0020	.0016	.0008								
SBT035M5RB	.002 Max Flat	24	.0364	13	.0055	.0055	.0055	.0047	.0047	.0047	.0047	.0039	.0035	.0031	.0024	.0016	.0008	.0008						
SBT0S0M8RB SBT060M10RB	R.002	24	.0359	13	.0055	.0055	.0055	.0047	.0047	.0047	.0039	.0039	.0035	.0031	.0024	.0016	.0008	.0008						
SBT060M10RB	R.002	20	.0438	15	.0055	.0055	.0055	.0055	.0047	.0047	.0047	.0047	.0039	.0039	.0039	.0035	.0024	.0024	.0008					
SBT0S0M8RB SBT060M10RB	R.002	18	.0475	17	.0055	.0055	.0055	.0055	.0047	.0047	.0047	.0047	.0039	.0039	.0039	.0039	.0035	.0035	.0024	.0016	.0008			
SBT060M10RB	R.002	16	.0510	19	.0055	.0055	.0055	.0055	.0047	.0047	.0047	.0047	.0047	.0039	.0039	.0039	.0039	.0039	.0039	.0031	.0024	.0016	.0008	

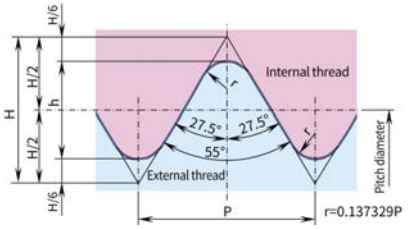
American Tapered Pipe NPT

Coarse	(Reference)	Pitch(mm) (Reference)	Applicable inserts
NTP1/16	27	0.941	TTP(S)60F$^{R}_{L}$8$^{A}_{B}$
NPT1/8	27	0.941	
NPT1/4	18	1.411	
NPT3/8	18	1.411	



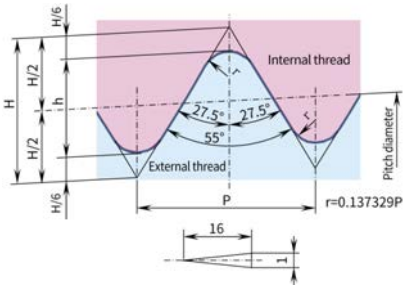
Parallel Pipe G/BSPP

Coarse	(Reference)	Pitch(mm) (Reference)	Applicable inserts
G1/16	28	0.9071	TTP55F$^{R}_{L}$8$^{A}_{B}$
G1/8	28	0.9071	
G1/4	19	1.3368	
G3/8	19	1.3368	



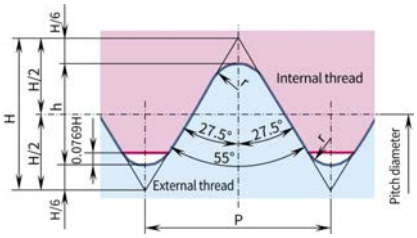
Tapered Pipe R/BSPT

Coarse	(Reference)	Pitch(mm) (Reference)	Applicable inserts
R(PT)1/16	28	0.9071	TTP55F$^{R}_{L}$8$^{A}_{B}$
R(PT)1/8	28	0.9071	
R(PT)1/4	19	1.3368	
R(PT)1/8	19	1.3368	



Whitworth BSW

Coarse	(Reference)	Pitch(mm) (Reference)	Applicable inserts
W1/8	40	0.64	TTP55F$^{R}_{L}$8$^{A}_{B}$
W3/16	24	1.06	
W1/4	20	1.27	
W5/16	18	1.41	
W3/8	16	1.59	



Recommended Depth of Cut (mm) and number of passes

American Tapered Pipe NPT

Item Number	Edge radius	Coarse	TPI	Total DOC	No. of pass	1	2	3	4	5	6	7	8	9	10
TTP(S)60F$^{R}/_{L}$8$^{A}/_{B}$	R0.05	NPT$^{1}/_{16}$	27	0.64	6	0.18	0.16	0.12	0.08	0.06	0.04				
		NPT$^{1}/_{8}$	27	0.64	6	0.18	0.16	0.12	0.08	0.06	0.04				
		NPT$^{1}/_{1}$	18	1.28	8	0.26	0.24	0.20	0.18	0.16	0.12	0.08	0.04		
		NPT$^{3}/_{8}$	18	1.28	8	0.26	0.24	0.20	0.18	0.16	0.12	0.08	0.04		

Parallel Pipe G/BSPP

Item Number	Edge radius	Coarse	TPI	Total DOC	No. of pass	1	2	3	4	5	6	7	8	9	10
TTP55F$^{R}/_{L}$8$^{A}/_{B}$	R0.05	G$^{1}/_{16}$	28	0.67	6	0.2	0.16	0.12	0.09	0.06	0.04				
		G$^{1}/_{8}$	28	0.67	6	0.2	0.16	0.12	0.09	0.06	0.04				
		G$^{1}/_{4}$	19	1.01	8	0.25	0.20	0.16	0.12	0.10	0.08	0.06	0.04		
		G$^{3}/_{8}$	19	1.01	8	0.25	0.20	0.16	0.12	0.10	0.08	0.06	0.04		

Tapered Pipe R/BSPT

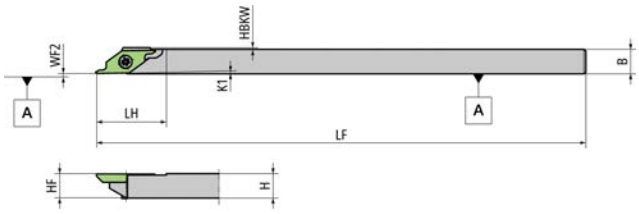
Item Number	Edge radius	Coarse	TPI	Total DOC	No. of pass	1	2	3	4	5	6	7	8	9	10
TTP55F$^{R}/_{L}$8$^{A}/_{B}$	R0.05	R(PT)$^{1}/_{16}$	28	0.67	6	0.20	0.16	0.12	0.09	0.06	0.04				
		R(PT)$^{1}/_{8}$	28	0.67	6	0.20	0.16	0.12	0.09	0.06	0.04				
		R(PT)$^{1}/_{4}$	19	1.01	8	0.25	0.20	0.16	0.12	0.10	0.08	0.06	0.04		
		R(PT)$^{3}/_{8}$	19	1.01	8	0.25	0.20	0.16	0.12	0.10	0.08	0.06	0.04		

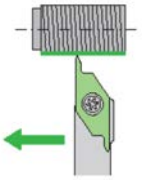
Whitworth BSW

Item Number	Edge radius	Coarse	TPI	Total DOC	No. of pass	1	2	3	4	5	6	7	8	9	10
TTP55F$^{R}/_{L}$8$^{A}/_{B}$	R0.05	W$^{1}/_{8}$	40	0.45	5	0.13	0.13	0.09	0.06	0.04					
		W$^{3}/_{16}$	24	0.79	7	0.2	0.16	0.14	0.11	0.08	0.06	0.04			
		W$^{1}/_{4}$	20	0.96	8	0.2	0.18	0.16	0.14	0.1	0.08	0.06	0.04		
		W$^{5}/_{16}$	18	1.07	8	0.25	0.22	0.18	0.14	0.1	0.08	0.06	0.04		
		W$^{3}/_{8}$	16	1.21	8	0.26	0.23	0.2	0.16	0.13	0.11	0.08	0.04		

External thread
CSVT.. series/Toolholder

CSV [91°] For Cam-style machine





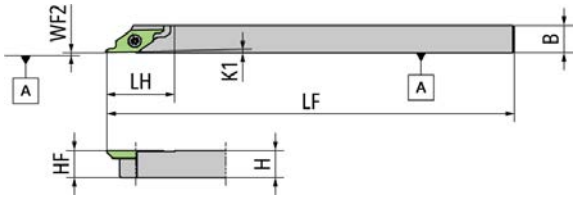
● Diagram shows right-hand tool

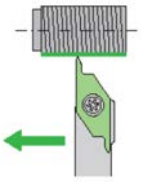
Item Number	Hand	B	H	HBKW	HF	K1	LF	LH	WF2	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
CSVR07	R	.276	.276	.020	.276	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR07GX	R	.276	.276	.020	.276	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08	R	.315	.315	.000	.315	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08GX	R	.315	.315	.000	.315	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR095	R	.374	.374	.000	.374	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR10	R	.394	.394	.000	.394	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR12	R	.472	.472	.000	.472	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR12GX	R	.472	.472	.000	.472	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL07	L	.276	.276	.020	.276	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL08	L	.315	.315	.000	.315	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL10	L	.394	.394	.000	.394	1	5.512	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CSVR07	LRIS-2.5*7	CLR-15S
CSVR07GX	LRIS-2.5*7	CLR-15S
CSVR08	LRIS-2.5*7	CLR-15S
CSVR08GX	LRIS-2.5*7	CLR-15S
CSVR095	LRIS-2.5*7	CLR-15S
CSVR10	LRIS-2.5*7	CLR-15S
CSVR12	LRIS-2.5*7	CLR-15S
CSVR12GX	LRIS-2.5*7	CLR-15S
CSVL07	LRIS-2.5*7	CLR-15S
CSVL08	LRIS-2.5*7	CLR-15S
CSVL10	LRIS-2.5*7	CLR-15S

CSV-NC [91°] For Gang-style machine





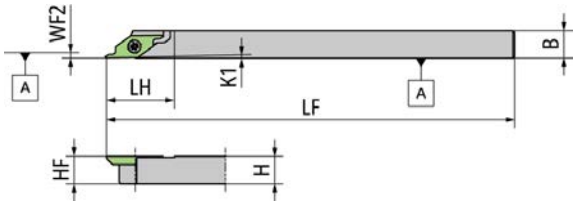
● Diagram shows right-hand tool

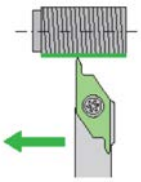
Item Number	Hand	B	H	HF	K1	LF	LH	WF2	Insert Gage	
		inch	inch	inch	°	inch	inch	inch		
CSVR06-IN-NC	R	3/8	3/8	3/8	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08-IN-NC	R	1/2	1/2	1/2	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL06-IN-NC	L	3/8	3/8	3/8	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL08-IN-NC	L	1/2	1/2	1/2	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR08NC	R	.315	.315	.315	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR10GXNC	R	.394	.394	.394	1	3.346	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR10NC	R	.394	.394	.394	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVR12NC	R	.472	.472	.472	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL08NC	L	.315	.315	.315	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL10NC	L	.394	.394	.394	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..
CSVL12NC	L	.472	.472	.472	1	4.724	.787	.004	CSVF../CSVB../CSVC..	CSVG../CSVT..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CSVR06-IN-NC	LRIS-2.5*7	CLR-15S
CSVR08-IN-NC	LRIS-2.5*7	CLR-15S
CSVL06-IN-NC	LRIS-2.5*7	CLR-15S
CSVL08-IN-NC	LRIS-2.5*7	CLR-15S
CSVR08NC	LRIS-2.5*7	CLR-15S
CSVR10GXNC	LRIS-2.5*7	CLR-15S
CSVR10NC	LRIS-2.5*7	CLR-15S
CSVR12NC	LRIS-2.5*7	CLR-15S
CSVL08NC	LRIS-2.5*7	CLR-15S
CSVL10NC	LRIS-2.5*7	CLR-15S
CSVL12NC	LRIS-2.5*7	CLR-15S

CSV-NC-F [91°] For Gang-style machine





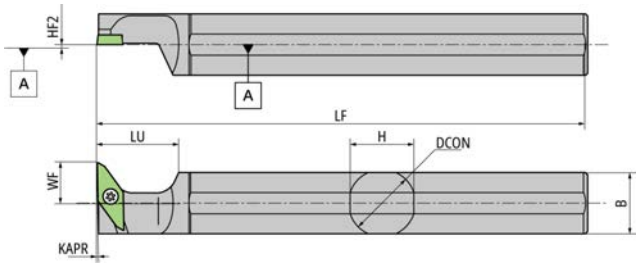
● Diagram shows right-hand tool

Item Number	Hand	B	H	HBKW	HF	K1	LF	LH	WF2	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
CSVR08NC-F	R	.315	.315	.000	.315	1	4.724	.787	.000-.004	CSVF../CSVB../CSVC..	CSVG../CSVT..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CSVR08NC-F	LRIS-2.5*7	CLR-15S

DS-CSVL [91°] DS Toolholders



● Diagram shows left-hand tool
NOTE: Use a right-handed (R) or non-handed insert.

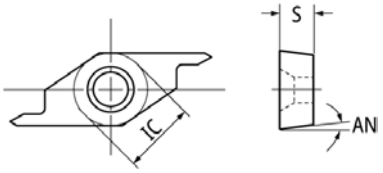
Item Number	Hand	B	DCON	H	HF2	KAPR	LF	LU	WF	Insert Gage	
		inch	inch	inch	inch	°	inch	inch	inch		
DS-CSVL15	L	.591	5/8	.591	.000	91	4.724	.787	.394	CSVF../CSVB..	CSVG../CSVT..

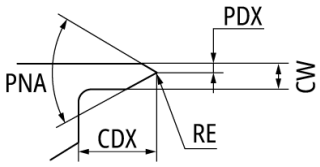
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-CSVL15	LRIS-2.5*7	CLR-15S

CSVT.. series/Inserts Carbide

CSVT-A

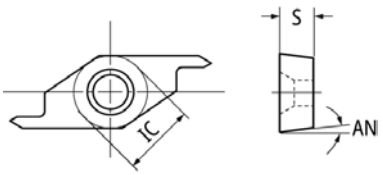


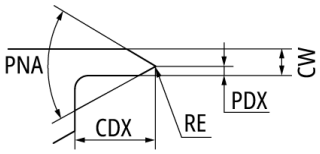


● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

Item Number	Hand	Chipbreaker	Pitch	AN	CDX	CW	EPSR	IC	PDX	PNA	RE	S	Carbide
													PVD
			inch	°	inch	inch	°	inch	inch	°	inch	inch	VM1
CSVT11FRP60-035A Ⓜ	R	No	127-51	7	.118	.039	35	1/4	.014	60	.001MAX	3/32	●
CSVT11FLP60-035A Ⓜ	L	No	127-51	7	.118	.039	35	1/4	.014	60	.001MAX	3/32	●

CSVT-B



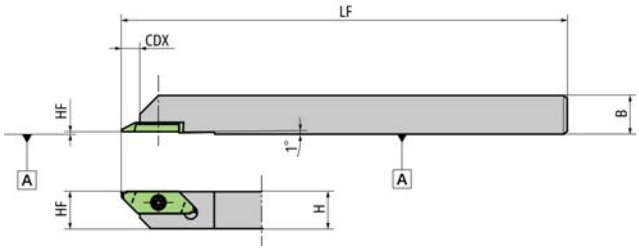


● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

Item Number	Hand	Chipbreaker	Pitch	AN	CDX	CW	EPSR	IC	PDX	PNA	RE	S	Carbide
													PVD
			inch	°	inch	inch	°	inch	inch	°	inch	inch	VM1
CSVT11FRP60-035B Ⓜ	R	No	127-51	7	.118	.039	35	1/4	.014	60	.001MAX	3/32	●
CSVT11FLP60-035B Ⓜ	L	No	127-51	7	.118	.039	35	1/4	.014	60	.001MAX	3/32	●

External thread
TTPS.. series/Toolholder

CTPS



● Diagram shows right-hand tool

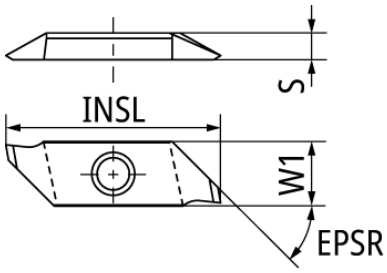
Item Number	Hand	B	CDX	H	HF	K1	LF	WF2	Insert Gage	
		inch	inch	inch	inch	°	inch	inch		
CTPSR06-IN	R	3/8	.197	3/8	3/8	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..
CTPSR08-IN	R	1/2	.197	1/2	1/2	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..
CTPSR10	R	.394	.197	.394	.394	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..
CTPSR12	R	.472	.197	.472	.472	1	4.724	.000	TBPS../CTPS..	GTPS../TTPS..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CTPSR06-IN	LRIS-2.5*7	CLR-15S
CTPSR08-IN	LRIS-2.5*7	CLR-15S
CTPSR10	LRIS-2.5*7	CLR-15S
CTPSR12	LRIS-2.5*7	CLR-15S

TTPS.. series/Inserts Carbide

TTPS



● Diagram shows right-hand tool
All angles shown are obtained when insert is set in the holder.

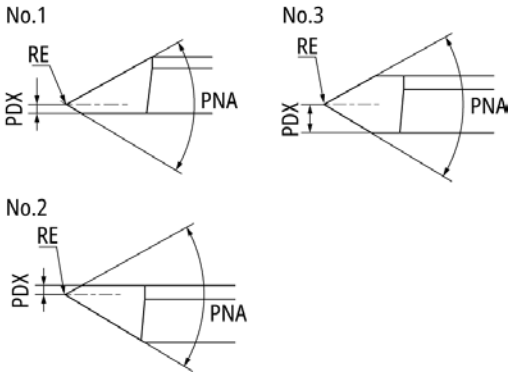
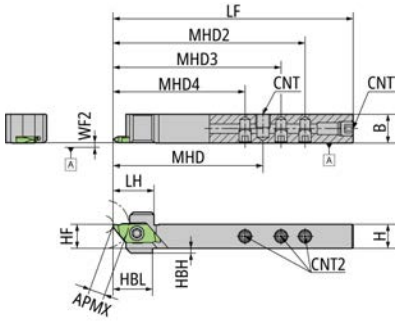
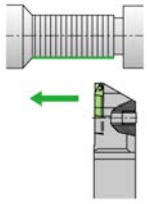


Figure	Item Number	Hand	Chipbreaker	Pitch	EPSR	INSL	PDX	PNA	RE	S	W1	Carbide	
												PVD	
				inch	°	inch	inch	°	inch	inch	inch	VM1	ZM3
1	**TTPS60FR4A**	R	Yes	127-34	45	.787	.016	60	.002MAX Flat	.098	.236	●	●
1	**TTPS60FR8A**	R	Yes	63-21	45	.787	.031	60	.002	.098	.236	●	●
2	**TTPS60FR4B**	R	Yes	127-34	45	.787	.016	60	.002MAX Flat	.098	.236	●	●
2	**TTPS60FR8B**	R	Yes	63-21	45	.787	.031	60	.002	.098	.236	●	●
3	**TTPS60FR-N**	R	Yes	25-17	45	.787	.049	60	.004	.098	.236	●	●

External thread
TTP.. series/Toolholder

TTP-OH3 Direct connect coolant port 3-hole type





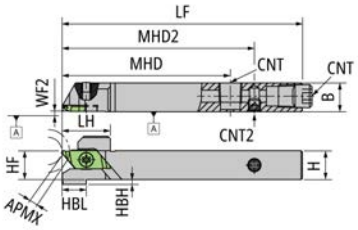
・Diagram shows right-hand tool

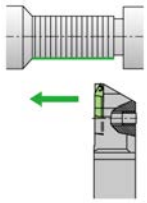
Item Number	Hand	APMX	B	CNT	CNT2	CUTDIA	H	HBH	HBL	HF	LF	LH	MHD	MHD2	MHD3	MHD4	WF2	Insert Gage
		inch	inch			inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	
TTPR1012H-OH3	R	.256	.472	M6*1	M5	.630	.394	.079	.650	.394	3.937	.675	2.461	3.150	2.756	2.165	.000	TTP..
TTPL1012H-OH3	L	.256	.472	M6*1	M5	.630	.394	.079	.650	.394	3.937	.675	2.461	3.150	2.756	2.165	.000	TTP..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
TTPR1012H-OH3	LRIS-4*12PW	SS0605SC	SS0505SC	CLR-15S	LW-2.5
TTPL1012H-OH3	LRIS-4*12PW	SS0605SC	SS0505SC	CLR-15S	LW-2.5

TTP-OH2 Direct connect coolant port 1-hole type





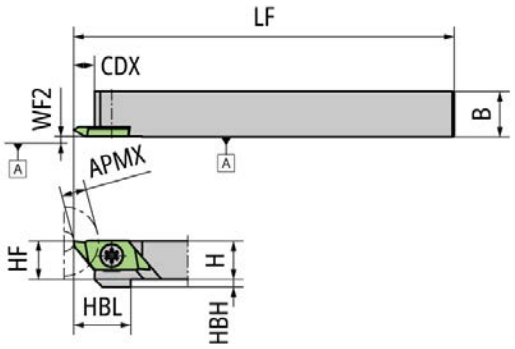
・Diagram shows right-hand tool

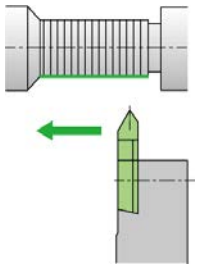
Item Number	Hand	APMX	B	CNT	CNT2	CUTDIA	H	HBH	HBL	HF	LF	LH	MHD	MHD2	WF2	Insert Gage
		inch	inch			inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	
TTPR08H-IN-OH2	R	.217	1/2	NPT1/8	M5	.709	1/2	.051	.394	1/2	3.937	.787	2.756	3.150	.008	TTP..
TTPR10X-IN-OH2	R	.217	5/8	NPT1/8	M5	.709	5/8	–	–	5/8	4.724	.768	2.756	3.937	.008	TTP..
TTPL08H-IN-OH2	L	.217	1/2	NPT1/8	M5	.709	1/2	.051	.394	1/2	3.937	.787	2.756	3.150	.008	TTP..
TTPL10X-IN-OH2	L	.217	5/8	NPT1/8	M5	.709	5/8	–	–	5/8	4.724	.768	2.756	3.937	.008	TTP..
TTPR12H-OH2	R	.217	.472	Rc1/8	M5	.709	.472	.079	.394	.472	3.937	.787	2.756	3.150	.008	TTP..
TTPR16X-OH2	R	.217	.630	Rc1/8	M5	.709	.630	–	–	.630	4.724	.768	2.756	3.937	.008	TTP..
TTPL12H-OH2	L	.217	.472	Rc1/8	M5	.709	.472	.079	.394	.472	3.937	.787	2.756	3.150	.008	TTP..
TTPL16X-OH2	L	.217	.630	Rc1/8	M5	.709	.630	–	–	.630	4.724	.768	2.756	3.937	.008	TTP..

Spare Parts

Item Number	Clamp screw	Screw (for CNT)	Screw (for CNT2)	Wrench (for Clamp screw)	Wrench (for CNT2)
TTPR08H-IN-OH2	LRIS-4*12PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
TTPR10X-IN-OH2	LRIS-4*12PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
TTPL08H-IN-OH2	LRIS-4*12PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
TTPL10X-IN-OH2	LRIS-4*12PW	SPNPT1/8	SS0505SC	CLR-15S	LW-2.5
TTPR12H-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5
TTPR16X-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5
TTPL12H-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5
TTPL16X-OH2	LRIS-4*12PW	SPR1/8	SS0505SC	CLR-15S	LW-2.5

TTP





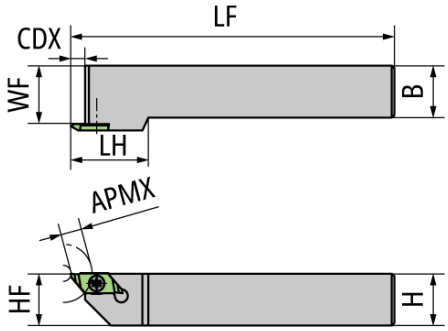
· Diagram shows right-hand tool

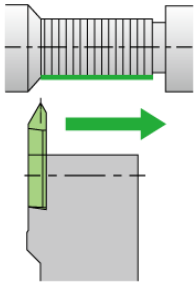
Item Number	Hand	APMX	B	CDX	H	HBH	HBL	HF	LF	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	inch	inch	
TTPR06-IN	R	.256	3/8	.276	3/8	.079	.591	3/8	4.724	.008	TTP..
TTPR08-IN	R	.256	1/2	.276	1/2	–	–	1/2	4.724	.008	TTP..
TTPR10-IN	R	.256	5/8	.276	5/8	–	–	5/8	4.724	.008	TTP..
TTPL06-IN	L	.256	3/8	.276	3/8	.079	.591	3/8	4.724	.008	TTP..
TTPL08-IN	L	.256	1/2	.276	1/2	–	–	1/2	4.724	.008	TTP..
TTPL10-IN	L	.256	5/8	.276	5/8	–	–	5/8	4.724	.008	TTP..
TTPR08	R	.256	.394	.276	.315	.157	.591	.315	4.724	.008	TTP..
TTPR10	R	.256	.394	.276	.394	.079	.591	.394	4.724	.008	TTP..
TTPR12	R	.256	.472	.276	.472	–	–	.472	4.724	.008	TTP..
TTPR12GX	R	.256	.472	.276	.472	–	–	.472	3.346	.008	TTP..
TTPR16	R	.256	.630	.276	.630	–	–	.630	4.724	.008	TTP..
TTPR16H	R	.256	.630	.276	.630	–	–	.630	3.937	.008	TTP..
TTPR20F	R	.256	.787	.276	.787	–	–	.787	3.150	.008	TTP..
TTPL08	L	.256	.394	.276	.315	.157	.591	.315	4.724	.008	TTP..
TTPL10	L	.256	.394	.276	.394	.079	.591	.394	4.724	.008	TTP..
TTPL12	L	.256	.472	.276	.472	–	–	.472	4.724	.008	TTP..
TTPL12GX	L	.256	.472	.276	.472	–	–	.472	3.346	.008	TTP..
TTPL16	L	.256	.630	.276	.630	–	–	.630	4.724	.008	TTP..
TTPL16H	L	.256	.630	.276	.630	–	–	.630	3.937	.008	TTP..
TTPL20F	L	.256	.787	.276	.787	–	–	.787	3.150	.008	TTP..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
TTPR06-IN	LRIS-4*10PW	CLR-15S
TTPR08-IN	LRIS-4*10PW	CLR-15S
TTPR10-IN	LRIS-4*10PW	CLR-15S
TTPL06-IN	LRIS-4*10PW	CLR-15S
TTPL08-IN	LRIS-4*10PW	CLR-15S
TTPL10-IN	LRIS-4*10PW	CLR-15S
TTPR08	LRIS-4*10PW	CLR-15S
TTPR10	LRIS-4*10PW	CLR-15S
TTPR12	LRIS-4*12PW	CLR-15S
TTPR12GX	LRIS-4*12PW	CLR-15S
TTPR16	LRIS-4*12PW	CLR-15S
TTPR16H	LRIS-4*12PW	CLR-15S
TTPR20F	LRIS-4*10	LLR-25S-20*65
TTPL08	LRIS-4*10PW	CLR-15S
TTPL10	LRIS-4*10PW	CLR-15S
TTPL12	LRIS-4*12PW	CLR-15S
TTPL12GX	LRIS-4*12PW	CLR-15S
TTPL16	LRIS-4*12PW	CLR-15S
TTPL16H	LRIS-4*12PW	CLR-15S
TTPL20F	LRIS-4*10	LLR-25S-20*65

TTP-K (M)





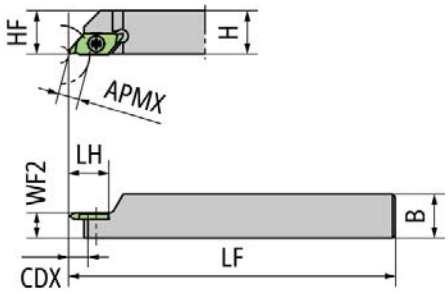
・Diagram shows right-hand tool

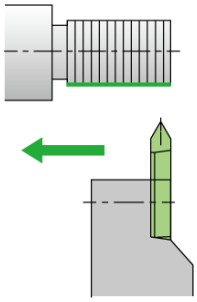
Item Number	Hand	APMX	B	CDX	H	HF	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	inch	
TTPR20K-25	R	.256	.787	.217	.787	.787	4.921	1.181	.984	TTP..
TTPR25M-30	R	.256	.984	.217	.984	.984	5.906	1.181	1.181	TTP..
TTPL20K-25	L	.256	.787	.217	.787	.787	4.921	1.181	.984	TTP..
TTPL25M-30	L	.256	.984	.217	.984	.984	5.906	1.181	1.181	TTP..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
TTPR20K-25	LRIS-4*10	LLR-25S
TTPR25M-30	LRIS-4*10	LLR-25S
TTPL20K-25	LRIS-4*10	LLR-25S
TTPL25M-30	LRIS-4*10	LLR-25S

TTP-F Shifted





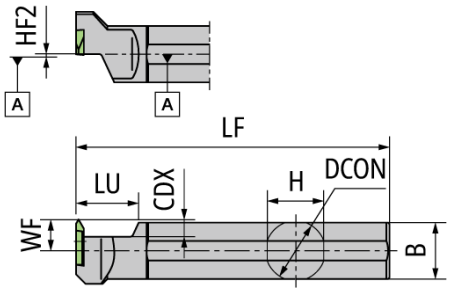
・Diagram shows left-hand tool

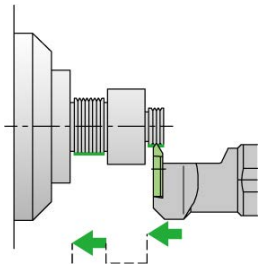
Item Number	Hand	APMX	B	CDX	H	HF	LF	LH	WF	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	inch	inch	
TTPL12-F06	L	.256	.472	.217	.472	.472	4.724	.630	.285	–	TTP..
TTPL16-F08	L	.256	.630	.217	.630	.630	4.724	.630	.364	–	TTP..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
TTPL12-F06	LRIS-4*6	LLR-25S
TTPL16-F08	LRIS-4*6	LLR-25S

DS-TTP DS Toolholders





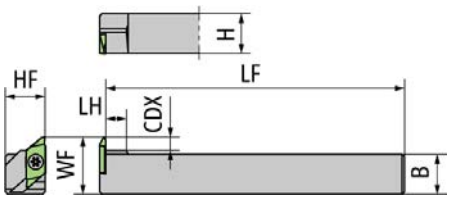
・Diagram shows left-hand tool
NOTE: Use a right-handed (R) insert.

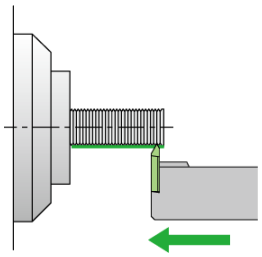
Item Number	Hand	B	CDX	DCON	H	HF2	LF	LU	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	inch	
DS-TTPL16F	L	.591	.217	.630	.591	.000	3.150	.787	.394	TTP..
DS-TTPL19	L	.709	.217	3/4	.709	.000	4.724	.787	.394	TTP..
DS-TTPL20	L	.748	.217	.787	.748	.000	4.724	.787	.394	TTP..
DS-TTPL22	L	.827	.217	.866	.827	.000	4.724	.787	.394	TTP..
DS-TTPL25	L	.945	.217	1.000	.945	.000	5.906	.787	.394	TTP..
DS-TTPL25-MET	L	.945	.217	.984	.945	.000	5.906	.787	.394	TTP..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-TTPL16F	LRIS-4*10	LLR-25S-20*65
DS-TTPL19	LRIS-4*10	LLR-25S-20*65
DS-TTPL20	LRIS-4*10	LLR-25S-20*65
DS-TTPL22	LRIS-4*10	LLR-25S-20*65
DS-TTPL25	LRIS-4*10	LLR-25S-20*65
DS-TTPL25-MET	LRIS-4*10	LLR-25S-20*65

CH-TTP for horizontal gang style tool post





・Diagram shows left-hand tool
NOTE: Use a right-handed (R) insert.

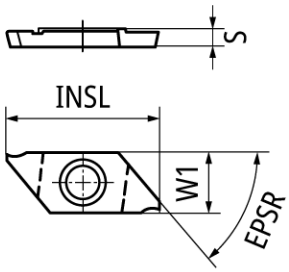
Item Number	Hand	B	CDX	H	HF	LF	LH	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	
CH-TTPL16	L	.630	.217	.630	.630	4.724	.354	.906	TTP..
CH-TTPL20	L	.787	.217	.787	.787	4.724	.354	1.063	TTP..

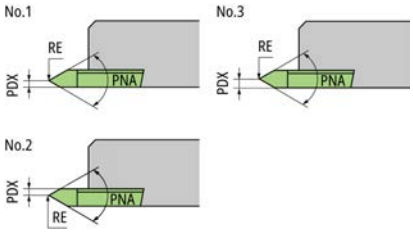
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CH-TTPL16	LRIS-4*10	LLR-25S
CH-TTPL20	LRIS-4*10	LLR-25S

TTP.. series/Inserts Carbide

TTP-R

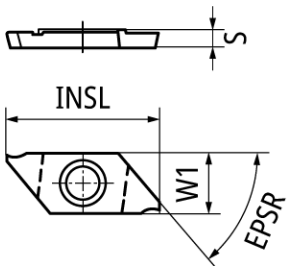


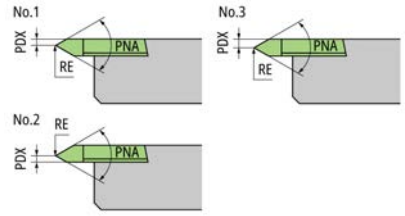


● Diagram shows right-hand tool

Figure	Item Number	Hand	Chipbreaker	TPI	EPSR	INSL	PDX	PNA	RE	S	W1	Carbide				
												PVD				Uncoated
				inch	°	inch	inch	°	inch	inch	inch	650	ST4	QM3	ZM3	KM1
1	**TTP60FR2A**	R	Yes	127-72	50	.783	.008	60	.002MAX Flat	.098	.315				●	
1	**TTP60FR4A**	R	Yes	127-34	50	.783	.016	60	.002MAX Flat	.098	.315	●	●	●	●	
1	**TTP60FR4AS** Ⓜ	R	Yes	127-34	50	.783	.016	60	.002MAX Flat	.098	.315					●
1	**TTP60FR8A**	R	Yes	63-21	50	.783	.031	60	.002	.098	.315	●	●	●	●	
1	**TTP60FR8AS** Ⓜ	R	Yes	63-21	50	.783	.031	60	.002	.098	.315					●
1	**TTP55FR8A**	R	Yes	48-16	50	.783	.031	55	.002	.098	.315				●	
2	**TTP60FR2B**	R	Yes	127-72	50	.783	.008	60	.002MAX Flat	.098	.315				●	
2	**TTP60FR4B**	R	Yes	127-34	50	.783	.016	60	.002MAX Flat	.098	.315	●	●	●	●	
2	**TTP60FR4BS** Ⓜ	R	Yes	127-34	50	.783	.016	60	.002MAX Flat	.098	.315					●
2	**TTP60FR8B**	R	Yes	63-21	50	.783	.031	60	.002	.098	.315	●	●	●	●	
2	**TTP60FR8BS** Ⓜ	R	Yes	63-21	50	.783	.031	60	.002	.098	.315					●
2	**TTP55FR8B**	R	Yes	48-16	50	.783	.031	55	.002	.098	.315				●	
3	**TTP60FR-N**	R	Yes	25-17	50	.783	.049	60	.004	.098	.315	●	●	●	●	
3	**TTP60FR-N02**	R	Yes	16-13	50	.783	.049	60	.008	.098	.315		●	●	●	
3	**TTP60FR-NS** Ⓜ	R	Yes	25-17	50	.783	.049	60	.004	.098	.315					●

TTP-L



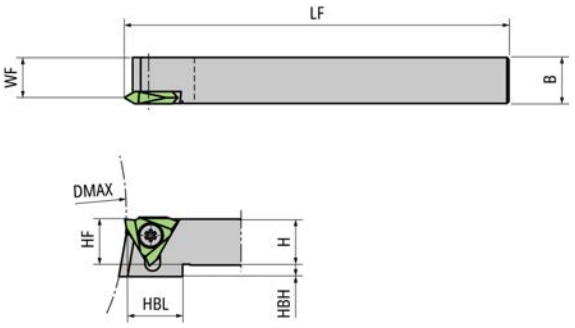


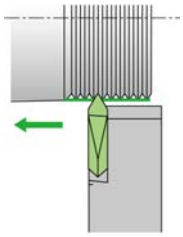
● Diagram shows left-hand tool

Figure	Item Number	Hand	Chipbreaker	TPI	EPSR	INSL	PDX	PNA	RE	S	W1	Carbide				
												PVD				Uncoated
				inch	°	inch	inch	°	inch	inch	inch	650	ST4	QM3	ZM3	KM1
1	**TTP60FL2A**	L	Yes	127-72	50	.783	.008	60	.002MAX Flat	.098	.315				●	
1	**TTP60FL4A**	L	Yes	127-34	50	.783	.016	60	.002MAX Flat	.098	.315	●	●	●	●	
1	**TTP60FL4AS** Ⓜ	L	Yes	127-34	50	.783	.016	60	.002MAX Flat	.098	.315					●
1	**TTP60FL8A**	L	Yes	63-21	50	.783	.031	60	.002	.098	.315	●	●	●	●	
1	**TTP60FL8AS** Ⓜ	L	Yes	63-21	50	.783	.031	60	.002	.098	.315					●
1	**TTP55FL8A**	L	Yes	48-16	50	.783	.031	55	.002	.098	.315				●	
2	**TTP60FL2B**	L	Yes	127-72	50	.783	.008	60	.002MAX Flat	.098	.315				●	
2	**TTP60FL4B**	L	Yes	127-34	50	.783	.016	60	.002MAX Flat	.098	.315	●	●	●	●	
2	**TTP60FL4BS** Ⓜ	L	Yes	127-34	50	.783	.016	60	.002MAX Flat	.098	.315					●
2	**TTP60FL8B**	L	Yes	63-21	50	.783	.031	60	.002	.098	.315	●	●	●	●	
2	**TTP60FL8BS** Ⓜ	L	Yes	63-21	50	.783	.031	60	.002	.098	.315					●
2	**TTP55FL8B**	L	Yes	48-16	50	.783	.031	55	.002	.098	.315				●	
3	**TTP60FL-N**	L	Yes	25-17	50	.783	.049	60	.004	.098	.315	●	●	●	●	
3	**TTP60FL-N02**	L	Yes	16-13	50	.783	.049	60	.008	.098	.315		●	●	●	
3	**TTP60FL-NS** Ⓜ	L	Yes	25-17	50	.783	.049	60	.004	.098	.315					●

External thread
TTMH.. series/Toolholder

STTN





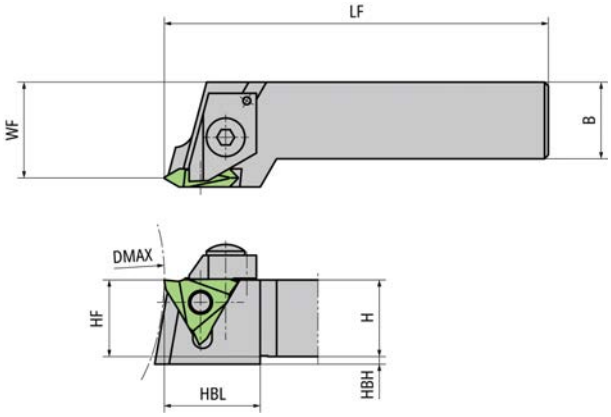
● Diagram shows right-hand tool

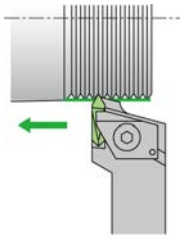
Item Number	Hand	B	DMAX	H	HBH	HBL	HF	LF	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	inch	
STTNR101032	R	.394	4.724	.394	.197	.591	.394	3.150	.335	TTMH32..
STTNR121232	R	.472	4.724	.472	.197	.591	.472	3.150	.413	TTMH32..
STTNR121232-K	R	.472	4.724	.472	.197	.591	.472	4.921	.413	TTMH32..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
STTNR101032	LR-S-4*9	RLR-20S
STTNR121232	LR-S-4*9	RLR-20S
STTNR121232-K	LR-S-4*9	RLR-20S

NTTB





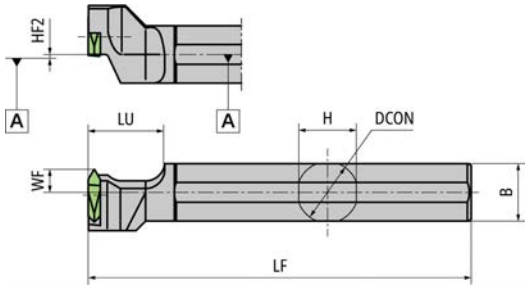
● Diagram shows right-hand tool

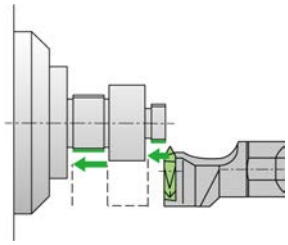
Item Number	Hand	B	DMAX	H	HBH	HF	LF	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	
NTTBR161632	R	.630	4.724	.630	.157	.630	4.724	.787	TTMH32..
NTTBR202032	R	.787	4.724	.787	–	.787	5.512	.984	TTMH32..

Spare Parts

Item Number	Clamp	Clamp screw	Spring	Wrench (for Clamp screw)
NTTBR161632	CPR5	AOS-5*25	ASG-5	LW-2.5
NTTBR202032	CPR5	AOS-5*25	ASG-5	LW-2.5

DS-STT DS Toolholders





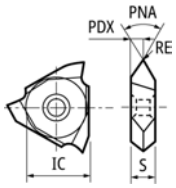
● Diagram shows left-hand tool
NOTE: Use a right-handed (R) insert.

Item Number	Hand	B	DCON	H	HF2	LF	LU	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	inch	
DS-STTL14F	L	.512	.551	.512	.000	3.150	.787	.236	TTMH32..
DS-STTL15H	L	.591	5/8	.591	.000	3.937	.787	.236	TTMH32..
DS-STTL16X	L	.591	.630	.591	.000	3.740	.787	.236	TTMH32..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-STTL14F	LR-S-4*9	RLR-20S
DS-STTL15H	LR-S-4*9	RLR-20S
DS-STTL16X	LR-S-4*9	RLR-20S

TTMH

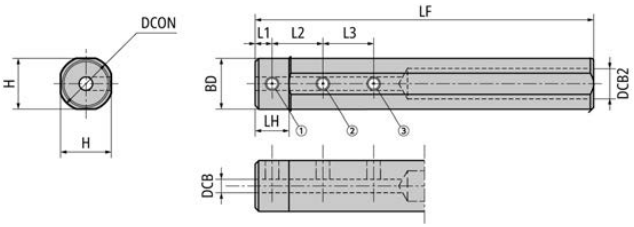


● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	Pitch	GAN	IC	PDX	PNA	RE	S	Carbide
										PVD
			inch	°	inch	inch	°	inch	inch	ZM3
TTMH3260R010	R	Yes	31-9	6	3/8	.063	60	.004	1/8	●
TTMH3260R015	R	Yes	25-9	6	3/8	.063	60	.006	1/8	●
TTMH3260R020	R	Yes	16-9	6	3/8	.063	60	.008	1/8	●

Internal Thread | STICK DUO
SBT.. series/Sleeve

NBH Shank diameter ø5/8" - ø3/4"

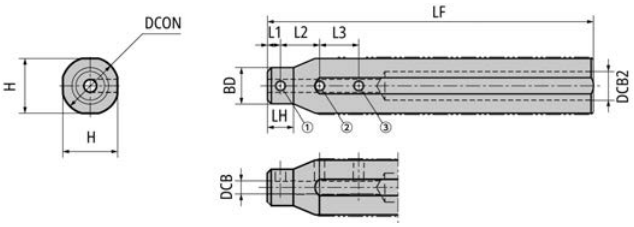


Item Number	Hand	BD	DCB	DCB2	DCON	H	LF	LH	L1	L2	L3	InsertBar Gage	
		inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
NBH02515H	N	.591	.098	.354	5/8	.591	3.937	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03015H	N	.591	.118	.354	5/8	.591	3.937	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03515H	N	.591	.138	.354	5/8	.591	3.937	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04015H	N	.591	.157	.354	5/8	.591	3.937	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05015H	N	.591	.197	.354	5/8	.591	3.937	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06015H	N	.591	.236	.354	5/8	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH02516H	N	.591	.098	.354	.630	.591	3.937	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03016H	N	.591	.118	.354	.630	.591	3.937	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03516H	N	.591	.138	.354	.630	.591	3.937	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04016H	N	.591	.157	.354	.630	.591	3.937	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05016H	N	.591	.197	.354	.630	.591	3.937	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06016H	N	.591	.236	.354	.630	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH02519K	N	.709	.098	.433	3/4	.709	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03019K	N	.709	.118	.433	3/4	.709	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03519K	N	.709	.138	.433	3/4	.709	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04019K	N	.709	.157	.433	3/4	.709	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05019K	N	.709	.197	.433	3/4	.709	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06019K	N	.709	.236	.433	3/4	.709	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..

Spare Parts

Item Number	Clamp screw			Wrench (for Clamp screw)
	①	②	③	
NBH02515H	SS0406F	SS0406F	–	LW-2
NBH03015H	SS0404F	SS0404F	SS0404F	LW-2
NBH03515H	SS0404F	SS0404F	SS0404F	LW-2
NBH04015H	SS0404F	SS0404F	SS0404F	LW-2
NBH05015H	SS0404F	SS0404F	SS0404F	LW-2
NBH06015H	SS0404F	SS0404F	SS0404F	LW-2
NBH02516H	SS0406F	SS0406F	–	LW-2
NBH03016H	SS0404F	SS0404F	SS0404F	LW-2
NBH03516H	SS0404F	SS0404F	SS0404F	LW-2
NBH04016H	SS0404F	SS0404F	SS0404F	LW-2
NBH05016H	SS0404F	SS0404F	SS0404F	LW-2
NBH06016H	SS0404F	SS0404F	SS0404F	LW-2
NBH02519K	SS0408F	SS0408F	–	LW-2
NBH03019K	SS0406F	SS0406F	SS0406F	LW-2
NBH03519K	SS0406F	SS0406F	SS0406F	LW-2
NBH04019K	SS0406F	SS0406F	SS0406F	LW-2
NBH05019K	SS0406F	SS0406F	SS0406F	LW-2
NBH06019K	SS0406F	SS0406F	SS0406F	LW-2

NBH Shank diameter ø.787" - ø1.260"



Item Number	Hand	BD	DCB	DCB2	DCON	H	LF	LH	L1	L2	L3	InsertBar Gage	
		inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
NBH02520K	N	.433	.098	.433	.787	.748	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03020K	N	.472	.118	.433	.787	.748	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03520K	N	.472	.138	.433	.787	.748	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04020K	N	.512	.157	.433	.787	.748	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05020K	N	.551	.197	.433	.787	.748	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06020K	N	.591	.236	.433	.787	.748	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH02522K	N	.433	.098	.433	.866	.827	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03022K	N	.472	.118	.433	.866	.827	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03522K	N	.472	.138	.433	.866	.827	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04022K	N	.512	.157	.433	.866	.827	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05022K	N	.551	.197	.433	.866	.827	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06022K	N	.591	.236	.433	.866	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH02523K	N	.433	.098	.433	.906	.827	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03023K	N	.472	.118	.433	.906	.827	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03523K	N	.472	.138	.433	.906	.827	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04023K	N	.512	.157	.433	.906	.827	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05023K	N	.551	.197	.433	.906	.827	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH02525K-MET	N	.433	.098	.433	.984	.945	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03025K-MET	N	.472	.118	.433	.984	.945	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03525K-MET	N	.472	.138	.433	.984	.945	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04025K-MET	N	.512	.157	.433	.984	.945	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05025K-MET	N	.551	.197	.433	.984	.945	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06025K-MET	N	.591	.236	.433	.984	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH02525K	N	.433	.098	.433	1.000	.945	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03025K	N	.472	.118	.433	1.000	.945	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03525K	N	.472	.138	.433	1.000	.945	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04025K	N	.512	.157	.433	1.000	.945	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH05025K	N	.551	.197	.433	1.000	.945	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06025K	N	.591	.236	.433	1.000	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH05032K	N	.551	.197	.433	1.260	1.181	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06032K	N	.591	.236	.433	1.260	1.181	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..

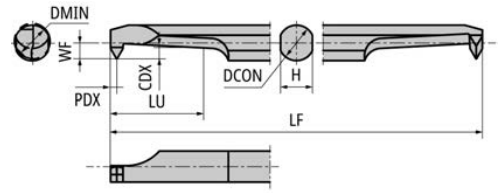
Spare Parts

Item Number	Clamp screw			Wrench (for Clamp screw)
	①	②	③	
NBH02520K	SS0404F	SS0404F	–	LW-2
NBH03020K	SS0404F	SS0404F	SS0406F	LW-2
NBH03520K	SS0404F	SS0404F	SS0406F	LW-2
NBH04020K	SS0404F	SS0406F	SS0406F	LW-2
NBH05020K	SS0404F	SS0406F	SS0406F	LW-2
NBH06020K	SS0404F	SS0406F	SS0406F	LW-2
NBH02522K	SS0404F	SS0406F	–	LW-2
NBH03022K	SS0404F	SS0406F	SS0408F	LW-2
NBH03522K	SS0404F	SS0406F	SS0406F	LW-2
NBH04022K	SS0404F	SS0406F	SS0406F	LW-2
NBH05022K	SS0404F	SS0406F	SS0406F	LW-2
NBH06022K	SS0404F	SS0406F	SS0406F	LW-2
NBH02523K	SS0404F	SS0406F	–	LW-2
NBH03023K	SS0404F	SS0406F	SS0408F	LW-2
NBH03523K	SS0404F	SS0406F	SS0406F	LW-2
NBH04023K	SS0404F	SS0406F	SS0406F	LW-2
NBH05023K	SS0404F	SS0406F	SS0406F	LW-2
NBH02525K-MET	SS0404F	SS0406F	–	LW-2
NBH03025K-MET	SS0404F	SS0406F	SS0408F	LW-2
NBH03525K-MET	SS0404F	SS0406F	SS0408F	LW-2
NBH04025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH05025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH06025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH02525K	SS0404F	SS0406F	–	LW-2
NBH03025K	SS0404F	SS0406F	SS0408F	LW-2
NBH03525K	SS0404F	SS0406F	SS0408F	LW-2
NBH04025K	SS0404F	SS0408F	SS0408F	LW-2
NBH05025K	SS0404F	SS0408F	SS0408F	LW-2
NBH06025K	SS0404F	SS0408F	SS0408F	LW-2
NBH05032K	SS0404F	SS0408F	SS0408F	LW-2
NBH06032K	SS0404F	SS0408F	SS0408F	LW-2

STICK DUO
SBT.. series/Insert bar Carbide

SBT

No.1



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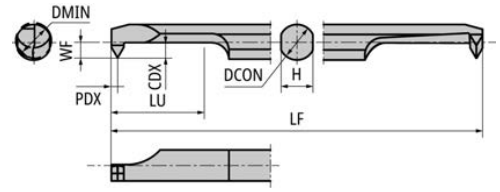
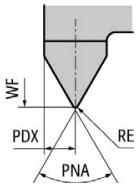
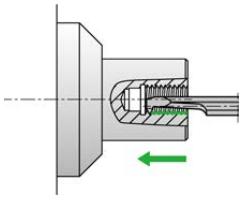




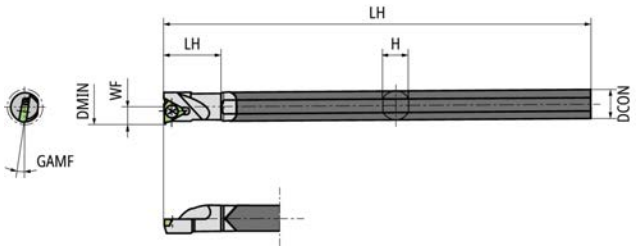


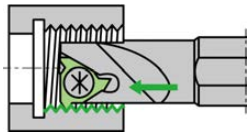
● Diagram shows right-hand tool
● No.1: Eccentric tapered shape

Figure	Item Number	Hand	Chipbreaker	DMIN	Pitch	CDX	DCON	H	LF	LU	PDX	PNA	RE	WF	Carbide
															PVD
				inch	inch	inch	inch	inch	inch	inch	inch	°	inch	inch	ZM3
1	**SBT025M3R**	R	No	.098	.020	.024	.098	.091	1.969	.213	.016	60	.002MAX Flat	.043	●
1	**SBT030M4R**	R	No	.118	36-32	.031	.118	.106	1.969	.295	.020	60	.002MAX Flat	.051	●
1	**SBT030M4RB**	R	Yes	.118	36-32	.031	.118	.106	1.969	.295	.020	60	.002MAX Flat	.051	●
1	**SBT035M5RB**	R	Yes	.138	32-24	.039	.138	.126	2.362	.335	.022	60	.002MAX Flat	.061	●
1	**SBT040M6RB**	R	Yes	.157	28-20	.047	.157	.142	2.362	.413	.028	60	.002	.071	●
2	**SBT050M8RB**	R	Yes	.197	28-18	.059	.197	.177	2.756	.622	.031	60	.002	.091	●
2	**SBT060M10RB**	R	Yes	.236	28-16	.071	.236	.213	3.150	.724	.037	60	.002	.110	●

Internal Thread
TMN.. series/Toolholder

TGC Carbide shank





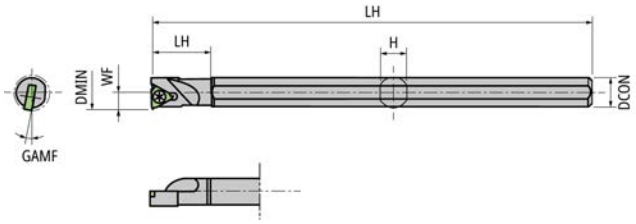
● Diagram shows right-hand tool

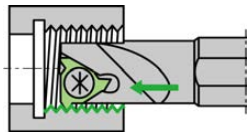
Item Number	Hand	DCON	DMIN	GAMF	H	LF	LH	WF	Insert Gage
		inch	inch	°	inch	inch	inch	inch	
TGC10T06H161R	R	.236	.315	10	.217	3.937	.512	.150	TMN06..
TGC10T08K162R	R	.315	.394	10	.276	4.921	.669	.185	TMN08..
TGC10T10M163R	R	.394	.472	10	.354	5.906	.787	.236	TMN09..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
TGC10T06H161R	LR-S-2*4.4	CLR-13S
TGC10T08K162R	LR-S-2*5.5	CLR-13S
TGC10T10M163R	LRIS-2.2*6	CLR-13S

HN Steel shank





● Diagram shows right-hand tool

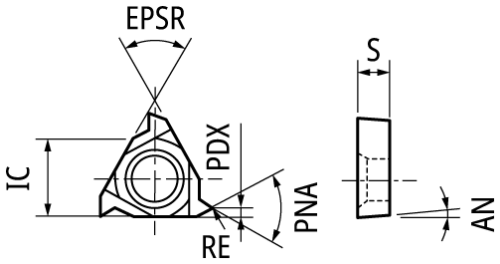
Item Number	Hand	DCON	DMIN	GAMF	H	LF	LH	WF	Insert Gage
		inch	inch	°	inch	inch	inch	inch	
HN59Z-0028	R	.236	.315	10	.217	3.937	.512	.150	TMN06..
HN59Z-0029	R	.315	.394	10	.276	4.921	.669	.185	TMN08..
HN59Z-0030	R	.394	.472	10	.354	5.906	.787	.236	TMN09..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
HN59Z-0028	LR-S-2*4.4	CLR-13S
HN59Z-0029	LR-S-2*5.5	CLR-13S
HN59Z-0030	LRIS-2.2*6	CLR-13S

TMN.. series/Inserts Carbide

TMN



● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	Pitch	AN	EPSR	IC	PDX	PNA	RE	S	Carbide
											PVD
			inch	°	°	inch	inch	°	inch	inch	ZM3
TMN06FR03	R	Yes	63-34	7	60	5/32	.020	60	.001	1/16	●
TMN08FR03	R	Yes	63-34	7	60	3/16	.020	60	.001	3/32	●
TMN09FR03	R	Yes	63-34	7	60	7/32	.020	60	.001	3/32	●

For high-efficiency thread cutting | Swiss CNC lathes

Thread Whirling

High productivity for precision screw manufacturing, like implant screws and bone screws
Ideal for medical screw thread forms that are becoming more complex
Single pass thread forming reduces cycle time

Features

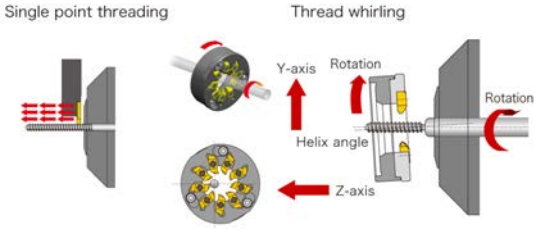
- NTK's insert design technology creates precise inserts matching even the most complex thread forms
- Sharp cutting edges and PVD coated inserts generate superior surface finishes and achieves long tool life

	Double-lead threads	Triple-lead threads
Work	Bone screw	Worm screw
Work material	Ti-6Al-4V ELI	brass
Workpiece		
Insert shape		
Major Dia.	ø.039"	ø.276"
Minor Dia.	ø.094"	ø.185"
Lead [Pitch×No. of Lead]	.126 inch	.193 inch

Machining multi-lead thread forms has many process requirements.
So it is important to contact us to discuss: mechanical specifications, spindle specifications, insert specifications, tooling specifications.

Thread whirling process vs. single point threading

In thread whirling, the whirling head is tilted to a specific helix angle, the cutter is rotated at high speed, the bar stock (c axis) is rotated at a low speed, and the pitch (z axis) is the feed.
The inserts shear the material which enables single pass thread forming.



lineup → U30 - 38

Special Item Capability

- Even though almost all bone screw shapes are special, NTK thread whirling inserts can make the correct shape of thread the first time, without any redesign or remanufacturing
- The combination of a sharp cutting edge and PVD coating achieves an excellent finish and long tool life.

Instructions

1. Refer to our chart and find your machine and spindle model. Select the suitable whirling cutter.
2. Submit the machine , spindle model information, workpiece drawing, material, and bar stock diameter to NTK. NTK calculates the lead angle and insert geometry from the work drawing and manufactures a dedicated insert.
3. Set the whirling cutter at the specified lead angle and set the cutting conditions.

Recommended Cutting Conditions

Conditions / No. of teeth		9	6	4	
Main spindle	RPM	10-40	10-25	7-15	Faster RPM reduces machining time
Whirling cutter	RPM	1500-4000			
Feed Rate		Same as thread lead = pitch			
Bar stock	mm	-ø.400"	-ø.400"	-ø.200	
Work Material		Ti-6Al-4V EL / SUS316 / 17-4PH / Titanium / brass			

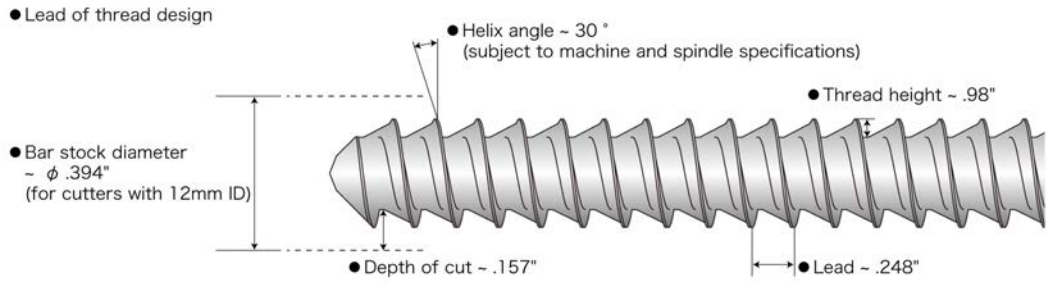
●Formula for calculating thread whirling process time

$$T\ (\text{Seconds}) = \frac{60 \times \text{Thread length}}{\text{Main spindle rpm} \times \text{Feed rate (Thread lead)}}$$

Ex.) Double lead / 2" length / .100" lead (2×.050" pitch) / 30 rpm

$$T\ (\text{Seconds}) = \frac{60 \times 2}{30 \times .100"} = 40\ \text{Seconds}$$

Applicable Thread Geometry (Approximated)



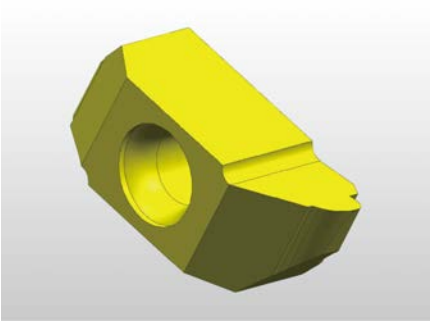
The geometries shown above are approximated and could vary by actual applications

Double-lead Bone Screw Process Example

1. 1st thread whirl at taper area
2. Rotate the bar 180°and whirl the 2nd thread on same area as 1
3. Thread whirl the straight section
4. To obtain two exits on the screw, back up half a lead (one pitch) and rotate 180 degrees. Additional machining is performed at the exit.

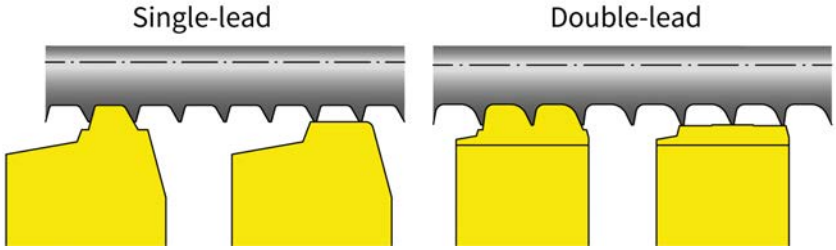
Basic Insert Grade : ZM3

ZM3 is the common grade for NTK thread whirling
ZM3 offers excellent surface finish
NTK can make inserts with other coatings to meet customers demands



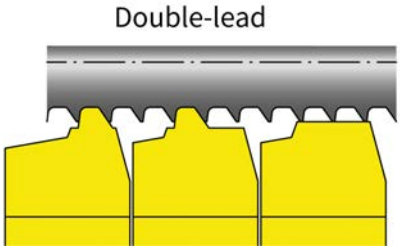
NTK Thread Machining Examples

For absolute flat on OD



Two insert combination brings absolute flat on OD to meet drawing specifications.

For tiny thread



NTK's Thread Whirling system can machine small diameter multi-lead screws to spec, with lower tool pressure, by using several types of specially designed and accurately ground inserts on the cutter.

NTK's Unique Attachment System

NTK's whirling insert holder can be attached and detached without removing mounting screws

①Loosen the Mounting Screws

②Rotate the Insert Holder 10 degrees

③Detach the Insert Holder without removing the Mounting Screws

Application Examples

Double-lead Bone Screw

Work Material : Ti-6Al-4v ELI

Bar Stock Dia.	ϕ.375	Number of start	2
Major Dia.	ϕ.157	Helix Angle	28.5°
Minor Dia.	ϕ.098	Hand of thread	Right
Cutting condition			
Main Spindle Speed (rpm)	15	Speed of whirling cutter (rpm)	3,500
Lead = Feed (IPR)	.217	Result	OK

NTK Thread Whirling: **Dramatically improved productivity**

Competitor's Thread Whirling: *Cannot complete with single pass. Requires feeding stock multiple times and two passes for threading each time.*

NTK thread whirling succeeded in double lead screw machining when one of the major thread whirling suppliers has failed many times.

Double-lead Bone Screw

Work Material : Ti-6Al-4v ELI

Bar Stock Dia.	ϕ.350	Number of start	2
Major Dia.	ϕ.180	Helix Angle	23.0°
Minor Dia.	ϕ.120	Hand of thread	Right
Cutting condition			
Main Spindle Speed (rpm)	12	Speed of whirling cutter (rpm)	2,500
Lead = Feed (IPR)	.200	Result	OK

NTK Thread Whirling: **Dramatically improved productivity**

Competitor's Thread Whirling: *Cannot complete with single pass. Requires feeding stock multiple times and two passes for threading each time.*

The customer could not get perfect double lead thread form in single pass from other manufacturers. NTK got perfect thread form with a single pass on first trial saving cycle time.

Double-lead Bone Screw

Work Material : Ti-6Al-4v ELI

Bar Stock Dia.	ϕ.250	Number of start	2
Major Dia.	ϕ.118	Helix Angle	15.4°
Minor Dia.	ϕ.083	Hand of thread	Right
Cutting condition			
Main Spindle Speed (rpm)	11	Speed of whirling cutter (rpm)	2,200
Lead = Feed (IPR)	.087	Result	OK

NTK Thread Whirling: **Dramatically improved productivity**

Competitor's Thread Whirling: *Cannot complete with single pass. Requires feeding stock multiple times and two passes for threading each time.*

Customer was concerned with stock rigidity and long cycle time. NTK applied three geometry inserts to achieve single pass machining, in dramatically short time. The up-sharp cutting edges and low cutting pressure produced "excellent" surface finish.

Single-lead Bone Screw

Work Material : 316SS

Bar Stock Dia.	ϕ.315	Number of start	1
Major Dia.	ϕ.138	Helix Angle	7.5°
Minor Dia.	ϕ.098	Hand of thread	Right
Cutting condition			
Main Spindle Speed (rpm)	23	Speed of whirling cutter (rpm)	2,000
Pitch = Feed (IPR)	.049	Result	OK

NTK Thread Whirling: **2600 pcs**

Competitor's Thread Whirling: 1000 pcs

Some thread whirling manufacturers offer 6-teeth or 12-teeth systems, too many teeth cause chip packing issues and more tool pressure. Fewer teeth means greater cycle time. NTK concluded that 9-teeth is the best configuration. Our customers can run 1.5 times faster and get longer tool life.

Single-lead Bone Screw

Work Material : Ti-6Al-4v ELI

Bar Stock Dia.	ϕ.197	Number of start	1
Major Dia.	ϕ.091	Helix Angle	5.3°
Minor Dia.	ϕ.067	Hand of thread	Right
Cutting condition			
Main Spindle Speed (rpm)	30	Speed of whirling cutter (rpm)	3,100
Pitch = Feed (IPR)	.023	Result	OK

NTK Thread Whirling: **2200 pcs**

This thread is up to 1.26" length with a small pitch. Cycle time could be increased with a single-point threading tool. NTK's inserts, designed for lower tool pressure, ran 2,200 pcs/corner at 30 rpm of bar stock (F10,800). It only took 110 seconds to finish a 1.26" length thread.

Triple-lead Worm Gear

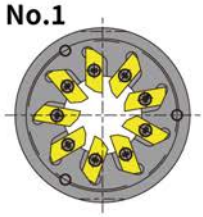
Work Material : Brass

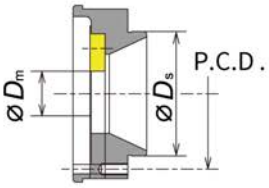
Bar Stock Dia.	ϕ.315	Number of start	3
Major Dia.	ϕ.276	Helix Angle	14.6°
Minor Dia.	ϕ.185	Hand of thread	Left
Cutting condition			
Main Spindle Speed (rpm)	20	Speed of whirling cutter (rpm)	3,500
Lead = Feed (IPR)	.189	Result	OK

Multi-lead threads, common in the Worm Gear industry are made by a forming or cutting process. The large helix angle is difficult to machine with single-point threading.
NTK now makes thread whirling inserts for multi-lead threads. Cycle time is reduced with a one pass process and thread form dimensions are stable with the low tool pressure.

Thread Whirling System

No.1





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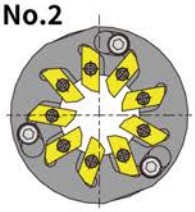
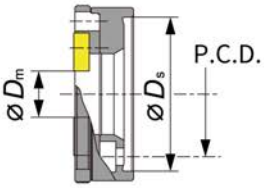
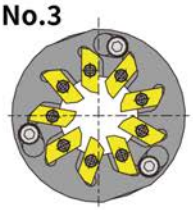
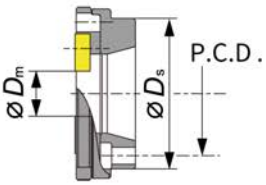




Quick-change

No.3





Quick-change

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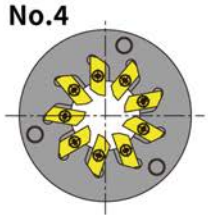

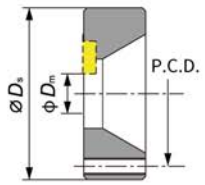

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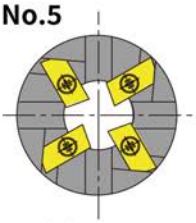
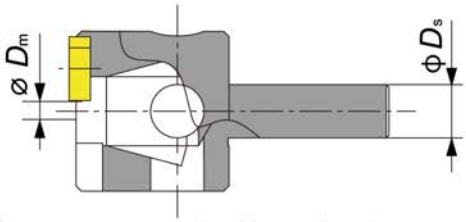
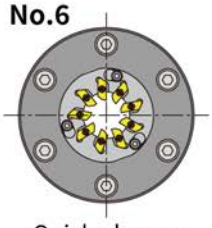
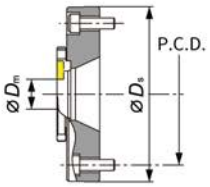




Guideline: Raw material diameter up to ϕ6, machinable up to length 18mm
(Contact CKD for further information)

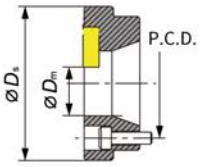
No.6



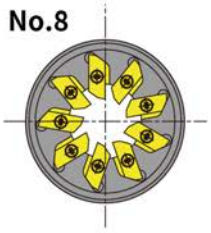


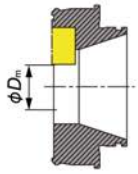
Quick-change

No.7

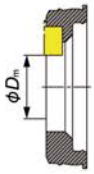


No.8

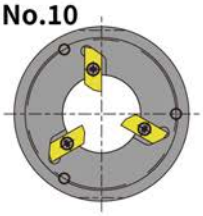


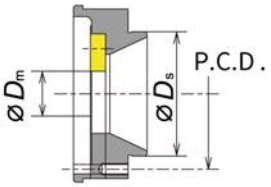


No.9

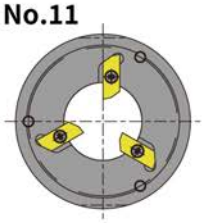


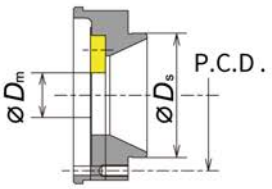
No.10





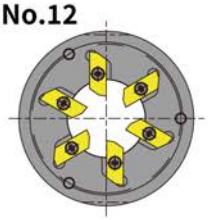
No.11

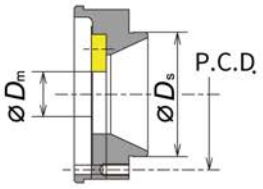




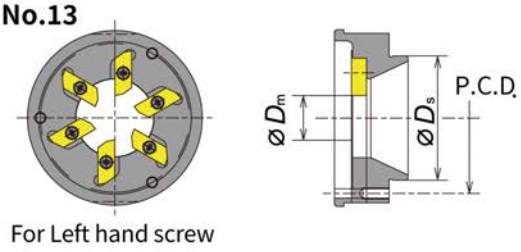
For Left hand screw

No.12



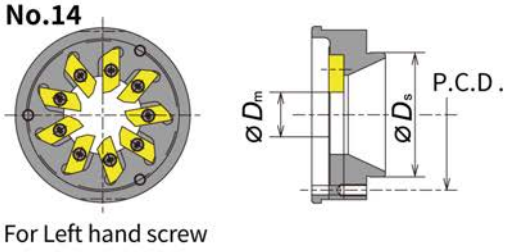


No.13



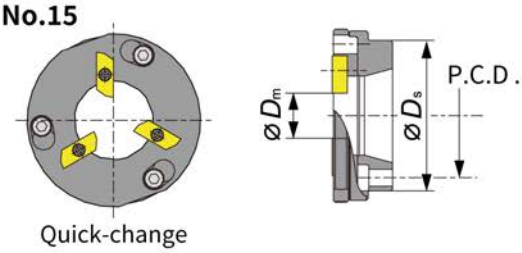
For Left hand screw

No.14



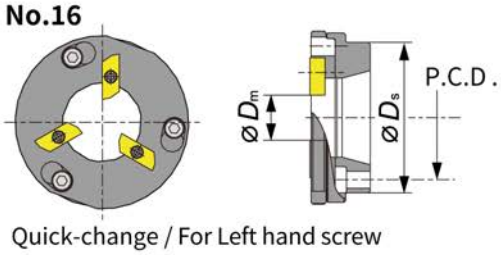
For Left hand screw

No.15



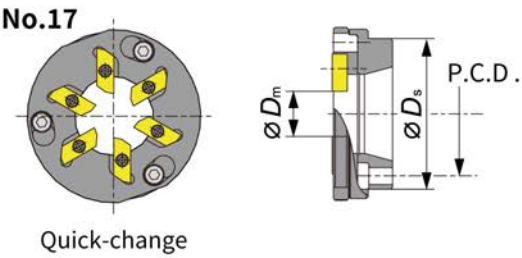
Quick-change

No.16



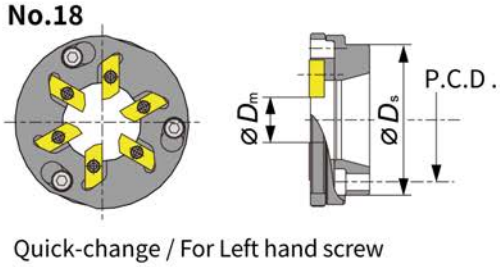
Quick-change / For Left hand screw

No.17



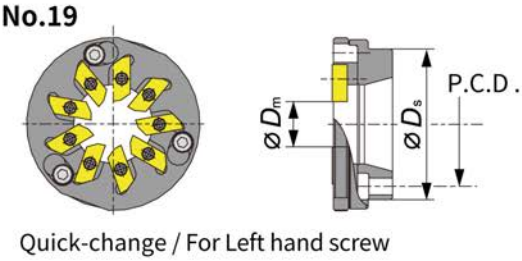
Quick-change

No.18



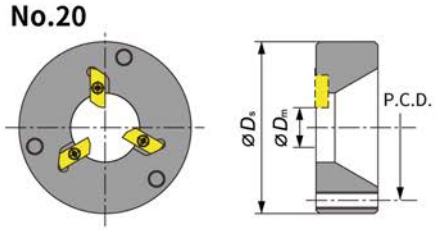
Quick-change / For Left hand screw

No.19

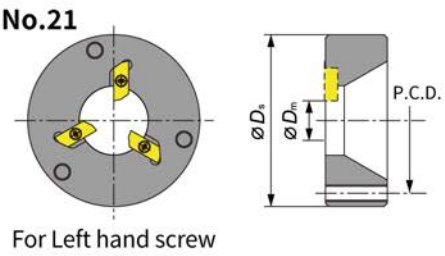


Quick-change / For Left hand screw

No.20

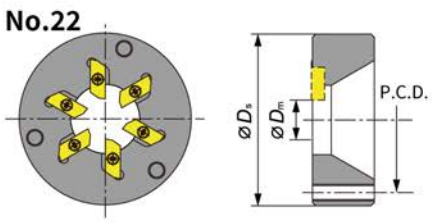


No.21

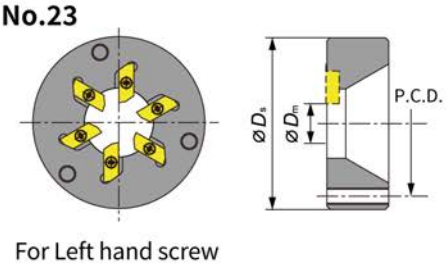


For Left hand screw

No.22

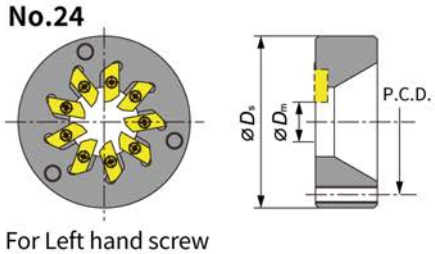


No.23



For Left hand screw

No.24



For Left hand screw

Spare Insert Holder (Cartridge)

Item number	No. of tooth	⌀Dm (mm)	Compatible cutters
TWC6HP2	6	12	No,2,No.3※
TWC9HP2	9	12	No,2,No.3※
TWC9HP2-D16	9	12	No,6※

※Cannot be used for TWC9TS20550P2, TWC9TO12050P2-D18 and TWC9HA22594P2
※Insert holder comes with insert screws and wrench Insert holder mounting screw is not included
※Screws for insert-thickness 4.0/6.0mm are supplied with the cutter body.

Spare Parts

Description		Item number
Insert Screw	for 4mm thick inserts	FSI17-2.2×6.0
	for 6.5mm thick inserts	FSI24-2.2×7.9
Wrench		T-07
Insert Holder Mounting Bolt		CS0309-TW

Machine make	Model	Location	Spindle make	Spindle model	Helix angle	No.	NTK Whirling cutter	No. of tooth	øDm (mm)	øDs	P.C.D.	Mount adapter bolt
CITIZEN	A20	Gang	CITIZEN	BTW-5000	0°-15°	10	TWC3C1040HP1	3	ø12	ø33	ø40	M3 (Provided with spindle)
						11	TWC3C1040HP1-LH	3	ø12			
	A20(2F)/A20(3F)			BTW-2000	±25°	12	TWC6C1040HP1	6	ø12			
						13	TWC6C1040HP1-LH	6	ø12			
	A32					1	TWC9C1040HP1	9	ø12			
						14	TWC9C1040HP1-LH	9	ø12			
						1	TWC9C1040HP1-D16	9	ø16			
	C12/16		JARVIS	LTRO170	±15°	2	TWC9C1037P2	9	ø12	ø37	ø30.5	CS0310 (M3)
	C20/C32(2M)		CITIZEN	BTW-1000	±25°	10	TWC3C1040HP1	3	ø12	ø33	ø40	M3 (Provided with spindle)
						11	TWC3C1040HP1-LH	3	ø12			
	C32					12	TWC6C1040HP1	6	ø12			
						13	TWC6C1040HP1-LH	6	ø12			
	D25			BTW-3100	0°-15°	1	TWC9C1040HP1	9	ø12			
						14	TWC9C1040HP1-LH	9	ø12			
	D25(1M)			BTW-6000	±25°	1	TWC9C1040HP1-D16	9	ø16			
	K16	Attachment	PCM	GSW-101	±15°	1	TWC6P1620HP1-D9	6	ø9	ø32	ø26	M4 (Provided with spindle)
	L20	Gang	CITIZEN	BTW-1000	±25°	10	TWC3C1040HP1	3	ø12	ø33	ø40	M3 (Provided with spindle)
						11	TWC3C1040HP1-LH	3	ø12			
						12	TWC6C1040HP1	6	ø12			
						13	TWC6C1040HP1-LH	6	ø12			
						1	TWC9C1040HP1	9	ø12			
						14	TWC9C1040HP1-LH	9	ø12			
						1	TWC9C1040HP1-D16	9	ø16			
			JARVIS	LTRO183	±15°	2	TWC9J1040P2	9	ø12	ø40	ø32.5	H-M4 × 12
			PCM	LSW-101-L20	±10°		TWC9P1340P2					M4 (Provided with spindle)
	L20/L20E/L20X		CITIZEN	BTW-3000 BTW-3100	0°-15°	1	TWC9C0746HP1			ø46	ø35	M3 (Provided with spindle)
	L20/L20X			BTW-2000	±25°	10	TWC3C1040HP1	3	ø12	ø33	ø40	M3 (Provided with spindle)
						11	TWC3C1040HP1-LH	3	ø12			
						12	TWC6C1040HP1	6	ø12			
						13	TWC6C1040HP1-LH	6	ø12			
	L20(7M)			BTW-1000		1	TWC9C1040HP1	9	ø12			
						14	TWC9C1040HP1-LH	9	ø12			
						1	TWC9C1040HP1-D16	9	ø16			
	L20E(1M)			BTW-3000	±15°	1	TWC9C0746HP1	9	ø12	ø46	ø35	M3 (Provided with spindle)
	L20E(2M)/L20E(3M)			BTW-1000	±25°	10	TWC3C1040HP1	3	ø12	ø33	ø40	M3 (Provided with spindle)
						11	TWC3C1040HP1-LH	3	ø12			
				BTW-5000		12	TWC6C1040HP1	6	ø12			
				BTW-3100	±15°	13	TWC6C1040HP1-LH	6	ø12			
				BTW-2000	±25°	1	TWC9C1040HP1	9	ø12			
						14	TWC9C1040HP1-LH	9	ø12			
	L20X			BTW-6000		1	TWC9C1040HP1-D16	9	ø16			
	L32/L32X			BTW-3000 BTW-3100	0°-15°	1	TWC9C0746HP1	9	ø12	ø46	ø35	M3 (Provided with spindle)
	L32(1M)			BTW-2000	±25°	10	TWC3C1040HP1	3	ø12	ø33	ø40	M3 (Provided with spindle)
				BTW-6000		11	TWC3C1040HP1-LH	3	ø12			
				BTW-3100	±15°	12	TWC6C1040HP1	6	ø12			
	L32(2M)			BTW-2000	±25°	13	TWC6C1040HP1-LH	6	ø12			
				BTW-6200		1	TWC9C1040HP1	9	ø12			
				BTW-6000		14	TWC9C1040HP1-LH	9	ø12			
				BTW-3100	±15°	1	TWC9C1040HP1-D16	9	ø16			
				BTW-2000	±25°							
	L32X			BTW-6000								
	M12/M16(2M)	Turret		MSW105	±15°	2	TWC9C1037P2	9	ø12	ø37	ø30.5	CS0310 (M3)
	M16	Gang		BTW-5000	±25°	10	TWC3C1040HP1	3	ø12	ø33	ø40	M3 (Provided with spindle)
						11	TWC3C1040HP1-LH	3	ø12			
						12	TWC6C1040HP1	6	ø12			
						13	TWC6C1040HP1-LH	6	ø12			
						1	TWC9C1040HP1	9	ø12			
						14	TWC9C1040HP1-LH	9	ø12			
						1	TWC9C1040HP1-D16	9	ø16			
	M2/16	Turret	JARVIS	LTR0128 LTRO168	±15°	2	TWC9C1037P2	9	ø12	ø37	ø30.5	CS0310 (M3)
	M2/16III		CITIZEN	MSW105								
	M20	Gang		BTW-2000	±25°	10	TWC3C1040HP1	3	ø12	ø33	ø40	M3 (Provided with spindle)
						11	TWC3C1040HP1-LH	3	ø12			
						12	TWC6C1040HP1	6	ø12			
						13	TWC6C1040HP1-LH	6	ø12			
				BTW-1000	+20°- -25°	1	TWC9C1040HP1	9	ø12			
						14	TWC9C1040HP1-LH	9	ø12			
						1	TWC9C1040HP1-D16	9	ø16			
	M20/16	Turret	PCM	NSW-101	±10°	2	TWC9P1340P2	9	ø12	ø40	ø32.5	M4 (Provided with spindle)
	M20/32	Gang	JARVIS	LTRO183	±15°		TWC9J1040P2					H-M4 × 12
		Turret		LTRO169								
	M20/32III		CITIZEN	KSW110			TWC9C1037P2			ø37	ø30.5	CS0310 (M3)
	M20/M32		PCM	KSW-101	±10°		TWC9P1340P2			ø40	ø32.5	M4 (Provided with spindle)

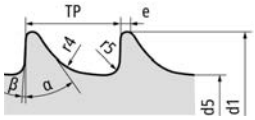
Machine make	Model	Location	Spindle make	Spindle model	Helix angle	No.	NTK Whirling cutter	No. of tooth	øDm (mm)	øDs	P.C.D.	Mount adapter bolt
				KSW110	±15°		TWC9C1037P2			ø37	ø30.5	CS0310 (M3)
	M20/M32(3M)	Gang	CITIZEN	BTW-1000	±25°	10	TWC3C1040HP1	3	ø12	ø33	ø40	M3 (Provided with spindle)
						11	TWC3C1040HP1-LH	3	ø12			
						12	TWC6C1040HP1	6	ø12			
						13	TWC6C1040HP1-LH	6	ø12			
						1	TWC9C1040HP1	9	ø12			
						14	TWC9C1040HP1-LH	9	ø12			
						1	TWC9C1040HP1-D16	9	ø16			
	M20/M32(4M)			BTW-4000	±15°	1	TWC9C0746HP1	9	ø12	ø46	ø35	M3 (Provided with spindle)
	M32			BTW-2000	±25°	10	TWC3C1040HP1	3	ø12	ø33	ø40	M3 (Provided with spindle)
						11	TWC3C1040HP1-LH	3	ø12			
						12	TWC6C1040HP1	6	ø12			
	M32(5M)			BTW-6000		13	TWC6C1040HP1-LH	6	ø12			
				BTW-2000		1	TWC9C1040HP1	9	ø12			
	$M_3$32			BTW-1000		14	TWC9C1040HP1-LH	9	ø12			
						1	TWC9C1040HP1-D16	9	ø16			
	$M_4$32-VII			BTW-4000	0°-15°	1	TWC9C0746HP1	9	ø12	ø46	ø35	M3 (Provided with spindle)
STAR	SL-10	Attachment	STAR	10159	±20°	7	TWC4S1433HP1	4	ø8	ø38	ø27	CS0310 (M3)
	SW-12											
	SW-20			68172	-20°-0°							
	ECAS-12/20			54178	±10°							
	ECAS-20T	Turret		59172	±20°							
	ECAS-32T			58171	±10°							
	SB-20R	Attachment		0M171	-20°-0°							
	SB-20/23RII											
	SR-20J/20RIII 20RIV/32JII			68172								
	SR-38			10172	±20°							
	SD-26 (Common to all types)			0M171	-20°-0°	15	TWC3S1640P2	3	ø12	ø40	ø33	CS04148S (M4)
	SD-26 type S	Swivel type unit		19121	±20°(MAXø8)	16	TWC3S1640P2-LH	3				
				19122	±25°(MAXø6)	17	TWC6S1640P2	6				
						18	TWC6S1640P2-LH	6				
	SP-20	Attachment		0M171	-20°-0°	3	TWC9S1640P2	9				
	ST-20	Turret		59172	±20°	19	TWC9S1640P2-LH	9				
	ST-38			43156								
	SV-12			45172	±10°							
	SV-20			42173								
	SV-20R			59172	±20°							
	SV-32			43172	±10°							
	SV-38R			43156	±20°							
	SX-38 type A											
	SX-38 type B			12174								
		Attachment		68172	-20°-0°							
TSUGAMI	BH20/BH38	Turret	TSUGAMI	3263-Y481	±10°	15	TWC3TS2252P2	3	ø12	ø52	ø42	CS0515 (M5)
						16	TWC3TS2252P2-LH	3				
						17	TWC6TS2252P2	6				
	B038T			3263-Y2481		18	TWC6TS2252P2-LH	6				
						3	TWC9TS2252P2	9				
						19	TWC9TS2252P2-LH	9				
	BS20	Attachment		3214-Y1371		3	TWC9TS20550P2	9	ø16	ø50	φ40	
	SS20/SS26/SS32			3268-Y451	0°-10° 0°-20° 0°-25° 0°-30°	20	TWC3TS2244HP1	3	ø12	ø52	ø44	CS0520 (M5)
	B0265/B0266-II					21	TWC3TS2244HP1-LH	3				CS0520 (M5)
	B0325/B0326-II					22	TWC6TS2244HP1	6				CS0520 (M5)
	B0265/B0266(V)-III					23	TWC6TS2244HP1-LH	6				CS0520 (M5)
	B0325/B0326(V)-III					4	TWC9TS2244HP1	9				CS0520 (M5)
	BW329Z/B0385 386(L)-III					24	TWC9TS2244HP1-LH	9				CS0520 (M5)
	S205/S206					4	TWC9TS1944HP1	9				CS0520 (M5)
	S205/S206-II			3281-Y2451		4	TWC9TS1644HP1	9				CS0515 (M5)
	B0123/124/126-II B0-V/B0-VR			3220-Y6541		4	TWC9TS1044HP1	9				CS0515 (M5)
	B0203/204/205 205-III/206-II											
	SS20/SS26/SS32			3268-Y271	0°-15°	4	TWC9TS1952P2BK	9	ø12	ø52	ø38	CS0515 (M5)
					0°-20°		TWC9TS1652P2BK					
	SS207/SS267/SS327	B-axis		Using B-axis	0°-15°	5	TWC4TS3010HP1	4	ø7	ø10	For single-corner inserts only	
	SS267/SS327-III	Attachment		3293-Y3031		4	TWC9TS1944HP1	9	ø12	ø52	ø44	CS0520 (M5)
TORNOS	DECO 10/10a	Attachment	TORNOS	224-1900	±15°	4	TWC6TO11542HP1	6	ø12	ø42	ø32	CS0410 (M4)
	Evo DECO 10/10			242-1900								
	DECO 13a/13e			226-1900	±15°	3	TWC9TO10540P2	9	ø12	ø40	ø31	CS0410 (M4)
	Evo DECO 16/10			243-1900								
	Swiss ST26			246-1900								
	DECO 20a			223-1900								
	DECO 26a			225-1900								
	Sigma 20			234-2750	±25°	3	TWC9TO12050P2-D18	9	ø18	ø50	ø40	CS0410 (M4)
	Sigma 32			236-2750								
HASEGAWA	JS-1W	–	HASEGAWA	–	0° -20°	6	TWC9HA22594P2	9	ø16	ø94	ø76	CS0620 (M6)
Various Machines	-	-	WTO	42BJ	-22°	8	TWC9WT42BJ20D12RH	9	ø12	-	-	-
	-	-		54BJ	30°	9	TWC9WT54BJ30D12RH	9	ø12	-	-	-
	-	-			30°	9	TWC9WT54BJ25D22RH	9	ø22	-	-	-

Standard Thread Whirling Inserts (two-sided) for Medical ISO Style Threads

TWC.. series/Inserts Carbide

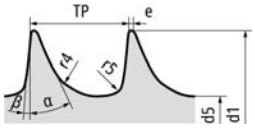
ISO5835

No.1



ISO5835 HA

No.2



ISO5835 HB

● Must use Thread whirling cutters with 12mm øDm dimension

Figure	Item Number	Hand	Chipbreaker	ISO Standard	Pitch	d1	d5	e	r4	r5	α	β	Carbide
													PVD
					inch	inch	inch	inch	inch	inch	inch	inch	ZM3
1	**TW5835-HA1.5-D12**	R	Yes	HA1.5	.020	.059	.043	.004	.012	.004	1.378	.118	●
1	**TW5835-HA2.0-D12**	R	Yes	HA2.0	.024	.079	.051	.004	.016	.004	1.378	.118	●
1	**TW5835-HA2.7-D12**	R	Yes	HA2.7	.039	.106	.075	.004	.024	.008	1.378	.118	●
1	**TW5835-HA3.5-D12**	R	Yes	HA3.5	.049	.138	.094	.004	.031	.008	1.378	.118	●
1	**TW5835-HA4.0-D12**	R	Yes	HA4.0	.059	.157	.114	.004	.031	.008	1.378	.118	●
1	**TW5835-HA4.5-D12**	R	Yes	HA4.5	.069	.177	.118	.004	.039	.012	1.378	.118	●
1	**TW5835-HA5.0-D12**	R	Yes	HA5.0	.069	.197	.138	.004	.039	.012	1.378	.118	●
2	**TW5835-HB4.0-D12**	R	Yes	HB4.0	.069	.157	.075	.004	.031	.012	.984	.197	●
2	**TW5835-HB6.5-D12**	R	Yes	HB6.5	.108	.256	.118	.008	.047	.031	.984	.197	●

ID Tooling

Product Lines V02

Recommended Cutting Conditions V04

General Information V05

LBM.. series V06

STICK DUO series V10

MBL.. series V25

ERGH.. series V28

CP.. series V30

CC.. series V32

TP.. series V35

TC.. series V39

ID Grooving .....

GTG.. series V43

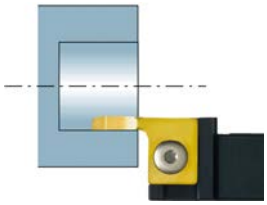
Internal Thread .....

TMN.. series V45

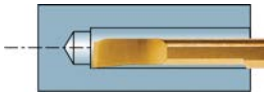
Boring bar adaptors V47

Product Lines

ID Tooling



Insert	LBM →V9		
	LBMA	DS-LBMB	CH-LBM
Holder	→V6-7	→V7	→V8
Min. Bore Dia.	ø.039"		



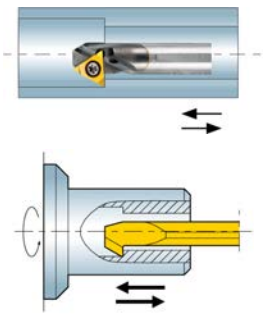
Insert	SHFS, SHFB, SBFS, SBFB →V15,V20-21		
	HY-NBH-OH	HY-NBH	NBH
Holder	STICK DUO SPLASH with Coolant through →V10-12	STICK DUO HYPER →V13-14	→V16-19
Min. Bore Dia.	ø.079"		

Insert \ Holder	HY-NBH-OH STICK DUO HYPER	HY-NBH STICK DUO HYPER	NBH STICK DUO
"S" chip breaker Sharp cutting edge — High Precision Insert	Best fit	Best fit	2nd OPT.
	SBFS-S	2nd OPT.	2nd OPT.	Best fit
"F" chip breaker Evacuates chips BACKWARD — SHFB-F High Precision Insert	Best fit	Best fit	2nd OPT.
	SBFB-F	2nd OPT.	2nd OPT.	Best fit
"H" Flat type Mirror finish edge — SHFS-H High Precision Insert	Best fit	Best fit	2nd OPT.
	SBFS-H	2nd OPT.	2nd OPT.	Best fit
Back turning	SBB	2nd OPT.	2nd OPT.	Best fit
Grooving	SBG	2nd OPT.	2nd OPT.	Best fit
Threading	SBT	2nd OPT.	2nd OPT.	Best fit

Insert	MBL →V27		ERGP →V29	
	C-MBR (Carbide shank)	S-MBR (Steel shank)	C-SEXR (Carbide shank)	S-SEXR (Steel shank)
Holder	Coolant through →V25-27	Coolant through →V25	Coolant through →V28-29	Coolant through →V28
Min. Bore Dia.	ø.197"		ø.236"	

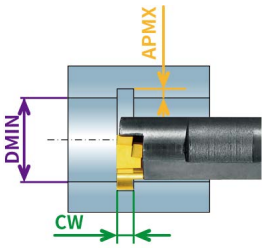
Insert	CC/CP →V31,V33-34		TC/TP →V38,V42	
	C-SCLC/P (Carbide shank)	S-SCLC/P (Steel shank)	C-STUC/P (Carbide shank)	S-STUC/P (Steel shank)
Holder	Coolant through →V30-32	Coolant through →V30,V32	Coolant through →V35-36,V39-40	Coolant through →V35,V39
Min. Bore Dia.	ø.276"		ø.315"	

ID Back Turning



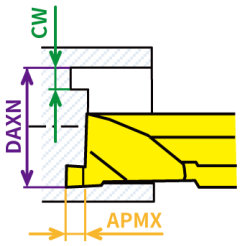
Insert	SBB →V22	TC/TP →V38,V42	MBL →V27
Holder	NBH	C-STZP/C (Carbide shank)	C-MSBR (Carbide shank)
	→V16-19	→V37,V41	→V27
Min. \Bore Dia.	ø.118"	ø.394"	ø.224" / ø.303"

ID Grooving



Insert	SBG →V23	GTG →V44
Holder	NBH	S-BG / BG
	→V16-19	→V43
CW : Blade width	.020" - .079"	.020" - .079"
APMX : Depth of cut	-.079"	-.118"
DMIN : Min. Bore Dia.	.118"/.157"/.197"/.236"/.315	.394"/.472"/.551"/.630"/.787"/.984"

ID Face Grooving



Insert	SFG →V24
Hoder	NBH
	→V16-19
CW : Blade width	.039" - .118"
APMX : Depth of cut	-.110"
DAXN : Min. Bore Dia.	.236"/.315"

Internal Thread

Insert	SBT →V24	TMN →V46
Holder	NBH	TGC / HN
	→V16-19	→V45
Thread Angle	60°	60°
Pitch	51 - 15 TPI	63 - 34 TPI
CDX	.024" - .071"	.028" - .039"

Recommended Cutting Conditions

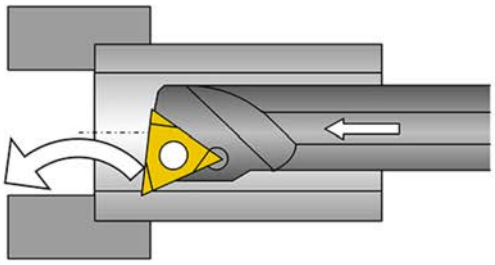
Min bore diameter ≦ φ.236 (LBM / STICK DUO)

ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**DT4**					**VM1 / TM4**	
	2nd choice	VM1 / ZM3					ZM3	
Cutting speed (SFM)		65 - 165 - 230				100 - 195 - 295		
Feed rate (IPR)		.0004 - .0012 - .002						
Depth of cut (inch)		.002 - .003 - .0039						

Min bore diameter > φ.236

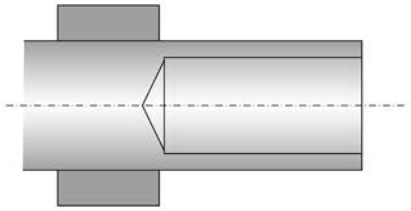
ISO Classification		S			M		P	
Work Material		Heat resistant alloys	Cobalt-chrome alloys	Titanium alloys	Hard to cut stainless steels	Free cutting stainless steels	Alloy steels	Carbon steels
Common Name		Inco718 Hastelloy MP35N	ASTM F-75	Ti-6Al-4V	SUS316L 17-4PH SUS304	SUS303 SUS430F	SCM435 SCr420	S10C S45C
Grade	1st choice	**650 / DT4**		**DT4**	**650 / ST4**		**650 / QM3**	
	2nd choice	DM4 / TM4					TM4	
Cutting speed (SFM)		130 - 230 - 330				130 - 295 - 590	130 - 295 - 490	
Feed rate (IPR)		.0008 - .0024 - .0047						
Depth of cut (inch)		.002 - .006 - .012						

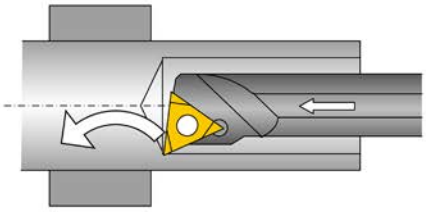
Through hole



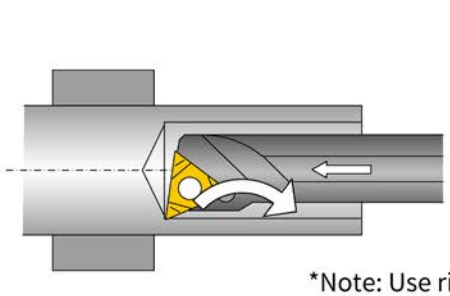
For chip control : chips can be evacuated forward

Blind hole





Typical inserts direct chip flow forward. Then packed chips damage and break cutting edge

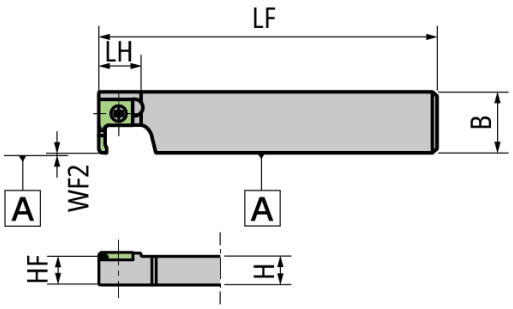


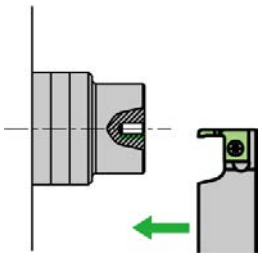
F05, F1, and FG chipbreakers will direct chips backwards and eliminate chipping on inserts

*Note: Use right-hand inserts with F05, F1 and FG chipbreaker for right-hand boring bars

LBM.. series/Toolholders

LBMA





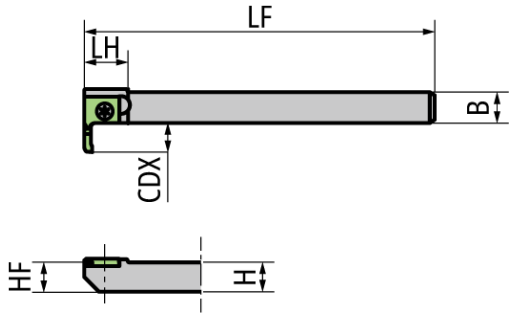
●Diagram shows right-hand tool

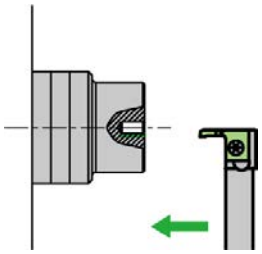
Item Number	Hand	B	H	HF	LF	LH	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	
LBMAR06-IN	R	3/8	3/8	3/8	4.724	.591	.000	LBM..
LBMAR08-IN	R	1/2	1/2	1/2	4.724	.591	.000	LBM..
LBMAR10-IN	R	5/8	5/8	5/8	4.724	.591	.000	LBM..
LBMAR08	R	.846	.315	.315	4.724	.591	.000	LBM..
LBMAR10	R	.846	.394	.394	4.724	.591	.000	LBM..
LBMAR12	R	.846	.472	.472	4.724	.591	.000	LBM..
LBMAR16	R	.846	.630	.630	4.724	.591	.000	LBM..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
LBMAR06-IN	LRIS-4*10PW	CLR-15S
LBMAR08-IN	LRIS-4*12PW	CLR-15S
LBMAR10-IN	LRIS-4*12PW	CLR-15S
LBMAR08	LRIS-4*10	LLR-25S
LBMAR10	LRIS-4*10PW	CLR-15S
LBMAR12	LRIS-4*10PW	CLR-15S
LBMAR16	LRIS-4*12PW	CLR-15S

LBMA-F





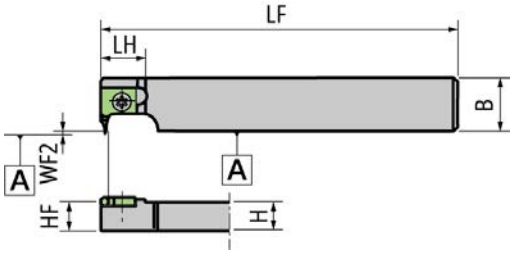
●Diagram shows right-hand tool

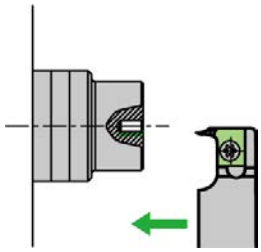
Item Number	Hand	B	CDX	H	HF	LF	LH	Insert Gage	
		inch	inch	inch	inch	inch	inch		
LBMAR10-F	R	.394	.394	.394	.394	4.724	.591	LBM..	LBM..S

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
LBMAR10-F	LRIS-4*12PW	CLR-15S

LBMA-S





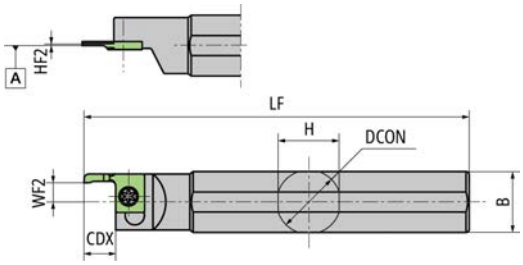
●Diagram shows right-hand tool

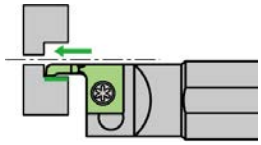
Item Number	Hand	B	H	HF	LF	LH	WF2	Insert Gage
		inch	inch	inch	inch	inch	inch	
LBMAR10SGX	R	.709	.394	.394	3.346	.591	.000	LBMD..S
LBMAR10S	R	.709	.394	.394	4.724	.591	.000	LBMD..S
LBMAR12S	R	.709	.472	.472	4.724	.591	.000	LBMD..S

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
LBMAR10SGX	LRIS-4*10PW	CLR-15S
LBMAR10S	LRIS-4*10PW	CLR-15S
LBMAR12S	LRIS-4*12PW	CLR-15S

DS-LBMB DS Toolholders





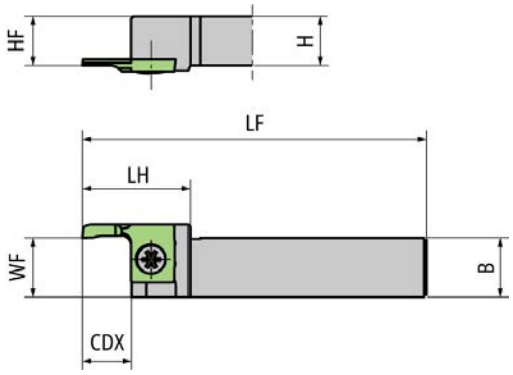
●Diagram shows left-hand tool

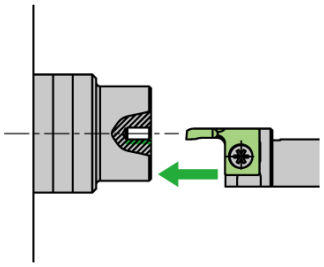
Item Number	Hand	B	CDX	DCON	H	HF2	LF	WF2	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch		
DS-LBMBL14F	L	.512	.394	.551	.512	.000	3.150	.250	LBM..	LBMD..S
DS-LBMBL15H	L	.591	.394	5/8	.591	.000	3.937	.250	LBM..	LBMD..S
DS-LBMBL16X	L	.591	.394	.630	.591	.000	3.740	.250	LBM..	LBMD..S
DS-LBMBL19	L	.709	.394	3/4	.709	.000	4.724	.250	LBM..	LBMD..S
DS-LBMBL20	L	.748	.394	.787	.748	.000	4.724	.250	LBM..	LBMD..S
DS-LBMBL22	L	.827	.394	.866	.827	.000	4.724	.250	LBM..	LBMD..S
DS-LBMBL25	L	.945	.394	1.000	.945	.000	5.906	.250	LBM..	LBMD..S
DS-LBMBL25-MET	L	.945	.394	.984	.945	.000	4.724	.250	LBM..	LBMD..S

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
DS-LBMBL14F	LRIS-4*10PW	CLR-15S
DS-LBMBL15H	LRIS-4*10PW	CLR-15S
DS-LBMBL16X	LRIS-4*10PW	CLR-15S
DS-LBMBL19	LRIS-4*10PW	CLR-15S
DS-LBMBL20	LRIS-4*10PW	CLR-15S
DS-LBMBL22	LRIS-4*10PW	CLR-15S
DS-LBMBL25	LRIS-4*10PW	CLR-15S
DS-LBMBL25-MET	LRIS-4*10PW	CLR-15S

CH-LBM for horizontal gang style tool post





●Diagram shows left-hand tool

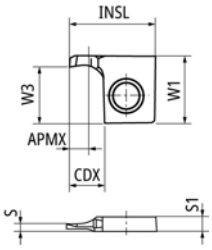
Item Number	Hand	B	CDX	H	HF	LF	LH	WF	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch		
CH-LBML1012H	L	.472	.394	.394	.394	3.937	.866	.486	LBM..	LBMD..S
CH-LBML1212H	L	.472	.394	.472	.472	3.937	.866	.486	LBM..	LBMD..S

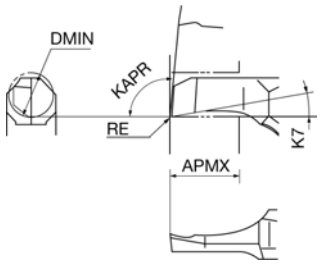
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
CH-LBML1012H	LRIS-4*10PW	CLR-15S
CH-LBML1212H	LRIS-4*10PW	CLR-15S

LBM.. series/Inserts Carbide

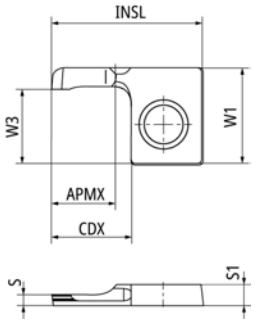
LBMD-S Short type

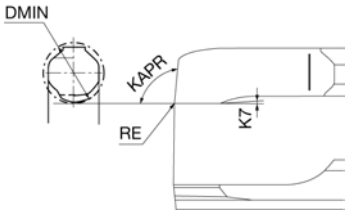




Item Number	Hand	Chipbreaker	DMIN	APMX	CDX	INSL	K7	KAPR	RE	S	S1	W1	W3	Carbide
														PVD
			inch	inch	inch	inch	°	°	inch	inch	inch	inch	inch	VM1
LBMD1020FLPB05S	L	Yes	.039	.079	.236	.591	10	95	.002	.049	.098	.472	.394	●
LBMD1020FLVBS	L	Yes	.039	.079	.236	.591	10	95	.000	.049	.098	.472	.394	●
LBMD1430FLPB05S	L	Yes	.055	.118	.236	.591	10	95	.002	.049	.098	.472	.394	●
LBMD1430FLVBS	L	Yes	.055	.118	.236	.591	10	95	.000	.049	.098	.472	.394	●
LBMD1730FLPB05S	L	Yes	.067	.118	.236	.591	10	95	.002	.049	.098	.472	.394	●
LBMD1730FLVBS	L	Yes	.067	.118	.236	.591	10	95	.000	.049	.098	.472	.394	●
LBMD2035FLPB05S	L	Yes	.079	.138	.236	.591	10	95	.002	.049	.098	.472	.394	●
LBMD2035FLVBS	L	Yes	.079	.138	.236	.591	10	95	.000	.049	.098	.472	.394	●
LBMD2335FLPB05S	L	Yes	.091	.138	.236	.591	10	95	.002	.049	.098	.472	.394	●
LBMD2335FLVBS	L	Yes	.091	.138	.236	.591	10	95	.000	.049	.098	.472	.394	●

LBM Long type



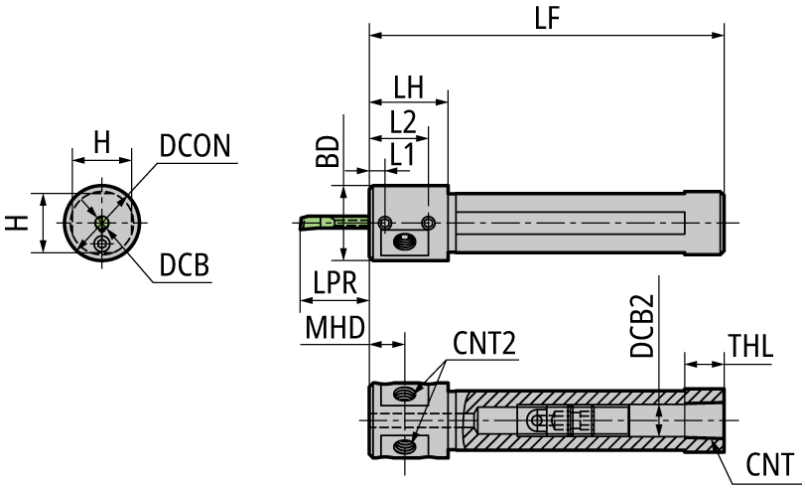


Item Number	Hand	Chipbreaker	DMIN	APMX	CDX	INSL	K7	KAPR	RE	S	S1	W1	W3	Carbide	
														PVD	
			inch	inch	inch	inch	°	°	inch	inch	inch	inch	inch	VM1	ZM3
LBMD1020FLPB05	L	Yes	.039	.079	.390	.744	10	95	.002	.049	.098	.472	.394	●	
LBMD1020FLVB	L	Yes	.039	.079	.390	.744	10	95	.000	.049	.098	.472	.394	●	
LBMD2060FLPB05	L	Yes	.079	.236	.390	.744	10	95	.002	.049	.098	.472	.394	●	
LBMD2060FLVB	L	Yes	.079	.236	.390	.744	10	95	.000	.049	.098	.472	.394	●	
LBME2060FLP05	L	No	.079	.236	.390	.744	2	105	.002	.049	.098	.472	.394	●	
LBME2060FLPB05	L	Yes	.079	.236	.390	.744	2	105	.002	.049	.098	.472	.394	●	
LBME2060FLV	L	No	.079	.236	.390	.744	2	105	.000	.049	.098	.472	.394	●	
LBME2060FLVB	L	Yes	.079	.236	.390	.744	2	105	.000	.049	.098	.472	.394	●	
LBM3080FLPB05	L	Yes	.118	.315	.390	.744	2	90	.002	.049	.098	.472	.378	●	
LBM3080FLVB	L	Yes	.118	.315	.390	.744	2	90	.000	.049	.098	.472	.378	●	
LBMC3080FLP05	L	Yes	.118	.315	.390	.744	2	95	.002	.049	.098	.472	.378	●	●
LBMC3080FLPB05	L	Yes	.118	.315	.390	.744	2	95	.002	.049	.098	.472	.378	●	●
LBMC3080FLV	L	No	.118	.315	.390	.744	2	95	.000	.049	.098	.472	.378	●	●
LBMC3080FLVB	L	Yes	.118	.315	.390	.744	2	95	.000	.049	.098	.472	.378	●	●

STICK DUO SPLASH

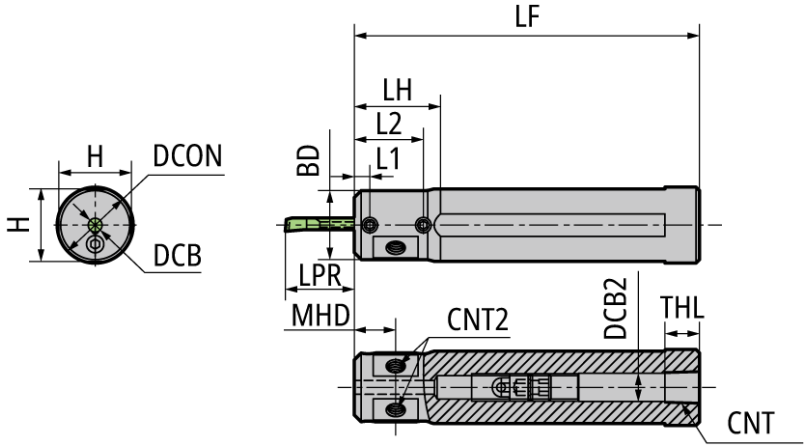
SHF.. series/Sleeve (Adjustable overhang/ Internal coolant system)

HY-NBH-OH Shank diameter ⌀.630"



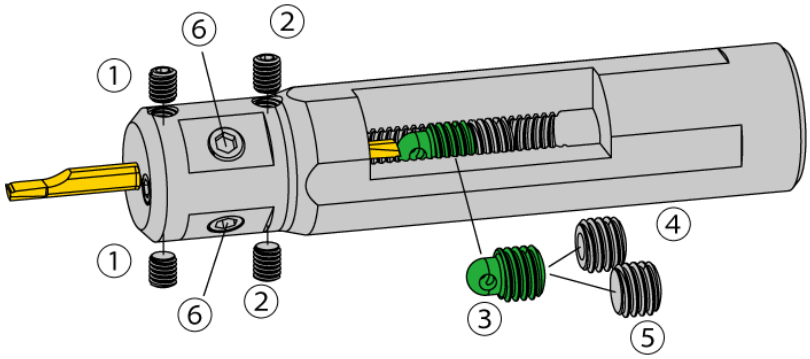
Item Number	BD	CNT	CNT2	DCB	DCB2	DCON	H	LF	LH	LPR	L1	L2	MHD	THL	Applicable insert bar	
	inch			inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
HY-NBH02016G-OH	.748	Rc1/8	M6×P1.0	.079	.323	.630	.591	3.543	.748	.197-.709	.157	.591	.374	.394	SBF../SHF..	SSP..
HY-NBH02516G-OH	.748	Rc1/8	M6×P1.0	.098	.323	.630	.591	3.543	.748	.248-.768	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH03016G-OH	.748	Rc1/8	M6×P1.0	.118	.323	.630	.591	3.543	.748	.295-.827	.157	.591	.374	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03516G-OH	.748	Rc1/8	M6×P1.0	.138	.323	.630	.591	3.543	.748	.346-.965	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH04016G-OH	.748	Rc1/8	M6×P1.0	.157	.323	.630	.591	3.543	.945	.394-1.102	.157	.787	.472	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05016G-OH	.748	Rc1/8	M6×P1.0	.197	.323	.630	.591	3.543	.945	.492-1.378	.157	.787	.472	.394	SBF../SHF..	SBG../SBT../SSP..

HY-NBH-OH Shank diameter ⌀.750" - ⌀1.000"



Item Number	BD	CNT	CNT2	DCB	DCB2	DCON	H	LF	LH	LPR	L1	L2	MHD	THL	Applicable insert bar	
	inch			inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
HY-NBH02019J-OH	.750	Rc1/8	M6×P1.0	.079	.323	3/4	.709	4.331	–	.197-.709	.157	.591	.374	.394	SBF../SHF..	SSP..
HY-NBH02519J-OH	.750	Rc1/8	M6×P1.0	.098	.323	3/4	.709	4.331	–	.248-.768	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH03019J-OH	.750	Rc1/8	M6×P1.0	.118	.323	3/4	.709	4.331	–	.295-.827	.157	.591	.374	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03519J-OH	.750	Rc1/8	M6×P1.0	.138	.323	3/4	.709	4.331	–	.346-.965	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH04019J-OH	.750	Rc1/8	M6×P1.0	.157	.323	3/4	.709	4.331	–	.394-1.102	.157	.787	.472	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05019J-OH	.750	Rc1/8	M6×P1.0	.197	.323	3/4	.709	4.331	–	.492-1.378	.157	.787	.472	.394	SBF../SHF..	SBG../SBT../SSP..
HY-NBH06019J-OH	.750	Rc1/8	M6×P1.0	.236	.323	3/4	.709	4.331	–	.591-1.654	.157	.787	.472	.394	SBF../SHF..	SBG../SFG../SBT../SSP..
HY-NBH02020J-OH	.787	Rc1/8	M6×P1.0	.079	.323	.787	.748	4.331	–	.197-.709	.157	.591	.374	.394	SBF../SHF..	SSP..
HY-NBH02520J-OH	.787	Rc1/8	M6×P1.0	.098	.323	.787	.748	4.331	–	.248-.768	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH03020J-OH	.787	Rc1/8	M6×P1.0	.118	.323	.787	.748	4.331	–	.295-.827	.157	.591	.374	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03520J-OH	.787	Rc1/8	M6×P1.0	.138	.323	.787	.748	4.331	–	.346-.965	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH04020J-OH	.787	Rc1/8	M6×P1.0	.157	.323	.787	.748	4.331	–	.394-1.102	.157	.787	.472	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05020J-OH	.787	Rc1/8	M6×P1.0	.197	.323	.787	.748	4.331	–	.492-1.378	.157	.787	.472	.394	SBF../SHF..	SBG../SBT../SSP..
HY-NBH06020J-OH	.787	Rc1/8	M6×P1.0	.236	.323	.787	.748	4.331	–	.591-1.654	.157	.787	.472	.394	SBF../SHF..	SBG../SFG../SBT../SSP..
HY-NBH02022X-OH	.787	Rc1/8	M6×P1.0	.079	.323	.866	.827	4.724	.984	.197-.709	.157	.591	.374	.394	SBF../SHF..	SSP..
HY-NBH02522X-OH	.787	Rc1/8	M6×P1.0	.098	.323	.866	.827	4.724	.984	.248-.768	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH03022X-OH	.787	Rc1/8	M6×P1.0	.118	.323	.866	.827	4.724	.984	.295-.827	.157	.591	.374	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03522X-OH	.787	Rc1/8	M6×P1.0	.138	.323	.866	.827	4.724	.984	.346-.965	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH04022X-OH	.787	Rc1/8	M6×P1.0	.157	.323	.866	.827	4.724	.984	.394-1.102	.157	.787	.472	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05022X-OH	.787	Rc1/8	M6×P1.0	.197	.323	.866	.827	4.724	.984	.492-1.378	.157	.787	.472	.394	SBF../SHF..	SBG../SBT../SSP..
HY-NBH06022X-OH	.787	Rc1/8	M6×P1.0	.236	.323	.866	.827	4.724	.984	.591-1.654	.157	.787	.472	.394	SBF../SHF..	SBG../SFG../SBT../SSP..
HY-NBH02025.0K-OH	.787	Rc1/8	M6×P1.0	.079	.323	.984	.945	4.921	.984	.197-.709	.157	.591	.374	.394	SBF../SHF..	SSP..
HY-NBH02525.0K-OH	.787	Rc1/8	M6×P1.0	.098	.323	.984	.945	4.921	.984	.248-.768	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH03025.0K-OH	.787	Rc1/8	M6×P1.0	.118	.323	.984	.945	4.921	.984	.295-.827	.157	.591	.374	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03525.0K-OH	.787	Rc1/8	M6×P1.0	.138	.323	.984	.945	4.921	.984	.346-.965	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH04025.0K-OH	.787	Rc1/8	M6×P1.0	.157	.323	.984	.945	4.921	.984	.394-1.102	.157	.787	.472	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05025.0K-OH	.787	Rc1/8	M6×P1.0	.197	.323	.984	.945	4.921	.984	.492-1.378	.157	.787	.472	.394	SBF../SHF..	SBG../SBT../SSP..
HY-NBH06025.0K-OH	.787	Rc1/8	M6×P1.0	.236	.323	.984	.945	4.921	.984	.591-1.654	.157	.787	.472	.394	SBF../SHF..	SBG../SFG../SBT../SSP..
HY-NBH02025.4K-OH	.787	Rc1/8	M6×P1.0	.079	.323	1.000	.945	4.921	.984	.197-.709	.157	.591	.374	.394	SBF../SHF..	SSP..
HY-NBH02525.4K-OH	.787	Rc1/8	M6×P1.0	.098	.323	1.000	.945	4.921	.984	.248-.768	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH03025.4K-OH	.787	Rc1/8	M6×P1.0	.118	.323	1.000	.945	4.921	.984	.295-.827	.157	.591	.374	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03525.4K-OH	.787	Rc1/8	M6×P1.0	.138	.323	1.000	.945	4.921	.984	.346-.965	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH04025.4K-OH	.787	Rc1/8	M6×P1.0	.157	.323	1.000	.945	4.921	.984	.394-1.102	.157	.787	.472	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05025.4K-OH	.787	Rc1/8	M6×P1.0	.197	.323	1.000	.945	4.921	.984	.492-1.378	.157	.787	.472	.394	SBF../SHF..	SBG../SBT../SSP..
HY-NBH06025.4K-OH	.787	Rc1/8	M6×P1.0	.236	.323	1.000	.945	4.921	.984	.591-1.654	.157	.787	.472	.394	SBF../SHF..	SBG../SFG../SBT../SSP..

Spare Parts

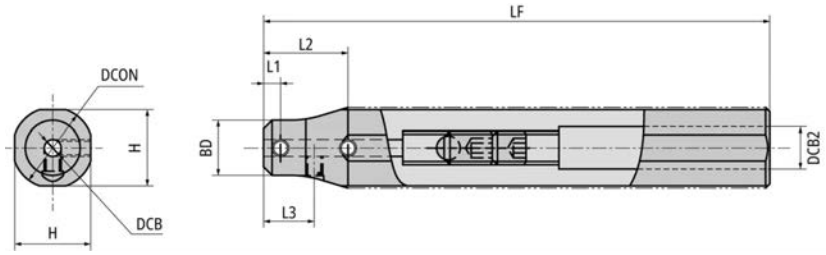


Item Number	Clamp Screw		Overhang Adjustment			M6 Screw	Wrench		
	①	②	③	④	⑤	⑥	①②	③④⑤	⑥
HY-NBH02016G-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02516G-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03016G-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03516G-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH04016G-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH05016G-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02019J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02519J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03019J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03519J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH04019J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH05019J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH06019J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02020J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02520J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03020J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03520J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH04020J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH05020J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH06020J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02022X-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02522X-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03022X-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03522X-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH04022X-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH05022X-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH06022X-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02025.0K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02525.0K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03025.0K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03525.0K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH04025.0K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH05025.0K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH06025.0K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02025.4K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02525.4K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03025.4K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03525.4K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH04025.4K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH05025.4K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH06025.4K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3

STICK DUO HYPER

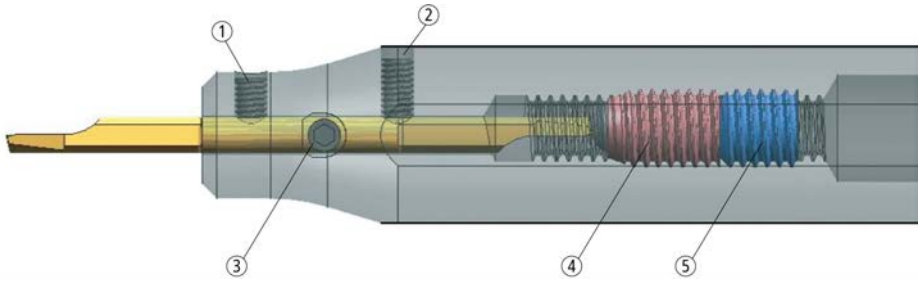
SHF.. series/Sleeve (Adjustable overhang)

HY-NBH



Item Number	Hand	BD	DCB	DCB2	DCON	H	LF	L1	L2	L3	Applicable insert bar	
		inch	inch	inch	inch	inch	inch	inch	inch	inch		
HY-NBH02016H	N	.433	.079	.394	.630	.591	3.937	.157	.591	.374	SBF../SHF..	SSP..
HY-NBH02516H	N	.453	.098	.394	.630	.591	3.937	.157	.591	.374	SBF../SHF..	SBT../SSP..
HY-NBH03016H	N	.472	.118	.394	.630	.591	3.937	.157	.591	.374	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03516H	N	.492	.138	.394	.630	.591	3.937	.157	.787	.472	SBF../SHF..	SBT../SSP..
HY-NBH04016H	N	.512	.157	.394	.630	.591	3.937	.157	.787	.472	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05016H	N	.551	.197	.394	.630	.591	3.937	.157	.787	.472	SBF../SHF..	SBG../SBT../SSP..
HY-NBH02019K	N	.433	.079	.394	3/4	.709	4.921	.157	.591	.374	SBF../SHF..	SSP..
HY-NBH02519K	N	.453	.098	.394	3/4	.709	4.921	.157	.591	.374	SBF../SHF..	SBT../SSP..
HY-NBH03019K	N	.472	.118	.394	3/4	.709	4.921	.157	.591	.374	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03519K	N	.492	.138	.394	3/4	.709	4.921	.157	.787	.472	SBF../SHF..	SBT../SSP..
HY-NBH04019K	N	.512	.157	.394	3/4	.709	4.921	.157	.787	.472	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05019K	N	.551	.197	.394	3/4	.709	4.921	.157	.787	.472	SBF../SHF..	SBG../SBT../SSP..
HY-NBH02020K	N	.433	.079	.394	.787	.748	4.921	.157	.591	.374	SBF../SHF..	SSP..
HY-NBH02520K	N	.453	.098	.394	.787	.748	4.921	.157	.591	.374	SBF../SHF..	SBT../SSP..
HY-NBH03020K	N	.472	.118	.394	.787	.748	4.921	.157	.591	.374	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03520K	N	.492	.138	.394	.787	.748	4.921	.157	.787	.472	SBF../SHF..	SBT../SSP..
HY-NBH04020K	N	.512	.157	.394	.787	.748	4.921	.157	.787	.472	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05020K	N	.551	.197	.394	.787	.748	4.921	.157	.787	.472	SBF../SHF..	SBG../SBT../SSP..
HY-NBH02022K	N	.433	.079	.394	.866	.827	4.921	.157	.591	.374	SBF../SHF..	SSP..
HY-NBH02522K	N	.453	.098	.394	.866	.827	4.921	.157	.591	.374	SBF../SHF..	SBT../SSP..
HY-NBH03022K	N	.472	.118	.394	.866	.827	4.921	.157	.591	.374	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03522K	N	.492	.138	.394	.866	.827	4.921	.157	.787	.472	SBF../SHF..	SBT../SSP..
HY-NBH04022K	N	.512	.157	.394	.866	.827	4.921	.157	.787	.472	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05022K	N	.551	.197	.394	.866	.827	4.921	.157	.787	.472	SBF../SHF..	SBG../SBT../SSP..
HY-NBH02025K-MET	N	.433	.079	.394	.984	.945	4.921	.157	.591	.374	SBF../SHF..	SSP..
HY-NBH02525K-MET	N	.453	.098	.394	.984	.945	4.921	.157	.591	.374	SBF../SHF..	SBT../SSP..
HY-NBH03025K-MET	N	.472	.118	.394	.984	.945	4.921	.157	.591	.374	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03525K-MET	N	.492	.138	.394	.984	.945	4.921	.157	.787	.472	SBF../SHF..	SBT../SSP..
HY-NBH04025K-MET	N	.512	.157	.394	.984	.945	4.921	.157	.787	.472	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05025K-MET	N	.551	.197	.394	.984	.945	4.921	.157	.787	.472	SBF../SHF..	SBG../SBT../SSP..
HY-NBH02025K	N	.433	.079	.394	1.000	.945	4.921	.157	.591	.374	SBF../SHF..	SSP..
HY-NBH02525K	N	.453	.098	.394	1.000	.945	4.921	.157	.591	.374	SBF../SHF..	SBT../SSP..
HY-NBH03025K	N	.472	.118	.394	1.000	.945	4.921	.157	.591	.374	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03525K	N	.492	.138	.394	1.000	.945	4.921	.157	.787	.472	SBF../SHF..	SBT../SSP..
HY-NBH04025K	N	.512	.157	.394	1.000	.945	4.921	.157	.787	.472	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05025K	N	.551	.197	.394	1.000	.945	4.921	.157	.787	.472	SBF../SHF..	SBG../SBT../SSP..

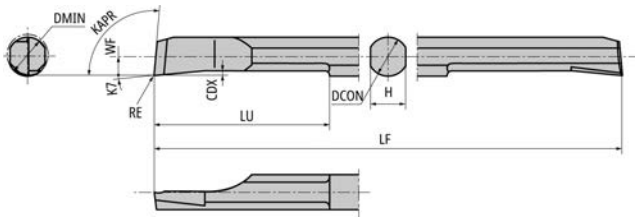
Spare Parts

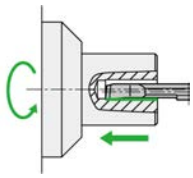


Item Number	Clamp Screw			Overhang Adjustment		Wrench	
	①	②	③	④	⑤	①②③	④⑤
HY-NBH02016H	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02516H	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03016H	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03516H	SS04045FS	SS0404F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH04016H	SS04045FS	SS0404F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH05016H	SS04045FS	SS0404F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02019K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02519K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03019K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03519K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH04019K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH05019K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02020K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02520K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03020K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03520K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH04020K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH05020K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02022K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02522K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03022K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03522K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH04022K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH05022K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02025K-MET	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02525K-MET	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03025K-MET	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03525K-MET	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH04025K-MET	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH05025K-MET	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02025K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02525K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03025K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03525K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH04025K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH05025K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104

SHF.. series/Insert bar Carbide

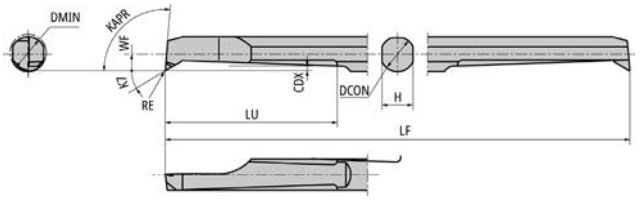
SHFS-S Sharp cutting edge

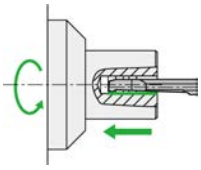




Item Number	Hand	Chipbreaker	DMIN	CDX	DCON	H	K7	KAPR	LF	LU	RE	WF	Carbide
													PVD
			inch	inch	inch	inch	°	°	inch	inch	inch	inch	TM4
SHFS020R005S	R	Yes	.087	.010	.079	.071	5	95	1.969	.394	.002	.035	●
SHFS025R005S	R	Yes	.106	.012	.098	.091	5	95	1.969	.492	.002	.045	●
SHFS025R015S	R	Yes	.106	.012	.098	.091	5	95	1.969	.492	.006	.045	●
SHFS030R005S	R	Yes	.126	.016	.118	.106	5	95	1.969	.591	.002	.055	●
SHFS030R015S	R	Yes	.126	.016	.118	.106	5	95	1.969	.591	.006	.055	●
SHFS035R005S	R	Yes	.146	.016	.138	.126	5	95	2.362	.689	.002	.065	●
SHFS035R015S	R	Yes	.146	.016	.138	.126	5	95	2.362	.689	.006	.065	●
SHFS040R005S	R	Yes	.165	.018	.157	.142	5	95	2.362	.787	.002	.075	●
SHFS040R015S	R	Yes	.165	.018	.157	.142	5	95	2.362	.787	.006	.075	●
SHFS050R005S	R	Yes	.205	.020	.197	.177	5	95	2.756	.984	.002	.094	●
SHFS050R015S	R	Yes	.205	.020	.197	.177	5	95	2.756	.984	.006	.094	●

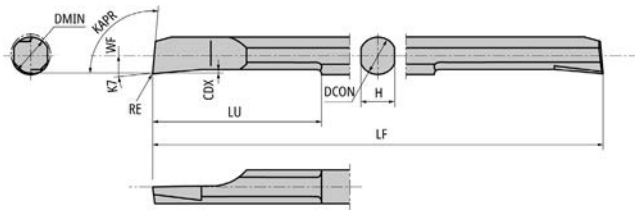
SHFB-F Evacuates chips BACKWARD

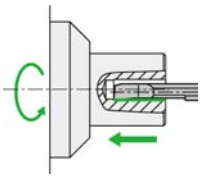




Item Number	Hand	Chipbreaker	DMIN	CDX	DCON	H	K7	KAPR	LF	LU	RE	WF	Carbide
													PVD
			inch	inch	inch	inch	°	°	inch	inch	inch	inch	TM4
SHFB020R005F	R	Yes	.087	.010	.079	.071	30	95	1.969	.315	.002	.037	●
SHFB025R005F	R	Yes	.106	.012	.098	.091	30	95	1.969	.492	.002	.047	●
SHFB025R015F	R	Yes	.106	.012	.098	.091	30	95	1.969	.492	.006	.047	●
SHFB030R005F	R	Yes	.126	.018	.118	.106	30	95	1.969	.591	.002	.055	●
SHFB030R015F	R	Yes	.126	.018	.118	.106	30	95	1.969	.591	.006	.055	●
SHFB035R005F	R	Yes	.146	.020	.138	.126	30	95	2.362	.689	.002	.065	●
SHFB035R015F	R	Yes	.146	.020	.138	.126	30	95	2.362	.689	.006	.065	●
SHFB040R005F	R	Yes	.165	.020	.157	.142	30	95	2.362	.787	.002	.075	●
SHFB040R015F	R	Yes	.165	.020	.157	.142	30	95	2.362	.787	.006	.075	●
SHFB050R005F	R	Yes	.205	.028	.197	.177	30	95	2.756	.984	.002	.094	●
SHFB050R015F	R	Yes	.205	.028	.197	.177	30	95	2.756	.984	.006	.094	●

SHFS-H Mirror finish edge

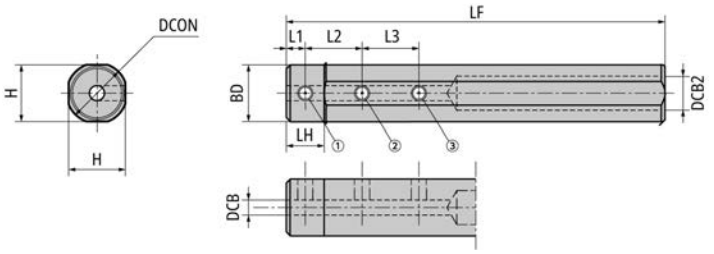




Item Number	Hand	Chipbreaker	DMIN	CDX	DCON	H	K7	KAPR	LF	LU	RE	WF	Carbide
													PVD
			inch	inch	inch	inch	°	°	inch	inch	inch	inch	TM4
SHFS020R005H Ⓜ	R	Yes	.087	.010	.079	.071	5	95	1.969	.394	.002	.035	●
SHFS025R005H Ⓜ	R	Yes	.106	.012	.098	.091	5	95	1.969	.492	.002	.045	●
SHFS025R015H Ⓜ	R	Yes	.106	.012	.098	.091	5	95	1.969	.492	.006	.045	●
SHFS030R005H Ⓜ	R	Yes	.126	.016	.118	.106	5	95	1.969	.591	.002	.055	●
SHFS030R015H Ⓜ	R	Yes	.126	.016	.118	.106	5	95	1.969	.591	.006	.055	●
SHFS035R005H Ⓜ	R	Yes	.146	.016	.138	.126	5	95	2.362	.689	.002	.065	●
SHFS035R015H Ⓜ	R	Yes	.146	.016	.138	.126	5	95	2.362	.689	.006	.065	●
SHFS040R005H Ⓜ	R	Yes	.165	.018	.157	.142	5	95	2.362	.787	.002	.075	●
SHFS040R015H Ⓜ	R	Yes	.165	.018	.157	.142	5	95	2.362	.787	.006	.075	●
SHFS050R005H Ⓜ	R	Yes	.205	.020	.197	.177	5	95	2.756	.984	.002	.094	●
SHFS050R015H Ⓜ	R	Yes	.205	.020	.197	.177	5	95	2.756	.984	.006	.094	●

STICK DUO
SB.. series/Sleeve

NBH Shank diameter ø.625" - ø.750"



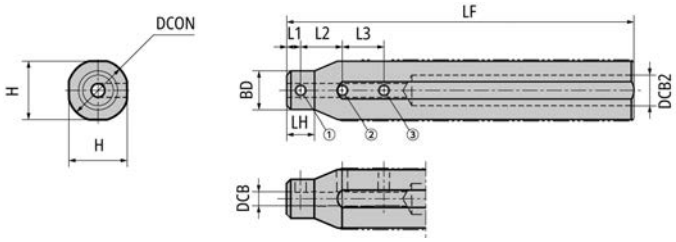
Item Number	Hand	BD	DCB	DCB2	DCON	H	LF	LH	L1	L2	L3	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
NBH02015H	N	.591	.079	.354	5/8	.591	3.937	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02515H	N	.591	.098	.354	5/8	.591	3.937	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03015H	N	.591	.118	.354	5/8	.591	3.937	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03515H	N	.591	.138	.354	5/8	.591	3.937	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04015H	N	.591	.157	.354	5/8	.591	3.937	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04515H	N	.591	.177	.354	5/8	.591	3.937	.394	.197	.591	.591	–	–
NBH05015H	N	.591	.197	.354	5/8	.591	3.937	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06015H	N	.591	.236	.354	5/8	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08015H	N	.591	.315	.354	5/8	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH02016H	N	.591	.079	.354	.630	.591	3.937	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02516H	N	.591	.098	.354	.630	.591	3.937	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03016H	N	.591	.118	.354	.630	.591	3.937	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03516H	N	.591	.138	.354	.630	.591	3.937	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04016H	N	.591	.157	.354	.630	.591	3.937	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04516H	N	.591	.177	.354	.630	.591	3.937	.394	.197	.591	.591	–	–
NBH05016H	N	.591	.197	.354	.630	.591	3.937	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06016H	N	.591	.236	.354	.630	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH07016H	N	.591	.276	.354	.630	.591	3.937	.394	.197	.787	.787	SBF../SHF..	–
NBH08016H	N	.591	.315	.354	.630	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH02019K	N	.709	.079	.433	3/4	.709	4.921	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02519K	N	.709	.098	.433	3/4	.709	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03019K	N	.709	.118	.433	3/4	.709	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03519K	N	.709	.138	.433	3/4	.709	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04019K	N	.709	.157	.433	3/4	.709	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04519K	N	.709	.177	.433	3/4	.709	4.921	.394	.197	.591	.591	–	–
NBH05019K	N	.709	.197	.433	3/4	.709	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06019K	N	.709	.236	.433	3/4	.709	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH07019K	N	.709	.276	.433	3/4	.709	4.921	.394	.197	.787	.787	SBF../SHF..	–
NBH08019K	N	.709	.315	.433	3/4	.709	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH10019K	N	.709	.394	.433	3/4	.709	4.921	.394	.197	.787	.787	–	–

Spare Parts

Item Number	Clamp screw			Wrench (for Clamp screw)
	①	②	③	①②
NBH02015H	SS0406F	SS0406F	–	LW-2
NBH02515H	SS0406F	SS0406F	–	LW-2
NBH03015H	SS0404F	SS0404F	SS0404F	LW-2
NBH03515H	SS0404F	SS0404F	SS0404F	LW-2
NBH04015H	SS0404F	SS0404F	SS0404F	LW-2
NBH04515H	SS0404F	SS0404F	SS0404F	LW-2
NBH05015H	SS0404F	SS0404F	SS0404F	LW-2
NBH06015H	SS0404F	SS0404F	SS0404F	LW-2
NBH08015H	SS0403F	SS0403F	SS0403F	LW-2
NBH02016H	SS0406F	SS0406F	–	LW-2
NBH02516H	SS0406F	SS0406F	–	LW-2
NBH03016H	SS0404F	SS0404F	SS0404F	LW-2
NBH03516H	SS0404F	SS0404F	SS0404F	LW-2
NBH04016H	SS0404F	SS0404F	SS0404F	LW-2
NBH04516H	SS0404F	SS0404F	SS0404F	LW-2
NBH05016H	SS0404F	SS0404F	SS0404F	LW-2
NBH06016H	SS0404F	SS0404F	SS0404F	LW-2
NBH07016H	SS0403F	SS0404F	SS0404F	LW-2
NBH08016H	SS0403F	SS0403F	SS0403F	LW-2
NBH02019K	SS0408F	SS0408F	–	LW-2
NBH02519K	SS0408F	SS0408F	–	LW-2
NBH03019K	SS0406F	SS0406F	SS0406F	LW-2
NBH03519K	SS0406F	SS0406F	SS0406F	LW-2
NBH04019K	SS0406F	SS0406F	SS0406F	LW-2
NBH04519K	SS0406F	SS0406F	SS0406F	LW-2
NBH05019K	SS0406F	SS0406F	SS0406F	LW-2
NBH06019K	SS0406F	SS0406F	SS0406F	LW-2
NBH07019K	SS0404F	SS0404F	SS0404F	LW-2
NBH08019K	SS0404F	SS0404F	SS0404F	LW-2
NBH10019K	SS0403F	SS0404F	SS0404F	LW-2

STICK DUO | SB.. series/Sleeve

NBH Shank diameter ø.787" - ø1.260"



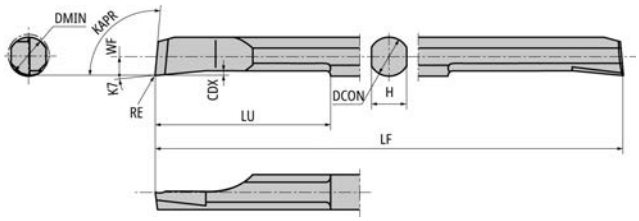
Item Number	Hand	BD	DCB	DCB2	DCON	H	LF	LH	L1	L2	L3	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
NBH02020K	N	.433	.079	.433	.787	.748	4.921	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02520K	N	.433	.098	.433	.787	.748	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03020K	N	.472	.118	.433	.787	.748	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03520K	N	.472	.138	.433	.787	.748	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04020K	N	.512	.157	.433	.787	.748	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04520K	N	.512	.177	.433	.787	.748	4.921	.394	.197	.591	.591	–	–
NBH05020K	N	.551	.197	.433	.787	.748	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06020K	N	.591	.236	.433	.787	.748	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH07020K	N	.630	.276	.433	.787	.748	4.921	.394	.197	.787	.787	SBF../SHF..	–
NBH08020K	N	.669	.315	.433	.787	.748	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH10020K	N	.748	.394	.433	.787	.748	4.921	.394	.197	.787	.787	–	–
NBH12020K	N	.748	.472	.551	.787	.748	4.921	.394	.197	.984	.984	–	–
NBH02022K	N	.433	.079	.433	.866	.827	4.921	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02522K	N	.433	.098	.433	.866	.827	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03022K	N	.472	.118	.433	.866	.827	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03522K	N	.472	.138	.433	.866	.827	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04022K	N	.512	.157	.433	.866	.827	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04522K	N	.512	.177	.433	.866	.827	4.921	.394	.197	.591	.591	–	–
NBH05022K	N	.551	.197	.433	.866	.827	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06022K	N	.591	.236	.433	.866	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH07022K	N	.630	.276	.433	.866	.827	4.921	.394	.197	.787	.787	SBF../SHF..	–
NBH08022K	N	.669	.315	.433	.866	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH10022K	N	.748	.394	.433	.866	.827	4.921	.394	.197	.787	.787	–	–
NBH12022K	N	.827	.472	.551	.866	.827	4.921	.394	.197	.984	.984	–	–
NBH02023K	N	.433	.079	.433	.906	.827	4.921	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02523K	N	.433	.098	.433	.906	.827	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03023K	N	.472	.118	.433	.906	.827	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03523K	N	.472	.138	.433	.906	.827	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04023K	N	.512	.157	.433	.906	.827	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04523K	N	.512	.177	.433	.906	.827	4.921	.394	.197	.591	.591	–	–
NBH05023K	N	.551	.197	.433	.906	.827	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06023K	N	.591	.236	.433	.906	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08023K	N	.669	.315	.433	.906	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH10023K	N	.748	.394	.433	.906	.827	4.921	.394	.197	.787	.787	–	–
NBH12023K	N	.827	.472	.551	.906	.827	4.921	.394	.197	.984	.984	–	–
NBH02025K-MET	N	.433	.079	.433	.984	.945	4.921	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02525K-MET	N	.433	.098	.433	.984	.945	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03025K-MET	N	.472	.118	.433	.984	.945	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03525K-MET	N	.472	.138	.433	.984	.945	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04025K-MET	N	.512	.157	.433	.984	.945	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04525K-MET	N	.512	.177	.433	.984	.945	4.921	.394	.197	.591	.591	–	–
NBH05025K-MET	N	.551	.197	.433	.984	.945	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06025K-MET	N	.591	.236	.433	.984	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH07025K-MET	N	.630	.276	.433	.984	.945	4.921	.394	.197	.787	.787	SBF../SHF..	–
NBH08025K-MET	N	.669	.315	.433	.984	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH10025K-MET	N	.748	.394	.433	.984	.945	4.921	.394	.197	.787	.787	–	–
NBH12025K-MET	N	.827	.472	.551	.984	.945	4.921	.394	.197	.984	.984	–	–
NBH02025K	N	.433	.079	.433	1.000	.945	4.921	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02525K	N	.433	.098	.433	1.000	.945	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03025K	N	.472	.118	.433	1.000	.945	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03525K	N	.472	.138	.433	1.000	.945	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04025K	N	.512	.157	.433	1.000	.945	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04525K	N	.512	.177	.433	1.000	.945	4.921	.394	.197	.591	.591	–	–
NBH05025K	N	.551	.197	.433	1.000	.945	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06025K	N	.591	.236	.433	1.000	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH07025K	N	.630	.276	.433	1.000	.945	4.921	.394	.197	.787	.787	SBF../SHF..	–
NBH08025K	N	.669	.315	.433	1.000	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH10025K	N	.748	.394	.433	1.000	.945	4.921	.394	.197	.787	.787	–	–
NBH12025K	N	.827	.472	.551	1.000	.945	4.921	.394	.197	.984	.984	–	–
NBH04532K	N	.512	.177	.433	1.260	1.181	4.921	.394	.197	.591	.591	–	–
NBH05032K	N	.551	.197	.433	1.260	1.181	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06032K	N	.591	.236	.433	1.260	1.181	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH07032K	N	.630	.276	.433	1.260	1.181	4.921	.394	.197	.787	.787	SBF../SHF..	–
NBH08032K	N	.669	.315	.433	1.260	1.181	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH10032K	N	.748	.394	.433	1.260	1.181	4.921	.394	.197	.787	.787	–	–
NBH12032K	N	.827	.472	.551	1.260	1.181	4.921	.394	.197	.984	.984	–	–
NBH14032K	N	.906	.551	.630	1.260	1.181	4.921	.394	.197	.984	.984	–	–
NBH16032K	N	.984	.630	.709	1.260	1.181	4.921	.394	.197	.984	.984	–	–

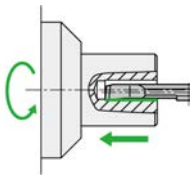
Spare Parts

Item Number	Clamp screw			Wrench (for Clamp screw)
	①	②	③	①②
NBH02020K	SS0404F	SS0404F	–	LW-2
NBH02520K	SS0404F	SS0404F	–	LW-2
NBH03020K	SS0404F	SS0404F	SS0406F	LW-2
NBH03520K	SS0404F	SS0404F	SS0406F	LW-2
NBH04020K	SS0404F	SS0406F	SS0406F	LW-2
NBH04520K	SS0404F	SS0406F	SS0406F	LW-2
NBH05020K	SS0404F	SS0406F	SS0406F	LW-2
NBH06020K	SS0404F	SS0406F	SS0406F	LW-2
NBH07020K	SS0404F	SS0406F	SS0406F	LW-2
NBH08020K	SS0404F	SS0404F	SS0404F	LW-2
NBH10020K	SS0404F	SS0404F	SS0404F	LW-2
NBH12020K	SS0403F	SS0403F	SS0403F	LW-2
NBH02022K	SS0404F	SS0406F	–	LW-2
NBH02522K	SS0404F	SS0406F	–	LW-2
NBH03022K	SS0404F	SS0406F	SS0408F	LW-2
NBH03522K	SS0404F	SS0406F	SS0406F	LW-2
NBH04022K	SS0404F	SS0406F	SS0406F	LW-2
NBH04522K	SS0404F	SS0406F	SS0406F	LW-2
NBH05022K	SS0404F	SS0406F	SS0406F	LW-2
NBH06022K	SS0404F	SS0406F	SS0406F	LW-2
NBH07022K	SS0404F	SS0406F	SS0406F	LW-2
NBH08022K	SS0404F	SS0406F	SS0406F	LW-2
NBH10022K	SS0404F	SS0404F	SS0404F	LW-2
NBH12022K	SS0404F	SS0404F	SS0404F	LW-2
NBH02023K	SS0404F	SS0406F	–	LW-2
NBH02523K	SS0404F	SS0406F	–	LW-2
NBH03023K	SS0404F	SS0406F	SS0408F	LW-2
NBH03523K	SS0404F	SS0406F	SS0406F	LW-2
NBH04023K	SS0404F	SS0406F	SS0406F	LW-2
NBH04523K	SS0404F	SS0406F	SS0406F	LW-2
NBH05023K	SS0404F	SS0406F	SS0406F	LW-2
NBH06023K	SS0404F	SS0406F	SS0406F	LW-2
NBH08023K	SS0404F	SS0406F	SS0406F	LW-2
NBH10023K	SS0404F	SS0404F	SS0404F	LW-2
NBH12023K	SS0404F	SS0404F	SS0404F	LW-2
NBH02025K-MET	SS0404F	SS0406F	–	LW-2
NBH02525K-MET	SS0404F	SS0406F	–	LW-2
NBH03025K-MET	SS0404F	SS0406F	SS0408F	LW-2
NBH03525K-MET	SS0404F	SS0406F	SS0408F	LW-2
NBH04025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH04525K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH05025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH06025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH07025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH08025K-MET	SS0404F	SS0406F	SS0406F	LW-2
NBH10025K-MET	SS0404F	SS0406F	SS0406F	LW-2
NBH12025K-MET	SS0404F	SS0404F	SS0404F	LW-2
NBH02025K	SS0404F	SS0406F	–	LW-2
NBH02525K	SS0404F	SS0406F	–	LW-2
NBH03025K	SS0404F	SS0406F	SS0408F	LW-2
NBH03525K	SS0404F	SS0406F	SS0408F	LW-2
NBH04025K	SS0404F	SS0408F	SS0408F	LW-2
NBH04525K	SS0404F	SS0408F	SS0408F	LW-2
NBH05025K	SS0404F	SS0408F	SS0408F	LW-2
NBH06025K	SS0404F	SS0408F	SS0408F	LW-2
NBH07025K	SS0404F	SS0408F	SS0408F	LW-2
NBH08025K	SS0404F	SS0406F	SS0406F	LW-2
NBH10025K	SS0404F	SS0406F	SS0406F	LW-2
NBH12025K	SS0404F	SS0404F	SS0404F	LW-2
NBH04532K	SS0404F	SS0408F	SS0408F	LW-2
NBH05032K	SS0404F	SS0408F	SS0408F	LW-2
NBH06032K	SS0404F	SS0408F	SS0408F	LW-2
NBH07032K	SS0404F	SS0408F	SS0408F	LW-2
NBH08032K	SS0404F	SS0408F	SS0408F	LW-2
NBH10032K	SS0404F	SS0408F	SS0408F	LW-2
NBH12032K	SS0404F	SS0406F	SS0406F	LW-2
NBH14032K	SS0504	SS0506	SS0506	LW-2
NBH16032K	SS0504	SS0506	SS0506	LW-2

SB.. series/Insert bar Carbide

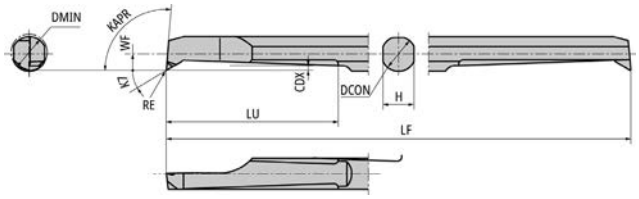
SBFS-S Sharp cutting edge

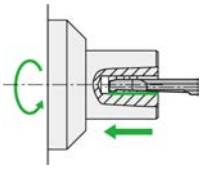




Item Number	Hand	Chipbreaker	DMIN	CDX	DCON	H	K7	KAPR	LF	LU	RE	WF	Carbide	
													PVD	
			inch	inch	inch	inch	°	°	inch	inch	inch	inch	DT4	ZM3
SBFS020R005S	R	Yes	.087	.010	.079	1.8	5	95	1.969	.394	0.05	.035	●	●
SBFS025R005S	R	Yes	.106	.012	.098	2.3	5	95	1.969	.492	0.05	.045	●	●
SBFS025R015S	R	Yes	.106	.012	.098	2.3	5	95	1.969	.492	0.15	.045	●	●
SBFS030R005S	R	Yes	.126	.016	.118	2.7	5	95	1.969	.591	0.05	.055	●	●
SBFS030R015S	R	Yes	.126	.016	.118	2.7	5	95	1.969	.591	0.15	.055	●	●
SBFS035R005S	R	Yes	.146	.016	.138	3.2	5	95	2.362	.689	0.05	.065	●	●
SBFS035R015S	R	Yes	.146	.016	.138	3.2	5	95	2.362	.689	0.15	.065	●	●
SBFS040R005S	R	Yes	.165	.018	.157	3.6	5	95	2.362	.787	0.05	.075	●	●
SBFS040R015S	R	Yes	.165	.018	.157	3.6	5	95	2.362	.787	0.15	.075	●	●
SBFS050R005S	R	Yes	.205	.020	.197	4.5	5	95	2.756	.984	0.05	.094	●	●
SBFS050R015S	R	Yes	.205	.020	.197	4.5	5	95	2.756	.984	0.15	.094	●	●
SBFS060R005S	R	Yes	.244	.024	.236	5.4	5	95	3.150	1.181	0.05	.114	●	●
SBFS060R015S	R	Yes	.244	.024	.236	5.4	5	95	3.150	1.181	0.15	.114	●	●

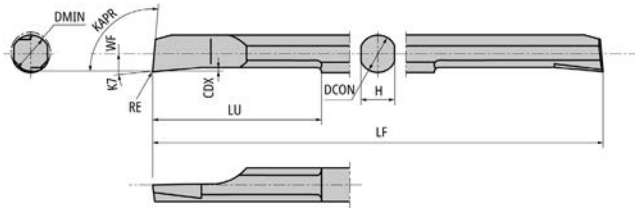
SBFB-F Evacuates chips BACKWARD

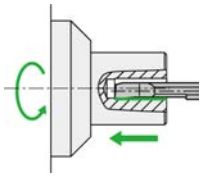




Item Number	Hand	Chipbreaker	DMIN	CDX	DCON	H	K7	KAPR	LF	LU	RE	WF	Carbide	
													PVD	
			inch	inch	inch	inch	°	°	inch	inch	inch	inch	DT4	ZM3
SBFB020R005F	R	Yes	.087	.010	.079	1.8	30	95	1.969	.315	.002	.037	●	●
SBFB025R005F	R	Yes	.106	.012	.098	2.3	30	95	1.969	.492	.002	.047	●	●
SBFB025R015F	R	Yes	.106	.012	.098	2.3	30	95	1.969	.492	.006	.047	●	●
SBFB030R005F	R	Yes	.126	.018	.118	2.7	30	95	1.969	.591	.002	.055	●	●
SBFB030R015F	R	Yes	.126	.018	.118	2.7	30	95	1.969	.591	.006	.055	●	●
SBFB035R005F	R	Yes	.146	.020	.138	3.2	30	95	2.362	.689	.002	.065	●	●
SBFB035R015F	R	Yes	.146	.020	.138	3.2	30	95	2.362	.689	.006	.065	●	●
SBFB040R005F	R	Yes	.165	.020	.157	3.6	30	95	2.362	.787	.002	.075	●	●
SBFB040R015F	R	Yes	.165	.020	.157	3.6	30	95	2.362	.787	.006	.075	●	●
SBFB050R005F	R	Yes	.205	.028	.197	4.5	30	95	2.756	.984	.002	.094	●	●
SBFB050R015F	R	Yes	.205	.028	.197	4.5	30	95	2.756	.984	.006	.094	●	●
SBFB060R005F	R	Yes	.244	.035	.236	5.4	30	95	3.150	1.181	.002	.114	●	●
SBFB060R015F	R	Yes	.244	.035	.236	5.4	30	95	3.150	1.181	.006	.114	●	●

SBFS-H Mirror finish edge

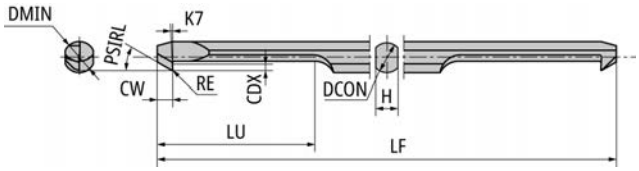


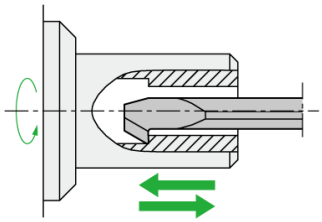


Item Number	Hand	Chipbreaker	DMIN	CDX	DCON	H	K7	KAPR	LF	LU	RE	WF	Carbide	
													PVD	
			inch	inch	inch	inch	°	°	inch	inch	inch	inch	DT4	ZM3
SBFS020R005H	R	Yes	.087	.010	.079	.071	5	95	1.969	.394	.002	.035		●
SBFS025R005H	R	Yes	.106	.012	.098	.091	5	95	1.969	.492	.002	.045		●
SBFS025R015H	R	Yes	.106	.012	.098	.091	5	95	1.969	.492	.006	.045		●
SBFS030R005H	R	Yes	.126	.016	.118	.106	5	95	1.969	.591	.002	.055		●
SBFS030R015H	R	Yes	.126	.016	.118	.106	5	95	1.969	.591	.006	.055		●
SBFS035R005H	R	Yes	.146	.016	.138	.126	5	95	2.362	.689	.002	.065		●
SBFS035R015H	R	Yes	.146	.016	.138	.126	5	95	2.362	.689	.006	.065		●
SBFS040R005H	R	Yes	.165	.018	.157	.142	5	95	2.362	.787	.002	.075		●
SBFS040R015H	R	Yes	.165	.018	.157	.142	5	95	2.362	.787	.006	.075		●
SBFS050R005H	R	Yes	.205	.020	.197	.177	5	95	2.756	.984	.002	.094		●
SBFS050R015H	R	Yes	.205	.020	.197	.177	5	95	2.756	.984	.006	.094		●
SBFS060R005H	R	Yes	.244	.024	.236	.213	5	95	3.150	1.181	.002	.114		●
SBFS060R015H	R	Yes	.244	.024	.236	.213	5	95	3.150	1.181	.006	.114		●
SBFS080R005H	R	Yes	.323	.031	.315	.287	5	95	3.150	1.181	.002	.154		●
SBFS080R015H	R	Yes	.323	.031	.315	.287	5	95	3.150	1.181	.006	.154		●

SB.. series/Insert bar Carbide for ID Back Turning

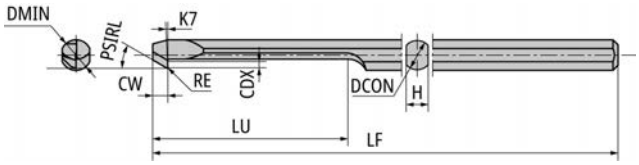
SBB-S Short type / Two-sided

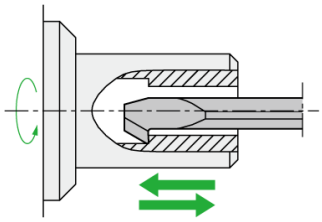




Item Number	Hand	Chipbreaker	DMIN	CDX	CW	DCON	H	K7	LF	LU	PSIRL	RE	WF	Carbide
														PVD
			inch	inch	inch	inch	inch	°	inch	inch	°	inch	inch	ZM3
SBB030RB005-S	R	Yes	.118	.020	.059	.118	.106	3	1.969	.591	30	.002	.051	●
SBB030RB010-S	R	Yes	.118	.020	.059	.118	.106	3	1.969	.591	30	.004	.051	●
SBB040RB005-S	R	Yes	.157	.031	.059	.157	.142	3	2.362	.709	30	.002	.071	●
SBB040RB015-S	R	Yes	.157	.031	.059	.157	.142	3	2.362	.709	30	.006	.071	●

SBB Long type / Single-sided

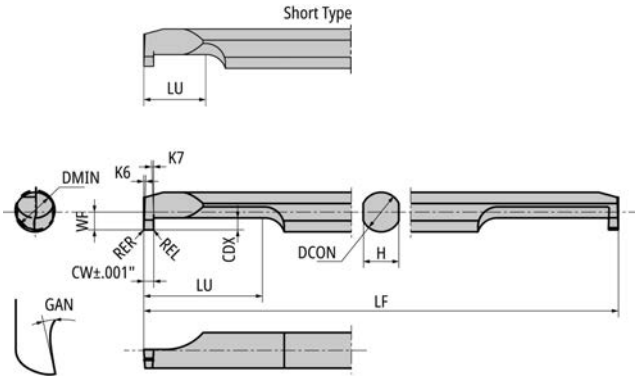


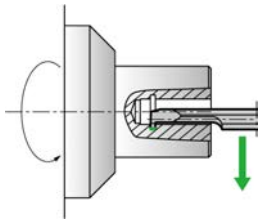


Item Number	Hand	Chipbreaker	DMIN	CDX	CW	DCON	H	K7	LF	LU	PSIRL	RE	WF	Carbide
														PVD
			inch	inch	inch	inch	inch	°	inch	inch	°	inch	inch	ZM3
SBB030RB005	R	Yes	.118	.020	.059	.118	.106	3	1.969	.748	30	.002	.051	●
SBB030RB010	R	Yes	.118	.020	.059	.118	.106	3	1.969	.748	30	.004	.051	●
SBB040RB005	R	Yes	.157	.031	.059	.157	.142	3	2.362	.945	30	.002	.071	●
SBB040RB015	R	Yes	.157	.031	.059	.157	.142	3	2.362	.945	30	.006	.071	●

SB.. series/Insert bar Carbide for ID Grooving

SBG-S Short type / Two-sided

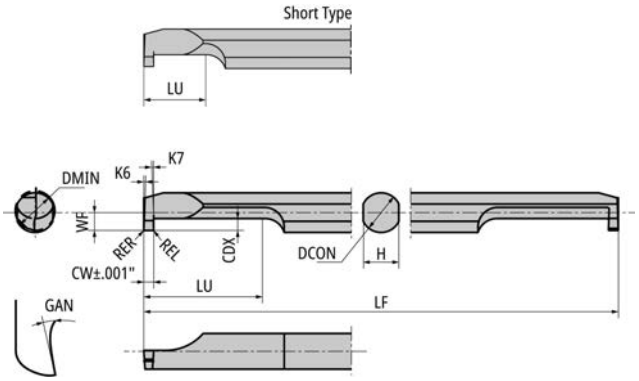


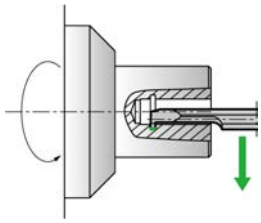


● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	DMIN	APMX	CDX	CW	DCON	GAN	H	K6	K7	LF	LU	REL	RER	WF	Carbide
																	PVD
			inch	inch	inch	inch	inch	°	inch	°	°	inch	inch	inch	inch	inch	ZM3
SBG030050RB-S	R	Yes	.118	.031	.039	.020	.118	8	.106	2	2	1.969	.177	.002	.002	.051	●
SBG030075RB-S	R	Yes	.118	.031	.039	.030	.118	8	.106	2	2	1.969	.177	.002	.002	.051	●
SBG030100RB-S	R	Yes	.118	.031	.039	.039	.118	8	.106	2	2	1.969	.177	.002	.002	.051	●
SBG030150RB-S	R	Yes	.118	.031	.039	.059	.118	8	.106	2	2	1.969	.177	.002	.002	.051	●
SBG040050RB-S	R	Yes	.157	.039	.047	.020	.157	8	.142	2	2	2.362	.236	.002	.002	.071	●
SBG040075RB-S	R	Yes	.157	.039	.047	.030	.157	8	.142	2	2	2.362	.236	.002	.002	.071	●
SBG040100RB-S	R	Yes	.157	.039	.047	.039	.157	8	.142	2	2	2.362	.236	.002	.002	.071	●
SBG040150RB-S	R	Yes	.157	.039	.047	.059	.157	8	.142	2	2	2.362	.236	.002	.002	.071	●
SBG050050RB-S	R	Yes	.197	.047	.055	.020	.197	8	.177	2	2	2.756	.295	.002	.002	.091	●
SBG050100RB-S	R	Yes	.197	.047	.055	.039	.197	8	.177	2	2	2.756	.295	.002	.002	.091	●
SBG050150RB-S	R	Yes	.197	.047	.055	.059	.197	8	.177	2	2	2.756	.295	.002	.002	.091	●
SBG050200RB-S	R	Yes	.197	.047	.055	.079	.197	8	.177	2	2	2.756	.295	.002	.002	.091	●
SBG060100RB-S	R	Yes	.236	.071	.079	.039	.236	8	.213	2	2	3.150	.295	.002	.002	.110	●
SBG060150RB-S	R	Yes	.236	.071	.079	.059	.236	8	.213	2	2	3.150	.295	.002	.002	.110	●
SBG060200RB-S	R	Yes	.236	.071	.079	.079	.236	8	.213	2	2	3.150	.295	.002	.002	.110	●
SBG080100RB-S	R	Yes	.315	.087	.094	.039	.315	8	.287	2	2	3.150	.335	.002	.002	.150	●
SBG080150RB-S	R	Yes	.315	.087	.094	.059	.315	8	.287	2	2	3.150	.335	.002	.002	.150	●
SBG080200RB-S	R	Yes	.315	.087	.094	.079	.315	8	.287	2	2	3.150	.335	.002	.002	.150	●

SBG Long type / Two-sided



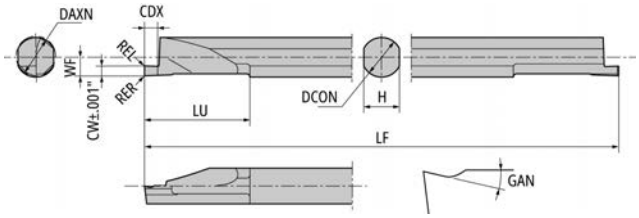


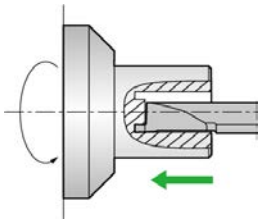
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	DMIN	APMX	CDX	CW	DCON	GAN	H	K6	K7	LF	LU	REL	RER	WF	Carbide
																	PVD
			inch	inch	inch	inch	inch	°	inch	°	°	inch	inch	inch	inch	inch	ZM3
SBG030050RB	R	Yes	.118	.031	.039	.020	.118	8	.106	2	2	1.969	.354	.002	.002	.051	●
SBG030075RB	R	Yes	.118	.031	.039	.030	.118	8	.106	2	2	1.969	.354	.002	.002	.051	●
SBG030100RB	R	Yes	.118	.031	.039	.039	.118	8	.106	2	2	1.969	.354	.002	.002	.051	●
SBG040050RB	R	Yes	.157	.039	.047	.020	.157	8	.142	2	2	2.362	.472	.002	.002	.071	●
SBG040075RB	R	Yes	.157	.039	.047	.030	.157	8	.142	2	2	2.362	.472	.002	.002	.071	●
SBG040100RB	R	Yes	.157	.039	.047	.039	.157	8	.142	2	2	2.362	.472	.002	.002	.071	●
SBG050050RB	R	Yes	.197	.047	.055	.020	.197	8	.177	2	2	2.756	.787	.002	.002	.091	●
SBG050100RB	R	Yes	.197	.047	.055	.039	.197	8	.177	2	2	2.756	.787	.002	.002	.091	●
SBG050150RB	R	Yes	.197	.047	.055	.059	.197	8	.177	2	2	2.756	.787	.002	.002	.091	●
SBG060100RB	R	Yes	.236	.071	.079	.039	.236	8	.213	2	2	3.150	.787	.002	.002	.110	●
SBG060150RB	R	Yes	.236	.071	.079	.059	.236	8	.213	2	2	3.150	.787	.002	.002	.110	●
SBG060200RB	R	Yes	.236	.071	.079	.079	.236	8	.213	2	2	3.150	.787	.002	.002	.110	●
SBG080100RB	R	Yes	.315	.087	.094	.039	.315	8	.287	2	2	3.150	.787	.002	.002	.150	●
SBG080150RB	R	Yes	.315	.087	.094	.059	.315	8	.287	2	2	3.150	.787	.002	.002	.150	●
SBG080200RB	R	Yes	.315	.087	.094	.079	.315	8	.287	2	2	3.150	.787	.002	.002	.150	●

SB.. series/Insert bar Carbide for ID Face Grooving

SFG





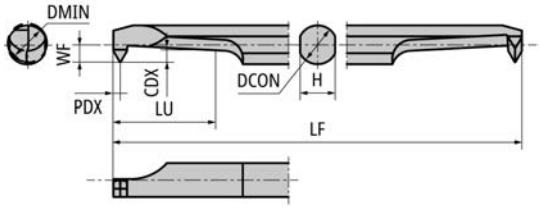
● Diagram shows right-hand tool

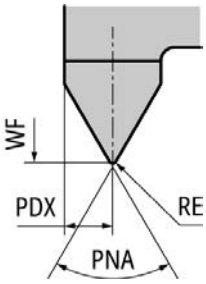
Item Number	Hand	Chipbreaker	DAXN	APMX	CDX	CW	DCON	GAN	H	LF	LU	REL	RER	WF	Carbide
															PVD
			inch	inch	inch	inch	inch	°	inch	inch	inch	inch	inch	inch	TM4
SFG060R100B	R	Yes	.236	.059	.067	.039	.236	14	.213	3.150	.630	.002	.002	.110	●
SFG060R150B	R	Yes	.236	.079	.087	.059	.236	14	.213	3.150	.630	.002	.002	.110	●
SFG060R200B	R	Yes	.236	.118	.126	.079	.236	14	.213	3.150	.630	.002	.002	.110	●
SFG080R100B	R	Yes	.315	.059	.067	.039	.315	14	.287	3.150	.630	.002	.002	.150	●
SFG080R150B	R	Yes	.315	.079	.087	.059	.315	14	.287	3.150	.630	.002	.002	.150	●
SFG080R200B	R	Yes	.315	.118	.126	.079	.315	14	.287	3.150	.630	.002	.002	.150	●
SFG080R300B	R	Yes	.315	.118	.126	.118	.315	14	.287	3.150	.630	.002	.002	.150	●

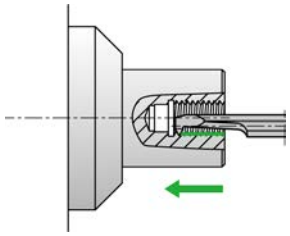
SB.. series/Insert bar Carbide for Internal Thread

SBT

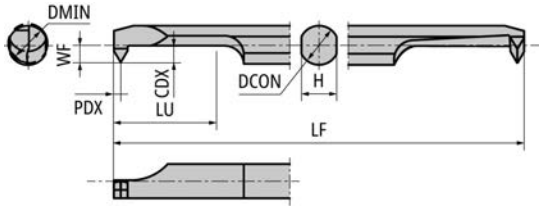
No.1







No.2

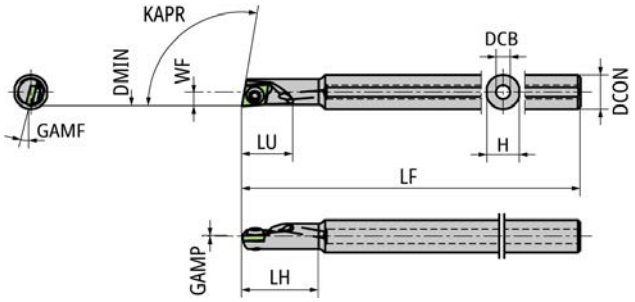


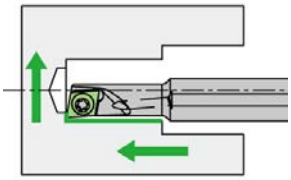
● Diagram shows right-hand tool
● No.1: Eccentric tapered shape

Figure	Item Number	Hand	Chipbreaker	DMIN	Pitch	CDX	DCON	H	LF	LU	PDX	PNA	RE	WF	Carbide
															PVD
				inch	inch	inch	inch	inch	inch	inch	inch	°	inch	inch	ZM3
1	**SBT025M3R**	R	No	.098	.020	.024	.098	.091	1.969	.213	.016	60	.002MAX Flat	.043	●
1	**SBT030M4R**	R	No	.118	36-32	.031	.118	.106	1.969	.295	.020	60	.002MAX Flat	.051	●
1	**SBT030M4RB**	R	Yes	.118	36-32	.031	.118	.106	1.969	.295	.020	60	.002MAX Flat	.051	●
1	**SBT035M5RB**	R	Yes	.138	32-24	.039	.138	.126	2.362	.335	.022	60	.002MAX Flat	.061	●
1	**SBT040M6RB**	R	Yes	.157	28-20	.047	.157	.142	2.362	.413	.028	60	.002	.071	●
2	**SBT050M8RB**	R	Yes	.197	28-18	.059	.197	.177	2.756	.622	.031	60	.002	.091	●
2	**SBT060M10RB**	R	Yes	.236	28-16	.071	.236	.213	3.150	.724	.037	60	.002	.110	●

MBL.. series/Toolholder

S-MBR-OH Mogul Bar / Coolant through / Steel shank





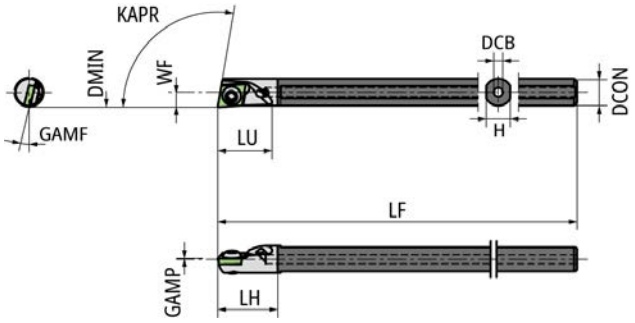
- Diagram shows right-hand tool
- Use a left-handed insert
- For F1 chipbreaker, right-hand inserts fit to right-hand toolholder
- F1 chipbreaker evacuates chips BACKWARD

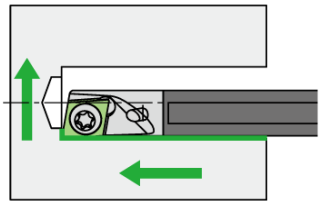
Item Number	Hand	DMIN	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	LU	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	inch	
S06F-MBRD05-OH	R	.197	.098	.236	13	0	.224	100	3.150	.531	.354	.006	.098	MBL..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
S06F-MBRD05-OH	LR-S-2*3.5	CLR-13S

C045-MBR-OH Mogul Bar / Coolant through / Carbide shank





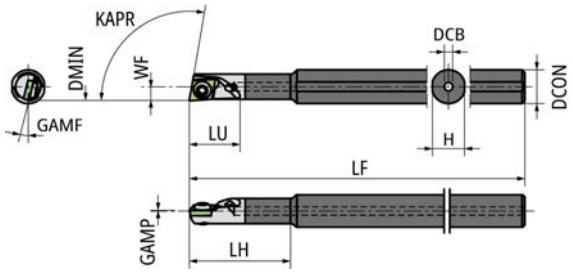
- Diagram shows right-hand tool
- Use a left-handed insert
- For F1 chipbreaker, right-hand inserts fit to right-hand toolholder
- F1 chipbreaker evacuates chips BACKWARD

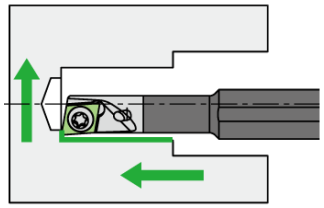
Item Number	Hand	DMIN	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	LU	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	inch	
C045F-MBRD05-OH	R	.197	.059	.177	13	0	.157	100	3.150	.413	.354	.006	.098	MBL..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C045F-MBRD05-OH	LR-S-2*3.5	CLR-13S

C06-MBR-OH Mogul Bar / Coolant through / Carbide shank





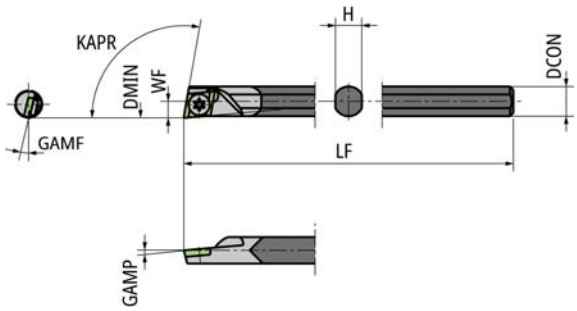
- Diagram shows right-hand tool
- Use a left-handed insert
- For F1 chipbreaker, right-hand inserts fit to right-hand toolholder
- F1 chipbreaker evacuates chips BACKWARD

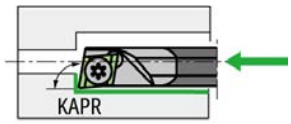
Item Number	Hand	DMIN	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	LU	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	inch	
C06F-MBRD05-OH	R	.197	.059	.236	13	0	.224	100	3.150	.709	.354	.006	.098	MBL..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C06F-MBRD05-OH	LR-S-2*3.5	CLR-13S

C045-MBR Carbide shank





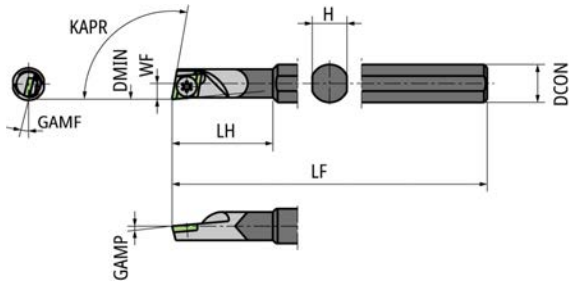
- Diagram shows right-hand tool
- Use a left-handed insert
- For F1 chipbreaker, right-hand inserts fit to right-hand toolholder
- F1 chipbreaker evacuates chips BACKWARD

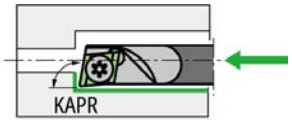
Item Number	Hand	DMIN	DCON	GAMF	GAMP	H	KAPR	LF	RE	WF	Insert Gage
		inch	inch	°	°	inch	°	inch	inch	inch	
C045F-MBR	R	.197	.177	13	5	.157	100	3.150	.006	.098	MBL..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C045F-MBR	LR-S-2*3.5	CLR-13S

C06-MBR Carbide shank





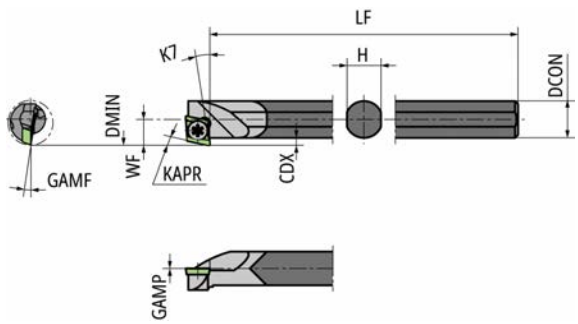
- Diagram shows right-hand tool
- Use a left-handed insert
- For F1 chipbreaker, right-hand inserts fit to right-hand toolholder
- F1 chipbreaker evacuates chips BACKWARD

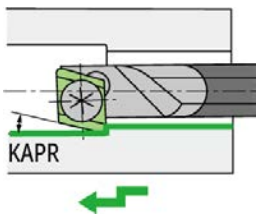
Item Number	Hand	DMIN	DCON	GAMF	GAMP	H	KAPR	LF	LH	RE	WF	Insert Gage
		inch	inch	°	°	inch	°	inch	inch	inch	inch	
C06F-MBR	R	.197	.236	13	5	.217	100	3.150	.709	.006	.098	MBL..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C06F-MBR	LR-S-2*3.5	CLR-13S

C-MSBR Carbide shank for ID Back Turning





- Diagram shows right-hand tool
- Use a left-handed insert
- For F1 chipbreaker, right-hand inserts fit to right-hand toolholder
- F1 chipbreaker evacuates chips BACKWARD

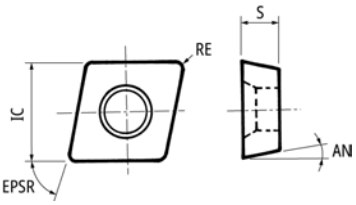
Item Number	Hand	DMIN	CDX	DCON	GAMF	GAMP	H	KAPR	LF	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	
C04J-MSBR	R	.224	.039	.157	10	0	.138	13	4.331	.006	.126	MBL..
C06J-MSBR	R	.303	.039	.236	4	0	.217	13	4.331	.006	.165	MBL..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C04J-MSBR	LR-S-2*3.5	CLR-13S
C06J-MSBR	LR-S-2*3.5	CLR-13S

MBL.. series/Inserts Carbide

MBL



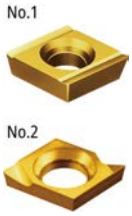
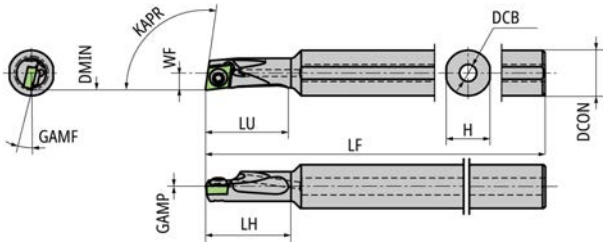
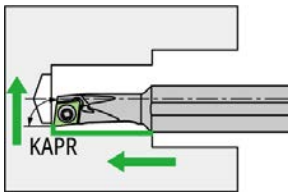


Figure	Item Number	Hand	Chipbreaker	AN	EPSR	IC	RE	S	Carbide			
									PVD			
				°	°	inch	inch	inch	QM3	ST4	TM4	ZM3
1	**MBL 005 FL**	L	Yes	9	75	.142	.002	.039	●		●	●
1	**MBL 015 FL**	L	Yes	9	75	.142	.006	.039	●		●	●
2	**MBL 005 FR F1**	R	Yes	9	75	.142	.002	.039	●	●	●	
2	**MBL 015 FR F1**	R	Yes	9	75	.142	.006	.039	●	●	●	

ERGP.. series/Toolholder

S-SEXR-OH Mogul Bar / Coolant through / Steel shank





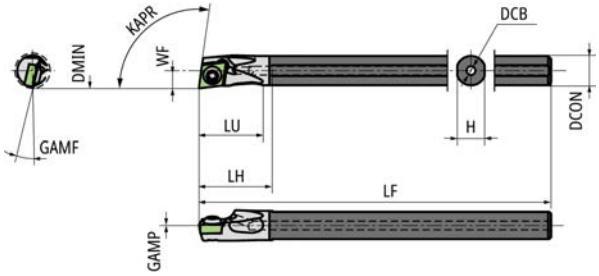
- Diagram shows right-hand tool
- Use a left-handed insert
- For F1 chipbreaker, right-hand inserts fit to right-hand toolholder
- F1 chipbreaker evacuates chips BACKWARD

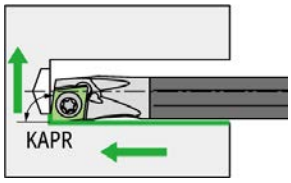
Item Number	Hand	DMIN	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	LU	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	inch	
S08G-SEXRRT3D06-OH	R	.236	.118	.315	13	0	.303	98	3.543	.591	.591	.008	.118	ERGP52..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
S08G-SEXRRT3D06-OH	LR-S-2*3.7	CLR-13S

C05-SEXR-OH Mogul Bar / Coolant through / Carbide shank





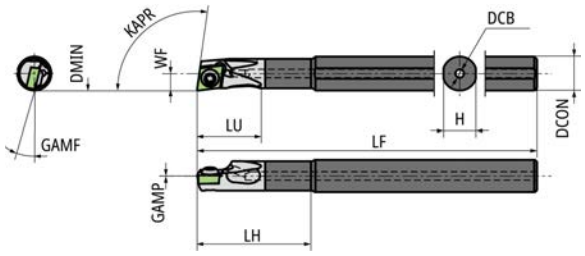
- Diagram shows right-hand tool
- Use a left-handed insert
- For F1 chipbreaker, right-hand inserts fit to right-hand toolholder
- F1 chipbreaker evacuates chips BACKWARD

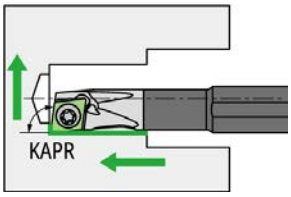
Item Number	Hand	DMIN	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	LU	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	inch	
C05G-SEXRRT3D06-OH	R	.236	.059	.197	13	0	.157	98	3.543	.492	.433	.008	.118	ERGP52..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C05G-SEXRRT3D06-OH	LR-S-2*3.7	CLR-13S

C06-SEXR-OH Mogul Bar / Coolant through / Carbide shank





- Diagram shows right-hand tool
- Use a left-handed insert
- For F1 chipbreaker, right-hand inserts fit to right-hand toolholder
- F1 chipbreaker evacuates chips BACKWARD

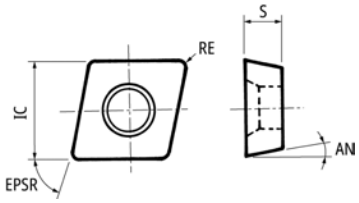
Item Number	Hand	DMIN	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	LU	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	inch	
C06G-SEXRRT3D06-OH	R	.236	.059	.236	13	0	.224	98	3.543	.787	.433	.008	.118	ERGP52..
C06G-SEXRLT3D06-OH	L	.236	.059	.236	13	0	.224	98	3.543	.787	.433	.008	.118	ERGP52..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C06G-SEXRRT3D06-OH	LR-S-2*3.7	CLR-13S
C06G-SEXRLT3D06-OH	LR-S-2*3.7	CLR-13S

ERGP.. series/Inserts Carbide

ERGP



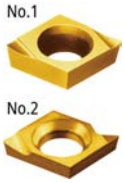
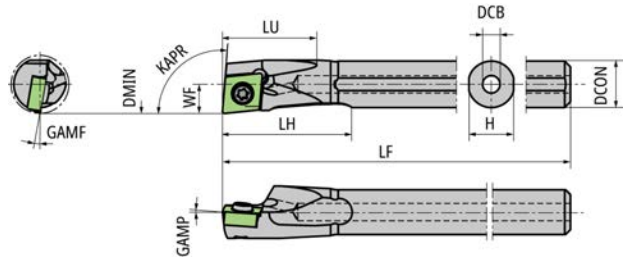
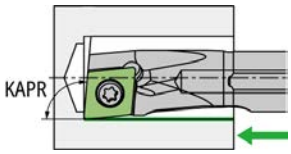


Figure	Item Number	Hand	Chipbreaker	AN	EPSR	IC	RE	S	Carbide			
									PVD			
				°	°	inch	inch	inch	QM3	ST4	TM4	ZM3
1	**ERGP 5208 FR A2**	R	Yes	9	75	5/32	.008	1/16			●	●
1	**ERGP 521 FR A2**	R	Yes	9	75	5/32	.016	1/16			●	
1	**ERGP 5208 FL A2**	L	Yes	9	75	5/32	.008	1/16			●	●
1	**ERGP 521 FL A2**	L	Yes	9	75	5/32	.016	1/16			●	●
2	**ERGP 5204 FR F1**	R	Yes	9	75	5/32	.004	1/16	●	●	●	
2	**ERGP 5208 FR F1**	R	Yes	9	75	5/32	.008	1/16	●	●	●	
2	**ERGP 521 FR F1**	R	Yes	9	75	5/32	.016	1/16	●	●	●	

CP.. series/Toolholder

S-SCLP-OH Mogul Bar / Coolant through / Steel shank





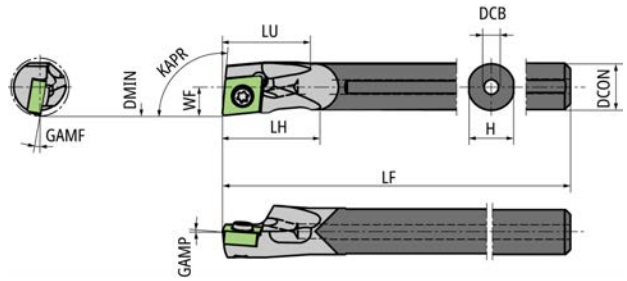
- Diagram shows right-hand tool
- Use a left-handed insert
- For F1 chipbreaker, right-hand inserts fit to right-hand toolholder
- F1 chipbreaker evacuates chips BACKWARD

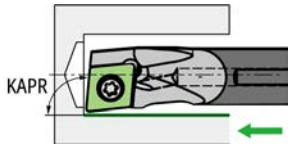
Item Number	Hand	DMIN	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	LU	RE	WF	Insert Gage
		inch	inch	inch	inch	°	inch	°	inch	inch	inch	inch	inch	
S06F-SCLPR04D07-OH	R	.276	.098	.236	9	5	.226	95	3.150	.669	.472	.008	.138	CP..62..
S07G-SCLPR04D08-OH	R	.315	.118	.276	7	5	.266	95	3.543	.768	.531	.008	.157	CP..62..
S08H-SCLPR06D10-OH	R	.394	.118	.315	10	5	.303	95	3.937	.866	.630	.016	.197	CP..21.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
S06F-SCLPR04D07-OH	LR-S-2*3.7	CLR-13S
S07G-SCLPR04D08-OH	LR-S-2*3.7	CLR-13S
S08H-SCLPR06D10-OH	LR-S-2.5*6	CLR-15S

C-SCLP-OH Mogul Bar / Coolant through / Carbide shank





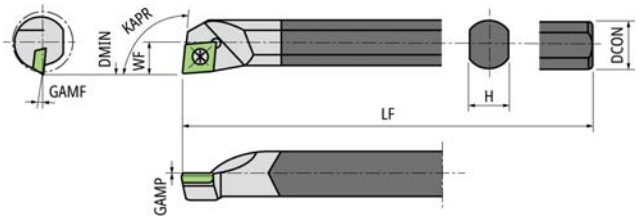
- Diagram shows right-hand tool
- Use a left-handed insert
- For F1 chipbreaker, right-hand inserts fit to right-hand toolholder
- F1 chipbreaker evacuates chips BACKWARD

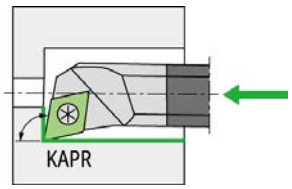
Item Number	Hand	DMIN	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	LU	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	inch	
C06H-SCLPR04D07-OH	R	.276	.079	.236	9	5	.226	95	3.937	.453	.472	.008	.138	CP..62..
C07J-SCLPR04D08-OH	R	.315	.079	.276	7	5	.266	95	4.331	.512	.531	.008	.157	CP..62..
C08K-SCLPR06D10-OH	R	.394	.098	.315	10	5	.303	95	4.921	.650	.591	.016	.197	CP..21.5..
C06H-SCLPL04D07-OH	L	.276	.079	.236	9	5	.226	95	3.937	.453	.472	.008	.138	CP..62..
C08K-SCLPL06D10-OH	L	.394	.098	.315	10	5	.303	95	4.921	.650	.591	.016	.197	CP..21.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C06H-SCLPR04D07-OH	LR-S-2*3.7	CLR-13S
C07J-SCLPR04D08-OH	LR-S-2*3.7	CLR-13S
C08K-SCLPR06D10-OH	LR-S-2.5*6	CLR-15S
C06H-SCLPL04D07-OH	LR-S-2*3.7	CLR-13S
C08K-SCLPL06D10-OH	LR-S-2.5*6	CLR-15S

C-SCLP-N Carbide shank





- Diagram shows right-hand tool
- Use a left-handed insert
- For F1 chipbreaker, right-hand inserts fit to right-hand toolholder
- F1 chipbreaker evacuates chips BACKWARD

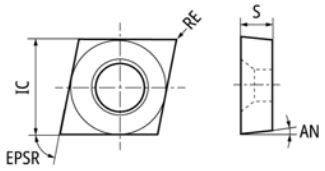
Item Number	Hand	DMIN	DCON	GAMF	GAMP	H	KAPR	LF	RE	WF	Insert Gage
		inch	inch	°	°	inch	°	inch	inch	inch	
C06J-SCLPR-04-N	R	.315	.236	6	0	.205	95	4.331	.016	.157	CP..62..
C08K-SCLPR-06-N	R	.394	.315	10	0	.276	95	4.921	.016	.197	CP..21.5..
C10M-SCLPR-08-N	R	.472	.394	6	0	.354	95	5.906	.016	.236	CP..21.5..

Spare Parts

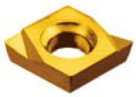
Item Number	Clamp screw	Wrench (for Clamp screw)
C06J-SCLPR-04-N	LR-S-2*4.4	CLR-13S
C08K-SCLPR-06-N	LR-S-2.5*5.5	CLR-15S
C10M-SCLPR-08-N	LR-S-3*6.2	RLR-20S

CP.. series/Inserts Carbide

CP..

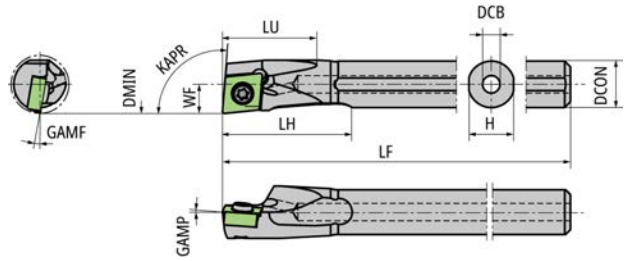


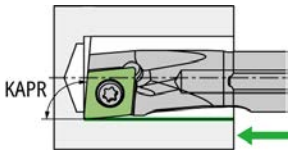
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	AN	RE	Carbide										
								PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	CPGH 21.508 FN AM5	**CPGH 060202 FN AM5**	80	1/4	3/32	11	.008						●		●			
	**CPGP 6204 FR F1**	**CPGH 040101 FR F1**	80	3/16	1/16	11	.004		●			●	●					
	CPGP 6208 FR F1	**CPGH 040102 FR F1**	80	3/16	1/16	11	.008		●			●	●					
	CPGP 621 FR F1	**CPGH 040104 FR F1**	80	3/16	1/16	11	.016		●			●	●					
	CPGH 21.508 FR F1	**CPGH 060202 FR F1**	80	1/4	3/32	11	.008		●			●	●					
	CPGH 21.51 FR F1	**CPGH 060204 FR F1**	80	1/4	3/32	11	.016		●			●	●					
	CPGP 6204 L S	**CPGH 040101 L S**	80	3/16	1/16	11	.004					●	●					
	CPGP 6208 L S	**CPGH 040102 L S**	80	3/16	1/16	11	.008					●	●					
	CPGP 621 L S	**CPGH 040104 L S**	80	3/16	1/16	11	.016					●	●					
	CPGH 21.508 L S	**CPGH 060202 L S**	80	1/4	3/32	11	.008					●	●					
	CPGH 21.51 L S	**CPGH 060204 L S**	80	1/4	3/32	11	.016					●	●					
	CPGH 21.508 FL A	**CPGH 060202 FL A**	80	1/4	3/32	11	.008						●		●			
	CPGH 21.51 FL A	**CPGH 060204 FL A**	80	1/4	3/32	11	.016						●		●			
	CPGP 6208 FL A1	**CPGH 040102 FL A1**	80	3/16	1/16	11	.008						●		●			
	CPGP 621 FL A1	**CPGH 040104 FL A1**	80	3/16	1/16	11	.016						●		●			

For more information on the holders, please reference page E51.

S-SCLC-OH Mogul Bar / Coolant through / Steel shank





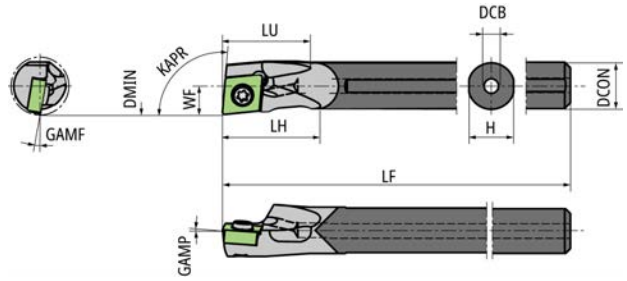
- Diagram shows right-hand tool
- Use a left-handed insert
- For F1 chipbreaker, right-hand inserts fit to right-hand toolholder
- F1 chipbreaker evacuates chips BACKWARD

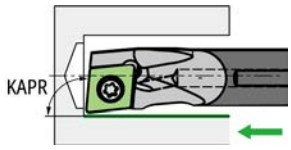
Item Number	Hand	DMIN	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	LU	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	inch	
S08H-SCLCR06D10-OH	R	.394	.118	.315	13	0	.303	95	3.937	.866	.630	.016	.197	CC..21.5..
S10K-SCLCR06D12-OH	R	.472	.138	.394	11	0	.378	95	4.921	1.083	.787	.016	.236	CC..21.5..
S12M-SCLCR06D14-OH	R	.551	.157	.472	9	0	.453	95	5.906	1.280	.906	.016	.276	CC..21.5..
S16Q-SCLCR09D18-OH	R	.709	.197	.630	10	0	.606	95	7.087	1.673	1.181	.016	.354	CC..32.5..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
S08H-SCLCR06D10-OH	LRIS-2.5*5	CLR-15S
S10K-SCLCR06D12-OH	LRIS-2.5*5	CLR-15S
S12M-SCLCR06D14-OH	LRIS-2.5*5	CLR-15S
S16Q-SCLCR09D18-OH	LRIS-4*8	LLR-25S-20*65

C-SCLC-OH Mogul Bar / Coolant through / Carbide shank





- Diagram shows right-hand tool
- Use a left-handed insert
- For F1 chipbreaker, right-hand inserts fit to right-hand toolholder
- F1 chipbreaker evacuates chips BACKWARD

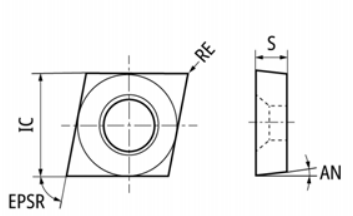
Item Number	Hand	DMIN	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	LU	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	inch	
C08K-SCLCR06D10-OH	R	.394	.098	.315	13	0	.303	95	4.921	.650	.591	.016	.197	CC..21.5..
C10M-SCLCR06D12-OH	R	.472	.098	.394	11	0	.378	95	5.906	.787	.768	.016	.236	CC..21.5..
C12M-SCLCR06D14-OH	R	.551	.118	.472	9	0	.453	95	5.906	.925	.886	.016	.276	CC..21.5..
C10M-SCLCL06D12-OH	L	.472	.098	.394	11	0	.378	95	5.906	.787	.768	.016	.236	CC..21.5..

Spare Parts

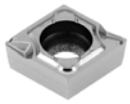
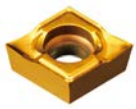
Item Number	Clamp screw	Wrench (for Clamp screw)
C08K-SCLCR06D10-OH	LRIS-2.5*5	CLR-15S
C10M-SCLCR06D12-OH	LRIS-2.5*5	CLR-15S
C12M-SCLCR06D14-OH	LRIS-2.5*5	CLR-15S
C10M-SCLCL06D12-OH	LRIS-2.5*5	CLR-15S

CC.. series/Inserts Carbide

CC..



Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	AN	RE	Carbide										
								PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	CCGT 32.504M R TMV	CCGT 09T301M R TMV	80	3/8	5/32	7	.003	●	●	●			●					
	CCGT 32.508M R TMV	CCGT 09T302M R TMV	80	3/8	5/32	7	.007	●	●	●			●					
	CCGT 32.51M R TMV	CCGT 09T304M R TMV	80	3/8	5/32	7	.015	●	●	●			●					
	CCGT 32.501 YL	CCGT 09T300 YL	80	3/8	5/32	7	.001				●		●					
	CCGT 32.504M YL	CCGT 09T301M YL	80	3/8	5/32	7	.003	●	●	●	●	●	●					
	CCGT 32.508M YL	CCGT 09T302M YL	80	3/8	5/32	7	.007	●	●	●	●	●	●					
	CCGT 32.51M YL	CCGT 09T304M YL	80	3/8	5/32	7	.015	●	●	●	●	●	●					
	CCGT 32.52M YL	CCGT 09T308M YL	80	3/8	5/32	7	.031		●	●	●	●	●					
	CCGT 21.504M CL	CCGT 060201M CL	80	1/4	3/32	7	.003		●	●	●	●	●					
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	CCGT 32.501 CL	CCGT 09T300 CL	80	3/8	5/32	7	.001				●		●					
	CCGT 32.504M CL	CCGT 09T301M CL	80	3/8	5/32	7	.003	●	●	●	●	●	●					
	CCGT 32.508M CL	CCGT 09T302M CL	80	3/8	5/32	7	.007	●	●	●	●	●	●					
	CCGT 32.51M CL	CCGT 09T304M CL	80	3/8	5/32	7	.015	●	●	●	●	●	●					
	CCGT 21.501 FN AM3	CCGT 060200 FN AM3	80	1/4	3/32	7	.001				●	●	●	●				
	CCGT 21.504M FN AM3	CCGT 060201M FN AM3	80	1/4	3/32	7	.003		●		●	●	●					
	CCGT 21.508 FN AM3	CCGT 060202 FN AM3	80	1/4	3/32	7	.008							●	●			
	CCGT 21.508M FN AM3	CCGT 060202M FN AM3	80	1/4	3/32	7	.007		●		●	●	●					
	CCGT 21.51 FN AM3	CCGT 060204 FN AM3	80	1/4	3/32	7	.016								●			
	CCGT 21.51M FN AM3	CCGT 060204M FN AM3	80	1/4	3/32	7	.015		●		●	●	●					
	CCGT 32.501 FN AM3	CCGT 09T300 FN AM3	80	3/8	5/32	7	.001				●	●	●	●				
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	CCGT 32.508 FN AM3	CCGT 09T302 FN AM3	80	3/8	5/32	7	.008					●		●				
	CCGT 32.508M FN AM3	CCGT 09T302M FN AM3	80	3/8	5/32	7	.007	●	●		●	●	●	●	●			
	CCGT 32.51 FN AM3	CCGT 09T304 FN AM3	80	3/8	5/32	7	.016					●		●				
	CCGT 32.51M FN AM3	CCGT 09T304M FN AM3	80	3/8	5/32	7	.015	●	●		●	●	●	●	●			
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	CCMT 21.51 FN AM3	CCMT 060204 FN AM3	80	1/4	3/32	7	.016			●								
	CCMT 32.508 FN AM3	CCMT 09T302 FN AM3	80	3/8	5/32	7	.008			●								
	CCMT 32.51 FN AM3	CCMT 09T304 FN AM3	80	3/8	5/32	7	.016			●								
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	CCGT 32.51M AZ7	CCGT 09T304M AZ7	80	3/8	5/32	7	.015				●	●	●		●			
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	CCMT 32.508 E01 AZ8	CCMT 09T302 E002 AZ8	80	3/8	5/32	7	.008										●	
	CCMT 32.51 E02 AZ8	CCMT 09T304 E004 AZ8	80	3/8	5/32	7	.016										●	
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	CCGT 21.508M R S	CCGT 060202M R S	80	1/4	3/32	7	.007				●	●						
	CCGT 21.508 R S	CCGT 060202 R S	80	1/4	3/32	7	.008							●	●			
	CCGT 21.508 L S	CCGT 060202 L S	80	1/4	3/32	7	.008							●	●			
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	CCGT 32.501 L S	CCGT 09T300 L S	80	3/8	5/32	7	.001							●				
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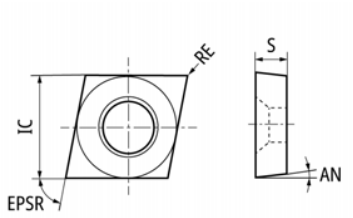

Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	AN	RE	Carbide										
								PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	650	ST4	DM4	DT4	QM3	TM4	VM11	ZM3	CP1	CP7	KM1
	CCGT 32.504 R S	CCGT 09T301 R S	80	3/8	5/32	7	.004					●		●	●			
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	CCGT 32.508M R S	CCGT 09T302M R S	80	3/8	5/32	7	.007				●	●	●					
	CCGT 32.508 R S	CCGT 09T302 R S	80	3/8	5/32	7	.008					●		●	●			
	CCGT 32.508 L S	CCGT 09T302 L S	80	3/8	5/32	7	.008							●				
	CCGT 32.51M R S	CCGT 09T304M R S	80	3/8	5/32	7	.015				●	●	●					
	CCGT 32.51 R S	CCGT 09T304 R S	80	3/8	5/32	7	.016					●						
	CCGT 21.501 R U	CCGT 060200 R U	80	1/4	3/32	7	.001				●				●			
	CCGT 21.504 R U	CCGT 060201 R U	80	1/4	3/32	7	.004				●				●			
	CCGT 21.504 L U	CCGT 060201 L U	80	1/4	3/32	7	.004								●			
	CCGT 21.508 R U	CCGT 060202 R U	80	1/4	3/32	7	.008				●				●			
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	CCGT 32.501 R U1	CCGT 09T300 R U1	80	3/8	5/32	7	.001				●		●		●			
	CCGT 32.501 L U1	CCGT 09T300 L U1	80	3/8	5/32	7	.001								●			
	CCGT 32.504 R U1	CCGT 09T301 R U1	80	3/8	5/32	7	.004				●		●		●			
	CCGT 32.504 L U1	CCGT 09T301 L U1	80	3/8	5/32	7	.004								●			
	CCGT 32.508 R U1	CCGT 09T302 R U1	80	3/8	5/32	7	.008				●		●		●			
	CCGT 32.508 L U1	CCGT 09T302 L U1	80	3/8	5/32	7	.008								●			
	CCGT 32.51 R U1	CCGT 09T304 R U1	80	3/8	5/32	7	.016				●		●		●			
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	CCET 21.507 R KHG	CCET 0602018 R KHG	80	1/4	3/32	7	.007							●				
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	CCET 21.508 R KHG	CCET 060202 R KHG	80	1/4	3/32	7	.008							●				
	CCET 21.508 L KHG	CCET 060202 L KHG	80	1/4	3/32	7	.008							●				
	CCET 32.502 R KHG	CCET 09T3005 R KHG	80	3/8	5/32	7	.002						●	●				
	CCET 32.502 L KHG	CCET 09T3005 L KHG	80	3/8	5/32	7	.002							●				
	CCET 32.503 R KHG	CCET 09T3008 R KHG	80	3/8	5/32	7	.003						●	●				
	CCET 32.503 L KHG	CCET 09T3008 L KHG	80	3/8	5/32	7	.003							●				
	CCET 32.507 R KHG	CCET 09T3018 R KHG	80	3/8	5/32	7	.007						●	●				
	CCET 32.507 L KHG	CCET 09T3018 L KHG	80	3/8	5/32	7	.007							●				
	CCET 32.508 R KHG	CCET 09T302 R KHG	80	3/8	5/32	7	.008						●	●				
	CCET 32.508 L KHG	CCET 09T302 L KHG	80	3/8	5/32	7	.008							●				
	CCGT 21.504 FR F1	CCGT 060201 FR F1	80	1/4	3/32	7	.004		●			●	●					
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	CCGT 21.51 FR F1	CCGT 060204 FR F1	80	1/4	3/32	7	.016		●			●	●					
	CCGT 32.508 FR F1	CCGT 09T302 FR F1	80	3/8	3/32	7	.008		●			●	●					
	CCGT 32.51 FR F1	CCGT 09T304 FR F1	80	3/8	3/32	7	.016		●			●	●					
	CCGW 21.501 FN	CCGW 060200 FN	80	1/4	3/32	7	.001								●			
	CCGW 21.501 H Ⓜ	CCGW 060200 H Ⓜ	80	1/4	3/32	7	.001											●
	CCGW 21.504 FN	CCGW 060201 FN	80	1/4	3/32	7	.004								●			
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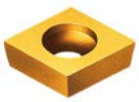
	CCGW 21.508 H Ⓜ	CCGW 060202 H Ⓜ	80	1/4	3/32	7	.008											●
	CCGW 32.500 V Ⓜ	CCGW 09T30 V Ⓜ	80	3/8	5/32	7	.000							●				
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	CCGW 32.501 H Ⓜ	CCGW 09T300 H Ⓜ	80	3/8	5/32	7	.001											●
	CCGW 32.504 FN	CCGW 09T301 FN	80	3/8	5/32	7	.004								●			
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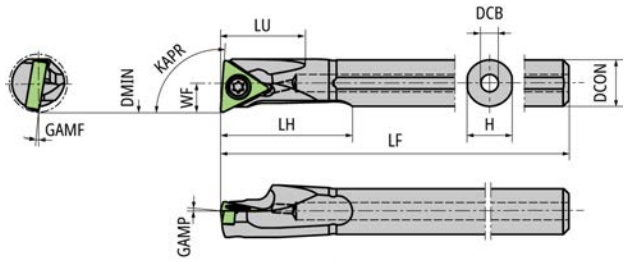
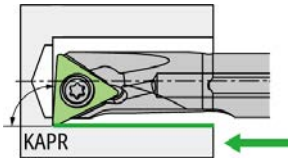
	CCGW 32.508 H Ⓜ	CCGW 09T302 H Ⓜ	80	3/8	5/32	7	.008											●
	CCGW 32.508M P	CCGW 09T302M P	80	3/8	5/32	7	.007				●							
	CCGW 32.508 P Ⓜ	CCGW 09T302 P Ⓜ	80	3/8	5/32	7	.008							●				

TP.. series/Toolholder

S-STUP-OH Mogul Bar / Coolant through / Steel shank





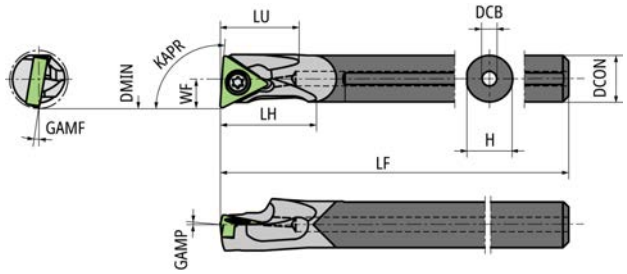
- Diagram shows right-hand tool
- Use a left-handed insert
- For F1/FG chipbreaker, right-hand inserts fit to right-hand toolholder
- F1/FG chipbreaker evacuates chips BACKWARD

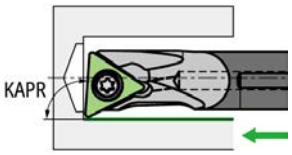
Item Number	Hand	DMIN	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	LU	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	inch	
S08H-STUPR09D10-OH	R	.394	.118	.315	10	5	.303	93	3.937	.886	.571	.016	.197	TP..73..
S10K-STUPR11D12-OH	R	.472	.138	.394	7.5	5	.378	93	4.921	1.083	.728	.016	.236	TP..22..
S12M-STUPR11D14-OH	R	.551	.157	.472	5	5	.453	93	5.906	1.280	.866	.016	.276	TP..22..
S16Q-STUPR11D18-OH	R	.709	.197	.630	3	5	.606	93	7.087	1.673	1.122	.016	.354	TP..22..
S20Q-STUPR11D22-OH	R	.866	.197	.787	3	5	.764	93	7.087	1.811	1.496	.016	.433	TP..22..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
S08H-STUPR09D10-OH	LR-S-2.5*4.8	CLR-15S
S10K-STUPR11D12-OH	LR-S-3*5.8	RLR-20S
S12M-STUPR11D14-OH	LR-S-3*5.8	RLR-20S
S16Q-STUPR11D18-OH	LR-S-3*5.8	RLR-20S
S20Q-STUPR11D22-OH	LR-S-3*5.8	RLR-20S

C-STUP-OH Mogul Bar / Coolant through / Carbide shank





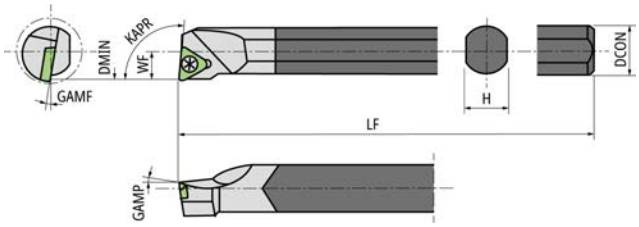
- Diagram shows right-hand tool
- Use a left-handed insert
- For F1/FG chipbreaker, right-hand inserts fit to right-hand toolholder
- F1/FG chipbreaker evacuates chips BACKWARD

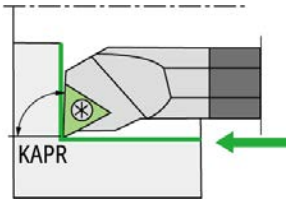
Item Number	Hand	DMIN	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	LU	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	inch	
C08K-STUPR09D10-OH	R	.394	.098	.315	10	5	.303	93	4.921	.650	.571	.016	.197	TP..73..
C10M-STUPR11D12-OH	R	.472	.098	.394	7.5	5	.378	93	5.906	.787	.689	.016	.236	TP..22..
C12M-STUPR11D14-OH	R	.551	.118	.472	5	5	.453	93	5.906	.906	.846	.016	.276	TP..22..
C16Q-STUPR11D18-OH	R	.709	.157	.630	3	5	.606	93	7.087	1.142	1.102	.016	.354	TP..22..
C08K-STUPL09D10-OH	L	.394	.098	.315	10	5	.303	93	4.921	.650	.571	.016	.197	TP..73..
C10M-STUPL11D12-OH	L	.472	.098	.394	7.5	5	.378	93	5.906	.787	.689	.016	.236	TP..22..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C08K-STUPR09D10-OH	LR-S-2.5*4.8	CLR-15S
C10M-STUPR11D12-OH	LR-S-3*5.8	RLR-20S
C12M-STUPR11D14-OH	LR-S-3*5.8	RLR-20S
C16Q-STUPR11D18-OH	LR-S-3*5.8	RLR-20S
C08K-STUPL09D10-OH	LR-S-2.5*4.8	CLR-15S
C10M-STUPL11D12-OH	LR-S-3*5.8	RLR-20S

C-STUP-N Carbide shank





- Diagram shows right-hand tool
- Use a left-handed insert
- For F1/FG chipbreaker, right-hand inserts fit to right-hand toolholder
- F1/FG chipbreaker evacuates chips BACKWARD

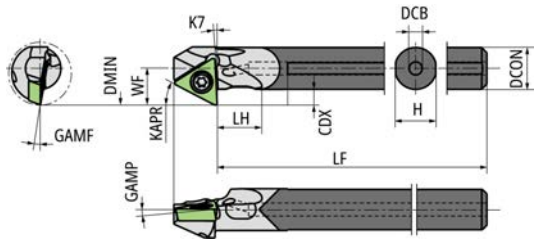
Item Number	Hand	DMIN	DCON	GAMF	GAMP	H	KAPR	LF	RE	WF	Insert Gage
		inch	inch	°	°	inch	°	inch	inch	inch	
C08K-STUPR-08-N	R	.394	.315	10	5	.276	93	4.921	.016	.197	TP..63..
C10M-STUPR-09-N	R	.472	.394	7	5	.354	93	5.906	.016	.236	TP..73..

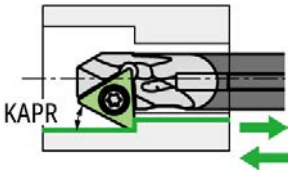
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C08K-STUPR-08-N	LR-S-2*5.5	CLR-13S
C10M-STUPR-09-N	LR-S-2.5*6	CLR-15S

TP.. series/Toolholder for ID Back Turning

C-STZP-OH Mogul Bar / Coolant through / Carbide shank





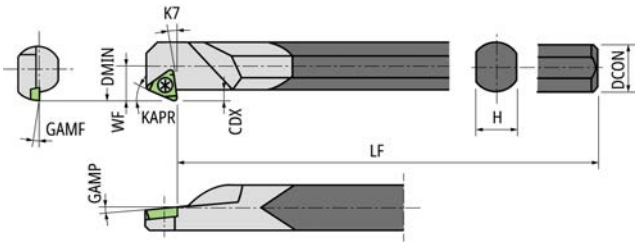
- Diagram shows right-hand tool
- Use right-hand inserts for machining backward
- Use left-hand inserts for machining forward

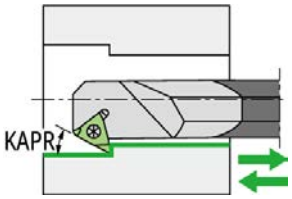
Item Number	Hand	DMIN	CDX	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	RE	WF	Insert Gage
		inch	inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	
C08K-STZPR09D12-OH	R	.472	.118	.098	.315	10	5	.303	27	4.921	.335	.016	.276	TP..73..
C10M-STZPR09D14-OH	R	.551	.118	.098	.394	7	5	.378	27	5.906	.472	.016	.315	TP..73..
C12M-STZPR11D175-OH	R	.689	.177	.118	.472	5	5	.453	27	5.906	.571	.016	.413	TP..22..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C08K-STZPR09D12-OH	LR-S-2.5*4.8	CLR-15S
C10M-STZPR09D14-OH	LR-S-2.5*4.8	CLR-15S
C12M-STZPR11D175-OH	LR-S-3*5.8	RLR-20S

B-STZP-N Carbide shank





- Diagram shows right-hand tool
- Use right-hand inserts for machining backward
- Use left-hand inserts for machining forward

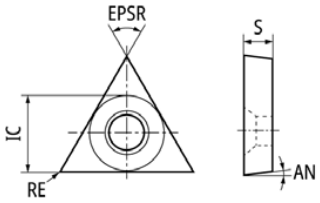
Item Number	Hand	DMIN	CDX	DCON	GAMF	GAMP	H	KAPR	LF	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	
B12Q-STZPR-09-N	R	.630	.118	.472	5	5	.433	27	7.087	.008	.354	TP..73..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
B12Q-STZPR-09-N	LR-S-2.5*6.8	CLR-15S

TP.. series/Inserts Carbide

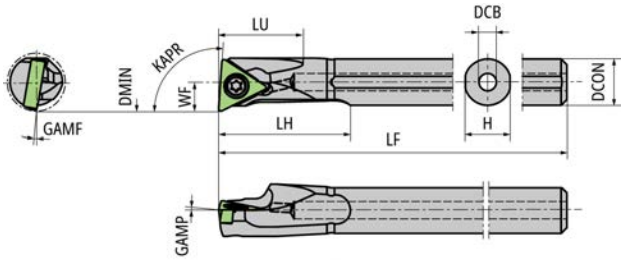
TPG.

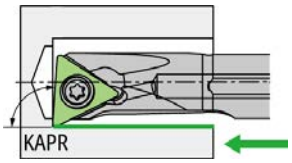


Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	AN	RE	Carbide										
								PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	TPGP 7308 R FG	TPGH 090202 R FG	60	7/32	3/32	11	.008		●			●	●					
	TPGP 731 R FG	TPGH 090204 R FG	60	7/32	3/32	11	.016		●			●	●					
	TPGH 2208 R FG	TPGH 110302 R FG	60	1/4	1/8	11	.008	●	●			●	●					
	TPGH 221 R FG	TPGH 110304 R FG	60	1/4	1/8	11	.016	●	●			●	●					
	TPGP 6308 FR F1	TPGH 080202 FR F1	60	3/16	3/32	11	.008						●	●	●			
	TPGP 631 FR F1	TPGH 080204 FR F1	60	3/16	3/32	11	.016						●	●	●			
	TPGP 7304 FR F1	TPGH 090201 FR F1	60	7/32	3/32	11	.004		●			●	●					
	TPGP 7308 FR F1	TPGH 090202 FR F1	60	7/32	3/32	11	.008		●			●	●	●	●			
	TPGP 731 FR F1	TPGH 090204 FR F1	60	7/32	3/32	11	.016		●			●	●	●	●			
	TPGP 732 FR F1	TPGH 090208 FR F1	60	7/32	3/32	11	.031		●			●	●		●			
	TPGH 2208 FR F1	TPGH 110302 FR F1	60	1/4	1/8	11	.008		●			●	●	●	●			
	TPGH 221 FR F1	TPGH 110304 FR F1	60	1/4	1/8	11	.016		●			●	●	●	●			
	TPGH 222 FR F1	TPGH 110308 FR F1	60	1/4	1/8	11	.031		●			●	●		●			
	TPGP 7308 FL K	TPGH 090202 FL K	60	7/32	3/32	11	.008						●					
	TPGP 731 FL K	TPGH 090204 FL K	60	7/32	3/32	11	.016						●					
	TPGP 732 FL K	TPGH 090208 FL K	60	7/32	3/32	11	.031						●					
	TPGP 7308 FL B2	TPGH 090202 FL B2	60	7/32	3/32	11	.008						●		●			
	TPGP 731 FL B2	TPGH 090204 FL B2	60	7/32	3/32	11	.016						●		●			
	TPGP 732 FL B2	TPGH 090208 FL B2	60	7/32	3/32	11	.031						●		●			
	TPGP 6308 FL B3	TPGH 080202 FL B3	60	3/16	3/32	11	.008						●		●			
	TPGP 631 FL B3	TPGH 080204 FL B3	60	3/16	3/32	11	.016						●		●			

S-STUC-OH Mogul Bar / Coolant through / Steel shank





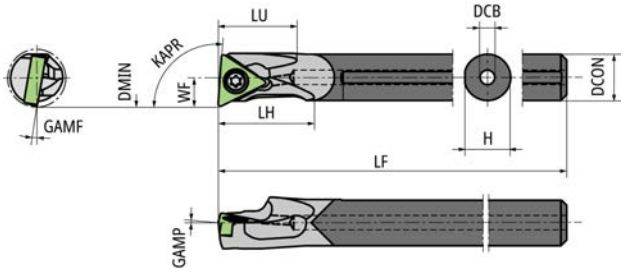
- Diagram shows right-hand tool
- Use a left-handed insert
- For F05 chipbreaker, right-hand inserts fit to right-hand toolholder
- F05 chipbreaker evacuates chips BACKWARD

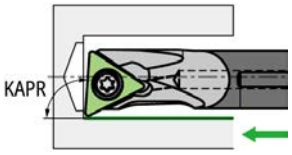
Item Number	Hand	DMIN	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	LU	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	inch	
S07G-STUCR06D08-OH	R	.315	.098	.276	11	0	.266	93	3.543	.768	.492	.008	.157	TC..52..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
S07G-STUCR06D08-OH	LR-S-2*4.4	CLR-13S

C-STUC-OH Mogul Bar / Coolant through / Carbide shank





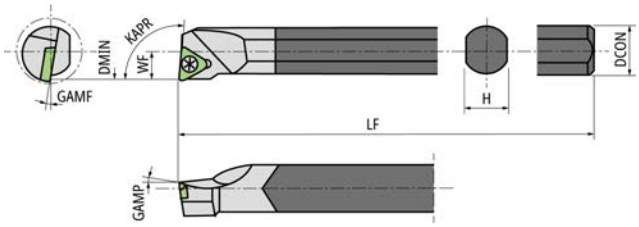
- Diagram shows right-hand tool
- Use a left-handed insert
- For F05 chipbreaker, right-hand inserts fit to right-hand toolholder
- F05 chipbreaker evacuates chips BACKWARD

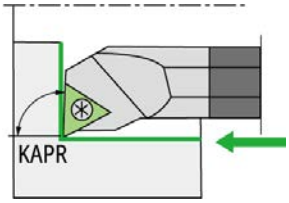
Item Number	Hand	DMIN	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	LU	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	inch	
C07J-STUCR06D08-OH	R	.315	.079	.276	11	0	.266	93	4.331	.512	.492	.008	.157	TC..52..
C07J-STUCL06D08-OH	L	.315	.079	.276	11	0	.266	93	4.331	.512	.492	.008	.157	TC..52..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C07J-STUCR06D08-OH	LR-S-2*4.4	CLR-13S
C07J-STUCL06D08-OH	LR-S-2*4.4	CLR-13S

C-STUC-N Carbide shank





- Diagram shows right-hand tool
- Use a left-handed insert
- For F05 chipbreaker, right-hand inserts fit to right-hand toolholder
- F05 chipbreaker evacuates chips BACKWARD

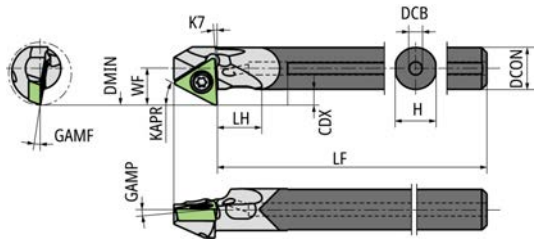
Item Number	Hand	DMIN	DCON	GAMF	GAMP	H	KAPR	LF	RE	WF	Insert Gage
		inch	inch	°	°	inch	°	inch	inch	inch	
C06J-STUCR-06-N	R	.315	.236	10	0	.205	93	4.331	.008	.157	TC..52..

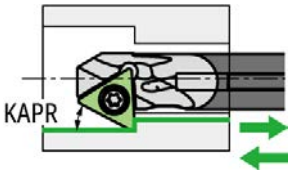
Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C06J-STUCR-06-N	LR-S-2*4.4	CLR-13S

TC.. series/Toolholder for ID Back Turning

C-STZC-OH Mogul Bar / Coolant through / Carbide shank





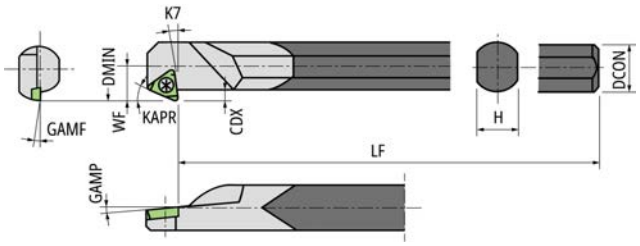
- Diagram shows right-hand tool
- Use right-hand inserts for machining backward
- Use left-hand inserts for machining forward

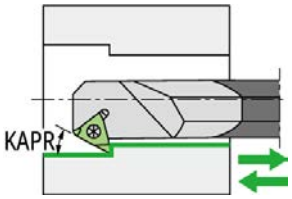
Item Number	Hand	DMIN	CDX	DCB	DCON	GAMF	GAMP	H	KAPR	LF	LH	RE	WF	Insert Gage
		inch	inch	inch	inch	°	°	inch	°	inch	inch	inch	inch	
C06H-STZCR06D10-OH	R	.394	.098	.079	.236	10	0	.228	27	3.937	.236	.008	.217	TC..52..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
C06H-STZCR06D10-OH	LR-S-2*4.4	CLR-13S

B-STZC-N Carbide shank





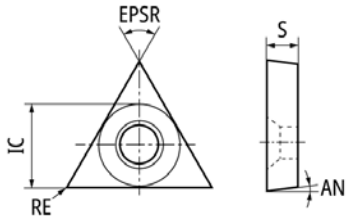
- Diagram shows right-hand tool
- Use right-hand inserts for machining backward
- Use left-hand inserts for machining forward

Item Number	Hand	DMIN	CDX	DCON	GAMF	GAMP	H	KAPR	LF	RE	WF	Insert Gage
		inch	inch	inch	°	°	inch	°	inch	inch	inch	
B06J-STZCR-06-N	R	.394	.098	.236	10	0	.205	27	4.331	.008	.217	TC..52..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
B06J-STZCR-06-N	LR-S-2*4.4	CLR-13S

TCG.

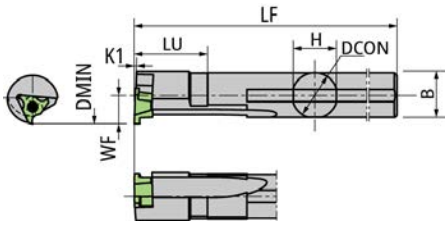


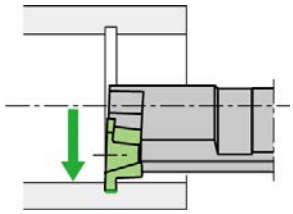
Steel	○	○	●	●	●	●	●	●		●	
Stainless Steel	○	●	○	○	○	●	○	●		●	
Cast Iron									●		
Non-Ferrous Material						○		○			●
Heat Resistant Alloy	●		●	○	○						
Hardened Material			○	○	○						
Others (non-metallic)											●

Shape	Item Number		EPSR	IC	S	AN	RE	BS	Carbide										
									PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	Uncoated
	(Inch)	(Metric)	°	inch	inch	°	inch	inch	650	ST4	DM4	DT4	QM3	TM4	VM1	ZM3	CP1	CP7	KM1
	TCGP 5204 FR F05	TCGH 060101 FR F05	60	–	–	7	–	–		●			●	●					
	TCGP 5208 FL F05	TCGH 060102 FL F05	60	5/32	1/16	7	.008	–						●		●			
	TCGP 5208 FR F05	TCGH 060102 FR F05	60	5/32	1/16	7	.008	–		●			●	●		●			
	TCGP 521 FR F05	TCGH 060104 FR F05	60	5/32	1/16	7	.016	–		●			●	●		●			
	TCGP 5208 FL K	TCGH 060102 FL K	60	5/32	1/16	7	.008	–						●					
	TCGP 521 FL K	TCGH 060104 FL K	60	5/32	1/16	7	.016	–						●					
	TCGP 5208 FL B1	TCGH 060102 FL B1	60	5/32	1/16	7	.008	–						●		●			
	TCGP 521 FL B1	TCGH 060104 FL B1	60	5/32	1/16	7	.016	–						●		●			

GTG.. series/Toolholders for ID Grooving

S-BG Mogul Bar / Steel shank





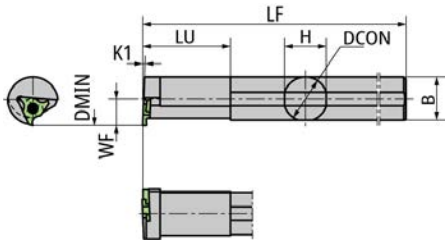
●Diagram shows right-hand tool
NOTE: Use a left-handed insert.

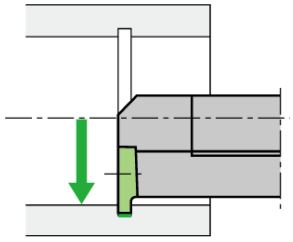
Item Number	Hand	DMIN	APMX	B	CW	DCON	H	K1	LF	LU	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	°	inch	inch	inch	
S08H-BGR10D10	R	.394	.039	.309	.020-.079	.315	.303	2	4.724	.787	.197	GTG10..
S10K-BGR10D12	R	.472	.039	.386	.020-.079	.394	.378	2	4.724	.984	.236	GTG10..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
S08H-BGR10D10	LR-S-2.5*6.8	CLR-15S
S10K-BGR10D12	LR-S-2.5*6.8	CLR-15S

BG Steel shank





●Diagram shows right-hand tool
NOTE: Use a left-handed insert.

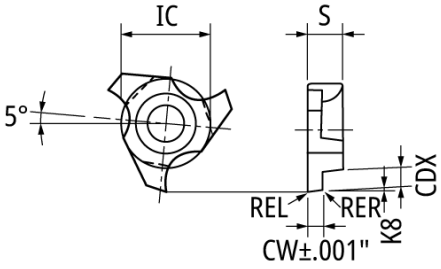
Item Number	Hand	DMIN	APMX	B	CW	DCON	H	K1	LF	LU	WF	Insert Gage
		inch	inch	inch	inch	inch	inch	°	inch	inch	inch	
BGR08-00S	R	.394	.039	.295	.020-.079	.315	.276	2	4.921	.787	.197	GTG10..
BGR08-10S	R	.394	.039	.295	.059-.079	.315	.276	2	4.921	.787	.197	GTG10..
BGR10-00S	R	.472	.039	.374	.020-.079	.394	.354	2	5.906	.984	.236	GTG10..
BGR10-10S	R	.472	.039	.374	.059-.079	.394	.354	2	5.906	.984	.236	GTG10..
BGR12-00S	R	.551	.079	.453	.039-.079	.472	.433	2	7.087	1.181	.276	GTG14..
BGR12-12S	R	.551	.079	.453	.069-.079	.472	.433	2	7.087	1.181	.276	GTG14..
BGR14-00S	R	.630	.079	.531	.039-.079	.551	.512	2	7.087	1.378	.315	GTG14..
BGR14-12S	R	.630	.079	.531	.069-.079	.551	.512	2	7.087	1.378	.315	GTG14..
BGR16	R	.787	.118	.610	.059-.079	.630	.591	2	7.874	1.575	.394	GTG20..
BGR20	R	.984	.118	.768	.059-.079	.787	.748	2	7.874	1.575	.472	GTG20..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
BGR08-00S	LR-S-2.5*6.8	CLR-15S
BGR08-10S	LR-S-2.5*6.8	CLR-15S
BGR10-00S	LR-S-2.5*6.8	CLR-15S
BGR10-10S	LR-S-2.5*6.8	CLR-15S
BGR12-00S	LR-S-3*7.8	RLR-20S
BGR12-12S	LR-S-3*7.8	RLR-20S
BGR14-00S	LR-S-3*7.8	RLR-20S
BGR14-12S	LR-S-3*7.8	RLR-20S
BGR16	LR-S-3*7.8	RLR-20S
BGR20	LR-S-3*7.8	RLR-20S

GTG.. series/Inserts Carbide

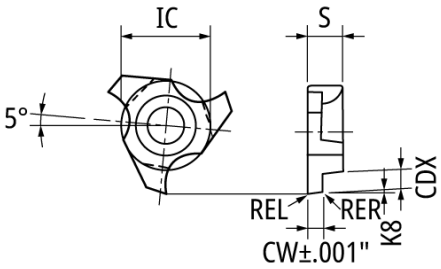
GTG..005



● Diagram shows left-hand tool

Item Number	Hand	Chipbreaker	APMX	CDX	CW	EPSR	IC	K8	REL	RER	S	Carbide
												PVD
			inch	inch	inch	°	inch	°	inch	inch	inch	TM4
GTG10050FL005	L	Yes	.039	.047	.020	60	7/32	2	.002	.002	1/8	●
GTG10075FL005	L	Yes	.039	.047	.030	60	7/32	2	.002	.002	1/8	●
GTG10100FL005	L	Yes	.039	.047	.039	60	7/32	2	.002	.002	1/8	●
GTG10150FL005	L	Yes	.039	.047	.059	60	7/32	2	.002	.002	1/8	●
GTG10200FL005	L	Yes	.039	.047	.079	60	7/32	2	.002	.002	1/8	●

GTG..

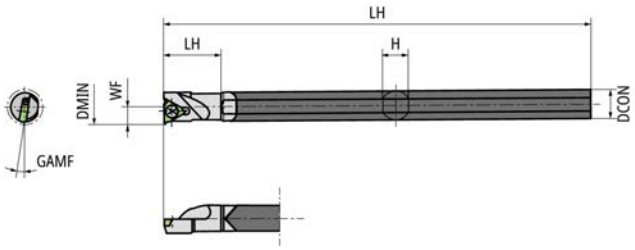


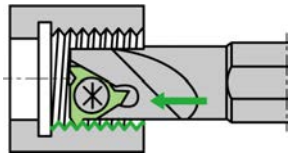
● Diagram shows left-hand tool

Item Number	Hand	Chipbreaker	APMX	CDX	CW	EPSR	IC	K8	REL	RER	S	Carbide	
												PVD	
			inch	inch	inch	°	mm	°	inch	inch	inch	QM3	ZM3
GTG10050FL00	L	Yes	.039	.047	.020	60	7/32	2	.002	.002	1/8		●
GTG10065FL00	L	Yes	.039	.047	.026	60	7/32	2	.002	.002	1/8		●
GTG10075FL00	L	Yes	.039	.047	.030	60	7/32	2	.002	.002	1/8		●
GTG10100FL00	L	Yes	.039	.047	.039	60	7/32	2	.002	.002	1/8		●
GTG10150FL00	L	Yes	.039	.047	.059	60	7/32	2	.002	.002	1/8		●
GTG10200FL01	L	Yes	.039	.047	.079	60	7/32	2	.004	.004	1/8		●
GTG14100FL00	L	Yes	.079	.087	.039	60	5/16	2	.002	.002	1/8		●
GTG14150FL00	L	Yes	.079	.087	.059	60	5/16	2	.002	.002	1/8		●
GTG14200FL01	L	Yes	.079	.087	.079	60	5/16	2	.004	.004	1/8		●
GTG20150FL	L	Yes	.118	.126	.059	60	3/8	2	.008	.008	1/8	●	
GTG20200FL	L	Yes	.118	.126	.079	60	3/8	2	.008	.008	1/8	●	

Internal Thread
TMN.. series/Toolholder

TGC Carbide shank





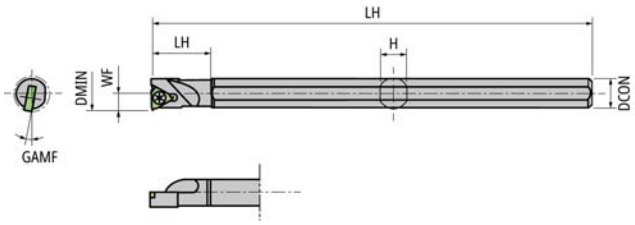
● Diagram shows right-hand tool

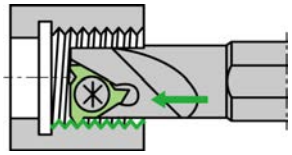
Item Number	Hand	DCON	DMIN	GAMF	H	LF	LH	WF	Insert Gage
		inch	inch	°	inch	inch	inch	inch	
TGC10T06H161R	R	.236	.315	10	.217	3.937	.512	.150	TMN06..
TGC10T08K162R	R	.315	.394	10	.276	4.921	.669	.185	TMN08..
TGC10T10M163R	R	.394	.472	10	.354	5.906	.787	.236	TMN09..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
TGC10T06H161R	LR-S-2*4.4	CLR-13S
TGC10T08K162R	LR-S-2*5.5	CLR-13S
TGC10T10M163R	LRIS-2.2*6	CLR-13S

HN Steel shank





● Diagram shows right-hand tool

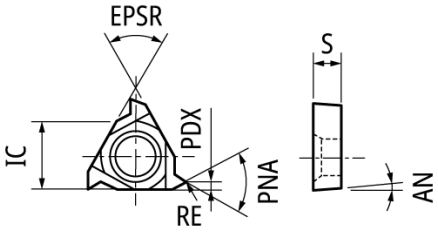
Item Number	Hand	DCON	DMIN	GAMF	H	LF	LH	WF	Insert Gage
		inch	inch	°	inch	inch	inch	inch	
HN59Z-0028	R	.236	.315	10	.217	3.937	.512	.150	TMN06..
HN59Z-0029	R	.315	.394	10	.276	4.921	.669	.185	TMN08..
HN59Z-0030	R	.394	.472	10	.354	5.906	.787	.236	TMN09..

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
HN59Z-0028	LR-S-2*4.4	CLR-13S
HN59Z-0029	LR-S-2*5.5	CLR-13S
HN59Z-0030	LRIS-2.2*6	CLR-13S

TMN.. series/Inserts Carbide

TMN

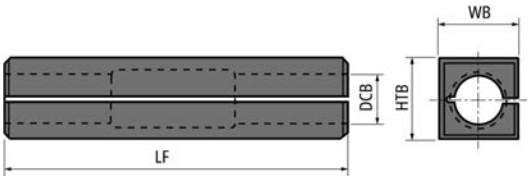


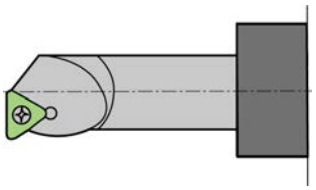
● Diagram shows right-hand tool

Item Number	Hand	Chipbreaker	Pitch	AN	EPSR	IC	PDX	PNA	RE	S	Carbide
											PVD
			inch	°	°	inch	inch	°	inch	inch	ZM3
TMN06FR03	R	Yes	63-34	7	60	5/32	.020	60	.001	1/16	●
TMN08FR03	R	Yes	63-34	7	60	3/16	.020	60	.001	3/32	●
TMN09FR03	R	Yes	63-34	7	60	7/32	.020	60	.001	3/32	●

Boring bar adaptors

S..-H





Item Number	DCB	HTB	LF	WB
	inch	inch	inch	inch
S06-H	.236	.787	2.362	.787
S08-H	.315	.787	2.362	.787
S10-H	.394	.787	2.362	.787
S12-H	.472	.984	2.756	.984

MEMO

Shaper

SHAPER DUO W02

Insert bar W03

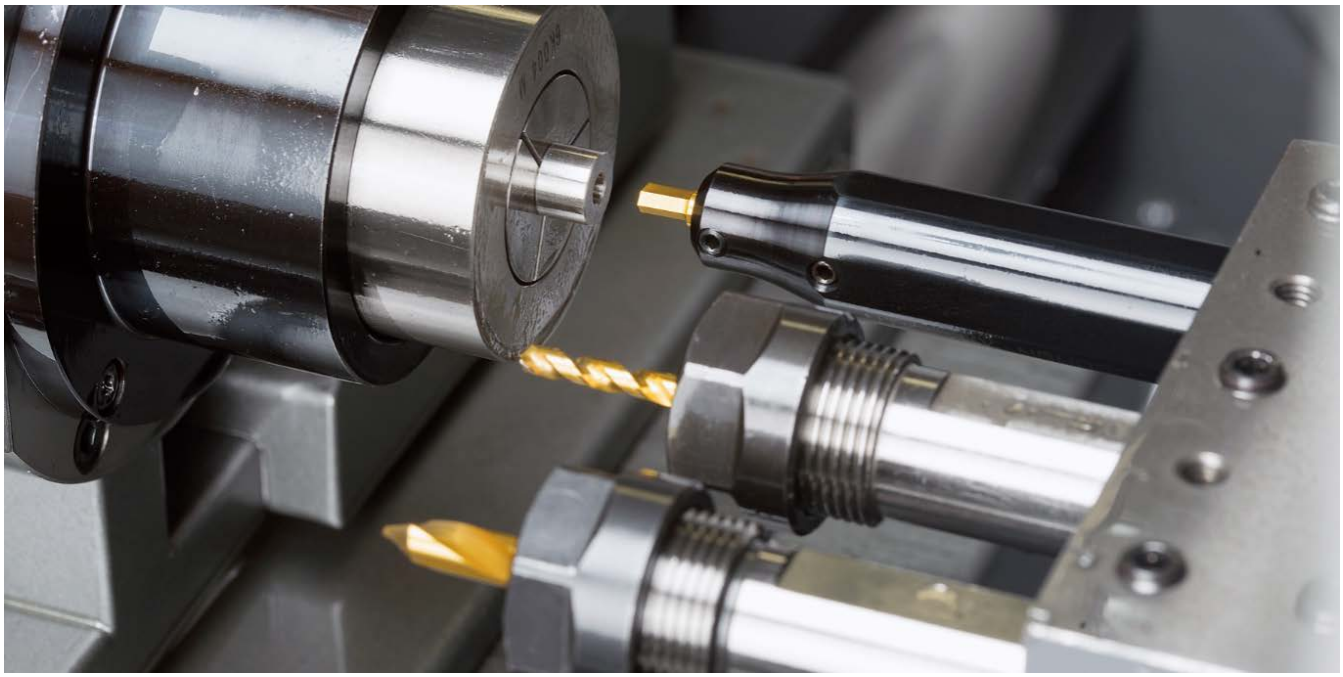
Sleeve W04

Machining Procedure W14

Set-up Instructions - Hexagonal W15

Machining Program Code Explanation W16

Troubleshooting W18



For socket hole machining on CNC automatic lathes

SHAPER DUO

Hexagon, square and hexalobular socket machining can be achieved at a low cost and without any special equipment .

Wide range of socket styles and sizes can be machined by using the sub-spindle of automatic lathes.

Features ①

- Machine square, hexagon, and hexalobular socket holes
- Less tool pressure than Rotary-Broaching. Ideal for machining small diameter work pieces
- Wide range of socket dimensions can be machined with one size of SHAPER DUO
- Special workpieces and small quantity part runs can be machined with less tool costs

Features ②

Comparison Chart of Hexalobular Socket Machining

	Tool Pressure	Cycle Time	Tool Cost	High speed spindle	Programming	
Shaper Duo	◎	◎	◎	Not necessary	Simple	• No high speed spindle needed • A lot less cycle time
End mill	○	×	△	Necessary	Complicated	• Need high speed spindle • Time consuming process

***Small diameter end mill driven by high-speed spindle is popular way to create Hexalobular(6-lobe) socket.**
It has some flexibility but needs high speed spindle unit and it is a time consuming process.
***SHAPER DUO can make Hexalobular(6-lobe) socket faster and simpler.**

Comparison Chart of HEX Socket Machining

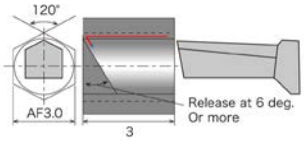
	Tool Pressure	Cycle Time	Flexibility	Tool Cost	
Shaper Duo	◎	△ ※Can be off-set by over-wrapping operation	○	◎	• Less tool pressure-especially on small diameter parts • One size can cover several socket sizes
Broach Tool	△	○	×	△	• Need to have tools for each socket size

***Rotary-broaching is an efficient way to machine a Hexagon socket.**
But tool pressure is high and often times it pushes part too hard.
***SHAPER DUO system enables less tool pressure and provides better tolerance with less cost.**

Example of machining Hexagon socket

SHAPER DUO has better tool life compared to the competitor which has an immediate worn and rounded cutting edge.
NTK's special grinding process and TM4 grade enable to:
① Keep good corner edge sharpness and long tool life ② Provide better tolerance and accuracy ③ Provide better surface quality

Work materials	303SS
Feed	78.7 IPM
Depth of cut (ap)	Roughing .001 inch
	Finishing .0002 inch
Coolant	WET

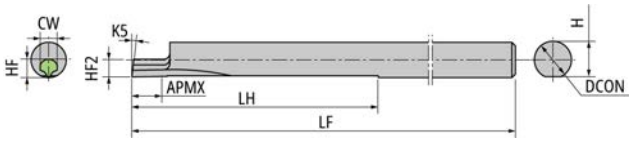


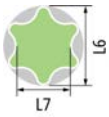
lineup → W3

Insert bar

Hexalobular socket (6-LOBE hole)

SSP-T

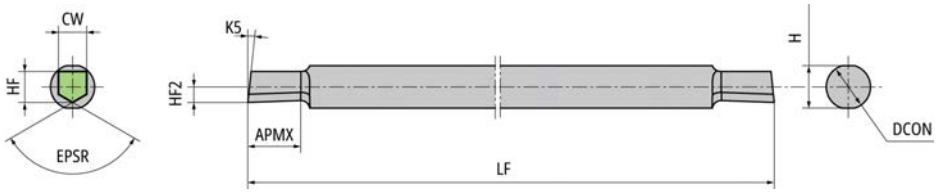




Item Number	Socket size	Socket number	L6 mm	L7 mm	Recommended Pilot bore Dia. mm	APMX mm	CW mm	DCON mm	H mm	HF mm	HF2 mm	K5 °	LF mm	LH mm	Carbide PVD coating TM4
SSP050N25T06	T6	6	1.75	1.27	1.15	2.5	1.2	5	4.75	1.09	2.4	6	70	35	●
SSP050N31T07	T7	7	2.1	1.5	1.38	3.1	1.4	5	4.75	1.29	2.4	6	70	35	●
SSP050N36T08	T8	8	2.4	1.75	1.62	3.6	1.6	5	4.75	1.5	2.4	6	70	35	●
SSP050N41T10	T10	10	2.8	2.05	1.92	4.1	1.8	5	4.75	1.7	2.4	6	70	35	●
SSP050N43T15	T15	15	3.35	2.4	2.3	4.3	2.2	5	4.75	2.1	2.4	6	70	35	●
SSP050N46T20	T20	20	3.95	2.85	2.71	4.6	2.6	5	4.75	2.5	2.4	6	70	35	●
SSP050N50T25	T25	25	4.5	3.25	3.13	5	3	5	4.75	2.9	2.4	6	70	35	●
SSP050N55T27	T27	27	5.1	3.68	3.52	5.5	3.4	5	4.75	3.3	2.4	6	70	35	●
SSP050N55T30	T30	30	5.6	4.05	3.91	5.5	3.8	5	4.75	3.7	2.4	6	70	35	●

Hexagon socket

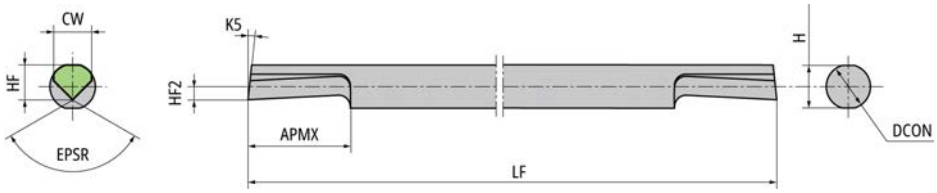
SSP-H

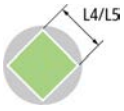


Item Number	Base AF L4 mm	AF range L5 inch	AF range L5 mm	APMX mm	CW mm	DCON mm	EPSR °	H mm	HF mm	HF2 mm	K5 °	LF mm	Carbide PVD coating TM4
SSP020N06515H	1	.039-.043	1-1.1	1.5	0.65	2	120	1.8	0.7	0.35	15	50	●
SSP020N07018H	1.1	.043-.047	1.1-1.2	1.8	0.7	2	120	1.8	0.8	0.4	15	50	●
SSP020N07518H	1.2	.047-.051	1.2-1.3	1.8	0.75	2	120	1.8	0.9	0.45	15	50	●
SSP020N08020H	1.3	.051-.055	1.3-1.4	2	0.8	2	120	1.8	1	0.5	15	50	●
SSP020N1130H	1.5	.055-.075	1.4-1.9	3	1.1	2	120	1.8	0.9	0.45	6	50	●
SSP020N1430H	2	.071-.098	1.8-2.5	3	1.4	2	120	1.8	1.2	0.6	6	50	●
SSP030N1940H	3	.091-.138	2.3-3.5	4	1.9	3	120	2.8	1.5	0.75	6	50	●
SSP040N2450H	4	.130-.177	3.3-4.5	5	2.4	4	120	3.8	2.5	1.25	6	60	●
SSP050N3260H	5	.169-.240	4.3-6.1	6	3.2	5	120	4.8	3.3	1.65	6	70	●
SSP060N42120H	6	.209-.319	5.3-8.1	12	4.2	6	120	5.6	4	2	6	80	●
SSP080N62160H	8	.287-.476	7.3-12.1	16	6.2	8	120	7.6	4.9	2.45	6	80	●
SSP080N75160H023	12.7	.469-.559	11.9-14.2	16	7.5	8	120	7.6	7.36	3.56	6	80	●

Square Socket

SSP-S



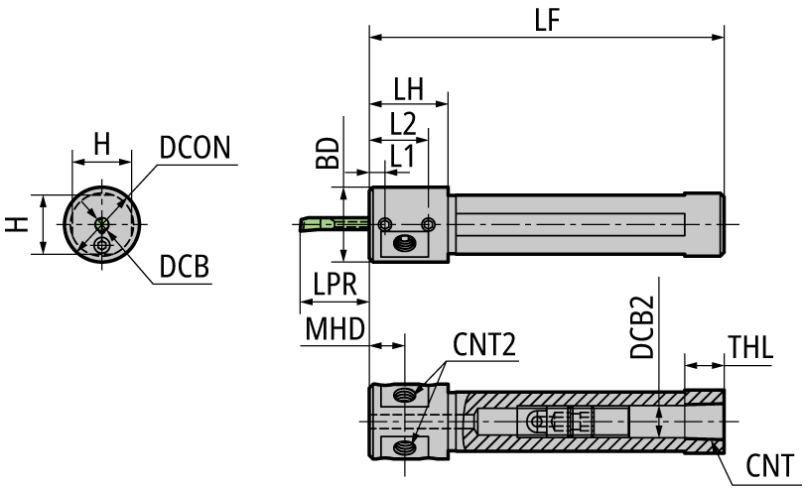


Item Number	Base AF L4 mm	AF range L5 Inch	AF range L5 mm	APMX mm	CW mm	DCON mm	EPSR °	H mm	HF mm	HF2 mm	K5 °	LF mm	Carbide PVD coating TM4
SSP020N1740S	2	.079-.091	2-2.3	4	1.7	2	90	1.8	1.6	0.7	6	50	●
SSP025N1940S	2.5	.091-.102	2.3-2.6	4	1.95	2.5	90	2.3	1.8	0.65	6	50	●
SSP030N2260S	3	.102-.118	2.6-3	6	2.2	3	90	2.8	2.05	0.65	6	50	●
SSP035N2760S	3.5	.114-.146	2.9-3.7	6	2.7	3.5	90	3.3	2.25	0.6	6	60	●
SSP040N3380S	4	.146-.177	3.7-4.5	8	3.35	4	90	3.8	3.05	1.15	6	60	●
SSP050N39100S	5	.177-.209	4.5-5.3	10	3.9	5	90	4.8	3.95	1.55	6	70	●
SSP060N47120S	6	.209-.256	5.3-6.5	12	4.75	6	90	5.6	4.5	1.7	6	80	●
SSP080N58160S	8	.256-.315	6.5-8	16	5.8	8	90	7.6	5.5	1.7	6	80	●

STICK DUO SPLASH

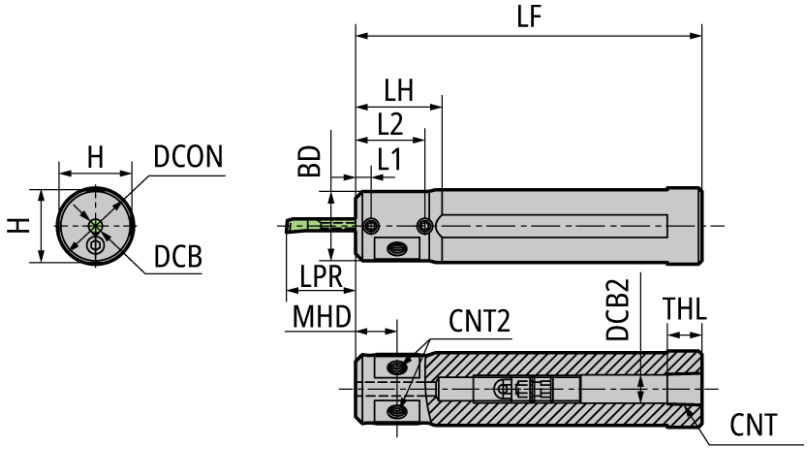
Sleeve for Shaper Duo series (Adjustable overhang / Internal coolant system)

HY-NBH-OH Shank diameter ⌀.630"



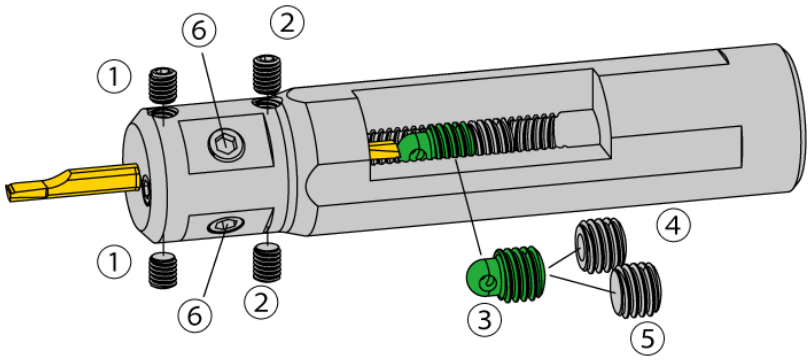
Item Number	BD	CNT	CNT2	DCB	DCB2	DCON	H	LF	LH	LPR	L1	L2	MHD	THL	Applicable insert bar	
	inch			inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
HY-NBH02016G-OH	.748	Rc1/8	M6×P1.0	.079	.323	.630	.591	3.543	.748	.197-.709	.157	.591	.374	.394	SBF../SHF..	SSP..
HY-NBH02516G-OH	.748	Rc1/8	M6×P1.0	.098	.323	.630	.591	3.543	.748	.248-.768	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH03016G-OH	.748	Rc1/8	M6×P1.0	.118	.323	.630	.591	3.543	.748	.295-.827	.157	.591	.374	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03516G-OH	.748	Rc1/8	M6×P1.0	.138	.323	.630	.591	3.543	.748	.346-.965	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH04016G-OH	.748	Rc1/8	M6×P1.0	.157	.323	.630	.591	3.543	.945	.394-1.102	.157	.787	.472	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05016G-OH	.748	Rc1/8	M6×P1.0	.197	.323	.630	.591	3.543	.945	.492-1.378	.157	.787	.472	.394	SBF../SHF..	SBG../SBT../SSP..

HY-NBH-OH Shank diameter ⌀.750" - ⌀1.000"



Item Number	BD	CNT	CNT2	DCB	DCB2	DCON	H	LF	LH	LPR	L1	L2	MHD	THL	Applicable insert bar	
	inch			inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
HY-NBH02019J-OH	.750	Rc1/8	M6×P1.0	.079	.323	3/4	.709	4.331	–	.197-.709	.157	.591	.374	.394	SBF../SHF..	SSP..
HY-NBH02519J-OH	.750	Rc1/8	M6×P1.0	.098	.323	3/4	.709	4.331	–	.248-.768	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH03019J-OH	.750	Rc1/8	M6×P1.0	.118	.323	3/4	.709	4.331	–	.295-.827	.157	.591	.374	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03519J-OH	.750	Rc1/8	M6×P1.0	.138	.323	3/4	.709	4.331	–	.346-.965	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH04019J-OH	.750	Rc1/8	M6×P1.0	.157	.323	3/4	.709	4.331	–	.394-1.102	.157	.787	.472	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05019J-OH	.750	Rc1/8	M6×P1.0	.197	.323	3/4	.709	4.331	–	.492-1.378	.157	.787	.472	.394	SBF../SHF..	SBG../SBT../SSP..
HY-NBH06019J-OH	.750	Rc1/8	M6×P1.0	.236	.323	3/4	.709	4.331	–	.591-1.654	.157	.787	.472	.394	SBF../SHF..	SBG../SFG../SBT../SSP..
HY-NBH02020J-OH	.787	Rc1/8	M6×P1.0	.079	.323	.787	.748	4.331	–	.197-.709	.157	.591	.374	.394	SBF../SHF..	SSP..
HY-NBH02520J-OH	.787	Rc1/8	M6×P1.0	.098	.323	.787	.748	4.331	–	.248-.768	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH03020J-OH	.787	Rc1/8	M6×P1.0	.118	.323	.787	.748	4.331	–	.295-.827	.157	.591	.374	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03520J-OH	.787	Rc1/8	M6×P1.0	.138	.323	.787	.748	4.331	–	.346-.965	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH04020J-OH	.787	Rc1/8	M6×P1.0	.157	.323	.787	.748	4.331	–	.394-1.102	.157	.787	.472	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05020J-OH	.787	Rc1/8	M6×P1.0	.197	.323	.787	.748	4.331	–	.492-1.378	.157	.787	.472	.394	SBF../SHF..	SBG../SBT../SSP..
HY-NBH06020J-OH	.787	Rc1/8	M6×P1.0	.236	.323	.787	.748	4.331	–	.591-1.654	.157	.787	.472	.394	SBF../SHF..	SBG../SFG../SBT../SSP..
HY-NBH02022X-OH	.787	Rc1/8	M6×P1.0	.079	.323	.866	.827	4.724	.984	.197-.709	.157	.591	.374	.394	SBF../SHF..	SSP..
HY-NBH02522X-OH	.787	Rc1/8	M6×P1.0	.098	.323	.866	.827	4.724	.984	.248-.768	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH03022X-OH	.787	Rc1/8	M6×P1.0	.118	.323	.866	.827	4.724	.984	.295-.827	.157	.591	.374	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03522X-OH	.787	Rc1/8	M6×P1.0	.138	.323	.866	.827	4.724	.984	.346-.965	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH04022X-OH	.787	Rc1/8	M6×P1.0	.157	.323	.866	.827	4.724	.984	.394-1.102	.157	.787	.472	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05022X-OH	.787	Rc1/8	M6×P1.0	.197	.323	.866	.827	4.724	.984	.492-1.378	.157	.787	.472	.394	SBF../SHF..	SBG../SBT../SSP..
HY-NBH06022X-OH	.787	Rc1/8	M6×P1.0	.236	.323	.866	.827	4.724	.984	.591-1.654	.157	.787	.472	.394	SBF../SHF..	SBG../SFG../SBT../SSP..
HY-NBH02025.0K-OH	.787	Rc1/8	M6×P1.0	.079	.323	.984	.945	4.921	.984	.197-.709	.157	.591	.374	.394	SBF../SHF..	SSP..
HY-NBH02525.0K-OH	.787	Rc1/8	M6×P1.0	.098	.323	.984	.945	4.921	.984	.248-.768	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH03025.0K-OH	.787	Rc1/8	M6×P1.0	.118	.323	.984	.945	4.921	.984	.295-.827	.157	.591	.374	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03525.0K-OH	.787	Rc1/8	M6×P1.0	.138	.323	.984	.945	4.921	.984	.346-.965	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH04025.0K-OH	.787	Rc1/8	M6×P1.0	.157	.323	.984	.945	4.921	.984	.394-1.102	.157	.787	.472	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05025.0K-OH	.787	Rc1/8	M6×P1.0	.197	.323	.984	.945	4.921	.984	.492-1.378	.157	.787	.472	.394	SBF../SHF..	SBG../SBT../SSP..
HY-NBH06025.0K-OH	.787	Rc1/8	M6×P1.0	.236	.323	.984	.945	4.921	.984	.591-1.654	.157	.787	.472	.394	SBF../SHF..	SBG../SFG../SBT../SSP..
HY-NBH02025.4K-OH	.787	Rc1/8	M6×P1.0	.079	.323	1.000	.945	4.921	.984	.197-.709	.157	.591	.374	.394	SBF../SHF..	SSP..
HY-NBH02525.4K-OH	.787	Rc1/8	M6×P1.0	.098	.323	1.000	.945	4.921	.984	.248-.768	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH03025.4K-OH	.787	Rc1/8	M6×P1.0	.118	.323	1.000	.945	4.921	.984	.295-.827	.157	.591	.374	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03525.4K-OH	.787	Rc1/8	M6×P1.0	.138	.323	1.000	.945	4.921	.984	.346-.965	.157	.591	.374	.394	SBF../SHF..	SBT../SSP..
HY-NBH04025.4K-OH	.787	Rc1/8	M6×P1.0	.157	.323	1.000	.945	4.921	.984	.394-1.102	.157	.787	.472	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05025.4K-OH	.787	Rc1/8	M6×P1.0	.197	.323	1.000	.945	4.921	.984	.492-1.378	.157	.787	.472	.394	SBF../SHF..	SBG../SBT../SSP..
HY-NBH06025.4K-OH	.787	Rc1/8	M6×P1.0	.236	.323	1.000	.945	4.921	.984	.591-1.654	.157	.787	.472	.394	SBF../SHF..	SBG../SFG../SBT../SSP..

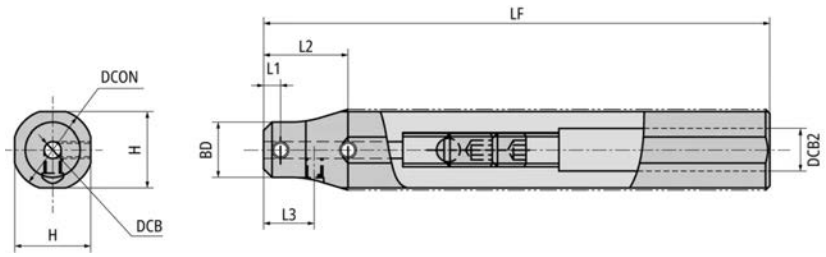
Spare Parts



Item Number	Clamp Screw		Overhang Adjustment			M6 Screw	Wrench		
	①	②	③	④	⑤	⑥	①②	③④⑤	⑥
HY-NBH02016G-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02516G-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03016G-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03516G-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH04016G-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH05016G-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02019J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02519J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03019J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03519J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH04019J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH05019J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH06019J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02020J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02520J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03020J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03520J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH04020J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH05020J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH06020J-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02022X-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02522X-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03022X-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03522X-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH04022X-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH05022X-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH06022X-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02025.0K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02525.0K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03025.0K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03525.0K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH04025.0K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH05025.0K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH06025.0K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02025.4K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH02525.4K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03025.4K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH03525.4K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH04025.4K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH05025.4K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3
HY-NBH06025.4K-OH	SS04045FS	SS0406F	SS0811R-OH	SS0806F-OH	SS0806F	SS0605SC	LW-2	LW-4*104	LW-3

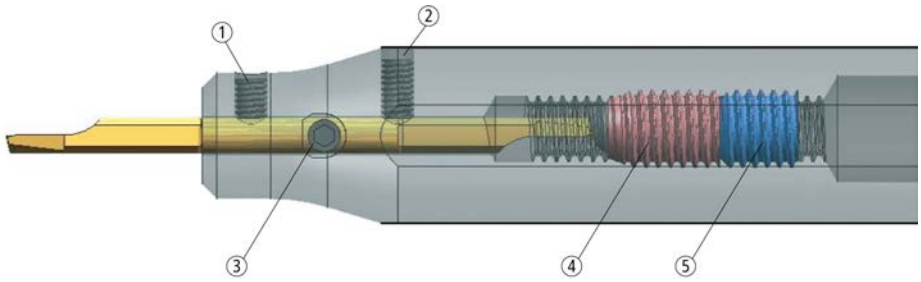
Sleeve for Shaper Duo series (Adjustable overhang)

HY-NBH



Item Number	Hand	BD	DCB	DCB2	DCON	H	LF	L1	L2	L3	Applicable insert bar	
		inch	inch	inch	inch	inch	inch	inch	inch	inch		
HY-NBH02016H	N	.433	.079	.394	.630	.591	3.937	.157	.591	.374	SBF../SHF..	SSP..
HY-NBH02516H	N	.453	.098	.394	.630	.591	3.937	.157	.591	.374	SBF../SHF..	SBT../SSP..
HY-NBH03016H	N	.472	.118	.394	.630	.591	3.937	.157	.591	.374	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03516H	N	.492	.138	.394	.630	.591	3.937	.157	.787	.472	SBF../SHF..	SBT../SSP..
HY-NBH04016H	N	.512	.157	.394	.630	.591	3.937	.157	.787	.472	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05016H	N	.551	.197	.394	.630	.591	3.937	.157	.787	.472	SBF../SHF..	SBG../SBT../SSP..
HY-NBH02019K	N	.433	.079	.394	3/4	.709	4.921	.157	.591	.374	SBF../SHF..	SSP..
HY-NBH02519K	N	.453	.098	.394	3/4	.709	4.921	.157	.591	.374	SBF../SHF..	SBT../SSP..
HY-NBH03019K	N	.472	.118	.394	3/4	.709	4.921	.157	.591	.374	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03519K	N	.492	.138	.394	3/4	.709	4.921	.157	.787	.472	SBF../SHF..	SBT../SSP..
HY-NBH04019K	N	.512	.157	.394	3/4	.709	4.921	.157	.787	.472	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05019K	N	.551	.197	.394	3/4	.709	4.921	.157	.787	.472	SBF../SHF..	SBG../SBT../SSP..
HY-NBH02020K	N	.433	.079	.394	.787	.748	4.921	.157	.591	.374	SBF../SHF..	SSP..
HY-NBH02520K	N	.453	.098	.394	.787	.748	4.921	.157	.591	.374	SBF../SHF..	SBT../SSP..
HY-NBH03020K	N	.472	.118	.394	.787	.748	4.921	.157	.591	.374	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03520K	N	.492	.138	.394	.787	.748	4.921	.157	.787	.472	SBF../SHF..	SBT../SSP..
HY-NBH04020K	N	.512	.157	.394	.787	.748	4.921	.157	.787	.472	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05020K	N	.551	.197	.394	.787	.748	4.921	.157	.787	.472	SBF../SHF..	SBG../SBT../SSP..
HY-NBH02022K	N	.433	.079	.394	.866	.827	4.921	.157	.591	.374	SBF../SHF..	SSP..
HY-NBH02522K	N	.453	.098	.394	.866	.827	4.921	.157	.591	.374	SBF../SHF..	SBT../SSP..
HY-NBH03022K	N	.472	.118	.394	.866	.827	4.921	.157	.591	.374	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03522K	N	.492	.138	.394	.866	.827	4.921	.157	.787	.472	SBF../SHF..	SBT../SSP..
HY-NBH04022K	N	.512	.157	.394	.866	.827	4.921	.157	.787	.472	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05022K	N	.551	.197	.394	.866	.827	4.921	.157	.787	.472	SBF../SHF..	SBG../SBT../SSP..
HY-NBH02025K-MET	N	.433	.079	.394	.984	.945	4.921	.157	.591	.374	SBF../SHF..	SSP..
HY-NBH02525K-MET	N	.453	.098	.394	.984	.945	4.921	.157	.591	.374	SBF../SHF..	SBT../SSP..
HY-NBH03025K-MET	N	.472	.118	.394	.984	.945	4.921	.157	.591	.374	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03525K-MET	N	.492	.138	.394	.984	.945	4.921	.157	.787	.472	SBF../SHF..	SBT../SSP..
HY-NBH04025K-MET	N	.512	.157	.394	.984	.945	4.921	.157	.787	.472	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05025K-MET	N	.551	.197	.394	.984	.945	4.921	.157	.787	.472	SBF../SHF..	SBG../SBT../SSP..
HY-NBH02025K	N	.433	.079	.394	1.000	.945	4.921	.157	.591	.374	SBF../SHF..	SSP..
HY-NBH02525K	N	.453	.098	.394	1.000	.945	4.921	.157	.591	.374	SBF../SHF..	SBT../SSP..
HY-NBH03025K	N	.472	.118	.394	1.000	.945	4.921	.157	.591	.374	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH03525K	N	.492	.138	.394	1.000	.945	4.921	.157	.787	.472	SBF../SHF..	SBT../SSP..
HY-NBH04025K	N	.512	.157	.394	1.000	.945	4.921	.157	.787	.472	SBF../SHF../SBB..	SBG../SBT../SSP..
HY-NBH05025K	N	.551	.197	.394	1.000	.945	4.921	.157	.787	.472	SBF../SHF..	SBG../SBT../SSP..

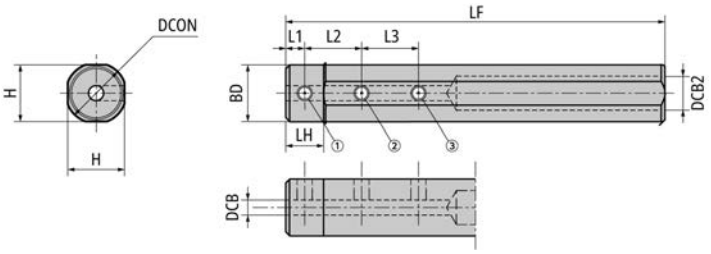
Spare Parts



Item Number	Clamp Screw			Overhang Adjustment		Wrench	
	①	②	③	④	⑤	①②③	④⑤
HY-NBH02016H	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02516H	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03016H	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03516H	SS04045FS	SS0404F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH04016H	SS04045FS	SS0404F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH05016H	SS04045FS	SS0404F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02019K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02519K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03019K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03519K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH04019K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH05019K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02020K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02520K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03020K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03520K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH04020K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH05020K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02022K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02522K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03022K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03522K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH04022K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH05022K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02025K-MET	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02525K-MET	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03025K-MET	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03525K-MET	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH04025K-MET	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH05025K-MET	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02025K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH02525K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03025K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH03525K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH04025K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104
HY-NBH05025K	SS04045FS	SS0406F	SS0404F	SS0812R	SS0808F	LW-2	LW-4*104

Sleeve for Shaper Duo series

NBH Shank diameter ø.625" - ø.750"

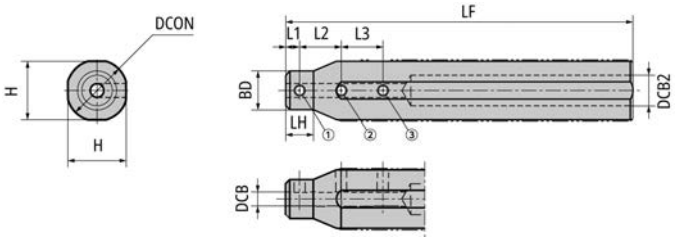


Item Number	Hand	BD	DCB	DCB2	DCON	H	LF	LH	L1	L2	L3	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
NBH02015H	N	.591	.079	.354	5/8	.591	3.937	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02515H	N	.591	.098	.354	5/8	.591	3.937	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03015H	N	.591	.118	.354	5/8	.591	3.937	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03515H	N	.591	.138	.354	5/8	.591	3.937	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04015H	N	.591	.157	.354	5/8	.591	3.937	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04515H	N	.591	.177	.354	5/8	.591	3.937	.394	.197	.591	.591	–	–
NBH05015H	N	.591	.197	.354	5/8	.591	3.937	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06015H	N	.591	.236	.354	5/8	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08015H	N	.591	.315	.354	5/8	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH02016H	N	.591	.079	.354	.630	.591	3.937	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02516H	N	.591	.098	.354	.630	.591	3.937	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03016H	N	.591	.118	.354	.630	.591	3.937	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03516H	N	.591	.138	.354	.630	.591	3.937	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04016H	N	.591	.157	.354	.630	.591	3.937	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04516H	N	.591	.177	.354	.630	.591	3.937	.394	.197	.591	.591	–	–
NBH05016H	N	.591	.197	.354	.630	.591	3.937	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06016H	N	.591	.236	.354	.630	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH07016H	N	.591	.276	.354	.630	.591	3.937	.394	.197	.787	.787	SBF../SHF..	–
NBH08016H	N	.591	.315	.354	.630	.591	3.937	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH02019K	N	.709	.079	.433	3/4	.709	4.921	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02519K	N	.709	.098	.433	3/4	.709	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03019K	N	.709	.118	.433	3/4	.709	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03519K	N	.709	.138	.433	3/4	.709	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04019K	N	.709	.157	.433	3/4	.709	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04519K	N	.709	.177	.433	3/4	.709	4.921	.394	.197	.591	.591	–	–
NBH05019K	N	.709	.197	.433	3/4	.709	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06019K	N	.709	.236	.433	3/4	.709	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH07019K	N	.709	.276	.433	3/4	.709	4.921	.394	.197	.787	.787	SBF../SHF..	–
NBH08019K	N	.709	.315	.433	3/4	.709	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH10019K	N	.709	.394	.433	3/4	.709	4.921	.394	.197	.787	.787	–	–

Spare Parts

Item Number	Clamp screw			Wrench (for Clamp screw)
	①	②	③	①②
NBH02015H	SS0406F	SS0406F	–	LW-2
NBH02515H	SS0406F	SS0406F	–	LW-2
NBH03015H	SS0404F	SS0404F	SS0404F	LW-2
NBH03515H	SS0404F	SS0404F	SS0404F	LW-2
NBH04015H	SS0404F	SS0404F	SS0404F	LW-2
NBH04515H	SS0404F	SS0404F	SS0404F	LW-2
NBH05015H	SS0404F	SS0404F	SS0404F	LW-2
NBH06015H	SS0404F	SS0404F	SS0404F	LW-2
NBH08015H	SS0403F	SS0403F	SS0403F	LW-2
NBH02016H	SS0406F	SS0406F	–	LW-2
NBH02516H	SS0406F	SS0406F	–	LW-2
NBH03016H	SS0404F	SS0404F	SS0404F	LW-2
NBH03516H	SS0404F	SS0404F	SS0404F	LW-2
NBH04016H	SS0404F	SS0404F	SS0404F	LW-2
NBH04516H	SS0404F	SS0404F	SS0404F	LW-2
NBH05016H	SS0404F	SS0404F	SS0404F	LW-2
NBH06016H	SS0404F	SS0404F	SS0404F	LW-2
NBH07016H	SS0403F	SS0404F	SS0404F	LW-2
NBH08016H	SS0403F	SS0403F	SS0403F	LW-2
NBH02019K	SS0408F	SS0408F	–	LW-2
NBH02519K	SS0408F	SS0408F	–	LW-2
NBH03019K	SS0406F	SS0406F	SS0406F	LW-2
NBH03519K	SS0406F	SS0406F	SS0406F	LW-2
NBH04019K	SS0406F	SS0406F	SS0406F	LW-2
NBH04519K	SS0406F	SS0406F	SS0406F	LW-2
NBH05019K	SS0406F	SS0406F	SS0406F	LW-2
NBH06019K	SS0406F	SS0406F	SS0406F	LW-2
NBH07019K	SS0404F	SS0404F	SS0404F	LW-2
NBH08019K	SS0404F	SS0404F	SS0404F	LW-2
NBH10019K	SS0403F	SS0404F	SS0404F	LW-2

NBH Shank diameter ⌀.787" - ⌀1.260"



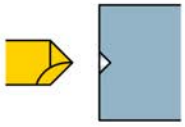
Item Number	Hand	BD	DCB	DCB2	DCON	H	LF	LH	L1	L2	L3	Insert Gage	
		inch	inch	inch	inch	inch	inch	inch	inch	inch	inch		
NBH02020K	N	.433	.079	.433	.787	.748	4.921	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02520K	N	.433	.098	.433	.787	.748	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03020K	N	.472	.118	.433	.787	.748	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03520K	N	.472	.138	.433	.787	.748	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04020K	N	.512	.157	.433	.787	.748	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04520K	N	.512	.177	.433	.787	.748	4.921	.394	.197	.591	.591	–	–
NBH05020K	N	.551	.197	.433	.787	.748	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06020K	N	.591	.236	.433	.787	.748	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH07020K	N	.630	.276	.433	.787	.748	4.921	.394	.197	.787	.787	SBF../SHF..	–
NBH08020K	N	.669	.315	.433	.787	.748	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH10020K	N	.748	.394	.433	.787	.748	4.921	.394	.197	.787	.787	–	–
NBH12020K	N	.748	.472	.551	.787	.748	4.921	.394	.197	.984	.984	–	–
NBH02022K	N	.433	.079	.433	.866	.827	4.921	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02522K	N	.433	.098	.433	.866	.827	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03022K	N	.472	.118	.433	.866	.827	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03522K	N	.472	.138	.433	.866	.827	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04022K	N	.512	.157	.433	.866	.827	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04522K	N	.512	.177	.433	.866	.827	4.921	.394	.197	.591	.591	–	–
NBH05022K	N	.551	.197	.433	.866	.827	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06022K	N	.591	.236	.433	.866	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH07022K	N	.630	.276	.433	.866	.827	4.921	.394	.197	.787	.787	SBF../SHF..	–
NBH08022K	N	.669	.315	.433	.866	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH10022K	N	.748	.394	.433	.866	.827	4.921	.394	.197	.787	.787	–	–
NBH12022K	N	.827	.472	.551	.866	.827	4.921	.394	.197	.984	.984	–	–
NBH02023K	N	.433	.079	.433	.906	.827	4.921	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02523K	N	.433	.098	.433	.906	.827	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03023K	N	.472	.118	.433	.906	.827	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03523K	N	.472	.138	.433	.906	.827	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04023K	N	.512	.157	.433	.906	.827	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04523K	N	.512	.177	.433	.906	.827	4.921	.394	.197	.591	.591	–	–
NBH05023K	N	.551	.197	.433	.906	.827	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06023K	N	.591	.236	.433	.906	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH08023K	N	.669	.315	.433	.906	.827	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH10023K	N	.748	.394	.433	.906	.827	4.921	.394	.197	.787	.787	–	–
NBH12023K	N	.827	.472	.551	.906	.827	4.921	.394	.197	.984	.984	–	–
NBH02025K-MET	N	.433	.079	.433	.984	.945	4.921	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02525K-MET	N	.433	.098	.433	.984	.945	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03025K-MET	N	.472	.118	.433	.984	.945	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03525K-MET	N	.472	.138	.433	.984	.945	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04025K-MET	N	.512	.157	.433	.984	.945	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04525K-MET	N	.512	.177	.433	.984	.945	4.921	.394	.197	.591	.591	–	–
NBH05025K-MET	N	.551	.197	.433	.984	.945	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06025K-MET	N	.591	.236	.433	.984	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH07025K-MET	N	.630	.276	.433	.984	.945	4.921	.394	.197	.787	.787	SBF../SHF..	–
NBH08025K-MET	N	.669	.315	.433	.984	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH10025K-MET	N	.748	.394	.433	.984	.945	4.921	.394	.197	.787	.787	–	–
NBH12025K-MET	N	.827	.472	.551	.984	.945	4.921	.394	.197	.984	.984	–	–
NBH02025K	N	.433	.079	.433	1.000	.945	4.921	.394	.197	.394	–	SBF../SHF..	SSP..
NBH02525K	N	.433	.098	.433	1.000	.945	4.921	.394	.197	.394	–	SBF../SHF..	SBT../SSP..
NBH03025K	N	.472	.118	.433	1.000	.945	4.921	.394	.197	.394	.394	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH03525K	N	.472	.138	.433	1.000	.945	4.921	.394	.197	.394	.394	SBF../SHF..	SBT../SSP..
NBH04025K	N	.512	.157	.433	1.000	.945	4.921	.394	.197	.591	.591	SBF../SHF../SBB..	SBG../SBT../SSP..
NBH04525K	N	.512	.177	.433	1.000	.945	4.921	.394	.197	.591	.591	–	–
NBH05025K	N	.551	.197	.433	1.000	.945	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06025K	N	.591	.236	.433	1.000	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH07025K	N	.630	.276	.433	1.000	.945	4.921	.394	.197	.787	.787	SBF../SHF..	–
NBH08025K	N	.669	.315	.433	1.000	.945	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH10025K	N	.748	.394	.433	1.000	.945	4.921	.394	.197	.787	.787	–	–
NBH12025K	N	.827	.472	.551	1.000	.945	4.921	.394	.197	.984	.984	–	–
NBH04532K	N	.512	.177	.433	1.260	1.181	4.921	.394	.197	.591	.591	–	–
NBH05032K	N	.551	.197	.433	1.260	1.181	4.921	.394	.197	.591	.591	SBF../SHF..	SBG../SBT../SSP..
NBH06032K	N	.591	.236	.433	1.260	1.181	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SBT../SSP..
NBH07032K	N	.630	.276	.433	1.260	1.181	4.921	.394	.197	.787	.787	SBF../SHF..	–
NBH08032K	N	.669	.315	.433	1.260	1.181	4.921	.394	.197	.787	.787	SBF../SHF..	SBG../SFG../SSP..
NBH10032K	N	.748	.394	.433	1.260	1.181	4.921	.394	.197	.787	.787	–	–
NBH12032K	N	.827	.472	.551	1.260	1.181	4.921	.394	.197	.984	.984	–	–
NBH14032K	N	.906	.551	.630	1.260	1.181	4.921	.394	.197	.984	.984	–	–
NBH16032K	N	.984	.630	.709	1.260	1.181	4.921	.394	.197	.984	.984	–	–

Spare Parts

Item Number	Clamp screw			Wrench (for Clamp screw)
	①	②	③	①②
NBH02020K	SS0404F	SS0404F	–	LW-2
NBH02520K	SS0404F	SS0404F	–	LW-2
NBH03020K	SS0404F	SS0404F	SS0406F	LW-2
NBH03520K	SS0404F	SS0404F	SS0406F	LW-2
NBH04020K	SS0404F	SS0406F	SS0406F	LW-2
NBH04520K	SS0404F	SS0406F	SS0406F	LW-2
NBH05020K	SS0404F	SS0406F	SS0406F	LW-2
NBH06020K	SS0404F	SS0406F	SS0406F	LW-2
NBH07020K	SS0404F	SS0406F	SS0406F	LW-2
NBH08020K	SS0404F	SS0404F	SS0404F	LW-2
NBH10020K	SS0404F	SS0404F	SS0404F	LW-2
NBH12020K	SS0403F	SS0403F	SS0403F	LW-2
NBH02022K	SS0404F	SS0406F	–	LW-2
NBH02522K	SS0404F	SS0406F	–	LW-2
NBH03022K	SS0404F	SS0406F	SS0408F	LW-2
NBH03522K	SS0404F	SS0406F	SS0406F	LW-2
NBH04022K	SS0404F	SS0406F	SS0406F	LW-2
NBH04522K	SS0404F	SS0406F	SS0406F	LW-2
NBH05022K	SS0404F	SS0406F	SS0406F	LW-2
NBH06022K	SS0404F	SS0406F	SS0406F	LW-2
NBH07022K	SS0404F	SS0406F	SS0406F	LW-2
NBH08022K	SS0404F	SS0406F	SS0406F	LW-2
NBH10022K	SS0404F	SS0404F	SS0404F	LW-2
NBH12022K	SS0404F	SS0404F	SS0404F	LW-2
NBH02023K	SS0404F	SS0406F	–	LW-2
NBH02523K	SS0404F	SS0406F	–	LW-2
NBH03023K	SS0404F	SS0406F	SS0408F	LW-2
NBH03523K	SS0404F	SS0406F	SS0406F	LW-2
NBH04023K	SS0404F	SS0406F	SS0406F	LW-2
NBH04523K	SS0404F	SS0406F	SS0406F	LW-2
NBH05023K	SS0404F	SS0406F	SS0406F	LW-2
NBH06023K	SS0404F	SS0406F	SS0406F	LW-2
NBH08023K	SS0404F	SS0406F	SS0406F	LW-2
NBH10023K	SS0404F	SS0404F	SS0404F	LW-2
NBH12023K	SS0404F	SS0404F	SS0404F	LW-2
NBH02025K-MET	SS0404F	SS0406F	–	LW-2
NBH02525K-MET	SS0404F	SS0406F	–	LW-2
NBH03025K-MET	SS0404F	SS0406F	SS0408F	LW-2
NBH03525K-MET	SS0404F	SS0406F	SS0408F	LW-2
NBH04025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH04525K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH05025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH06025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH07025K-MET	SS0404F	SS0408F	SS0408F	LW-2
NBH08025K-MET	SS0404F	SS0406F	SS0406F	LW-2
NBH10025K-MET	SS0404F	SS0406F	SS0406F	LW-2
NBH12025K-MET	SS0404F	SS0404F	SS0404F	LW-2
NBH02025K	SS0404F	SS0406F	–	LW-2
NBH02525K	SS0404F	SS0406F	–	LW-2
NBH03025K	SS0404F	SS0406F	SS0408F	LW-2
NBH03525K	SS0404F	SS0406F	SS0408F	LW-2
NBH04025K	SS0404F	SS0408F	SS0408F	LW-2
NBH04525K	SS0404F	SS0408F	SS0408F	LW-2
NBH05025K	SS0404F	SS0408F	SS0408F	LW-2
NBH06025K	SS0404F	SS0408F	SS0408F	LW-2
NBH07025K	SS0404F	SS0408F	SS0408F	LW-2
NBH08025K	SS0404F	SS0406F	SS0406F	LW-2
NBH10025K	SS0404F	SS0406F	SS0406F	LW-2
NBH12025K	SS0404F	SS0404F	SS0404F	LW-2
NBH04532K	SS0404F	SS0408F	SS0408F	LW-2
NBH05032K	SS0404F	SS0408F	SS0408F	LW-2
NBH06032K	SS0404F	SS0408F	SS0408F	LW-2
NBH07032K	SS0404F	SS0408F	SS0408F	LW-2
NBH08032K	SS0404F	SS0408F	SS0408F	LW-2
NBH10032K	SS0404F	SS0408F	SS0408F	LW-2
NBH12032K	SS0404F	SS0406F	SS0406F	LW-2
NBH14032K	SS0504	SS0506	SS0506	LW-2
NBH16032K	SS0504	SS0506	SS0506	LW-2

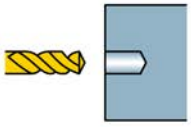
Machining Procedure

① Center drilling



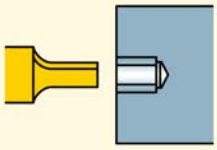
Make a center hole which is smaller than pilot hole drill.

② Drilling (Pilot hole)



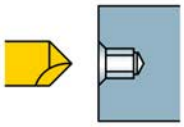
Select a drill with same or smaller (0 ~ -0.1mm) dia. as AF and machine a bit deeper because burrs may cause chipping on shaper insert

③ Shaper tool



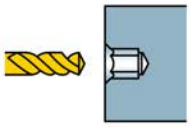
Machine socket rotating 60 degrees 6 times

④ Chamfering



Chamfer with the same pilot hole drill as ①

⑤ Deburring



Finish and deburr with the same drill as in process②
☆Reduce cutting conditions due to heavy interruption

SHAPER DUO Process Chart -Hexalobular-

Socket Size	Tool	Pilot bore Dia. (mm)	Starting" X" position (mm)	Final" X" position (mm)	Number of passes		Estimated cycle time*		
					Roughing pass 0.025mm	Finishing pass 0.005mm	ISO10664 Standard depth of Hexalobular hole (mm)	Whole process ①-⑤	Shaper process ③
T6	**SSP050N25T06**	1.15	1.14	1.75	13	1	1.82	51 sec	23.2 sec
T7	**SSP050N31T07**	1.38	1.35	2.06	15	1	2.44	59 sec	28.2 sec
T8	**SSP050N36T08**	1.62	1.59	2.40	17	1	3.05	67 sec	33.8 sec
T10	**SSP050N41T10**	1.92	1.89	2.80	19	1	3.56	75 sec	39.5 sec
T15	**SSP050N43T15**	2.3	2.29	3.35	22	1	3.81	84 sec	46.2 sec
T20	**SSP050N46T20**	2.71	2.69	3.95	26	1	4.07	94 sec	55.4 sec
T25	**SSP050N50T25**	3.13	3.09	4.50	29	1	4.45	105 sec	63.8 sec
T27	**SSP05S0N55T27**	3.52	3.51	5.07	32	1	4.70	115 sec	71.8 sec
T30	**SSP050N55T30**	3.91	3.89	5.60	35	1	4.95	125 sec	80.2 sec

*Using carbide drills *Shaper cutting conditions Feed: 3000mm/min Depth of cut : Roughing 0.025mm / Finishing 0.005mm

SHAPER DUO Process Chart -Hexagonal-

HEX Standard	Tool	Pilot bore Dia. (mm)	Starting" X" position (mm)	Final" X" position (mm)	Number of passes		Estimated cycle time*		
					Roughing pass 0.025mm	Finishing pass 0.005mm	ISO 2936 standard depth of Hex hole (mm)	Whole process ①-⑤	Shaper process ③
HEX 1.5	**SSP020N1130H**	1.5	1.47	1.73	6	1	2	39 sec	14 sec
HEX 2.0	**SSP020N1430H**	2.0	1.95	2.31	8	1	2.5	44 sec	16 sec
HEX 2.5	**SSP030N1940H**	2.5	2.48	2.89	9	1	3	50 sec	20 sec
HEX 3.0	**SSP030N1940H**	3.0	2.95	3.46	11	1	3.5	55 sec	23 sec
HEX 4.0	**SSP040N2450H**	4.0	3.96	4.62	14	1	5	73 sec	33 sec
HEX 5.0	**SSP050N3260H**	5.0	4.96	5.77	17	1	6	90 sec	46 sec
HEX 6.0	**SSP060N42120H**	6.0	5.97	6.93	20	1	8	117 sec	63 sec
HEX 8.0	**SSP080N62160H**	8.0	7.98	9.24	26	1	10	155 sec	92 sec

*Using carbide drills *Shaper cutting conditions Feed: 3000mm/min Depth of cut : Roughing 0.025mm / Finishing 0.005mm

Recommended cutting conditions

Feed : 120IPM (F1000 - F4000 mm/min) Depth of Cut : Roughing .0010"(0.025mm) / Finishing .0002"(0.005mm)

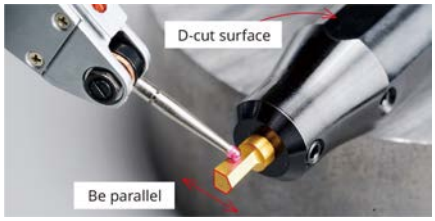
Precautions when replacing the insert bar

The tool nose position dimensions (HF2) vary. Check the dimensions of the cutting tool after changing tools or indexing insert bar.

SHAPER DUO Set-up Instructions -Hexagonal

Outside machine

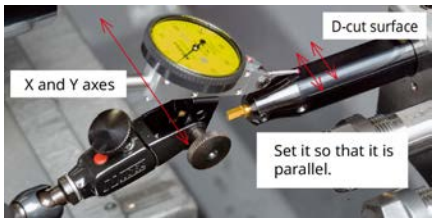
①



- Set the insert bar in the sleeve and check the parallelism of the flat portion of the sleeve and the insert bar.
- Minimize the overhang of the insert.

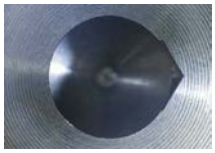
Inside machine

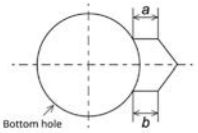
②



- Set the sleeve into the tool post and make sure the sleeve is set parallel.
- Minimize sleeve overhang.

③



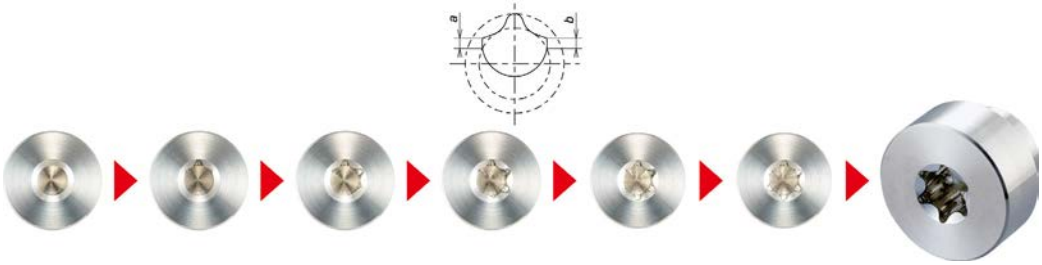


- Increase the number of machining passes with smaller depth of cut if the insert chips with large depth of cut.
  (.001"(0.025mm)×5pass is recommended)
  No chamfering process is required for measuring purpose.
- Measure the length of both [a] and [b] with comparator or magnifier.
- Adjust centerline height by rotating the sleeve until you get the same length for [a] and [b].(The difference should be less than .0008"(0.02mm))
  *If the straight is not seen with increased passes, you need to reset the insert and the sleeve.Please make sure both the insert and the sleeve are set up correctly.

④ **Machine Hexagonal shape**

***Run full HEX machining program.**

Machining hexalobular shape is basically the same as hexagon socket



Important Note for Insert Set-up

When using the STICK DUO HYPER series, it is important that the insert is installed and oriented so the bar flat is lined up with the clamp screws. If installed in the wrong position, insert edge chipping may occur due to interference with the positioning and clamping screws. See diagram below.

Machining Program Code Explanation

Important: The programming codes and values will depend on the machine brands.For details, please contact the machine manufacturer.
Example machining piece : Hexagon socket dimensions
: AF 3.0mm, Diagonal 3.46mm, Socket depth 3.5mm, Pilot drill diameter ϕ3.0mm
DOC : Roughing 0.025mm / Finishing 0.005mm
Insert bar : TM4 SSP030N1940H

■ Programming tips

- Make a program considering final "X"position.

#1 Final " X "position : 3.46mm (AF)
#2 Finishing position of roughing : 3.46−0.01 (Finishing) =3.45mm
#3 Calculate total DOC for roughing : 3.45−3.0 (Pilot hole) = 0.45mm
#4 Determine number of cuts : 0.45÷0.05 (DOC for Dia.)= 9.0 + 2 (round down to whole number and add " 2" for program adjustment)
→ Roughing sequence runs 11 times
#5 Set starting point : 3.45−(0.05×(11−1)) = 2.95mm : must subtract by "1" for program adjustment

Main program

```
☆:Rear spindle rotation stop
☆:Back spindle indexing  0°  ·····①
T○○○○(Shaper)
G50  U-1.5  ·····②
G0  X2.95  Z-2.0  T○○  ·····③
☆:Sub-program call (○○○①) Repeat 11 times  ·····④
☆:Sub-program call (○○○②)  ·····⑤

☆Back spindle indexing  60°  ·····①
G0  X2.95  Z-2.0
☆:Sub-program call (○○○①) Repeat 11 times  ·····④
☆:Sub-program call (○○○②)  ·····⑤

☆:Back spindle indexing  120°  ·····①
G0  X2.95  Z-2.0
☆:Sub-program call (○○○①) Repeat 11 times  ·····④
☆:Sub-program call (○○○②)  ·····⑤

☆:Back spindle indexing  180°  ·····①
G0  X2.95  Z-2.0
☆:Sub-program call (○○○①) Repeat 11 times  ·····④
☆:Sub-program call (○○○②)  ·····⑤

☆:Back spindle indexing  240°  ·····①
G0  X2.95  Z-2.0
☆:Sub-program call (○○○①) Repeat 11 times  ·····④
☆:Sub-program call (○○○②)  ·····⑤

☆:Back spindle indexing  300°  ·····①
G0  X2.95  Z-2.0
☆:Sub-program call (○○○①) Repeat 11 times  ·····④
☆:Sub-program call (○○○②)  ·····⑤

☆:Spindle indexing release
G0  Z-2.0
G50  U-1.5
G0  U0  W0  T0
M1
```

Sub-program ①

```
N○○○①  (Roughing)
G4  U0.02  ·····⑥
G98  G1  Z3.5  F3000  ·····⑦
G4  U0.02
U-0.2  W-0.018  ·····⑧
G4  U0.02
G0  Z-2.0
G4  U0.02
U0.25  ·····⑨
M99
```

Sub-program ②

```
N○○○②  (Finishing)
G98  G1  X3.46  Z-2.0  F1000
G4  U0.02
Z3.5  F3000
G4  U0.02
U-0.2  W-0.018
G4  U0.02
G0  Z-2.0
M99
```

☆:Enter the program corresponding to your machine.

①=Index the sub-spindle 6 times in 60 degree increments.

②=Specify the coordinate system shift command (in X axis direction) for the tool.
[2 x HF2 ; where HF2 is tool dimension located in the catalog].
* A positive direction shift is recommended for easier programming.

③=Execute the positioning of the tool.
- X position should be smaller than pilot drill diameter.
- Z position should be offset 2.0 mm from material to achieve program feed rate.

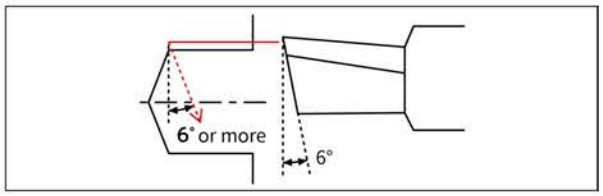
④=Go to the Sub-Program #1.
- Sequence runs 11 times. First cutting point X2.95 and final cutting point X3.45, with 0.05 DOC (for diameter) each time.

⑤=Go to the Sub-Program #2, for finishing sequence.
- Finishing operation with 0.005mm DOC (X 3.46) is recommended for better surface finish.

⑥=Specify dwell time. This allows the program and machine to stay synchronized.

⑦=Cut into part 3.5mm. F3000 is recommended feed to be used for most materials; including Titanium Alloy and Stainless Steel.

⑧=This code backs off the tool with an angle greater than K5 degrees (10 degrees used in example).



⑨=Return to the X position + 0.05mm (the DOC for diameter).

Hexagon Socket Programming Code Examples from Machine Builders in Metric

Important: The programming codes and values will depend on the machine brands.For details, please contact to the machine manufactures.
Example machining piece : Hexagon socket dimensions
: AF 3.0mm, Diagonal 3.46mm, Socket depth 3.5mm, Pilot drill diameter ϕ3.0mm
DOC : Roughing 0.025mm / Finishing 0.005mm
Insert bar : TM4 SSP030N1940H

■CITIZEN

Main program

```
M25
M78  S0  ·····①
T○○○○(Shaper)
G50  U-1.5  ·····②
G0  X2.95  Z-2.0  T○○  ·····③
M98  P2100  L11  ·····④
M98  P2200  ·····⑤

M78  S60  ·····①
G0  X2.95  Z-2.0
M98  P2100  L11
M98  P2200
```

《A》

Repeat《A》 at S120, S180, S240, S300 with indexing at 60° increments

```
M20
G0  Z-2.0
G50  U-1.5
G0  U0  W0  T0
M1
```

Sub-program①

```
N2100  (Roughing)
G4  U0.02  ·····⑥
G98  G1  Z3.5  F3000  ·····⑦
G4  U0.02
U-0.2  W-0.018  ·····⑧
G4  U0.02
G0  Z-2.0
G4  U0.02
U0.25  ·····⑨
M99
```

Sub-program②

```
N2200  (Finishing)
G98  G1  X3.46  Z-2.0  F1000
G4  U0.02
Z3.5  F3000
G4  U0.02
U-0.2  W-0.018
G4  U0.02
G0  Z-2.0
M99
```

■STAR

Main program

```
M25
T○○○○ (Shaper)
G50  U-1.5  ·····②
M8
G0  X2.95  Z-2.0  C0  T○○  ·····①③
M98  P2100  L11  ·····④
M98  P2200  ·····⑤

G0  C60.0  ·····①
G0  X2.95  Z-2.0
M98  P2100  L11
M98  P2200
```

《A》

Repeat《A》 at C120, C180, C240, C300 with indexing at 60° increments

```
G0  Z-2.0
G50  U-1.5
G0  T0
G28  W0
M1
```

Sub-program①

```
O2100  (Roughing)
G4  U0.02  ·····⑥
G98  G1  Z3.5  F3000  ·····⑦
G4  U0.02
U-0.2  W-0.018  ·····⑧
G4  U0.02
G0  Z-2.0
G4  U0.02
U0.25  ·····⑨
M99
```

Sub-program②

```
O2200  (Finishing)
G98  G1  X3.46  Z-2.0  F1000
G4  U0.02
Z3.5  F3000
G4  U0.02
U-0.2  W-0.018
G4  U0.02
G0  Z-2.0
M99
```

■TSUGAMI

Main program

```
M105
M150
G28  H0  ·····①
M182
T○○○○ (Shaper)
G50  U-1.5  ·····②
G0  X2.95  Z2.0  T○○  ·····③
M98  P2100  L11  ·····④
M98  P2200  ·····⑤
M183

G0  C60  ·····①
M182
G0  X2.95  Z2.0
M98  P2100  L11
M98  P2200
M183
```

《A》

Repeat《A》 at C120, C180, C240, C300 with indexing at 60° increments

```
M151
G0  Z2.0
G50  U-1.5
G0  U0  W0  T0
M1
```

Sub-program①

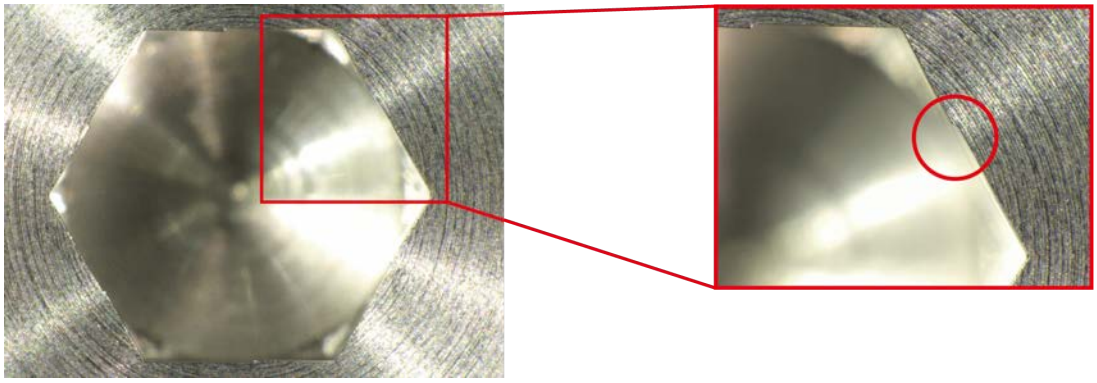
```
O2100  (Roughing)
G4  U0.02  ·····⑥
G98  G1  Z-3.5  F3000  ·····⑦
G4  U0.02
U-0.2  W0.018  ·····⑧
G4  U0.02
G0  Z2.0
G4  U0.02
U0.25  ·····⑨
M99
```

Sub-program②

```
O2200  (Finishing)
G98  G1  X3.46  Z2.0  F1000
G4  U0.02
Z-3.5  F3000
G4  U0.02
U-0.2  W0.018
G4  U0.02
G0  Z2.0
M99
```

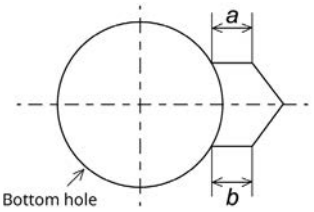
Troubleshooting

Problem: Step on sides

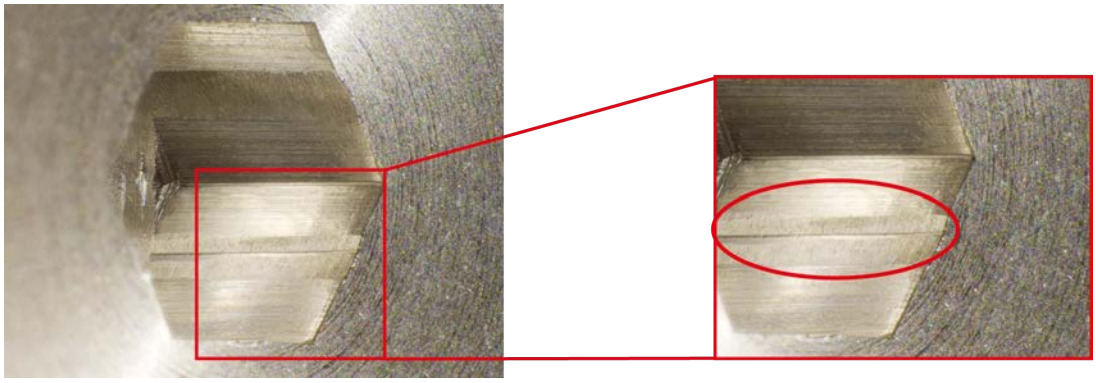


Cause: Incorrect tool set-up (Center-line shift)

Solution: Machine one angle and make sure both [a] and [b] lengths are identical, rotating the sleeve if necessary



Problem: Wall dented



Cause: Pilot hole remaining

Solution: Need pilot hole tool's offset

Problem: Wall tapered

Solution:

- Smaller depth of cut
- Less tool overhang

Problem: Chuck is slipping / Insert chipped

Solution:

- Run at 120 IPM (3000 mm/min) feed rate
- Smaller depth of cut

- 120 IPM (3000 mm/min) feed rate can cover most materials including Titanium alloy and Stainless steel.
- Too slow or too fast of a feed rate may cause excessive tool pressure for the workpiece and tool.

Endmill

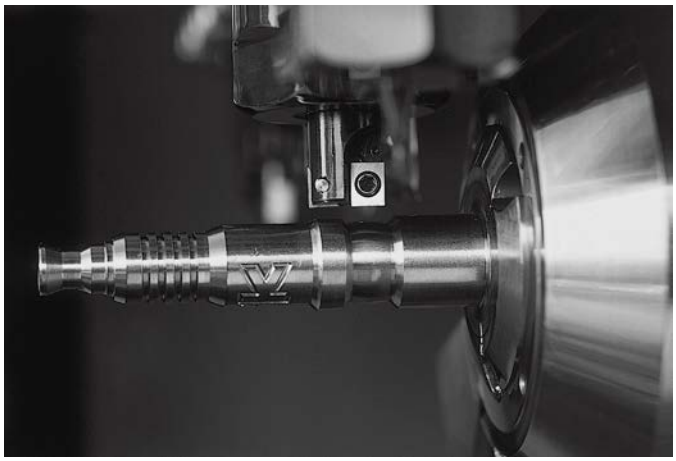
Product Lines	**X02**
Recommended Cutting Conditions	**X03**
RWEM.. series	**X04**
REZ.. series	**X05**
REL.. series	**X08**

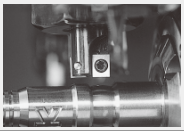
Product Lines

S-MILL / Solid Carbide Endmills

Series	Features	DC (inch)	CICT	APMX (inch)	Pages
RWEM.. series	Small diameter solid end mill • Original NTK design for sharpness and ease of use on automated lathes • Stable machining even with small-diameter machining that is easy to vibrate • A lineup of full-length dimensions optimized for Swiss CNC lathes	ø.080" - .394"	2,3,4 flute	- .236"	**X4**

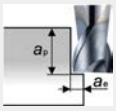
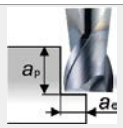
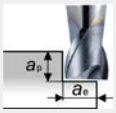
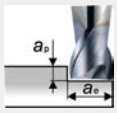
Indexable Endmills



Series	Features	DC (inch)	CICT	APMX (inch)	Pages
REZ.. series	Lead angle 90° • Can be used for right angle milling • Plunging and D-cuts using an insert with a center cutting edge • Slope milling is possible • Oversized head allows for machining close to guide bushing • Standard 45 degree lead angle end mill with indexable inserts	ø.315" - .787"	1,2,3 flute	- .209"	**X5**
REL.. series 	Lead angle 89° • Solid → Easy tool management with indexable inserts • No need to re-grind or re-coat which reduces tool costs • Fine grain carbide - PVD coated inserts enable three to five times faster cutting speeds compared to high-speed end mills	ø.394"	2 flute	- .209"	**X8**

Recommended Cutting Conditions

S-MILL / Solid Carbide Endmills

Flute	øDc (mm)	Carbon steel		Alloy steel		Stainless steel		 ae = øDc × 0.2		 ae = øDc × 0.5		 ae = øDc × 0.75		 ae = øDc × 0.9		ae = øDc	
		rpm	IPM	rpm	IPM	rpm	IPM	ap (inch)	ae (inch)	ap (inch)	ae (inch)	ap (inch)	ae (inch)	ap (inch)	ae (inch)	ap (inch)	
2 flute	2.0	14,300	9.1	11,100	7.1	10,300	5.5	≦.079	.016	≦.031	.039	≦.024	.059	≦.020	.071	≦.016	
	3.0	9,500	13.0	7,400	10.2	6,900	8.3	≦.118	.024	≦.047	.059	≦.035	.091	≦.028	.106	≦.024	
	4.0	7,200	15.4	5,600	11.8	5,200	9.4	≦.157	.031	≦.063	.079	≦.047	.118	≦.039	.142	≦.031	
	5.0	5,700	16.5	4,500	13.0	4,100	10.2	≦.197	.039	≦.079	.098	≦.059	.150	≦.047	.177	≦.039	
	6.0	4,800	17.3	3,700	13.4	3,400	10.6	≦.236	.047	≦.094	.118	≦.071	.177	≦.059	.213	≦.047	
	7.0	4,100	16.5	3,200	13.0	3,000	10.6	≦.236	.055	≦.110	.138	≦.083	.209	≦.067	.248	≦.055	
	8.0	3,600	16.1	2,800	12.6	2,600	9.8	≦.236	.063	≦.126	.157	≦.094	.236	≦.079	.283	≦.063	
	10.0	2,900	14.6	2,200	11.0	2,100	9.1	≦.236	.079	≦.157	.197	≦.118	.295	≦.098	.354	≦.079	
3 flute	3.0	9,500	15.4	7,400	12.2	6,900	9.8	≦.118	.315	≦.047	.059	≦.035	.091	≦.028	.106	≦.024	
	4.0	7,200	18.5	5,600	14.2	5,200	11.4	≦.157	.031	≦.063	.079	≦.047	.118	≦.039	.142	≦.031	
	5.0	5,700	19.7	4,500	15.7	4,100	12.2	≦.197	.039	≦.079	.098	≦.059	.150	≦.047	.177	≦.039	
	6.0	4,800	20.9	3,700	16.1	3,400	13.0	≦.236	.047	≦.094	.118	≦.071	.177	≦.059	.213	≦.047	
	7.0	4,100	20.1	3,200	15.7	3,000	12.6	≦.236	.055	≦.110	.138	≦.083	.209	≦.067	.248	≦.055	
	8.0	3,600	19.3	2,800	15.0	2,600	12.2	≦.236	.063	≦.126	.157	≦.094	.236	≦.079	.283	≦.063	
	10.0	2,900	17.3	2,200	13.0	2,100	11.0	≦.236	.079	≦.157	.197	≦.118	.295	≦.098	.354	≦.079	
4 flute	3.0	9,500	18.1	7,400	14.2	6,900	11.4	≦.118	.024	≦.047	.059	≦.035	.091	≦.028	.106	≦.024	
	4.0	7,200	21.3	5,600	16.5	5,200	13.4	≦.157	.031	≦.063	.079	≦.047	.118	≦.039	.142	≦.031	
	5.0	5,700	23.2	4,500	18.1	4,100	14.6	≦.197	.039	≦.079	.098	≦.059	.150	≦.047	.177	≦.039	
	6.0	4,800	24.4	3,700	18.9	3,400	15.0	≦.236	.047	≦.094	.118	≦.071	.177	≦.059	.213	≦.047	
	7.0	4,100	23.2	3,200	18.1	3,000	15.0	≦.236	.055	≦.110	.138	≦.083	.209	≦.067	.248	≦.055	
	8.0	3,600	22.4	2,800	17.3	2,600	14.2	≦.236	.063	≦.126	.157	≦.094	.236	≦.079	.283	≦.063	
	10.0	2,900	20.1	2,200	15.4	2,100	12.6	≦.236	.079	≦.157	.197	≦.118	.295	≦.098	.354	≦.079	

Cutting conditions (machine, work material...) affect surface finish and burr generation.
If cutting performance is not good with above cutting conditions, please adjust speed and feed by same ratio.

Indexable Endmills

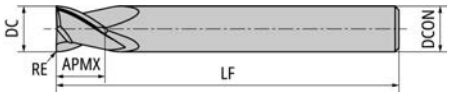
Work Material	Speed SFM	Axial Feed IPR	Depth of cut inch	Width of cut
Stainless	130 ~ 200	~ .0008	~ .079	- 50% of cutter diameter
Steel	260 ~ 400	~ .001	~ .118	- 50% of cutter diameter

S-MILL

RWEM.. series

RWEM-H2

No.1



No.2

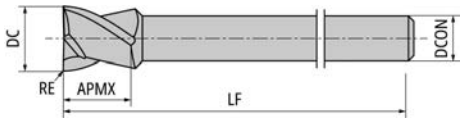
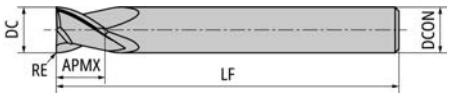


Figure	Item Number	NOF	APMX	DC	DCON	LF	RE	Carbide
			inch	inch	inch	inch	inch	AC3
1	**RWEM020H2R00S04**	2	.079	.079	.157	1.575	.000	●
1	**RWEM030H2R00S04**	2	.118	.118	.157	1.575	.000	●
1	**RWEM040H2R00S04**	2	.157	.157	.157	1.575	.000	●
1	**RWEM050H2R00S06**	2	.197	.197	.236	1.772	.000	●
1	**RWEM060H2R00S06**	2	.236	.236	.236	1.772	.000	●
1	**RWEM070H2R00S08**	2	.236	.276	.315	1.969	.000	●
2	**RWEM080H2R00S07**	2	.236	.315	.276	1.969	.000	●
1	**RWEM080H2R00S08**	2	.236	.315	.315	1.969	.000	●
2	**RWEM100H2R00S07**	2	.236	.394	.276	1.969	.000	●
1	**RWEM100H2R00S10**	2	.236	.394	.394	1.969	.000	●

RWEM-H3

No.1



No.2

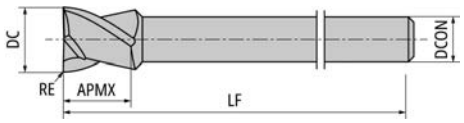
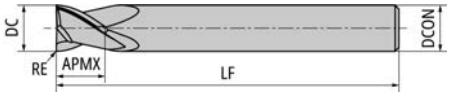


Figure	Item Number	NOF	APMX	DC	DCON	LF	RE	Carbide
			inch	inch	inch	inch	inch	AC3
1	**RWEM030H3R00S04**	3	.118	.118	.157	1.575	.000	●
1	**RWEM040H3R00S04**	3	.157	.157	.157	1.575	.000	●
1	**RWEM050H3R00S06**	3	.197	.197	.236	1.772	.000	●
1	**RWEM060H3R00S06**	3	.236	.236	.236	1.772	.000	●
1	**RWEM070H3R00S08**	3	.236	.276	.315	1.969	.000	●
2	**RWEM080H3R00S07**	3	.236	.315	.276	1.969	.000	●
1	**RWEM080H3R00S08**	3	.236	.315	.315	1.969	.000	●
2	**RWEM100H3R00S07**	3	.236	.394	.276	1.969	.000	●
1	**RWEM100H3R00S10**	3	.236	.394	.394	1.969	.000	●

RWEM-H4

No.1



No.2

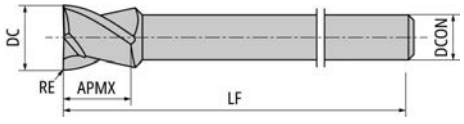
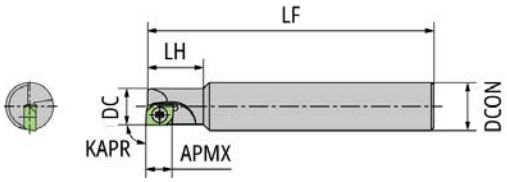


Figure	Item Number	NOF	APMX	DC	DCON	LF	RE	Carbide
			inch	inch	inch	inch	inch	AC3
1	**RWEM030H4R00S04**	4	.118	.118	.157	1.575	.000	●
1	**RWEM040H4R00S04**	4	.157	.157	.157	1.575	.000	●
1	**RWEM050H4R00S06**	4	.197	.197	.236	1.772	.000	●
1	**RWEM060H4R00S06**	4	.236	.236	.236	1.772	.000	●
1	**RWEM070H4R00S08**	4	.236	.276	.315	1.969	.000	●
2	**RWEM080H4R00S07**	4	.236	.315	.276	1.969	.000	●
1	**RWEM080H4R00S08**	4	.236	.315	.315	1.969	.000	●
2	**RWEM100H4R00S07**	4	.236	.394	.276	1.969	.000	●
1	**RWEM100H4R00S10**	4	.236	.394	.394	1.969	.000	●

Indexable Endmills

REZ.. series/Toolholders for Lead angle 90°

REZ-1R



● Diagram shows right-hand tool

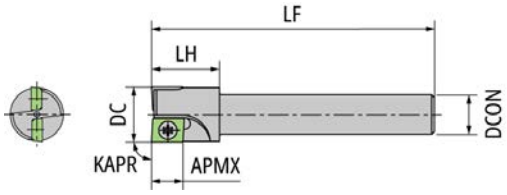
Item Number	Hand	APMX	CICT	DC	DCON	KAPR	LF	LH	Insert Gage
		inch		inch	inch	°	inch	inch	
REZ080C1R212	R	※.209"	1	.315	.394	90	2.362	.472	CZH04..
REZ100C1R218	R	※.209"	1	.394	.394	90	2.953	.472	CZH05..-141

※.157" for an insert with a center cutting edge
.138" for an insert CZH-BL
Note : The model number stamped on the actual holder is shortened due to space constraints.

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
REZ080C1R212	FSI02-2.2*4.0	T-07
REZ100C1R218	FSI02-2.2*4.3	T-07

REZ-2R



● Diagram shows right-hand tool

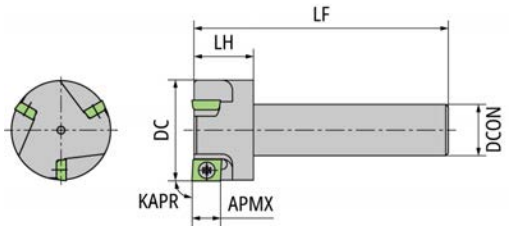
Item Number	Hand	APMX	CICT	DC	DCON	KAPR	LF	LH	Insert Gage
		inch		inch	inch	°	inch	inch	
REZ100B2R329	R	※.209"	2	.394	.197	90	1.575	.394	CZH04..
REZ100C2R133	R	※.209"	2	.394	.236	90	1.969	.472	CZH04..
REZ100C2R132	R	※.209"	2	.394	.276	90	1.969	.472	CZH04..
REZ100C2R141	R	※.209"	2	.394	.394	90	1.969	.472	CZH04..
REZ120C2R141	R	※.209"	2	.472	.394	90	1.969	.472	CZH04..
REZ140C2R141	R	※.209"	2	.551	.394	90	1.969	.472	CZH04..

※.157" for an insert with a center cutting edge
.138" for an insert CZH-BL
Note : The model number stamped on the actual holder is shortened due to space constraints.

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
REZ100B2R329	FSI02-2.2*4.3	T-07
REZ100C2R133	FSI02-2.2*4.3	T-07
REZ100C2R132	FSI02-2.2*4.3	T-07
REZ100C2R141	FSI02-2.2*4.3	T-07
REZ120C2R141	FSI02-2.2*4.3	T-07
REZ140C2R141	FSI02-2.2*4.3	T-07

REZ-3R for oversized head



● Diagram shows right-hand tool

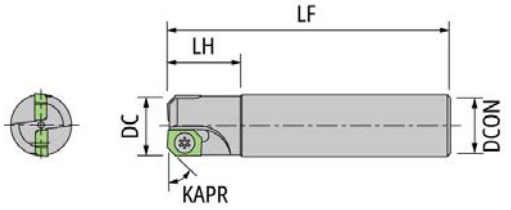
Item Number	Hand	APMX	CICT	DC	DCON	KAPR	LF	LH	Insert Gage
		inch		inch	inch	°	inch	inch	
REZ150B3R330	R	※.209"	3	.591	.197	90	1.575	.394	CZH04..
REZ200M3R319	R	※.209"	3	.787	.276	90	1.969	.472	CZH04..
REZ200M3R320	R	※.209"	3	.787	.394	90	1.969	.472	CZH04..

※.157" for an insert with a center cutting edge
.138" for an insert CZH-BL
Note : The model number stamped on the actual holder is shortened due to space constraints.

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
REZ150B3R330	FSI02-2.2*4.3	T-07
REZ200M3R319	FSI02-2.2*4.3	T-07
REZ200M3R320	FSI02-2.2*4.3	T-07

REZ-2R for Lead angle 45°



● Diagram shows right-hand tool

Item Number	Hand	CICT	DC	DCON	KAPR	LF	LH	Insert Gage	
			inch	inch	°	inch	inch		
REZ100C2R461	R	2	.394	.394	45	1.969	.472	CZH04..	CZH04..-C45
REZ100C2R466	R	2	.394	.276	45	1.969	.472	CZH04..	CZH04..-C45

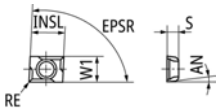
Note : The model number stamped on the actual holder is shortened due to space constraints.

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
REZ100C2R461	FSI02-2.2*4.3	T-07
REZ100C2R466	FSI02-2.2*4.3	T-07

REZ.. series/Insert Carbide

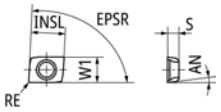
CZH-BL Less tool pressure with chipbreaker



● Diagram shows right-hand tool

Item Number	Chipbreaker	Center cutting edge	Wiper	AN	EPSR	INSL	RE	S	W1	Carbide	
										PVD	
				°	°	inch	inch	inch	inch	DM4	TM4
CZH04005CFR-BL	Yes	No	No	7	87	.219	.002	.074	.165	●	●
CZH0402CFR-BL	Yes	No	No	7	87	.219	.008	.074	.165	●	●

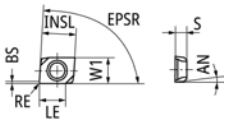
CZH-070



● Diagram shows right-hand tool

Item Number	Chipbreaker	Center cutting edge	Wiper	AN	EPSR	INSL	RE	S	W1	Carbide	
										PVD	
				°	°	inch	inch	inch	inch	DT4	ZM3
CZH04005CFR-070	No	Yes	No	7	87	.219	.002	.074	.165	●	●
CZH0402CFR-070	No	Yes	No	7	87	.219	.008	.074	.165	●	●

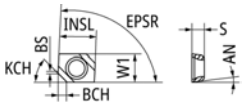
CZH-140/141



● Diagram shows right-hand tool

Item Number	Chipbreaker	Center cutting edge	Wiper	AN	BS	EPSR	INSL	LE	RE	S	W1	Carbide	
												PVD	
				°	inch	°	inch	inch	inch	inch	inch	DT4	ZM3
CZH04005CFR-140	No	Yes	Straight	7	.016	87	.219	.157	.002	.074	.165	●	●
CZH0402CFR-140	No	Yes	Straight	7	.016	87	.219	.157	.008	.074	.165	●	●
CZH05005CFR-141	No	Yes	Straight	10	.016	87	.208	.157	.002	.086	.219		●
CZH0502CFR-141	No	Yes	Straight	10	.016	87	.208	.157	.008	.086	.219		●

CZH-C45 for Lead angle 45°



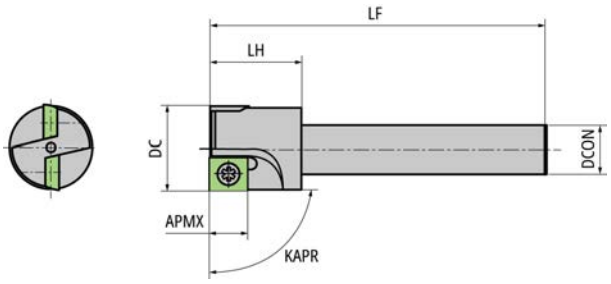
● Diagram shows right-hand tool

Item Number	Chipbreaker	Center cutting edge	Wiper	AN	BCH	BS	EPSR	INSL	KCH	S	W1	Carbide	
												PVD	
				°	inch	inch	°	inch	°	inch	inch	DT4	QM3
CZH0400CFR-C45	Yes	No	Straight	7	.053	.012	87	.219	45	.074	.165	●	●

Indexable Endmills

REL.. series/Toolholders for Lead angle 89°

REL-2R



● Diagram shows right-hand tool

Item Number	Hand	APMX	CICT	DC	DCON	KAPR	LF	LH	Insert Gage
				inch	inch	°	inch	inch	
REL100C2R106	R	.209	2	.394	.394	89	1.969	.472	CLH04..-045
REL100C2R107	R	.209	2	.394	.276	89	1.969	.472	CLH04..-045

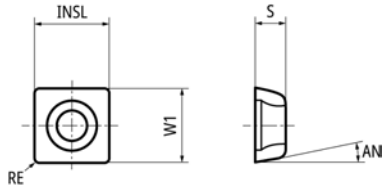
Note : The model number stamped on the actual holder is shortened due to space constraints.

Spare Parts

Item Number	Clamp screw	Wrench (for Clamp screw)
REL100C2R106	FSI02-2.2*4.3	T-07
REL100C2R107	FSI02-2.2*4.3	T-07

REL.. series/Insert Carbide

CLH-045



● Diagram shows right-hand tool

Item Number	Chipbreaker	Center cutting edge	Wiper	AN	INSL	RE	S	W1	Carbide
									PVD
				°	inch	inch	inch	inch	ZM3
CLH04005CFN-045	No	No	No	7	.219	.002	.074	.165	●
CLH0402CFN-045	No	No	No	7	.219	.008	.074	.165	●

Information

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List of Property Symbols Complying with ISO13399

ISO13399 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	chip breaker face count
CBP	chip breaker property
CBDP	connection bore depth
CBMD	chip breaker 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	work piece 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
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

ISO13399 Property Symbols	Content
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
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	chip breaker 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
M2	distance between the nominal inscribed circle and the corner of an insert that has the secondary included angle

ISO13399 Property Symbols	Content
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
REL	corner radius left hand
RER	corner radius right hand
RMPX	ramping angle maximum
RPMX	rotational speed maximum
S	insert thickness
S1	insert thickness total
SC	insert shape code
SDL	step diameter length
SIG	point angle
SSC	insert seat size code

ISO13399 Property Symbols	Content
SX	shank cross section shape code
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
WF2	distance between the cutting reference point and the front seating surface of a turning tool
WFS	functional width secondary
WT	weight of item
ZEFF	face effective cutting edge count
ZEFP	peripheral effective cutting edge count
ZNC	cutting edge center count
ZNF	face mounted insert count
ZNP	peripheral mounted insert count

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

Spare Parts - Wrenches

Standard Items

Package quantity : 5pc/case

Item Number	Appearance
CLR-13S	
CLR-15S	
RLR-20S	
LLR-25S	
LLR-25S-20*65	
LLR-28S	

Optional Items

Package quantity : 5pc/case

Item Number	Appearance
LLR-13S	
LLR-15S	
LLR-20S	

Driver type wrench for increased adaptability

Package quantity : 1pc/case

Item Number	Magnetic Driver Handle
XX2815-04	

Package quantity : 5pc/case

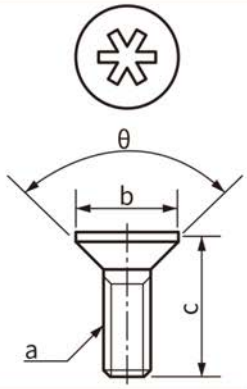
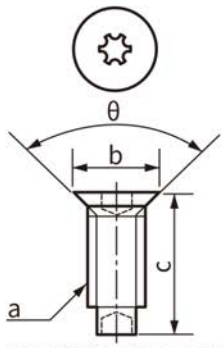
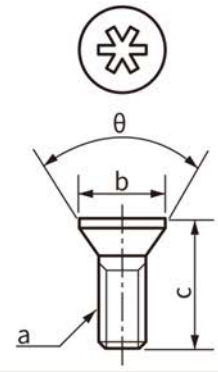
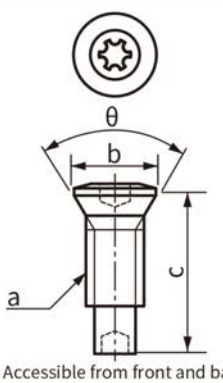
Item Number	Replaceable Bits
HLR-13S	
HLR-15S	
HLR-20S	
HLR-25S	

Driver type wrench kits

Package quantity : 1pc/case

Item Number	Contents
XX2815-04-135	XX2815-04 with HLR-13S
XX2815-04-155	XX2815-04 with HLR-15S
XX2815-04-20S	XX2815-04 with HLR-20S
XX2815-04-255	XX2815-04 with HLR-25S

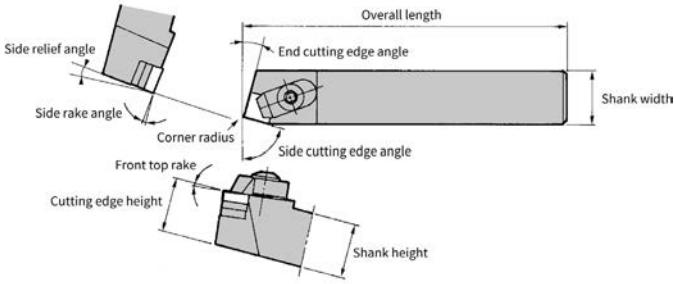
Clamp Screws and Wrenches

Clamp Screw		Dimension (mm)				Standard Wrench
Appearance	Item Number	a	b	c	θ (°)	Item Number
	LR-S-2×3.5	M2×P0.4	3.1	3.5	82	CLR-13S
	LR-S-2×3.7	M2×P0.4	3.1	3.7	82	
	LR-S-2×4.4	M2×P0.4	3.1	4.4	82	
	LR-S-2×5.5	M2×P0.4	3.0	5.5	90	
	LR-S-2.5×4.8	M2.5×P0.45	3.6	4.8	82	CLR-15S
	LR-S-2.5×5.5	M2.5×P0.45	3.6	5.5	82	
	LR-S-2.5×6	M2.5×P0.45	3.5	6.0	90	
	LR-S-2.5×6.8	M2.5×P0.45	3.5	6.8	90	
 Accessible from front and back	LR-S-3×5.8	M3×P0.5	4.1	5.8	90	RLR-20S
	LR-S-3×6.2 ※1	M3×P0.5	5.2	6.2	82	
	LR-S-3×7.8 ※1	M3×P0.5	4.0	7.8	90	
	LR-5-3.5×10.6 ※2	M3.5×P0.6	5.0	10.6	90	
	LR-S-4×5.8	M4×P0.7	5.8	6.0	82	
	LR-S-4×9	M4×P0.7	5.8	9.0	82	
	LR-S-4×10PW	M4×P0.7	5.8	10.0	90	CLR-15S
	LRIS-2×6	M2×P0.4	2.6	6.0	60	CLR-13S
	LRIS-2.2×6	M2.2×P0.45	3.15	6.0	60	
	LRIS-2.5×5	M2.5×P0.45	3.6	5.0	60	CLR-15S
	LRIS-2.5×7	M2.5×P0.45	3.6	7.0	60	
	LRIS-3×6	M3×P0.5	4.0	6.0	60	RLR-20S
	LRIS-3×8	M3×P0.5	4.2	8.0	60	
	LRIS-4×5	M4×P0.7	5.85	5.0	60	LLR-25S LLR-25S-20＊65
	LRIS-4×6	M4×P0.7	5.85	6.0	60	
	LRIS-4×8	M4×P0.7	5.85	8.0	60	
	LRIS-4×10	M4×P0.7	5.85	10.0	60	
	LRIS-4×12	M4×P0.7	5.85	12.0	60	
 Accessible from front and back	LRIS-5×10	M5×P0.8	7.0	9.5	60	LLR-28S
	LRIS-4×10PW	M4×P0.7	5.7	10.0	60	CLR-15S
	LRIS-4×12PW	M4×P0.7	5.7	12.0	60	

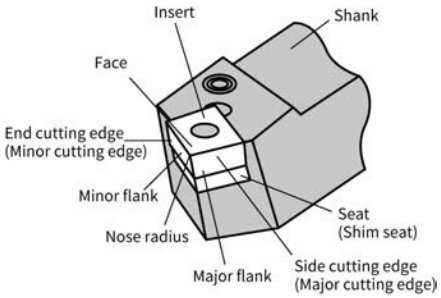
※1 Tightening Torque 15.9 lbs.in (1.8N.m)
※2 Tightening Torque 18.6 lbs.in (2.1N.m)

Turning Tool Terminology

Toolholder part names



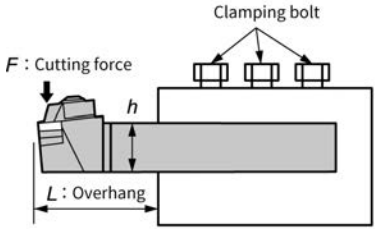
Part names of a cutting tool



Holder rigidity

Toolholder deflection

$$\delta = \frac{4 \times F \times L^3}{E \times b \times h^3} = \frac{4 \times k_c \times f \times L^3}{E \times b \times h^3}$$

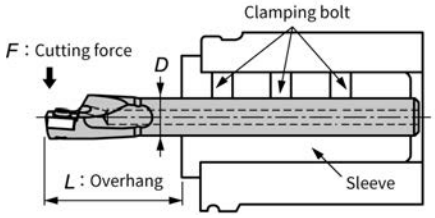


Symbol	Term	Unit
δ	Deflection amount	mm
b	Shank width	mm
h	Shank height	mm
E	Young's modulus	N/mm^2
a_p	Depth of cut	mm
f	Feed amount	mm/rev
k_c	Specific cutting force	N/mm^2
L	Overhang	mm
F	Cutting force	N

($F = k_c \times a_p \times f$)

Boring bar deflection

$$\delta = \frac{64 \times F \times L^3}{3 \times E \times \pi \times D^4} = \frac{64 \times k_c \times a_p \times f \times L^3}{3 \times E \times \pi \times D^4}$$



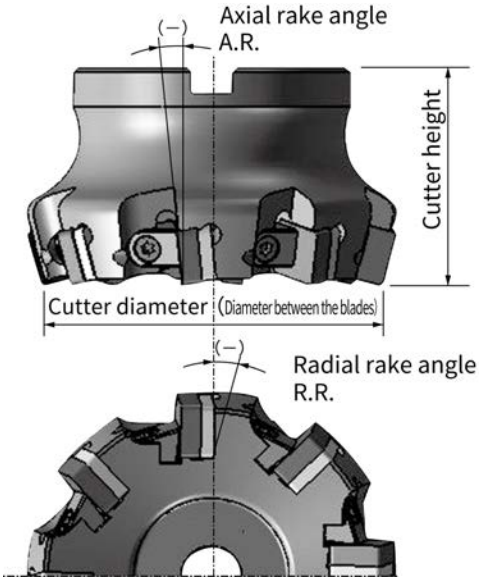
Symbol	Term	Unit
δ	Deflection amount	mm
D	Shank width	mm
E	Young's modulus	N/mm^2
a_p	Depth of cut	mm
f	Feed amount	mm/rev
k_c	Specific cutting force	N/mm^2
L	Overhang	mm
F	Cutting force	N

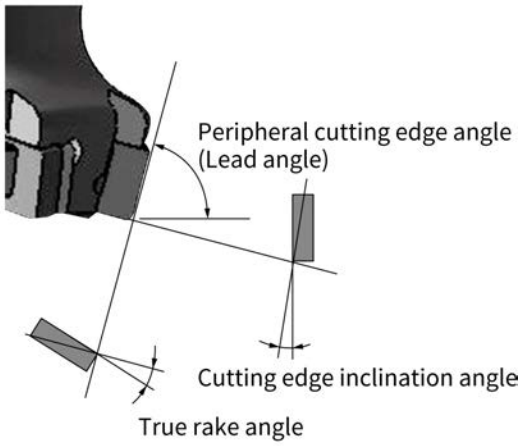
($F = k_c \times a_p \times f$)

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 Cutter Terminology

Milling cutter terminology





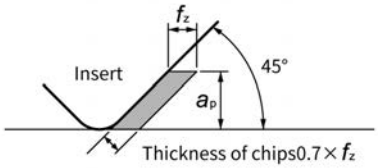
Functions of each cutting edge angle

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

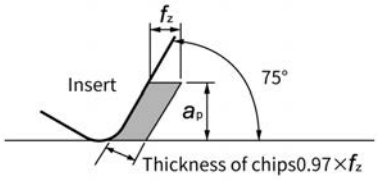
Functions of each angle

[Lead angle]: Relationship of this angle and chip thickness

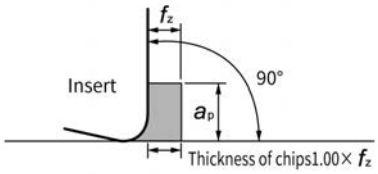
Lead angle : 45 degrees



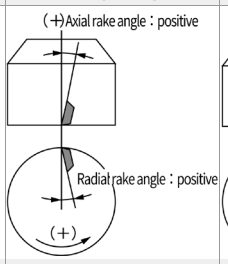
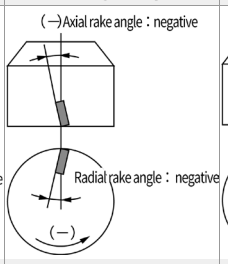
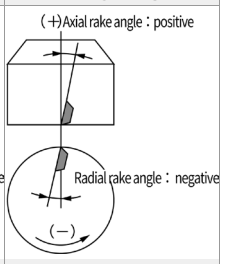
Lead angle : 75 degrees



Lead angle : 90 degrees

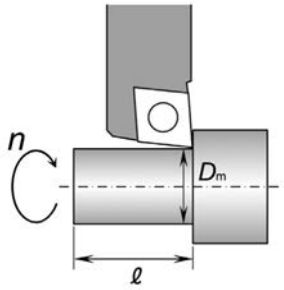


[Rake angle]: Combinations and characteristics

		Double-positive cutting edge shape (DP edge shape)	Double-negative cutting edge shape (DN edge shape)	Negative-positive cutting edge shape (NP edge shape)
Combinations of the angles for basic cutting edge shapes				
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



Calculating the cutting speed from the rotation speed

$$v_c = \frac{\pi \times D_m \times n}{12} \quad (\text{SFM})$$

Calculating the revolution speed from the cutting speed

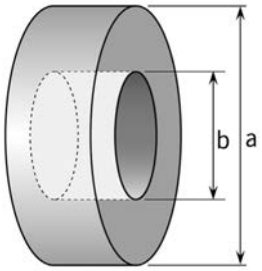
$$n = \frac{12 \times v_c}{\pi \times D_m} \quad (\text{rpm})$$

v_c : Cutting speed (SFM)
D_m : Machining diameter (inch)
n : Spindle speed (rpm)
π : Pi (3.14)

Example : Obtaining a cutting speed for machining a work piece of 2" diameter at the spindle speed of 1,000 min^{-1}:

$$v_c = \frac{\pi \times 2 \times 1000}{12} = \underline{523\,(\text{SFM})}$$

Calculating the cutting time



Calculating the cutting time for OD (ID) machining

$$T = \frac{\ell}{f \times n} \quad (\text{min})$$

Calculating the cutting time for facing

$$T = \frac{\pi \times (a^2 - b^2)}{4000 \times v_c \times f} \quad (\text{min})$$

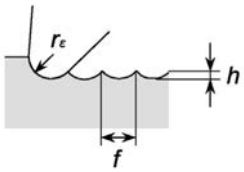
T : Cutting time (min)
ℓ : Cutting length (inch)
f : Feed rate (IPR)
n : Spindle speed (rpm)

T : Cutting time (min)
v_c : Cutting speed (m/min)
f : Feed amount (mm/rev)
π : Pi (3.14)

Example : Obtaining a cutting time for machining of work to be cut 4" long at the spindle speed of 1,000 rpm and at a feed rate of .004 IPR:

$$T = \frac{4}{.004 \times 1000} = \underline{1\,(\text{min})}$$

Calculating the theoretical surface roughness



$$h = \frac{f^2}{8\,r_\varepsilon} \times 1000^{\,2} \quad (\mu\text{inch})$$

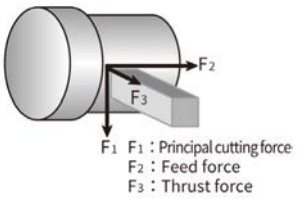
h : Theoretical surface roughness (μinch)
f : Feed amount (IPR)
r_ε : Corner radius (inch)

Example : Obtaining the theoretical surface roughness when machining with an insert having .031" corner nose radius at a feed rate of .004 IPR:

$$h = \frac{.004^{\,2}}{8 \times .031} \times 1000^{\,2} = \underline{64.51\,(\,\mu\,\text{inch})}$$

[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 force



$$F_{(N)} = k_c \times a_p \times f$$

F : Cutting force (N)
k_c : Specific cutting force (N/mm²) ※See the table below.
a_p : Depth of cut (mm)
f : Feed amount (mm/rev)

Example : Calculating the cutting force for grey cast iron cut at the feed rate of 0.2 mm/rev and with a depth of cut of 3 mm:

$$F = 1800 \times 3 \times 0.2 = \underline{1080\,(N)}$$

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 amount (mm/rev)
a_p : Depth of cut (mm)
k_c : Specific cutting force (N/mm²) ※See the table below.
η : Mechanical efficiency (0.7 - 0.8)

Example : Calculating the cutting power for the machining of grey 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)

$$P_c = \frac{700 \times 0.4 \times 2 \times 1400}{60 \times 10^{3} \times 0.8} = \underline{16.33\,(kW)}$$

Specific cutting force

Work material		Tensile strength or hardness	Specific cutting force (N/mm²) "kc" to cutting feed rate (mm/rev)				
			0.1mm/rev	0.2mm/rev	0.3mm/rev	0.4mm/rev	0.6mm/rev
Soft steel		520	3610	3100	2720	2500	2280
Medium steel		620	3080	2700	2570	2450	2300
Hard steel		720	4500	3600	6250	2950	2640
Tool steel	SKD	670	3040	2800	2630	2500	2400
		770	3150	2850	2620	2450	2340
Cr-Mo steel	SCM	600	3610	3200	2880	2700	2500
		730	4500	3900	3400	3150	2850
Alloy steel	SNCM	900	3070	2650	2350	2200	1980
		HB350	3310	2900	2580	2400	2200
Gray cast iron	FC	HB200	2110	1800	1600	1400	1330

Calculating the volume of chips produced

$$Q_{(cm^3/min)} = v_c \times f \times a_p$$

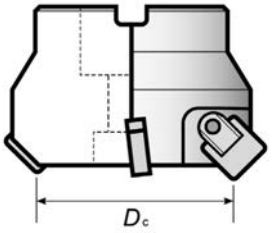
Q : Volume of evacuated chips (cm^3/min)
V_c : Cutting speed (m/min)
a_p : Depth of cut (mm)
f : Feed amount (mm /rev)

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 2mm

$$Q = 700 \times 0.4 \times 2 = \underline{560\ (cm^3/min)}$$

Calculation Formula for Milling Processes

Calculating the cutting speed



Calculating the cutting speed from the rotation speed

$$V_c \underset{(SFM)}{=} \frac{\pi \times D_c \times n}{12}$$

V_c : Cutting speed (SFM)
D_c : Cutter diameter (inch)
n : Spindle speed (rpm)
π : Pi (3.14)

Calculating the revolution speed from the cutting speed

$$n \underset{(rpm)}{=} \frac{12 \times V_c}{\pi \times D_c}$$

Example : Obtaining the cutting speed for machining with an 8" diameter cutter at the Spindle speed of 1,000 rpm:

$$V_c = \frac{\pi \times 8 \times 1000}{12} = \underline{2093\ (SFM)}$$

Calculating the feeding speed and feed rate

Calculating the feed rate per blade

$$f_z \underset{(IPT)}{=} \frac{V_f}{z \times n}$$

f_z : Inch amount per tooth (IPT)
V_f : Table feed (inch/min)
z : Number of tooth
n : Spindle speed (rpm)

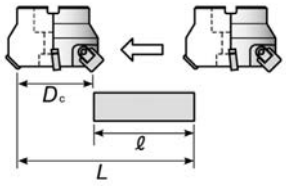
Calculating the feeding speed per minute

$$V_f \underset{(inch/min)}{=} f_z \times z \times n$$

Example : Obtaining the feed rate for milling with a 10-teeth cutter at the .008 IPT and the revolution speed of 1,000 rpm

$$V_f = .008 \times 10 \times 1000 = \underline{80\ (inch/min)}$$

Calculating the machining time



$$T \underset{(min)}{=} \frac{L}{V_f}$$

T : Cutting time (min)
L : Total length of table feed (inch) (ℓ + D_c)
v_f : Table feed (inch/min)

Example : Obtaining the machining time for milling 8" on a work piece fed at the rate of 40 inch/min:

$$T = \frac{8}{40} = \underline{0.2\ (min)}$$

Calculating the cutting power

$$P_c = \frac{a_e \times a_p \times v_f \times k_c}{60 \times 10^{6} \times \eta} \quad (kW)$$

P_c : Required power (kW)
a_e : Cutting length (mm)
a_p : Depth of cut (mm)
v_f : Feed rate (mm/min)
k_c : Specific cutting force (N/mm^2) ※See the table below.
η : Mechanical efficiency (0.7 - 0.8)

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 per 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) "kc " to cutting feed amount (mm/rev)				
			0.1mm/t	0.2mm/t	0.3mm/t	0.4mm/t	0.6mm/t
Soft steel		520	2200	1950	1820	1700	1580
Medium steel		620	1980	1800	1730	1600	1570
Hard steel		720	2520	2200	2040	1850	1740
Tool steel	SKD	670	1980	1800	1730	1700	1600
		770	2030	2030	1800	1750	1700
Cr-Mo steel	SCM	600	2180	2000	1860	1800	1670
		730	2540	2250	2140	2000	1800
Alloy steel	SNCM	900	2000	1800	1680	1600	1500
		HB350	2100	1900	1760	1700	1530
Gray cast iron	FC	HB200	1750	1400	1240	1050	970
Aluminum alloy	AC,ADC	160	580	480	400	350	320

Calculating the volume of evacuated chips

$$Q = a_e \times a_p \times v_f \quad (cm^3/min)$$

Q : Volume of evacuated chips (cm^2/min)
a_e : Cutting length (mm)
a_p : Depth of cut (mm)
V_f : Feed rate (mm/min)

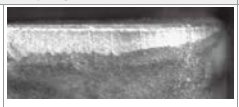
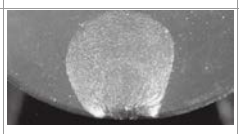
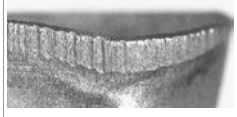
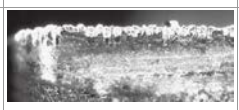
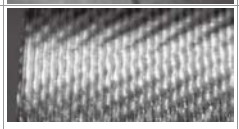
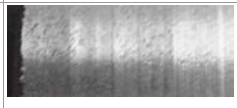
Example : Obtaining the volume of chips evacuated per minute for machining at a cutting speed of 700 m/min, feed rate of 0.4 mm/rev, and with a 2 mm depth of cut:

$$Q = 150 \times 3 \times 1100 = 495(cm^3/min)$$

Troubleshooting for Turning

Type of problem	Possible cause	Corrective measures: Material/grade selection: Change to a harder material/grade	Material/grade selection: Change to a tougher material/grade	Material/grade selection: Change to a material/grade more resistant to thermal shock	Material/grade selection: Change to a material/grade more resistant to deposition	Cutting conditions: Cutting speed (Decrease ↘ / Increase ↗)	Cutting conditions: Feed rate (Decrease ↘ / Increase ↗)	Cutting conditions: Depth of cut (Decrease ↘ / Increase ↗)	Cutting conditions: Coolant: Use non-water-soluble type	Cutting conditions: Coolant: Review dry or wet operation	Tool shape: Review the type of chipbreaker	Tool shape: Rake angle (Decrease ↘ / Increase ↗)	Tool shape: Nose radius of the insert	Tool shape: Side cutting edge angle	Tool shape: Cutting edge strength, honing	Tool shape: Improve the accuracy of insert	Tool shape: Improve the rigidity of the holder	Machine/installation: Improve the installation accuracy of the cutting tool	Machine/installation: Review the overhang of the cutting tool	Machine/installation: 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												↘	↘					

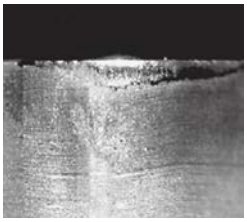
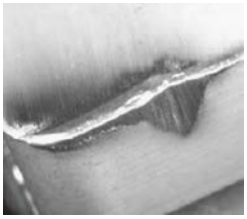
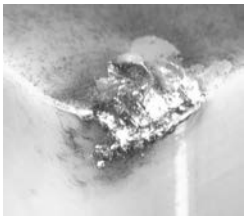
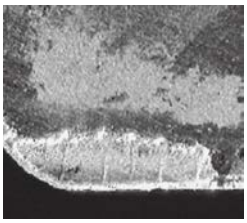
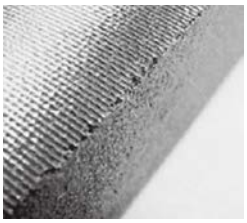
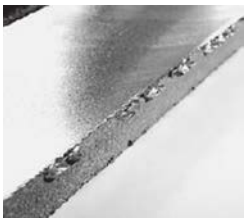
Troubleshooting Case Studies: Turning

	Case/Symptom		Possible causes	Corrective measures
Insert	VB wear		• The material / grade is too soft • Cutting speed is too high • Relief angle is too small	• Use a coated grade • Choose a material/grade highly resistant to wear • Decrease the cutting speed
	Wear on face		• High temperature causes chemical reactions between the insert material and chips	• Use a coated grade • Decrease both of the cutting speed and feed rate • Widen the rake angle
	Notching wear		• The work 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
	Chipping/fracture		• Feed rate is too high • Chips have become trapped • Chatter resulting in vibration	• Enlarge the honed edge • Make the nose radius larger • Narrow the rake angle to secure the cutting edge strength
	Flaking		• This is due to compressive forces being applied to the cutting edge from elastic deformation in the area being cut • This occurs when deposited/adhered material is peeled off	• Change the cutting conditions by checking the cutting edge • Choose a material/grade highly resistant to fracture • Increase the coolant rate and pressure • Improve the run-out of the main spindle of the machine
	Plastic deformation		• High cutting force and excessive heat is applied to the cutting edge	• Choose a material/grade highly resistant to wear • Decrease both of the cutting speed and feed rate • Make the nose radius larger • Use coolant
	Built-up edge		• This occurs because the cutting temperature is lower than the recrystallization temperature of the work material	• Increase the cutting speed • Use coolant with excellent lubrication performance • Change to a grade with less affinity to the work material
	Deposition		• The deposition is caused to the face by a chemical reaction of the work 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 work material
	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
Work piece	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
	Burring		• The feed rate is incorrect • The shape of insert is not suitable	• Decrease the feed rate • Use a smaller edge preparation
	Chatter mark		• The cutting force is too great • The rigidity of the work piece 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
	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 work material

Troubleshooting for Milling

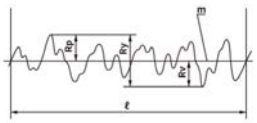
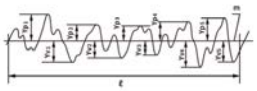
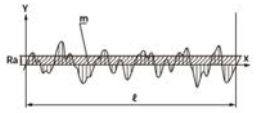
Type of problem	Possible cause	Corrective measures: Material/grade selection — Change to a harder material/grade	Change to a tougher material/grade	Change to a material/grade more resistant to thermal shock	Change to a material/grade more resistant to deposition	Cutting conditions — Cutting speed: Decrease ↘	Cutting speed: Increase ↗	Feed rate: Decrease ↘	Feed rate: Increase ↗	Depth of cut: Decrease ↘	Depth of cut: Increase ↗	Review cutter diameter and cutting width	Review tool path	Coolant: Wet	Coolant: Dry	Tool shape — Relief angle of insert: Decrease ↘	Relief angle of insert: Increase ↗	Nose radius of cutting edge: Decrease ↘	Nose radius of cutting edge: Increase ↗	Cutting edge strength, honing: Decrease ↘	Cutting edge strength, honing: Increase ↗	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 Case Studies: Milling

	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.
Work piece	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 the 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.

Surface Roughness Standards

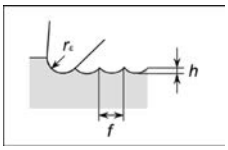
Obtaining the surface roughness

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 $Rz = Rp + Rv$	
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 $Rz_{JIS} = \frac{(Yp1+Yp2+Yp3+Yp4+Yp5)+(Yv1+Yv2+Yv3+Yv4+Yv5)}{5}$	
Arithmetic average of roughness	Ra	Ra	The average of absolute values on the roughness curve f (x) for the reference length: $Ra = \frac{1}{\ell}\int_0^{\ell}\{f(x)\}$	

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.

$$h_{(\mu m)} = \frac{f^2}{8\,r_\varepsilon} \times 1000$$



h : Theoretical surface roughness (μm)
f : Feed amount (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

Relationship with triangle symbols

Arithmetic average roughness Ra(μm)	Maximum height Rz(μm)	10-point average roughness Rz_{JIS}(μm)	※ (Triangle symbol)
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	

Examples of reading

1. When Ra = 1.6μm ➡ 1.6μm Ra
2. When Rz = 6.3μm ➡ 6.3μm Rz
3. When Rz_{JIS} = 6.3μm ➡ 6.3μm Rz_{JIS}

※The finishing symbols (triangle symbol ▽ and symbol ~) are no longer used in JIS pursuant to the 1994 revision.

Hardness Comparison Chart

Brinell hardness,10mm balls 3000kg(fHB)		Vickers Hardness (HV)	Rockwell hardness			Shore hardness (HS)	Tensile strength Kgf/mm2 [N/m2] Approximate value Mpa(1)
Standard ball	Tungsten carbide ball		Scale A Load: 60 kgf brale indenter (HRA)	Scale B Load: 100 kgf Diameter 1/16" indenter (HRB)	Scale C Load: 150 kgf brale indenter (HRC)		
–	–	940	85.6	–	68	97	
–	–	920	85.3	–	67.5	96	
–	–	900	85	–	67	95	
–	(767)	880	84.7	–	66.4	93	
–	(757)	860	84.4	–	65.9	92	
–	(745)	840	84.1	–	65.3	91	
–	(733)	820	83.8	–	64.7	90	
–	(722)	800	83.4	–	64	88	
–	(710)	780	83	–	63.3	87	
–	(698)	760	82.6	–	62.5	86	
–	(684)	740	82.2	–	61.8	84	
–	(670)	720	81.8	–	61	83	
–	(656)	700	81.3	–	60.1	81	
–	(647)	690	81.1	–	59.7	–	
–	(638)	680	80.8	–	59.2	80	
–	630	670	80.6	–	58.8	–	
–	620	660	80.3	–	58.3	79	
–	611	650	80	–	57.8	–	
–	601	640	79.8	–	57.3	77	
–	591	630	78	–	56.8	–	
–	582	620	79.2	–	56.3	75	
–	573	610	78.9	–	55.7	–	
–	564	600	78.6	–	55.2	74	
–	554	590	78.4	–	54.7	–	
–	545	580	78	–	54.1	72	
–	535	570	77.8	–	53.6	–	
–	525	560	77.4	–	53	71	
–	517	550	77	–	52.3	–	
–	507	540	76.7	–	51.7	69	
–	497	530	76.4	–	51.1	–	
–	488	520	76.1	–	50.5	67	
–	479	510	75.7	–	49.8	–	
–	471	500	75.3	–	49.1	66	
–	460	490	74.9	–	48.4	–	
–	452	480	74.5	–	47.7	64	
–	442	470	74.1	–	46.9	–	
–	433	460	73.6	–	46.1	62	
–	425	450	73.3	–	45.3	–	
–	415	440	72.8	–	44.5	59	
–	405	430	72.3	–	43.6	–	

Brinell hardness,10mm balls 3000kg(fHB)		Vickers Hardness (HV)	Rockwell hardness			Shore hardness (HS)	Tensile strength Kgf/mm2 [N/m2] Approximate value Mpa(1)
Standard ball	Tungsten carbide ball		Scale A Load: 60 kgf brale indenter (HRA)	Scale B Load: 100 kgf Diameter 1/16" indenter (HRB)	Scale C Load: 150 kgf brale indenter (HRC)		
–	397	420	71.8	–	42.7	57	
–	388	410	71.4	–	41.8	–	
–	379	400	70.8	–	40.8	55	
–	369	390	70.3	–	39.8	–	
–	360	380	69.8	(110.0)	38.8	52	
–	350	370	69.2	–	37.7	–	
–	341	360	68.7	–	36.6	50	
–	331	350	62.1	–	35.5	–	
–	322	340	67.6	–	34.4	47	
–	313	330	67	–	33.3	–	
247	247	260	62.4	(101.0)	24	37	825
243	243	255	62	–	23.1	–	805
238	238	250	61.6	99.5	22.2	36	795
233	233	245	61.2	–	21.3	–	780
228	228	240	60.7	98.1	20.3	34	765
219	219	230		96.7	(18.0)	33	730
209	209	220		95	(15.7)	32	695
200	200	210		93.4	(13.4)	30	670
190	190	200		91.5	(11.0)	29	635
181	181	190		89.5	(8.5)	28	605
171	171	180		87.1	(6.0)	26	580
162	162	170		85	(3.0)	25	545
152	152	160		81.7	(0.0)	24	515
143	143	150		78.7		22	490
133	133	140		75		21	455
124	124	130		71.2		20	425
114	114	120		66.7		–	390
105	105	110		62.3		–	–
95	95	100		56.2		–	–
90	90	95		52		–	–
86	86	90		48		–	–
81	81	85		41		–	–

(1) 1 MPa = 1 N/mm^2
(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

Grade Comparison Chart

BIDEMICS / Ceramics / NTK CeramiX

	NTK	GREENLEAF	HERTEL	INDEXABLE	ISCAR	KENNAMETAL	KYOCERA	NEWCOMER	ROMAY	SANDVIK	SPK	SSANGYONG	SUMITOMO	TAEGUTEC	TUNGALOY	VALENITE
K Cast iron	HC1 HW2	GEM19	AC5	I50	IN11	K060	KA30	NP5200	CC10			SZ200 SZ300		AB120 AW20		
	HC2 HC5 HC6	GEM7	HT610CA MC2	I100	IN22 IN23	K090 KY1615	A65 A66N PT600M	NP5000	CC20 CC30	CC620 CC650 CC6050	SN60 SN80 SH2	SD200 ST100 ST300 ST500 SD200 TA300 TC300	NB90S	AB30	LX11 LX21 CX710	Q32
	SX6 SP9	CSN100 CSN200 GSN100 HSN100 HSN200		MW30 MW43	IS6 IS8 IS80	KY3000 KY3400 KY3500 KYK25 KYK35 KY4400 KYK10 KY1320	CS7050 KS500 KS6000 KS6050		CC510 CC513 CC514 CC514SC CC515 CC516 CC516SC	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	VPQ130 VPQ135
S Heat resistant alloy	JX1 JX3															
	533 WA1	WG300 WG600 WG700			IW7	KY1525 KY4300			CC60	CC670		SW400 SW500 SW700 SW800	WX1500 WX120	TC430		
	SX3 SX5 SX7 SX9	XSYTIN-1		MW37	IS9	KY1540 KY2100 KYS25 KYS30 KYSP30 KYSM10	CF1 KS6030 KS6040		CC5477	CC6060 CC650 CC6065		SN800 SN900	WX2500 WX2000	AS20	M101S	
H Hardened material	450 ZC4 HC5 HC7 ZC7	GEN7	HT610CA	I100	IN22 IN23 IN420	KY1615 KY4400	A65 A66N KT66 PT600M		CC30SC	CC6050 CC650		ST500 TM300 TC100 TC300	NB90S NB150H	AW120 AB30	LX11	Q35 VPZ205 VPZ215
	533 WA1	WG300 WG600 WG700			IW7	KY4300 KYS25				CC670		SW400 SW500 SW700 SW800				

BIDEMICS / CBN

	NTK	DIJET	MOLDINO	INDEXABLE	ISCAR	KENNAMETAL	KYOCERA	MITSUBISHI	SANDVIK	SECO	SPK	SSANGYONG	SUMITOMO	TAEGUTEC	TUNGALOY	WALTER
K Cast iron	B23 B30 B99	JBN330 JBN795	BH200 BH250	CBN90 CBN95 CBN100	IB50 IB55 IB85	KB1345 KB1630 KB5630 KB9610 KB9640 KB1340	KBN60M KBN65B KBN900	BC5030 MB710 MB730 MB5015 MBS140	CB7525 CB7925	CBN20 CBNO50C CBN200 CBN300 CBN300P CBN350 CBN600	WBN100 WBN105 WBN115 WBN120 WBN750	SBN1000 SBN1600	BN500 BN600 BN700 BNS800	KB90 KB9OA TB650 TB670 TB730	BX470 BX480 BX850 BX870 BX90S BX910 BX930 BX950 BXC90	
P Heat resistant alloy	JP2															
	120			CBN80		KB1340 KB1630 KB5630		MB730		CBN170			BN700	KB90 TB730	BX950	
H Hardened material	B52 B36 B40 B5K B6K	JBN245 JBN300	BH200 BH250	CBN45 CBN50 CBN60 CBN70	IB10HC IB20H IB25HA IB25HC IB50 IB55	KB1340 KB1610 KB1625 KB5610 KB5625 KB5630 KB9610 KB9640	KBNO5M KBN10C KBN10M KBN25C KBN25M KBN30M KBN35N KBN510 KBN525 KBN900	BC8020 MB810 MB825 MB835 MB8025 MBC010	CB20 CB50 CB7015 CB7025 CB7525	CBN10 CBNO50C CBN100 CBN150 CBN160P CBN170 CBN200 CBN300P CBN350	WBN500 WBN550 WBN600 WBN650	SBN1000 SBN2000 SBN4000	BN250 BN300 BN350 BN1000 BN2000 BNC80 BNC100 BNC150 BNC160 BNC200 BNC300 BNC2010 BNC2020 BNX10 BNX20 BNX25 BNX300	KB50 TB610 TB650 TB670	BX310 BX330 BX360 BX380 BX530 BXC50 BXM10 BXM20	VPC225 WLB30 WLB50

PCD

	NTK	DIJET	INDEXABLE	ISCAR	KENNAMETAL	KYOCERA	MITSUBISHI	SANDVIK	SECO	SSANGYONG	SUMITOMO	TAEGUTEC	TUNGALOY	WALTER
N Non-ferrous material	PD1 PD2	JDA10 JDA30 JDA40 JDA715 JDA735 JDA745	PCD3 PCD-F PCD-UF	ID5 ID8	KD1400 KD1405 KD1425 KD1410 KD1415 KD1425	KPD001 KPD010 KPD230	MD205 MD220 MD230	CD10	PD10 PD20 PD30	SPD1000 SPD2000 SPD3000	DA10 DA90 DA150 DA200 DA1000 DA2200	KP100 KP300 KP500	DX110 DX120 DX140 DX160 DX180	WCD10

Note: This chart is based on published data and not authorized by each manufacturer

Non coated carbide

	NTK	DIJET	GREENLEAF	MOLDINO	INDEXABLE	ISCAR	KENNAMETAL	KYOCERA	MITSUBISHI	ROMAY	SANDVIK	SECO	SUMITOMO	TAEGUTEC	TUNGALOY	WALTER
P Steel	KM1	DX30 DX35 SR30 SRT	G20M G60 G50 G70	EX35 EX40 EX45 WS10	CI5 CI6 CI7 CI9	IC50M IC54 IC70 IC28	KU10 K420 K125M	PW30	UTi20T			S10M 525M S60M	A30 ST10P ST20E ST30E ST40E	CT3000	TX40 UX25 UX30	
N Non-ferrous material	KM1	CR1 KG03 KG1 KG10 KG20 KG30 KT9 LF12	G02 G23	WH02 WH05 WH10 WH20D	CI1 CI2 CI3 CI4 CI65	IC04 IC10 IC20 IC28	K313 K68 K110M K115M K600 K1	GW15 GW25 KW10	HTi05T HTi10 UTi20T	R600	H10 H10F H13A	883 890 HX	EH520 G10E H1	UF1	G1F G2 G2F G3 KS05F KS15F KS20 TH03 TH10 TU10	WK1 WSN10

PVD coated carbide

	NTK	DIJET	GREENLEAF	MOLDINO	INDEXABLE	ISCAR	KENNAMETAL	KYOCERA	MITSUBISHI	SANDVIK	SECO	SUMITOMO	TAEGUTEC	TUNGALOY	WALTER
P Steel	VM1 ZM3 QM3 TM4 DT4 DM4	JC5003 JC5015 JC5030 JC5040	G915 G920 G925 G935	CY15 CY150 CY250 CY9020 HC844 IP2000 IP3000	CI25A C29	IC328 IC507 IC807 C907 C908 IC928 IC3028 IC830 IC570	KC5010 KC5025 KC5510 KC5525 KCU10 KCU25 KC710 KC720 KC722 KC730 KC735M KC792M	PR915 PR930 PR1005 PR1025 PR1115 PR1215 PR1225	VP10MF VP10RT VP15TF VP20MF VP20RT	GC1125 GC1525 GC15 GC1025 GC1145 GC2035 GC2145 GC4125	CP200 CP250 CP500	AC350 AC520U AC530U ACZ150 ACZ310 ACZ330 ACZ350	TT1040 TT7220 TT8010 TT8020 TT9030 TT9080	AH120 AH130 AH140 AH710 AH725 AH730 AH740 GH130 GH330 SH730 AH330 GH730	WSM30 WXM33 WXP20 WXP43
M Stainless steel	ST4 VM1 ZM3 QM3 TM4 DT4 DM4	JC5003 JC5015 JC5030 JC5040	G915 G920 G925	CY250 CY9020 P050S P100S	C23 CI24 C129	IC308 IC507 IC520 IC807/907 IC908 IC928 IC1008 IC1028 IC3028 IC830 IC570	KC5010 KC5025 KC5510 KC5525 KCU10 KCU25 KC710 KC720 KC722 KC730 KC735M KC792M	PR915 PR930 PR1025 PR1125 PR1215 PR1225	VP10MF VP10RT VP15TF VP20MF VP20RT	GC15 GC1005 GC1025 GC1105 GC1115 GC1125 GC1145 GC1525 GC2030 GC2035 GC4125	CP200 CP250 CP500 T52000 T52500	AC350 AC510U AC520U AC530U AC6040M ACZ150 ACZ310 ACZ330 ACZ350 EH510Z EH520Z AC6030M AC610M AC830P AC630M	TT1040 TT5080 TT7010 TT7080 TT7220 TT8010 TT8020 TT9030 TT9080 TT9020	AH120 AH130 AH140 AH710 AH725 AH730 GH130 GH330 GH730 SH730 AH330	WXM20 WXM33 WXN10 WXP20 WXP43
K Cast iron	QM3 DM4	JC5003 JC5015		CY10H CY100H CY9020		IC507 IC508 IC908 IC910 IC808 IC1008	KC5010 KC5025 KC5510 KC5525 KCU10 KCU25 KC720 KC730	PR905 PR1215	VP10RT VP15TF VP20RT	GC1020 GC1125 GC15	CP200 CP250 CP500 DTS2500 TK1000 TK2000 TS2000	AC510U AC520U AC530U ACZ310 EH10Z EH20Z EH510Z AC405K	TT1040 TT6080 TT7010 TT7080	AH110 AH120 GH110 GH130	
S Heat resistant alloy	650		G920 G925			IC807/907 IC908 IC830	KC5010 KC5510 KC5525 KC7310 KCU10 KCU25			GC15 GC1005 GC1025 GC1105 GC1115 GC1125 GC2145 GC4125		AC510U AC520U AC530U	TT8125 TT8135 TT8020 TT9030 TT9080 TT9020	AH905	
H Hardened material							KC5010 KC5510 KCU10 KCU25			GC1010 GC1025 GC1030		AC503U			

CVD coated carbide

	NTK	DIJET	GREENLEAF	MOLDINO	INDEXABLE	ISCAR	KENNAMETAL	KYOCERA	MITSUBISHI	ROMAY	SANDVIK	SECO	SUMITOMO	TAEGUTEC	TUNGALOY	WALTER
K Cast iron	CP1	JC050W JC105V JC110V JC215V JC605W JC605X JC610	GA5022 GA5023	GM25 GM8015 GM8020 GM8025 HG3305 HG3315 HG8010 HX3505 HX3515	CIN2 CINX CIT3 CIT6 CIX	IC418 IC428 IC9007 IC9015 IC9150	KCK05 KCK15 KCK20 KCP05 KCP10 KCP25 KCP30 KC9325	CA4010 CA4115 CA4120 CA4505 CA4515 CA5505	MC5005 MC5015 MY5015 UC5105 UC5115 UE6110	R100 R200 R500	GC3005 GC3205 GC3210 GC3215 GC4215 GC4315	MK1500 TH1000 TK1000 TK2000 TP200 TP2500 TX150	AC300G AC410K AC420K AC700G AC810P AC820P AC8025P ACK200	TT6300 TT6800 TT7005 TT7015	T1115 T5105 T5115 T5125	WPP01 WPP10 WPP20

Material Cross Reference Chart

Machine structural carbon steel

Grade	Japan	China	USA	UK	Germany	France	Russia
	JIS	GB	AISI/SAE	BS	DIN	NF	ГОСТ
Machine structural carbon steel	S10C	08 10	1010	040A10 045A10 045M10	C10E C10R	XC10	
	S12C		1012	040A12		XC12	
	S15C	15	1015	055M15	C15E C15R		
	S17C		1017			XC18	
	S20C	20	1020	070M20 C22 C22E C22R	C22 C22E C22R	C22 C22E C22R	
	S22C		1023				
	S25C	25	1025	C25 C25E C25R	C25 C25E C25R	C25 C25E C25R	
	S28C		1029				25Г
	S30C	30	1030	080A30 080M30 C30 C30E C30R	C30 C30E C30R	C30 C30E C30R	30Г
	S33C						30Г
	S35C	35	1035	C35 C35E C35R	C35 C35E C35R	C35 C35E C35R	35Г
	S38C		1038				35Г
	S40C	40	1039 1040	080M40 C40 C40E C40R	C40 C40E C40R	C40 C40E C40R	40Г
	S43C		1042 1043	080A42			40Г
	S45C	45	1045 1046	C45 C45E C45R	C45 C45E C45R	C45 C45E C45R	45Г
	S48C			080A47			45Г
	S50C	50	1049	080M50 C50 C50E C50R	C50 C50E C50R	C50 C50E C50R	50Г
	S53C		1050 1053				50Г
	S55C	55	1055	080M55 C55 C55E C55R	C55 C55E C55R	C55 C55E C55R	
	S58C	60	1059 1060	C60 C60E C60R	C60 C60E C60R	C60 C60E C60R	60Г
	S09CK			045A10 045M10	C10E	XC10	
	S15CK	15F			C15E	XC12	
	S20CK					XC18	

Machine structural carbon steel

Grade	Japan	China	USA	UK	Germany	France	Russia
	JIS	GB	AISI/SAE	BS	DIN	NF	ГОСТ
Nickel-chromium steel	SNC236				36CrNi6		40XH
	SNC415	12CrNi2			14CrNi10		
	SNC631	30CrNi3			36CrNi10		30XH3A
	SNC815	12Cr2Ni4		655M13	15CrNi13		
	SNC836	37CrNi3			31CrNi14		
Nickel-chromium molybdenum steel	SCNM220	20CrNiMo	8615 8617 8620 8622	805A20 805M20 805A22 805M22	20NiCrMo2 20NiCrMoS2	20NCD2	
	SCNM240		8637 8640		40NiCrMo2-2		
	SCNM415						
	SCNM420	18CrNiMnMoA	4320		17NiCrMo6-4		20XH2M (20XHM)
	SCNM431				30CrNiMo8		
	SCNM439	40CrNiMoA	4340		40NiCrMo6		
	SCNM447				34CrNiMo6		
	SCNM616						
	SCNM625						
	SCNM630						
	SCNM815						
Chromium steel	SCr415	15Cr 15CrA			17Cr3 17CrS3		15X 15XA
	SCr420	20Cr	5120				20X
	SCr430	30Cr	5130 5132	34Cr4 34CrS4	34Cr4 34CrS4	34Cr4 34CrS4	30X
	SCr435	35Cr	5132	37Cr4 37CrS4	37Cr4 37CrS4	37Cr4 37CrS4	35X
	SCr440	40Cr	5140	530M40 41Cr4	41Cr4 41CrS4	41Cr4 41CrS4	40X
	SCr445	45Cr 50Cr					45X
Chromium molybdenum steels	SCM415	15CrMo			15CrMo4		
	SCM418	20CrMo			18CrMo4 18CrMoS4		20XM
	SCM420			708M20	20CrMo5		20XM
	SCM421						
	SCM430	30CrMo 30CrMoA	4231				30XM 30XMA
	SCM432						
	SCM435	35CrMo	4137	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	35XM
	SCM440	42CrMo	4140 4142	708M40 709M40 42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	
	SCM445		4145 4147				
	SCM822						

Machine structural carbon steel

Grade	Japan	China	USA	UK	Germany	France	Russia
	JIS	GB	AISI/SAE	BS	DIN	NF	ГОСТ
Manganese steel	SMn420	20Mn2	1522	150M19	20Mn5		
	SMn433	30Mn2 35Mn2	1534	150M36	34Mn5		30Г2 35Г2
	SMn438	40Mn2	1541	150M36	36Mn5		35Г2 40Г2
	SMn443	45Mn2	1541				40Г2 45Г2
	SMnC420	15CrMn	5115		16MnCr5		
	SMnC443	40CrMn	5140				
Structural steel (H steel)	SMn420H		1522H				
	SMn433H						
	SMn438H		1541H				
	SMn443H		1541H				
	SMnC420H						
	SMnC433H						
	SCr415H	15CrH			17Cr3 17CrS3		15Х
	SCr420H	20Cr1H	5120H		17Cr3		20Х
	SCr430H		5130H 5132H	34Cr4 34CrS4	34Cr4 34CrS4	34Cr4 34CrS4	30Х
	SCr435H		5135H	37Cr4 37CrS4	37Cr4 37CrS4	37Cr4 37CrS4	35Х
	SCr440H	40CrH	5140H	41Cr4 41CrS4	41Cr4 41CrS4	41Cr4 41CrS4	40Х
	SCM415H	15CrMoH	4118H		15CrMo5		
	SCM418H				18CrMo4 18CrMoS4		
	SCM420H	20CrMoH	4118H	708H20	18CrMo4		
	SCM435H		4135H 4137H	34CrMo 34CrMoS4	34CrMo 34CrMoS4	34CrMo 34CrMoS4	
	SCM440H		4140H 4142H	42CrMo 42CrMoS4	42CrMo 42CrMoS4	42CrMo 34CrMoS4	
	SCM445H		4145H 4147H				
	SCM822H						
	SNC415H						
	SNC631H						
	SNC815H	12Cr2Ni4H		655H13	15NiCr13		
	SNCM220H	20CrNiMoH	8617H 8620H 8622H	805H17 805H20 805H22	21NiCrMo2	20NCD2	
	SNCM420H	20CrNiMoH	4320H		20CrNiMoS6-4		

Stainless steel , Heat-resistant alloy

Grade	Japan	China	USA		UK	Germany	France	Russia
	JIS	GB	UNS	AISI	BS	DIN	NF	ГОСТ
Stainless steel	SUS201	1CrMn6Ni5N	S20100	201			Z12CMN17-07Az	
	SUS202	1CrMn8Ni5N	S20200	202	284S16			12Х17Г9АН4
	SUS301	1CrMn10Ni5Mo3N 1Cr17Ni7	S30100	301	301S21	X12CrNi17 7	Z11CN17-08	07Х16Н6
	SUS301L					X2CrNiN18-7		
	SUS301J1					X12CrN117 7		
	SUS302	1Cr18Ni9	S30200	302	302S25		Z12CN18-09	12Х18Н9
	SUS302B		S30215	302B				
	SUS303	Y1Cr18Ni9	S30300	303	303S21	X10CrNiS18 9	Z8CNF18-09	
	SUS303Se	Y1Cr18Ni9Se	S30323	303Se	303S41			12Х18Н10Е
	SUS304	0Cr18Ni9	S30400	304	304S31	X5CrNi18 10	Z7CN18-09	08Х18Н10
	SUS304L	00Cr18Ni10	S30403	304L	304S11	X2CrNiN19 11	Z3CN19-11	03Х18Н11
	SUS304N1	0Cr18Ni9N	S30451	304N			Z6CN19-09Az	
	SUS304N2	OCr19NiNbN	S30452					
	SUS304LN	OOCR18Ni10N	S30453	304LN		X2CrNiN18 10	Z3CN18-10Az	
	SUS304J1							
	SUS304J2							
	SUS304J3		S30431	30431				
	SUS305	1Cr18Ni12	S30500	305	305S19	X5CrNi18 12	Z8CN18-12	06Х18Н11
	SUS305J1							
	SUS309S	0Cr23Ni13	S30908	309S			Z10CN24-13	
	SUS310S	0Cr25Ni20	S31008	310S	310S31		Z8CN25-20	10Х23Н18
	SUS316	0Cr17Ni12Mo2	S31600	316	316S31	X5CrMo17 12 2 X5CrMo17 12 3	Z7CND17-12-02 Z6CND18-12-03	
	SUS316L	OOCR17Ni14Mo2	S31603	316L	316S11	X2CrNiMo17 13 2 X2CrNiMo17 13 2	Z3CND17-12-02 Z3CND17-12-03	03Х17Н14М3
	SUS316N	0Cr17Ni12Mo2N	S31651	316N				
	SUS316LN	00Cr17Ni13Mo2N	S31653	316LN		X2CrNiMoN17 12 2 X2CrNiMoN17 12 3	Z3CND17-11Az Z3CND17-11Az	
	SUS316Ti		S31635			X6CrNiMoTi17 12 2	Z6CNDT17-12	08Х17Н13М2Т
	SUS316J1	0Cr18Ni12Mo2Cu2						
	SUS316J1L	00Cr18Ni14Mo2Cu2						
	SUS317	OCr19NiMo3	S31700	317	317S16			
	SUS317L	00Cr19Ni13Mo3	S31703	317L	317LS12	X2CrNiMo18 16 4	Z3CND19-15-04	
	SUS317LN		S31753				Z3CND19-14Az	
	SUS317J1	0Cr18N116Mo5						
	SUS317J2							
	SUS317J3							
	SUS836L		N08367					
	SUS890L		N08904	N08904	904S14		Z2NCDU25-20	
	SUS321	1Cr18Ni9Ti 0Cr18Ni10Ti	S32100	321	321S31	X6CrNiTi18 10	Z6CNT18-10	08Х18Н10Т
	SUS347	0Cr18Ni11Nb	S34700	347	347S31	X6CrNiNb18 10	Z6CNNb18-10	08Х18Н12Б
	SUS384		S38400	384			Z6CN18-16	
	SUSXM7	0Cr18Ni9Cu3	S30430	304Cu	394S17		Z2CNU18-10	
	SUSXM15J1	0Cr18Ni13Si4	S38100				Z15CNS20-12	
	SUS329J1	0Cr26Ni5Mo2	S32900	329				
	SUS329J3L		S32924	S31803			Z3CNDU22-05Az	08Х21Н5М2Т
	SUS329J4L		S39275	S31260			Z3CNDU25-07 Az	
	SUS405	0Cr13AI 0Cr13	S40500	405	405S17	X6CrAl13	Z8CA12	
	SUS410L	00Cr12					Z3C14	
	SUS429		S42900	429				
	SUS430	1Cr17	S43000	430	430S17	X6Cr17	Z8C17	12Х17
	SUS430F	Y1Cr17	S43020	430F		X7CrMoS18	Z8CF17	
	SUS430LX		S43035			X6CrTi17	Z4CT17	
	SUS430J1L					X6CrNb17	Z4CNB17	

Stainless steel , Heat-resistant alloy

Grade	Japan	China	USA		UK	Germany	France	Russia
	JIS	GB	UNS	AISI	BS	DIN	NF	ГОСТ
Stainless steel	SUS434	1Cr17Mo	S43400	434	434S17	X6CrMo17 1	Z8CD17-01	
	SUS436L		S43600	436				
	SUS436J1L							
	SUS444		S44400	444			Z3CDT18-02	
	SUS447J1	00Cr30Mo2	S44700					
	SUSXM27	00Cr27Mo	S44627				Z1CD26-01	
	SUS403	1Cr12	S40300	403				
	SUS410	1Cr13	S41000	410	410S21	X10Cr13	Z13C13	
	SUS410S		S41008	410S	403S17	X6Cr13	Z8C12	08X13
	SUS410F2							
	SUS410J1	1Cr13Mo 1Cr12Mo	S41025			X12CrS13		
	SUS416	Y1Cr13	S41600	416	416S21		Z11CF13	
	SUS420J1	2Cr13	S42000	420	420S29	X20Cr13	Z20C13	20X13
	SUS420J2	3Cr13	S42000	420	420S37	X30Cr13	Z33C13	30X13
	SUS420F	Y3Cr13	S42020	420F			Z30CF13	
	SUS420F2							
	SUS429J1							
	SUS431	1Cr17Ni2	S43100	431	431S29	X20CrNi17 2	Z15CN16-02	20X17H2
	SUS440A	7Cr17	S44002	440A			Z70C15	
	SUS440B	8Cr17	S44003	440B				
	SUS440C	9Cr18 11Cr17 9Cr18Mo	S44004	440C			Z100CD17	95X18
	SUS440F	Y11Cr17	S44020	S44020				
	SUS630	0Cr17Ni4CuNb	S17400	S17400		X5CrNiCuNb16-4	Z6CNU17-04	
	SUS631	0Cr17Ni7AI	S17700	S17700		X7CrNiAI17-7	Z9CNA17-07	09X17H7 Ю
	SUS632J1							
Heat-resistant alloy	SUH31				331S42		Z35CNWS14-14	45X14H14B2M
	SUH35				349S52		Z52CMN21-09Az	
	SUH36	5Cr21Mn9Ni4N	S63008		349S54	X53CrMnNi21 9	Z55CMN21-09Az	55X20Г9AH4
	SUH37	2Cr21Ni12	S63017		381S34			
	SUH38							
	SUH309	2Cr23Ni13	S30900	309	309S24		Z15CN24-13	
	SUH310	2Cr25Ni20	S31000	310	310S24	CrNi2520	Z15CN25-20	20X25H20CX2
	SUH330	1Cr16Ni35	N08330	N08330			Z12NC35-16	
	SUH660	0Cr15Ni25Ti2MoAIVB	S66286				Z6NCTV25-20	
	SUH661		R30155					
	SUH21					CrAI1205		
	SUH409		S40900	409	409S19	X6CrTi12	Z6CT12	
	SUH409L						Z3CT12	
	SUH446	2Cr25N	S44600	446			Z12C25	15X28
	SUH1	4Cr9Si2	S65007		401S45	X45CrSi9 3	Z45CS9	
	SUH3	4Cr10Si2Mo					Z40CSD10	40X10C2M
	SUH4	8Cr20Si2Ni			443S65		Z80CSN20-02	
	SUH11							40X9C2
	SUH660	2Cr12MoVNbN						20X12BHMБФР
	SUH616	2Cr12NiMoWV	S42200					

Tool steel

Grade	Japan	China	USA	UK	Germany	France	Russia
	JIS	GB	AISI/STM	BS	DIN	NF	ГОСТ
Carbon tool steel	SK140(SK1)	T13				C140E3U	Y13
	SK120(SK2)	T12	W1-1111/2			C120W3U	Y12
	Sk105(SK3)	T11	W1-10		C105W1	C105E2U	Y11
	SK95(SK4)	T10	W1-9			C90E2U	Y10
	SK85(SK5)	T8Mn T9	W1-8		C80W1	C90E2U C80E2U	Y8Г Y9
	SK75(SK6)	T8			C80W1	C80E2U C70E2U	Y8
	SK65(SK7)	T7			C70W2	C70E2U	Y7
High speed tool steel	SKH2	W18Cr4V	T1	BT1		HS18-0-1	P18
	SKH3	W18Cr4Co5	T4	BT4	S18-1-2-5	HS18-1-1-5	P18K5Ф2
	SKH4	W18Cr4V2Co8	T5	BT5		HS18-0-2-9	P18K5Ф
	SKH10	W12Cr4VCo5	T15	BT15	S12-1-4-5	HS12-1-5-5	
	SKH51	W6Mo5Cr4V2	M2	BM2	S6-5-2	H6-5-2	P6M5
	SKH52	CW6Mo5Cr4V2 W6Mo5Cr4V3	M3-1				P6M5Ф3
	SKH53	CW6Mo5Cr4V3	M3-2		S6-5-3	H6-5-3	P6M5Ф3
	SKH54		M4	BM4		HS6-5-4	
	SKH55	W6Mo5Cr4V2Co5 W7Mo5Cr4V2Co5	M35 M41	BM35	S6-5-2-5	HS6-5-2-5HC	P6M5K5
	SKH56	M36					
	SKH57			BT42	S10-4-3-10	HS10-4-3-10	
	SKH58	W2Mo9Cr4V2	M7			HS2-9-2	
	SKH59	W2Mo9Cr4VCo8	M42	BM42	S2-10-1-8	HS2-9-1-8	
Alloy tool steel	SKS11		F2				XB4
	SKS2				105WCr6	105WCr5	ХВГ
	SKS21	W					
	SKS5						
	SKS51		L6				
	SKS7						
	SKS8	Cr06				C140E3UCr4	13X
	SKS4	5CrW2Si 6CrW2S1	S1				6XB2C 5XB2CФ
	SKS41	4CrW2Si	S1				4XB2C
	SKS43		W2-91/2	BW2		10V2	
	SKS44		W2-8				
	SKS3	9CrWMn					9ХВФ
	SKS31	CrWMn			105WCr6	105WCr5	ХВГ
	SKS93						
	SKS94						
	SKS95	8MnSi					
	SKD1	Cr12	D3	B03	X210Cr12	X200Cr12	X12
	SKD10	Cr12Mo1V1	D2		X153CrMoV12		X12M
	SKD11	Cr12MoV	D2	BD2	X153CrMoV12	X160CrMoV12	
	SKD12	Cr5Mo1V	A2	BA2		X100CrMoV5	
	SKD4					X32WCrV3	
	SKD5	3Cr2W8V	H21	BH21	X30WCrV9-3	X30WCrV9	
	SKD6	4Cr5MoSiV	H11	BH11	X38CrMoV51	X38CrMoV5	4X5МФС
	SKD61	4CrMoSiV1	H13	BH13	X40CrMoV51	X40CrMoV5	4X5МФ1С
	SKD62		H12	BH12		X35CrWMoV5	3X3M3Ф
	SKD7	4CrMo3SiV	H10	BH10	X32CrMoV33	32CrMoV12-18	
	SKD8		H19	BH19			
	SKT3					55CrNiMo9V4	
	SKT4	5CrNiMo		BH225/5	55NiCrMoV6	55NiCrMoV7	5XHM

Special application steel

Grade	Japan	China	USA	UK	Germany	France	Russia
	JIS	GB	AISI/STM	BS	DIN	NF	ГОСТ
Spring steel	SUP3		1075 1078				75 80 85
	SUP6	55Si2Mn			56SiCr7	60Si7	60С2
	SUP7	60Si2Mn 60Si2MnA	9260		61SiCr7	60Si7	60С2Г
	SUP9	55CrMnA	5155		55Cr3	55Cr3	
	SUP9A	60CrMnA	5160		55Cr3	60Cr3	
	SUP10	50CrVA	6150	735A51 735H51	50CrV4	51CrV4	ХФА50ХГФА
	SUP11	60CrMnBA	51B60		51CrV4		50ХГР
	SUP12		9254	685A57 685H57	54SiCr6	54SiCr6	
	SUP13	60CrMnMoA	4161	705A60 705H60	60CrMn3-2	60CrMo4	
Sulfur and Sulfur Composite Free-cutting Steel	SUM11		1110				
	SUM12	Y12	1108				
	SUM21		1212				
	SUM22	Y15	1213	(230M07)	9SMn28	S250	
	SUM22L	Y12Pb	12L13		9SMnPb28	S250Pb	
	SUM23		1215				
	SUM23L						
	SUM24L	Y15Pb	12L14		9SMnPb28	S250Pb	
	SUM25				9SMn36	S300	
	SUM31		1117		15S10		
	SUM31L						
	SUM32	Y20		210M15 210A15		(13MF4)	
	SUM41	Y30 Y35	1137			(35MF6)	
	SUM42	Y40Mn	1141			(45MF6.1)	
	SUM43		1141	(226M44)		(45MF6.3)	
High carbon chromium bearing steel	SUJ1	GCr4	51100				
	SUJ2	GCr5	52100		100Cr6	100Cr6	ЩХ15
	SUJ3	GCr15SiMn	ASTMA485 Grade1				
	SUJ4	GCr15SiMo					
	SUJ5	GCr18Mo					

Cast iron

Grade	Japan	China	USA	UK	Germany	France	Russia
	JIS	GB	AISI/SAE	BS	DIN	NF	ГОСТ
Gray cast iron	FC100	HT100	NO.20	100			cy10
	FC150	HT150	NO.30	150	GG15	GGL150	cy15
	FC200	HT200	NO.35	200	GG20	GGL200	cy20
	FC250	HT250	NO.45	250	GG25	GGL250	cy25
	FC300	HT300	NO.50	300	GG30	GGL300	cy30
	FC350	HT350	NO.60	350	GG35	GGL350	cy35
					GG40	GGL400	cy40
Ductile cast iron	FCD400	QT400-18	60-40-18	400/17	GGG40	FGS370-17	By40
	FCD450	QT450-10	65-45-12	420/12		FGS400-12	By45
	FCD500	QT500-7	70-50-05	500/7	GGG50	FGS500-7	By50
	FCD600	QT600-3	80-60-03	600/7	GGG60	FGS600-2	By60
	FCD700	QT700-2	100-70-03	700/2	GGG70	FGS700-2	By70
	FCD800	QT800-2	120-90-02	800/2	GGG80	FGS800-2	By80
		QT900-2		900/2			By100

Nonferrous metals

Grade	Japan	China	USA	UK	Germany	France	Russia
	JIS	GB	ASTM	BS	DIN	NF	ГОСТ
Aluminum alloy		1A99	1119		A199.99R		A99
		1A97			A199.98R		A97
		1A95					A95
	A1080	1A80		1080(1A)	A199.90	1080A	A8
	A1050	1A50	1050	1050(1B)	A199.50	1050A	A5
	A5052	5A02	5052	NS4	AlMg2.5	5052	Amg
		5A03		NS5			AMg3
	A5056	5A05	5056	NS6	AlMg5		AMg5V
	A5556	5A30	5456	NG61		5957	
	A2117	2A01	2036		AlCu2.5Mg0.5	2117	D18
	A2017	2A11		HF15	AlCuMg1	2017S	D1
	A2024	2A12	2124		AlCuMg2	2024	D16AVTV
		2B16	2319				
	A2N01	2A80					AK4
	A2018	2A90	2218				AK2
	A2014	2A14	2014		AlCuSiMn	2014	AK8
	A7075	7A09	7175		AlZnMgCu1.5	7075	V95P
Cast aluminum alloy	AC4C	ZAlSi7Mn	356.2	LM25	G-AlSi7Mg		
	AC3C	ZAlSi12	413.2	LM6	G-Al12	A-S12-Y4	AL2
		ZAlSi5Cu1Mg	355.2				AL5
		ZAlSi2Cu2Mg1	413		G-Al12(Cu)		
		ZAlCu5Mn					AL19
		ZAlCu5MnCdVA	201				
		ZAlMg10	520	LM10	G-AlMg10	AG11	AL8
		ZAlMg5Si			G-AlMg5Si		AL13

Swiss Machine List

Citizen

Cincom

Machine Model	Gang Station					Turret Station						Sleeve Station		Hand	Max. cutting dia.
	Inch		Metric		Number of tools	Inch		Metric		Number of tools		Inch	Metric		
	H×B	LF	H×B	LF		H×B	LF	H×B	LF	Turret	Station	"	mm		mm
A20	□1/2	4	□12(□13)	120	5-7			–	–	–	–	ø1	ø25.4	R	ø20
B12	□3/8	4.75	□10	100	5			–	–	–	–	ø3/4	ø19.05/ø20	R	ø12
B12E/B16E	□3/8	4.75	□10	120(60)	5			–	–	–	–	ø3/4	ø19.05/ø20	R	ø12/ø16
D25(1M7)/D25(1M8)			□16(□19)	150	7	–	–	–	–	–	–	ø1	ø25.4	R	ø25
L12X			□10(□12)	110	7(6)	–	–	–	–	–	–	ø3/4	ø19.05	R	ø12
L20(2M7)/L20(2M8)/L20(2M9)/ L20(2M10)/L20(2M12)	□1/2	4.75	□12	130	5			–	–	–	–	ø3/4	ø19.05	R	ø20
L20(3M8)/L20(3M9)/L20(3M10)/ L20(3M12)/L20(3M12B5)			□12(□13/16)	130	6	–	–	–	–	–	–	ø3/4	ø19.05	R	ø20
L32	□5/8	4.75	□16	130	5			–	–	–	–	ø1	ø25.4	R	ø32
M16	□3/8		□10	120	5			□10	60	1	10	ø3/4	ø19.05	R	ø16
M32	□5/8	4.75	□16(□20)	130	5	□3/4		□16	90	1	10	ø1	ø25.4	R	ø32
R04			□8	120	7			–	–	–	–	ø5/8	ø15.875	R	ø4
R07			□8	120	5			–	–	–	–	ø5/8	ø15.875	R	ø7

*□ : H x B dimensions are the same

Miyano

Machine Model	Turret Station	Number of tools(Top/Bottom)	Hand	Sleeve dia.	Max. cutting dia.
ABX-51THY2	20×20×100	12+12/12	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	ø51
ABX-64THY2	20×20×100	12+12/12	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	ø64
ABX-51SYY2	20×20×100	12/12	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	ø51
ABX-64SYY2	20×20×100	12/12	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	ø64
ANX-42SYY	20×20×100	12/12	R	ø8/ø10/ø12/ø16/ø20/ø25	ø42
BNA-42S2	20×20×100	8(16)/-	R	ø8/ø10/ø12/ø16/ø20/ø25	ø42
BNA-42DHY3	20×20×100	8(16)/6	R	ø8/ø10/ø12/ø16/ø20/ø25	ø42
BNA-42MSY2	20×20×100	8(16)/-	R	ø8/ø10/ø12/ø16/ø20/ø25	ø42
BNA42CY5	20×20×100	12/-	R	ø8/ø10/ø12/ø16/ø20/ø25	ø42
BNA42SY5	20×20×100	12/-	R	ø8/ø10/ø12/ø16/ø20/ø25	ø42
BNA42GTY	Gang 20×20×125 Turret 20×20×100	Gang 3 Turret 8	R	ø8/ø10/ø12/ø16/ø20/ø25	ø42
BNC-42C7	20×20×100	8(16)/-	R	ø8/ø10/ø12/ø16/ø20/ø25	ø42
BND-51SY2	20×20×100	12/-	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	ø51
BNE-42S6/SY6	20×20×100	12/12	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	ø42
BNE-51S6/SY6	20×20×100	12/12	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	ø51
BNE-51MSY	20×20×100	12/12	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	ø42
BNE-51MYY	20×20×100	12/12	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	ø51
BNE-65MYY	20×20×100	12/12	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	ø65
BNJ-42S6/SY6	20×20×100	12/6	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	ø42
BNJ-51SY6	20×20×100	12/6	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	ø51
LX-06E3	20×20×125(100)	8	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32	-
LX-08E3	25×25×150	8	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	-
LX-08C	25×25×150	10	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	-
LZ-01R2	20×20×125(100)	12	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	-
LZ-01RY2	20×20×125(100)	12	R	ø8/ø10/ø12/ø16/ø20/ø25/ø32/ø40	-

On the sub-spindle side, the left-hand byte can be used as the reverse byte.

Ocean Cincom

Machine Model	Gang Station	Number of tools	Hand	Sleeve dia.	Max. cutting dia.
RL01	10×10×60-120	4※1	L	ø16/ø20	ø10
RL03	10×10×100※2 12×12×100 16×16×100	max5	L	ø20	Collet chuck Stationary type ø35 Pull Type ø40
GN-3200	10×10×100※2 12×12×100 16×16×100	max5	L	ø20	Collet chuck Stationary type ø35 Pull Type ø40
GN-3200W	10×10×100※2 12×12×100 16×16×100	max10	L	ø20	Collet chuck Stationary type ø35 Pull Type ø40
GN-4200	10×10×100※2 12×12×100 16×16×100	max8	L	ø20	Collet chuck Stationary type ø35 Pull Type ø40

※1: Total number of sleeves

※2: Shank size is selectable

STAR

Machine Model	Gang Station					Turret Station						Sleeve Station		Hand	DS-Sleeve item number	Max. cutting dia.
	Inch		Metric		Number of tools	Inch		Metric		Number of tools		Inch	Metric			
	H×B	LF	H×B	LF		H×B	LF	H×B	LF	Turret	Station	"	mm			mm
ECAS-12			□10	95-150	6								ø22	R	SS-DSU-L23 SS-DSU-SK	ø13
ECAS-20			□12(16)	80-144	6								ø22	R	SS-DSU-L23 SS-DSU-SK	ø20
ECAS-20T								□12(16)	80	3	8/Turret		ø22	R	SS-DSU-B8D34	ø20
ECAS-32T			□16	80-120	4			□16	60-78	2	10/Turret		ø22/32	R	SS-DSU-SK	ø32
JNC-10								□8	65	1	6		–	L	–	ø10
JNC-16								□10	80	1	6		–	L	–	ø16
JNC-25/32								□16	78-120	1	10		ø22	R	–	ø25/ø32
KJR-16B/25B								□16	78	1	12/16		ø22	R	–	ø16/ø25
KNC-16/20								□16	68	1	16		ø22	R	–	ø16/ø20
KNC-25II/32II								□16	78	1	20		ø22/32	R	–	ø25/ø32
RNC-10/16			□10	80-120	5								ø22	R	–	ø10/ø16
RNC-16II/16BII			□10	80-120	5								ø22	R	–	ø16
SA-16R			□10	95-120	6								ø22	R	–	ø16
SB-12II/12R/16II	□1/2 (3/8)		□12(10)	95-130	6(7)								ø22	R	SS-DSU-L23 SS-DSU-SK	ø13/ø16
SB-16/16R	□1/2 (3/8)		□12(10)	95-130	6(7)								ø22	R	SS-DSU-L23 SS-DSU-SK	ø16
SB-16III			□12	95-130	5								ø22	R	SS-DSU-L23 SS-DSU-SK	ø16
SB-16III			□10	95-130	6								ø22	R	SS-DSU-L23 SS-DSU-SK	ø16
SB-20/20R	□1/2 (3/8)		□12(10)	95-130	6(7)								ø22	R	SS-DSU-L23 SS-DSU-SK	ø20
SB-20RII			□12	100-130	6								ø22/32	R	SS-DSU-B8L23 SS-DSU-L23 SS-DSU-SK	ø20/ø25.4 (Option)
SB-20RII			□16	100-130	5								ø22	R	SS-DSU-B8L23 SS-DSU-L23 SS-DSU-SK	ø20/ø25.4 (Option)
SC-20			□12	95-130	6								ø22	R	–	ø20
SD-26 typeC, E, G, S			□16	95-135	7								ø22/32	R	SS-DSU-B8L23	ø26
SE-12/12B, 16/16B			□10	95-120	5								ø22	R	–	ø13/ø16
SF-25								□16	73-98	1	10		ø22/32	R	–	ø25
SG-42								□16(20)	84-88	1	10		ø22/32	R	–	ø42
SH-12/16			□10	95-120	5								ø22	R	–	ø13/ø16
SH-7			□8	95-120	5								ø22	R	–	ø7
SI-12/12C			□10	80-130	6								ø22	R	–	ø13
SL-7, SL-10			□10	95-115	6								ø16/22	R	SS-DSU-B8L23	ø10
SL-7, SL-10			□8	68-115	6								ø16	R	SS-DSU-B8L23	ø10
SP-20			□12	100-130	8								ø22/32	R	SS-DSU-B8L23 SS-DSU-L23 SS-DSU-SK	ø23
SP-20			□12+□16	100-130	7 (□12-4 pcs □16-3 pcs)								ø22	R	SS-DSU-B8L23 SS-DSU-L23 SS-DSU-SK	ø25.4 (Option)
SP-23			□12	100-130	8								ø22/32	R	SS-DSU-B8L23 SS-DSU-L23 SS-DSU-SK	ø23
SP-23			□12+□16	100-130	7 (□12-4 pcs □16-3 pcs)								ø22	R	SS-DSU-B8L23 SS-DSU-L23 SS-DSU-SK	ø25.4 (Option)
SR-10J	□5/16		□8	67-110	6								ø22	R	SS-DSU-L23 SS-DSU-SK	ø10
SR-16/20			□12	95-120	5								ø22	R	–	ø16/ø20
SR-20J	□1/2		□12	100-135	6								ø22	R	SS-DSU-L23 SS-DSU-SK	ø20
SR-20JII typeA, B			□12	100-135	6								ø22	R	SS-DSU-B8L23	ø20/ø23 (Option)
SR-20R/20RII/20RIII			□12	100-135	6								ø22	R	SS-DSU-L23 SS-DSU-SK	ø20
SR-20RIV	□1/2		□12	100-130	7								ø22	R	SS-DSU-B8L23	ø20
SR-25J/32J	□5/8		□16	95-155	6								ø22/32	R	SS-DSU-L23 SS-DSU-SK	ø25/ø32
SR-32, SR-32J, SR-38			□16	100-135	6								ø22	R	–	ø32
SR-32JII	□5/8		□16		6								ø22	R	SS-DSU-B8L23 SS-DSU-B8D34	ø32

Machine Model	Gang Station					Turret Station						Sleeve Station		Hand	DS-Sleeve item number	Max. cutting dia.
	Inch		Metric		Number of tools	Inch		Metric		Number of tools		Inch	Metric			
	H×B	LF	H×B	LF		H×B	LF	H×B	LF	Turret	Station	"	mm			mm
SR-32JIII	□5/8		□16	100-135	6								ø22	R	SS-DSU-B8L23	ø32
SST-16			□12	95-115	5								ø22	R	–	ø16
ST-20								□12(16)	70-78	3	8/Turret		ø22	R	–	ø20
ST-38								□16(20)	85	3	10/Turret		ø22/32	R	–	ø38
SV-12/20			□12	95-135	4			□12	70-78	1	8		ø22	R	–	ø13/ø20
SV-12/20			□16	95-135	5			□16	65-70	1	8		ø22	R	–	ø13/ø20
SV-20R			□12	90-135	7			□12	70-78 (Depends on unit)				ø22	R	SS-DSU-B8L23	ø20/ø23 (Option)
SV-20R			□16	90-135	6			□16	65-70 (Depends on unit)				ø32	R	SS-DSU-B8L23	ø20/ø23 (Option)
SV-32			□16	95-135	4			□16	80-88	1	10		ø22/32	R	–	ø32
SV-32J/32JII			□16	95-135	4			□16	65-70	1	8		ø22/32	R	–	ø32
SV-38R			□16+□20 (Cut-off)	95-135	5			□16(20)	84-88	1	10		ø22/32	R	SS-DSU-B8D34	ø38
SW-12RII			□10	80-115	6								ø16	R	SS-DSU-B8L23	ø13
SW-20	□1/2 (5/8)		□12(16)	80-144	6								ø22	R	SS-DSU-B8L23	ø20
SW-7			□8	80-120	4								–	R	–	ø7
SX-38			□16+□20	95-135	3+1			□16(□20)	84-88	10			ø22/32	R	SS-DSU-B8D34	ø38

*□ : H x B dimensions are the same

TSUGAMI

Machine Model	Gang Station					Turret Station						Sleeve Station		Hand	Max. cutting dia.
	Inch		Metric		Number of tools	Inch		Metric		Number of tools		Inch	Metric		
	H×B	LF	H×B	LF		H×B	LF	H×B	LF	Turret	Station	"	mm		mm
P013H/P014H			□8	100-120	6			–	–	–	–		ø16	R	ø1
P033H/P034H			□8	100-120	6			–	–	–	–		ø16	R	ø3
P053/P054	–	–	□8	100-120	6			–	–	–	–		ø16	R	ø5
P036W	–	–	□8	100-120	8			–	–	–	–		ø16	R	ø3
P056W	–	–	□8	100-120	8			–	–	–	–		ø16	R	ø5
B007-III	–	–	□7(□8/□10)	85	8			–	–	–	–		ø25	R	ø7
B073-II	–	–	□8	85	9								ø20	R	ø7
B073-VR/B075-VR	–	–	□8	85	9								ø20	R	ø7
B073C/B075C	–	–	□8	85	9								ø20	R	ø7
B073-V/B075-V	–	–	□8	85	9								ø20	R	ø7
B073-III/B074-III/B075-III	–	–	□8	85	9								ø20	R	ø7
B074/B07-V	–	–	□8	85	9			–	–	–	–		ø20	R	ø7
B074-II	–	–	□8	85	6			–	–	–	–		ø20	R	ø7
B0123/B0124/B0125/B0126	–	–	□12	85	9			–	–	–	–		ø20	R	ø12
B012F/B012-V/BE12-V	–	–	□12	85	9			–	–	–	–		ø20	R	ø12
B0123-II/B0124-II/B0125-II/B0126-II	–	–	□12	85	9			–	–	–	–		ø20	R	ø12
B0123-VR/B0125-VR/B0126-VR	□1/2	–	□12	85	9			–	–	–	–		ø20	R	ø12
B0123C/B0125C/B0126C	–	–	□12	85	9			–	–	–	–		ø20	R	ø12
B0123-V/B0125-V/B0126-V	□1/2	–	□12	85	9			–	–	–	–		ø20	R	ø12
B0123-III/B0124-III/B0125-III/B0126-III	□1/2	–	□12	85	9			–	–	–	–		ø20	R	ø12
B016MF	–	–	□12	85	9			–	–	–	–		ø20	R	ø16
B018-III	–	–	□12	85	9			–	–	–	–		ø20	R	ø18
B0203/B0204/B0205/B0205-II/B0205-III/B0206-II	–	–	□12	85	9			–	–	–	–		ø20	R	ø20
B0203-II/B0204-II/B0206-II	–	–	□12	85	9			–	–	–	–		ø20	R	ø20
B0203-VR/B0205-VR/B0206-VR	□1/2	–	□12	85	9			–	–	–	–		ø20	R	ø20
B0203-V/B0205-V/B0206-V	□1/2	–	□12	85	9			–	–	–	–		ø20	R	ø20
B0203-III/B0204-III/B0205-III/B0206-III	□1/2	–	□12	85	9			–	–	–	–		ø20	R	ø20
B020F/B020-V/BE20-V	–	–	□12	85	9			–	–	–	–		ø20	R	ø20
B026-V	–	–	□12(□16)	85	6			–	–	–	–		ø25	R	ø26
B0265-II/B0266-II	–	–	□16	100	12								ø25	R	ø26
B0265-III/B0266-III	□5/8	–	□16	100	12								ø25	R	ø26
B0325-II/B0326-II	–	–	□16	100	12								ø25	R	ø32
B0325-III/B0326-III	□5/8	–	□16	100	12								ø25	R	ø32
B0385/B0385L	–	–	□16	125	8			–	–	–	–		ø32	R	ø38
B0385(L)-III/B0386(L)-III	□5/8/□3/4	–	□16/□20	100	12			–	–	–	–		ø25/ø32	R	ø38
B038T	–	–	□16	125	3			□20	125	1	8		ø25/ø32	R	ø38
BA20-III			□12	85	6			–	–	–	–		ø25	R	ø20
BA26-III			□12(□16)	85	6			–	–	–	–		ø25	R	ø26
BC18	□1/2		□12	85	10			–	–	–	–		ø25	R	ø18
BC25	□1/2		□12	85	10			–	–	–	–		ø10/ø25	R	ø25
BE18	□1/2		□12	85	9			–	–	–	–		ø20	R	ø18
BH20/BH20Z	□1/2		□12	85	4			□12	85	1	12		ø25/ø32	R	ø20
BH38	□5/8		□16	125	7			□20	125	1	12		ø25/ø32	R	ø38
BM07			□8	85	9			–	–	–	–		ø20	R	ø7
BM163/BM164/BM165	□1/2		□12	85	9			–	–	–	–		ø20	R	ø16
BM163-VR/BM165-VR	□1/2		□12	85	9			–	–	–	–		ø20	R	ø16
BM163-III/BM164-III/BM165-III	□1/2		□12	85	9			–	–	–	–		ø20	R	ø16
BM163-II/BM164-II/BM165-II			□12	85	9			–	–	–	–		ø20	R	ø16
BM20-V	□1/2		□12	85	9			–	–	–	–		ø20	R	ø20
BN12-III			□12	85	7			–	–	–	–		ø20	R	ø12
BN20-III			□12(□16)	85	7			–	–	–	–		ø20	R	ø20
BS12-V	□1/2		□12	85	8(12)			–	–	–	–		ø20/ø25	R	ø12
BS18-III	□1/2		□12	85	7(10)			–	–	–	–		ø14/ø25	R	ø18
BS20-V	□1/2		□12	85	8(12)			–	–	–	–		ø20/ø25	R	ø20
BS26(ABC)-V	□5/8		□16	100	7(10)			–	–	–	–		ø16/ø25	R	ø26
BS32C-V	□5/8		□16	100	6			–	–	–	–		ø16/ø25	R	ø32
BU12			□12	85	4			□12	80	1	8		ø20	R	ø51
BU20			□12	85	4			□12	80	1	8		ø20	R	ø20

Machine Model	Gang Station					Turret Station						Sleeve Station		Hand	Max. cutting dia.
	Inch		Metric		Number of tools	Inch		Metric		Number of tools		Inch	Metric		
	H×B	LF	H×B	LF		H×B	LF	H×B	LF	Turret	Station	"	mm		mm
BU26			□16	100	7			□20	80	1	8		ø20/ ø32	R	ø26
BU38	□1/2		□16	100	7			□20	80	1	8		ø20/ ø32	R	ø38
BW07-III	□1/2		□12	85	7			–	–	–	–		ø20	R	ø7
BW12-III/BW129Z	□1/2		□12	85	7			–	–	–	–		ø20	R	ø12
BW20-III/BW209Z	□1/2		□12(□16)	85	7			–	–	–	–		ø20	R	ø20
BW269Z/ZJ	□5/8		□16	100	7	–	–	–	–	–	–		ø25	R	ø26
BW329Z/ZJ	□5/8		□16	100	7	–	–	–	–	–	–		ø25	R	ø32
C004-III			□13	60-100	6-8			–	–	–	–		-ø10	R/L	ø120
C150	–	–	□10	60-100	4-6			–	–	–	–		-ø8	R/L	ø80
C180	–	–	□12	60-100	4-6			–	–	–	–		-ø10	R/L	ø120
C220	–	–	□13	60-100	6-8			–	–	–	–		-ø10	R/L	ø120
C300-V	–	–	□16	100-130	6-10			–	–	–	–		-ø14	R/L	ø170
CH154			□12	60-100	-16			–	–	–	–		-ø10	R/L	ø15
M34J			–	–	–			□20	125	1	12		ø20/ ø32	R	ø34
M42J/M42D/M42SD			–	–	–			□20	125	1	12		ø25/ ø32	R	ø42
M50SY-III			–	–	–			□20	100	1	12		ø32	R	ø51
M50J			–	–	–			□20	100	1	12		ø20/ ø32	R	ø51
MB25			–	–	–			□20	80	2	8/Turret		ø20/ ø32	R	ø25
MB35-III			–	–	–			□20	80	2	8/Turret		ø20/ ø32	R	ø35
MB38-III			–	–	–			□20	80	2	8/Turret		ø20/ ø32	R*	ø38
MB50-III			–	–	–			□20	80	2	8/Turret		ø20/ ø32	R	ø50
MU26			–	–	–			□20	80	2	8/Turret		ø20/ ø32	R	ø26
MU38			–	–	–			□20	80	2	8/Turret		ø20/ ø32	R	ø38
NU50-III			–	–	–			□20	100	1	12		ø20/ ø32	R	ø51
B020M-II/SS20M/SS20M-5AX			□10 Can be mounted on the spindle	46	–			BT15 spindle			24		ø20	R	ø20
S205/S206	□1/2		□12(□16)	100	8			–	–	–	–		ø20/ ø22	R	ø20
S205A-II/S206A-II	□1/2		□12(□16)	100	9			–	–	–	–		ø20	R	ø25
S205-II/S206-II	□1/2		□12(□16)	100	9			–	–	–	–		ø20	R	ø25
SS20	□1/2		□16	100	8			–	–	–	–		ø20/ ø22	R	ø20
SS207/SS207-5AX	□1/2		□12(□16)	100	8			–	–	–	–		ø20/ ø22	R	ø20
SS207-II/SS207-II-5AX	□1/2		□12(□16)	100	9			–	–	–	–		ø20	R	ø25
SS26	□5/8		□16	100	7			–	–	–	–		ø20/ ø22	R	ø26
SS267/SS267-5AX	□5/8		□16	100	8								ø25	R	ø26
SS267-III/SS267-III-5AX	□5/8		□16	100	8			–	–	–	–		ø25	R	ø26
SS32/SS32L	□5/8		□16	100	7			–	–	–	–		ø20/ ø22	R	ø32
SS327/SS327-5AX	□5/8		□16	100	8								ø25	R	ø32
SS327-III/SS327-III-5AX	□5/8		□16	100	8								ø25	R	ø32
TMB2			–	–	–			□20	125	1	16		ø32	R	ø51
TMU1			–	–	–			□20	125	1	16		ø32	R	ø38
TMA8-IV/TMA8J			□20 Can be mounted on the spindle	100				KM40 spindle			30			R	ø220
M06JC-II								□20	125	1	8		ø25	R	ø220/ ø42
M06J-II								□25	150	1	8		ø32/ ø40	R	ø260/ ø51
M08J-II/M08JL5-II/M08JL8-II								□25	150	1	8		ø32/ ø40	R	ø280/ ø65
M06D-II/M06DY-II/M06SJ-II/M06SD-II/M06SY-II								□25	150	1	12		ø40	R	ø260/ ø51
M08D-II/M08DY-II/M08SJ-II/M08SD-II/M08SY-II								□25	150	1	12		ø40	R	ø280/ ø65
M10D								□25	150	12			ø40	R	ø400
M10J/M10JL5								□25	150	12			ø40	R	ø400

*□ : H x B dimensions are the same

DMG MORI

Machine Model	Gang Station					Sleeve Station		Hand	Max. cutting dia
	Inch		Metric		Number of tools	Inch	Metric		
	H×B	LF	H×B	LF		"	mm		mm
Sprint 20/5			□12		6		ø20	R	ø20
Sprint 20/8			□12		6		ø20	R	ø20
Sprint 32/5			□16		6		ø20	R	ø32
Sprint 32/8			□16		6		ø20	R	ø32

*□ : H x B dimensions are the same

NOMURA

Machine Model	Gang Station					Sleeve Station		Hand	Max. cutting dia
	Inch		Metric		Number of tools	Inch	Metric		
	H×B	LF	H×B	LF		"	mm		mm
NS-P1053A			□9.5	130	5			R	ø10
NN-10C			□10	130	6		ø17	R	ø10
NN-10E			□10	130	6		ø16	R	ø10
NN-10C2			□10	130	6		ø17	R	ø10
NN-10CS			□10	130	6		ø17	R	ø10
NN-10CS (No live tools)			□10	130	5		ø17	R	ø10
NN-10SII			□10	130	5		ø23	R	ø10
NN-10T			□10	130	7		ø23	R	ø10
NN-10SB5			□10	130	5		ø23	R	ø16
NN-16SB5			□10	130	5		ø23	R	ø16
NN-16SB6 Type1	□1/2	5.12	□12.7	130	5		ø17(ø22)	R	ø16
NN-16SB6 Type2	□1/2	5.12	□12.7	130	5		ø17(ø22)	R	ø16
NN-16SB6 Type2.5	□1/2	5.12	□12.7	130	5		ø17(ø22)	R	ø16
NN-16SB6 Type3	□1/2	5.12	□12.7	130	5		ø17(ø22)	R	ø16
NN-16SB7	□1/2	5.12	□12.7		5(7)		ø16	R	ø16
NN-16HIII			□12	130	6		ø23	R	ø16
NN-20HIII			□12	130	6		ø23	R	ø20
NN-16UIII			□12	130	5		ø23	R	ø16
NN-20UIII			□12	130	5		ø23	R	ø20
NN-20CS	□1/2	5.12	□12.7	130	5(6)		ø22	R	ø20(ø25)
NN-20U5	□1/2	5.12	□12.7	130	5(6)		ø22	R	ø20(ø25)
NN-16UB5			□12	130	5		ø23	R	ø16
NN-20UB5			□12	130	5		ø23	R	ø20
NN-20UB7			□12	130	6		ø23	R	ø20
NN-20UB8	□1/2	5.12	□12.7	130	5(6)		ø22	R	ø20(ø25)
NN-20YB			□12	130	8		ø23	R	ø20
NN-25UB8	□1/2	5.12	□12		5		ø22	R	ø25
NN-32UB8	□1/2	5.12	□16		5		ø22	R	ø32
NN-38UB8	□3/4		□20		5		ø22/ø32	R	ø38
NN-25YB/32YB			□16	130	8		ø22/ø32	R	ø25
NN-32YB2			□16	130	5		ø23/ø32	R	ø32
NN-32YB3	□5/8		□16		5		ø22/ø32	R	ø32
NN-32YB3XB	□5/8		□16		6		ø22/ø32	R	ø32
NN-16J	□1/2	5.12	□12.7	130	6		ø23	R	ø16
NN-20J	□1/2	5.12	□12.7	130	6		ø23	R	ø20
NN-20J2	□1/2	5.12	□12.7	130	6		ø22	R	ø20
NN-20J3	□1/2	5.12	□12.7		6		ø23	R	ø20
NN-20J3XB	□1/2	5.12	□12.7		5		ø23	R	ø20

*□ : H x B dimensions are the same

TORNOS

Machine Model	Gang Station					Turret Station					Sleeve Station		Hand	Max. cutting dia.
	Inch		Metric		Number of tools	Inch		Metric		Number of tools	Inch	Metric		
	H×B	LF	H×B	LF		H×B	LF	H×B	LF		"	mm		mm
EvoDECO 10/10	□5/16		□8		8							ø20/ø25	R	ø10
EvoDECO 10/8	□5/16		□8		8							ø20/ø25	R	ø10
EvoDECO 16/10	□1/2		□12		10							ø20/ø25	R	ø16
EvoDECO 16/8	□1/2		□12		10							ø20/ø25	R	ø16
EvoDECO 20	□5/8		□16		10							ø20/ø25	R	ø25.4
EvoDECO 32	□5/8		□16		10							ø20/ø25	R	ø32
Swiss ST 26	□1/2		□12		17							ø20/ø22/ø25	R	ø25.4
Sigma 20/6	□5/8		□16		14						ø1	ø20	R	ø25.4
Sigma 32/6	□5/8		□16		14						ø1.26	ø32	R	ø32
SwissNano	□5/16		□8		7							ø12/ø16	R	ø4
Delta 12/4	□1/2		□12	85	5							ø20	R	ø12
Delta 12/5	□1/2		□12	85	5							ø20	R	ø12
Delta 20/4	□1/2		□12	85	5							ø20	R	ø20
Delta 20/5	□1/2		□12	85	5							ø20	R	ø20
Delta 38/5B			□20	125	8							ø25/ø32	R	ø38
Delta 38/5BL			□20	125	8							ø25/ø32	R	ø38
Gamma 20/5			□16	100	8							ø20/ø22	R	ø20
Gamma 20/6			□16	100	8							ø20/ø22	R	ø20
CT20	□1/2		□12	100	5								R	ø20
MultiSwiss 6X16								□16		6		ø25		
MultiSwiss 8X26								□16		8		ø25		
MultiSwiss 6X32								□16		8		ø25		
Swiss GT13			□12		8							ø20/ø22		13
Swiss GT26			□16		9							ø20/ø22		26
Swiss GT26B			□16		8							ø20/ø22		26
Swiss GT32			□16		9							ø20/ø22		32
Swiss GT32B			□16		8							ø20/ø22		32
SwissDeco 26-G			□16		8							ø20/ø25		26
SwissDeco 26-T			□16					□16		8		ø20/ø25		26
SwissDeco 26-TB			□16					□16		8		ø20/ø25		26
SwissDeco 32-G			□16		8							ø20/ø25		32
SwissDeco 26-T			□16					□16		8		ø20/ø25		32
SwissDeco 26-TB			□16					□16		8		ø20/ø25		32

*□ : H x B dimensions are the same

Hanwha Machinery

Machine Model	Gang Station					Turret Station					Sleeve Station		Hand	Max. cutting dia.
	Inch		Metric		Number of tools	Inch		Metric		Number of tools	Inch	Metric		
	H×B	LF	H×B	LF		H×B	LF	H×B	LF		"	mm		mm
XD 03			□8		6							ø15.875	R	ø3
XD 07			□8		6							ø15.875	R	ø7
XD 12			□12		5							ø20	R	ø12
XD 16			□12		5							ø20	R	ø16
XD 20 / 20V			□12		6							ø25	R	ø20
XDI20			□12		6							ø25	R	ø20
XD 26			□16		5							ø25	R	ø26
XD32			□16		5							ø32	R	ø32
XD 38			□16		5							ø32	R	ø38
XD 42			□20		5							ø32	R	ø42
XE 12			□12		6							ø20	R	ø12
XE 16			□12		6							ø20	R	ø16
XE 20			□12		6							ø25	R	ø20
XE 26			□16		5							ø25	R	ø26
XE 35			□16		5							ø32	R	ø35
XP 12 /12S			□12		6							ø20	R	ø12
XP 16 /16S			□12		6							ø20	R	ø16
XP 20			□12		6							ø25	R	ø20
XP 26 / 26S			□16		5							ø25	R	ø26
STL38H			□16		5			□16				ø32	R	ø38

*□ : H x B dimensions are the same

MEMO

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1180	E21-22,E48	Parts
1182	E48	Parts
2413	E48,G3	Parts
2415	E6,E21-22,E24	Parts
2417	E6,E21-22,E24,E48	Parts
3919	E48	Parts
5104	G3,G5	Parts
9414	E6,E21-22,E24,E48,F50-53,G3	Parts
1/4-20UNC*1-1/4	E52	Parts
1230-C	F50-53	Parts
2*8AW	E59	Parts
2.5*8AW	E59	Parts
2417-C	F50-53	Parts
3/8-16UNC*1-1/2	E52	Parts
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ACH-W..	Q18,Q31,Q54,Q61	Parts
ACN422	E6,E8-9	Parts
ACN423	E5,E8,G6	Parts
ADN423	E14-16,G11	Parts
AMS-3	I10	Parts
AMS-4	I10	Parts
AMS-5T	I10-11	Parts
AMS-6T	I12	Parts
AOB-3S	I10	Parts
AOB-4S	I10	Parts
AOB-5*14	T34	Parts
AOB-5*16	T34	Parts
AOB-5C	F23,F26	Parts
AOB-5S-T25	I10-11	Parts
AOB-6C	F23-24,F48	Parts
AOB-6S-T30	I12	Parts
AOS-5*16	S29	Parts
AOS-5*20	F10,T23,T31	Parts
AOS-5*25	F9-10,R25,T23-24,T30,U22	Parts
AOS-5*26W	E38	Parts
AOS-6*26W	G6,G11	Parts
AOS-6*30	F10,T31	Parts
AOS-6*30W	E5,E8,E14-16,E23-24,E34-35,E45,G6,G11,G16,G20	Parts
APCW	I27	Insert
APCW-PD	I27	Insert
ARN42	E48-50	Parts
ARP42A	I11	Parts
ASG-5	F9-10,F23,F26,R25,T23-24,T30-31,U22	Parts
ASG-6	F10,F23-24,F48,T31	Parts
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ASGL6-D	E5,E8,E14-16,E23-24,E34-35,E45,G6,G14,G16,G20	Parts
ASN423	E23-30,E63,G16,I15,I18,I21	Parts
ASN522	E63	Parts
ATN323	E38-41	Parts
AVN323	E34-35	Parts
AWN423-W	E45,G20	Parts
AZT659D	E63	Parts
B		
BG	T40,V43	Toolholder
BS0520	E59,S40	Parts
BS0620	S39	Parts
BS0625	E59,S40	Parts
BS0829W	E26-29	Parts
BS0835W	E6,E8-9,E23,E25-30,E39-41,E48-50	Parts
B-STZC-N	R47,V41	Toolholder
B-STZP-N	R45,V37	Toolholder
C		
C11	E28	Toolholder
C12	E26	Toolholder
C13	E27	Toolholder
C14	E26	Toolholder
C15	E28	Toolholder
C16	E29	Toolholder
C17	E29	Toolholder
C21	E39	Toolholder
C22	E39	Toolholder
C23	E41	Toolholder
C24	E41	Toolholder
C25	E40	Toolholder
C31	E8	Toolholder
C54	E49	Toolholder
C55	E50	Toolholder
CC..	D32,Q22-24,V33-34	Insert
CC08M	E6,E8-9,E23,E25-30,E48-50	Parts
CC08MS	E39-41	Parts
CCBN	E9	Toolholder
CCGW	D6,D33,Q24	Insert
CCKN	E9	Toolholder
CCLN	E6	Toolholder
CCLN-CX	E6	Toolholder
CDH	D6,E52	Insert
CH-FGV	T42	Toolholder
CH-GTT	R34,T22	Toolholder
CH-LBM	V8	Toolholder
CH-SDUC	Q33	Toolholder
CH-STUC	Q57	Toolholder
CH-SVUC	Q46	Toolholder
CH-SVUP	Q55	Toolholder
CH-SVXC	R37	Toolholder
CH-TBPA	R20	Toolholder
CH-TTP	U20	Toolholder
CL1-1-E..	F5,F27	Parts
CL2RVRL	E57	Parts
CL3RV	E57	Parts
CL4RV	E57	Parts
CL6RV	E58	Parts
CL-7	G5	Parts
CL8RV	E58	Parts
CLH04-004	H6	Insert
CLH04-035	H5	Insert
CLH04-045	X8	Insert
CLH05	H7	Insert
CLR-13S	Q53-55,Q57,R44,R47,U28,V25-31,V36,V39-41	Parts
CLR-15S	H6-7,Q7-8,10-12,15-16,20-21,R6-8,11-14,17-20,24,27-28,S6-7,10-13,T8-10,12-21,40,U12-14,V6-8,30-32,43	Parts
CM-..	F7	Parts
C-MBR	V26-27	Toolholder
C-MBR-OH	V25-26	Toolholder

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C-MSBR	R44,V27	Toolholder
CN.G	D34,E13,G10,Q66	Insert
CNGN	D9,E10,G7	Insert
CNGA	D7,E11,G8	Insert
CNGA-WL	D8,E12,G9	Insert
CNGG-AG	D9,E12,G9	Insert
CNGX	D10,E13,G10	Insert
COUP	O7,O9	Parts
CP..	D34,V31	Insert
CPL5	F10	Parts
CPL5S	F9-10,R25,T23,T30-31	Parts
CPL6	F10,T31	Parts
CPR5	F10,T24,U22	Parts
CPR5S	F9,R25,T23,T30	Parts
CPR6	F10	Parts
CR1-1-E..	F5,F27	Parts
CRDC	E59	Toolholder
CRDN	E48	Toolholder
CRGN	E49	Toolholder
CRGN-CD	E48	Toolholder
CRN..	E62	Toolholder
CRXC	E62	Toolholder
CS0309-TW	U35	Parts
CS0310	U37	Parts
CS0316	E52	Parts
CS0410	U37	Parts
CS04148S	U37	Parts
CS0420	O41	Parts
CS0425	E62,O41	Parts
CS0515	E54,U37	Parts
CS0516LSH	S31-32,S35	Parts
CS0520	O40,U37	Parts
CS0520W	F13	Parts
CS0525	E62	Parts
CS0619LSHW	S37	Parts
CS0620	U37	Parts
CS0623LSHW	S37	Parts
CS0625	E52	Parts
CS0625W	F13	Parts
C-SCLC-OH	V32	Toolholder
C-SCLP-N	V31	Toolholder
C-SCLP-OH	V30	Toolholder
CSDN-CX	E24	Toolholder
CSDNN	E25	Toolholder
C-SEXR-OH	V28-29	Toolholder
CSHN	E30	Toolholder
CSKN-CX	E21	Toolholder
CSRN-CX	E22	Toolholder
CSSN	E23	Toolholder
CSSN-CD	E22	Toolholder
C-STUC-N	V40	Toolholder
C-STUC-OH	V39	Toolholder
C-STUP-N	V36	Toolholder
C-STUP-OH	V35	Toolholder
C-STZC-OH	R47,V41	Toolholder
C-STZP-OH	R45,V37	Toolholder
CSV	Q10,R6,S6,T8,U12	Toolholder
CSVB-V	R9	Insert
CSVB-VB	R9	Insert
CSVB-VX	R9	Insert

Part No.	Listed on	Part name
CSVC-V	S8	Insert
CSVC-VB	S8	Insert
CSVF-V	Q13	Insert
CSVF-VB	Q13	Insert
CSVF-VX	Q13	Insert
CSVG	T11	Insert
CSV-NC	Q11,R7,S7,T9,U13	Toolholder
CSV-NC-F	Q11,R7,S7,T9,U13	Toolholder
CSVT-A	U15	Insert
CSVT-B	U15	Insert
CTDP20/25	S36	Insert
CTDP-OH	S33	Toolholder
CTDP-OH2	S32	Toolholder
CTDP-OH3	S31	Toolholder
CTDPR/L	S34-35	Toolholder
CTPA-FL	S26	Insert
CTPA-FLK	S25	Insert
CTPA-FLN	S25	Insert
CTPA-FR	S24	Insert
CTPA-FRN	S24	Insert
CTPAL-SUB	S23	Toolholder
CTPA-OH	R18,S21	Toolholder
CTPA-OH2	R17,S20	Toolholder
CTPAR/L	R19,S22	Toolholder
CTPAR-SUB	S23	Toolholder
CTP-FL	S19	Insert
CTP-FLK	S18	Insert
CTP-FLN	S19	Insert
CTP-FR	S16	Insert
CTP-FRK	S17	Insert
CTP-FRN	S17	Insert
CTPL-SUB	S15	Toolholder
CTPL-SUB-OH3	S14	Toolholder
CTP-OH	S12	Toolholder
CTP-OH2	S11	Toolholder
CTPR/L	S13	Toolholder
CTPR-SUB	S15	Toolholder
CTPR-SUB-OH3	S14	Toolholder
CTPS-001	S10	Insert
CTPS-FR	S9	Insert
CTPSR	R10,S9,T12,U16	Toolholder
CTPS-SUB04	S10	Toolholder
CTPW25-L	S28	Insert
CTPW25-R	S28	Insert
CTPWR/L	S27	Toolholder
CTV-A/B	S41	Insert
CTV-K2	S29	Toolholder
CTV-M(B)	S40	Toolholder
CTV-N038	S41	Insert
CTVN-K2	S29	Toolholder
CTVR/L	S39	Toolholder
CTV-R/N/L	S41	Insert
CTV-S	S30	Insert
CTV-X	S40	Toolholder
CTWP-003	S37	Toolholder
CTWPR/L	S37	Toolholder
CVL3N	F23	Parts
CVL3SN	F26	Parts
CVL4N	F23-24	Parts
CVL4SN	F23	Parts

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CVL6	F23-24,F48	Parts
CVL8	F23	Parts
CVR3N	F23	Parts
CVR3SN	F23	Parts
CVR4N	F23-24	Parts
CVR4SN	F23	Parts
CVR6	F23-24,F48	Parts
CVR8	F23	Parts
CZH-070	X7	Insert
CZH-140/141	X7	Insert
CZH-BL	X7	Insert
CZH-C45	X7	Insert
D		
DAS41	F5,F27	Parts
DB1	F5	Toolholder
DB7	F27	Toolholder
DBA-..	F27	Parts
DC..	D35,Q37-39	Insert
DC5TN	E38	Parts
DC6CN	E5,E8,E14-16,E23-24,E45,G6,G16,G20	Parts
DC6DN	E14-16,G11	Parts
DC6VN	E34-35	Parts
DCGT-WP	D37,Q38-39	Insert
DCGW	Q39	Insert
DCM.	D37,Q39	Insert
DL-025-08-JRF	I6	Parts
DL-025-20-JRF	I6	Parts
DL-040-20-JRF	I6	Parts
DN.G	D38,E20,G15,Q68	Insert
DNGN	D12,E17,G12	Insert
DNGA	D11,E18,G13	Insert
DNGG-AG	D12,E19,G14	Insert
DNGX	D13,E19,G14	Insert
DPGN-V	D13	Insert
DS-CSVL	Q12,R8,T10,U14	Toolholder
DS-FGV	T43	Toolholder
DS-GTT	R33,T22	Toolholder
DS-LBMB	V7	Toolholder
DS-PTX	Q62	Toolholder
DS-PTX-ACH	Q61	Toolholder
DS-PTX-ACH-OH	Q61	Toolholder
DS-SCL	Q20	Toolholder
DS-SCL-004,005	Q19	Toolholder
DS-SCL-ACH	Q18	Toolholder
DS-SDU	Q32	Toolholder
DS-SDU-ACH	Q31	Toolholder
DS-SDU-ACH-OH	Q31	Toolholder
DS-SDX	Q34	Toolholder
DS-SDX-006	Q34	Toolholder
DS-STT	U23	Toolholder
DS-SVVPN	Q55	Toolholder
DS-SVVPN-ACH	Q54	Toolholder
DS-SVX	Q50	Toolholder
DS-SVXP	Q53	Toolholder
DS-TBP	R15	Toolholder
DS-TTP	U20	Toolholder
E		
E..-SDW43-..	I28	Cutter
ENGN	D13	Insert
ERGP	D38,V29	Insert

Part No.	Listed on	Part name
F		
FBV	T44	Insert
FDX-45	I23	Insert
FDX-75	I17	Insert
FDX-88	I20	Insert
FGV	T42	Toolholder
FGV-D6	T44	Insert
FSI01-2.5*5	H6-7	Parts
FSI02-2.2*4.0	X5	Parts
FSI02-2.2*4.3	X5-6,X8	Parts
FSI04-2.0*4.3	H5	Parts
FSI17-2.2*6.0	U35	Parts
FSI21-5.0*12.45	I28,I30,I32	Parts
FSI22-4.0*11	I26	Parts
FSI23-4.0*7	I26	Parts
FSI24-2.2*7.9	U35	Parts
FSI26-4.0*12-LH	I14	Parts
FSI28-6.0*18	E55-56,F19-20,F33-34,F45-46	Parts
FSS15-3.0*12	E5,E8,E14-16,E23-24,E34-35,E38,E45,G20	Parts
FSS16-3.0*8	G6,G11,G16	Parts
G		
GBI-VGW..	F29,F31	Blade
GBO-VGW..	F30,F32	Blade
GBRL	E53-54	Blade
GBRR	E53-54	Blade
GBVL	F16-17	Blade
GBVR	F15,F18	Blade
GBWPFL	F39,F41	Blade
GBWPFR	F37,F43	Blade
GEV	F25-26	Insert
GFV-6	F48	Toolholder
GFV-N	F49	Insert
GKN	F8	Insert
GKP	F8	Insert
GKV-3	F26	Toolholder
GKVR	F24	Toolholder
GKWP	F13	Toolholder
GKWP-H	E56,F20,F34,F46	Toolholder
GSV-6	F48	Toolholder
GTG	T41,V44	Insert
GTG-005	T41,V44	Insert
GTMA43-R	F11,T32	Insert
GTMH32-E	T26	Insert
GTMH32-GX	T25	Insert
GTMH32-RE	T29	Insert
GTMH32-SSH	T27	Insert
GTMH32-VT	T28	Insert
GTMT43	F11,T32	Insert
GTMX32-LS	T28	Insert
GTMX32-SS	T27	Insert
GTMX32-T	T25	Insert
GTMX32-V90	T29	Insert
GTPA	T14	Insert
GTPA-OH	T13	Toolholder
GTPAR	T13	Toolholder
GTPS	T12	Insert
GTT	R29-31,T17-19	Toolholder
GTT-OH	R28,T17	Toolholder
GTT-OH2	R27,T16	Toolholder
GTT-OH3	R27,T15	Toolholder

Alphabetical

Part No.	Listed on	Part name
GTV	F25	Insert
GTVR/L..	F23	Toolholder
GTWP-H	E55,F19,F33,F45	Toolholder
GTWPR/L	F12,T33	Toolholder
GWPFM-GT	F47,S38	Insert
GWPG(M)-GW	F14,T35	Insert
GWPG-GV	F14,T35	Insert
H		
HACDH..	E52	Parts
HAR..	E62	Parts
HARCGX..	E59	Parts
HAZT1255A	E63	Parts
HC35KR-..	E59	Parts
HC59TS-4	E63	Parts
HC60TS-4	E63	Parts
HC6CN	E5,G6	Parts
HC6DN	E14-19,G11	Parts
HC6SN	E23-24,G16	Parts
HC6VN	E34-35	Parts
HCLN	E5	Toolholder
HCS3P050	I6-7	Parts
HCS5P080	I6-7	Parts
HDHN	E15	Toolholder
HDJN	E14	Toolholder
HDNNN	E16	Toolholder
HLR-13S	Y4	Parts
HLR-15S	Y4	Parts
HLR-20S	Y4	Parts
HLR-25S	Y4	Parts
HLW175	I15,I18,I21	Parts
HLW177	I15	Parts
HN	U28,V45	Toolholder
HN-ATS	E63	Toolholder
HN-BTS	E63	Toolholder
HOSE-AN	O9	Parts
HOSE-CN	O6	Parts
HOSE-DA	O9	Parts
HOSE-R1/8	O6	Parts
HOSE-ST	O9	Parts
HRCD	E52	Toolholder
HSDNN	E24	Toolholder
HSSN	E23	Toolholder
HVJN	E34	Toolholder
HVPN	E35	Toolholder
HVVNN	E35	Toolholder
HWS3P050	I6-7	Parts
HWS5P080	I6-7	Parts
HY-NBH	V13-14,W7-8	Toolholder
HY-NBH-OH	V10-12,W4-6	Toolholder
I		
ICSN434	E6	Parts
ICSN454	E6	Parts
IRSN43	E48,G3	Parts
IRSN45	E48,G3	Parts
IRSN53	E48	Parts
ISSN434	E21-22,E24	Parts
ISSN454	E21-22,E24	Parts
ISSN534	E21-22,E24	Parts
J		
JFDX	I15,I18,I21	Cutter
JOINT-AN	O7	Parts
JOINT-ST	O7	Parts
JQTE	I26	Cutter
JQTS	I26	Cutter
JRFIH	I6	Cutter
JRFMH	I6	Cutter
JRFMH-MM	I7	Cutter
JRNMW	I12	Cutter
JRPMW	I10	Cutter
JSDW	I28,I30,I32	Cutter
JWNXM	I14	Cutter
JXTM	I24	Cutter
K		
K..-C	F50-53	Parts
L		
L1E..	F5	Parts
L2E..	F5	Parts
LBM	V9	Insert
LBMA	V6	Toolholder
LBMA-F	V6	Toolholder
LBMA-S	V7	Toolholder
LBMD-S	V9	Insert
LCL3	E40,Q63	Parts
LCL33N	Q59-62	Parts
LCL4	E7,E14-15,E27,Q65,Q67	Parts
LCS3	E40,Q63	Parts
LCS33	Q59-62	Parts
LCS4	E15,E25,Q65,Q67	Parts
LCS4CA	E7,E14,Q65,Q67	Parts
LLR-13S	Y4	Parts
LLR-15S	Y4	Parts
LLR-20S	Y4	Parts
LLR-25S	I24,Q14-17,Q21,Q25-28,Q33-36,Q40,R20,R22,S14-15,S23,S27,S31-33,S35,U19-20	Parts
LLR-25S-20*65	Q18-20,Q29-32,Q34,Q36,R15,U18,U20,V32	Parts
LLR-28S	S35	Parts
LLR-T10	E5,E8,E14-16,E23-24,E34-35,E38,E45,G6,G11,G16,G20	Parts
LLR-T15	E38,I14	Parts
LLR-T20	E5,E8,E14-16,E23-24,E34-35,E45,G6,G11,G16,G20	Parts
LLR-T25	I10-11,I15,I24	Parts
LLR-T30	I12	Parts
LNM	D14	Insert
LNX	I25	Insert
LRIS-2*6	Q53-55,Y5	Parts
LRIS-2.2*6	Q57,U28,Y5	Parts
LRIS-2.5*4.5	S10	Parts
LRIS-2.5*5	V32,Y5	Parts
LRIS-2.5*7	Q10-12,15-16,20-21,26-30,R6-8,10,36-37,S6-7,T8-10,12,42-43,U12-14,16,Y5	Parts
LRIS-3*6	Y5	Parts
LRIS-3*8	Q48,R39,Y5	Parts
LRIS-4*10	Q14-17,Q21,Q25-36,Q40,R15,R19-20,S27,U18-20,V6,Y5	Parts
LRIS-4*10PW	R11-14,R19,R24,S13,S22,T13,T15-21,V6-8,Y5	Parts
LRIS-4*12	I24,R22,S31-33,S35,Y5	Parts
LRIS-4*12PW	Q33,R11-14,R17-20,S11-13,S20-22,T13-14,U17-18,V6-7,Y5	Parts
LRIS-4*5	S14-15,S23,Y5	Parts
LRIS-4*6	U19,Y5	Parts
LRIS-4*8	Q18-20,V32,Y5	Parts
LRIS-5*10	S35,Y5	Parts
LR-S-2*3.5	R44,V25-27,Y5	Parts

Alphabetical

Part No.	Listed on	Part name
LR-S-2*3.7	V28-30,Y5	Parts
LR-S-2*4.4	R47,U28,V31,V39-41,Y5	Parts
LR-S-2*5.5	U28,V36,Y5	Parts
LR-S-2.5*4.8	R45,V35,V37,Y5	Parts
LR-S-2.5*5.5	V31,Y5	Parts
LR-S-2.5*6	V30,V36,Y5	Parts
LR-S-2.5*6.8	R45,T40,V37,V43,Y5	Parts
LR-S-3*5.8	R45,V35,V37,Y5	Parts
LR-S-3*6.2	V31,Y5	Parts
LR-S-3*7.8	T40,V43,Y5	Parts
LR-S-3.5*10.6	Q60,Y5	Parts
LR-S-4*10PW	Q7-8,R27-28,R30-33,Y5	Parts
LR-S-4*5.8	R30,T19,Y5	Parts
LR-S-4*9	R34,T22,U22-23,Y5	Parts
LSC42	E7,Q65	Parts
LSD42	E14-15,Q67	Parts
LSP3	E40,Q63	Parts
LSP4	E7,E14-15,E27,Q65,Q67	Parts
LSS42	E25,E27	Parts
LST317	E40,Q63	Parts
LW-2	Q60-62,R41-42,T36-38,U25-26,V12,14,17,W6,8,10	Parts
LW-2.5	E40,52,F9-10,I6-7,Q7-8,14,R11,S11,14,T15-16,U17	Parts
LW-2.5S	I6,S29	Parts
LW-3	E7,14-15,25,F10,O41,15,18,26,S12,31-32,V12,W6	Parts
LW-3S	T34	Parts
LW-4	E6,8-9,21-30,39-41,F13,19-20,I6-7,O40,S37	Parts
LW-4*104	V12,V14,W6,W8	Parts
LW-5	E52,F13	Parts
LWU-4	E52	Parts
LWU-5	E52	Parts
M		
M2*8	E62	Parts
M3*12	E6,E8-9,E23,E25-30,E39-41,E48-50	Parts
M3*5.5	E63	Parts
M3*8	E62-63,I11,I15,I17,I21	Parts
M4*5.5	E63	Parts
MBL	R44,V27	Insert
N		
NBH	R41-42,T36-38,T45-46,U25-26,V16-19,W9-12	Toolholder
NGTA-32	T24	Toolholder
NGTA-43	F10,T31	Toolholder
NGTB-32	T23	Toolholder
NGTB-43	F9,T30	Toolholder
NGTN-32	T23	Toolholder
NGTN-43	F9,T30	Toolholder
NS	F7	Toolholder
NTTB	U22	Toolholder
P		
P..-SDW43-..	I30	Cutter
PCLN	E7,Q65	Toolholder
PCLN-N	E7,Q65	Toolholder
PDJN	E15,Q67	Toolholder
PDJN-N	E14,Q67	Toolholder
PLUG	O7	Parts
POLY-V	F50-53	Toolholder
PSBN	E27	Toolholder
PSDNN	E25	Toolholder
PTAN-N	Q63	Toolholder
PTLN	E40,Q63	Toolholder
PTM	F50-53	Insert
PTXN-N	Q60	Toolholder
PTXN-OH2	Q59	Toolholder
PTXN-OH3	Q59	Toolholder
R		
R1E..	F5	Parts
R2E..	F5	Parts
RBGN	D14	Insert
RBGX	D15	Insert
RCE-H4	H4	Endmill
RCE-J6	H4	Endmill
RCGX	D15,E60	Insert
RCGX10	D16,E61	Insert
RCGY	D17,E62	Insert
RCL-020	H7	Endmill
RCL-021	H7	Endmill
RCL-050	H6	Endmill
RCL-059	H6	Endmill
RCL-066	H5	Endmill
REL-2R	X8	Endmill
REZ-1R	X5	Endmill
REZ-2R	X5	Endmill
REZ-2R-45	X6	Endmill
REZ-3R	X6	Endmill
RKN	F8	Insert
RLR-20S	Q48,60,R34,39,45,T40,U22-23,V31,35,37,43	Parts
RNGN	D18,E51,G4,I13	Insert
RNGF	I7	Insert
RNIW	I12	Cutter
RPGN	D19,G5,I11	Insert
RPGX	D19,E61	Insert
RPIW	I10	Cutter
RWEM	X4	Endmill
S		
S..-H	V47	others
S-412	F7	Parts
SBB	R43,V22	Insert
SBB-S	R43,V22	Insert
SBFB-F	V20	Insert
SBFS-H	V21	Insert
SBFS-S	V20	Insert
SBG	T39,V23	Insert
S-BG	T40,V43	Toolholder
SBG-S	T39,V23	Insert
SBT-R	U27,V24	Insert
SBT-RB	U27,V24	Insert
SC..F-..	E57-58,F5,F27	Parts
SC0..C-..	E57-58	Parts
SCAC	Q21	Toolholder
SCGW	D20	Insert
SCJ	O7,O10	Parts
SCJ-L	O7,O10	Parts
SCLC	Q17	Toolholder
SCLC-N	Q16	Toolholder
SCLC-N-F	Q17	Toolholder
SCLC-N-OH	Q15	Toolholder
SCLC-N-OH2	Q14	Toolholder
SCLC-N-OH3	Q14	Toolholder
S-CRGN	G3	Toolholder
S-CRGP	G5	Toolholder

Alphabetical

Part No.	Listed on	Part name
SDCW	D20,I29,I31,I33	Insert
SDCW-AE	I33	Insert
SDCW-EE	I29	Insert
SDCW-PE	I31	Insert
SDEW	D39	Insert
SDJC	Q28	Toolholder
SDJC-N	Q27	Toolholder
SDJC-N-F	Q28	Toolholder
SDJC-N-OH	Q26	Toolholder
SDJC-N-OH2	Q25	Toolholder
SDJC-N-OH3	Q25	Toolholder
SDNC	Q36	Toolholder
SDQC	Q35	Toolholder
SDXC-N	Q33	Toolholder
SFG	T47,V24	Insert
S-HCLN	G6	Toolholder
S-HDUN	G11	Toolholder
SHFB-F	V15	Insert
SHFS-H	V15	Insert
SHFS-S	V15	Insert
S-HSKN	G16	Toolholder
SM..RV	E57-58	Parts
S-MBR-OH	V25	Toolholder
SNEN-ZN	I20	Insert
SNGN	D22,E31,G17,I16,I19,I22	Insert
SNGA	D21,E32,G18	Insert
SNGN-AN	I23	Insert
SNGN-EN	I17	Insert
SNGF	I16,I19,I22	Insert
SNGX	D23,E32,G18	Insert
SNMG	D39,E34,G19	Insert
SPGN	D24	Insert
SPNPT1/8	Q7-8,14-15,18,25-26,R11-14,S11-12,T15-17,U17	Parts
SPNPT1/8L	Q8,Q14,Q25,Q40,Q42,R11,R18,R27,S20,T16	Parts
SPR1/8	Q8,14-15,18,25-26,29,42,R11-14,S11-12,T13,U17	Parts
SPR1/8L	Q7-8,S31-32	Parts
SR08	E6,E8-9,E23,E25-30,E39-41,E48-50	Parts
SS0403F	R41-42,T36-38,T45,V17,V19,W10,W12	Parts
SS04045FS	V12,V14,W6,W8	Parts
SS0404F	R41-42,T36-38,45-46,U25-26,V14,17,19,W8,10,12	Parts
SS0406F	R41-42,T36-38,U25-26,V12,14,17,19,W6,8,10,12	Parts
SS0408F	R42,T37-38,T46,U25-26,V17,V19,W12	Parts
SS0504	V19,W12	Parts
SS0505SC	Q7-8,14,18,25,R11,13,18,S11,14,20,T15-16,U17	Parts
SS0506	O40-41,V19,W12	Parts
SS0515	O40	Parts
SS0605SC	Q8,14-15,25-26,29,R11-12,S12,T13,U17,V12,W6	Parts
SS0806F	V12,W6	Parts
SS0806F-OH	V12,W6	Parts
SS0808F	V14,W8	Parts
SS0811R-OH	V12,W6	Parts
SS0812R	V14,W8	Parts
S-SCLC-OH	V32	Toolholder
S-SCLP-OH	V30	Toolholder
SS-DSU-B8D34	O41	others
SS-DSU-B8L23	O41	others
SS-DSU-L23	O40	others
SS-DSU-SK	O40	others

Part No.	Listed on	Part name
S-SEXR-OH	V28	Toolholder
SSP-H	W3	Insert
SSP-S	W3	Insert
SSP-T	W3	Insert
S-STUC-OH	V39	Toolholder
S-STUP-OH	V35	Toolholder
STAC-N	Q57	Toolholder
S-TCLN	G6	Toolholder
S-TSKN	G16	Toolholder
STTN	U22	Toolholder
STXN-N	Q60	Toolholder
SVAC	Q47	Toolholder
SVAC-N	Q46	Toolholder
SVAC-N-1L	Q47	Toolholder
SVAC-NW	Q48,R39	Toolholder
SVAC-W	Q48,R39	Toolholder
SVJB-OH	Q40	Toolholder
SVJB-OH2	Q40	Toolholder
SVJC	Q43	Toolholder
SVJC-F	Q44	Toolholder
SVJC-OH	Q42	Toolholder
SVJC-OH2	Q42	Toolholder
SVQC	Q51	Toolholder
SVQP-N	Q54	Toolholder
SVVCN	Q51	Toolholder
SVVC-N	Q50	Toolholder
SVXC-N	Q49	Toolholder
SVXP-N	Q53	Toolholder
S-WCLN	G6	Toolholder
S-WDUN	G11	Toolholder
S-WSKN	G16	Toolholder
S-WWLN	G20	Toolholder
S-WWLN-2	G20	Toolholder
T		
T-06	H5	Parts
T-07	U35,X5-6,X8	Parts
T-15A	I15,I18,I21,I26	Parts
T-20	I28,I30,I32	Parts
TB	R26	Insert
TBDP	R23	Insert
TBDPR/L	R22	Toolholder
TB-F	R25	Toolholder
TBGE	D24	Insert
TBMH	R35	Insert
TB-N	R25	Toolholder
TBP	R16	Insert
TBPA	R21	Insert
TBPA-BM	R21	Insert
TBPA-OH	R17	Toolholder
TBPA-V	R21	Insert
TBP-BM	R16	Insert
TBP-OH	R12	Toolholder
TBP-OH2	R11	Toolholder
TBP-OH3	R11	Toolholder
TBPR/L	R12	Toolholder
TBPS	R10	Insert
TBPS-V	R10	Insert
TBP-V	R16	Insert
TBT	R24	Toolholder
TBVC..	R36	Insert

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Part No.	Listed on	Part name
TBVC-F	R36	Toolholder
TBVCR	R36	Toolholder
TC..-WP	D40,Q58	Insert
TC5TN	E38	Parts
TC6CN	E5,E8,E23-24,G6,G16	Parts
TCBN	E8	Toolholder
TCG.	D40,Q58,R48,V42	Insert
TCGW	D40,Q58	Insert
TCLN	E5	Toolholder
TF..	Q9	Insert
TFT	Q8	Toolholder
TFT-OH2	Q8	Toolholder
TFT-OH3	Q7	Toolholder
TFX..	Q9	Insert
TGC	U28,V45	Toolholder
TMG32-E	T27	Insert
TMN	U29,V46	Insert
TN.G	D41,E44,Q64	Insert
TNGN	D26,E42	Insert
TNGA	D25,E43	Insert
TNGG-AG	D26,E43	Insert
TPGN	D28	Insert
TPG.	D42,R46,V38	Insert
TSDNN	E24	Toolholder
TSN	E64	Insert
TSSN	E23	Toolholder
TTFN	E38	Toolholder
TTGN	E38	Toolholder
TTMH	U24	Insert
TTP-F	U19	Toolholder
TTP-K(M)	U19	Toolholder
TTP-L	U21	Insert
TTP-OH2	U17	Toolholder
TTP-OH3	U17	Toolholder
TTP-R	U21	Insert
TTPR/L	U18	Toolholder
TTPS	U16	Insert
TW5835	U38	Insert
TWC	U36-37	TW cutter
V		
VBGT	D42,Q41	Insert
VC..	D43,Q52,R38	Insert
VC..2M	D43,Q52,R38,R40	Insert
VC..-WP	D43,Q52,R38	Insert
VCGN-V	D28	Insert
VCGW	D43,Q52	Insert
VDB	F6,F28	Insert
VDB-R	F6,F28	Insert
VGW	F21,F35	Insert
VGW-R	F22,F36	Insert
VN.G	D44,E37	Insert
VNGA	D29,E36	Insert
VNGX	D30,E36	Insert
VP.T	D44,Q56	Insert
VRAO	E57	Toolholder
VRAON	E58	Toolholder
W		
W106	E52	Parts
W107	E52	Parts
W110	E52	Parts
W120	E52	Parts
WCBN	E8	Toolholder
WCLN	E5	Toolholder
WDHN	E15	Toolholder
WDJN	E14	Toolholder
WDNNN	E16	Toolholder
WN.G	D45,E47,G22	Insert
WNGA	D30,E46,G21	Insert
WNGX	D31	Insert
WNX	I14	Insert
WS060415-003	Q18,Q31,Q54,Q61	Parts
WS060419-004	Q18,Q31,Q54,Q61	Parts
WS0616-T15	I15,I18,I21	Parts
WS0620	E63	Parts
WS0816-T25	I15	Parts
WS-4	E62	Parts
WS-5	E59,E62	Parts
WS-6	E59	Parts
WSDNN	E24	Toolholder
WSSN	E23	Toolholder
WTFN	E38	Toolholder
WTGN	E38	Toolholder
WVJN	E34	Toolholder
WVPN	E35	Toolholder
WVVNN	E35	Toolholder
WWLN	E45	Toolholder
WWLN-2	E45	Toolholder
X		
XNS-36	G5	Parts
XX2815-04	Y4	Parts
XX2815-04-13S	Y4	Parts
XX2815-04-15S	Y4	Parts
XX2815-04-20S	Y4	Parts
XX2815-04-25S	Y4	Parts
Y		
Y-CTPA	R20	Toolholder
Y-GTPA	T14	Toolholder
Y-GTPA-OH	T13	Toolholder
Y-GTT	R33,T21	Toolholder
Y-GTT-OH	R32,T20	Toolholder
Y-GTT-OH2	R32,T20	Toolholder
Y-SCLC-OH2	Q18	Toolholder
Y-SDJC	Q30	Toolholder
Y-SDJC-OH	Q29	Toolholder
Y-SDJC-OH2	Q29	Toolholder
Y-SDNC	Q36	Toolholder
Y-SVJC	Q45	Toolholder
Y-SVJC-OH	Q45	Toolholder
Y-SVJC-OH2	Q44	Toolholder
Y-SVXC	Q49	Toolholder
Y-TBDP	R22	Toolholder
Y-TBP	R14	Toolholder
Y-TBP-OH	R14	Toolholder
Y-TBP-OH2	R13	Toolholder
Z		
ZT1130	D31	Insert

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Specifications in this catalog are subject to change due to improvements.

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