2015

CDBP CUTTING TOOLS

PROFESSIONAL CARBIDE CUTTING TOOLS MANUFACTURE

Chengdu Bangpu Cutting Tools Co., Ltd

CDBP release China Cutting dream


QUALITY MANAGEMENT SYSTEM
CERTIFICATE
Quality Management System
ISO9001: 2008
GB/T 19001-2008
CHINA QUALITY CERTIFICATION CENTRE


质量管理体系认证证书
ISO9001:2008
GB/T 19001-2008
中国质量认证中心

COMPANY Introduction

Concentrate on CNC inserts, accomplish international brands! Chengdu Bangpu Cutting Tools Co., Ltd is a professional carbide products manufacturer which produces carbide indexable inserts, cutting tools, woodworking reversible inserts , hingeboring bits and dowel drill bits.

Chengdu Bangpu Cutting Tools Co., Ltd owns an imported production line from developed countries like Swiss, Germany, etc, including Ball Grinding Mill, Spray granulation tower, CNC automotive pressing machine, low pressure vacum sintering furnace, CNC Grinding Machines, CNC forming Tool Grinding Machine, Automatic Chamfering machine, CVD and PVD coating furnace, high-speed milling machine, EDM machine, WEDM-LS, Linear detector, Sigma meter ,Coercive force machine, Metalloscope ,etc., with annual output twenty million pieces, and has passed the ISO 9001 international quality system certification.

Our company's products have been exported to Europe, America, Southeast Asia, Middle East and other regions, our main products have three categories:

1, Milling and Turning inserts for processing aluminum, cast iron, stainless steel, a variety of steel and other metals , grooving inserts, drilling and milling inserts, cermet indexable inserts with thick-film multi-layer coating, tool holders, brazing inserts.

2, The indexable woodworking inserts, woodworking dowel drill bits, hinge boring bits, high precision planer, etc.

3, Inserts shim, diamond and CBN substrate, mining ball gear, blanks, rod, wire drawing dies, punching dies and other carbide products.

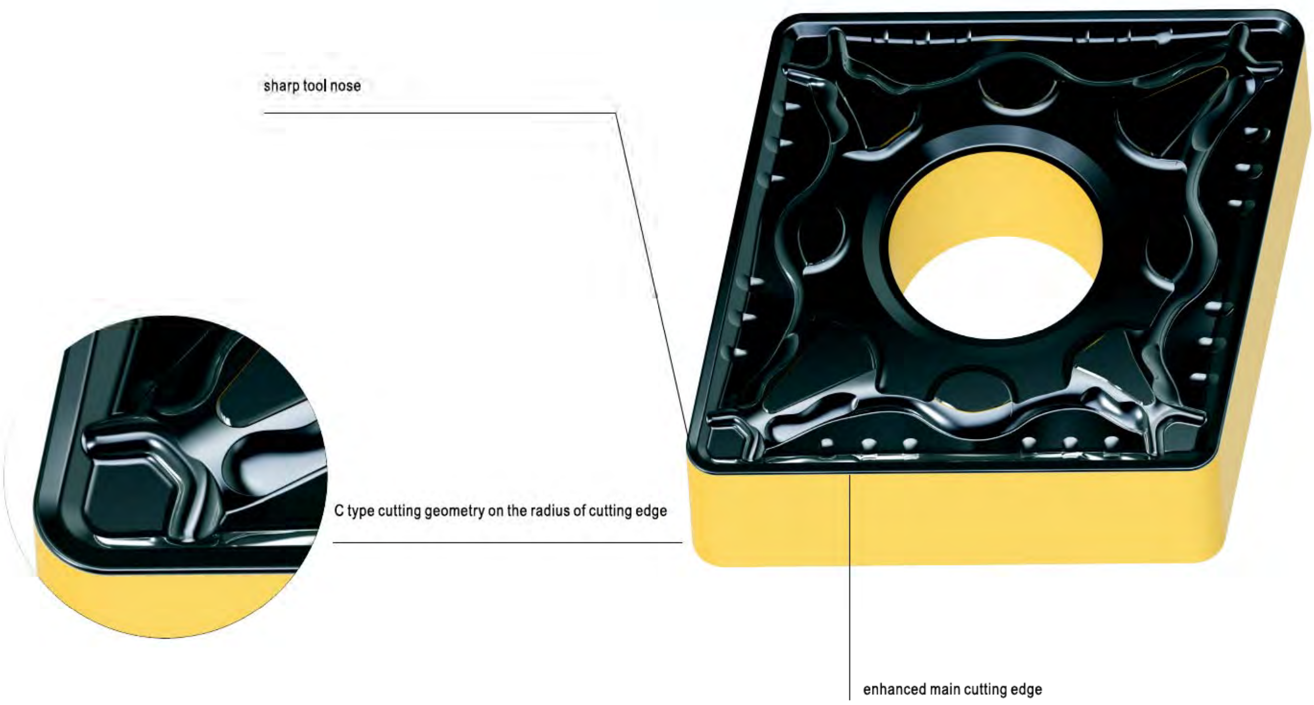
We can customize all kinds of cemented carbides products according to your drawings and samples.

Tenacious state, widely benefit the world! We will always provide you our best products and service!

CONTENTS

ISO Turning Inserts

CDBP FW\MD\RA\RB



indexable inserts geometry-MD

MD
–general geometry for semi-finishing machining on steel
–enhanced main cutting edge
 . inserts can be used in semi-finishing machining with bigger cutting depth and bigger feed rate
 . apmax：8mm，fmax：0.6mm
–C type cutting geometry
 . perfect working under small cutting depth and unstable allowance machining
 . without any problem in contour machining
 . apmin：0. 4mm，fmin：0. 1mm
–basic type CNMG, DNMG,SNMG,TNMG,WNMG

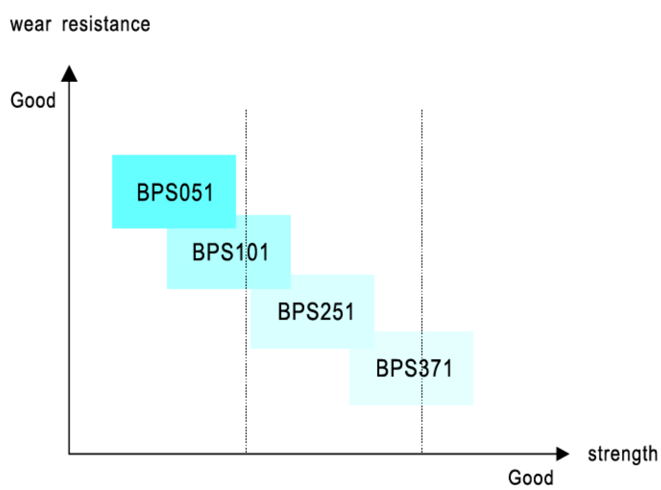
application
–with better working range
–high performance under unstable allowance machining
–typical work piece: steel wheel and hub,gear

advantage:
-perfect chip breaking performance with C type geometry, chips will be easily peel off
-larger working range makes fewer geometry types
-sharp tool nose ,enhanced main cutting edge, providing best work performance bombine with good wear resistance coat grade

CDBP Newest steel processing inserts
Better performance for steel processing

new products
2015

Processing conditions



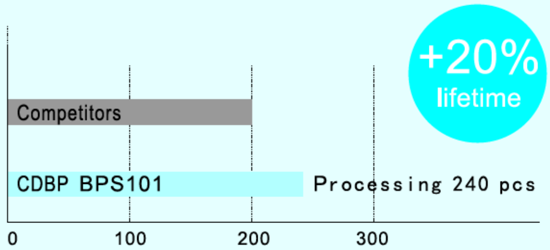
semi-finishing

automobile gearbox spare parts

work piece：	27MnCr5JV
inserts type：	CNMG 120408-MD
grade：	BPS 101
entering angle：	75°

cutting data

speed	350m/min
feed rate	0.35-1.0mm/rev 0. 35~1. 00mm/rev
cutting depth	3mm



perfect chip break performance with double chip breaker/ C type geometry

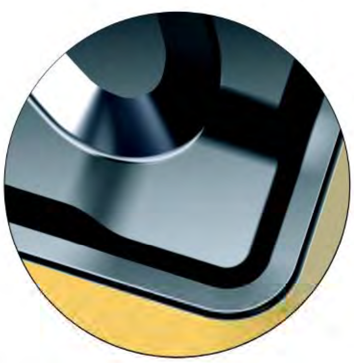
ap：3mm，f:0.35mm

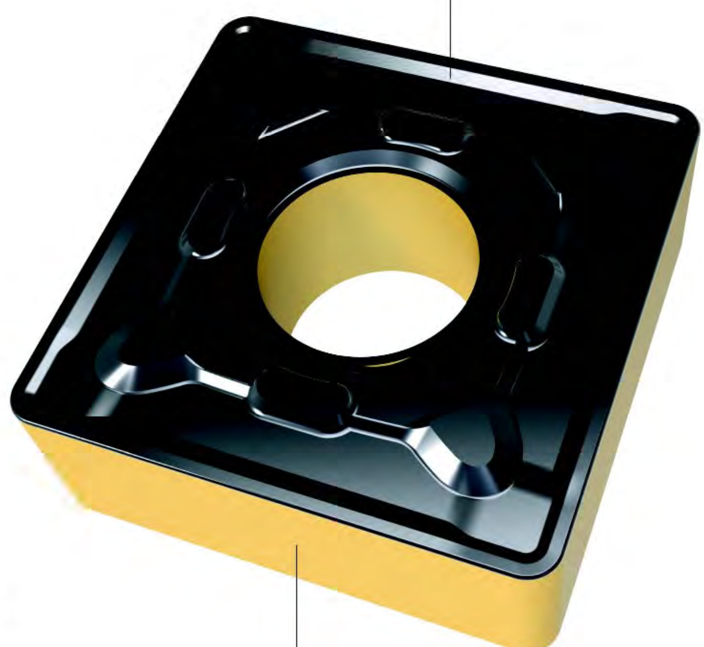
ISO Turning Inserts

RA geometry heavy cutting machining

Indexable inserts

- Suitable for heavy interrupted cutting and for workpiece with scale due to strong cutting edge
- Smooth chip control by wide and shallow chipbreaker design
- Prevents crater wear by positive land on insert corner





RA chipbreaker

application

- Cutting Different Margin Forgings,and "First Cutting"Machining
- Castings surface sand in heavy industry
- Maximum feed rate in rough heavy cutting
- Lathe can use maximum power to ensure maximum processing efficiency
- Typical machining parts:Crankshaft for ship,Generator shaft,Train wheels,and so on

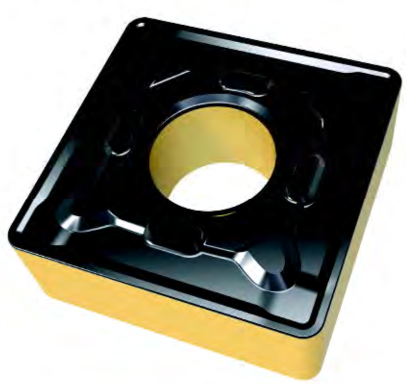
Advantages:

- Negative chamfer with steps reduces the cutting force,extend the lifetime of the cutting edge
- Strong Grade BPS 371 can be used in bad conditions,Blade won't broken,can save your machining cost.
- This kind of chip breaker can reduce friction area,Thus reducing the processing temperature, increase blade life.

RA chip breaker application

- RA chip breaker is better use for forgings hard rough cutting.
- RA cover all the cutting area below RB chip breaker,RB is the interchangeable chip breaker for rough machining,so the RA and RB can meet all the requirments of rough cutting.

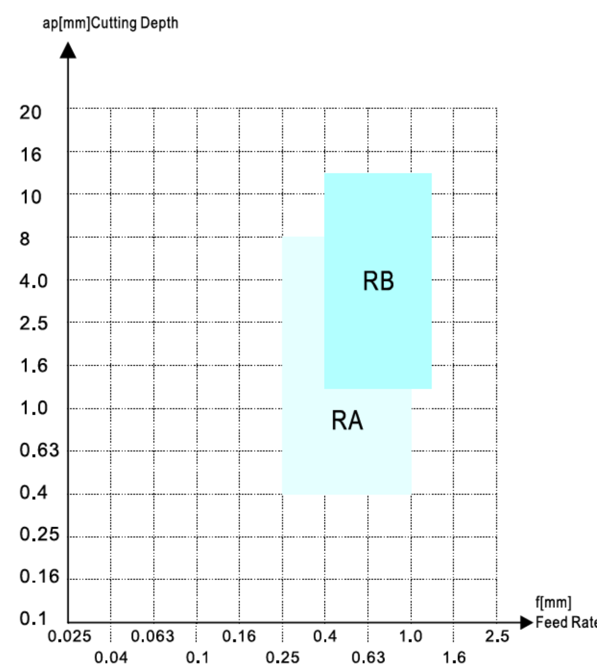
C type inserts with RA chip breaker



S type inserts with RA chip breaker

R type inserts with RA chip breaker

Cutting Condition



Roll use in steel industry

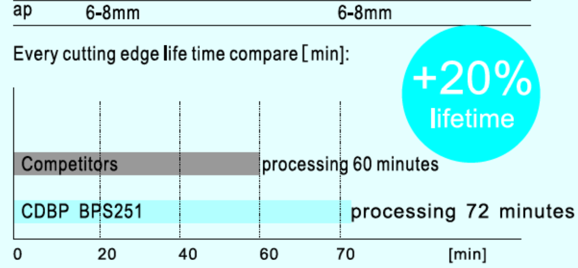
Rough cutting

Working materials:	42CrMo4
CNC carbide inserts:	SNMG190624-RA
Grade:	BPS251
Entering Angle:	75°

Cutting Data

	Competitors	RA CDBP RA
Vc	80m/min	80m/min
f	1.0mm	1.0mm
ap	6-8mm	6-8mm

Every cutting edge life time compare [min]:



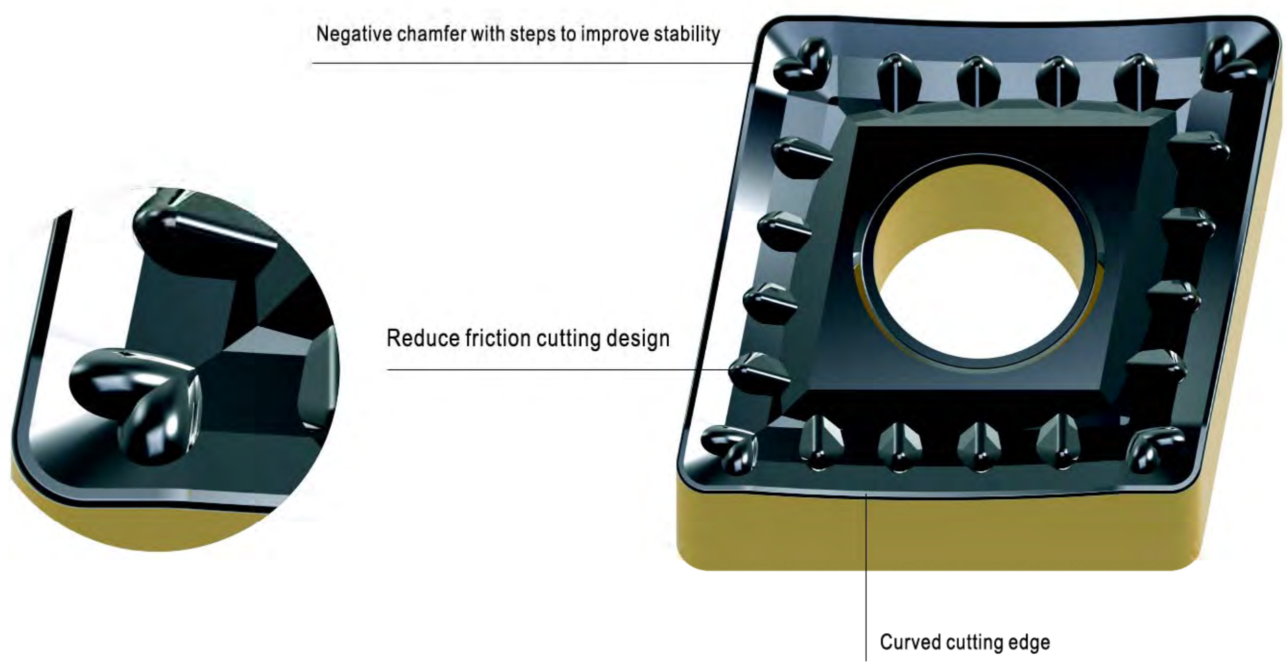
Remarks:

CNC carbide inserts life time can be more than 1 hours without split.

BPS251 make the cutting edge have better life time and security,

can obtain best production efficiency.

CDBP RB chip breaker
Heavy machining roughing cutting applications



CNC carbide inserts chip breaker-RB

RB chip breaker

-Heavy machining single face rough cutting CNC carbide inserts
-Stabiliy cutting edge design,negative chamfer with steps
-Reduce friction cutting design
 .low cutting force
 . high feed rate with perfect chip break performance
 . Low power requirements,can be used in low power lathe
-Basic Type; C, S and T
-CDBP Grade recommend:BPS101,BPS251 and BPS371
 better use for Steel and Cast Iron cutting.

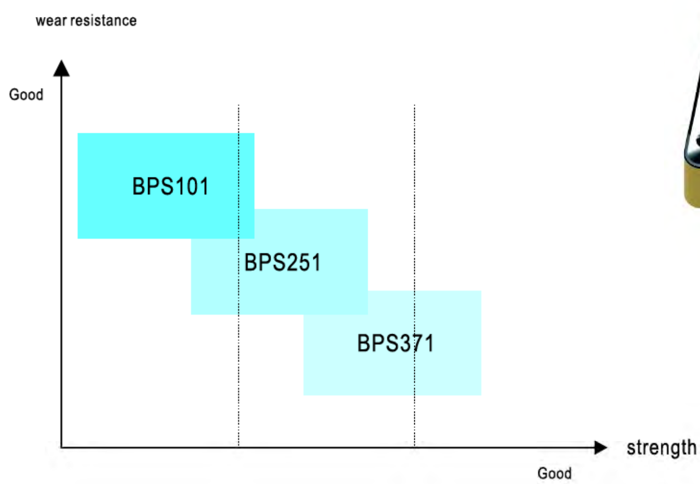
Applications:
-Compare with before rough cutting inserts,it have a widely applications,not only use for heavy machining roug cutting,but also better use for turning contour finishing.
-Forgings rough cutting,such as the bearing's inner and outer rings of Wind turbine or generator shaft.
-It also can achieve high efficient processing,when cutting depth have big fluctuations

Advantages:
Low cutting force by curved cutting edge design
Prevents crater wear by positive land on insert corner
Prevents adhesion by 2-steps dots and reduces load on dots

CDBP heavy cutting
To improve the steel turning production efficiency

new products
2015

Cutting Condition



Rough Cutting
Wind turbine flange

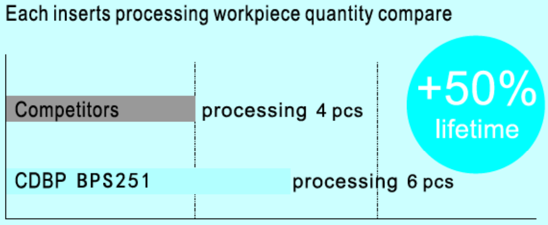
Cutting Materials:	Q345E+Z25
CNC carbide inserts item:	CNMM 190624-RB
Grade:	BPS 251
Entering Angle:	95°

Cutting Data:

Speed:	90-120m/min
Feed Rate	0.9~1.1mm/rev
Cutting Depth:	7-14mm

Remarks:perfect chip break performance,long life time.

Each inserts processing workpiece quantity compare



perfect chip break performance with
double chip breaker/C type geometry

ap: 10mm, f:1.0mm

ISO Turning Inserts

CDBP SL、LHC and SN chip breaker

New chip breaker specifically for heat-resistant alloys

NEW 2015

Applications：

LHC/SN chip breaker

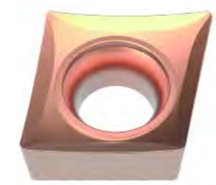
–Cutting heat-resistant alloys(such as Incone1718 ,Waspalloy)

–Used in aviation and aerospace industry(such as turbo body, turbine disc).

–Oil and Gas Industry Measuring instruments

–Chemical industry valves and pumps parts

–Widely use for ISO S type materials,such as Cobalt-based and nickel based heat-resistant alloys



SL CNC carbide inserts:Finishing

SL/LH chip braker

–Sharp cutting edge,low cutting force,light cutting chip breaker.fewer calories when cutting heat-resistant alloys.

–Perfect chip break performance

–Avoid cutting damage

–Basic Type:C,D,T,V,W

LHC CNC carbide inserts:Finishing

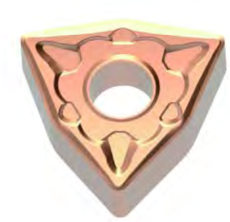
SN chip breaker

–Semi-finishing

–Sharp cutting edge with strong cutting edge,suitable for cutting high strength ISO S type materials

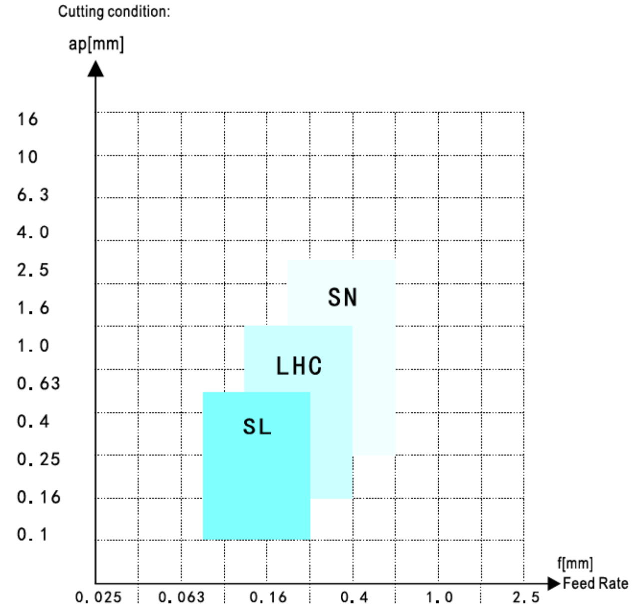
Perfect performance for Intermittent processing cast superalloy.

–Basic Type:C,D,S,W



SN CNC carbide inserts:Se-mi Finishing

Cutting condition:



Advantages:

–Low cutting force,can be reliably processing unstable parts(such as turbine housing),.fewer calories when cutting heat-resistant alloys.

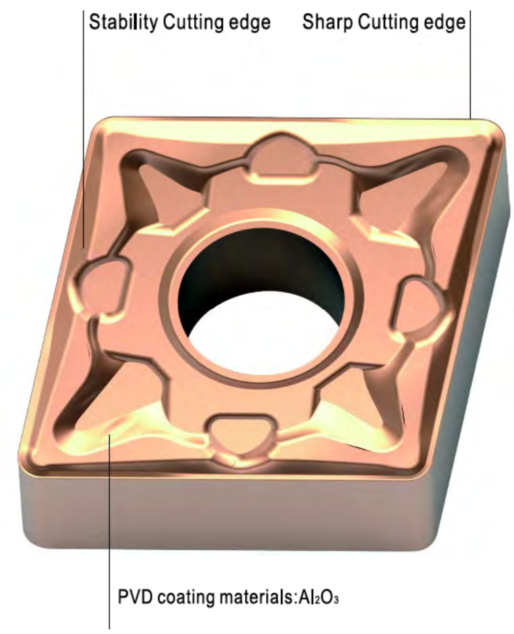
–BPG118 and BPG3318 use the newest technical PVD coated materials(Al2O3), With high temperature resistance coating,can be used for high cutting speed.

–LH and SN chip breaker will extend inserts 150% lifetime compare with before.

ISO Turning Inserts

CDBP BPG118,BPG218,BPG318 Stable,Reliable,Unique

Using the world's latest technology,Successful combine Al_2O_3 with CNC carbide inserts.



Inserts Materials

–Use PVD Al_2O_3 coating,compare with before PVD coating,the inserts's wear resistance and heat resistance improved.
–As PVD coating temperature is low,so the crafts reliable.
–Use advanced technology,The blade has a smooth rake face and sharp cutting edge.
–Perfect strength and better wear resistance.

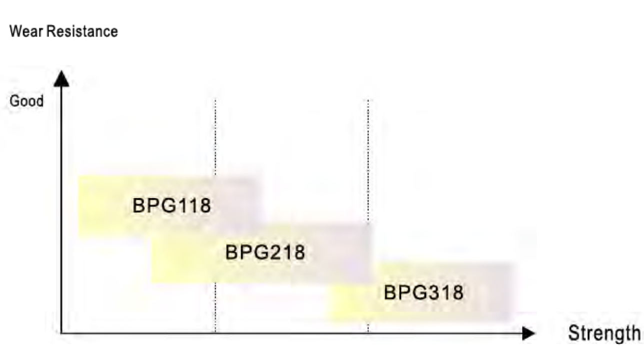
Advantages:

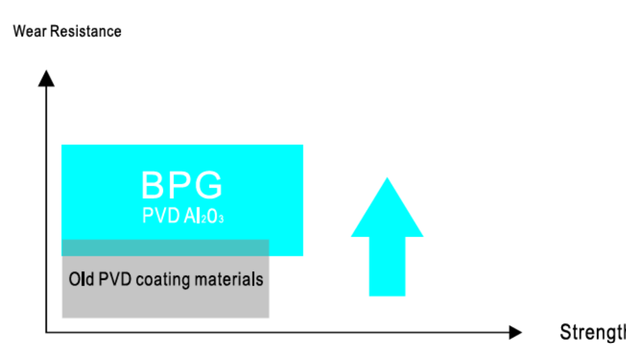
–Use ultrafine particle substrates combine with Al_2O_3 coating,leads the reliable crafts.
–Use heat-resistance Al_2O_3 coating has best hot hardness,so it has better wear resistance.
–Sharp cutting edge with PVD coating,to ensure the workpiece don't have glitches,also reduce the built-up edge.

Cutting Condition

CDBP BPG118/BPG218/BPG318

Chip Breaker: SN



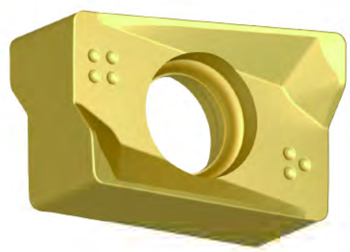


Face milling and shoulder milling

Face milling inserts

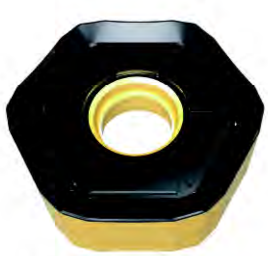
Universal Milling inserts-economical and efficient

CNC carbide inserts



Shoulder milling
- Diamond ,Negative Inserts
- Each inserts have four cutting edge
- Item:GNMU110506-M1
- Nose radius:0.5-1.0mm

Shoulder milling
- Dia:20-63mm
- Entering angle:90°
- Perfect instead APMT series, more economical and efficient



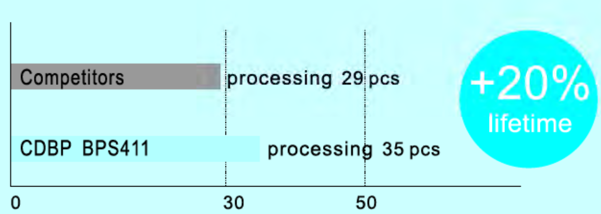
Face milling
- Hexagon,Negative Inserts
- Each inserts have twelve cutting edge, to achieve maximum use.
- Design with wiper

Processing example

Machine tool	HM635
Inserts Shank	HSK-A100
Power	15kw

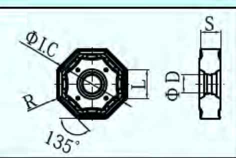
Vc	226m/min
N	900min
Vf	0.24mm/min
ae	628mm
ap	2.5mm

HNGX Face milling
- Dia:40-200mm
- Entering Angle:45°
- Use for face milling and rough milling



Face milling inserts

Universal Milling inserts-economical and efficient

Insert shape		Type	Dimension（mm）				Material recommended									
							CVD coating grade			PVD coating grade					Uncoating grade	
			I.C	S	d	r	BPC122	BPS321	BPS411	BPG108	BPG05B	BPG20B	BPG25B	BPG30B	BK10	BU810
		ONGX080608-L	20.2	6.00	5.3	0.8									☆	★
		ONGX080608-F	20.2	6.00	5.3	0.8	☆			★	★					
		ONGX080608-M	20.2	6.00	5.3	0.8		☆	★	☆		☆	☆			
		ONGX080608-R	20.2	6.00	5.3	0.8		☆	★				☆	☆		

Application		BPS321	BPS411	BPG05B	BPG20B	BPG30A	BU810
	P:steel	★	★	★	★	☆	
	M:stainless steel		☆	★	★	★	
	K:cast iron		★		☆		★
	N:non-ferrous metal						★

SA45**Cutter

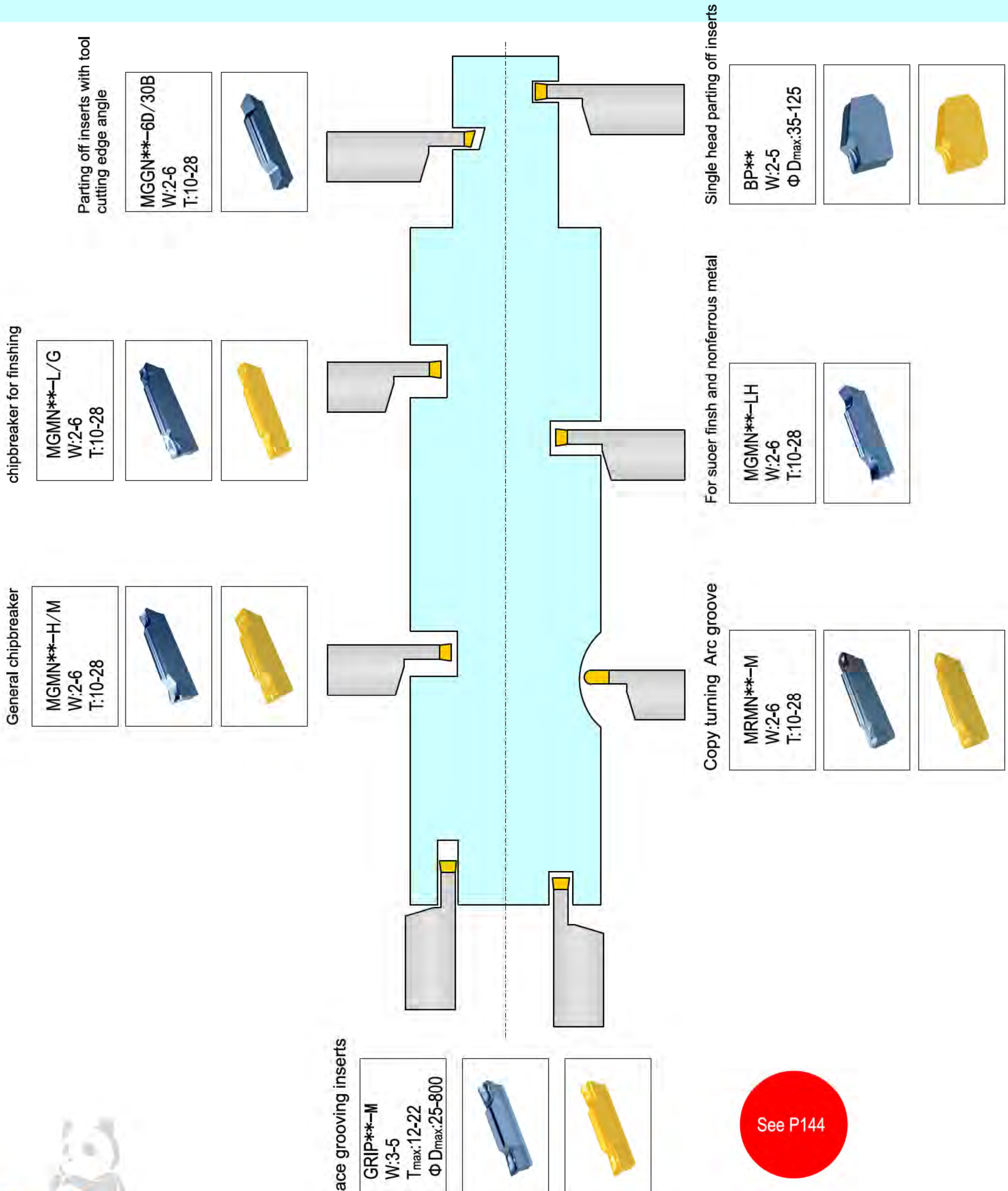
45° tool cutting edge Angle

Special treatment makes reliable Quality

Inserts with various grades and chipbreaker are available

Apply to roughing and finshing of different materials

Grooving series.
Better performance in Grooving and parting.

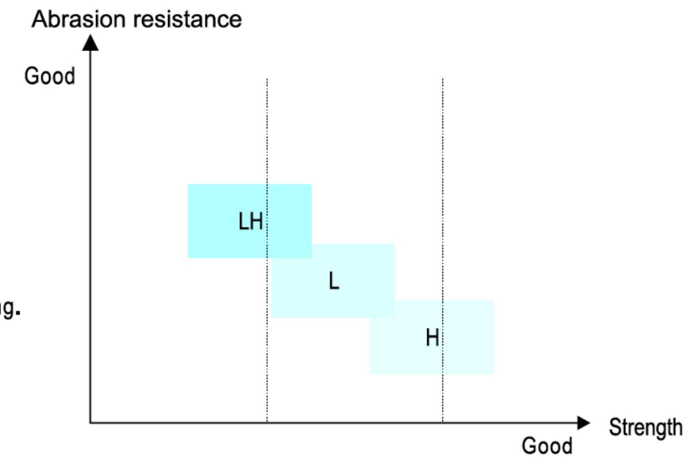


See P144

Grooving series.
Better performance in Grooving and parting.

new products 2015

- Better Geometry.
- Good Substrate.
- More Efficiency.
- Higher cost performance.



LH-For Supperfinishing also for nonferrous metals.
L-Sharp cutting edge reducing the resistance in machining.For finishing.
H-With strong cutting edge good for medium to roughing machining.

Semi-finishing
Belt pulley

before processing

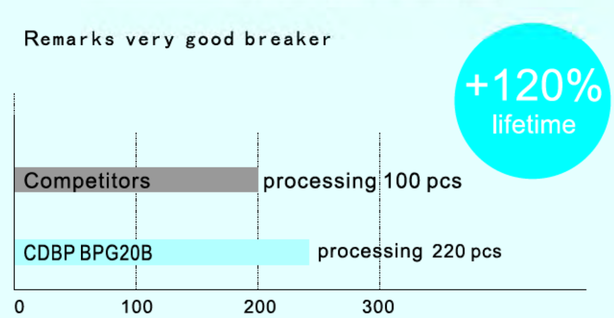
workpiece:	HT250
Our inserts:	MGMN 300-L
Our grade:	BPG 20B

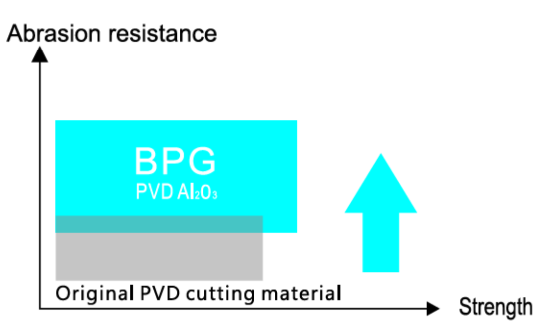
After processing

Cutting parameters

Vc :	195m/min
Vf :	0.35-1.0mm/rev 0. 35~0. 15mm/rev

Remarks very good breaker





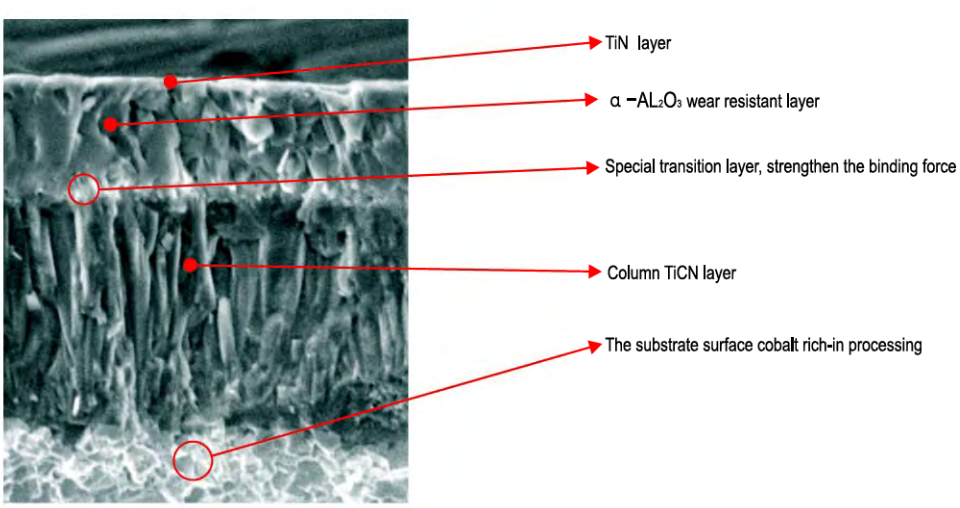
A Materials

A1 Coating grades properties overview

A1-1 TURNING K

Grade	ISO classification	Colour	Recommend for application
BPC042	K05(K01-K05)	Black	CVD coated carbide is extremely hard substrate and extremely thick, smooth, wear-resistant coating. Recommended for nodular cast iron high-speed turning.
BPC052	K10(K05-K15)	Black	CVD coated carbide is extremely hard substrate and extremely thick, smooth, wear-resistant coating. Recommended for nodular cast iron high-speed turning.
BPC102	K15(K10-K25)	Black	CVD-coated cemented carbide, the hard substrate coated with a smooth and wear-resistant coating, can bear harsh intermittent cutting conditions. Universal grade for all cast iron roughing cutting at low to medium speed.
BPS101	K15(K10-K25)	Black/yellow	CVD-coated cemented carbide grades, thick abrasion resistant coating on the high intensity gradient sintered base.Machining of gray and ductile iron at low to medium cutting speed. Security in wet and dry machining.

CVD coating



A1 Coating grades properties overview

A1-2 TURNING P

A

Materials

Grade	ISO classification	Colour	Recommend for application
BPS051	P05(P01-P10)	Black/yellow	CVD coated grade: stable conditions for steel finishing can obtain high metal removal rate. Excellent resistance to crater wear and plastic deformation resistance. Recommended for stable conditions. Wet and dry processing.
BPS101	P15(P10-P20) K15(K10-K20)	Black/yellow	CVD coated carbide grade, wear-resistance materials coated on the gradient sintered substrate which has both good hardness, toughness. Can bear high temperatures. For steel and steel castings finishing to roughing processing, Continue cutting to light interrupted cutting. Machining of gray and ductile iron at low to medium cutting speed. For hard materials continuous cutting and light interrupted cutting from finishing to roughing. Wet and dry processing.
BPS153	P15(P10-P20) K15(K10-K20)	Yellow	CVD coated carbide grade, wear-resistance materials coated on the gradient sintered substrate which has both good hardness, toughness. Can bear high temperatures. For steel and steel castings finishing to roughing processing, Continue cutting to light interrupted cutting. Machining of gray and ductile iron at low to medium cutting speed. For hard materials continuous cutting and light interrupted cutting from finishing to roughing. Wet and dry processing.
BPS251	P20(P15-P30) M15(M10-M20)	Black/yellow	CVD coated carbide grade, Universal grade, suitable for steel and cast steel continuous cutting and interrupted cutting finishing to roughing. Grades with a wide range of applications. Stainless steel continuous cutting and interrupted cutting.
BPS253	P20(P15-P30) M15(M10-M20)	Yellow	CVD coated carbide grade, Universal grade, suitable for steel and cast steel continuous cutting and interrupted cutting finishing to roughing. Grades with a wide range of applications. Stainless steel continuous cutting and interrupted cutting.
BPS371	P30(P25-P40)	Black/yellow	CVD coated carbide grade, high-strength alloy substrate with thick wear-resistant coating. Machining steel and cast steel in bad conditions. Edge line security for interrupted cutting high metal removal rate.
BPS373	P30(P25-P40)	Yellow	CVD coated carbide grade, high-strength alloy substrate with thick wear-resistant coating. Machining steel and cast steel in bad conditions. Edge line security for interrupted cutting high metal removal rate.

A1 Coating grades properties overview

A1-3 TURNING M

Grade	ISO classification	Colour	Recommend for application
BPG05B	M10(M05-M15)	Cyan-blue gray dark	With high hot hardness and good resistanceto plastic deformation. Suitable for high speed cutting and finishing process of austenitic stainless steel, quenched steel and carbon steel
BPG20B	M25(M10-M30)	Cyan-blue gray dark	PVD coated micro-grain carbide.Use for a variety of stainless steel finishing at medium to low cutting speed. When need excellent edge strength and high surface quality, provide the perfect ride cutting. A high thermal shock resistance. Suitable for light interrupted cuts.
BPG30B	M35(M25-M40)	Cyan-blue gray dark	PVD coated carbide.For austenitic stainless steels and duplex stainless steel semi-finishing to roughing at low to medium cutting speed.High thermal shock resistance. Ideal for quickly interrupted cutting.
BPG30A	M35(M25-M40)	Purple yellow	PVD coated carbide.For austenitic stainless steels and duplex stainless steel semi-finishing to roughing at low to medium cutting speed.High thermal shock resistance. Ideal for quickly interrupted cutting.

PVD coating

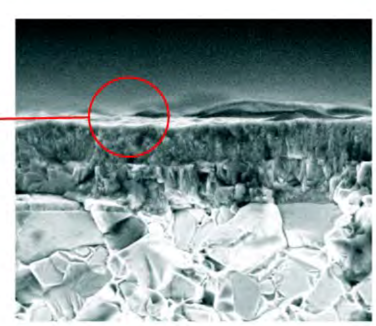
Coating materials: TiAlN

Coating microhardness: HV3200

Coating temperature: 450-480℃, without effect on ultra-grained alloy substrate.

Coating failure temperature: 900˚C, high heat resistance.

Guarantee the sharp cutting edge after coating.



A1 Coating grades properties overview

A1-4 TURNING S

Grade	ISO classification	Colour	Recommend for application
BPG118	S05-S15	Purple yellow	PVD coated carbide grade for medium-speed milling of heat resistant alloys. With good ability to avoid built-up edge and good resistance to plastic deformation capacity.
BPG218	S15(S15-S30)	Purple yellow	PVD coated carbide grade have good ability to avoid built-up edge and good resistance to plastic deformation capacity. For unstable conditions, such as long cutting edge, clogging, deep shoulder milling, long overhang, milling processes. Light milling of stainless steel; combine grinding blade for viscous and hardening materials; moderate speed milling of heat resistant alloys; hardened parts milling at low feed and medium-speed.
BPG318	S25(S20-S30)	Purple yellow	PVD coated micro-grain carbide. Can provide a sharp cutting action and excellent toughness of the cutting edge, a good anti-the grooves wear and thermal shock resistance. For carbon steel finishing at low feed rate or low cutting speed. a variety of stainless steel finishing at low to medium cutting speed, but also suitable for light interrupted cutting. Low-speed machining of heat resistant alloys, or light interrupted cuts. General short contact time processing step and high strength requirements of sharp cutting edges processing step.

TURNING N

Grade	ISO classification	Color	Recommend for application
BPU109	N10(N01-N15)	DLC	DLC coating color, the coating can reduce BUE, obtain higher surface quality. Suitable for aluminum, magnesium, copper, brass, plastic finishing to roughing processing.

A1 Coating grades properties overview

A1-5 MILLING K

Grade	ISO classification	Colour	Recommend for application
BPG05B	K10(K05-K15)	Cyan-blue gray dark	With high hot hardness and good resistanceto plastic deformation. Suitable for high speed cutting and finishing process of austenitic stainless steel, quenched steel and carbon steel
BPG108	K05-K15	Purple yellow	PVD coated carbide grade for gray cast iron and ductile iron medium to rough milling in wet conditions. In the medium to high cutting speeds,can predictor the tool-life.
BPC122	K15(K10-K25)	Black	CVD-coated cemented carbide, the hard substrate coated with a smooth and wear-resistant coating, can bear harsh intermittent cutting conditions. Universal grade for all cast iron roughing cutting at low to medium speed.
BPS321	K30(K25-K35)	Black/yellow	Coated carbide grade for toughness demanding operating conditions to work at low speed, medium load and reload processing.

A1 Coating grades properties overview

A1-6 MILLING P

Grade	ISO classification	Colour	Recommend for application
BPG05B	P05(P01-P15)	Cyan-blue gray dark	With high hot hardness and good resistance to plastic deformation. Suitable for high speed cutting and finishing process of austenitic stainless steel, quenched steel and carbon steel
BPG20B	P15(P10-P20)	Cyan-blue gray dark	PVD coated micro-grain carbide.Use for a variety of stainless steel finishing at medium to low cutting speed. When need excellent edge strength and high surface quality, provide the perfect ride cutting. A high thermal shock resistance. Suitable for light interrupted cuts.
BPG308	P20(P15-P30)	Purple yellow	PVD coated carbide grade , for example, the long cutting edge, clogging, deep shoulder milling, long overhang, milling processes. or an alternative of toughness processes. Combining the peripheral-edge grinding blade, preferred for viscous material, such as low carbon steel.
BPG217	P20(P15-P30)	Yellow	Using high strength, high wear resistance and owe loss Phase Equilibrium ultrafine grain substrate with PVD TiAlN coating, suitable for most of the material machining,can achieve a stable turning and milling.
BPS321	P30(P25-P40)	Black/yellow	High-strength matrix combined with AL2O3 coating suitable for steel and cast iron milling.
BPS322	P30(P25-P40)	Black	High-strength matrix combined with AL2O3 coating suitable for steel and cast iron milling.
BPS411	P40(P35-P50)	Black/yellow	Toughness coated carbide grade for steel milling in demanding process.For vertical milling and shoulder milling, the grade BPS411 should be working in stable conditions, such as short overhangs, surface milling, shallow shoulder milling.For toughness process,BPS411 is the best choice. suitable for mixed materials small batch production. Whether the coolant supply is excellent.
BPS412	P40(P35-P50)	Black	Toughness coated carbide grade for steel milling in demanding process.For vertical milling and shoulder milling, the grade BPS412 should be working in stable conditions, such as short overhangs, surface milling, shallow shoulder milling.For toughness process, BPS412 is the best choice.suitable for mixed materials small batch production. Whether the coolant supply is excellent.

A1 Coating grades properties overview

A1-7 MILLING M

Grade	ISO classification	Colour	Recommend for application
BPG05B	M10(M05-M15)	Cyan-blue gray dark	With high hot hardness and good resistance to plastic deformation. Suitable for high speed cutting and finishing process of austenitic stainless steel, quenched steel and carbon steel
BPG20B	M15(M10-M25)	Cyan-blue gray dark	PVD coated carbide grade for light milling of stainless steel. Combine grinding blade preferred for viscous and work hardening materials.
BPG30B	M25(M15-M30)	Cyan-blue gray dark	PVD coated carbide grade for medium to high-speed stainless steel (austenitic) milling. Combined with positive rake angle trough also applies to the heat-resistant materials and titanium alloys.
BPG45B	M35(M25-M40)	Cyan-blue gray dark	Coated carbide grade for medium speed milling abrasive trends stainless steel, such as casting parts, ferritic / martensitic stainless steel, and PH steel.
BPS411	M40(M30-M40)	Black/yellow	Coated carbide grade for stainless steel castings heavy machining process.

A1 Coating grades properties overview

A1-8 MILLING S

Grade	ISO classification	Colour	Recommend for application
BPU10B	S10(S05-S10)	Cyan-blue gray dark	PVD coated carbide grade, for the excellent working conditions titanium milling. Has excellent abrasion resistance at high cutting speeds. Instability and vibration sensitive.
BPG318	S15(S15-S30)	Purple yellow	PVD coated carbide grade for medium-speed milling of heat resistant alloys. With good ability to avoid built-up edge and good resistance to plastic deformation capacity.
BPG40A	S30(S30-S40)	Yellow	Coated carbide grade for heat-resistant aluminum castings milling.

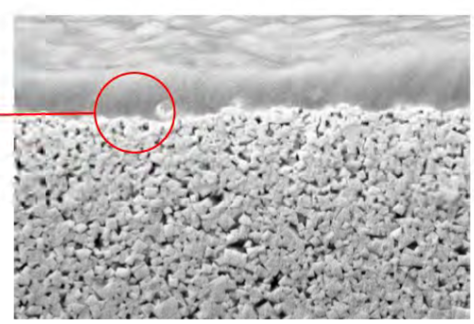
Coating materials: TiAlN

Coating microhardness: HV3200

Coating temperature: 450-480℃, without effect on ultra-grained alloy substrate.

Coating failure temperature: 900˚C, high heat resistance.

Guarantee the sharp cutting edge after coating.



PVD coating

A1 Coating grades properties overview

A1-9 ISO packet turning

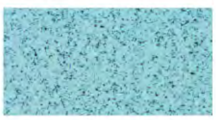
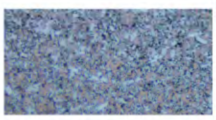
ISOclassification	ISO packet	Processing category	Coating grade	Surface Colour	Substrate properties			Coating type	Coating descrption	Thickness	Recommended cutting speed (m/min)
					Density (g/cm3)	Hardness (HRA)	Bending strength(N/mm2)				
K	K05~K10	Finishing	BPC052	Black	14.9	93	2500	MT-CVD	TiCN-AL_2O_3	Thick film	300 (200-400)
	K10~K20	Semi finishing	BPC102	Black	14.8	92	2000	MT-CVD	TiCN-AL_2O_3	Thick film	250 (180-300)
	K10~K20	Semi finishing	BPS101	Black/yellow	14.8	92	2200	MT-CVD	TiCN-AL_2O_3	Thick film	250 (180-300)
M	M01~M10	Finishing	BPG05B	Cyan-blue gray dark	14.9	92.5	3000	PVD	TiALN	Film	120 (100-150)
	M10~M20	Semi finishing	BPG20B	Cyan-blue gray dark	13.5	91.3	2500	PVD	TiALN	Thick film	120 (100-150)
	M20~M35	Rough machining	BPG30B	Cyan-blue gray dark	14.3	91.6	3000	PVD	TiALN	Film	120 (100-150)
P	P01~P15	Finishing	BPS051	Black/yellow	14.9	92.5	2000	MT-CVD/CVD	TiCN-AL_2O_3-TiN	Thick film	250 (180-300)
	P10~P20	Finishing	BPS101	Black/yellow	13.7	91.4	2000	MT-CVD/CVD	TiCN-AL_2O_3-TiN	Thick film	250 (180-300)
	P20~P30	Semi finishing	BPS251	Black/yellow	13.6	91.5	2200	MT-CVD/CVD	TiCN-AL_2O_3-TiN	Thick film	220 (180-280)
	P25~P35	Rough machining	BPS371	Black/yellow	13.5	91	2500	MT-CVD/CVD	TiCN-AL_2O_3-TiN	Thick film	130 (100-240)
	P20~P30	Semi finishing	BPG308	Purple yellow	14.3	91.6	3000	PVD	TiALN	Film	120 (100-150)
S	SO1~S10	Finishing	BPG118	Purple yellow	14.9	92.5	2800	PVD	TiALN+TiN	Film	60 (40-90)
	S10~S20	Semi finishing	BPG218	Purple yellow	14.45	91.8	3000	PVD	TiALN+TiN	Film	50 (30-70)
	S20~S30	Rough machining	BPG318	Purple yellow	14.5	90	2500	PVD	TiALN+TiN	Film	30 (20-60)
N	N01~N10	Finishing	BPU109	DLC Colour	14.9	92.5	3000	PVD	DLC	Film	
	N10~N20	Finishing	BPG05B	Cyan-blue gray dark	14.9	92.5	3000	PVD	TiALN	Film	120 (100-150)

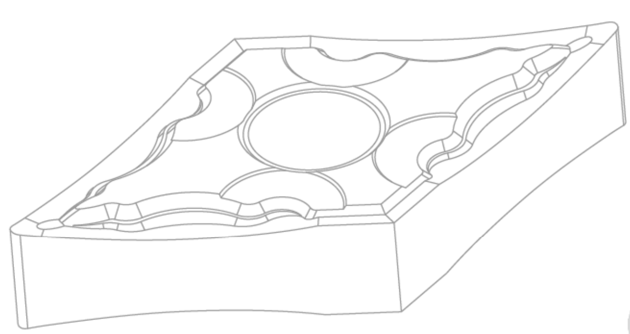
A1 Coating grades properties overview

A1-10 ISO Coating Grade For MILLING

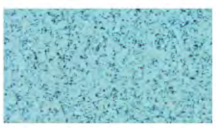
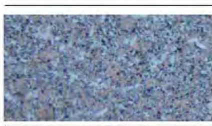
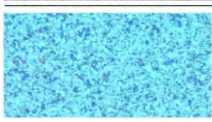
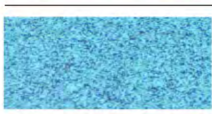
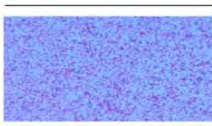
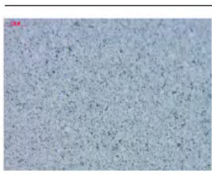
ISOclassification	ISO packet	Processing category	Coating grade	Surface Colour	Substrate properties			Coating type	Coating descrption	Thickness	Recommended cutting speed (m/min)
					Density (g/cm3)	Hardness (HRA)	Bending strength(N/mm2)				
K	K10~K20	Finishing	BPG108	Purple yellow	14.9	93	2500	PVD	TiALN	Film	300 (200-400)
K	K10~K20	Semi finishing	BPC122	Black	14.8	92	2000	MT-CVD	$TiCN-AL_2O_3$	Thick film	250 (180-300)
K	K20~K30	Semi finishing	BPS321	Black/yellow	14.5	90	2000	MT-CVD	$TiCN-AL_2O_3$	Thick film	150 (120~200)
K	K30~K40	Rough machining	BPS411	Black/yellow	14.2	89.5	3500	MT-CVD	$TiCN-AL_2O_3$		120 (100-150)
M	M05~M10	Finishing	BPG05B	Cyan-blue gray dark	14.9	92.5	3000	PVD	TiALN	Film	150 (120~200)
M	M20~M30	Semi finishing	BPG20B	Cyan-blue gray dark	14.5	91.8	2900	PVD	TiALN	Film	120 (100-150)
M	M20~M35	Semi finishing	BPG30B	Cyan-blue gray dark	14.2	89.5	2900	PVD	TiALN	Film	120 (100-150)
M	M30~M40	Rough machining	BPS411	Black/yellow	14.2	89.5	2900	MT-CVD	$TiCN-AL_2O_3$	Thick film	120 (100-150)
P	M05~M10	Finishing	BPG05B	Cyan-blue gray dark	14.9	92.5	3000	PVD	TiALN	Film	250 (180-300)
P	M20~M30	Semi finishing	BPG20B	Cyan-blue gray dark	14.5	91.8	2900	PVD	TiALN	Film	220 (180-280)
P	P20~P30	Semi finishing	BPG217	Yellow	14.5	91.8	2900	PVD	TiALN +TiN	Film	150 (120~200)
P	P25~P35	Semi finishing	BPG25B	Cyan-blue gray dark	14.5	90	2000	PVD	TiALN	Film	120 (100-150)
P	P30~P40	Rough machining	BPS321	Black/yellow	14.5	90	2000	MT-CVD	$TiCN-AL_2O_3$	Thick film	120 (100-150)
P	P30~P40	Rough machining	BPS411	Black/yellow	14.2	89.5	3500	MT-CVD	$TiCN-AL_2O_3$		120 (100-150)

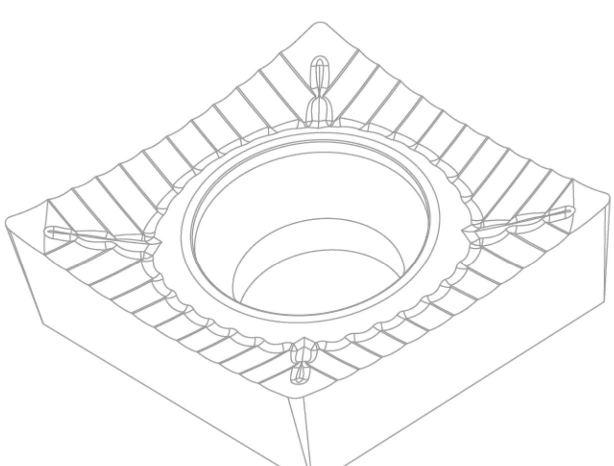
A2 Features overview of cemented carbide

	Grade	ISO classification	Density (g/cm3)	Hardness HRA	Bending strength (N/mm2)	Usage and performance
	BP20	P20~P25 M20	12.3	≥91.5	1910	Excellent in red handness, anti-heat crak, anti xdformation.Suitable for processing the structural alloy steel, alloy tool steel, high manganese steel and stainless steel
	BP35	P30~P40	12.7	≥91.0	2220	Excellention red hardness anti-thermal deformation . high strength. common grage. Suitable for the roughing of steel, castiron
	BU810	K05~K15	14.7~15	92.8-93.1	2700	Sub-micron grain, suitable for the continuous and interrupted finishing of non-ferrous metal
	BU820	K10-K25	14.3~14.6	91.8	3500	Sub-micro grain, suitable for the milling and drilling tools
	BK10UF	K01-K15	14.6-15	≥92.8	2060	Ultra-fine grain alloy,good wear resistance and high strength. suitable for the semi-finishing. finishing of abrasive materials (like high-hard . chilled-hard castiron ,piled welding, spray welding hard rubber. card board and non-ferrous metal.) hard rubber,cardoard and non- ferrous metal
	BK20UF	K10-K30	14.5-14.9	≥92.0	2360	Ultra-fine grain alloy,good wear resistance and high strength. suitable for the semi-finishing. finishing of abrasive materials (like high-hard . chilled-hard castiron ,piled welding, spray welding hard rubber. card board and non-ferrous metal.) hard rubber,cardoard and non- ferrous metal
	BK30UF	K15-K35	14.4-14.8	≥91.5	2520	Ultra-fine grain allo. good wear resistance and anti-shocking. suitable for processing the castion, non-ferrous metal,plastic wood, and etc.

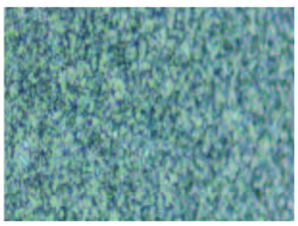


A2 Features overview of cemented carbide

	Grade	ISO classification	Density (g/cm3)	Bending strength (N/mm2)	Hardness HRA	Usage and performance
	YG6	K15~K20	14.85~15.05	2050	90.5~91.5	High wear resistance, good resistance to shock and vibration. Application of cast iron, non-ferrous metals and alloys, non-metallic materials medium cutting speed for semi-finishing and finishing.
	YG8	K30	14.6~14.85	2520	89.5~90.5	The use of high strength, impact resistance, good shock resistance, but wear resistance and allows the cutting speed is low. For cast iron, non-ferrous metals and alloys, non-metallic materials low speed roughing.
	BK10	K10~K20	14.8~15	2000	91.5~92.5	High wear resistance, the use of high strength, suitable for machining of chilled alloy cast iron and steel, and ordinary cast iron processing.
	YT5	P30	12.7~13.1	2200	89.5~90.5	High strength, impact resistance and thermal shock resistance; suitable for carbon and alloy steel rough machining.
	YT14	P20	11.2~11.6	1750	91.5~92.5	The use of high strength, impact resistance, good shock resistance, suitable for carbon and alloy steel finishing, semi finishing.
	YT15	P10	11.1~11.5	1650	92~93.2	Good wear resistance. Suitable for steel, cast steel, alloy steel finishing, semi finishing.
	YW1	M10	13.5~13.7	1710	92~93	Good red hardness, it can withstand a certain degree of impact load, is general better alloy. Suitable for heat resistant steel, high manganese steel, stainless steel and other hard processing steel processing, applicable to ordinary steel and iron processing.
	YW2	M20	13.35~13.55	1880	91.5~92.5	Good wear resistance, the use of higher strength, can bear larger impact load. Suitable for heat resistant steel, high manganese steel, stainless steel and high alloy steel roughing, semi-finishing, and is also suitable for ordinary steel and cast iron.

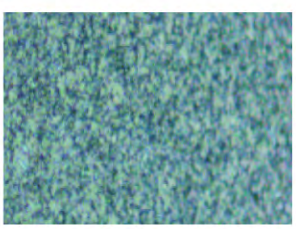


A3 Features overview of cermet



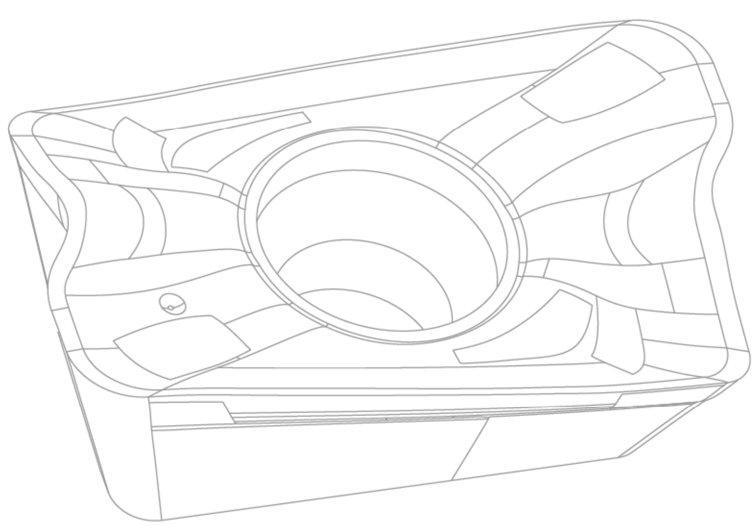
BN201

ISO classification	K05~K20 P10~P30 M10~M30
Density (g/cm3)	6.1~7.2
Hardness HRA	>91
Bending strength (N/mm2)	>2000
Usage and performance	Suitable for the finishing ,semi-finishing of stainless steel



BN301

ISO classification	K01~K10 P01~P20 M01~M20
Density (g/cm3)	6.5~7.2
Hardness HRA	>92
Bending strength (N/mm2)	>1800
Usage and performance	Suitable for the finishing ,semi-finishing of stainless steel



A4 Recommended grade overview for carbide insert

ISO Standard		Steel					Stainless steel					Cast iron				Non-ferrous metals			Heat Resistant alloys		
		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30	N01	N10	N20	S01	S10	S20
General turning	CVD coating	BPS051											BPC052								
			BPS101												BPC102					BPG363	
				BPS251																	
					BPS371																
	PVD coating		BPG20A					BPG05B								BPU109			BPG118		
									BPG20B								BPG05B			BPG218	
										BPG30B											
	Cermet	BN201					BN201														
				BN301					BN301												
	Cemented carbide											BK10				BU810			BU810		
Chipbreaker	CVD coating			BPS253									BPS253								
					BPS373																
	PVD coating			BPG20B			BPG05B									BPG05B			BPG118		
					BPG30B				BPG20B											BPG218	
										BPG30B											
	Cemented carbide						BU810					BK10				BU810			BU810		
								BK10												BK10	

Standard		Steel					Stainless steel					Cast iron				Non-ferrous metals			Heat Resistant alloys		
		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30	N01	N10	N20	S01	S10	S20
Milling	CVD coating				BPS321 BPS411					BPS411			BPC122	BPS321	BPS411						
	PVD coating	BPG05B		BPG20B BPG25B			BPG05B	BPG20B	BPG30B	BPG45B			BPG108								
	Cermet																				
	Cemented carbide		BP20	BP35				BP35					BK10			BU810			BU810	BK10	

B Cutting tools

B General turning

B1−1 Turning inserts overview

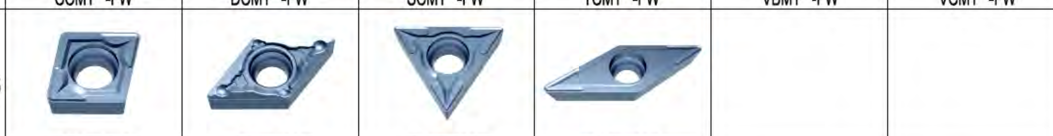
Finishing of steel	52	CNMG**-FW	DNMG**-FW	SNMG**-FW	TNMG**-FW	VNMG**-FW	WNMG**-FW	
	53	CCMT**-FW	DCMT**-FW	SCMT**-FW	TCMT**-FW	VBMT**-FW	VCMT**-FW	
	54	CNGG**L/R-S	DNGG**L/R-S	TNGG**L/R-S	WNGG**L/R-S			
	55	CCGT**L/R-S	CCGH**L/R-S	DCET**L/R-S				
	56	DCGT**L/R-S	DPET**L/R-S	SCGT**L/R-S	SPGH**L/R-S	SPGT**L/R-S	TCGT**L/R-S	TPGH
	57	TPGR**L-S	TPET**L-S	TPGX**L-S	VBET**L-S			
	58	VBGT**L/R-S	VCGT**L/R-S	VDGX**L/R-S	VPET**L/R-S	WPGT**L/R-S	DCET**L/R-E	TNGG**L/R-E
Semi Finishing of steel	59	CNMG**-MD	DNMG**-MD	SNMG**-MD	TNMG**-MD	VNMG**-MD	WNMG**-MD	
	61	CNMG**-MA	DNMG**-MA	SNMG**-MA	TNMG**-MA	VNMG**-MA	WNMG**-MA	
	62	CNMG**-TM	DNMG**-TM	TNMG**-TM	VNMG**-TM	WNMG**-TM	VNMG**-UX	WNMG**-UX

B1−1 Turning inserts overview

Semi Finishing of steel	63	CNMG**-U	DNMG**-U	SNMG**-U	TNMG**-U	VNMG**-U	WNMG**-U	
	64	SNMG**L/R-N	SNGG**L/R-N	TNGG**L/R-N	VNGG**L/R-N	WNGG**L/R-N		
	65	CNGG**L/R-H	DNGG**L/R-H	VNGG**L/R-H				
	66	CCMT**-MD	DCMT**-MD	SCMT**-MD	TCMT**-MD	VCMT**-MD	RCMT**MOE-R*	
	68	CPMH**L/R-N	DCGT**L/R-N	TPGH**L/R-N	VBGT**L/R-N	WPGT**L/R-N		
	69	CCET**L/R-E	CCGT**L/R-E	SPGT**L/R-E	TPET**L/R-E	TCGT**L/R-E	DCET**L/R-E	
Rough machining of steel、cast iron	70	CNMG**-RA	DNMG**-RA	SNMG**-RA	TNMG**-RA	WNMG**-RA		
	71	CNMM**-RB	SNMM**-RB	TNMM**-RB				
	72	CCMT**-RA	DCMT**-RA	SCMT**-RA	TCMT**-RA	RCGT**-HP		

B General Turning

B1−1 Turning inserts overview

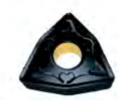
Finishing of stainless steel	74						
		CCMT**-FW	DCMT**-FW	SCMT**-FW	TCMT**-FW	VBMT**-FW	VCMT**-FW
	75						
		CCMT**-MX	DCMT**-MV	TCMT**-MX	VBMT**-MX		
	76						
		CNMG**E-LH	DNMG**E-LH	SNMG**E-LH	TNMG**E-LH	VNMG**E-LH	CNMG**E-LH
Semi-finishing of stainless steel	77						
		CCMT**-MD	DCMT**-MD	SCMT**-MD	TCMT**-MD	VCMT**-MD	
	78						
		CNMG**-MA	DNMG**-MA	SNMG**-MA	TNMG**-MA	VNMG**-MA	WNMG**-MA
	79						
		CNMG**-SA	TNMG**-SA	WNMG**-SA			
Finishing of Heat Resistant alloys	81						
		CCGT**-SL	DCGT**-SL	SCGT**-SL	TCGT**-SL	VCGT**-SL	VBGT**-SL
The semi-Finishing of Heat Resistant alloys	82						
		CNGG**E-LHC	DNGG**E-LHC	SNGG**E-LHC	TNGG**E-LHC	VNGG**E-LHC	WNGG**E-LHC

B1−1 Turning inserts overview

Category	No.	Images							
The heat resistant alloys semi-finishing and roughing process	83		CNMG**-SN	DNMG**-SN	SNMG**-SN	TNMG**-SN	VNMG**-SN	WNMG**-SN	
Aluminum processing	85		CCGT**-LHC	DCGT**-LHC	SCGT**-LHC	TCGT**-LHC	VBGT**-LHC	VCGT**-LHC	RCGT**-LHC
	87		CCGT**-LH2	DCGT**-LH2	TCGT**-LH2	VCGT**-LH2	VPGT**-LH2		
	88		CNGG**-LHC	DNGG**-LHC	SNGG**-LHC	TNGG**-LHC	VNGG**-LHC	WNGG**-LHC	
	89		CCGT**-LH	DCGT**-LH	TCGT**-LH	VCGT**-LH	VBGT**-LH		
	90		CNMG**-LH	DNMG**-LH	SNMG**-LH	TNMG**-LH	VNMG**-LH	WNMG**-LH	
	91		APKT**PDER-LH	APKT**PDFR-G2C	APEX**FR-LHC	APKT**FR-LHC	APKT**T4PDFR-LH1C	LDHT**PDFR-LHC	SEKT**AFFN-LH2
Inserts for processing wheel	92		GDMA840-LHC	GIPATYZ-35V-1.2-LHC	GIP600E-3.00-LHC	MRGN	VCGT	VPGT	

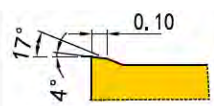
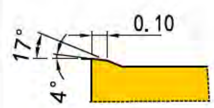
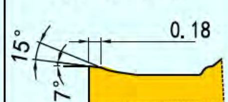
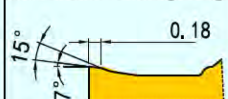
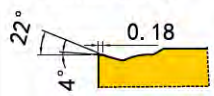
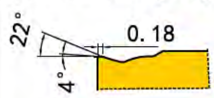
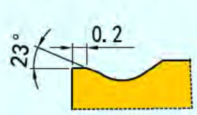
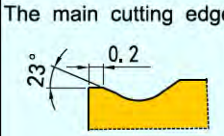
B General Turning

B1–1 Turning inserts overview

Finishing of cast iron	94	 CNMG**-CX	 DNMG**-CX	 SNMG**-CX	 TNMG**-CX	 WNMG**-CX		
The semi–Finishing of cast iron	95	 CNMG**-CQ	 DNMG**-CQ	 SNMG**-CQ	 TNMG**-CQ	 WNMG**-CQ	 VNMG**-CQ	
	96	 CNMG**-U	 DNMG**-U	 SNMG**-U	 TNMG**-U	 VNMG**-U	 WNMG**-U	
Rough machining of cast iron	97	 CNMG**-GH	 DNMG**-GH	 TNMG**-GH	 WNMG**-GH			
	98	 CNMA**	 DNMA**	 SNMA**	 TNMA**	 WNMA**		
Peeling–Inserts	100	 LPUC	 LNUC	 XNGX				
	100	 LNGF	 LNGF					
Turning inserts for profile	101	 KNUX	 KNUX					
	101	 KNUX						

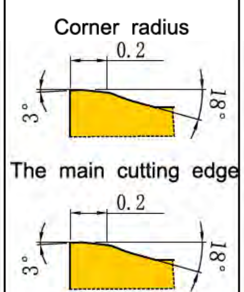
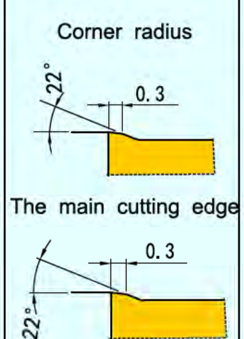
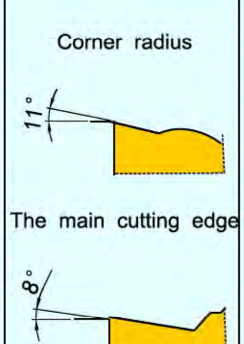
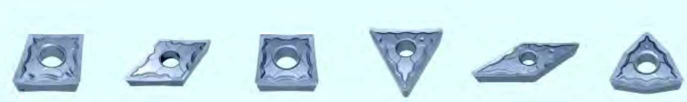
B1–2 Description of chipbreaker

A Negative inserts

ISO	Chip breaker	Recommended cutting parameter	Cutting egde shape	Chipbreaker features
P	FW 	ap=0.15-1.5 mm fn=0.07-0.5 mm/r	Corner radius  The main cutting edge 	For steel finishing turning. Cutting control ability is better than other chipbreakers in steel process Operations: longitudinal cutting, facing, back-turning and profiling. Advantages: light cutting geometry, low cutting forces suitable for slender Shafts, thin walled and unstably clamped components.This chipbreaker matches with wear-resisting.Grade will be better. Limitations: depth of cut and feed range. Components typically: axles, gears where good surface finish is a priority. 
P	MD 	ap=0.2-8.6 mm fn=0.1-0.65 mm/r	Corner radius  The main cutting edge 	For medium turning. With broad applied range for steel. Operations: longitudinal cutting, facing and profiling Advantages: High reliability and universality with fault-free cutting. This chipbreaker matches with wear-resisting Grade will be better. Components typically: axles, hubs, gears, etc in steel. 
P M	MA 	ap=0.2-6.0 mm fn=0.15-0.5 mm/r	Corner radius  The main cutting edge 	For semi-finishing turning. For semi-finishing of steel and cast iron; Operations:Turning,facing and profiling. Advantages:Suitable for general field.Positive edge shape of blade, performance of Sharp cutting. Typical parts:Ordinary steel parts and cast iron parts. 
P K	U 	ap=0.25-4.0 mm fn=0.15-0.5 mm/r	Corner radius  The main cutting edge 	For semi-finishing to finishing turning. With broad applied range for cast iron. Operations: turning, facing. Advantages: high cutting edge hardness, low cutting resistance force, easy chip-flow. Combined with more abrasive grade can get better efficiency. Limitations: Sensitive to casting, forging and discontinuous cutting. Typical parts : pieces of cast iron. 

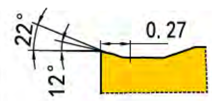
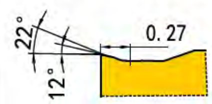
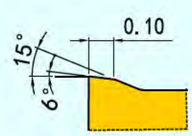
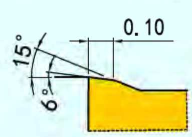
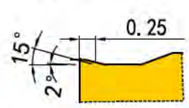
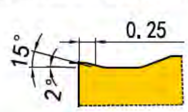
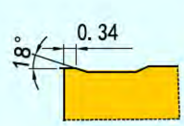
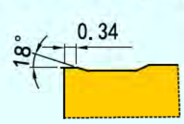
B1−2 Description of chipbreaker

A Negative inserts

ISO	Chip breaker	Recommended cutting parameter	Cutting edge shape	Chipbreaker features
P	TM 	ap=0.15-4.5 mm fn=0.2-0.5 mm/r		For semi-finishing machining; For semi finishing turning Of steel. Operations: turning, facing, profiling. Advantages: High universality, easy chip-flow, special bulge close to the nose radiusand big rake angle generate the cutting ability and low cutting force of chipbreaker Limitations: the depth of cutting and feed. Typical parts: ordinary steel parts. 
P	RA 	ap=0.7-15 mm fn=0.2-1 mm/r		For rough turning. With high metal removal rate when process steel and stainless steel. Operations: longitudinal turning, facing and profiling Advantages: High universality, with high roughing process ability. Limitations: risk of overloading cutting edge, risk of insert movement in seat at high cutting data when used with lever-type toolholder. Components typically: axles, hubs, gears, etc. in steel. 
P	RB 单面 	ap=0.7-15 mm fn=0.2-1 mm/r		For rough turning. With high removal rate in steel with double and single sided insert alternatives. Advantages: universal capability, double-sided insert geometry with high Roughing capability contributing towards good machining economy. Components typically: axles, flange, gears, etc. 
M S N	LH 	ap=0.08-3.5 mm fn=0.1-0.4 mm/r		Used for finish turning; Suitable for stainless steel and non-ferrous metals such as aluminum alloy materials processing; Operations: turning and facing; Advantages: with a lower cutting force light cutting groove, reliability and versatility, achieved without fault cutting; Limitations: the feed rate and cutting depth limitation of application scope; Typical parts: aluminum alloy parts. 

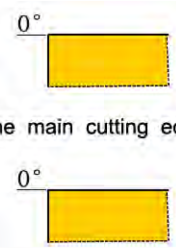
B1−2 Description of chipbreaker

A Negative inserts

ISO	Chip breaker	Recommended cutting parameter	Cutting edge shape	Chipbreaker features
S	SN 	ap=0.05-4.5 mm fn=0.12-0.65 mm/r	Corner radius  The main cutting edge 	For semi-finishing turning. Widely used for Resistance alloy/titalium alloy. Operations: longitudinal turning, facing and profiling Advantages: reliable giving problem-free machining general chipbreaker for stainless steel. Limitations: can be affected by casting and forging skin as well as Intermittent cuts. 
K	CX 	ap=0.15-2.0 mm fn=0.08-0.30 mm/r	Corner radius  The main cutting edge 	For finish turning; Gray and nodular cast iron. Operations:Longitudinal Turning,facing and profiling. Advantages:Light cutting groove with lower cutting force.Have many advantages for the machining of parts vibration sensitive and unstable clamping.When turning the through hole, can provide a higher and more consistent quality of workpiece. Limitations: The depth of cutting and feed. Typical parts:Ordinary parts of cast iron. 
K	CQ 	ap=0.2-6.0 mm fn=0.15-0.50 mm/r	Corner radius  The main cutting edge 	For semi-finish turning; Gray and nodular cast iron. Operations:Longitudinal Turning,facing and profiling. Advantages:Reliable giving trouble-free machining. Limitations: Lower strength of Cutting edge in the intermittent cutting. Typical parts:Ordinary parts of cast iron. 
K	GH 	ap=1.0-8.0 mm fn=0.3-0.85 mm/r	Corner radius  The main cutting edge 	For rough turning. Gray and nodular cast iron. Operations:Turning,facing and profiling. Advantages: A wide range of rough machining of cast iron, provides good economy of machining. Typical parts:Parts of cast iron. 

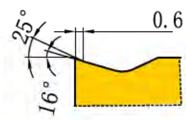
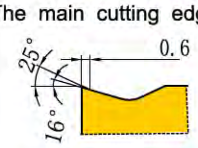
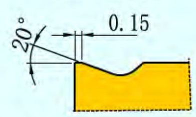
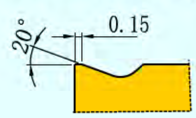
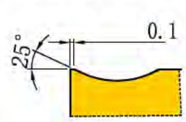
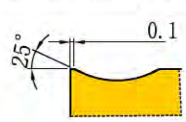
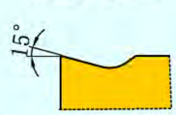
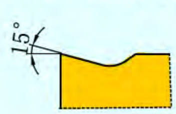
B1−2 Description of chipbreaker

A Negative inserts

ISO	Chip breaker	Recommended cutting parameter	Cutting edge shape	Chipbreaker features
K	No slot 	ap=0.2-12.0 mm fn=0.1-1.19 mm/r		For rough turning. For grey and nodular cast-iron. Operations: longitudinal turning, facing and to some extent profiling. Advantages: broad application range for roughing. Limitations: can generate high radial cutting forces which may effect component and clamping. Components typically: cast-iron components in general. 
P	KNUX 	ap=1-6mm fn=0.2-0.7 mm/r		For fine to medium turing of steel and statinless steel. Operations: Profiling turning and turning. For finishing and semi-finishing of steel and stainless steel Typical parts: arbor wheel, thin wall and wheel. Advantages: light cutting chip breaker, low cutting forces, suitable for processing slender shafts, thin wall and unstable clamped components. 

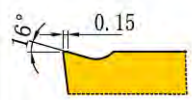
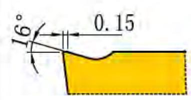
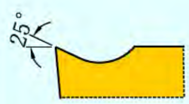
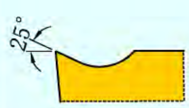
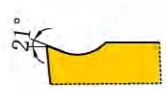
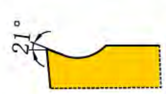
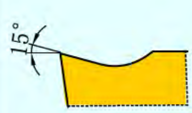
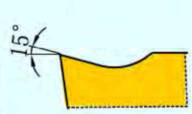
B1—2 Description of chipbreaker

A Negative inserts

ISO	Chip breaker	Recommended cutting parameter	Cutting edge shape	Chipbreaker features
P	E 	ap=0.08-2.6 mm fn=0.1-0.25 mm/r	Corner radius  The main cutting edge 	For finish machining. Apply to steel finish machining . Operations: turning, facing. Advantage: a sharp edge, resistance to strong adhesion,processing size and high precision, good surface quality, smooth chip removal. Typical parts: ordinary steel parts. 
P	N 	ap=0.3-1.2 mm fn=0.03-0.18 mm/r	Corner radius  The main cutting edge 	Operations: turning, facing. Apply to steel semi finish maching,finish machining. Edge:edge tough,resistant to strong adhesion,processing siz and high precision, good surface quality,smooth chip removal. Limitations: generally used only for steel parts general machining. Typical parts:ordinary steel parts. 
K	A 	ap=0.08-3.2 mm fn=0.18-0.38 mm/r	Corner radius  The main cutting edge 	For semi-finishing machining, finish machining . Used for semi-finishing and finishing of cast iron parts. Operations: turning, facing. Strong cutting edge, flat chip breaker with good chip space, smooth chip removal, high adhesion-resisting. Make sure the cutting surface quality and precision. Limitations : used for processing of cast iron parts. Typical parts : pieces of cast iron. 
N	S 	ap=0.06-2.0 mm fn=0.05-0.2 mm/r	Corner radius  The main cutting edge 	For finishing, semi finish turning. Wide application range for non-ferrous metal and steel Operations: cutting, copying turning. Advantage: a sharp edge, small cutting resistance, smooth chip removal, with good chip control force, has wide application range. Typical parts: ordinary steel, non-ferrous metal parts. 

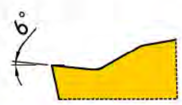
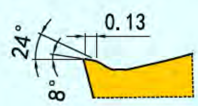
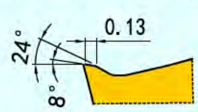
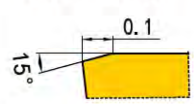
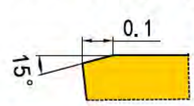
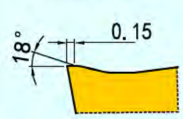
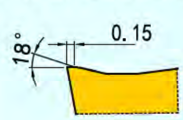
B1−2 Description of chipbreaker

B Positive inserts

ISO	Chip breaker	Recommended cutting parameter	Cutting edge shape	Chipbreaker features
P	N 	ap=0.06-3.6 mm fn=0.2-0.36 mm/r	Corner radius  The main cutting edge 	Apply to steel semi finish machining, finish machining Operations: turning, facing. Advantages: high toughness of cutting edge, high adhesion-resisting, high accuracy of processing size, good surface quality and smooth chip removal. Limitations: generally used only for ordinary steel parts general machining. Typical parts: ordinary steel parts. 
P	E 	ap=0.08-2.6 mm fn=0.1-0.25 mm/r	Corner radius  The main cutting edge 	For semi-finishing machining, finish machining . Apply to steel semi finishing. Operations: turning, facing. Advantages: high toughness of cutting edge, high adhesion-resisting, high accuracy of processing size, good surface quality and smooth chip removal. Limitations: the cutting depth and feed rate. Typical parts: ordinary steel parts. 
P	H 	ap=0.08-3.2 mm fn=0.1-0.3 mm/r	Corner radius  The main cutting edge 	Apply to steel finishing, semi finish turning. Operations: turning, facing and copying turning. Provided good range, small cutting resistance, sharp blade, smooth chip removal, has good processing dimensional accuracy and surface quality. Limitations: the cutting speed. Typical parts: common steel . 
N	S 	钢: ap=0.06-2.3 mm fn=0.05-0.18 mm/r 有色金属: ap=0.08-2.5 mm fn=0.06-0.2 mm/r	Corner radius  The main cutting edge 	For finishing, semi finish turning; Wide application range for ordinary steel and low carbon steel. Operations: turning, copying turning; Advantage: a sharp edge, small cutting resistance, smooth chip removal, with good chip control force, has wide application range; Limitations: cutting edge has overload risk, cutting depth and feed rate restriction; Typical parts: ordinary steel, non-ferrous metal parts. 

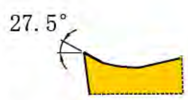
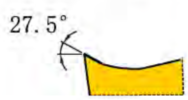
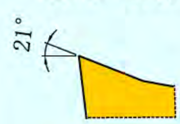
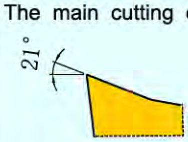
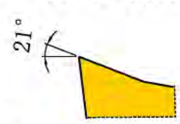
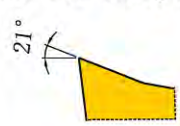
B1−2 Description of chipbreaker

B Positive inserts

ISO	Chip breaker	Recommended cutting parameter	Cutting edge shape	Chipbreaker features
P M	FW 	ap=0.15-2.0 mm fn=0.01-0.3 mm/r	Corner radius  The main cutting edge 	For finishing turning. With good chip control above all in steel、stainless steel、grey and nodular cast-iron. Operations: turning, facing, profiling and back-facing. Advantages: Light cutting chip breaker with low cutting force. Suitable for processing slender shaft, thin-walled parts and unstable clamped parts. Limitations: depth of cut and feed. Typical parts: shaft, wheel and gear hub 
P M	MD 	ap=0.2-4.5mm fn=0.1-0.35 mm/r	Corner radius  The main cutting edge 	For medium-duty turning. With broad capability for steel、stainless steel、grey and nodular cast-iron. Operations: turning, facing and profiling. Advantages: high universality, reliable and problem-free cutting Limitations: depth of cut and feed, risk of overloading the cutting edge. Components typically: axles, shafts, hubs, gears, etc. 
P	R 	ap=0.15-12.8 mm fn=0.05-3.5 mm/r	Corner radius  The main cutting edge 	For semi-finishing turning . Used for steel, stainless steel and cast-iron. Operations : turning, facing and profiling. Advantages: high reliability. Limitations: chip breaking via round insert. Components typically: shafts, axles, etc. 
P	RA 	ap=0.2-14.5 mm fn=0.1-1.2 mm/r	Corner radius  The main cutting edge 	For rough turning. With high removal rate in steel、stainless steel、grey and nodular cast-iron. Operations: turning, facing and profiling. Advantages: all-round, positive geometry giving good roughing capability with good balance between high removal rate and minimum vibration tendencies. Limitations: depth of cut and feed, risk of overloading the cutting edge. Components typically: axles, shafts, hubs, gears, etc. 

B1–2 Description of chipbreaker

B Positive inserts

ISO	Chip breaker	Recommended cutting parameter	Cutting edge shape	Chipbreaker features
N	LH 	ap=0.1-5.0 mm fn=0.03-0.5 mm/r	Corner radius  The main cutting edge 	Used for finish turning. Aluminum alloy and other non-ferrous metals. Operations: turning, facing and copying cutting. Advantages: open positive rake angle groove in high cutting speed cutting light. Used as far as possible the high cutting speed (high2500m / min) can obtain more production efficiency. Limitations : used for nonferrous metal material processing. Typical parts: ordinary aluminum parts. 
N	LH2 	ap=0.1-6.5 mm fn=0.13-0.6 mm/r	Corner radius  The main cutting edge 	Used for finish turning. Aluminum alloy and other non-ferrous metals. Operations: turning, facing and copying cutting. Advantages: open positive rake angle groove in high cutting speed cutting light. Used as far as the high cutting speed can be obtained more production efficiency. Limitations : used for nonferrous metal material processing. Typical parts: ordinary aluminum parts. 
S	SL 	ap=0.06-1.7 mm fn=0.03-0.3 mm/r	Corner radius  The main cutting edge 	Used for finish turning; Suitable for finishing machining of heat resistance alloy, titanium alloy and other aerospace parts. Operations: turning, facing; Advantages: Light cutting chip breaker with low cutting force. High reliability and universality. Problem free cutting . Limitations: the feed rate and cutting depth limitation of application scope; 

B1−3 Recommended grade and chipbreaker

P Process steel

	Process type	Chip breaker	Tolerance	Chipbreaker diagram	Recommended cutting parameter	CVD coating	PVD coating
Negative Angle blade before	Finishing	FW	M		ap=0.3-1.5 mm、fn=0.07-0.5 mm/r	BPS051、BPS101	
		N	G		ap=0.3-1.2 mm、fn=0.03-0.18 mm/r		BU810、BPG05B
		E	G		ap=0.8-2.6 mm、fn=0.1-0.25 mm/r		BU810、BPG05B
		H	G		ap=0.8-3.2 mm、fn=0.1-0.3 mm/r		BU810、BPG05B
		S	G		ap=0.6-2.0 mm、fn=0.05-0.2 mm/r		BU810、BPG05B
	Semi-finishing	TM	M		ap=1.5-4.5 mm、fn=0.2-0.5 mm/r	BPS101、BPS251	BPG308
		MD	M		ap=0.4-8.6 mm 、fn=0.1-0.65 mm/r	BPS101、BPS251	BPG308
		MA	M		ap=0.8-3.2 mm、fn=0.1-0.3 mm/r		BU810、BPG05B
		U	M		ap=0.8-2.6 mm、fn=0.1-0.3 mm/r		BU810、BPG05B
		UX	M		ap=0.8-3.2 mm、fn=0.1-0.3 mm/r		BU810、BPG05B
		S	G		ap=0.6-2.0 mm、fn=0.05-0.2 mm/r		BU810、BPG05B
	Rough finish	RA	M		ap=0.7-15 mm、fn=0.2-1 mm/r	BPS373	
Is the former Angle blade	Finishing	N	G		ap=0.3-1.2 mm、fn=0.03-0.18 mm/r		BU810、BPG05B
		H	G		ap=0.8-3.2 mm、fn=0.1-0.3 mm/r		BU810、BPG05B
		E	G		ap=0.8-2.6 mm、fn=0.1-0.3 mm/r		BU810、BPG05B
		S	G		ap=0.6-2.0 mm、fn=0.05-0.2 mm/r		BU810、BPG05B
		FW	M		ap=0.5-2.0 mm、fn=0.01-0.3 mm/r	BPS051、BPS101	
	Semi-finishing	N	G		ap=0.3-1.2 mm、fn=0.03-0.18 mm/r		
		MD	M		ap=0.2-4.5mm、fn=0.1-0.35 mm/r	BPS101、BPS251	BPG308
		R	M		ap=0.5-12.8 mm	BPS101、BPS251	BPG308
	Rough finish	RA	M		ap=0.2-4.5 mm、fn=0.1-0.35 mm/r	BPS373	

B1−3 Recommended grade and chipbreaker

M Process on stainless steel

ISO	Process type	Chip breaker	Tolerance	Chipbreaker diagram	Recommended cutting parameter	CVD coating	PVD coating
Negative Angle blade before	Finishing	LH	M		ap=0.8-3.5 mm、fn=0.1-0.4 mm/r		BPG05B
		MX	M		ap=0.1-1.5 mm、fn=0.05-0.4 mm/r		BPG05B
	Semi-finishing	MD	M		ap=0.4-8.6 mm、fn=0.1-0.65 mm/r		BPG20B、BPG30B
		MA	M		ap=0.5-8.5 mm、fn=0.12-0.65 mm/r		BPG20B、BPG30B

N Non-ferrous metals

	Process type	Chip breaker	Tolerance	Chipbreaker diagram	Recommended cutting parameter	Carbide grade
Negative Angle blade before	Finishing	LH	M		ap=0.8-3.5 mm、fn=0.1-0.4 mm/r	BU810
	Semi-finishing, finishing	S	G		ap=0.8-2.5 mm、fn=0.06-0.2 mm/r	BU810

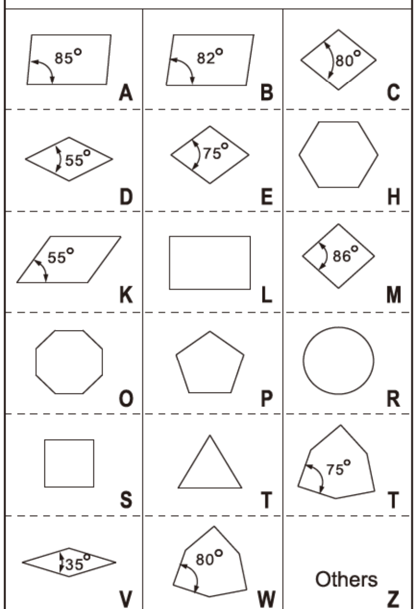
	Process type	Chip breaker	Tolerance	Chipbreaker diagram	Recommended cutting parameter	Carbide grade
Is the former Angle blade	Semi-finishing , roughing turning	LH	G		ap=0.1-5.0 mm、fn=0.03-0.5 mm/r	BU810
		LH2	G		ap=0.4-6.5 mm、fn=0.13-0.6 mm/r	BU810
	Semi-finishing	S	G		ap=0.6-2.0 mm、fn=0.05-0.2 mm/r	BU810

K Process on cast iron

	Process type	Chip breaker	Tolerance	Chipbreaker diagram	Recommended cutting parameter	CVD coating
Negative Angle blade before	Finishing	CX	M		ap= 0.06-1.7 mm、fn= 0.03-0.3 mm/r	BPC052
	Semi-finishing	CQ	M		ap= 0.2-6.0 mm、fn= 0.15-0.5 mm/r	BPC102
		U	M		ap=1-4.0 mm、fn=0.15-0.5 mm/r	BPC102
	Rough finish	GH	M		ap=0.4-14 mm、fn=0.19-0.85 mm/r	BPC102
		No slot	M		ap=0.2-12.0 mm、fn=0.1-1.19 mm/r	BPC102

B1-4 General turning inserts code key

Insert Shape/Code



Insert shape

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

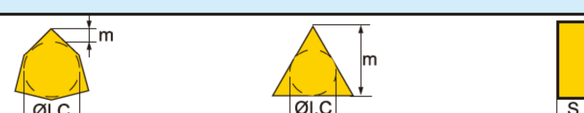
Chipbreaker and clamping system

T N M G

Clearance angle of main cutting edge

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

Allowed tolorence



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

(Reference) Details of M-class tolerance (Identied by shape and size)

Nose height tolerance (mm)

Inscribed circle	T	S	C (80°)	K (55°)	V (35°)	R
6.35	±0.08	±0.08	±0.08	±0.11	±0.16	---
9.525	±0.08	±0.08	±0.08	±0.11	±0.16	---
12.7	±0.13	±0.13	±0.13	±0.15	---	---
15.875	±0.15	±0.15	±0.15	±0.18	---	---
19.05	±0.15	±0.15	±0.15	±0.18	---	---
25.4	---	±0.18	---	---	---	---

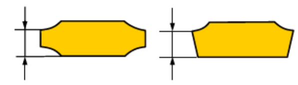
Tolerance of inscribed circle

Inscribed circle	T	S	C (80°)	K (55°)	V (35°)	R
6.35	±0.05	±0.05	±0.05	±0.05	±0.05	---
9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
12.7	±0.08	±0.08	±0.08	±0.08	---	±0.08
15.875	±0.10	±0.10	±0.10	±0.10	---	±0.10
19.05	±0.10	±0.10	±0.10	±0.10	---	±0.10
25.4	---	±0.13	---	---	---	±0.13

B1-4 General turning inserts code key

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

Length of cutting edge



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

Code	Insert thickness (mm)
00	0.79
T0	0.99
01	1.59
T1	1.98
02	2.38
T2	2.78
03	3.18
T3	3.97
04	4.76
T4	4.96
05	5.56
T5	5.95
06	6.35
T6	6.75
07	7.94
09	9.52
T9	9.72
11	11.11
12	12.70

Insert thickness

22 04 08 - FW (ISO)

4 3 2 (inch)

Inscribed circle

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

Thickness

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

Nose radius

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

Nose radius Code

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

Chipbreaker code

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

P Process steel

a Grade for coating

Grade	ISO classification	Colour	Recommend for application
BPS051	P05(P01-P10)	Black/yellow	CVD coated grade: stable conditions for steel semi-finishing to roughing can obtain high metal removal rate. Excellent resistance to crater wear and plastic deformation resistance. Recommended for stable conditions. Wet and dry processing.
BPS101	P15(P10-P20) K15(K10-K20)	Black/yellow	CVD coated carbide grade, wear-resistance materials coated on the gradient sintered substrate which has both good hardness, toughness. Can bear high temperatures. For steel and steel castings finishing to roughing processing, Continue cutting to light interrupted cutting. Machining of gray and ductile iron at low to medium cutting speed. For hard materials continuous cutting and light interrupted cutting from finishing to roughing. Wet and dry processing.
BPS153	P15(P10-P20) K15(K10-K20)	Yellow	CVD coated carbide grade, wear-resistance materials coated on the gradient sintered substrate which has both good hardness, toughness. Can bear high temperatures. For steel and steel castings finishing to roughing processing, Continue cutting to light interrupted cutting. Machining of gray and ductile iron at low to medium cutting speed. For hard materials continuous cutting and light interrupted cutting from finishing to roughing. Wet and dry processing.
BPS251	P20(P15-P30) M15(M10-M20)	Black/yellow	CVD coated carbide grade, Universal grade, suitable for steel and cast steel continuous cutting and interrupted cutting finishing to roughing. Grades with a wide range of applications. Stainless steel continuous cutting and interrupted cutting.
BPS253	P20(P15-P30) M15(M10-M20)	Yellow	CVD coated carbide grade, Universal grade, suitable for steel and cast steel continuous cutting and interrupted cutting finishing to roughing. Grades with a wide range of applications. Stainless steel continuous cutting and interrupted cutting.
BPS371	P30(P25-P40)	Black/yellow	CVD coated carbide grade, high-strength alloy substrate with thick wear-resistant coating. Machining steel and cast steel in bad conditions. Edge line security for interrupted cutting high metal removal rate.
BPS373	P30(P25-P40)	Yellow	CVD coated carbide grade, high-strength alloy substrate with thick wear-resistant coating. Machining steel and cast steel in bad conditions. Edge line security for interrupted cutting high metal removal rate.
BPG308	P20(P15-P30)	Purple yellow	PVD coated carbide grade , for example, the long cutting edge, clogging, deep shoulder milling, long overhang, milling processes. or an alternative of toughness processes. Combining the peripheral-edge grinding blade, preferred for viscous material, such as low carbon steel.

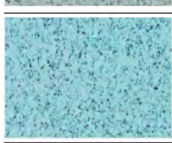
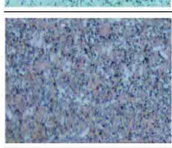
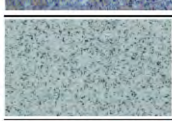
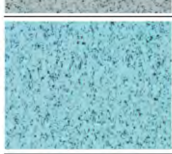
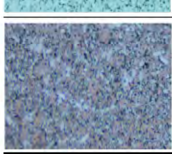
B1–5 Inserts for processing steel

P Process steel

b Cermet

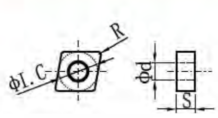
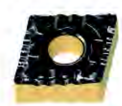
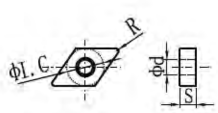
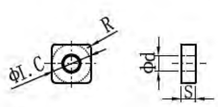
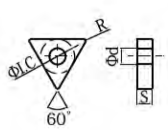
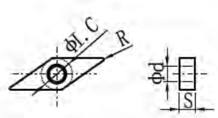
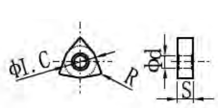
	Grade	ISO classification	Density (g/cm3)	Hardness HRA	Bending strength (N/mm2)	Usage and performance
	BN201	K01~K10 P01~P20 M01~M20	6.5~7.2	>92	>1800	Suitable for the finishing ,semi-finishing of stainless steel
	BN301	K05~K20 P10~P30 M10~M30	6.1~7.2	>91	>2000	Suitable for the finishing ,semi-finishing of stainless steel

C Grade for uncoating

	Grade	ISO classification	Density (g/cm3)	Hardness HRA	Bending strength (N/mm2)	Usage and performance
	YT5	P30	12.7~13.1	89.5~90.5	2200	High strength, impact resistance and thermal shock resistance; suitable for carbon and alloy steel rough machining.
	YT14	P20	11.2~11.6	91.5~92.5	1750	The use of high strength, impact resistance, good shock resistance, suitable for carbon and alloy steel finishing, semi finishing.
	YT15	P10	11.1~11.5	92~93.2	1650	Good wear resistance. Suitable for steel, cast steel, alloy steel finishing, semi finishing.
	BP10	P05~P15	10.0~11.0	≥92.0	1760	Excellent in red hardness.anti-heat crack, anti -plastic deformatio. Suitablefor thefinishing semi finishing of steel castiron .
	BP20	P20~P25 M20	12.3	≥91.5	1910	Excellent in red handness, anti-heat crak, anti xdformation.Suitable for processing the structural alloy steel, alloy tool steel, high manganese steel and stainless steel
	BP35	P30~P40	12.7	≥91.0	2220	Excellention red hardness anti-thermal deformation . high strength. common grage. Suitable for the roughing of steel, castiron

B1−5 Inserts for processing steel ········ Finishing

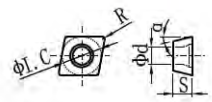
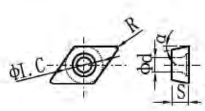
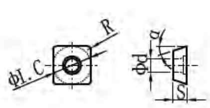
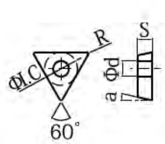
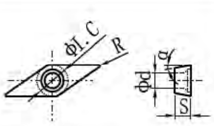
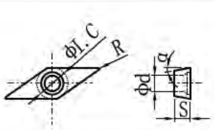
Negative inserts

The basic shape of blade		Type		Dimension (mm)				Grade recommended							
								CVD coating grade				PVD coating grade		ceramic	
				ΦI.C	S	Φd	R	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301
		CNMG	090304-FW	9.525	3.18	3.81	0.4		★	☆					
			090308-FW	9.525	3.18	3.81	0.8		★	☆					
			120404-FW	12.7	4.76	5.16	0.4		★	☆					
			120408-FW	12.7	4.76	5.16	0.8		★	☆					
			120412-FW	12.7	4.76	5.16	1.2		★	☆					
		DNMG	110404-FW	9.525	4.76	3.81	0.4		★	☆					
			110408-FW	9.525	4.76	3.81	0.8		★	☆					
			150404-FW	12.7	4.76	5.16	0.4		★	☆					
			150408-FW	12.7	4.76	5.16	0.8		★	☆					
			150604-FW	12.7	6.35	5.16	0.4		★	☆					
			150608-FW	12.7	6.35	5.16	0.8		★	☆					
			150612-FW	12.7	6.35	5.16	1.2		★	☆					
		SNMG	120404-FW	12.7	4.76	5.16	0.4		★	☆					
			120408-FW	12.7	4.76	5.16	0.8		★	☆					
			120412-FW	12.7	4.76	5.16	1.2		★	☆					
		TNMG	160404-FW	9.525	4.76	3.81	0.4		★	☆					
			160408-FW	9.525	4.76	3.81	0.8		★	☆					
			160412-FW	9.525	4.76	3.81	1.2		★	☆					
			220404-FW	12.7	4.76	5.16	0.4		★	☆					
			220408-FW	12.7	4.76	5.16	0.8		★	☆					
		VNMG	160404-FW	9.525	4.76	3.81	0.4		★	☆					
			160408-FW	9.525	4.76	3.81	0.8		★	☆					
		WNMG	060404-FW	9.525	4.76	3.81	0.4		★	☆					
			060408-FW	9.525	4.76	3.81	0.8		★	☆					
			060412-FW	9.525	4.76	3.81	1.2		★	☆					
			080404-FW	12.7	4.76	5.16	0.4		★	☆					
			080408-FW	12.7	4.76	5.16	0.8		★	☆					
			080412-FW	12.7	4.76	5.16	1.2		★	☆					

★ Recommended grade ☆ Optional grade

B1–5 Inserts for processing steel .... Finishing

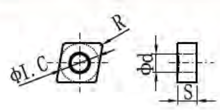
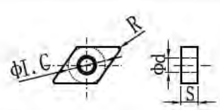
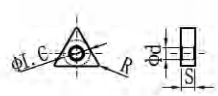
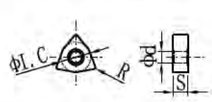
Positive inserts

The basic shape of inserts		Type		Dimension (mm)					Grade recommended							
									CVD coating grade				PVD coating grade		ceramic	
				ΦI.C	S	Φd	R	α	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301
		CCMT	060202-FW	6.35	2.38	2.8	0.2	7°	☆	★						
			060204-FW	6.35	2.38	2.8	0.4	7°	☆	★						
			060208-FW	6.35	2.38	2.8	0.8	7°	☆	★						
			09T302-FW	9.525	3.97	4.4	0.2	7°	☆	★						
			09T304-FW	9.525	3.97	4.4	0.4	7°	☆	★						
			09T308-FW	9.525	3.97	4.4	0.8	7°	☆	★						
			120404-FW	12.7	4.76	5.5	0.4	7°	☆	★						
			120408-FW	12.7	4.76	5.5	0.8	7°	☆	★						
		DCMT	070202-FW	6.35	2.38	2.8	0.2	7°	☆	★						
			070204-FW	6.35	2.38	2.8	0.4	7°	☆	★						
			11T302-FW	9.525	3.97	4.4	0.2	7°	☆	★						
			11T304-FW	9.525	3.97	4.4	0.4	7°	☆	★						
			11T308-FW	9.525	3.97	4.4	0.8	7°	☆	★						
		SCMT	09T304-FW	9.525	3.97	4.4	0.4	7°	☆	★						
			09T308-FW	9.525	3.97	4.4	0.8	7°	☆	★						
		TCMT	090204-FW	5.56	2.38	2.5	0.4	7°	☆	☆						
			090208-FW	5.56	2.38	2.5	0.8	7°	☆	☆						
			110304-FW	6.35	3.18	2.8	0.4	7°	☆	☆						
			110308-FW	6.35	3.18	2.8	0.8	7°	☆	☆						
			110312-FW	6.35	3.18	2.8	1.2	7°	☆	★						
			16T304-FW	9.525	3.97	4.4	0.4	7°	☆	☆						
			16T308-FW	9.525	3.97	4.4	0.8	7°	☆	☆						
			16T312-FW	9.525	3.97	4.4	1.2	7°	☆	☆						
		VBMT	110304-FW	6.35	3.18	2.8	0.4	5°	☆	☆						
			110308-FW	6.35	3.18	2.8	0.8	5°	☆	☆						
			160404-FW	9.525	4.76	4.4	0.4	5°	☆	★						
			160408-FW	9.525	4.76	4.4	0.8	5°	☆	★						
		VCMT	110304-MD	6.35	3.18	2.8	0.4	7°	☆	☆						
			110308-MD	6.35	3.18	2.8	0.8	7°	☆	☆						
			160404-FW	9.525	4.76	4.4	0.4	7°	☆	☆						
			160408-FW	9.525	4.76	4.4	0.8	7°	☆	☆						

★ Recommended grade ☆ Optional grade

B1–5 Inserts for processing steel .... Finishing

Negative inserts

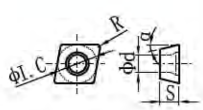
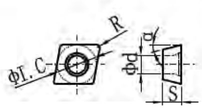
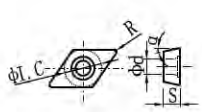
The basic shape of blade		Type		Dimension (mm)				Grade recommended									
								CVD coating grade				PVD coating grade		Ceramic		Uncoated grade	
				ΦI.C	S	Φd	R	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301	BU810	
		CNGG	090402L/R-S	9.525	4.76	3.81	0.2							☆		★	
			090404L/R-S	9.525	4.76	3.81	0.4							☆		★	
			090408L/R-S	9.525	4.76	3.81	0.8							☆		★	
		DNGG	110402L/R-S	9.525	4.76	3.81	0.2							☆		★	
			110404L/R-S	9.525	4.76	3.81	0.4							☆		★	
			110408L/R-S	9.525	4.76	3.81	0.8							☆		★	
		TNGG	110402L/R-S	6.35	4.76	2.4	0.2							☆		★	
			110404L/R-S	6.35	4.76	2.4	0.4							☆		★	
			110408L/R-S	6.35	4.76	2.4	0.8							☆		★	
			160402L/R-S	9.525	4.76	3.81	0.2							☆		★	
			160404L/R-S	9.525	4.76	3.81	0.4							☆		★	
			160408L/R-S	9.525	4.76	3.81	0.8							☆		★	
		WNGG	060402L/R-S	9.525	4.76	3.81	0.2							☆		★	
			060404L/R-S	9.525	4.76	3.81	0.4							☆		★	
			060408L/R-S	9.525	4.76	3.81	0.8							☆		★	

★ Recommended grade ☆ Optional grade

★ Recommended grade ☆ Optional grade

B1−5 Inserts for processing steel .... Finishing

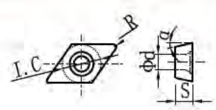
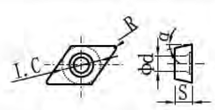
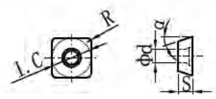
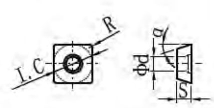
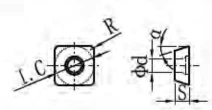
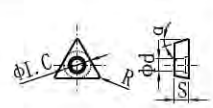
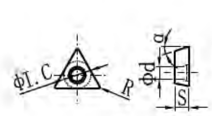
Positive inserts

The basic shape of inserts		Type		Dimension (mm) ΦI.C	S	Φd	R	α	Grade recommended: CVD coating grade BPS051	BPS101	BPS251	BPS371	PVD coating grade BPG05B	BPG308	Ceramic BN201	BN301	Uncoated grade BU810	
		CCGT	060202L/R-S	6.35	2.38	2.8	0.2	7°					☆	☆	☆		★	
			060204L/R-S	6.35	2.38	2.8	0.4	7°					☆	☆	☆		★	
			09T302L/R-S	9.525	3.97	4.4	0.2	7°					☆	☆	☆		★	
			09T304L/R-S	9.525	3.97	4.4	0.4	7°					☆	☆	☆		★	
			09T308L/R-S	9.525	3.97	4.4	0.8	7°					☆	☆	☆		★	
			120402L/R-S	12.7	4.76	5.5	0.2	7°					☆	☆	☆		★	
			120404L/R-S	12.7	4.76	5.5	0.4	7°					☆	☆	☆		★	
			120408L/R-S	12.7	4.76	5.5	0.8	7°					☆	☆	☆		★	
		CCGH	060202L/R-S	6.35	2.38	2.8	0.2	7°					☆	☆	☆		★	
			060204L/R-S	6.35	2.38	2.8	0.4	7°					☆	☆	☆		★	
		DCET	070201L/R-S	6.35	2.38	2.8	0.1	7°					☆	☆	☆		★	
			070202L/R-S	6.35	2.38	2.8	0.2	7°					☆	☆	☆		★	
			070204L/R-S	6.35	2.38	2.8	0.4	7°					☆	☆	☆		★	
			11T301L/R-S	9.525	3.97	4.4	0.1	7°					☆	☆	☆		★	
			11T302L/R-S	9.525	3.97	4.4	0.2	7°					☆	☆	☆		★	
			11T304L/R-S	9.525	3.97	4.4	0.4	7°					☆	☆	☆		★	

★ Recommended grade ☆ Optional grade

B1−5 Inserts for processing steel .... Finishing

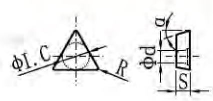
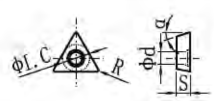
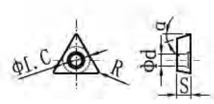
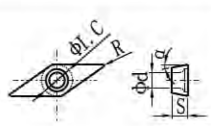
Positive inserts

The basic shape of inserts		Type		Dimension（mm）					Grade recommended									
									CVD coating grade				PVD coating grade		Ceramic		Uncoated grade	
				ΦI.C	S	Φd	R	α	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301	BU810	
		DCGT	070202L/R-S	6.35	2.38	2.8	0.2	7°					☆	☆	☆		★	
			070204L/R-S	6.35	2.38	2.8	0.4	7°					☆	☆	☆		★	
			11T302L/R-S	9.525	3.97	4.4	0.2	7°					☆	☆	☆		★	
			11T304L/R-S	9.525	3.97	4.4	0.4	7°					☆	☆	☆		★	
		DPET	070201L/R-S	6.35	2.38	2.8	0.1	11°					☆	☆	☆		★	
			070202L/R-S	6.35	2.38	2.8	0.2	11°					☆	☆	☆		★	
			11T301L/R-S	9.525	3.97	4.4	0.1	11°					☆	☆	☆		★	
			11T302L/R-S	9.525	3.97	4.4	0.2	11°					☆	☆	☆		★	
		SCGT	09T304L/R-S	9.525	3.97	4.4	0.4	7°					☆	☆	☆		★	
			09T308L/R-S	9.525	3.97	4.4	0.8	7°					☆	☆	☆		★	
		SPGH	090304L/R-S	9.525	3.18	4.4	0.4	11°					☆	☆	☆		★	
			090308L/R-S	9.525	3.18	4.4	0.8	11°					☆	☆	☆		★	
			120304L/R-S	12.7	3.18	5.5	0.4	11°					☆	☆	☆		★	
			120308L/R-S	12.7	3.18	5.5	0.8	11°					☆	☆	☆		★	
		SPGT	090304L/R-S	9.525	3.18	4.4	0.4	11°					☆	☆	☆		★	
			090308L/R-S	9.525	3.18	4.4	0.8	11°					☆	☆	☆		★	
			120304L/R-S	12.7	3.18	5.5	0.4	11°					☆	☆	☆		★	
			120308L/R-S	12.7	3.18	5.5	0.8	11°					☆	☆	☆		★	
		TCGT	110302L/R-S	6.35	3.18	2.8	0.2	7°					☆	☆	☆		★	
			110304L/R-S	6.35	3.18	2.8	0.4	7°					☆	☆	☆		★	
		TPGH	090202L/R-S	5.56	2.38	2.5	0.2	11°					☆	☆	☆		★	
			090204L/R-S	5.56	2.38	2.5	0.4	11°					☆	☆	☆		★	
			110202L/R-S	6.35	2.38	3.4	0.2	11°					☆	☆	☆		★	
			110204L/R-S	6.35	2.38	3.4	0.4	11°					☆	☆	☆		★	
			110302L/R-S	6.35	3.18	3.4	0.2	11°					☆	☆	☆		★	
			110304L/R-S	6.35	3.18	3.4	0.4	11°					☆	☆	☆		★	
			110308L/R-S	6.35	3.18	3.4	0.8	11°					☆	☆	☆		★	
			160302L/R-S	9.525	3.18	4.4	0.2	11°					☆	☆	☆		★	
			160304L/R-S	9.525	3.18	4.4	0.4	11°					☆	☆	☆		★	
			160308L/R-S	9.525	3.18	4.4	0.8	11°					☆	☆	☆		★	

★ Recommended grade ☆ Optional grade

B1−5 Inserts for processing steel .... Finishing

Positive inserts

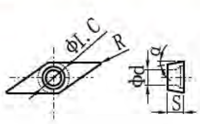
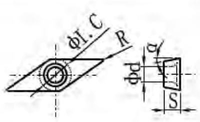
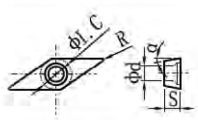
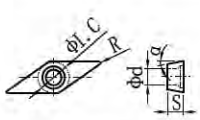
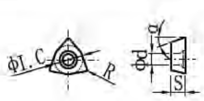
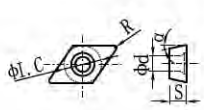
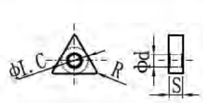
The basic shape of inserts		Type		Dimension (mm) ΦI.C	S	Φd	R	α	Grade recommended: CVD coating grade BPS051	BPS101	BPS251	BPS371	PVD coating grade BPG05B	BPG308	Ceramic BN201	BN301	Uncoated grade BU810	
		TPGR	090202L/R-S	5.56	2.38		0.2	11°					☆	☆	☆		★	
			090204L/R-S	5.56	2.38		0.4	11°					☆	☆	☆		★	
			090208L/R-S	5.56	2.38		0.8	11°					☆	☆	☆		★	
		TPET	110301L-S	6.35	3.18	3.4	0.1	11°					☆	☆	☆		★	
			110302L-S	6.35	3.18	3.4	0.2	11°					☆	☆	☆		★	
		TPGX	090202L-S	5.56	2.38	2.5	0.2	11°					☆	☆	☆		★	
			090204L-S	5.56	2.38	2.5	0.4	11°					☆	☆	☆		★	
			090208L-S	5.56	2.38	2.5	0.8	11°					☆	☆	☆		★	
			110302L-S	6.35	3.18	3.4	0.2	11°					☆	☆	☆		★	
			110304L-S	6.35	3.18	3.4	0.4	11°					☆	☆	☆		★	
			110308L-S	6.35	3.18	3.4	0.8	11°					☆	☆	☆		★	
		VBET	110301L-S	6.35	3.18	2.8	0.1	5°					☆	☆	☆		★	
			110302L-S	6.35	3.18	2.8	0.2	5°					☆	☆	☆		★	

★ Recommended grade ☆ Optional grade

B General Turning

B1–5 Inserts for processing steel ···························· Finishing

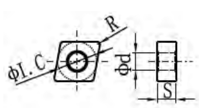
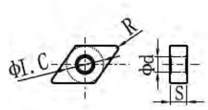
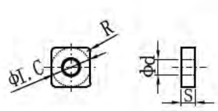
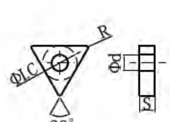
Positive inserts

The basic shape of inserts		Type		Dimension (mm) ΦI.C	S	Φd	R	α	Grade recommended: CVD coating grade BPS051	BPS101	BPS251	BPS371	PVD coating grade BPG05B	BPG308	Ceramic BN201	BN301	Uncoated grade BU810
		VBGT	110301L/R-S	6.35	3.18	2.8	0.1	5°					☆	☆	☆		★
			110302L/R-S	6.35	3.18	2.8	0.2	5°					☆	☆	☆		★
			110304L/R-S	6.35	3.18	2.8	0.4	5°					☆	☆	☆		★
			160402L/R-S	9.525	4.76	4.4	0.2	5°					☆	☆	☆		★
			160404L/R-S	9.525	4.76	4.4	0.4	5°					☆	☆	☆		★
		VCGT	160404L/R-S	9.525	4.76	4.4	0.4	7°					☆	☆	☆		★
			160408L/R-S	9.525	4.76	4.4	0.8	7°					☆	☆	☆		★
		VDGX	160302L/R-S	9.525	3.18	4.4	0.2	15°					☆	☆	☆		★
			160304L/R-S	9.525	3.18	4.4	0.4	15°					☆	☆	☆		★
		VPET	110301L/R-S	6.35	3.18	2.8	0.1	11°					☆	☆	☆		★
			110302L/R-S	6.35	3.18	2.8	0.2	11°					☆	☆	☆		★
		WPGT	060304L/R-S	9.525	4.76	3.18	0.4	11°					☆	☆	☆		★
			060308L/R-S	9.525	4.76	3.18	0.8	11°					☆	☆	☆		★
		DCET	070204L/R-E	6.35	2.38	2.8	0.4	7°					☆	☆	☆		★
			11T302L/R-E	9.525	3.97	4.4	0.2	7°					☆	☆	☆		★
			11T304L/R-E	9.525	3.97	4.4	0.4	7°					☆	☆	☆		★
		TNGG	160404L/R-E	9.525	4.76	3.81	0.4	-					☆	☆	☆		★
			160408L/R-E	9.525	4.76	3.81	0.8	-					☆	☆	☆		★

★ Recommended grade ☆ Optional grade

B1–5 Inserts for processing steel — Semi finishing

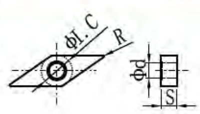
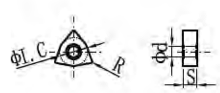
Negative inserts

The basic shape of inserts		Type		Dimension (mm)				Grade recommended							
								CVD coating grade				PVD coating grade		Ceramic	
				ΦI.C	S	Φd	R	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301
		CNMG	090304-MD	9.525	3.18	3.81	0.4		★	★	☆				
			090308-MD	9.525	3.18	3.81	0.8		★	★	☆				
			120404-MD	12.7	4.76	5.16	0.4		★	★	☆				
			120408-MD	12.7	4.76	5.16	0.8		★	★	☆				
			120412-MD	12.7	4.76	5.16	1.2		★	★	☆				
			160608-MD	15.875	6.35	6.35	0.8		★	★	☆				
			160612-MD	15.875	6.35	6.35	1.2		★	★	☆				
			190608-MD	19.05	6.35	7.93	0.8		★	★	☆				
			190612-MD	19.05	6.35	7.93	1.2		★	★	☆				
			190616-MD	19.05	6.35	7.93	1.6		★	★	☆				
		DNMG	110404-MD	9.525	4.76	3.81	0.4		★	★	☆				
			110408-MD	9.525	4.76	3.81	0.8		★	★	☆				
			150404-MD	12.7	4.76	5.16	0.4		★	★	☆				
			150408-MD	12.7	4.76	5.16	0.8		★	★	☆				
			150412-MD	12.7	4.76	5.16	1.2		★	★	☆				
			150604-MD	12.7	6.35	5.16	0.4		★	★	☆				
			150608-MD	12.7	6.35	5.16	0.8		★	★	☆				
			150612-MD	12.7	6.35	5.16	1.2		★	★	☆				
		SNMG	090304-MD	9.525	3.18	3.81	0.4		★	★	☆				
			120404-MD	12.7	4.76	5.16	0.4		★	★	☆				
			120408-MD	12.7	4.76	5.16	0.8		★	★	☆				
			120412-MD	12.7	4.76	5.16	1.2		★	★	☆				
			150608-MD	15.875	6.35	6.35	0.8		★	★	☆				
			150612-MD	15.875	6.35	6.35	1.2		★	★	☆				
			190608-MD	19.05	6.35	7.93	0.8		★	★	☆				
			190612-MD	19.05	6.35	7.93	1.2		★	★	☆				
			190616-MD	19.05	6.35	7.93	1.6		★	★	☆				
		TNMG	160404-MD	9.525	4.76	3.81	0.4		★	★	☆				
			160408-MD	9.525	4.76	3.81	0.8		★	★	☆				
			160412-MD	9.525	4.76	3.81	1.2		★	★	☆				
			220404-MD	12.7	4.76	5.16	0.4		★	★	☆				
			220408-MD	12.7	4.76	5.16	0.8		★	★	☆				
			220412-MD	12.7	4.76	5.16	1.2		★	★	☆				

★ Recommended grade ☆ Optional grade

B1–5 Inserts for processing steel .... Semi finishing

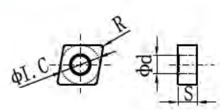
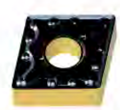
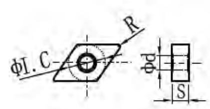
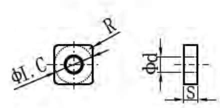
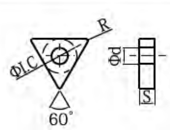
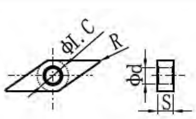
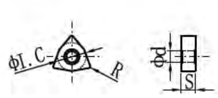
Negative inserts

The basic shape of inserts		Type		Dimension (mm)				Grade recommended							
								CVD coating grade				PVD coating grade		Ceramic	
				ΦI.C	S	Φd	R	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301
		VNMG	160404-MD	9.525	4.76	3.81	0.4		★	★	☆				
			160408-MD	9.525	4.76	3.81	0.8		★	★	☆				
			160412-MD	9.525	4.76	3.81	1.2		★	★	☆				
		WNMG	060404-MD	9.525	4.76	3.81	0.4		★	★	☆				
			060408-MD	9.525	4.76	3.81	0.8		★	★	☆				
			060412-MD	9.525	4.76	3.81	1.2		★	★	☆				
			080404-MD	12.7	4.76	5.16	0.4		★	★	☆				
			080408-MD	12.7	4.76	5.16	0.8		★	★	☆				
			080412-MD	12.7	4.76	5.16	1.2		★	★	☆				

★ Recommended grade ☆ Optional grade

B1–5 Inserts for processing steel ······ Semi finishing

Negative inserts

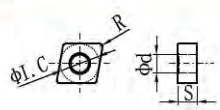
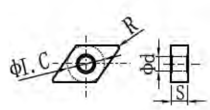
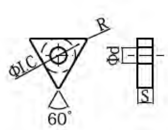
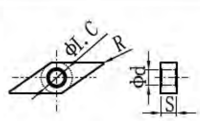
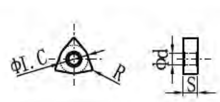
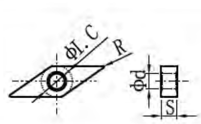
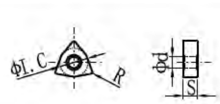
The basic shape of inserts		Type		Dimension (mm)				Grade recommended							
								CVD coating grade				PVD coating grade		Ceramic	
				ΦI.C	S	Φd	R	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301
		CNMG	120404-MA	12.7	4.76	5.16	0.4		★	★	☆				
			120408-MA	12.7	4.76	5.16	0.8		★	★	☆				
			120412-MA	12.7	4.76	5.16	1.2		★	★	☆				
			160604-MA	15.875	6.35	6.35	0.4		☆	☆	☆				
			160608-MA	15.875	6.35	6.35	0.8		★	★	☆				
		DNMG	150404-MA	12.7	4.76	5.16	0.4		★	★	☆				
			150408-MA	12.7	4.76	5.16	0.8		★	★	☆				
			150604-MA	12.7	6.35	5.16	0.4		★	★	☆				
			150608-MA	12.7	6.35	5.16	0.8		★	★	☆				
		SNMG	120404-MA	12.7	4.76	5.16	0.4		☆	☆	☆				
			120408-MA	12.7	4.76	5.16	0.8		★	★	☆				
		TNMG	160404-MA	9.525	4.76	5.16	0.4		★	★	☆				
			160408-MA	9.525	4.76	5.16	0.8		★	★	☆				
			160412-MA	9.525	4.76	5.16	1.2		★	★	☆				
		VNMG	160404-MA	9.525	4.76	5.16	0.4		★	★	☆				
			160408-MA	9.525	4.76	5.16	0.8		★	★	☆				
		WNMG	080404-MA	12.7	4.76	5.16	0.4		★	★	☆				
			080408-MA	12.7	4.76	5.16	0.8		★	★	☆				

★ Recommended grade ☆ Optional grade

B General Turning

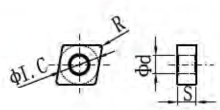
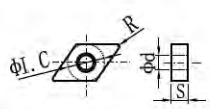
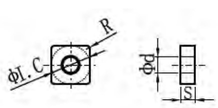
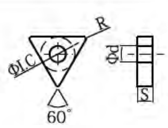
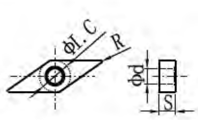
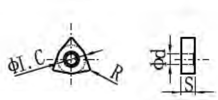
B1−5 Inserts for processing steel ········ Semi finishing

Negative inserts

The basic shape of inserts		Type		Dimension（mm）				Grade recommended							
								CVD coating grade				PVD coating grade		Ceramic	
				ΦI.C	S	Φd	R	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301
		CNMG	120404-TM	12.7	4.76	5.16	0.4		★	★	☆				
			120408-TM	12.7	4.76	5.16	0.8		★	★	☆				
			120412-TM	12.7	4.76	5.16	1.2		★	★	☆				
		DNMG	150404-TM	12.7	4.76	5.16	0.4		★	★	☆				
			150408-TM	12.7	4.76	5.16	0.8		★	★	☆				
			150412-TM	12.7	4.76	5.16	1.2		★	★	☆				
			150604-TM	12.7	6.35	5.16	0.4		★	★	☆				
			150608-TM	12.7	6.35	5.16	0.8		★	★	☆				
			150612-TM	12.7	6.35	5.16	1.2		★	★	☆				
		TNMG	160404-TM	9.525	4.76	3.81	0.4		★	★	☆				
			160408-TM	9.525	4.76	3.81	0.8		★	★	☆				
			160412-TM	9.525	4.76	3.81	1.2		★	★	☆				
			220404-TM	12.7	4.76	5.16	0.4		★	★	☆				
			220408-TM	12.7	4.76	5.16	0.8		★	★	☆				
			220412-TM	12.7	4.76	5.16	1.2		★	★	☆				
		VNMG	160404-TM	9.525	4.76	3.81	0.4		★	★	☆				
			160408-TM	9.525	4.76	3.81	0.8		★	★	☆				
			160412-TM	9.525	4.76	3.81	1.2		★	★	☆				
		WNMG	080404-TM	12.7	4.76	5.16	0.4		★	★	☆				
			080408-TM	12.7	4.76	5.16	0.8		★	★	☆				
			080412-TM	12.7	4.76	5.16	1.2		★	★	☆				
		VNMG	160408-UX	9.525	4.76	3.81	0.8		★	★	☆				
			160412-UX	9.525	4.76	3.81	1.2		★	★	☆				
		WNMG	080408-UX	12.7	4.76	5.16	0.8		★	★	☆				
			080412-UX	12.7	4.76	5.16	1.2		★	★	☆				

★ Recommended grade ☆ Optional grade

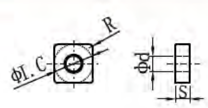
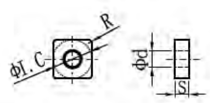
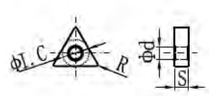
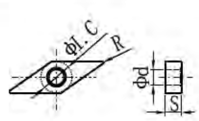
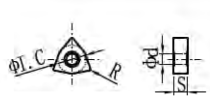
Negative inserts

The basic shape of inserts		Type		Dimension (mm) ΦI.C	S	Φd	R	Grade recommended CVD coating grade BPS051	BPS101	BPS251	BPS371
		CNMG	120404-U	12.7	4.76	5.16	0.4		☆	☆	
			120408-U	12.7	4.76	5.16	0.8		☆	★	
			120412-U	12.7	4.76	5.16	1.2		☆	☆	
			160604-U	15.875	6.35	6.35	0.4		☆	☆	
			160608-U	15.875	6.35	6.35	0.8		☆	★	
			160612-U	15.875	6.35	6.35	1.2		☆	☆	
		DNMG	150404-U	12.7	4.76	5.16	0.4		☆	☆	
			150408-U	12.7	4.76	5.16	0.8		☆	☆	
			150604-U	12.7	6.35	5.16	0.4		☆	☆	
			150608-U	12.7	6.35	5.16	0.8		☆	☆	
		SNMG	120404-U	12.7	4.76	5.16	0.4		☆	☆	
			120408-U	12.7	4.76	5.16	0.8		☆	☆	
			150608-U	15.875	6.35	5.16	0.8		☆	☆	
			150612-U	15.87	6.35	5.16	1.2		☆	☆	
		TNMG	160404-U	9.525	4.76	5.16	0.4		☆	☆	
			160408-U	9.525	4.76	5.16	0.8		☆	★	
			160412-U	9.525	4.76	5.16	1.2		☆	★	
		VNMG	160404-U	9.525	4.76	5.16	0.4		☆	☆	
			160408-U	9.525	4.76	5.16	0.8		☆	★	
			160412-U	9.525	4.76	5.16	1.2		☆	★	
		WNMG	080404-U	12.7	4.76	5.16	0.4		☆	☆	
			080408-U	12.7	4.76	5.16	0.8		☆	★	
			080412-U	12.7	4.76	5.16	1.2		☆	★	

★ Recommended grade ☆ Optional grade

B1–5 Inserts for processing steel — Semi finishing

Negative inserts

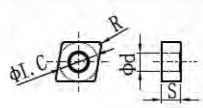
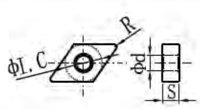
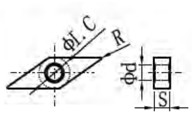
The basic shape of inserts		Type		Dimension（mm）				Grade recommended								
								CVD coating grade				PVD coating grade		Ceramic		Uncoated grade
				ΦI.C	S	Φd	R	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301	BU810
		SNMG	120404L/R-N	12.7	4.76	5.16	0.4					☆	☆	☆		★
			120408L/R-N	12.7	4.76	5.16	0.8					☆	☆	☆		★
												☆	☆	☆		★
		SNGG	090304L/R-N	9.525	3.18	3.81	0.4					☆	☆	☆		★
			090308L/R-N	9.525	3.18	3.81	0.8					☆	☆	☆		★
			120404L/R-N	12.7	4.76	5.16	0.4					☆	☆	☆		★
			120408L/R-N	12.7	4.76	5.16	0.8					☆	☆	☆		★
		TNGG	110302L/R-N	6.35	3.18	2.4	0.2					☆	☆	☆		★
			110304L/R-N	6.35	3.18	2.4	0.4					☆	☆	☆		★
			110308L/R-N	6.35	3.18	2.4	0.8					☆	☆	☆		★
			160304L/R-N	9.525	3.18	3.81	0.4					☆	☆	☆		★
			160402L/R-N	9.525	4.76	3.81	0.2					☆	☆	☆		★
			160404L/R-N	9.525	4.76	3.81	0.4					☆	☆	☆		★
			160408L/R-N	9.525	4.76	3.81	0.8					☆	☆	☆		★
			160412L/R-N	9.525	4.76	3.81	1.2					☆	☆	☆		★
			160416L/R-N	9.525	4.76	3.81	1.6					☆	☆	☆		★
			220404L/R-N	12.7	4.76	5.16	0.4					☆	☆	☆		★
			220408L/R-N	12.7	4.76	5.16	0.8					☆	☆	☆		★
			220412L/R-N	12.7	4.76	5.16	1.2					☆	☆	☆		★
		VNGG	110302L/R-N	6.35	3.18	2.4	0.2					☆	☆	☆		★
			110304L/R-N	6.35	3.18	2.4	0.4					☆	☆	☆		★
			160402L/R-N	9.525	4.76	3.81	0.2					☆	☆	☆		★
			160404L/R-N	9.525	4.76	3.81	0.4					☆	☆	☆		★
		WNGG	060404L/R-N	9.525	4.76	3.81	0.4					☆	☆	☆		★
			060408L/R-N	9.525	4.76	3.81	0.8					☆	☆	☆		★

★ Recommended grade ☆ Optional grade

B General Turning

B1−5 Inserts for processing steel .... Semi finishing

Negative inserts

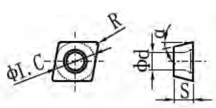
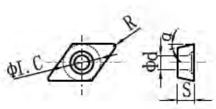
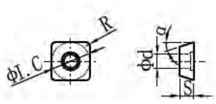
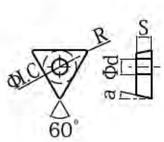
The basic shape of inserts		Type		Dimension（mm）				Grade recommended									
								CVD coating grade				PVD coating grade		Ceramic		Uncoated grade	
				ΦI.C	S	Φd	R	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301	BU810	
		CNGG	090404L/R-H	9.525	4.76	3.81	0.4					☆	☆	☆		★	
			090408L/R-H	9.525	4.76	3.81	0.8					☆	☆	☆		★	
			120404L/R-H	12.7	4.76	5.16	0.4					☆	☆	☆		★	
			120408L/R-H	12.7	4.76	5.16	0.8					☆	☆	☆		★	
		DNGG	110404L/R-H	9.525	4.76	3.81	0.4					☆	☆	☆		★	
			110408L/R-H	9.525	4.76	3.81	0.8					☆	☆	☆		★	
			150404L/R-H	12.7	4.76	5.16	0.4					☆	☆	☆		★	
			150408L/R-H	12.7	4.76	5.16	0.8					☆	☆	☆		★	
		VNGG	160402L/R-H	9.525	4.76	3.81	0.2					☆	☆	☆		★	
			160404L/R-H	9.525	4.76	3.81	0.4					☆	☆	☆		★	
			160408L/R-H	9.525	4.76	3.81	0.8					☆	☆	☆		★	

★ Recommended grade ☆ Optional grade

B General Turning

B1−5 Inserts for processing steel .... Semi finishing

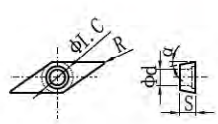
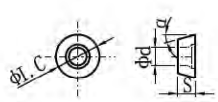
Positive inserts

The basic shape of inserts		Type		Dimension（mm）					Grade recommended							
									CVD coating grade				PVD coating grade		Ceramic	
				ΦI.C	S	Φd	R	α	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301
		CCMT	060204-MD	6.35	2.38	2.8	0.4	7°		★	★			☆		
			060208-MD	6.35	2.38	2.8	0.8	7°		★	★			☆		
			09T302-MD	9.525	3.97	4.4	0.2	7°		★	★			☆		
			09T304-MD	9.525	3.97	4.4	0.4	7°		★	★			☆		
			09T308-MD	9.525	3.97	4.4	0.8	7°		★	★			☆		
			120404-MD	12.7	4.76	5.5	0.4	7°		★	★			☆		
			120408-MD	12.7	4.76	5.5	0.8	7°		★	★			☆		
			120412-MD	12.7	4.76	5.5	1.2	7°		★	★			☆		
		DCMT	070204-MD	6.35	2.38	2.8	0.4	7°		★	★			☆		
			070208-MD	6.35	2.38	2.8	0.8	7°		★	★			☆		
			11T302-MD	9.525	3.97	4.4	0.2	7°		★	★			☆		
			11T304-MD	9.525	3.97	4.4	0.4	7°		★	★			☆		
			11T308-MD	9.525	3.97	4.4	0.8	7°		★	★			☆		
			11T312-MD	9.525	3.97	4.4	1.2	7°		★	★			☆		
		SCMT	09T302-MD	9.525	3.97	4.4	0.2	7°		★	★			☆		
			09T304-MD	9.525	3.97	4.4	0.4	7°		★	★			☆		
			09T308-MD	9.525	3.97	4.4	0.8	7°		★	★			☆		
			09T312-MD	9.525	3.97	4.4	1.2	7°		★	★			☆		
			120404-MD	12.7	4.76	5.5	0.4	7°		★	★			☆		
			120408-MD	12.7	4.76	5.5	0.8	7°		★	★			☆		
			120412-MD	12.7	4.76	5.5	1.2	7°		★	★			☆		
		TCMT	090204-MD	5.56	2.38	2.5	0.4	7°		★	★			☆		
			090208-MD	5.56	2.38	2.5	0.8	7°		★	★			☆		
			110304-MD	6.35	3.18	2.8	0.4	7°		★	★			☆		
			110308-MD	6.35	3.18	2.8	0.8	7°		★	★			☆		
			110312-MD	6.35	3.18	2.8	1.2	7°		★	★			☆		
			16T304-MD	9.525	3.97	4.4	0.4	7°		★	★			☆		
			16T308-MD	9.525	3.97	4.4	0.8	7°		★	★			☆		
			16T312-MD	9.525	3.97	4.4	1.2	7°		★	★			☆		

★ Recommended grade ☆ Optional grade

B1–5 Inserts for processing steel ··· Semi finishing

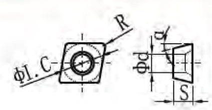
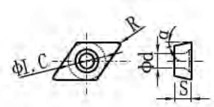
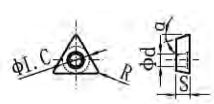
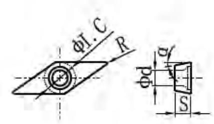
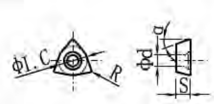
Positive inserts

The basic shape of inserts		Type		Dimension (mm)					Grade recommended							
									CVD coating grade				PVD coating grade		Ceramic	
				ΦI.C	S	Φd	R	α	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301
		VCMT	110304-MD	6.35	3.18	2.8	0.4	7°		★	★			☆		
			110308-MD	6.35	3.18	2.8	0.8	7°		★	★			☆		
			160404-MD	9.525	4.76	4.4	0.4	7°		★	★			☆		
			160408-MD	9.525	4.76	4.4	0.8	7°		★	★			☆		
		VBMT	110304-MD	6.35	3.18	2.8	0.4	5°		☆	☆			☆		
			110308-MD	6.35	3.18	2.8	0.8	5°		☆	☆			☆		
			160404-MD	9.525	4.76	4.4	0.4	5°		★	★			☆		
			160408-MD	9.525	4.76	4.4	0.8	5°		★	★			☆		
		RCMT	0803MOE-R1	8	2.38	3.3	-	7°		★	★			☆		
			10T3MOE-R1	10	3.97	4.5	-	7°		★	★			☆		
			1204MOE-R2	12	4.76	4.4	-	7°		★	★			☆		
			1606MOE-R3	16	6.35	5.5	-	7°		★	★			☆		
			2006MOE-R4	20	6.35	6.5	-	7°		★	★			☆		

★ Recommended grade ☆ Optional grade

B1–5 Inserts for processing steel ········ Semi finishing

Positive inserts

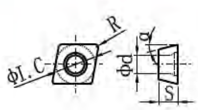
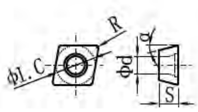
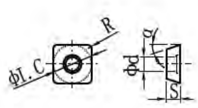
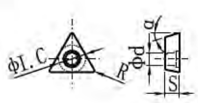
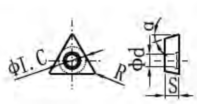
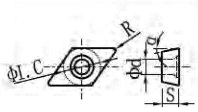
The basic shape of inserts		Type		Dimension（mm）					Grade recommended									
									CVD coating grade				PVD coating grade		Ceramic		Uncoated grade	
				ΦI.C	S	Φd	R	α	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301	BU810	
		CPMH	090304L/R-N	9.525	3.18	4.4	0.4	11°					☆	☆	☆		★	
			090308L/R-N	9.525	3.18	4.4	0.8	11°					☆	☆	☆		★	
													☆	☆	☆		★	
													☆	☆	☆		★	
		DCGT	070201L/R-N	6.35	2.38	2.8	0.1	7°					☆	☆	☆		★	
			070202L/R-N	6.35	2.38	2.8	0.2	7°					☆	☆	☆		★	
			11T301L/R-N	9.525	3.97	4.4	0.1	7°					☆	☆	☆		★	
			11T302L/R-N	9.525	3.97	4.4	0.2	7°					☆	☆	☆		★	
			11T304L/R-N	9.525	3.97	4.4	0.4	7°					☆	☆	☆		★	
		TPGH	110302L/R-N	6.35	3.18	3.4	0.2	11°					☆	☆	☆		★	
			110304L/R-N	6.35	3.18	3.4	0.4	11°					☆	☆	☆		★	
			110308L/R-N	6.35	3.18	3.4	0.8	11°					☆	☆	☆		★	
			160304L/R-N	9.525	3.18	4.4	0.4	11°					☆	☆	☆		★	
			160308L/R-N	9.525	3.18	4.4	0.8	11°					☆	☆	☆		★	
		VBGT	110301L/R-N	6.35	3.18	2.8	0.1	5°					☆	☆	☆		★	
			110302L/R-N	6.35	3.18	2.8	0.2	5°					☆	☆	☆		★	
			110304L/R-N	6.35	3.18	2.8	0.4	5°					☆	☆	☆		★	
			110308L/R-N	6.35	3.18	2.8	0.8	5°					☆	☆	☆		★	
			160402L/R-N	9.525	4.76	4.4	0.2	5°					☆	☆	☆		★	
			160404L/R-N	9.525	4.76	4.4	0.4	5°					☆	☆	☆		★	
			160408L/R-N	9.525	4.76	4.4	0.8	5°					☆	☆	☆		★	
		WPGT	060304L/R-N	9.525	4.76	4.4	0.4	11°					☆	☆	☆		★	
			060308L/R-N	9.525	4.76	4.4	0.8	11°					☆	☆	☆		★	

★ Recommended grade ☆ Optional grade

B1–5 Inserts for processing steel

Semi finishing

Positive inserts

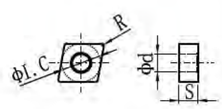
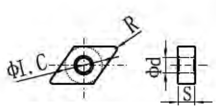
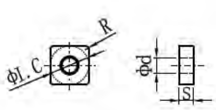
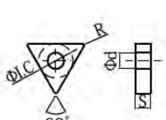
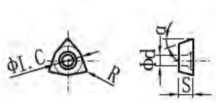
The basic shape of inserts		Type		Dimension (mm)					Grade recommended									
									CVD coating grade				PVD coating grade		Ceramic		Uncoated grade	
				ΦI.C	S	Φd	R	α	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301	BU810	
		CCET	060201L/R-E	6.35	2.38	2.8	0.1	7°					☆	☆	☆		★	
			060202L/R-E	6.35	2.38	2.8	0.2	7°					☆	☆	☆		★	
			060204L/R-E	6.35	2.38	2.8	0.4	7°					☆	☆	☆		★	
			09T301L/R-E	9.525	3.97	4.4	0.1	7°					☆	☆	☆		★	
			09T302L/R-E	9.525	3.97	4.4	0.2	7°					☆	☆	☆		★	
			09T304L/R-E	9.525	3.97	4.4	0.4	7°					☆	☆	☆		★	
		CCGT	060201L/R-E	6.35	2.38	2.8	0.1	7°					☆	☆	☆		★	
			060202L/R-E	6.35	2.38	2.8	0.2	7°					☆	☆	☆		★	
			060204L/R-E	6.35	2.38	2.8	0.4	7°					☆	☆	☆		★	
			09T301L/R-E	9.525	3.97	4.4	0.1	7°					☆	☆	☆		★	
			09T302L/R-E	9.525	3.97	4.4	0.2	7°					☆	☆	☆		★	
			09T304L/R-E	9.525	3.97	4.4	0.4	7°					☆	☆	☆		★	
		SPGT	090304L/R-E	9.525	3.18	4.4	0.4	11°					☆	☆	☆		★	
			090308L/R-E	9.525	3.18	4.4	0.8	11°					☆	☆	☆		★	
			120304L/R-E	12.7	3.18	5.5	0.4	11°					☆	☆	☆		★	
			120308L/R-E	12.7	3.18	5.5	0.8	11°					☆	☆	☆		★	
		TPET	110302L/R-E	6.35	3.18	2.8	0.2	11°					☆	☆	☆		★	
		TCGT	110302L/R-E	6.35	3.18	2.8	0.2	7°					☆	☆	☆		★	
		DCET	070202L/R-H	6.35	2.38	2.8	0.2	7°					☆	☆	☆		★	
			070204L/R-H	6.35	2.38	2.8	0.4	7°					☆	☆	☆		★	
			11T302L/R-H	9.525	3.97	4.4	0.2	7°					☆	☆	☆		★	
			11T304L/R-H	9.525	3.97	4.4	0.4	7°					☆	☆	☆		★	

★ Recommended grade ☆ Optional grade

B General Turning

B1–5 Inserts for processing steel .... Rough machining

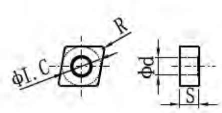
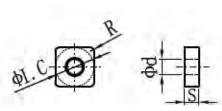
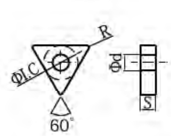
Negative inserts

The basic shape of inserts		Type		Dimension (mm)				Grade recommended							
								CVD coating grade				PVD coating grade		Uncoated grade	
				ΦI.C	S	Φd	R	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301
		CNMG	120408-RA	12.7	4.76	5.16	0.8		☆	★	☆				
			120412-RA	12.7	4.76	5.16	1.2		☆	★	☆				
			120416-RA	12.7	4.76	5.16	1.6		☆	☆	☆				
			160608-RA	15.875	6.35	6.35	0.8		☆	☆	☆				
			160612-RA	15.875	6.35	6.35	1.2		☆	☆	★				
			160616-RA	15.875	6.35	6.35	1.6		☆	☆	☆				
			190612-RA	19.05	6.35	7.93	1.2		☆	☆	★				
		DNMG	150408-RA	12.7	4.76	5.16	0.8		☆	☆	★				
			150412-RA	12.7	4.76	5.16	1.2		☆	☆	★				
			150416-RA	12.7	4.76	5.16	1.6		☆	☆	☆				
			150608-RA	12.7	6.35	5.16	0.8		☆	☆	★				
			150612-RA	12.7	6.35	5.16	1.2		☆	☆	★				
			150616-RA	12.7	6.35	5.16	1.6		☆	☆	☆				
		SNMG	120408-RA	12.7	4.76	5.16	0.8		☆	★	☆				
			120412-RA	12.7	4.76	5.16	1.2		☆	★	☆				
			120416-RA	12.7	4.76	5.16	1.6		☆	☆	☆				
			150608-RA	15.875	6.35	6.35	0.8		☆	☆	★				
			150612-RA	15.875	6.35	6.35	1.2		☆	☆	★				
			150616-RA	15.875	6.35	6.35	1.6		☆	☆	★				
			190608-RA	19.05	6.35	7.93	0.8		☆	☆	★				
			190612-RA	19.05	6.35	7.93	1.2		☆	☆	★				
			190616-RA	19.05	6.35	7.93	1.6		☆	☆	☆				
			190624-RA	19.05	6.35	7.93	2.4		☆	☆	☆				
		TNMG	160408-RA	9.525	4.76	3.81	0.8		☆	★	☆				
			160412-RA	9.525	4.76	3.81	1.2		☆	★	☆				
			220408-RA	12.7	4.76	5.16	0.8		☆	☆	★				
			220412-RA	12.7	4.76	5.16	1.2		☆	☆	★				
			220416-RA	12.7	4.76	5.16	1.6		☆	☆	☆				
		WNMG	060408-RA	9.525	4.76	3.81	0.8		☆	★	★				
			060412-RA	9.525	4.76	3.81	1.2		☆	★	★				
			080408-RA	12.7	4.76	5.16	0.8		☆	☆	★				
			080412-RA	12.7	4.76	5.16	1.2		☆	☆	★				
			080416-RA	12.7	4.76	5.16	1.6		☆	☆	☆				

★ Recommended grade ☆ Optional grade

B1−5 Inserts for processing steel .... Rough machining

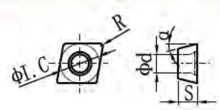
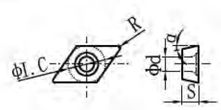
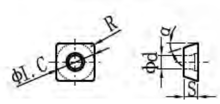
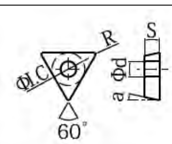
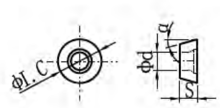
Negative inserts

The basic shape of inserts		Type		Dimension（mm）				Grade recommended							
								CVD coating grade				PVD coating grade		Uncoated grade	
				ΦI.C	S	Φd	R	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301
		CNMM	120408-RB	12.7	4.76	5.16	0.8			☆	☆				
			120412-RB	12.7	4.76	5.16	1.2			★	☆				
			120416-RB	12.7	4.76	5.16	1.6			☆	☆				
			160608-RB	15.875	6.35	6.35	0.8			☆	☆				
			160612-RB	15.875	6.35	6.35	1.2			☆	★				
			160616-RB	15.875	6.35	6.35	1.6			☆	★				
			190612-RB	19.05	6.35	7.93	1.2			☆	★				
			190616-RB	19.05	6.35	7.93	1.6			☆	★				
			190624-RB	19.05	6.35	7.93	2.4			☆	☆				
			250724-RB	25.4	7.94	9.12	2.4			☆	☆				
			250924-RB	25.4	9.52	9.12	2.4			☆	☆				
		SNMM	120408-RB	12.7	4.76	5.16	0.8			☆	☆				
			120412-RB	12.7	4.76	5.16	1.2			☆	☆				
			120416-RB	12.7	4.76	5.16	1.6			☆	☆				
			150608-RB	15.875	6.35	6.35	0.8			☆	★				
			150612-RB	15.875	6.35	6.35	1.2			☆	★				
			150616-RB	15.875	6.35	6.35	1.6			☆	☆				
			190608-RB	19.05	6.35	7.93	0.8			☆	★				
			190612-RB	19.05	6.35	7.93	1.2			☆	★				
			190616-RB	19.05	6.35	7.93	1.6			☆	★				
			190624-RB	19.05	6.35	7.93	2.4			☆	★				
			250724-RB	25.4	7.94	9.12	2.4			☆	★				
			250924-RB	25.4	9.52	9.12	2.4			☆	★				
			250932-RB	25.4	9.52	9.12	3.2			☆	☆				
		TNMM	160408-RB	9.525	4.76	3.81	0.8			★	☆				
			160412-RB	9.525	4.76	3.81	1.2			★	☆				
			220408-RB	12.7	4.76	5.16	0.8			☆	★				
			220412-RB	12.7	4.76	5.16	1.2			☆	★				
			220416-RB	12.7	4.76	5.16	1.6			☆	☆				

★ Recommended grade ☆ Optional grade

B1–5 Inserts for processing steel .... Rough machining

Positive inserts

The basic shape of inserts		Type		Dimension (mm)					Grade recommended							
									CVD coating grade				PVD coating grade		Uncoated grade	
				ΦI.C	S	Φd	R	α	BPS051	BPS101	BPS251	BPS371	BPG05B	BPG308	BN201	BN301
		CCMT	09T308-RA	9.525	3.97	4.4	0.8	7°		★	★	☆				
			120408-RA	12.7	4.76	5.5	0.8	7°		☆	★	☆				
			120412-RA	12.7	4.76	5.5	1.2	7°		☆	★	☆				
		DCMT	11T308-RA	9.525	3.97	4.4	0.8	7°		☆	★	☆				
		SCMT	120412-RA	12.7	4.76	5.5	1.2	7°		☆	★	☆				
		TCMT	16T308-RA	9.525	3.97	4.4	0.8	7°		☆	★	☆				
		RCGT	2006MOE-R4	20	6.35	6.5	-	7°		★	★	☆				
			2507MOS-HP	25	7.94	7.2	-	7°		★	★	☆				
			3209MOS-HP	32	9.525	9.5	-	7°		★	★	☆				

★ Recommended grade ☆ Optional grade

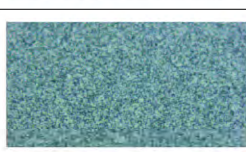
B1–6 Inserts for processing stainless steel .... Grades

M Process on stainless steel

a Grade for coating

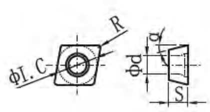
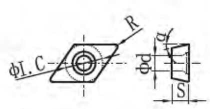
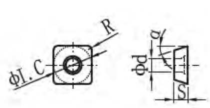
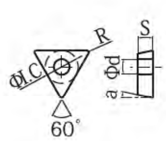
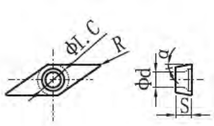
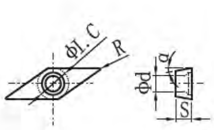
Grade	ISO classification	Surface colour	Applications Recommended
BPG05B	M10(M05-M15)	Cyan-blue gray dark	PVD coated carbide grade for milling typical hardened steel and plastic mold steel,processing hardness above HRC36.
BPG20B	M25(M10-M30)	Cyan-blue gray dark	PVD coated micro-grain carbide.Use for a variety of stainless steel finishing at medium to low cuttingspeed. When need excellent edge strength and high surface quality, provide the perfect ride cutting. A high thermal shock resistance. Suitable for light interrupted cuts.
BPG30B	M30(M25-M35)	Cyan-blue gray dark	PVD coated carbide.For austenitic stainless steels and duplex stainless steel semi-finishing to roughing at low to medium cutting speed.High thermal shock resistance. Ideal for quickly interrupted cutting.
BPG25B	M35(M30-M40)	Cyan-blue gray dark	PVD coated carbide.For austenitic stainless steels and duplex stainless steel semi-finishing to roughing at low to medium cutting speed.High thermal shock resistance. Ideal for quickly interrupted cutting.

b Cermet

	Grade	ISO classification	Density (g/cm3)	Hardness HRA	Bending strength (N/mm2)	Usage and performance
	BN201	M01~M20	6.5~7.2	>92	>1800	Suitable for the finishing ,semi-finishing of stainless steel
	BN301	M10~M30	6.1~7.2	>91	>2000	Suitable for the finishing ,semi-finishing of stainless steel

B1−6 Inserts for processing stainless steel .... Finishing

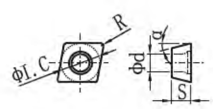
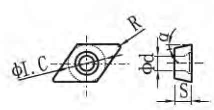
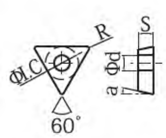
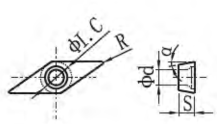
Positive inserts

The basic shape of inserts		Type		Dimension (mm)					Grade recommended									
									CVD coating grade				PVD coating grade				Uncoated grade	
				ΦI.C	S	Φd	R	α	BPS051	BPS101	BPS251	BPG371	BPG05B	BPG20B	BPG30B	BPG25B	BU810	BK10
		CCMT	060202-FW	6.35	2.38	2.8	0.2	7°					☆	★	☆			
			060204-FW	6.35	2.38	2.8	0.4	7°					☆	★	☆			
			09T302-FW	9.525	3.97	4.4	0.2	7°					☆	★	☆			
			09T304-FW	9.525	3.97	4.4	0.4	7°					☆	★	☆			
			09T308-FW	9.525	3.97	4.4	0.8	7°					☆	★	☆			
			120404-FW	12.7	4.76	5.5	0.4	7°					☆	★	☆			
		DCMT	070202-FW	6.35	2.38	2.8	0.2	7°					☆	★	☆			
			070204-FW	6.35	2.38	2.8	0.4	7°					☆	★	☆			
			11T302-FW	9.525	3.97	4.4	0.2	7°					☆	★	☆			
			11T304-FW	9.525	3.97	4.4	0.4	7°					☆	★	☆			
			11T308-FW	9.525	3.97	4.4	0.8	7°					☆	★	☆			
		SCMT	09T304-FW	9.525	3.18	4.4	0.4	7°					☆	★	☆			
			09T308-FW	9.525	3.18	4.4	0.8	7°					☆	★	☆			
			120404-FW	12.7	4.76	5.5	0.4	7°					☆	★	☆			
			120408-FW	12.7	4.76	5.5	0.8	7°					☆	★	☆			
			120412-FW	12.7	4.76	5.5	1.2	7°					☆	★	☆			
		TCMT	090202-FW	5.56	2.38	2.5	0.2	7°					☆	★	☆			
			090204-FW	5.56	2.38	2.5	0.4	7°					☆	★	☆			
			110302-FW	6.35	3.18	2.8	0.2	7°					☆	★	☆			
			110304-FW	6.35	3.18	2.8	0.4	7°					☆	★	☆			
			110308-FW	6.35	3.18	2.8	0.8	7°					☆	★	☆			
			16T304-FW	9.525	3.97	4.4	0.4	7°					☆	★	☆			
		VBMT	110302-FW	6.35	3.18	2.8	0.2	5°					☆	☆	☆			
			110304-FW	6.35	3.18	2.8	0.4	5°					☆	☆	☆			
			110308-FW	6.35	3.18	2.8	0.8	5°					☆	☆	☆			
			160402-FW	9.525	4.76	4.4	0.2	5°					☆	★	☆			
			160404-FW	9.525	4.76	4.4	0.4	5°					☆	★	☆			
			160408-FW	9.525	4.76	4.4	0.8	5°					☆	★	☆			
		VCMT	110302-FW	6.35	3.18	2.8	0.2	7°					☆	☆	☆			
			110304-FW	6.35	3.18	2.8	0.4	7°					☆	☆	☆			
			110308-FW	6.35	3.18	2.8	0.8	7°					☆	☆	☆			
			160402-FW	9.525	4.76	4.4	0.2	7°					☆	☆	☆			
			160404-FW	9.525	4.76	4.4	0.4	7°					☆	☆	☆			
			160408-FW	9.525	4.76	4.4	0.8	7°					☆	☆	☆			

★ Recommended grade ☆ Optional grade

B1-6 Inserts for processing stainless steel .... Finishing

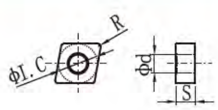
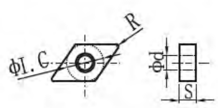
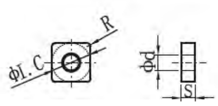
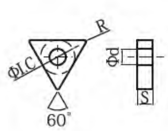
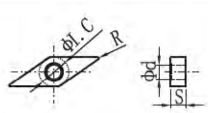
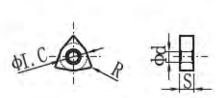
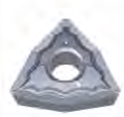
Positive inserts

The basic shape of inserts		Type		Dimension (mm)					Grade recommended									
									CVD coating grade				PVD coating grade				Uncoated grade	
				ΦI.C	S	Φd	R	α	BPS051	BPS101	BPS251	BPG371	BPG05B	BPG20B	BPG30B	BPG25B	BU810	BK10
		CCMT	060202-MX	6.35	2.38	2.8	0.2	7°					☆	☆	☆			
			060204-MX	6.35	2.38	2.8	0.4	7°					☆	★	☆			
			060208-MX	6.35	2.38	2.8	0.8	7°					☆	★	☆			
			09T302-MX	9.525	3.97	4.4	0.2	7°					☆	☆	☆			
			09T304-MX	9.525	3.97	4.4	0.4	7°					☆	★	☆			
			09T308-MX	9.525	3.97	4.4	0.8	7°					☆	★	☆			
			120404-MX	12.7	4.76	5.5	0.4	7°					☆	☆	☆			
		DCMT	070202-MV	6.35	2.38	2.8	0.2	7°					☆	☆	☆			
			070204-MV	6.35	2.38	2.8	0.4	7°					☆	★	☆			
			11T302-MV	9.525	3.97	4.4	0.2	7°					☆	☆	☆			
			11T304-MV	9.525	3.97	4.4	0.4	7°					☆	★	☆			
			11T308-MV	9.525	3.97	4.4	0.8	7°					☆	★	☆			
		TCMT	090202-MX	5.56	2.38	2.5	0.2	7°					☆	★	☆			
			090204-MX	5.56	2.38	2.5	0.4	7°					☆	★	☆			
			110302-MX	6.35	3.18	2.8	0.2	7°					☆	★	☆			
			110304-MX	6.35	3.18	2.8	0.4	7°					☆	★	☆			
			110308-MX	6.35	3.18	2.8	0.8	7°					☆	☆	☆			
			16T304-MX	9.525	3.97	4.4	0.4	7°					☆	★	☆			
			16T308-MX	9.525	3.97	4.4	0.8	7°					☆	★	☆			
		VBMT	110302-MX	6.35	3.18	2.8	0.2	5°					☆	☆	☆			
			110304-MX	6.35	3.18	2.8	0.4	5°					☆	★	☆			
			110308-MX	6.35	3.18	2.8	0.8	5°					☆	★	☆			
			160402-MX	9.525	4.76	4.4	0.2	5°					☆	☆	☆			
			160404-MX	9.525	4.76	4.4	0.4	5°					☆	★	☆			
			160408-MX	9.525	4.76	4.4	0.8	5°					☆	★	☆			

★ Recommended grade ☆ Optional grade

B1−6 Inserts for processing stainless steel .... Finishing

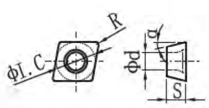
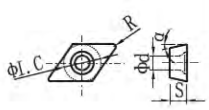
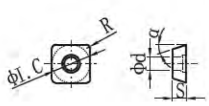
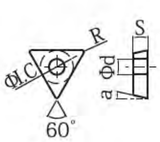
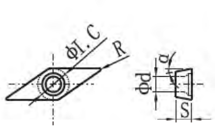
Negative inserts

The basic shape of inserts		Type		Dimension (mm)					Grade recommended									
									CVD coating grade				PVD coating grade				Uncoated grade	
				ΦI.C	S	Φd	R		BPS051	BPS101	BPS251	BPG371	BPG05B	BPG20B	BPG30B	BPG25B	BU810	BK10
		CNMG	120402E-LH	12.7	4.76	5.16	0.2						☆	☆	☆			
			120404E-LH	12.7	4.76	5.16	0.4						★	☆	☆			
			120408E-LH	12.7	4.76	5.16	0.8						★	☆	☆			
		DNMG	150404E-LH	12.7	4.76	5.16	0.4						★	☆	☆			
			150408E-LH	12.7	4.76	5.16	0.8						★	☆	☆			
			150604E-LH	12.7	6.35	5.16	0.4						★	☆	☆			
			150608E-LH	12.7	6.35	5.16	0.8						★	☆	☆			
		SNMG	120404E-LH	12.7	4.76	5.16	0.4						★	☆	☆			
			120408E-LH	12.7	4.76	5.16	0.8						★	☆	☆			
			120412E-LH	12.7	4.76	5.16	1.2						★	☆	☆			
		TNMG	160404E-LH	9.525	4.76	3.81	0.4						★	☆	☆			
			160408E-LH	9.525	4.76	3.81	0.8						★	☆	☆			
			160412E-LH	9.525	4.76	3.81	1.2						★	☆	☆			
			220408E-LH	12.7	4.76	5.16	0.8						★	☆	☆			
		VNMG	160402E-LH	9.525	4.76	3.81	0.2						☆	☆	☆			
			160404E-LH	9.525	4.76	3.81	0.4						★	☆	☆			
			160408E-LH	9.525	4.76	3.81	0.8						★	☆	☆			
		WNMG	060404E-LH	9.525	4.76	3.81	0.4						★	☆	☆			
			060408E-LH	9.525	4.76	3.81	0.8						★	☆	☆			
			080404E-LH	12.7	4.76	5.16	0.4						★	☆	☆			
			080408E-LH	12.7	4.76	5.16	0.8						★	☆	☆			
			080412E-LH	12.7	4.76	5.16	1.2						★	☆	☆			

★ Recommended grade ☆ Optional grade

B1–6 Inserts for processing stainless steel ········· Semi finishing

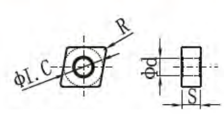
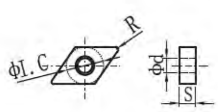
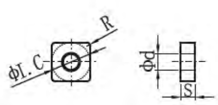
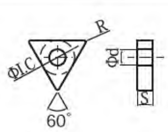
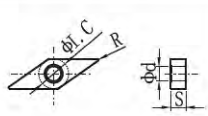
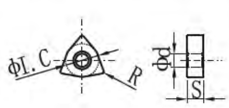
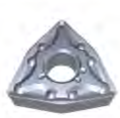
Positive inserts

The basic shape of inserts		Type		Dimension (mm)					Grade recommended									
									CVD coating grade				PVD coating grade				Uncoated grade	
				ΦI.C	S	Φd	R	α	BPS051	BPS101	BPS251	BPG371	BPG05B	BPG20B	BPG30B	BPG25B	BU810	BK10
		CCMT	060204-MD	6.35	2.38	2.8	0.4	7°					☆	★	☆			
			060208-MD	6.35	2.38	2.8	0.8	7°					☆	★	☆			
			09T302-MD	9.525	3.97	4.4	0.2	7°					☆	★	☆			
			09T304-MD	9.525	3.97	4.4	0.4	7°					☆	★	☆			
			09T308-MD	9.525	3.97	4.4	0.8	7°					☆	★	☆			
			120404-MD	12.7	4.76	5.5	0.4	7°					☆	★	☆			
			120408-MD	12.7	4.76	5.5	0.8	7°					☆	★	☆			
			120412-MD	12.7	4.76	5.5	1.2	7°					☆	★	☆			
		DCMT	070204-MD	6.35	2.38	2.8	0.4	7°					☆	★	☆			
			070208-MD	6.35	2.38	2.8	0.8	7°					☆	★	☆			
			11T302-MD	9.525	3.97	4.4	0.2	7°					☆	★	☆			
			11T304-MD	9.525	3.97	4.4	0.4	7°					☆	★	☆			
			11T308-MD	9.525	3.97	4.4	0.8	7°					☆	★	☆			
			11T312-MD	9.525	3.97	4.4	1.2	7°					☆	★	☆			
		SCMT	09T302-MD	9.525	3.97	4.4	0.2	7°					☆	★	☆			
			09T304-MD	9.525	3.97	4.4	0.4	7°					☆	★	☆			
			09T308-MD	9.525	3.97	4.4	0.8	7°					☆	★	☆			
			09T312-MD	9.525	3.97	4.4	1.2	7°					☆	★	☆			
			120404-MD	12.7	4.76	5.5	0.4	7°					☆	★	☆			
			120408-MD	12.7	4.76	5.5	0.8	7°					☆	★	☆			
			120412-MD	12.7	4.76	5.5	1.2	7°					☆	★	☆			
		TCMT	090204-MD	5.56	2.38	2.5	0.4	7°					☆	★	☆			
			090208-MD	5.56	2.38	2.5	0.8	7°					☆	★	☆			
			110304-MD	6.35	3.18	2.8	0.4	7°					☆	★	☆			
			110308-MD	6.35	3.18	2.8	0.8	7°					☆	★	☆			
			110312-MD	6.35	3.18	2.8	1.2	7°					☆	★	☆			
			16T304-MD	9.525	3.97	4.4	0.4	7°					☆	★	☆			
			16T308-MD	9.525	3.97	4.4	0.8	7°					☆	★	☆			
			16T312-MD	9.525	3.97	4.4	1.2	7°					☆	★	☆			
		VCMT	110304-MD	6.35	3.18	2.8	0.4	7°					☆	★	☆			
			110308-MD	6.35	3.18	2.8	0.8	7°					☆	★	☆			
			160404-MD	9.525	4.76	4.4	0.4	7°					☆	★	☆			
			160408-MD	9.525	4.76	4.4	0.8	7°					☆	★	☆			
		VBMT	110304-MD	6.35	3.18	2.8	0.4	5°					☆	★	☆			
			110308-MD	6.35	3.18	2.8	0.8	5°					☆	★	☆			
			160404-MD	9.525	4.76	4.4	0.4	5°					☆	★	☆			
			160408-MD	9.525	4.76	4.4	0.8	5°					☆	★	☆			

★ Recommended grade ☆ Optional grade

B1−6 Inserts for processing stainless steel .... Semi finishing

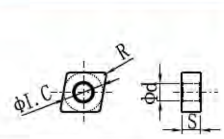
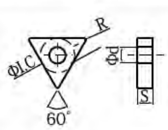
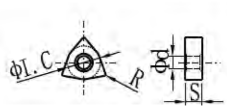
Negative inserts

The basic shape of inserts		Type		Dimension (mm)					Grade recommended									
									CVD coating grade				PVD coating grade				Uncoated grade	
				ΦI.C	S	Φd	R		BPS051	BPS101	BPS251	BPS371	BPG05B	BPG20B	BPG30B	BPG25B	BU810	BK10
		CNMG	120404-MA	12.7	4.76	5.16	0.4						☆	★	☆			
			120408-MA	12.7	4.76	5.16	0.8						☆	★	☆			
			120412-MA	12.7	4.76	5.16	1.2						☆	★	☆			
			160604-MA	15.875	6.35	6.35	0.4						☆	☆	☆			
			160608-MA	15.875	6.35	6.35	0.8						☆	★	☆			
		DNMG	150404-MA	12.7	4.76	5.16	0.4						☆	★	☆			
			150408-MA	12.7	4.76	5.16	0.8						☆	★	☆			
			150604-MA	12.7	6.35	5.16	0.4						☆	★	☆			
			150608-MA	12.7	6.35	5.16	0.8						☆	★	☆			
		SNMG	120404-MA	12.7	4.76	5.16	0.4						☆	☆	☆			
			120408-MA	12.7	4.76	5.16	0.8						☆	★	☆			
		TNMG	160404-MA	9.525	4.76	5.16	0.4						☆	★	☆			
			160408-MA	9.525	4.76	5.16	0.8						☆	★	☆			
			160412-MA	9.525	4.76	5.16	1.2						☆	★	☆			
		VNMG	160404-MA	9.525	4.76	5.16	0.4						☆	★	☆			
			160408-MA	9.525	4.76	5.16	0.8						☆	★	☆			
		WNMG	080404-MA	12.7	4.76	5.16	0.4						☆	★	☆			
			080408-MA	12.7	4.76	5.16	0.8						☆	★	☆			
			080412-MA	12.7	4.76	5.16	1.2						☆	☆	☆			

★ Recommended grade ☆ Optional grade

B1−6 Inserts for processing stainless steel ········ Finishing

Negative inserts

The basic shape of inserts		Type		Dimension (mm)					Grade recommended									
									CVD coating grade				PVD coating grade				Uncoated grade	
				ΦI.C	S	Φd	R		BPS051	BPS101	BPS251	BPG371	BPG05B	BPG20B	BPG30B	BPG25B	BU810	BK10
		CNMG	120404-SA	12.7	4.76	5.16	0.4						☆	★	☆			
			120408-SA	12.7	4.76	5.16	0.8						☆	★	☆			
			120412-SA	12.7	4.76	5.16	1.2						☆	★	☆			
		TNMG	160404-SA	12.7	4.76	5.16	0.4						☆	★	☆			
			160408-SA	12.7	4.76	5.16	0.8						☆	★	☆			
		WNMG	080404-SA	12.7	4.76	5.16	0.4						☆	★	☆			
			080408-SA	12.7	4.76	5.16	0.8						☆	★	☆			

★ Recommended grade ☆ Optional grade

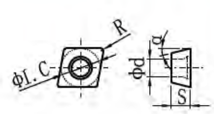
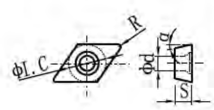
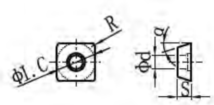
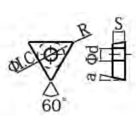
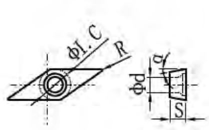
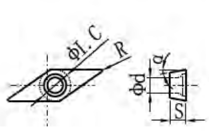
B General Turning

S Heat-resisting alloy process

Grade	ISO classification	Colour	Recommend for application
BPG118	S05-S15	Purple yellow	PVD coated carbide grade for medium-speed milling of heat resistant alloys. With good ability to avoid built-up edge and good resistance to plastic deformation capacity.
BPG218	S15(S15-S30)	Purple yellow	PVD coated carbide grade have good ability to avoid built-up edge and good resistance to plastic deformation capacity. For unstable conditions, such as long cutting edge, clogging, deep shoulder milling, long overhang, milling processes. Light milling of stainless steel; combine grinding blade for viscous and hardening materials; moderate speed milling of heat resistant alloys; hardened parts milling at low feed and medium-speed.
BPG318	S25(S20-S30)	Purple yellow	PVD coated micro-grain carbide. Can provide a sharp cutting action and excellent toughness of the cutting edge, a good anti-the grooves wear and thermal shock resistance. For carbon steel finishing at low feed rate or low cutting speed. a variety of stainless steel finishing at low to medium cutting speed, but also suitable for light interrupted cutting. Low-speed machining of heat resistant alloys, or light interrupted cuts. General short contact time processing step and high strength requirements of sharp cutting edges processing step.

B1−7 Inserts for Heat-resisting alloy ········· Finishing

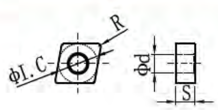
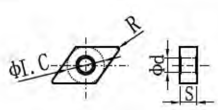
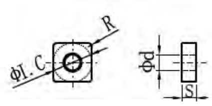
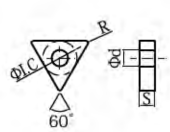
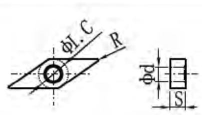
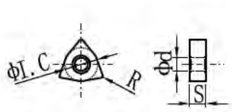
Positive inserts

The basic shape of inserts		Type		Dimension（mm）					Grade recommended									
									CVD coating grade				PVD coating grade				Uncoated grade	
				ΦI.C	S	Φd	R	α	BPS051	BPS101	BPS251	BPS371	BPG118	BPG218	BPG318	BPG40A	BU810	
		CCGT	060202-SL	6.35	2.38	2.8	0.2	7°					★	☆				
			060204-SL	6.35	2.38	2.8	0.4	7°					★	☆				
			09T302-SL	9.525	3.97	4.4	0.2	7°					★	☆				
			09T304-SL	9.525	3.97	4.4	0.4	7°					★	☆				
			09T308-SL	9.525	3.97	4.4	0.8	7°					★	☆				
			120404-SL	12.7	4.76	5.5	0.4	7°					★	☆				
			120408-SL	12.7	4.76	5.5	0.8	7°					★	☆				
		DCGT	070202-SL	6.35	2.38	2.8	0.2	7°					★	☆				
			070204-SL	6.35	2.38	2.8	0.4	7°					★	☆				
			11T302-SL	9.525	3.97	4.4	0.2	7°					★	☆				
			11T304-SL	9.525	3.97	4.4	0.4	7°					★	☆				
			11T308-SL	9.525	3.97	4.4	0.8	7°					★	☆				
		SCGT	09T304-SL	9.525	3.18	4.4	0.4	7°					★	☆				
			09T308-SL	9.525	3.18	4.4	0.8	7°					★	☆				
			120404-SL	12.7	4.76	5.5	0.4	7°					★	☆				
			120408-SL	12.7	4.76	5.5	0.8	7°					★	☆				
			120412-SL	12.7	4.76	5.5	1.2	7°					★	☆				
		TCGT	090202-SL	5.56	2.38	2.5	0.2	7°					★	☆				
			090204-SL	5.56	2.38	2.5	0.4	7°					★	☆				
			110302-SL	6.35	3.18	2.8	0.2	7°					★	☆				
			110304-SL	6.35	3.18	2.8	0.4	7°					★	☆				
			110308-SL	6.35	3.18	2.8	0.8	7°					★	☆				
			16T304-SL	9.525	3.97	4.4	0.4	7°					★	☆				
		VCGT	110302-SL	6.35	3.18	2.8	0.2	7°					★	☆				
			110304-SL	6.35	3.18	2.8	0.4	7°					★	☆				
			110308-SL	6.35	3.18	2.8	0.8	7°					★	☆				
			160402-SL	9.525	4.76	4.4	0.2	7°					★	☆				
			160404-SL	9.525	4.76	4.4	0.4	7°					★	☆				
			160408-SL	9.525	4.76	4.4	0.8	7°					★	☆				
		VBGT	110302-SL	6.35	3.18	2.8	0.2	5°					★	☆				
			110304-SL	6.35	3.18	2.8	0.4	5°					★	☆				
			110308-SL	6.35	3.18	2.8	0.8	5°					★	☆				
			160402-SL	9.525	4.76	4.4	0.2	5°					★	☆				
			160404-SL	9.525	4.76	4.4	0.4	5°					★	☆				
			160408-SL	9.525	4.76	4.4	0.8	5°					★	☆				

★ Recommended grade ☆ Optional grade

B1−7 Inserts for Heat-resisting alloy ····· Semi finishing

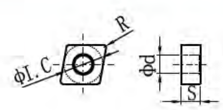
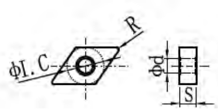
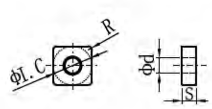
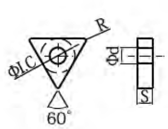
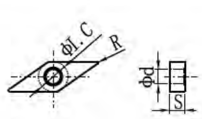
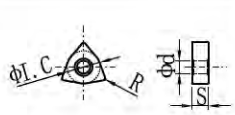
Negative inserts

The basic shape of inserts		Type		Dimension (mm)				Grade recommended								
								CVD coating grade				PVD coating grade				Uncoated grade
				ΦI.C	S	Φd	R	BPS051	BPS101	BPS251	BPG371	BPG118	BPG218	BPG318	BPG40A	BU810
		CNGG	120402E-LHC	12.7	4.76	5.16	0.2					★	☆	☆		
			120404E-LHC	12.7	4.76	5.16	0.4					★	☆	☆		
			120408E-LHC	12.7	4.76	5.16	0.8					★	☆	☆		
		DNGG	150404E-LHC	12.7	4.76	5.16	0.4					★	☆	☆		
			150408E-LHC	12.7	4.76	5.16	0.8					★	☆	☆		
			150604E-LHC	12.7	6.35	5.16	0.4					★	☆	☆		
			150608E-LHC	12.7	6.35	5.16	0.8					★	☆	☆		
		SNGG	120404E-LHC	12.7	4.76	5.16	0.4					★	☆	☆		
			120408E-LHC	12.7	4.76	5.16	0.8					★	☆	☆		
			120412E-LHC	12.7	4.76	5.16	1.2					★	☆	☆		
		TNGG	160404E-LHC	9.525	4.76	3.81	0.4					★	☆	☆		
			160408E-LHC	9.525	4.76	3.81	0.8					★	☆	☆		
			160412E-LHC	9.525	4.76	3.81	1.2					★	☆	☆		
			220408E-LHC	12.7	4.76	5.16	0.8					★	☆	☆		
		VNGG	160401E-LHC	9.525	4.76	3.81	0.1					★	☆	☆		
			160402E-LHC	9.525	4.76	3.81	0.2					★	☆	☆		
			160404E-LHC	9.525	4.76	3.81	0.4					★	☆	☆		
			160408E-LHC	9.525	4.76	3.81	0.8					★	☆	☆		
		WNGG	060404E-LHC	9.525	4.76	3.81	0.4					★	☆	☆		
			060408E-LHC	9.525	4.76	3.81	0.8					★	☆	☆		
			080404E-LHC	12.7	4.76	5.16	0.4					★	☆	☆		
			080408E-LHC	12.7	4.76	5.16	0.8					★	☆	☆		
			080412E-LHC	12.7	4.76	5.16	1.2					★	☆	☆		

★ Recommended grade ☆ Optional grade

B1−7 Inserts for Heat-resisting alloy · Rough machining

Negative inserts

The basic shape of inserts		Type		Dimension（mm）				Grade recommended									
								CVD coating grade				PVD coating grade				Uncoated grade	
				ΦI.C	S	Φd	R	BPS051	BPS101	BPS251	BPG371	BPG118	BPG218	BPG318	BPG40A	BU810	
		CNMG	120408-SN	12.7	4.76	5.16	0.8					☆	★	☆			
			120412-SN	12.7	4.76	5.16	1.2					☆	☆	☆			
			160608-SN	15.875	6.35	6.35	0.8					☆	☆	☆			
			160612-SN	15.875	6.35	6.35	1.2					☆	☆	☆			
			190608-SN	19.05	6.35	7.93	0.8					☆	☆	☆			
			190612-SN	19.05	6.35	7.93	1.2					☆	☆	☆			
		DNMG	110408-SN	9.525	4.76	3.81	0.8					☆	★	☆			
			110412-SN	9.525	4.76	3.81	1.2					☆	☆	☆			
			150408-SN	12.7	4.76	5.16	0.8					☆	☆	☆			
			150412-SN	12.7	4.76	5.16	1.2					☆	☆	☆			
			150608-SN	12.7	6.35	5.16	0.8					☆	☆	☆			
			150612-SN	12.7	6.35	5.16	1.2					☆	☆	☆			
		SNMG	120408-SN	12.7	4.76	5.16	0.8					☆	☆	☆			
			120412-SN	12.7	4.76	5.16	1.2					☆	☆	☆			
			150612-SN	15.875	6.35	6.35	1.2					☆	☆	☆			
		TNMG	160408-SN	9.525	4.76	3.81	0.8					☆	★	☆			
			160412-SN	9.525	4.76	3.81	1.2					☆	☆	☆			
			220404-SN	12.7	4.76	5.16	0.4					☆	☆	☆			
			220408-SN	12.7	4.76	5.16	0.8					☆	☆	☆			
			220412-SN	12.7	4.76	5.16	1.2					☆	☆	☆			
		VNMG	160408-SN	9.525	4.76	3.81	0.8					☆	☆	☆			
			160412-SN	9.525	4.76	3.81	1.2					☆	☆	☆			
		WNMG	060408-SN	9.525	4.76	3.81	0.8					☆	★	☆			
			060412-SN	9.525	4.76	3.81	1.2					☆	☆	☆			
			080408-SN	12.7	4.76	5.16	0.8					☆	☆	☆			
			080412-SN	12.7	4.76	5.16	1.2					☆	☆	☆			

★ Recommended grade　　☆ Optional grade

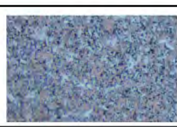
B1–8 Aluminum processing

N Aluminum processing

a Grade for coating

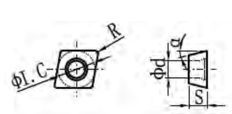
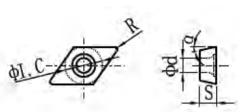
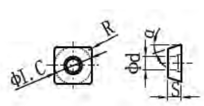
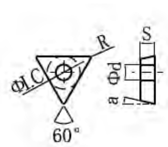
Grade	ISO classification	Surface colour	Applications Recommended
BPU109	N10(N01-N15)	DLC colour	Diamond coating grade, the coating can reduce BUE,obtain higher surface quality. Suitable for aluminum, magnesium, copper, brass, plastic finishing to roughing processing.

b Grade for uncoating

	Grade	ISO classification	Density (g/cm3)	Hardness HRA	Bending strength (N/mm2)	Application and performance
	BU810	K05~K15	14.7~15	92.8-93.1	2700	Sub-micron grain, suitable for the continuous and interrupted finishing of non-ferrous metal
	BK10	K10~K20	14.8~15	91.5~92.5	2000	High wear resistance, the use of high strength, suitable for machining of chilled alloy cast iron and steel, and ordinary cast iron processing.

B1−8 Aluminum processing ······ High precision series

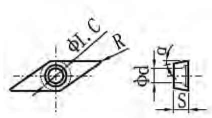
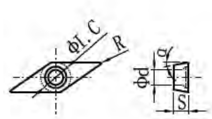
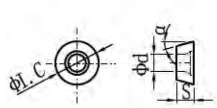
Positive inserts

The basic shape of inserts		Type		Dimension (mm)					Grade recommended					
									PVD coating grade			Uncoated grade		
				ΦI.C	S	Φd	R	α	BPG05B	BPG308	BPU109	BU810	BK20UF	BK10
		CCGT	060202-LHC	6.35	2.38	2.8	0.2	7°			☆	★		
			060204-LHC	6.35	2.38	2.8	0.4	7°			☆	★		
			060208-LHC	6.35	2.38	2.8	0.8	7°			☆	☆		
			09T302-LHC	9.525	3.97	4.4	0.2	7°			☆	★		
			09T304-LHC	9.525	3.97	4.4	0.4	7°			☆	★		
			09T308-LHC	9.525	3.97	4.4	0.8	7°			☆	★		
			120402-LHC	12.7	4.76	5.5	0.2	7°			☆	☆		
			120404-LHC	12.7	4.76	5.5	0.4	7°			☆	★		
			120408-LHC	12.7	4.76	5.5	0.8	7°			☆	★		
		DCGT	070202-LHC	6.35	2.38	2.8	0.2	7°			☆	★		
			070204-LHC	6.35	2.38	2.8	0.4	7°			☆	★		
			070208-LHC	6.35	2.38	2.8	0.8	7°			☆	☆		
			11T302-LHC	9.525	3.97	4.4	0.2	7°			☆	★		
			11T304-LHC	9.525	3.97	4.4	0.4	7°			☆	★		
			11T308-LHC	9.525	3.97	4.4	0.8	7°			☆	★		
			11T312-LHC	9.525	3.97	4.4	1.2	7°			☆	☆		
		SCGT	09T302-LHC	9.525	3.97	4.4	0.2	7°			☆	★		
			09T304-LHC	9.525	3.97	4.4	0.4	7°			☆	★		
			09T308-LHC	9.525	3.97	4.4	0.8	7°			☆	★		
			120402-LHC	12.7	4.76	5.5	0.2	7°			☆	☆		
			120404-LHC	12.7	4.76	5.5	0.4	7°			☆	★		
			120408-LHC	12.7	4.76	5.5	0.8	7°			☆	★		
			120412-LHC	12.7	4.76	5.5	1.2	7°			☆	★		
			120416-LHC	12.7	4.76	5.5	1.6	7°			☆	☆		
		TCGT	090202-LHC	5.56	2.38	2.5	0.2	7°			☆	★		
			090204-LHC	5.56	2.38	2.5	0.4	7°			☆	★		
			090208-LHC	5.56	2.38	2.5	0.8	7°			☆	☆		
			110202-LHC	6.35	2.38	2.8	0.2	7°			☆	★		
			110204-LHC	6.35	2.38	2.8	0.4	7°			☆	★		
			110208-LHC	6.35	2.38	2.8	0.8	7°			☆	☆		
			16T302-LHC	9.525	3.97	4.4	0.2	7°			☆	★		
			16T304-LHC	9.525	3.97	4.4	0.4	7°			☆	★		
			16T308-LHC	9.525	3.97	4.4	0.8	7°			☆	★		
			16T312-LHC	9.525	3.97	4.4	1.2	7°			☆	☆		

★ Recommended grade ☆ Optional grade

B1−8 Aluminum processing ······ High precision series

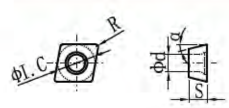
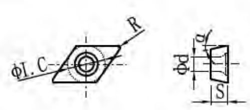
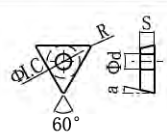
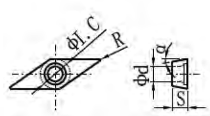
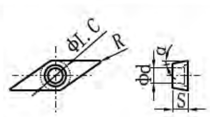
Positive inserts

The basic shape of inserts		Type		Dimension (mm)					Grade recommended					
									PVD coating grade			Uncoated grade		
				ΦI.C	S	Φd	R	α	BPG05B	BPG308	BPU109	BU810	BK20UF	BK10
		VBGT	110302-LHC	6.35	3.18	2.8	0.2	5°			☆	★		
			110304-LHC	6.35	3.18	2.8	0.4	5°			☆	★		
			110308-LHC	6.35	3.18	2.8	0.8	5°			☆	★		
			160402-LHC	9.525	4.76	4.4	0.2	5°			☆	★		
			160404-LHC	9.525	4.76	4.4	0.4	5°			☆	★		
			160408-LHC	9.525	4.76	4.4	0.8	5°			☆	★		
			160412-LHC	9.525	4.76	4.4	1.2	5°			☆	★		
			220516-LHC	12.7	5.96	5.5	1.6	5°			☆	☆		
			220525-LHC	12.7	5.96	5.5	2.5	5°			☆	☆		
			220530-LHC	12.7	5.96	5.5	3	5°			☆	☆		
		VCGT	110302-LHC	6.35	3.18	2.8	0.2	7°			☆	★		
			110304-LHC	6.35	3.18	2.8	0.4	7°			☆	★		
			110308-LHC	6.35	3.18	2.8	0.8	7°			☆	★		
			130302-LHC	7.86	3.18	3.4	0.2	7°			☆	☆		
			130304-LHC	7.86	3.18	3.4	0.4	7°			☆	☆		
			160402-LHC	9.525	4.76	4.4	0.2	7°			☆	★		
			160404-LHC	9.525	4.76	4.4	0.4	7°			☆	★		
			160408-LHC	9.525	4.76	4.4	0.8	7°			☆	★		
			160412-LHC	9.525	4.76	4.4	1.2	7°			☆	★		
			220520-LHC	12.7	5.96	5.5	2	7°			☆	☆		
			220530-LHC	12.7	5.96	5.5	3	7°			☆	☆		
		RCGT	0602MO-LHC	6	2.38	2.5	-	7°			☆	☆		
			0803MO-LHC	8	3.18	3.4	-	7°			☆	★		
			1003MO-LHC	10	3.18	4.4	-	7°			☆	★		
			10T3MO-LHC	10	3.97	4.4	-	7°			☆	★		
			1204MO-LHC	12	4.76	5.5	-	7°			☆	★		

★ Recommended grade ☆ Optional grade

B1−8 Aluminum processing ………… High precision series

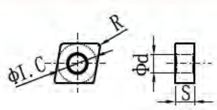
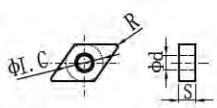
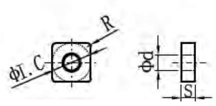
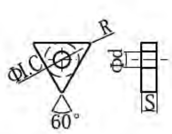
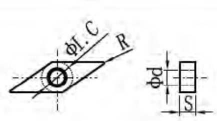
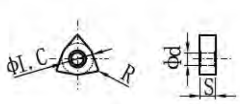
Positive inserts

The basic shape of inserts		Type		Dimension (mm) ΦI.C	S	Φd	R	α	Grade recommended: PVD coating grade BPG05B	BPG308	BPU109	Uncoated grade BU810	BK20UF	BK10
		CCGT	09T302-LH2C	9.525	3.97	4.4	0.2	7°			☆	☆		
			09T304-LH2C	9.525	3.97	4.4	0.4	7°			☆	☆		
		DCGT	11T302-LH2C	9.525	3.97	4.4	0.2	7°			☆	★		
			11T304-LH2C	9.525	3.97	4.4	0.4	7°			☆	★		
			11T308-LH2C	9.525	3.97	4.4	0.8	7°			☆	★		
		TCGT	16T304-LH2C	9.525	3.97	4.4	0.4	7°			☆	★		
			16T308-LH2C	9.525	3.97	4.4	0.8	7°			☆	★		
		VCGT	160404-LH2C	9.525	4.76	4.4	0.4	7°			☆	★		
			160408-LH2C	9.525	4.76	4.4	0.8	7°			☆	★		
			220530-LH2C	12.7	5.96	5.5	3	7°			☆	★		
		VPGT	220530-LH2C	12.7	5.96	5.5	3	11°			☆	★		

★ Recommended grade ☆ Optional grade

B1−8 Aluminum processing ······ High precision series

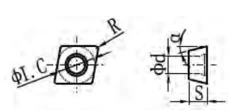
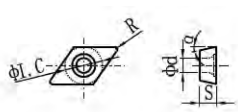
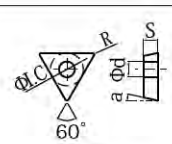
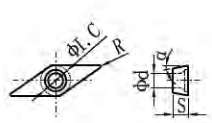
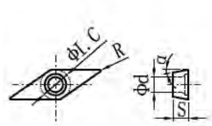
Negative inserts

The basic shape of inserts		Type		Dimension (mm)				Grade recommended					
								PVD coating grade			Uncoated grade		
				ΦI.C	S	Φd	R	BPG05B	BPG308	BPU109	BU810	BK20UF	BK10
		CNGG	120402-LHC	12.7	4.76	5.16	0.2			☆	★		
			120404-LHC	12.7	4.76	5.16	0.4			☆	★		
			120408-LHC	12.7	4.76	5.16	0.8			☆	★		
			120412-LHC	12.7	4.76	5.16	1.2			☆	☆		
		DNGG	150404-LHC	12.7	4.76	5.16	0.4			☆	★		
			150408-LHC	12.7	4.76	5.16	0.8			☆	★		
			150604-LHC	12.7	6.35	5.16	0.4			☆	★		
			150608-LHC	12.7	6.35	5.16	0.8			☆	★		
		SNGG	120404-LHC	12.7	4.76	5.16	0.4			☆	★		
			120408-LHC	12.7	4.76	5.16	0.8			☆	★		
			120412-LHC	12.7	4.76	5.16	1.2			☆	☆		
		TNGG	160404-LHC	9.525	4.76	3.81	0.4			☆	★		
			160408-LHC	9.525	4.76	3.81	0.8			☆	★		
			160412-LHC	9.525	4.76	3.81	1.2			☆	☆		
			220408-LHC	12.7	4.76	5.16	0.8			☆	★		
			220412-LHC	12.7	4.76	5.16	1.2			☆	☆		
		VNGG	160401-LHC	9.525	4.76	3.81	0.1			☆	☆		
			160402-LHC	9.525	4.76	3.81	0.2			☆	☆		
			160404-LHC	9.525	4.76	3.81	0.4			☆	★		
			160408-LHC	9.525	4.76	3.81	0.8			☆	★		
		WNGG	060404-LHC	9.525	4.76	3.81	0.4			☆	★		
			060408-LHC	9.525	4.76	3.81	0.8			☆	★		
			080404-LHC	12.7	4.76	5.16	0.4			☆	★		
			080408-LHC	12.7	4.76	5.16	0.8			☆	★		
			080412-LHC	12.7	4.76	5.16	1.2			☆	☆		

★ Recommended grade ☆ Optional grade

B1-8 Aluminum processing

Positive inserts

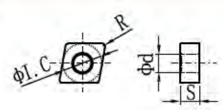
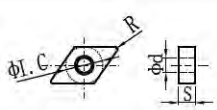
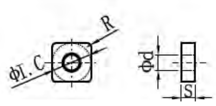
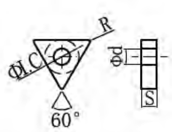
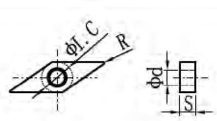
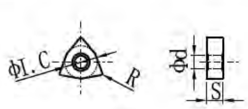
The basic shape of inserts		Type		Dimension (mm)					Grade recommended					
									PVD coating grade			Uncoated grade		
				ΦI.C	S	Φd	R	α	BPG05B	BPG308	BPU109	BU810	BK20UF	BK10
		CCGT	060202-LH	6.35	2.38	2.8	0.2	7°			☆	★		
			060204-LH	6.35	2.38	2.8	0.4	7°			☆	★		
			060208-LH	6.35	2.38	2.8	0.8	7°			☆	☆		
			09T302-LH	9.525	3.97	4.4	0.2	7°			☆	★		
			09T304-LH	9.525	3.97	4.4	0.4	7°			☆	★		
			09T308-LH	9.525	3.97	4.4	0.8	7°			☆	★		
			120402-LH	12.7	4.76	5.5	0.2	7°			☆	☆		
			120404-LH	12.7	4.76	5.5	0.4	7°			☆	★		
			120408-LH	12.7	4.76	5.5	0.8	7°			☆	★		
		DCGT	070202-LH	6.35	2.38	2.8	0.2	7°			☆	★		
			070204-LH	6.35	2.38	2.8	0.4	7°			☆	★		
			070208-LH	6.35	2.38	2.8	0.8	7°			☆	☆		
			11T302-LH	9.525	3.97	4.4	0.2	7°			☆	★		
			11T304-LH	9.525	3.97	4.4	0.4	7°			☆	★		
			11T308-LH	9.525	3.97	4.4	0.8	7°			☆	★		
			11T312-LH	9.525	3.97	4.4	1.2	7°			☆	☆		
		TCGT	090202-LH	5.56	2.38	2.5	0.2	7°			☆	★		
			090204-LH	5.56	2.38	2.5	0.4	7°			☆	★		
			090208-LH	5.56	2.38	2.5	0.8	7°			☆	☆		
		VCGT	110302-LH	6.35	3.18	2.8	0.2	7°			☆	★		
			110304-LH	6.35	3.18	2.8	0.4	7°			☆	★		
			110308-LH	6.35	3.18	2.8	0.8	7°			☆	★		
			130302-LH	7.86	3.18	3.4	0.2	7°			☆	☆		
			130304-LH	7.86	3.18	3.4	0.4	7°			☆	☆		
			160402-LH	9.525	4.76	4.4	0.2	7°			☆	★		
			160404-LH	9.525	4.76	4.4	0.4	7°			☆	★		
			160408-LH	9.525	4.76	4.4	0.8	7°			☆	★		
		VBGT	110302-LH	6.35	3.18	2.8	0.2	5°			☆	★		
			110304-LH	6.35	3.18	2.8	0.4	5°			☆	★		
			110308-LH	6.35	3.18	2.8	0.8	5°			☆	★		
			160402-LH	9.525	4.76	4.4	0.2	5°			☆	★		
			160404-LH	9.525	4.76	4.4	0.4	5°			☆	★		
			160408-LH	9.525	4.76	4.4	0.8	5°			☆	★		

★ Recommended grade ☆ Optional grade

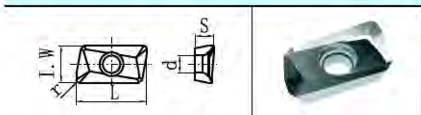
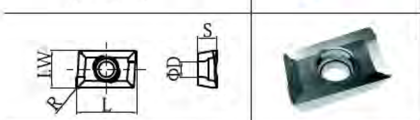
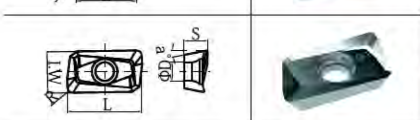
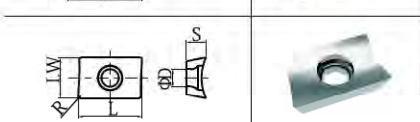
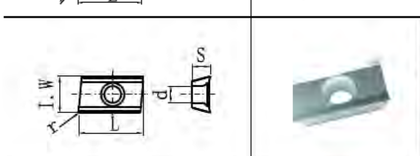
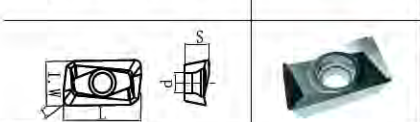
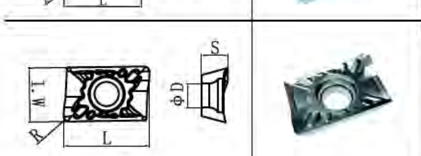
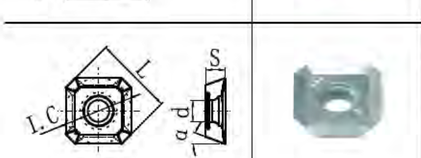
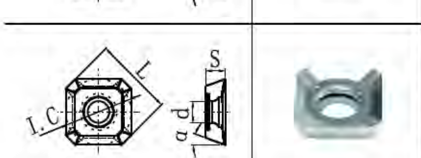
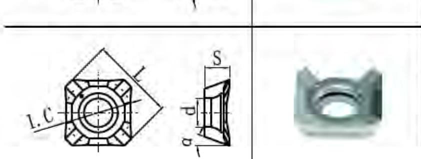
B General Turning

B1−8 Aluminum processing .... Ordinary Precision Series

Negative inserts

The basic shape of inserts		Type		Dimension (mm)				Grade recommended					
								PVD coating grade			Uncoated grade		
				ΦI.C	S	Φd	R	BPG05B	BPG308	BPU109	BU810	BK20UF	BK10
		CNMG	120402-LH	12.7	4.76	5.16	0.2			☆	★		
			120404-LH	12.7	4.76	5.16	0.4			☆	★		
			120408-LH	12.7	4.76	5.16	0.8			☆	★		
			120412-LH	12.7	4.76	5.16	1.2			☆	★		
		DNMG	150404-LH	12.7	4.76	5.16	0.4			☆	★		
			150408-LH	12.7	4.76	5.16	0.8			☆	★		
			150604-LH	12.7	6.35	5.16	0.4			☆	★		
			150608-LH	12.7	6.35	5.16	0.8			☆	★		
		SNMG	120404-LH	12.7	4.76	5.16	0.4			☆	★		
			120408-LH	12.7	4.76	5.16	0.8			☆	★		
			120412-LH	12.7	4.76	5.16	1.2			☆	★		
		TNMG	160404-LH	9.525	4.76	3.81	0.4			☆	★		
			160408-LH	9.525	4.76	3.81	0.8			☆	★		
			160412-LH	9.525	4.76	3.81	1.2			☆	★		
			220408-LH	12.7	4.76	5.16	0.8			☆	★		
			220412-LH	12.7	4.76	5.16	1.2			☆	☆		
		VNMG	160404-LH	9.525	4.76	3.81	0.4			☆	★		
			160408-LH	9.525	4.76	3.81	0.8			☆	★		
		WNMG	060404-LH	9.525	4.76	3.81	0.4			☆	★		
			060408-LH	9.525	4.76	3.81	0.8			☆	★		
			080404-LH	12.7	4.76	5.16	0.4			☆	★		
			080408-LH	12.7	4.76	5.16	0.8			☆	★		
			080412-LH	12.7	4.76	5.16	1.2			☆	★		

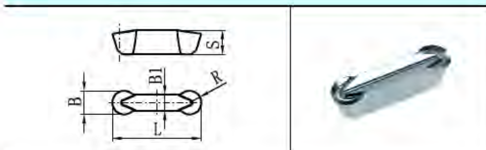
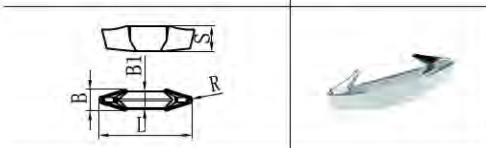
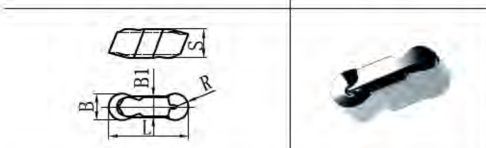
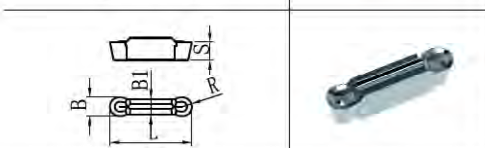
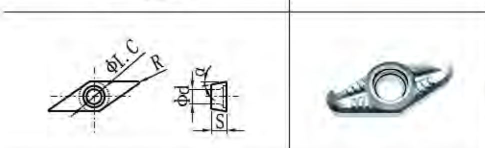
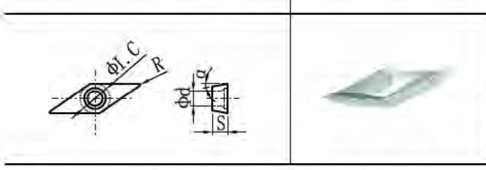
★ Recommended grade ☆ Optional grade

Insert shape	Type	Dimension（mm）						Material recommended												
								CVD coating grade		PVD coating grade						Uncoating grade				
		I.W	L	S	Φd	r		BPS153	BPS253	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30A	BP20	BP35	BK10	BU810	BU820
	APKT11T304-LHC	6.5	12.24	3.6	2.8	0.4					☆		☆		☆				★	
	APKT11T308-LHC	6.5	12.24	3.6	2.8	0.8					☆		☆		☆				★	
	APKT1035PDER-LH	6.7	11	3.5	2.8	0.4					☆		☆		☆				★	
	APKT1135PDFR-G2C	6.2	11.3	3.5	2.8	0.8					☆		☆		☆				★	
	APKT1604PDFR-G2C	9.26	17	4.76	4.4	0.8					☆		☆		☆				★	
	APEX100304FR-LHC	6.6	10.3	3.18	2.8	0.4					☆		☆		☆				★	
	APKT160402FR-LHC	9.8	16.88	4.76	4.4	0.2					☆		☆		☆				★	
	APKT160404PDFR-LHC	9.8	16.88	4.76	4.4	0.4					☆		☆		☆				★	
	APKT160408FR-LHC	9.8	16.88	4.76	4.4	0.8					☆		☆		☆				★	
	APKT160416FR-LHC	9.8	16.88	4.76	4.4	1.6					☆		☆		☆				★	
	APKT16T4PDFR-LH1C	9.5	17	4.96	4.4	0.8					☆		☆		☆				★	
	APKT1652PDFR-LH2C	9.8	16.88	4.76	4.4	3.2					☆		☆		☆				★	
	LDHT1504PDFR-LHC	9.9	15.2	4.76	4.4	0.8					☆		☆		☆				★	
					α	L														
	SEKT13T3AEFN-LH	13.4	3.97	4.4	20°						☆		☆		☆				★	
	SEKT13T3AEFN-LHC	13.4	3.97	4.4	20°						☆		☆		☆				★	
	SDKT0903AEFN-LH	9.525	3.18	3.4	15°						☆		☆		☆				★	
	SDKT0903AEFN-LH1	9.525	3.18	3.4	15°						☆		☆		☆				★	
	SDKT0903AEFN-LHC	9.525	3.18	3.4	15°						☆		☆		☆				★	
	SDKT0903AEFN-LH1C	9.525	3.18	3.4	15°						☆		☆		☆				★	
	SEKT1204AFFN-LH2	12.7	4.76	5.5	20°	16					☆		☆		☆				★	
	SDHT1204AEFN-LH2	12.7	4.76	5.5	15°	15.76					☆		☆		☆				★	
	SEKT1204AFFN-LH2C	12.7	4.76	5.5	20°	16					☆		☆		☆				★	
	SDHT1204AEFN-LH2C	12.7	4.76	5.5	15°	15.76					☆		☆		☆				★	

★ Recommended grade ☆ Optional grade

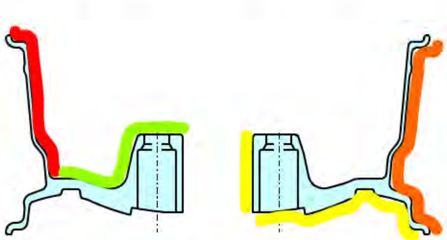
B General Turning

B1−8 Inserts For Wheel Turning .... High precision series

The basic shape of inserts		Type		Dimension（mm）					Grade recommended						
									PVD coating grade			Uncoated grade			
				L	R	B1	S	R	BPG05B	BPG308	BPU109	BK10	BU810	BK20UF	BK10
		GDMA840-LHC		30	8	5.6	8.2	4			☆	☆	★		
		GIPATYZ-35V-1.2-LHC		30	7.2	6	8.2	1.2			☆	☆	★		
		GIP600E-3.00-LHC		18	6	4.8	6.5	3			☆	☆	★		
		MRGN	400-A-LHC	21	4	3.3	4.8	2			☆	☆	☆		
			500-A-LHC	26	5	4.1	5.8	2.5			☆	☆	☆		
			600-A-LHC	26	6	5	5.8	3			☆	☆	★		
			800-A-LHC	31	8	6	6.5	4			☆	☆	☆		
		VCGT	160412-LHC	9.525	4.76	4.4	1.2	7°			☆	☆	★		
			220520-LHC	12.7	5.96	5.5	2	7°			☆	☆	★		
			220530-LHC	12.7	5.96	5.5	3	7°			☆	☆	★		
		VPGT	220612-LH2C	12.7	6.35	5.5	1.2	7°			☆	☆	★		
			220530-LH2C	12.7	5.96	5.5	3	7°			☆	☆	★		

★ Recommended grade ☆ Optional grade

B1−8 Aluminum wheel-hub processing solution .... High precision series



VCGT220530−LHC VPGT220612−LH2C VCGT160412−LH2C

GIPATYZ-35V-1.2-LHC VCGT160412−LHC

GDMA840E-LHC VCGT160412−LH2C

GDMA840E-LHC GIP600E-3.00-LHC VCGT160412−LH2C

Provide complete solutions and technical services

For details, please consult your local sales manager.

K Process on cast iron

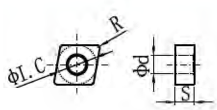
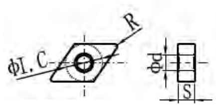
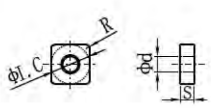
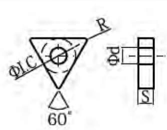
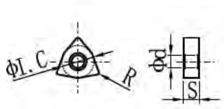
a Grade for coating

Grade	ISO classification	Colour	Recommend for application
BPC042	K05(K01-K05)	Black	CVD coated carbide is extremely hard substrate and extremely thick, smooth, wear-resistant coating. Recommended for nodular cast iron high-speed turning.
BPC052	K10(K05-K15)	Black	CVD coated carbide is extremely hard substrate and extremely thick, smooth, wear-resistant coating. Recommended for nodular cast iron high-speed turning.
BPC102	K15(K10-K25)	Black	CVD-coated cemented carbide, the hard substrate coated with a smooth and wear-resistant coating, can bear harsh intermittent cutting conditions. Universal grade for all cast iron roughing cutting at low to medium speed.
BPS101	K15(K10-K25)	Black/yellow	CVD-coated cemented carbide grades, thick abrasion resistant coating on the high intensity gradient sintered base.Machining of gray and ductile iron at low to medium cutting speed. Security in wet and dry machining.

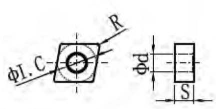
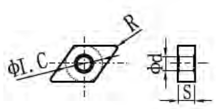
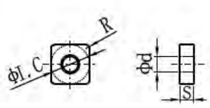
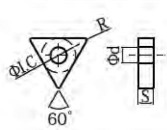
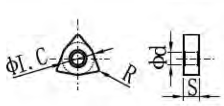
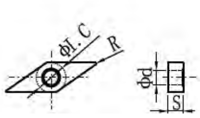
b Grade for uncoating

Grade	ISO classification	Density (g/cm3)	Bending strength (N/mm2)	Hardness HRA	Applications Recommended
YG6	K15~K20	14.85~15.05	2050	90.5~91.5	High wear resistance, good resistance to shock and vibration. Application of cast iron, non-ferrous metals and alloys, non-metallic materials medium cutting speed for semi-finishing and finishing.
YG8	K30	14.6~14.85	2520	89.5~90.5	The use of high strength, impact resistance, good shock resistance, but wear resistance and allows the cutting speed is low. For cast iron, non-ferrous metals and alloys, non-metallic materials low speed roughing.
BK10	K10~K20	14.8~15	2000	91.5~92.5	High wear resistance, the use of high strength, suitable for machining of chilled alloy cast iron and steel, and ordinary cast iron processing.

B1−7 Inserts for processing cast iron ································ Finishing

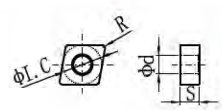
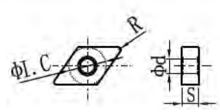
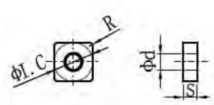
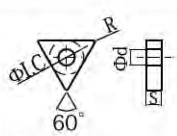
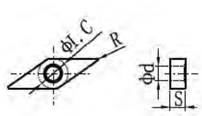
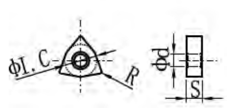
The basic shape of inserts		Type		Dimension（mm）				Grade recommended						
								CVD coating grade					Uncoated grade	
				ΦI.C	S	Φd	R	BPC042	BPC052	BPC102	BPS051	BPS101	BU810	BU820
		CNMG	120404-CX	12.7	4.76	5.16	0.4		☆	☆				
			120408-CX	12.7	4.76	5.16	0.8		☆	★				
			120412-CX	12.7	4.76	5.16	1.2		☆	★				
			160604-CX	15.875	6.35	6.35	0.4		☆	☆				
			160608-CX	15.875	6.35	6.35	0.8		☆	☆				
			160612-CX	15.875	6.35	6.35	1.2		☆	☆				
		DNMG	110404-CX	9.525	4.76	3.81	0.4		☆	☆				
			110408-CX	9.525	4.76	3.81	0.8		☆	☆				
			150404-CX	12.7	4.76	5.16	0.4		☆	☆				
			150408-CX	12.7	4.76	5.16	0.8		☆	★				
			150412-CX	12.7	4.76	5.16	1.2		☆	★				
			150604-CX	12.7	6.35	5.16	0.4		☆	☆				
			150608-CX	12.7	6.35	5.16	0.8		☆	★				
			150612-CX	12.7	6.35	5.16	1.2		☆	★				
		SNMG	090304-CX	9.525	3.18	3.81	0.4		☆	☆				
			090308-CX	9.525	3.18	3.81	0.8		☆	☆				
			120404-CX	12.7	4.76	5.16	0.4		☆	☆				
			120408-CX	12.7	4.76	5.16	0.8		☆	★				
			120412-CX	12.7	4.76	5.16	1.2		☆	☆				
			150608-CX	15.875	6.35	6.35	0.8		☆	☆				
			150612-CX	15.875	6.35	6.35	1.2		☆	☆				
		TNMG	160404-CX	9.525	4.76	3.81	0.4		☆	★				
			160408-CX	9.525	4.76	3.81	0.8		☆	★				
			160412-CX	9.525	4.76	3.81	1.2		☆	★				
		WNMG	060404-CX	9.525	4.76	5.16	0.4		☆	★				
			060408-CX	9.525	4.76	5.16	0.8		☆	★				
			080404-CX	12.7	4.76	5.16	0.4		☆	★				
			080408-CX	12.7	4.76	5.16	0.8		☆	★				
			080412-CX	12.7	4.76	5.16	1.2		☆	★				

★ Recommended grade ☆ Optional grade

The basic shape of inserts		Type		Dimension (mm)				Grade recommended						
								CVD coating grade					Uncoated grade	
				ΦI.C	S	Φd	R	BPC042	BPC052	BPC102	BPS051	BPS101	BU810	BU820
		CNMG	120404-CQ	12.7	4.76	5.16	0.4		☆	★				
			120408-CQ	12.7	4.76	5.16	0.8		☆	★				
			120412-CQ	12.7	4.76	5.16	1.2		☆	★				
			120416-CQ	12.7	4.76	5.16	1.6		☆	★				
			160608-CQ	15.875	6.35	6.35	0.8		☆	☆				
			160612-CQ	15.875	6.35	6.35	1.2		☆	☆				
			160616-CQ	15.875	6.35	6.35	1.6		☆	☆				
		DNMG	110408-CQ	9.525	4.76	3.81	0.8		☆	★				
			110412-CQ	9.525	4.76	3.81	1.2		☆	☆				
			150404-CQ	12.7	4.76	5.16	0.4		☆	★				
			150408-CQ	12.7	4.76	5.16	0.8		☆	★				
			150412-CQ	12.7	4.76	5.16	1.2		☆	★				
			150604-CQ	12.7	6.35	5.16	0.4		☆	★				
			150608-CQ	12.7	6.35	5.16	0.8		☆	★				
			150612-CQ	12.7	6.35	5.16	1.2		☆	★				
		SNMG	120408-CQ	12.7	4.76	5.16	0.8		☆	★				
			120412-CQ	12.7	4.76	5.16	1.2		☆	☆				
			120416-CQ	12.7	4.76	5.16	1.6		☆	☆				
			150612-CQ	15.875	6.35	6.35	1.2		☆	☆				
			150616-CQ	15.875	6.35	6.35	1.6		☆	☆				
		TNMG	160408-CQ	9.525	4.76	3.81	0.8		☆	★				
			160412-CQ	9.525	4.76	3.81	1.2		☆	★				
			220408-CQ	12.7	4.76	5.16	0.8		☆	☆				
			220412-CQ	12.7	4.76	5.16	1.2		☆	☆				
		WNMG	060404-CQ	9.525	4.76	3.81	0.4		☆	★				
			060408-CQ	9.525	4.76	3.81	0.8		☆	★				
			060412-CQ	9.525	4.76	3.81	1.2		☆	★				
			080404-CQ	12.7	4.76	5.16	0.4		☆	★				
			080408-CQ	12.7	4.76	5.16	0.8		☆	★				
			080412-CQ	12.7	4.76	5.16	1.2		☆	☆				
			080416-CQ	12.7	4.76	5.16	1.6		☆	☆				
		VNMG	160404-CQ	9.525	4.76	3.81	0.4		☆	☆				
			160408-CQ	9.525	4.76	3.81	0.8		☆	★				
			160412-CQ	9.525	4.76	3.81	1.2		☆	☆				

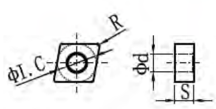
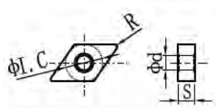
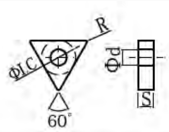
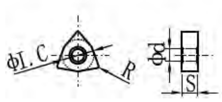
★ Recommended grade ☆ Optional grade

B1–7 Inserts for processing cast iron — Semi finishing

The basic shape of inserts		Type		Dimension（mm）				Grade recommended						
								CVD coating grade					Uncoated grade	
				ΦI.C	S	Φd	R	BPC042	BPC052	BPC102	BPS051	BPS101	BU810	BU820
		CNMG	120404-U	12.7	4.76	5.16	0.4			☆		☆		
			120408-U	12.7	4.76	5.16	0.8			★		☆		
			120412-U	12.7	4.76	5.16	1.2			☆		☆		
			160604-U	15.875	6.35	6.35	0.4			☆		☆		
			160608-U	15.875	6.35	6.35	0.8			★		☆		
			160612-U	15.875	6.35	6.35	1.2			☆		☆		
		DNMG	150404-U	12.7	4.76	5.16	0.4			☆		☆		
			150408-U	12.7	4.76	5.16	0.8			☆		☆		
			150604-U	12.7	6.35	5.16	0.4			☆		☆		
			150608-U	12.7	6.35	5.16	0.8			☆		☆		
		SNMG	120404-U	12.7	4.76	5.16	0.4			☆		☆		
			120408-U	12.7	4.76	5.16	0.8			☆		☆		
			150608-U	15.875	6.35	5.16	0.8			☆		☆		
			150612-U	15.875	6.35	5.16	1.2			☆		☆		
		TNMG	160404-U	9.525	4.76	5.16	0.4			☆		☆		
			160408-U	9.525	4.76	5.16	0.8			★		☆		
			160412-U	9.525	4.76	5.16	1.2			★		☆		
		VNMG	160404-U	9.525	4.76	5.16	0.4			☆		☆		
			160408-U	9.525	4.76	5.16	0.8			★		☆		
			160412-U	9.525	4.76	5.16	1.2			★		☆		
		WNMG	080404-U	12.7	4.76	5.16	0.4			☆		☆		
			080408-U	12.7	4.76	5.16	0.8			★		☆		
			080412-U	12.7	4.76	5.16	1.2			★		☆		

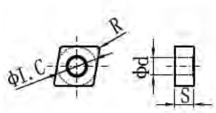
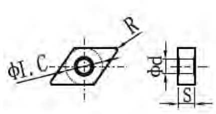
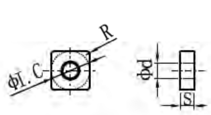
★ Recommended grade ☆ Optional grade

B1–7 Inserts for processing cast iron ········· Semi finishing

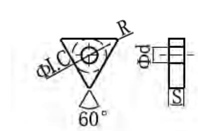
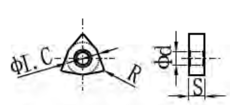
The basic shape of inserts		Type		Dimension（mm）				Grade recommended						
								CVD coating grade					Uncoated grade	
				ΦI.C	S	Φd	R	BPC042	BPC052	BPC102	BPS051	BPS101	BU810	BU820
		CNMG	120408-GH	12.7	4.76	5.16	0.8		☆	★				
			120412-GH	12.7	4.76	5.16	1.2		☆	★				
			120416-GH	12.7	4.76	5.16	1.6		☆	☆				
			160608-GH	15.875	6.35	6.35	0.8		☆	☆				
			160612-GH	15.875	6.35	6.35	1.2		☆	☆				
			190608-GH	19.05	6.35	7.93	0.8		☆	☆				
			190612-GH	19.05	6.35	7.93	1.2		☆	☆				
		DNMG	110408-GH	9.525	4.76	3.81	0.8		☆	☆				
			150408-GH	12.7	4.76	5.16	0.8		☆	★				
			150608-GH	12.7	6.35	5.16	0.8		☆	☆				
		TNMG	160408-GH	9.525	4.76	3.81	0.8		☆	★				
			160412-GH	9.525	4.76	3.81	1.2		☆	★				
			220408-GH	12.7	4.76	5.16	0.8		☆	★				
			220412-GH	12.7	4.76	5.16	1.2		☆	★				
		WNMG	060408-GH	9.525	4.76	3.81	0.8		☆	☆				
			060412-GH	9.525	4.76	3.81	1.2		☆	☆				
			080408-GH	12.7	4.76	5.16	0.8		☆	★				
			080412-GH	12.7	4.76	5.16	1.2		☆	★				
			080416-GH	12.7	4.76	5.16	1.6		☆	☆				

★ Recommended grade ☆ Optional grade

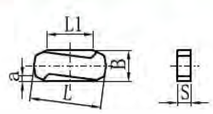
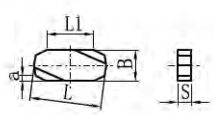
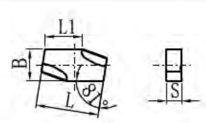
B1−7 Inserts for processing cast iron ························· Semi finishing

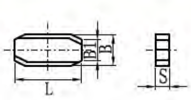
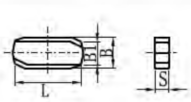
The basic shape of inserts		Type		Dimension (mm)				Grade recommended						
								CVD coating grade					Uncoated grade	
				ΦI.C	S	Φd	R	BPC042	BPC052	BPC102	BPS051	BPS101	BU810	BU820
		CNMA	120404	12.7	4.76	5.16	0.4		☆	★				
			120408	12.7	4.76	5.16	0.8		☆	★				
			120412	12.7	4.76	5.16	1.2		☆	★				
			120416	12.7	4.76	5.16	1.6		☆	★				
			160604	15.875	6.35	6.35	0.4		☆	☆				
			160608	15.875	6.35	6.35	0.8		☆	★				
			160612	15.875	6.35	6.35	1.2		☆	★				
			160616	15.875	6.35	6.35	1.6		☆	★				
			190612	19.05	6.35	7.94	1.2		☆	★				
			190616	19.05	6.35	7.94	1.6		☆	★				
			190624	19.05	6.35	7.94	2.4		☆	★				
		DNMA	110404	9.525	4.76	3.81	0.4		☆	★				
			110408	9.525	4.76	3.81	0.8		☆	★				
			110412	9.525	4.76	3.81	1.2		☆	★				
			150404	12.7	4.76	5.16	0.4		☆	★				
			150408	12.7	4.76	5.16	0.8		☆	★				
			150412	12.7	4.76	5.16	1.2		☆	★				
			150604	12.7	6.35	5.16	0.4		☆	★				
			150608	12.7	6.35	5.16	0.8		☆	★				
			150612	12.7	6.35	5.16	1.2		☆	★				
		SNMA	090304	9.525	3.18	3.81	0.4		☆	☆				
			090308	9.525	3.18	3.81	0.8		☆	★				
			120404	12.7	4.76	5.16	0.4		☆	★				
			120408	12.7	4.76	5.16	0.8		☆	★				
			120412	12.7	4.76	5.16	1.2		☆	★				
			120416	12.7	4.76	5.16	1.6		☆	★				
			150608	15.875	6.35	6.35	0.8		☆	★				
			150612	15.875	6.35	6.35	1.2		☆	★				
			150616	15.875	6.35	6.35	1.6		☆	★				
			190608	19.05	6.35	7.93	0.8		☆	★				
			190612	19.05	6.35	7.93	1.2		☆	★				
			190616	19.05	6.35	7.94	1.6		☆	★				
			190624	19.05	6.35	7.94	2.4		☆	★				
			250724	25.4	7.94	9.12	2.4		☆	★				
			250924	25.4	9.52	9.12	2.4		☆	★				

★ Recommended grade ☆ Optional grade

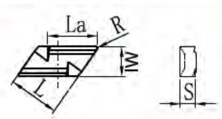
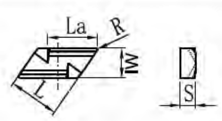
The basic shape of inserts		Type		Dimension (mm) ΦI.C	S	Φd	R	Grade recommended: CVD coating grade BPC042	BPC052	BPC102	BPS051	BPS101	Uncoated grade BU810	BU820
		TNMA	160404	9.525	4.76	3.81	0.4		☆	★				
			160408	9.525	4.76	3.81	0.8		☆	★				
			160412	9.525	4.76	3.81	1.2		☆	★				
			160416	9.525	4.76	3.81	1.6		☆	★				
			220404	12.7	4.76	5.16	0.4		☆	★				
			220408	12.7	4.76	5.16	0.8		☆	★				
			220412	12.7	4.76	5.16	1.2		☆	★				
			220416	12.7	4.76	5.16	1.6		☆	★				
			270616	15.875	6.35	6.35	1.6		☆	★				
		WNMA	060404	9.525	4.76	3.81	0.4		☆	★				
			060408	9.525	4.76	3.81	0.8		☆	★				
			060412	9.525	4.76	3.81	1.2		☆	★				
			080404	12.7	4.76	5.16	0.4		☆	★				
			080408	12.7	4.76	5.16	0.8		☆	★				
			080412	12.7	4.76	5.16	1.2		☆	★				
			080416	12.7	4.76	5.16	1.6		☆	★				

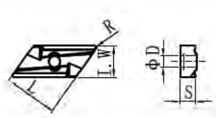
★ Recommended grade ☆ Optional grade

The basic shape of inserts		Type		Dimension (mm)					Grade recommended							
									CVD coating grade				Uncoated grade			
				B	L	S	L1	a	BPS101	BPS251	BPS321	BPS371	BP35	YT5	YW1	YW2
		LPUC	121517	12	31	7.5	17	1.5				★	★	☆		
			182020	18	37	12	20	2				★	★	☆		
			182027	18	43	12	27	2				★	★	☆		
			183020	18	43	12	20	3				★	★	☆		
			183027	18	47	12	27	3				★	★	☆		
		LNUC	121517	12	31	7.5	17	1.5				★	★	☆		
			182020	18	37	12	20	2				★	★	☆		
			182027	18	43	12	27	2				★	★	☆		
			183020	18	43	12	20	3				★	★	☆		
			183027	18	47	12	27	3				★	★	☆		
		XNGX	20.171138R	17.5	38.3	12	27					★	★	☆		

The basic shape of inserts		Type		Dimension (mm)				Grade recommended							
								CVD coating grade				Uncoated grade			
				B	L	S	L1	BPS101	BPS251	BPS321	BPS371	BP35	YT5	YW1	YW2
		LNGF	4012	20	40	12.4	12.15				★	★	☆		
		LNGF	3008-F	12	30	7.5	17.5				★	★	☆		

★ Recommended grade ☆ Optional grade

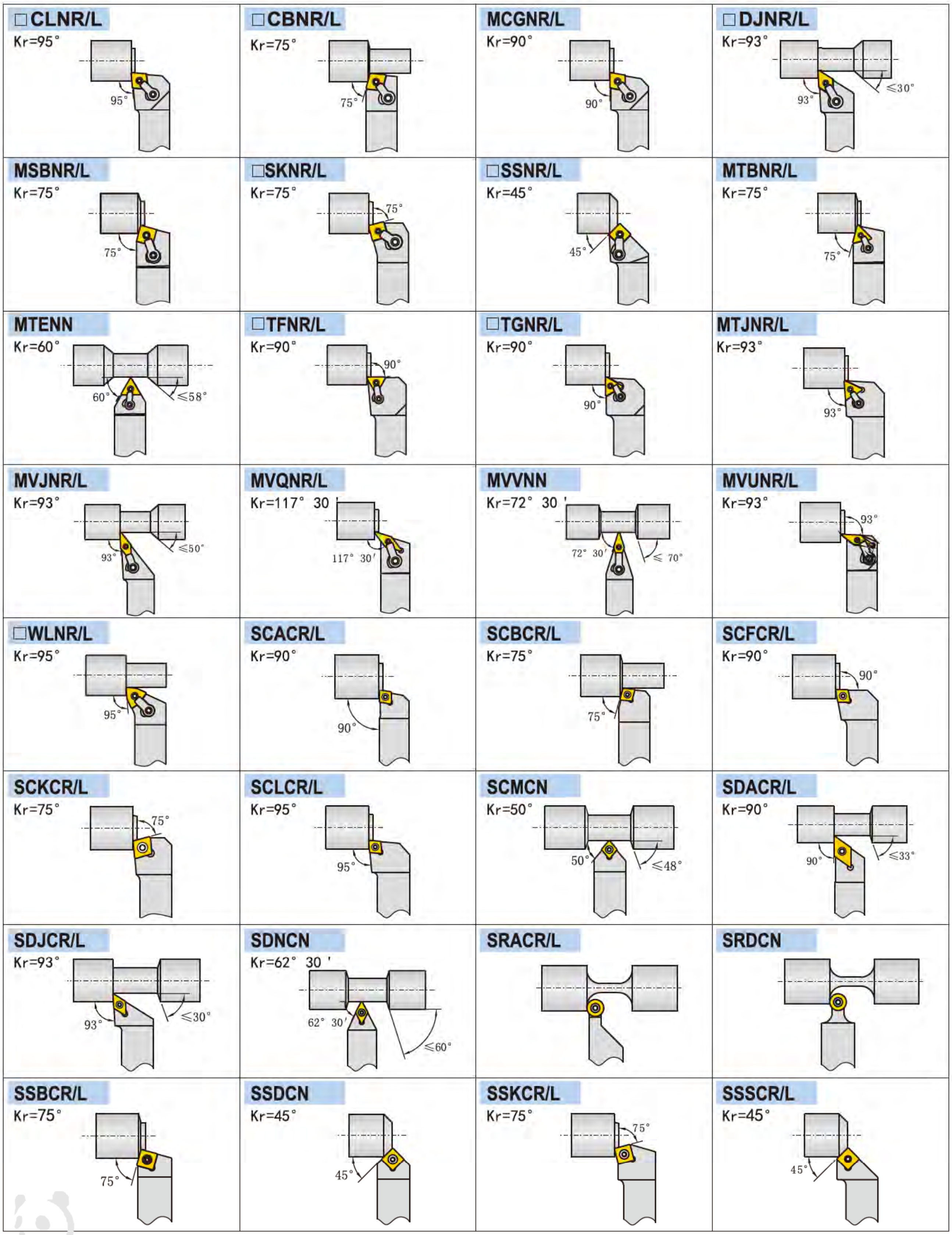
The basic shape of inserts		Type		Dimension (mm)					Grade recommended							
									CVD coating grade				PVD coating grade		Uncoated grade	
				B	L	LW	S	R	BPS051	BPP301	BPS251	BPS371	BPG05B	BPG308	YT5	BU810
		KNUX	160405L11	16	16.15	9.525	4.76	0.5	☆	☆	★				★	☆
			160410L11	16	16.15	9.525	4.76	1	☆	☆	★				★	☆
			160405R11	16	16.15	9.525	4.76	0.5	☆	☆	★				★	☆
			160410R11	16	16.15	9.525	4.76	1	☆	☆	★				★	☆
		KNUX	160405L11-1	16.15	9.525	3.38	4.76	0.5	☆	☆	★				★	☆
			160410L11-1	16.15	9.525	3.38	4.76	1	☆	☆	★				★	☆
			160405R11-1	16.15	9.525	3.38	4.76	0.5	☆	☆	★				★	☆
			160410R11-1	16.15	9.525	3.38	4.76	1	☆	☆	★				★	☆

The basic shape of inserts		Type		Dimension (mm)					Grade recommended							
									CVD coating grade				PVD coating grade		Uncoated grade	
				B	LW	ΦD	S	R	BPS051	BPP301	BPS251	BPS371	BPG10A	BPG308	YT5	BU810
		KNUX	160405L11-2	16.15	9.525	3.38	4.76	0.5	☆	☆	★				★	☆
			160410L11-2	16.15	9.525	3.38	4.76	1	☆	☆	★				★	☆
			160405R11-2	16.15	9.525	3.38	4.76	0.5	☆	☆	★				★	☆
			160410R11-2	16.15	9.525	3.38	4.76	1	☆	☆	★				★	☆

★ Recommended grade ☆ Optional grade

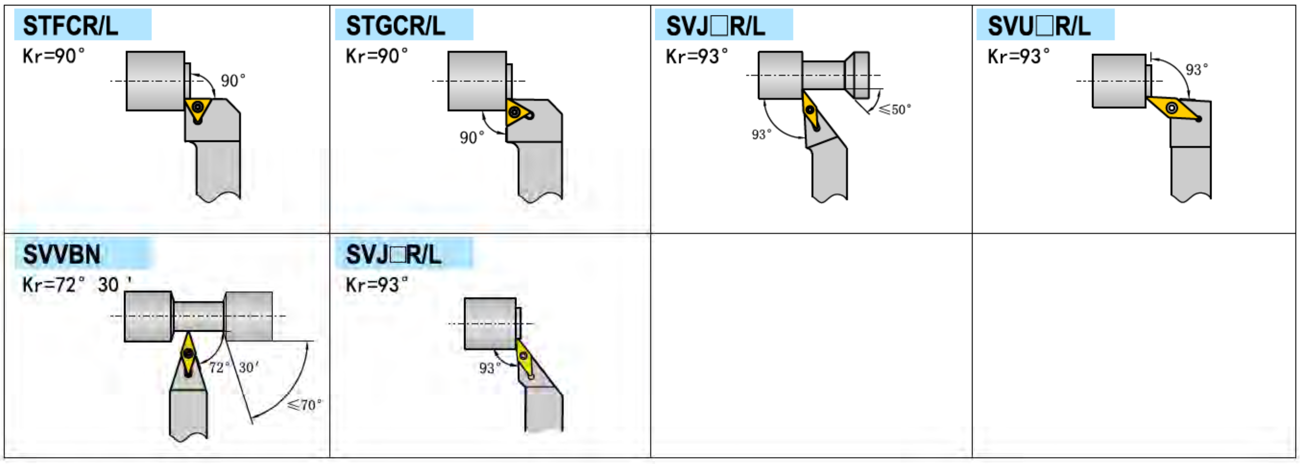
B2-1 Turning toolholders overview

External Turning tools

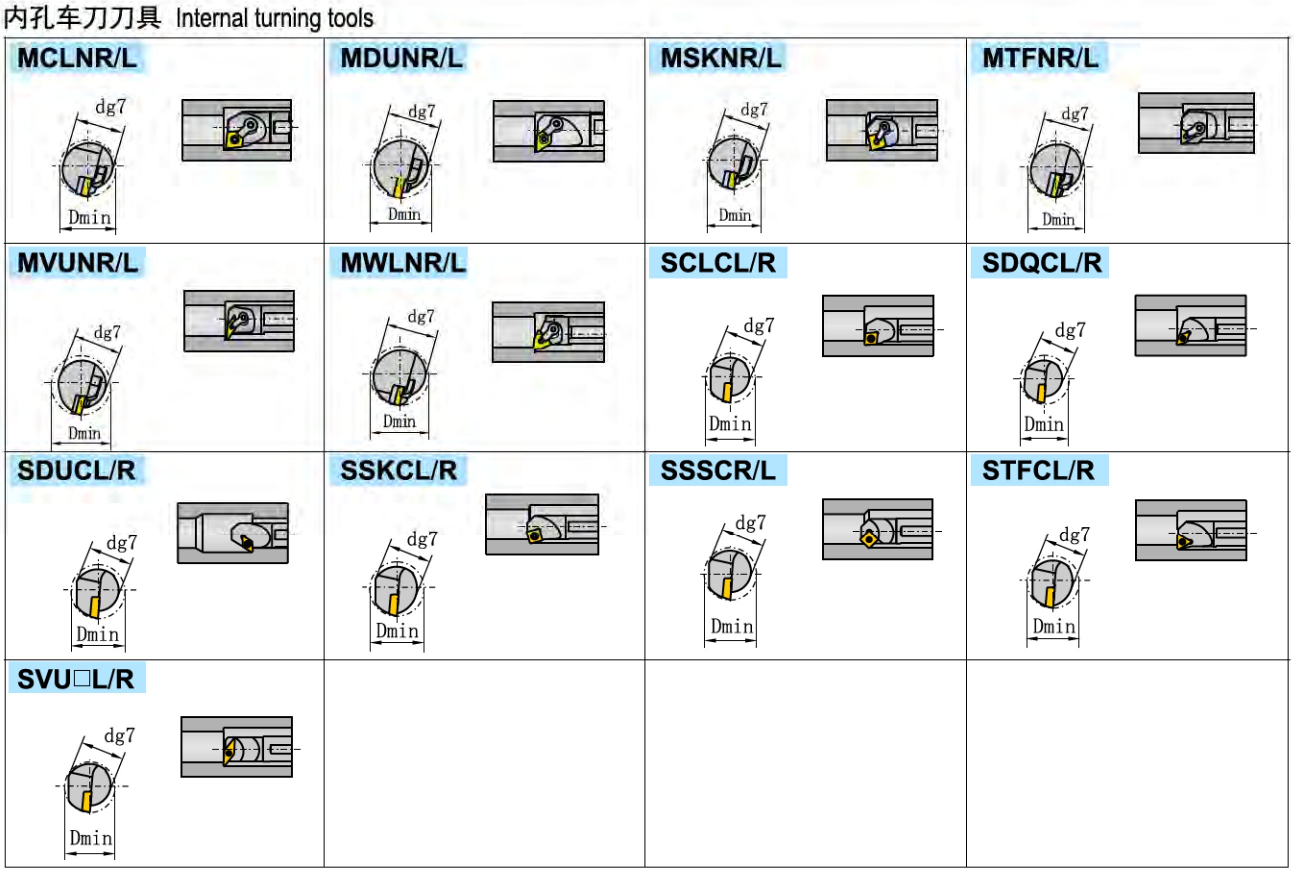


B2–1 Turning toolholders overview

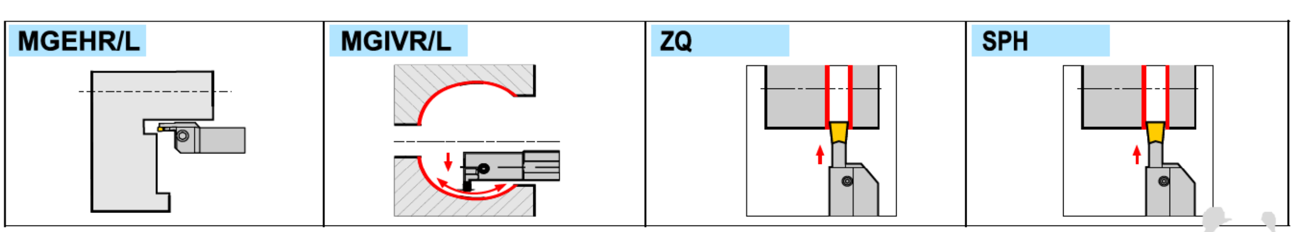
External Turning tools



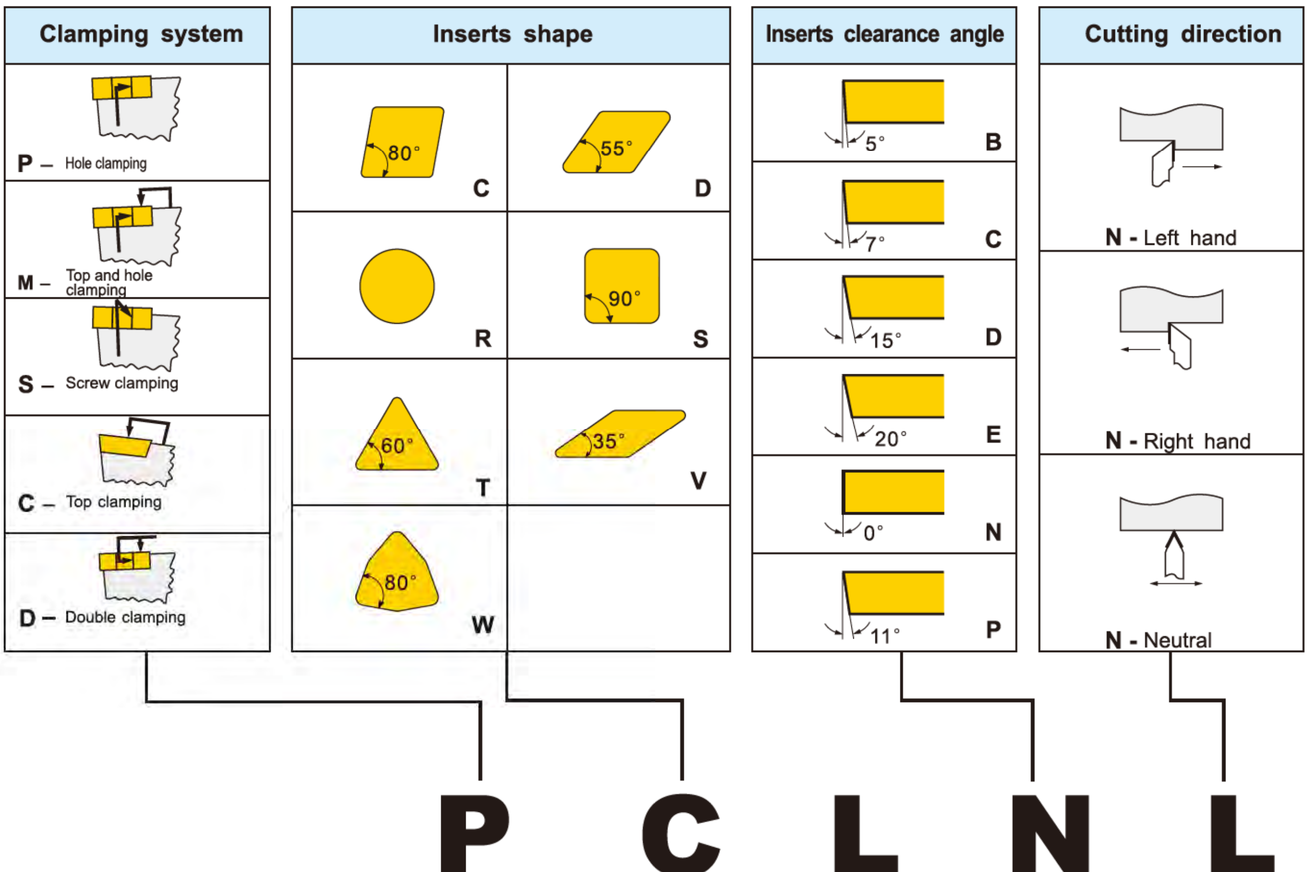
内孔车刀刀具 Internal turning tools

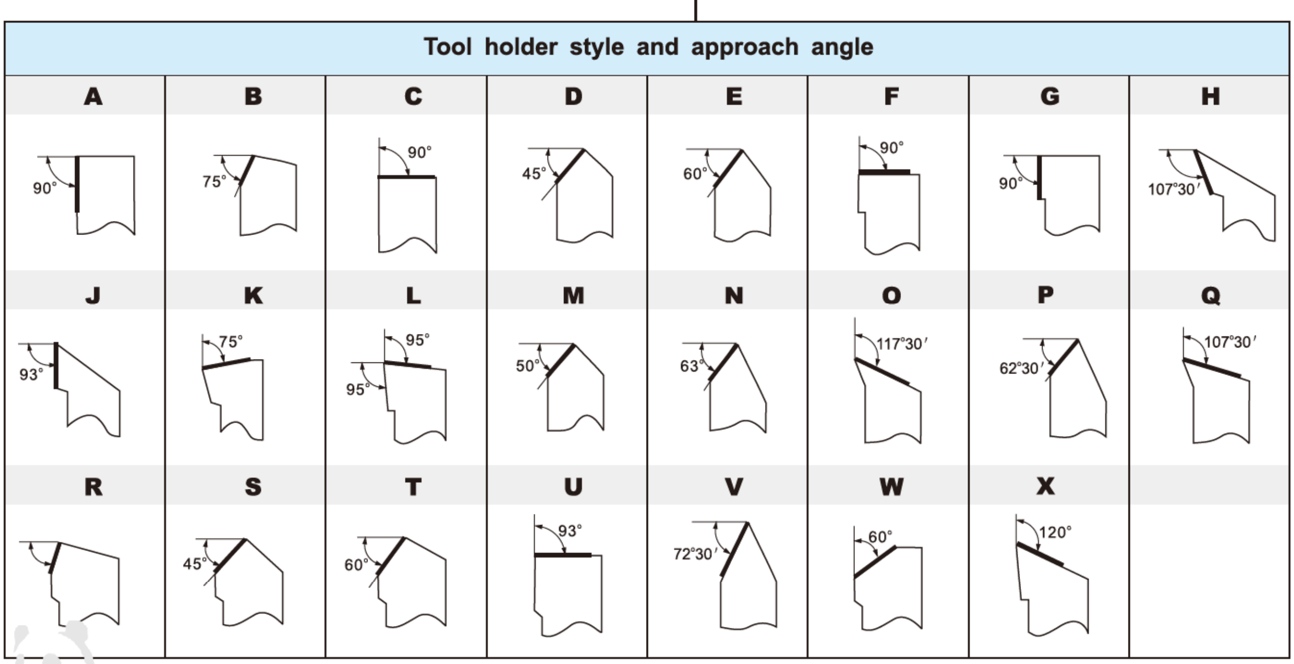


切断(槽)刀：Grooving tools

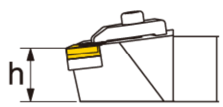


B2–2 External turning tools code key



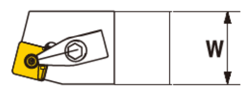


Nose height (mm)



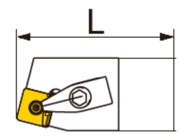
Code	Height
12	12
16	16
20	20
25	25
32	32
40	40
50	50

Width of toolholder (mm)



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

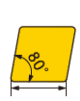
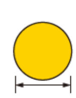
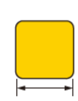
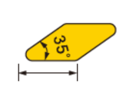
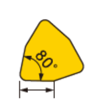
Length of toolholder (mm)



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

25 25 M 12

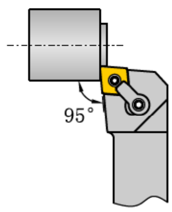
Length of cutting edge

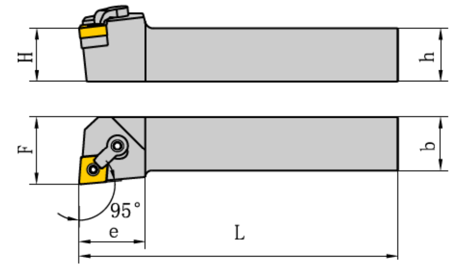
Inserts shape	**C**	**D**	**R**	**S**	**T**	**V**	**W**
							
Inscribed circle (mm)	Length of cutting edge (mm)						
5.56	---	---	---	---	09	---	---
6.35	06	07	---	---	11	---	---
9.525	09	11	09	09	16	16	06
12.7	12	15	12	12	22	22	08
15.875	16	19	15	15	27	---	---
19.05	19	---	19	19	33	---	---
25.4	25	---	25	25	44	---	---
32.0	---	---	32	---	---	---	---

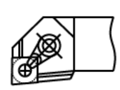
B2–3 External turning tools

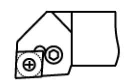
□CLNR/L

Kr=95°






M-Type


P-Type

Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning.Facing h	b	L	e	H	F	Parts Shim	Pin	Clamp	Screw	Wrench
MCLNR/L	1616H12	●	●	CN□□1204□□	16	16	100	32	16	20	MC1204	CTM617	HL1814	ML0625	L2.5,L3.0
	2020K12	●	●		20	20	125	32	20	25					
	2525M12	●	●		25	25	150	32	25	32					
	3232P12	●	●		32	32	170	32	32	40					
	2525M16	●	○	CN□□1606□□	25	25	150	35	25	32	MC1604	CTM822	HL2217	ML0830	L3.0,L4.0
	3232P16	○	○		32	32	170	35	32	40					
	3232P19	○	○	CN□□1906□□	32	32	170	36	32	40	MC1904	CTM1022	HL2217	ML0830	L4.0
	4040R19	○	○		40	40	200	36	40	50					

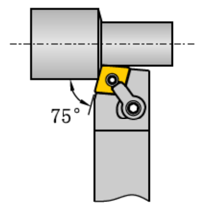
Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning.Facing h	b	L	e	H	F	Parts Shim	Lever	Screw	Shim Pin	Wrench
PCLNR/L	1616H09			CN□□0903□□	16	16	100	20	16	20	MC0903B	LV3	VHX0617	SP10	L2.5
	2020K09				20	20	125	22	20	25					
	2525M09				25	25	150	22	25	32					
	1616H12			CN□□1204□□	16	16	100	28	16	20	MC1204B	LV4	VHX0821	SP4	L3.0
	2020K12				20	20	125	28	20	25					
	2525M12				25	25	150	28	25	32					
	3225P12				32	25	170	28	32	32					
	3232P12				32	32	170	28	32	40					
	2525M16			CN□□1606□□	25	25	150	33	25	32	MC1604B	LV5	VHX0825	SP5	L3.0
	3232P16				32	32	170	33	32	40					
	3225P19			CN□□1906□□	32	25	170	38	32	32	MC1904B	LV6	VHX1027	SP6	L4.0
	3232P19				32	32	170	38	32	40					
	4040S19				40	40	250	38	40	50					

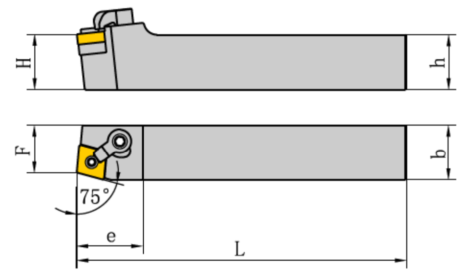
● stock item ○ be preparing for stock the others can be made to order

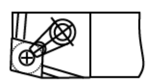
B2–3 External turning tools

□CBNR/L

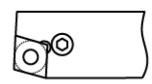
Kr=75°







M-Type



P-Type

Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning h	b	L	e	H	F	Parts Shim	Pin	Clamp	Screw	Wrench
MCBNR/L	2020K12	●	●		20	20	125	32	20	17					
	2525M12	●	●	CN□□1204□□	25	25	150	32	25	22	MC1204	CTM617	HL1814	ML0625	L2.5,L3.0
	3232P12	●	●		32	32	170	32	32	27					
	3232P16	○		CN□□1606□□	32	32	170	36	32	27	MC1604	CTM822	HL2217	ML0830	L3.0,L4.0
	3232P19			CN□□1906□□	32	32	170	36	32	27	MC1904	CTM1022	HL2217	ML0830	L4.0

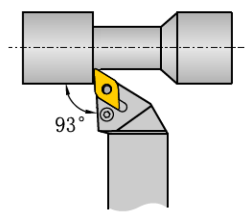
Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning h	b	L	e	H	F	Parts Shim	Lever	Screw	Shim Pin	Wrench
PCBNR/L	1616H12				16	16	100	27	16	20					
	2020K12			CN□□1204□□	20	20	125	27	20	25	MC1204B	LV4	VHX0821	SP4	L3.0
	2525M12				25	25	150	27	25	32					
	2525M16			CN□□1606□□	25	25	150	33	25	32	MC1604B	LV5	VHX0825	SP5	L3.0
	3232P16				32	32	170	33	32	40					
	3225P19			CN□□1906□□	32	25	170	38	32	32	MC1904B	LV6	VHX1027	SP6	L4.0
	3232P19				32	32	170	38	32	40					

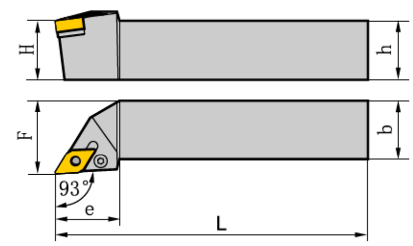
● stock item ○ be preparing for stock the others can be made to order

B2–3 External turning tools

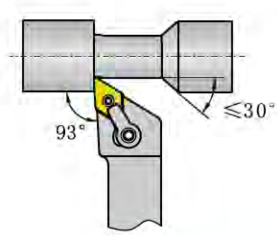
□DJNR/L

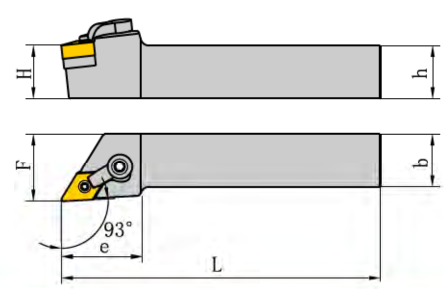
Kr=93°





Type		Stock Item R	Stock Item L	Recommended inserts	Application: Turning.Facing.Profiling h	b	L	e	H	F	Parts: Shim	Pin	Clamp	Screw	Wrench
PDJNR/L	1616H11			DN□□1104□□	16	16	100	25	16	20	MD1103B	LV3	VHX0617	SP3	L2.5
	2020K11				20	20	125	25	20	25					
	2525M11				25	25	150	30	25	32					
	2020K15			DN□□1504□□ DN□□1506□□	20	20	125	35	20	25	MC1504B MD1506B	LV4B	VHX0821	SP4	L3.0
	2525M15				25	25	150	35	25	32					
	3225P15				32	25	170	35	32	32					
	3232P15				32	32	170	35	32	32					





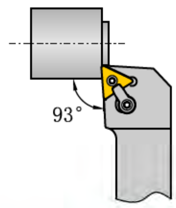
Type		Stock Item R	Stock Item L	Recommended inserts	Application: Turning.Facing.Profiling h	b	L	e	H	F	Parts: Shim	Pin	Clamp	Screw	Wrench
MDJNR/L	1616H11	●	●	DN□□1104□□	16	16	100	32	16	20	MD1103	CTM513	HL1814	ML0625	L2.,L3.0
	2020K11	●	●		20	20	125	32	20	25					
	2525M11	●	●		25	25	150	32	25	32					
	2020K15	●	●	DN□□1504□□ DN□□1506□□	20	20	125	38	20	25	MD1504 MD1506	CTM619	HL2114	ML0625	L2.5,L3.0
	2525M15	○	○		25	25	150	38	25	32					
	3232P15				32	32	170	38	32	40					

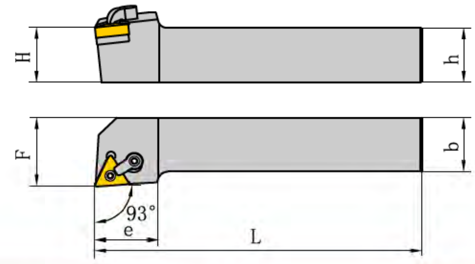
● stock item ○ be preparing for stock the others can be made to order

B2–3 External turning tools

MTJNR/L

Kr=93°

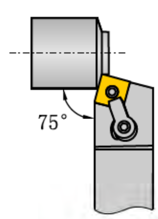


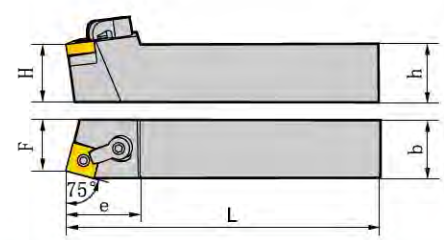


Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning h	b	L	e	H	F	Parts Shim	Pin	Clamp	Screw	Wrench
MTJNR/L	1616H16	●	●	TN□□1604□□	16	16	100	28	16	20	MT1603	CTM513	HL1814	ML0625	L2.0.,L3.0
	2020K16	●	●		20	20	125	28	20	25					
	2525M16	●	●		25	25	150	28	25	32					
	3232P16	●	○		32	32	170	28	32	40					
	2525M22	○		TN□□2204□□	25	25	150	32	25	32	MT2204	CTM617	HL1917	ML0830	L2.5,L4.0
	3232P22				32	32	170	32	32	32					
	4040R22				40	40	200	32	40	50					

□SBNR/L

Kr=75°





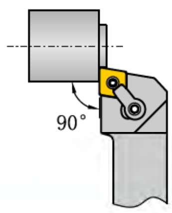
Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning.Facing.Profiling h	b	L	e	H	F	Parts Shim	Pin	Clamp	Screw	Wrench
MSBNR/L	2020K12	●	○	SN□□1204□□	22	22	125	32.5	20	17	MS1204	CTM617	HL1814	ML0625	L2.5.,L3.0
	2525M12	●	○		25	25	150	32.5	25	22					
	3232P12				32	32	170	32.5	32	27					
	3232P19			SN□□19064□□	32	32	170	40	32	27	MS1904	CTM1022	HL2217	ML0830	L4.0
	4040S19				40	40	250	40	40	35					

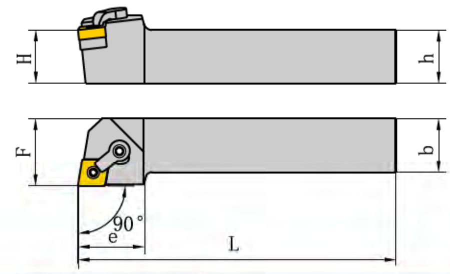
● stock item ○ be preparing for stock the others can be made to order

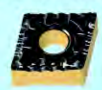
B2–3 External turning tools

MCGNR/L

Kr=90°

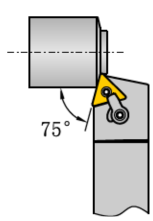


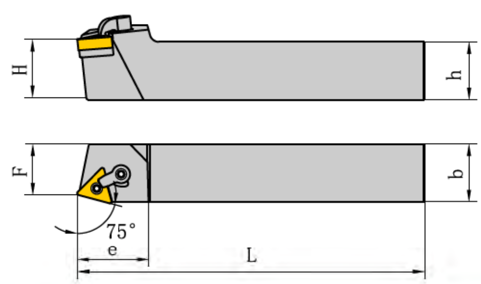


Type		Stock Item		Recommended inserts	Application						Parts				
					Turning.Facing						Shim	Pin	Clamp	Screw	Wrench
		R	L		h	b	L	e	H	F					
	2020K12	●	○		20	20	125	32	20	25					
MCGNR/L	2525M12	●	○	CN□□1204□□	25	25	150	32	25	32	MC1204	CTM617	HL1814	ML0625	L2.5,L3.0
	3232P12				32	32	170	32	32	40					
	3232P19			CN□□1906□□	32	32	170	36	32	40	MC1904	CTM1022	HL2217	ML0830	L4.0

MTBNR/L

Kr=75°





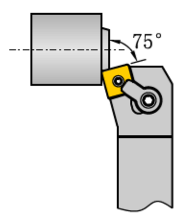
Type		Stock Item		Recommended inserts	Application						Parts				
					Turning						Shim	Pin	Clamp	Screw	Wrench
		R	L		h	b	L	e	H	F					
MTBNR/L	2020K16	●	○	TN□□1604□□	20	20	125	26	20	15.5	MT1603	CTM513	HL1814	ML0625	L2.0.,L3.0
	2525M16	●	○		25	25	150	26	25	20.5					

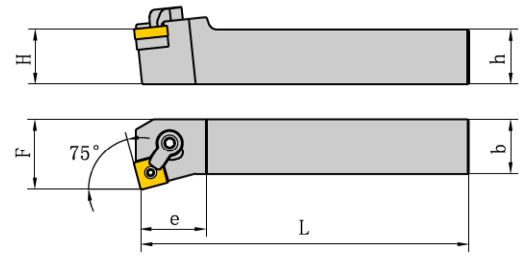
● stock item ○ be preparing for stock the others can be made to order

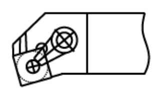
B2-3 External turning tools

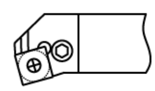
□SKNR/L

Kr=75°






M-Type


P-Type

Type		Stock Item		Recommended inserts	Application						Parts				
					Turning						Shim	Pin	Clamp	Screw	Wrench
		R	L		h	b	L	e	H	F					
MSKNR/L	2020K12	●	○	SN□□1204□□	20	20	125	29	20	25	MS1204	CTM617	HL1814	ML0625	L2.5.,L3.0
	2525M12	●	○		25	25	150	29	25	32					
	2525M15			SN□□1506□□	25	25	150	32	25	32	MS1504	CTM822	HL2217	ML0830	L3.0,L4.0
	3232P15				32	32	170	32	32	40					
	3232P19			SN□□1906□□	32	32	170	36	32	40	MS1904	CTM1022	HL2217	ML0830	L4.0
	4040S19				40	40	250	40	40	50					

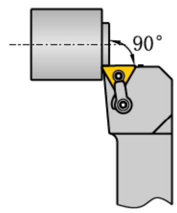
Type		Stock Item		Recommended inserts	Application						Parts				
					Turning						Shim	Lever	Screw	Shim Pin	Wrench
		R	L		h	b	L	e	H	F					
PSKNR/L	2020K12			SN□□1204□□	20	20	125	26	20	25	MS1204B	LV4	VXH0821	SP4	L3.0
	2525M12				25	25	150	26	25	32					
	3232P12				32	32	170	26	32	40					

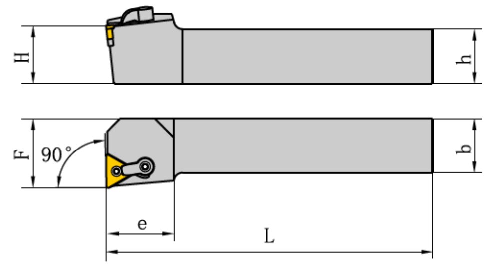
● stock item ○ be preparing for stock the others can be made to order

B2–3 External turning tools

MTFNR/L

Kr=90°





Type		Stock Item R	Stock Item L	Recommended inserts	Application Facing h	b	L	e	H	F	Parts Shim	Pin	Clamp	Screw	Wrench
MTFNR/L	1616H16	●	●	TN□□1604□□	16	16	100	28	16	20	MT1603	CTM513	HL1814	ML0625	L2.0.,L3.0
	2020K16	●	●		20	20	125	28	20	25					
	2525M16	●	●		25	25	150	28	25	32					
	3232P16	○			32	32	170	28	32	40					
	2525M22			TN□□2204□□	25	25	150	32	25	32	MT2204	CTM617	HL1917	ML0830	L2.5,L4.0
	3232P22				32	32	170	32	32	32					

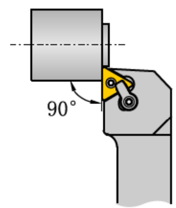
Type		Stock Item R	Stock Item L	Recommended inserts	Application Facing h	b	L	e	H	F	Parts Shim	Lever	Screw	Shim Pin	Wrench
PTFNR/L	1616H16			TN□□1604□□	16	16	100	20	16	20	MT1603B	LV3	VXH0617	SP3	L2.5
	2020K16				20	20	125	20	20	25					
	2525M16				25	25	150	20	25	32					
	2525M22			TN□□2204□□	25	25	150	25	25	32	MT2204B	LV4	VHX0821	SP4	L3.0
	3232P22				32	32	170	25	32	40					

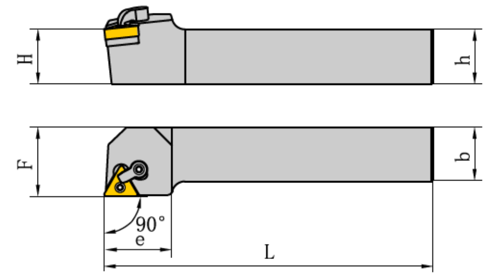
● stock item ○ be preparing for stock the others can be made to order

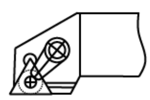
B2–3 External turning tools

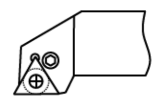
□TGNR/L

Kr=90°









Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning h	b	L	e	H	F	Parts Shim	Pin	Clamp	Screw	Wrench
MTGNR/L	1616H16	●	●	TN□□1604□□	16	16	100	28	16	20	MT1603	CTM513	HL1814	ML0625	L2.0.,L3.0
	2020K16	●	●		20	20	125	28	20	25					
	2525M16	●	●		25	25	150	28	25	32					
	2525P22			TN□□2204□□	32	32	170	32	32	40	MT2204	CTM617	HL1917	ML0830	L2.5,L4.0

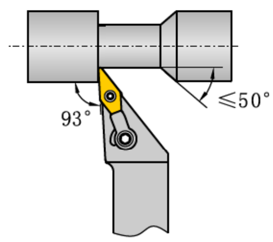
Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning h	b	L	e	H	F	Parts Shim	Lever	Screw	Shim Pin	Wrench
PTGNR/L	1616H16			TN□□1604□□	16	16	100	20	16	20	MT1603B	LV3	VXH0617	SP3	L2.5
	2020K16				20	20	125	20	20	25					
	2525M16				25	25	150	20	25	32					
	2525M22			TN□□2204□□	25	25	150	28	25	32	MT2204B	LV4	VHX0821	SP4	L3.0
	3232P22				32	32	170	28	32	40					

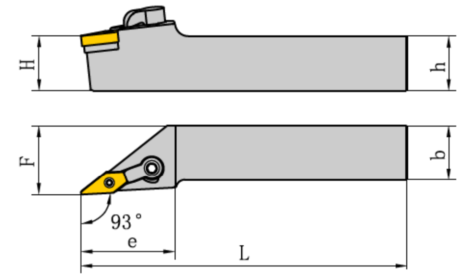
● stock item ○ be preparing for stock the others can be made to order

B2–3 External turning tools

MVJNR/L

Kr=93°

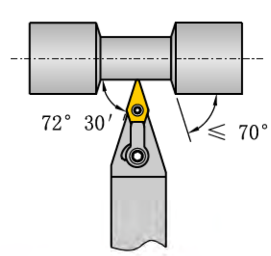


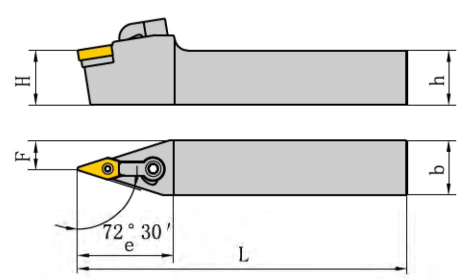


Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning.Profiling h	b	L	e	H	F	Parts Shim	Pin	Clamp	Screw	Wrench
MVJNR/L	1616H16	●	○	VN□□1604□□	16	16	100	36	16	20	MV1603	CTM513	HL2414	ML0625	L2.0,L3.0
	2020K16	●	○		20	20	125	36	20	25					
	2525M16	○			25	25	150	42	25	32					
	3232P16				32	32	170	42	32	40					

MVVNN

Kr=72° 30 '





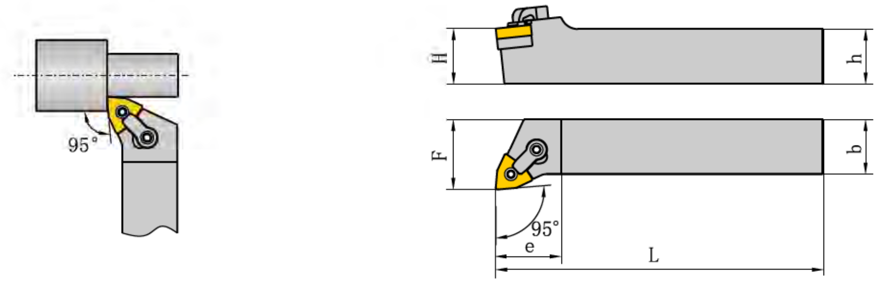
Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning.Facing.Profiling h	b	L	e	H	F	Parts Shim	Pin	Clamp	Screw	Wrench
MVVNN	2020K16	●		VN□□1604□□	20	20	125	48	20	10	MV1603	CTM513	HL2414	ML0625	L2.0,L4.0
	2525M16	●			25	25	150	48	25	12.5					
	3232P16	○			32	32	170	48	32	16					

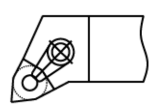
● stock item ○ be preparing for stock the others can be made to order

B2-3 External turning tools

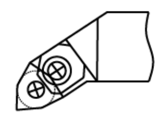
□WLNR/L

Kr=95°

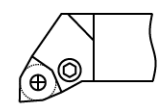




M-Type



W-Type



P-Type

Type		Stock Item R	Stock Item L	Recommended inserts	Application: Turning.Facing.Profiling h	b	L	e	H	F	Parts: Shim	Pin	Clamp	Screw	Wrench
MWLNR/L	1616H06	○		WN□□0604□□	16	16	100	23	16	20	MW0603	CTM513	HL1814	ML0625	L2.0,L3.0
	2020K06	○			20	20	125	23	20	25					
	2525M06	●	●		25	25	150	23	25	32					
	1616H08	●	●	WN□□0804□□	16	16	100	25	16	20					
	2020K08	●	●		20	20	125	25	20	25	MW0804	CTM617	HL1814	ML0625	L2.5,L3.0
	2525M08	●	●		25	25	150	25	25	32					
	3232P08	●	●		32	32	170	25	32	40					

Type		Stock Item R	Stock Item L	Recommended inserts	Application: Turning h	b	L	e	H	F	Parts: Shim	Pin	Clamp	Screw	Wrench
WWLNR/L	2020K08			WN□□0804□□	20	20	125	32	20	25	WW08	CTM6-S	YW08	CTWC	L3.0,L4.0
	2525M08				25	25	150	33	25	32					
	3232P08				32	32	170	33	32	40					

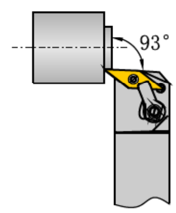
Type		Stock Item R	Stock Item L	Recommended inserts	Application: Turning h	b	L	e	H	F	Parts: Shim	Lever	Screw	Shim Pin	Wrench
PWLNR/L	1616H06			WN□□0604□□	16	16	100	20	16	20	MW0603B	LV3	VHX0617	SP3	L2.5
	2020K06				20	20	125	20	20	25					
	1616H08			WN□□0804□□	16	16	100	26	16	20	MW0804B	LV4	VHX0821	SP4	L3.0
	2020K08				20	20	125	26	20	25					
	2525M08				25	25	150	26	25	32					

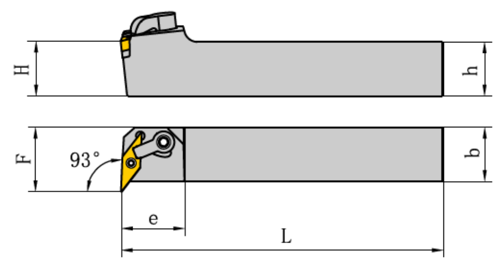
● stock item ○ be preparing for stock the others can be made to order

B2–3 External turning tools

MVUNR/L

Kr=93°

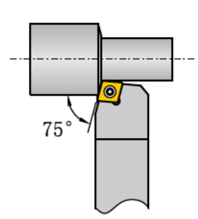


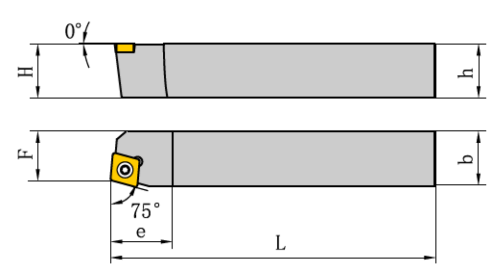


Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning.Profiling h	b	L	e	H	F	Parts Shim	Pin	Clamp	Screw	Wrench
MVUNR/L	2525M16			VN□□1604□□	25	25	150	21	25	32	MV1603	CTM513	HL2414	ML0625	L2.0,L3.0

SCBCR/L

Kr=75°





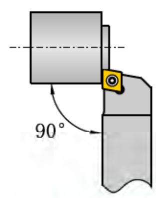
Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning h	b	L	e	H	F	Parts Screw	Wrench
SCBCR/L	0808E06			CC□□0602□□	8	8	70	10	8	8	M2.5×8	T-8
	1010E06	○			10	10	70	10	10	10		
	1212F06	○			12	12	80	13	12	12		
	1212F09	○		CC□□09T3□□	12	12	80	13	12	12	M3.5×9	T-15

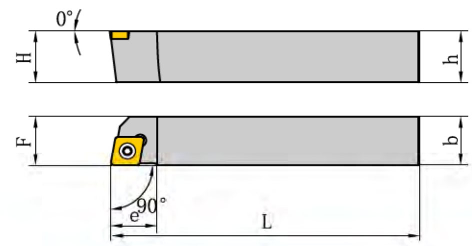
● stock item ○ be preparing for stock the others can be made to order

B2–3 External turning tools

SCACR/L

Kr=90°

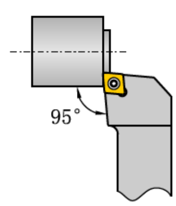


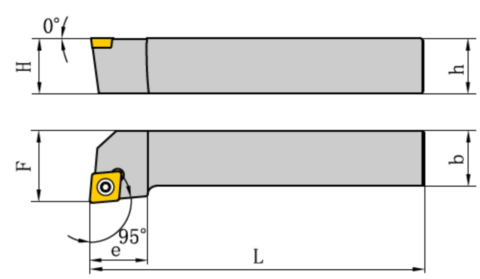


Type		Stock Item		Recommended inserts	Application						Parts	
					Turning						Screw	Wrench
		R	L		h	b	L	e	H	F		
SCACR/L	0808E06			CC□□0602□□	8	8	70	10	8	8	M2.5×8	T-8
	1010E06	○			10	10	70	10	10	10		
	1212F06	○			12	12	80	13	12	12		
	1212K09	○		CC□□09T3□□	12	12	80	13	12	12	M3.5×9	T-15

SCLCR/L

Kr=95°





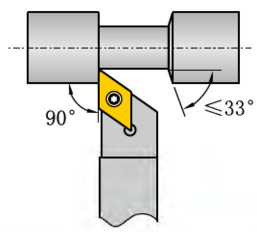
Type		Stock Item		Recommended inserts	Application						Parts	
					Turning						Screw	Wrench
		R	L		h	b	L	e	H	F		
SCLCR/L	1010E06	●	○	CC□□0602□□	10	10	70	13	10	5	M2.5×8	T-8
	1212F09	●	●	CC□□09T3□□	12	12	80	15	12	6	M3.5×9	T-15
	1616H09	●	●		16	16	100	15	16	8		
	2020K09	●	●		20	20	125	15	20	10		
	2525M09	●	●		25	25	150	15	25	12.5		
	2020K12	●	●	CC□□1204□□	20	20	125	20	20	10	M5×12	T-20
	2525M12	●	●		25	25	150	20	25	12.5		
	3232P12	○			32	32	170	20	32	40		

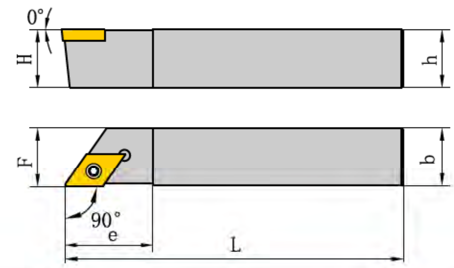
● stock item ○ be preparing for stock the others can be made to order

B2–3 External turning tools

SDACR/L

Kr=90°

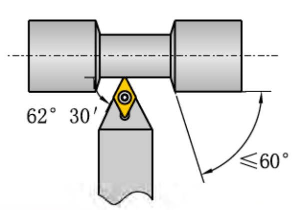


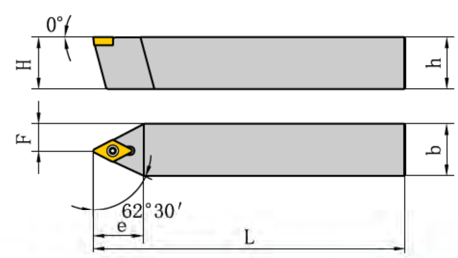


Type		Stock Item R	Stock Item L	Recommended inserts	h	b	L	e	H	F	Screw	Wrench
SDACR/L	0808E07			DC□□0702□□	8	8	70	15	8	8	M2.5×8	T-8
	1010E07				10	10	70	15	10	10		
	2020K07				12	12	125	15	12	12		
	1212K11			DC□□11T3□□	12	12	125	22	12	12	M3.5×9	T-15
	1616H11	○			16	16	100	22	16	16		
	2020K11	●			20	20	125	22	20	20		
	2525M11	○			25	25	150	22	25	25		

SDNCN

Kr=62° 30 '





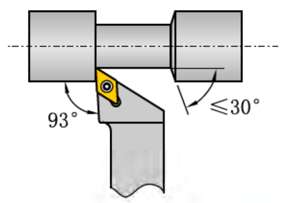
Type		Stock Item R	Stock Item L	Recommended inserts	h	b	L	e	H	F	Screw	Wrench
SDNCN	1010E07	●	●	DC□□0702□□	10	10	70	5	10	12	M2.5×8	T-8
	1212E07	○	○		12	12	70	13	12	16		
	1212H11	●	●	DC□□11T3□□	12	12	100	14	12	16	M3.5×9	T-15
	1616H11	●	●		16	16	100	14	16	20		
	2020K11	●	●		20	20	125	16	20	25		
	2525M11				25	25	150	22	25	25		

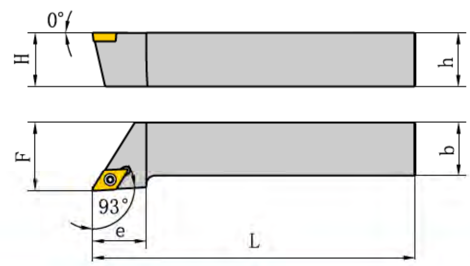
● stock item ○ be preparing for stock the others can be made to order

B2–3 External turning tools

SDJCR/L

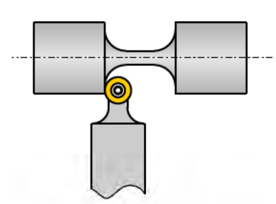
Kr=93°

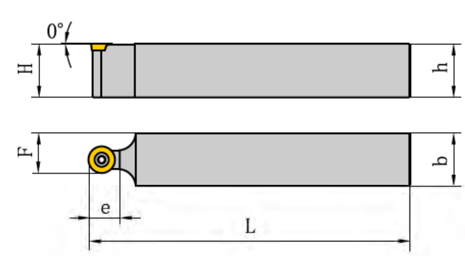




Type		Stock Item		Recommended inserts	Application						Parts	
					Turning						Screw	Wrench
		R	L		h	b	L	e	H	F		
SDJCR/L	1010E07	●		DC□□0702□□	10	10	70	14	10	12	M2.5×8	T-8
	1212F07	●	○		12	12	80	14	12	16		
	1616H07	●	●		16	16	100	14	16	20		
	1212F11			DC□□11T3□□	12	12	80	20	12	16		
	1616H11	●	●		16	16	100	20	16	20	M3.5×9	T-15
	2020K11	●	●		20	20	125	20	20	25		
	2525M11	●	●		25	25	150	22	25	32		
	3232P11	○			32	32	170	23	32	40		
	4040R11				40	40	200	25	40	50		

SRDCN





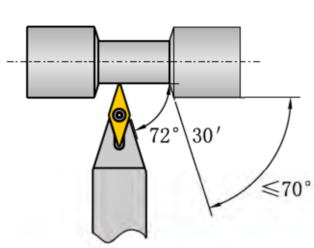
Type		Stock Item		Recommended inserts	Application						Parts	
					Turning						Screw	Wrench
		R	L		h	b	L	e	H	F		
SRDCN	1616H08	○		RC□□0803□□	16	16	100	16	16	12	M2.5×8	T-8
	2020K08	○			20	20	125	16	20	14		
	2525M08	○			25	25	150	16	25	16.5		
	1010E10			RC□□1003□□	10	10	70	20.3	10	10	M3.5×9	T-15
	1212F10				12	12	80	20.3	12	11		
	1616H10	●			16	16	100	20.3	16	13		
	2020K10	●			20	20	125	20.3	20	15		
	2525M10	●			25	25	150	20.3	25	17.5		

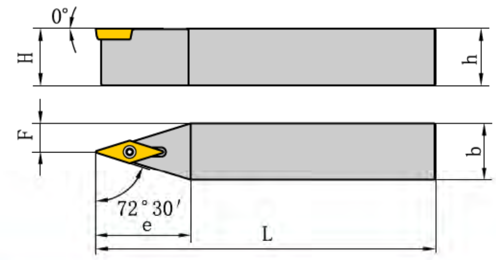
● stock item ○ be preparing for stock the others can be made to order

B2–3 External turning tools

SVVBN

Kr=72° 30 '





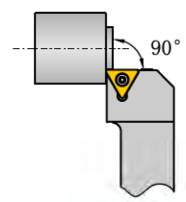
Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning h	b	L	e	H	F	Parts Screw	Parts Wrench
SVVBN	1212F11	●		VB□□1103□□	12	12	80	24	12	6	M2.5×8	T-8
	1616H11	●			16	16	100	24	16	8		
	2020K11	●			20	20	125	24	20	10		
	2525M11	●			25	25	150	24	25	12.5		
	1616H16	●		VB□□1604□□	16	16	100	34	16	8	M3.5×9	T-15
	2020K16	●			20	20	125	34	20	10		
	2525M16	●			25	25	150	34	25	12.5		
	3232P16	○			32	32	170	34	32	16		
SVVCN	1212F11	●		VC□□1103□□	12	12	80	24	12	6	M2.5×8	T-8
	1616H11	●			16	16	100	24	16	8		
	2020K11	○			20	20	125	24	20	10		
	2525M11	○			25	25	150	24	25	12.5		
	1616H16	○		VC□□1604□□	16	16	100	34	16	8	M3.5×9	T-15
	2020K16	●			20	20	125	34	20	10		
	2525M16	●			25	25	150	34	25	12.5		
	3232P16	○			32	32	170	34	32	16		

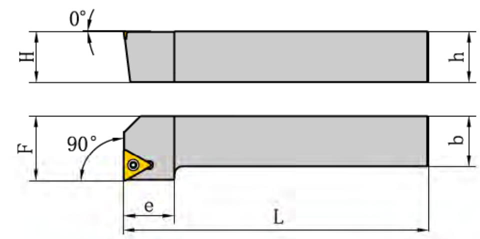
● stock item ○ be preparing for stock the others can be made to order

B2–3 External turning tools

STFCR/L

Kr=90°



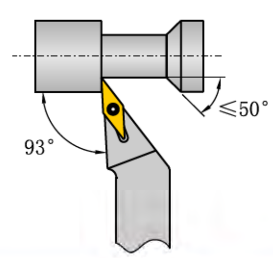


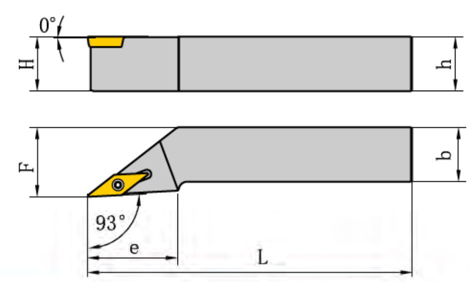
Type		Stock Item R	Stock Item L	Recommended inserts	h	b	L	e	H	F	Screw	Wrench
STFCR/L	1212F11	●		TC□□1102□□	12	12	80	14	12	16	M2.5×8	T-8
	1616H11	●	○		16	16	100	14	16	20		
	2020K16	●	○	TC□□16T3□□	20	20	125	22	20	25	M3.5×9	T-15
	2525M16	●	○		25	25	150	22	25	32		
	3232P16	○			32	32	170	22	32	40		

(Application: Turning — h, b, L, e, H, F; Parts — Screw, Wrench)

SVJ□R/L

Kr=93°





Type		Stock Item R	Stock Item L	Recommended inserts	h	b	L	e	H	F	Screw	Wrench
SVJBR/L	1616H16	●	●	VB□□1604□□	16	16	100	32	16	20	M3.5×9	T-15
	2020K16	●	●		20	20	125	32	20	25		
	2525M16	●	●		25	25	150	32	25	32		
	3232P16	○			32	32	170	40	32	40		
SVJCR/L	1616H16	●	●	VC□□1604□□	16	16	100	32	16	20		
	2020K16	●	●		20	20	125	32	20	25		
	2525M16	●	●		25	25	150	40	25	32		
	3232P16	○			32	32	170	40	32	40		

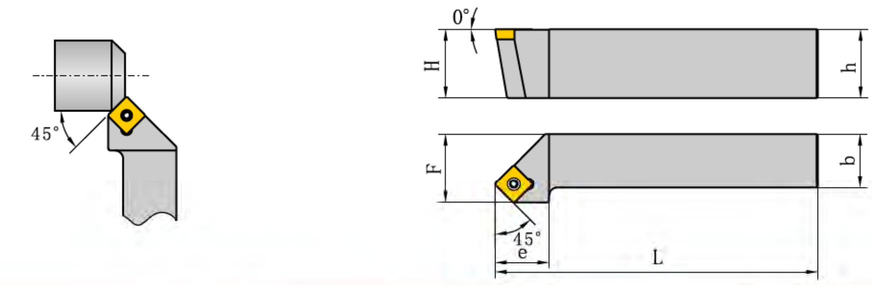
(Application: Turning — h, b, L, e, H, F; Parts — Screw, Wrench)

● stock item ○ be preparing for stock the others can be made to order

B2–3 External turning tools

SSSCR/L

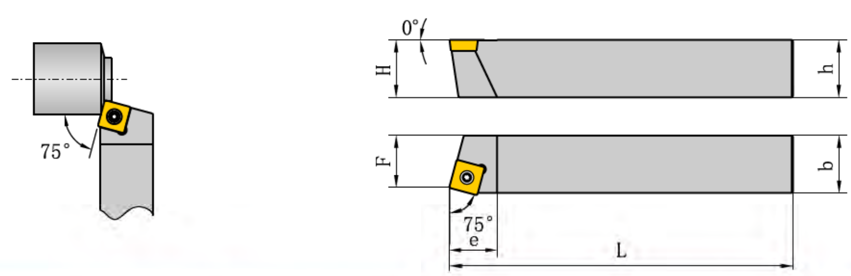
Kr=45°



Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning h	b	L	e	H	F	Parts Screw	Parts Wrench
SSSCR/L	1212F09	○		SC□□09T3□□	12	12	80	16	12	16	M3.5×9	T-15
	1616H09	●	●	SC□□09T3□□	16	16	100	16	16	20	M3.5×9	T-15
	2020K09	●	●	SC□□09T3□□	20	20	125	18	20	25	M3.5×9	T-15
	2525M09	●	●	SC□□09T3□□	25	25	150	25	25	32	M3.5×9	T-15
	2525M12	○		SC□□1204□□	25	25	150	25	25	32	M5×12	T-20

SSB□R/L

Kr=75°



Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning h	b	L	e	H	F	Parts Screw	Parts Wrench
SSBCR/L	1212F09	●		SC□□09T3□□	12	12	80	14	12	9.5	M3.5×9	T-15
	1616H09	●		SC□□09T3□□	16	16	100	14	16	12	M3.5×9	T-15
SSBPR/L	2020K12			SP□□1203□□	20	20	125	32	20	17	M5×12	T-20
	2525M12			SP□□1203□□	25	25	150	32	25	22	M5×12	T-20

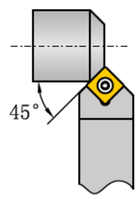
● stock item ○ be preparing for stock the others can be made to order

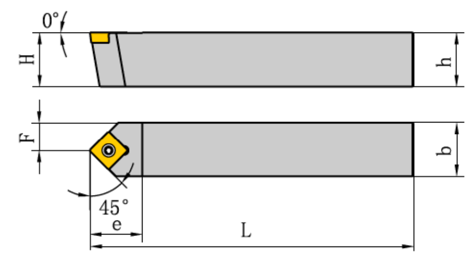
B2–3 External turning tools

B General Turning

SSDCN

Kr=45°

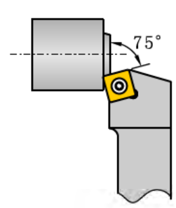


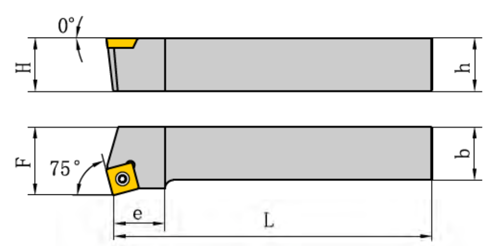


Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning h	b	L	e	H	F	Parts Screw	Parts Wrench
SSDCN	1212F09	○		SC□□09T3□□	12	12	80	16	12	6	M3.5×9	T-15
	1616H09	●			16	16	100	16	16	8		
	2020K09	●			20	20	125	16	20	10		
	2525M09	●			25	25	150	16	25	12.5		

SSKCR/L

Kr=75°





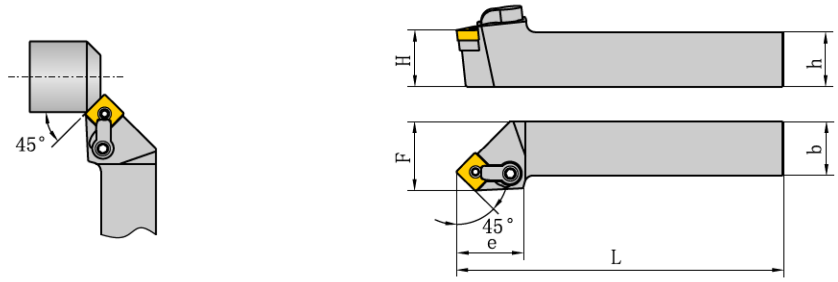
Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning h	b	L	e	H	F	Parts Screw	Parts Wrench
SSKCR/L	1212F09	○		SC□□09T3□□	12	12	80	16	12	16	M3.5×9	T-15
	1616H09	●			16	16	100	16	16	20		
	2020K09	●			20	20	125	18	20	25		
	2525M09	●			25	25	150	25	25	32		
	2525M12	○		SC□□1204□□	25	25	150	25	25	32	M5×12	T-20

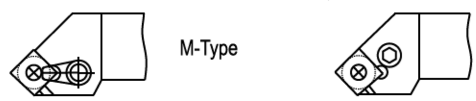
● stock item ○ be preparing for stock the others can be made to order

B2-3 External turning tools

□SSNR/L

Kr=45°





Type		Stock Item R	Stock Item L	Recommended inserts	h	b	L	e	H	F	Shim	Pin	Clamp	Screw	Wrench
MSSNR/L	2020K12	●	●	SN□□1204□□	20	20	125	34	20	25	MS1204	CTM617	HL1814	ML0625	L2.5.,L3.0
	2525M12	●	●		25	25	150	34	25	32					
	3232P12	○			32	32	170	34	32	40					
	2525M15			SN□□1506□□	25	25	150	36	25	32	MS1504	CTM822	HL2217	ML0830	L3.0,L4.0
	3232P15				32	32	170	45	32	40					
	3232P19			SN□□1906□□	32	32	170	45	32	40	MS1904	CTM1022	HL2217	ML0830	L4.0
	4040S19				40	40	250	50	40	50					

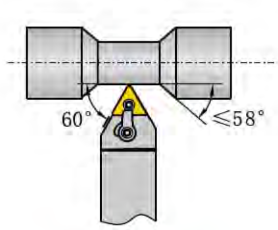
Type		Stock Item R	Stock Item L	Recommended inserts	h	b	L	e	H	F	Shim	Lever	Screw	Shim Pin	Wrench
PSSNR/L	2020K12			SN□□1204□□	20	20	125	26	20	25	MS1204B	LV4	VXH0821	SP4	L3.0
	2525M12				25	25	150	26	25	32					
	3232P12				32	32	170	26	32	40					
	2525M15			SN□□1506□□	25	25	150	32	25	32	MS1504B	LV5	VHX0825	SP5	L3.0
	3232P15				32	32	170	32	32	40					

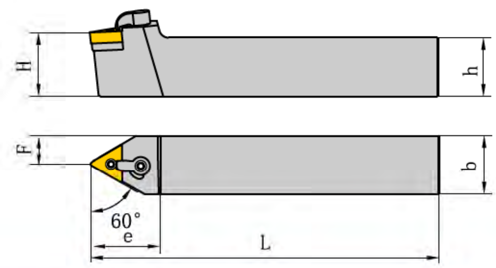
● stock item ○ be preparing for stock the others can be made to order

B2–3 External turning tools

MTENN

Kr=60°

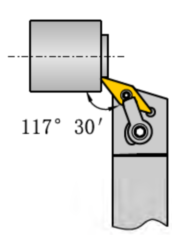


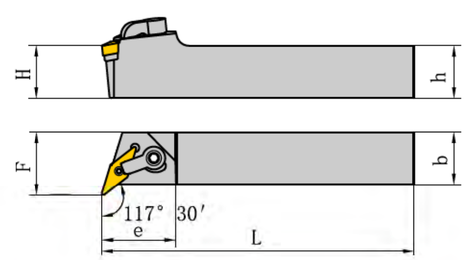


Type		Stock Item		Recommended inserts	Application						Parts				
					Turning						Shim	Pin	Clamp	Screw	Wrench
		R	L		h	b	L	e	H	F					
MTENN	2020K16	●		TN□□1604□□	20	20	125	35	20	10	MT1603	CTM513	HL1814	ML0625	L2.0.,L3.0
	2525M16	●			25	25	150	35	25	12.5					
	3232P16	○			32	32	170	35	32	16					
	4040S16				40	40	250	35	40	20					
	2525M22			TN□□2204□□	25	25	150	38	25	12.5	MT2204	CTM617	HL1917	ML0830	L2.5,L4.0
	3232P22				32	32	170	38	32	16					

MVQNR/L

Kr=117° 30 '





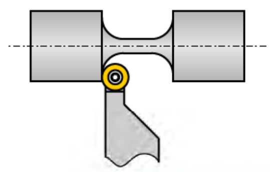
Type		Stock Item		Recommended inserts	Application						Parts				
					Turning.Facing.Profiling						Shim	Pin	Clamp	Screw	Wrench
		R	L		h	b	L	e	H	F					
MVQNR/L	2020K16	●	○	VN□□1604□□	20	20	125	40	25	32	MV1603	CTM513	HL2414	ML0625	L2.0,L3.0
	2525M16	●	○		25	25	150	40	25	32					
	3232P16	○			32	32	170	40	32	40					

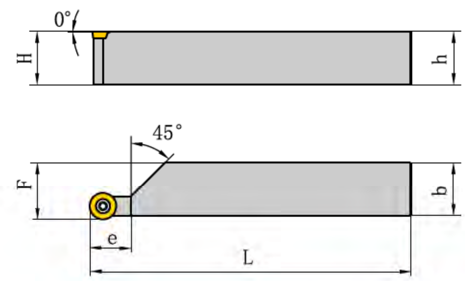
● stock item ○ be preparing for stock the others can be made to order

B2-3 External turning tools

SRACR/L

Kr=45°

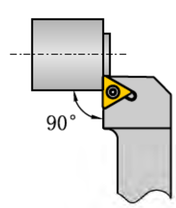


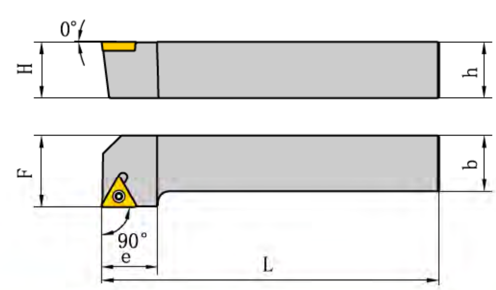


Type		Stock Item		Recommended inserts	Application						Parts	
					Turning						Screw	Wrench
		R	L		h	b	L	e	H	F		
SRACR/L	1616H08	●	○	RC□□0803□□	16	16	100	16	16	16.5	M2.5×8	T-8
	2020K08	●	○		20	20	125	16	20	20.5		
	2525M08	○			25	25	150	16	25	25.5		
	2020K10	●	○	RC□□1003□□	20	20	125	20.3	20	20.4	M3.5×9	T-15
	2525M10	○			25	25	150	20.3	25	25.4		

STGCR/L

Kr=90°





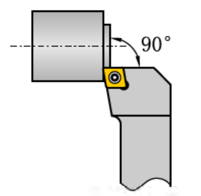
Type		Stock Item		Recommended inserts	Application						Parts	
					Turning						Screw	Wrench
		R	L		h	b	L	e	H	F		
STGCR/L	1616H11	●	○	TC□□1102□□	16	16	100	14	16	20	M2.5×8	T-8
	2020K16	●	○	TC□□16T3□□	20	20	125	20	20	25	M3.5×9	T-15
	2525M16	●	○		25	25	150	20	25	32		

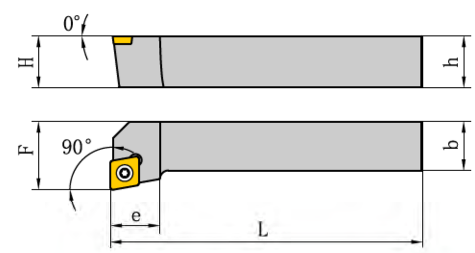
● stock item ○ be preparing for stock the others can be made to order

B2–3 External turning tools

SCFCR/L

Kr=90°

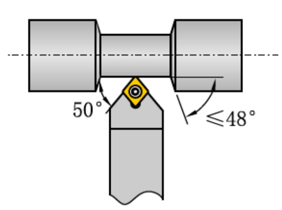


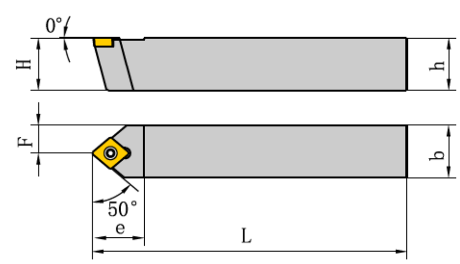


Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning h	b	L	e	H	F	Parts Screw	Parts Wrench
SCFCR/L	1212E06	●		CC□□0602□□	12	12	70	16	12	16	M2.5×8	T-8

SCMCN

Kr=50°





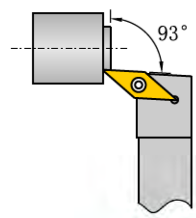
Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning h	b	L	e	H	F	Parts Screw	Parts Wrench
SCMCN	1010E06	●		CC□□0602□□	10	10	70	13	10	5	M2.5×8	T-8
	1212F09	●		CC□□09T3□□	12	12	80	15	12	6	M3.5×9	T-15
	1616H09				16	16	100	15	16	8		
	2020K09				20	20	125	15	20	10		
	2525M09				25	25	150	15	25	12.5		
	2020K12			CC□□1204□□	20	20	125	20	20	10	M5×12	T-20
	2525M12				25	25	150	20	25	12.5		

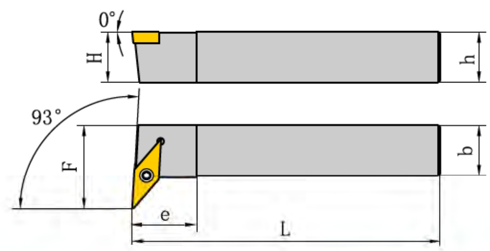
● stock item ○ be preparing for stock the others can be made to order

B2–3 External turning tools

SVU□R/L

Kr=93°

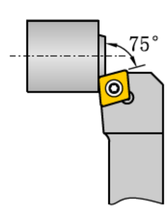


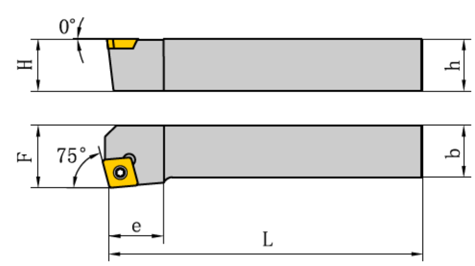


Type		Stock Item		Recommended inserts	Application						Parts	
					Turning						Screw	Wrench
		R	L		h	b	L	e	H	F		
SVUBR/L	2020K16	○		VB□□1604□□	20	20	125	16	20	30	M3.5×9	T-15
	2525M16	○			25	25	150	16	25	35		
SVUCR/L	2020K16	○		VC□□1604□□	20	20	125	16	20	30	M3.5×9	T-15
	2525M16	○			25	25	150	16	25	35		

SCKCR/L

Kr=75°





Type		Stock Item		Recommended inserts	Application						Parts	
					Turning						Screw	Wrench
		R	L		h	b	L	e	H	F		
SCKCR/L	2020K09	●	○	CC□□09T3□□	20	20	125	23	20	25	M3.5×9	T-15
	2525M09	●	○		25	25	150	23	25	32		
	2020K12			CC□□1204□□	20	20	125	28	20	25	M5×12	T-20
	2525M12				25	25	150	28	25	32		

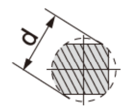
● stock item ○ be preparing for stock the others can be made to order

B2-4 Internal turning tools code key

Toolholders type

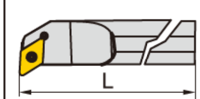
Code	Type
A	Steel Pole With Inner cooler hole
C	Cemented carbide toolholder
E	Cemented carbide toolholder with Inner cooler hole
S	Steel Pole
X	For special inserts

Diameter



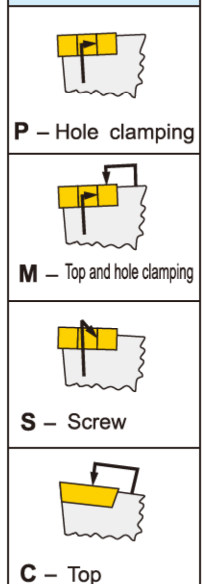
Code	Diameter
08	08
10	10
16	16
20	20
25	25
32	32
40	40
50	50

Length oftoolholder

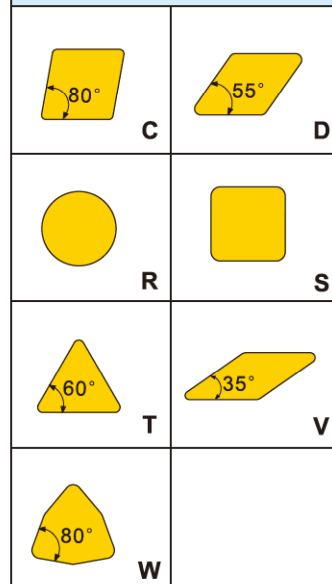


Code	Length
H	100
K	125
M	150
N	160
Q	180
R	200
S	250
T	300
U	350
V	400

Clamping system

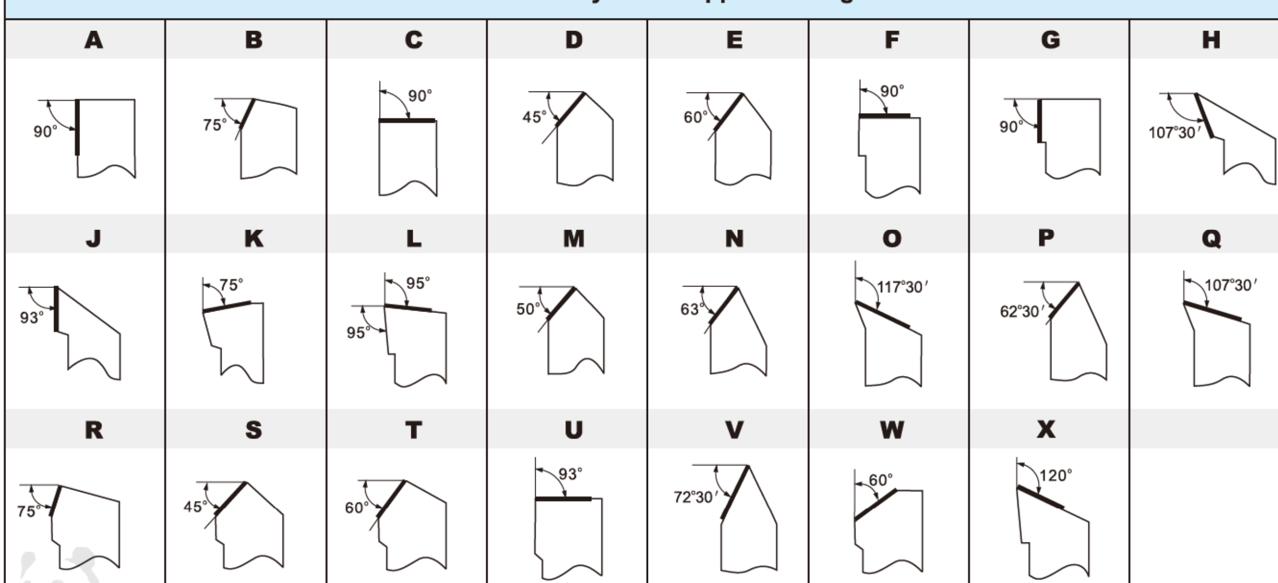


Inserts shape



S 16 R - S D U

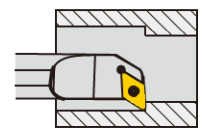
Tool holder style and approach angle



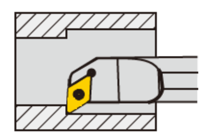
B General Turning

Inserts clearance angle	
5°	B
7°	C
15°	D
20°	E
0°	N
11°	P

Cutting direction



L - Left hand



R - Right hand

Manufacturers of options	
D	Increase offset f size+1. 0mm
E	Increase offset f size+2. 0mm
R	Round shank
W	Wedge clamping
X	Back boring

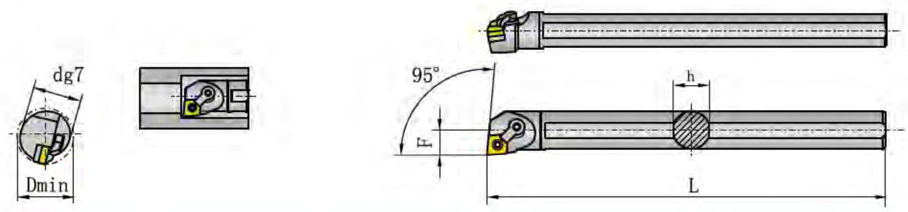
C R 07

Length of cutting edge

Inserts shape	C	D	R	S	T	V	W
	80°	55°			60°	35°	80°
Inscribed circle (mm)	Length of cutting edge (mm)						
5.56	—	—	—	—	09	—	—
6.35	06	07	—	—	11	—	—
9.525	09	11	09	09	16	16	06
12.7	12	15	12	12	22	22	08
15.875	16	19	15	15	27	—	—
19.05	19	—	19	19	33	—	—
25.4	25	—	25	25	44	—	—

B2-5 Internal turning tools

MCLNR/L



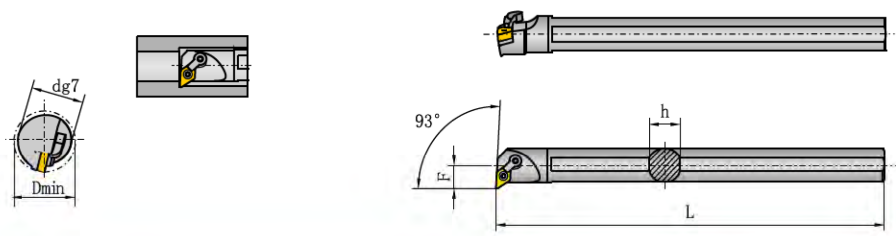
Type		Stock Item		Recommended inserts	Application							SpareParts				
					Through-hole maching							Shim	Pin	Clamp	Screw	Wrench
					Minimum processing diameter	Φd	F	L	h	α°						
S20Q	-MCLNR/L12	●	●	CN□□1204□□	25	20	13	180	19	15		X	CTM613	HL1810	ML0620	L2.5,L3.0
S25R		●	●		32	25	17	200	24	12				HL1814	ML0625	
S32S		●	●		40	32	22.5	250	30	17		MC1204	CTM617			
S40T		●	○		50	40	27	300	38	15						
S45U		○			55	45	29.5	350	43	15						
S50U					60	50	31	350	48	12						
S60V					70	60	36	400	58	10						
S50U	-MCLNR/L19			CN□□1906□□	60	50	31	350	48	12		MC1904	CTM1022	HL2217	ML0803	L4.0

● stock item ○ be preparing for stock the others can be made to order

B General Turning

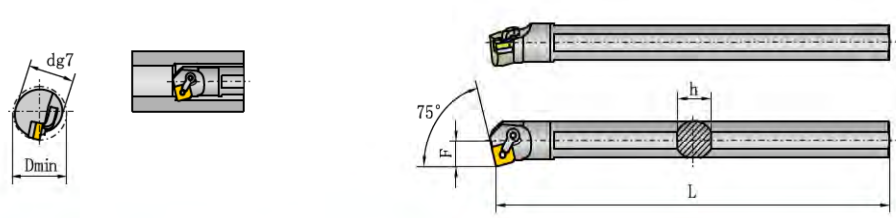
B2-5 Internal turning tools

MDUNR/L



Type		Stock Item		Recommended inserts	Application: Through-hole maching: Minimum processing diameter	Φd	F	L	h	α°	SpareParts: Shim	Pin	Clamp	Screw	Wrench
S25R	-MDUNR/L15	●	●	DN□□1504□□	32	25	17	200	24	12	X	CTM613	HL2114	ML0625	L2.5,L3.0
S32S		●	●		40	32	22.5	250	30	17	MD1504	CTM617			
S40T		○			50	40	27	300	38	15					
S50U					60	50	32	350	48	12					
*H25R	-MDUNR/L15B				32	25	17	200	24	12	X	CTM613			
*H32S					40	32	22.5	250	30	17	MD1504	CTM617			
*H40T					50	40	26	300	38	15					
*H50U					60	50	33	350	48	12					

MSKNR/L

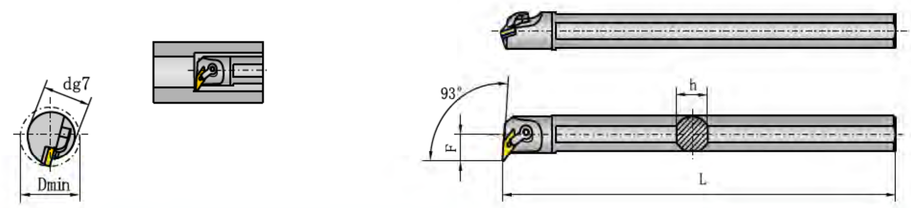


Type		Stock Item		Recommended inserts	Application: Through-hole maching: Minimum processing diameter	Φd	F	L	h	α°	SpareParts: Shim	Pin	Clamp	Screw	Wrench
S20Q	-MSKNR/L12	●	○	SN□□1204□□	25	20	13	180	19	15	X	CTM613	HL1810	ML0620	L2.5,L3.0
S25R		●	○		32	25	17	200	24	12			HL1814	ML0625	
S32S		●	○		40	32	22	250	30	17	MC1204	CTM617			
S40T		○			50	40	27	300	38	15					
S45U					55	45	30	350	43	15					
S50U					63	50	34	350	48	12					

● stock item ○ be preparing for stock the others can be made to order

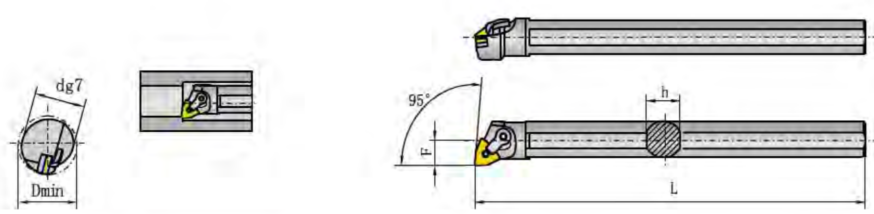
B2-5 Internal turning tools

MVUNR/L



Type		Stock Item		Recommended inserts	Application: Through-hole maching: Minmum processing diameter	Φd	F	L	h	α°	SpareParts: Shim	Pin	Clamp	Screw	Wrench
S25R	-MVUNR/L16	●	○	VN□□1604□□	36	25	20	200	24	12	X	CTM510	HL2414	ML0620	L2.5,L3.0
S32S		●	○		42	32	22	250	30	17	MV1603	CTM513			
S40T		○			50	40	27	300	38	15					
S50U					63	50	32	350	48	12					
*H25R	-MVUNR/L16B				36	25	20	200	20	12	X	CTM510			
*H32S					42	32	22	250	30	17	MV1603	CTM513			
*H40T					50	40	27	300	38	15					
*H50U					63	50	32	350	48	12					

MWLNR/L

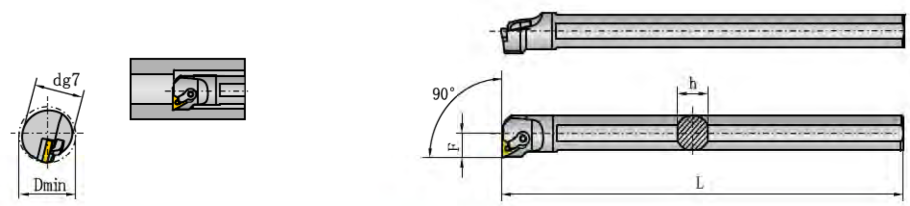


Type		Stock Item		Recommended inserts	Application: Through-hole maching: Minmum processing diameter	Φd	F	L	h	α°	SpareParts: Shim	Pin	Clamp	Screw	Wrench
S16N	-MWLNR/L06	●	○	WN□□0604□□	22	16	11	160	15	18	X	CTM510	HL1511	ML0518	L2.0,L2.5
S20Q		●	○		25	20	13	180	19	15				ML0520	
S25R		●	○		32	25	17	200	24	12					
S20Q	-MWLNR/L08	●	●	WN□□0804□□	25	20	13	180	19	15		CTM613	HL1810	ML0620	L2.5
S25R		●	●		32	25	17	200	24	12			HL1814	ML0625	L2.5,L3.0
S32S		●	●		41	32	22	250	30	17	MW0804	CTM617			
S40T		●	○		50	40	27	300	38	15					
S50U		○			60	50	31	350	48	12					

● stock item ○ be preparing for stock the others can be made to order

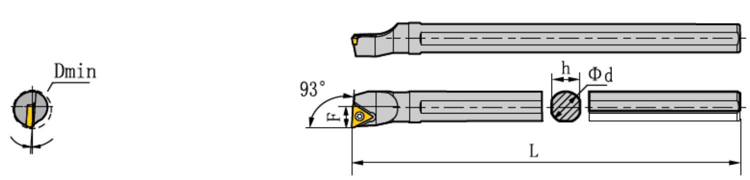
B2–5 Internal turning tools

MTFNR/L



Type		Stock Item		Recommended inserts	Application							SpareParts				
					Through–hole-maching							Shim	Pin	Clamp	Screw	Wrench
					Minmum processing diameter	Φd	F	L	h	α°						
S20Q	-MTFNR/L16	●	○	TN□□1604□□	25	20	13	180	19	15		X	CTM510	HL1810	ML0620	L2.0,L3.0
S25R		●	○		32	25	17	200	24	12				HL1814	ML0625	
S32S		●	○		41	32	22.5	250	30	17		MT1603	CTM513			
S40T		○			50	40	27	300	38	15						
S50U					60	50	31	350	48	12						
S40T	-MTFNR/L22			TN□□2204□□	50	40	27	300	38	15		MT2204	CTM617	HL1917	M;0830	L2.0,L4.0
S50U					60	50	31	350	48	12						

STUPL/R

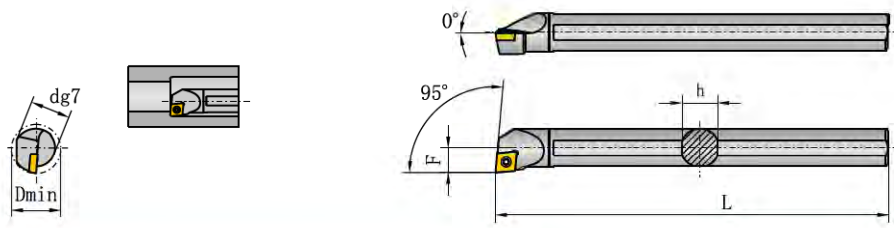


Type		Stock Item		Recommended inserts	Application							SpareParts	
					Profiling ,Through hole machining							Screw	Wrench
		R	L		Minmum processing diameter	Φd	F	L	h	α°			
S10K	-STUPR/L1103	●	○	TC□□1103□□	13	10	7	125	9	12		M3×8	T-8
S12M		●	○		16	12	8	150	11	10			
S16N		●	○		20	16	10	160	15	8			
S20Q		●	○		24	20	13	180	19	6			
S20Q	-STUPR/L16	●	○	TC□□1604□□	24	20	13	180	19	4		M3.5×9	T-15
S25R		○	○		32	25	17	200	24	2			
S32S					39	32	22	250	32	0			
S40T					50	40	27	300	38	0			
S50U					60	50	31	350	48	0			

● stock item ○ be preparing for stock the others can be made to order

B2–5 Internal turning tools

SCLCL/R

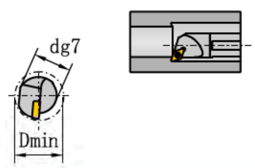


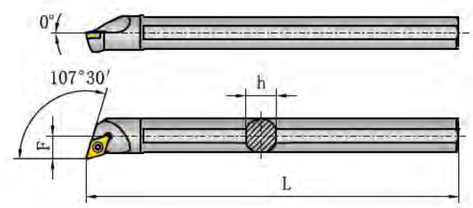
Type		Stock Item R	Stock Item L	Recommended inserts	Application Turning: Minimum processing diameter	Φd	F	L	h	θ°	SpareParts: Screw	SpareParts: Wrench
S07K	-SCLCR/L06	●	●	CC□□0602□□	9	7	5	125	7	15	M2.5×6	T-8
S08K		●	●		10	8	5.5	125	7	13		
S08K	-SCLCR/L06-A16	●	●		12	8	5	125	15	13		
S09K		●	●		12	9	5	125	15	13		
S10K	-SCLCR/L06	●	●		13	10	7	125	9	12		
S10K	-SCLCR/L06-A16	●	●		13	10	6	125	15	12		
S12M	-SCLCR/L06	●	●		16	12	5.5	150	11	10		
S12M	-SCLCR/L09	●	●	CC□□09T3□□	16	12	9	150	11	12	M3.5×9	T-15
S14M	-SCLCR/L09-A16	●	●		17	14	9	180	19	12		
S16N	-SCLCR/L09	●	●		20	16	11	160	15	10		
S20Q		●	●		25	20	13	180	19	8		
S25R		●	●		31	25	17	200	24	6		
S32S		●	●		39	32	22	250	30	4		
S20Q	-SCLCR/L12	●	●	CC□□1204□□	25	20	13	180	19	8	M5×12	T-20
S25R		●	●		32	25	17	200	24	8		
S32S		●			39	32	22	250	30	6		
S40T		○			50	40	27	300	38	4		

● stock item ○ be preparing for stock the others can be made to order

B2–5 Internal turning tools

SDQCL/R



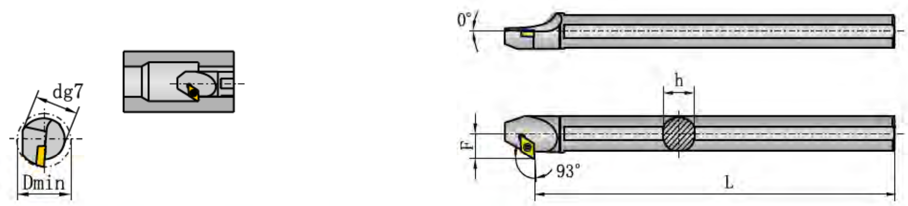


Type		Stock Item R	Stock Item L	Recommended inserts	Application: Turning, Facing, Profiling — Minimum processing diameter	Φd	F	L	h	θ°		SpareParts: Screw	SpareParts: Wrench
S10K	-SDQCR/L07	●	●	DC□□0702□□	19	10	7	125	9	10		M2.5×6	T-8
S12M		●	●		23	12	9	150	11	8			
S16N		●	●		27	16	11	160	15	6		M2.5×8	
S20Q	-SDQCR/L11	●	●	DC□□11T3□□	25	20	13	180	19	6		M3.5×9	T-15
S25R		●	●		32	25	17	200	24	4			
S32S		●	○		40	32	22	250	30	4			
*H10K	-SDQCR/L07B			DC□□0702□□	13	10	7	125	9	10		M2.5×8	T-8
*H12M					16	12	9	150	11	8			
*H16N					20	16	10.5	160	15	6			
*H20Q	-SDQCR/L11B			DC□□11T3□□	25	20	13	180	19	6		M3.5×9	T-15
*H25R					32	25	16	200	24	4			
*H32S					39	32	20	250	30	4			

● stock item ○ be preparing for stock the others can be made to order

B2-5 Internal turning tools

SDUCL/R



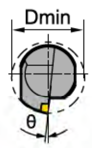
Type		Stock Item		Recommended inserts	Application							SpareParts	
					Facing, Through hole,Brad hole machining							Screw	Wrench
		R	L		Minimum processing diameter	Φd	F	L	h	θ°			
S10K		●	●		15	10	8	125	9	10			
S12M	-SDUCR/L07	●	●	DC□□0702□□	17	12	9	150	11	8		M2.5×6	T-8
S16N		●	●		22	16	11	160	15	6			
S20Q		●	●		25	20	13	180	19	6			
S25R		●	●		32	25	17	200	24	4			
S32S	-SDUCR/L11	●	○	DC□□11T3□□	39	32	22	250	30	4		M3.5×9	T-15
S40T					50	40	27	300	38	2			
S50U					60	50	31	350	48	0			
*H10K					15	10	8	125	9	10			
*H12M	-SDUCR/L07B			DC□□0702□□	17	12	9	150	11	8		M2.5×6	T-8
*H16N					22	16	11	160	15	6			
*H20Q					25	20	13	180	19	6			
*H25R					32	25	16	200	24	4			
*H32S	-SDUCR/L11B			DC□□11T3□□	39	32	20	250	30	4		M3.5×9	T-15
*H40T					50	40	24	300	38	2			
*H50U					60	50	29	350	48	0			
★C10H					13	10	7	100	9.5	8			
★C12K	-SDUCR/L07			DC□□0702□□	16	12	9	125	11	8		M2.5×6	T-8
★C16M					20	16	11	150	15	6			
★C20Q	-SDUCR/L11			DC□□11T3□□	25	20	13	180	19	6		M3.5×9	T-15
★C25R					32	25	17	200	24	6			

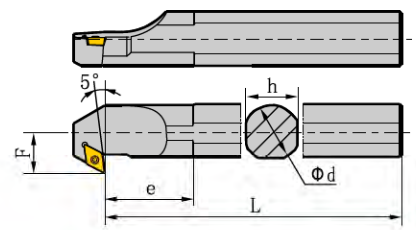
● stock item ○ be preparing for stock the others can be made to order

B General Turning

B2–5 Internal turning tools

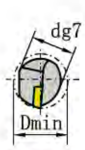
SDZCL/R

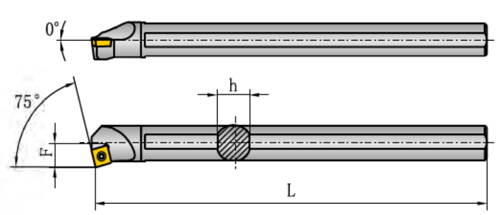




Type		Stock Item R	Stock Item L	Recommended inserts	Application: Profiling ,Through hole machining – Minimum processing diameter	Φd	F	L	e	h	θ°	SpareParts: Screw	SpareParts: Wrench
S10K	-SDZCR/L07	●	●	DC□□0702□□	15	10	8.5	125	30	9	12	M2.5×8	T-8
S12M		●	●		18	12	10	150	30	11	10		
S16N		●	●		24	16	13	160	30	15	8		
S20Q	-SDZCR/L11	●	●	DC□□11T3□□	28	20	15	180	40	19	8	M3.5×9	T-15
S25R		●	●		34	25	18	200	45	24	6		
S32S		●	○		38	32	22	250	50	30	4		
*H10K	-SDZCR/L07B			DC□□0702□□	15	10	8.5	125	30	9	12	M2.5×8	T-8
*H12M					18	12	9.5	150	30	11	10		
*H16N					24	16	11.5	160	30	15	8		
*H20Q	-SDZCR/L11B			DC□□11T3□□	28	20	14.5	180	40	19	8	M3.5×9	T-15
*H25R					34	25	17	200	45	24	6		

SSKCL/R



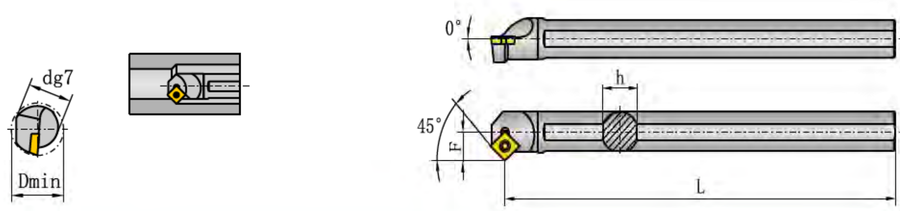


Type		Stock Item R	Stock Item L	Recommended inserts	Application: Through hole machining – Minimum processing diameter	Φd	F	L	h	θ°		SpareParts: Screw	SpareParts: Wrench
S12M	-SSKCR/L09	●	○	SC□□09T3□□	16	12	8.5	150	11	12		M3.5×9	T-15
S16N		●	○		20	16	11	160	15	10			
S20Q		●	○		24	20	13	180	19	8			
S25R		○	○		31	25	17	200	24	6			
S12M	-SSKPR/L09			SP□□0903□□	16	12	8.5	150	11	8			
S16N					20	16	11	160	15	6			

● stock item ○ be preparing for stock the others can be made to order

B2-5 Internal turning tools

SSSCR/L

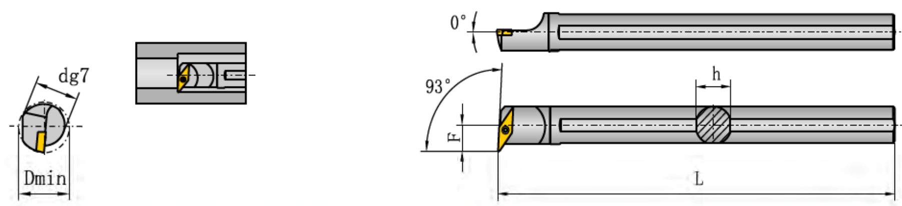


Type		Stock Item R	Stock Item L	Recommended inserts	Application: Through hole machining, Chamfering — Minimum processing diameter	Φd	F	L	h	α°	SpareParts: Screw	SpareParts: Wrench
S12M	-SSSCR/L09	●	●	SC□□09T3□□	16	12	8.5	150	11	12	M3.5×9	T-15
S16N		●	●		22	16	11.5	160	15	10		
S20Q		●	○		26	20	13.5	180	19	8		
S25R		○	○		31	25	17	200	24	6		
S32S		○	○		38	32	22	250	30	4		
*H12M	-SSSCR/L09B				16	12	8.5	150	11	12		
*H16N					22	16	11.5	160	15	10		
*H20Q					26	20	13.5	180	19	8		
*H25R					31	25	16	200	24	6		
*H32S					38	32	19.5	250	30	4		
S12M	-SSSPR/L09			SP□□09T3□□	16	12	9	150	11	8	M3.5×9	T-15
S16N					20	16	11	160	15	6		
S20Q					24	20	13	180	19	4		
S25R					32	25	17	200	24	4		
S32S					40	32	22	250	30	0		

● stock item ○ be preparing for stock the others can be made to order

B2–5 Internal turning tools

SVU□L/R



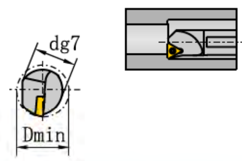
Type		Stock Item R	Stock Item L	Recommended inserts	Application / Profiling: Minimum processing diameter	Φd	F	L	h	θ°	SpareParts: Screw	SpareParts: Wrench
S16N	-SVUBR/L11	●	●	VB□□1103□□	22	16	11.5	160	15	10	M2.5×8	T-8
S20Q		●	●		27	20	14	180	19	8		
S20Q	-SVUBR/L16	●	●	VB□□1604□□	31	20	19	180	19	8	M3.5×9	T-15
S25R		●	○		35	25	20	200	24	6		
S32S		○	○		42	32	22.5	250	30	8		
S40T					51	40	27	300	38	6		
S50U					60	50	32	350	48	4		
*H16N	-SVUBR/L11B			VB□□1103□□	22	16	11.5	160	15	10	M2.5×8	T-8
*H20Q					27	20	14	180	19	8		

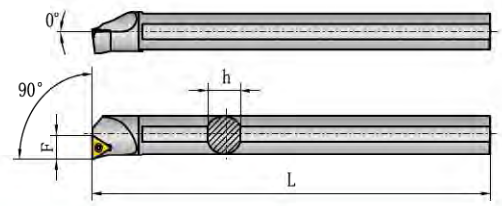
Type		Stock Item R	Stock Item L	Recommended inserts	Application / Throught hole machining, Chamfering: Minimum processing diameter	Φd	F	L	h	θ°	SpareParts: Screw	SpareParts: Wrench
S16N	-SVUCR/L11	●	●	VC□□1103□□	22	16	11.5	160	15	10	M2.5×8	T-8
S20Q		●	●		27	20	14	180	19	8		
S20Q	-SVUCR/L16	●	●	VC□□1604□□	31	20	14	180	19	8	M3.5×9	T-15
S25R		●	●		35	25	17	200	24	6		
S32S		●	●		42	32	22.5	250	30	8		
S40T		○			51	40	27	300	38	6		
S50U					60	50	32	350	48	4		
*H20Q	-SVUCR/L16B			VC□□1604□□	31	20	19	180	19	8		
*H25R					35	25	20	200	24	6		
*H32S					42	32	22.5	250	30	8		
*H40T					51	40	27	300	38	6		
*H50U					60	50	32	350	48	4		

● stock item ○ be preparing for stock the others can be made to order

B2-5 Internal turning tools

STFCL/R





B General Turning

Type		Stock Item		Recommended inserts	Application							SpareParts	
					Facing, Through hole,Brad hole machining							Screw	Wrench
		R	L		Minmum processing diameter	Φd	F	L	h	θ°			
S08K	-STFCR/L09	●	●	TC□□0902□□	11	8	6	125	7	15		M2.5×6	T-8
S10K		●	●		13	10	7	125	9	13			
S12M		●	●		16	12	8.5	150	11	10			
S10K	-STFCR/L11	●	●	TC□□1102□□	13	10	7	125	9	12			
S12M		●	●		16	12	8.5	150	11	10			
S16N		●	●		20	16	11	160	15	8			
S20Q		●	●		25	20	13	180	19	6			
S20Q	-STFCR/L16	●	●	TC□□16T3□□	25	20	13	180	19	8		M3.5×9	T-15
S25R		●	●		31	25	17	200	24	6			
S32S		●	●		39	32	22	250	30	4			
S40T		●	●		50	40	27	300	38	2			
S50U		○			60	50	31	350	48	0			

● stock item ○ be preparing for stock the others can be made to order

C Parting and grooving

C1 Parting and grooving blade materials

P Process on steel

Grade	ISO classification	Surface colour	Applications Recommended
BPS253	P20(P15-P30)	Yellow	CVD coated carbide grade, Universal grade, suitable for steel and cast steel continuous cutting and interrupted cutting finishing to roughing. Grades with a wide range of applications. Stainless steel continuous cutting and interrupted cutting.
BPS373	P30(P25-P40)	Yellow	CVD coated carbide grade, high-strength alloy substrate with thick wear-resistant coating. Machining steel and cast steel in bad conditions. Edge line security for interrupted cutting high metal removal rate.
BPG20B	M25(M10-M30)	Cyan-blue gray dark	PVD coated micro-grain carbide.Use for a variety of stainless steel finishing at medium to low cutting speed. When need excellent edge strength and high surface quality, provide the perfect ride cutting. A high thermal shock resistance. Suitable for light interrupted cuts.
BPG30B	M35(M25-M40)	Cyan-blue gray dark	PVD coated carbide.For austenitic stainless steels and duplex stainless steel semi-finishing to roughing at low to medium cutting speed.High thermal shock resistance. Ideal for quickly interrupted cutting.

M Process on stainless steel

Grade	ISO classification	Surface colour	Applications Recommended
BPG05B	M10(M05-M15)	Cyan-blue gray dark	With high hot hardness and good resistance to plastic deformation. Suitable for high speed cutting and finishing process of austenitic stainless steel, quenched steel and carbon steel
BPG20B	M25(M10-M30)	Cyan-blue gray dark	PVD coated micro-grain carbide.Use for a variety of stainless steel finishing at medium to low cutting speed. When need excellent edge strength and high surface quality, provide the perfect ride cutting. A high thermal shock resistance. Suitable for light interrupted cuts.
BPG30B	M35(M25-M40)	Cyan-blue gray dark	PVD coated carbide.For austenitic stainless steels and duplex stainless steel semi-finishing to roughing at low to medium cutting speed.High thermal shock resistance. Ideal for quickly interrupted cutting.

C1 Parting and grooving blade materials

K Process on cast iron

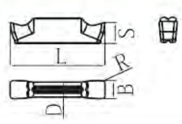
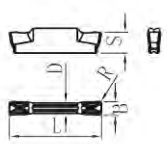
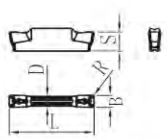
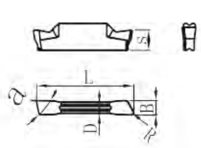
Grade	ISO classification	Surface colour	Applications Recommended
BPS253	K25 (K10-K30	Yellow	CVD coated carbide grade, Universal grade, suitable for steel and cast steel continuous cutting and interrupted cutting finishing to roughing. Grades with a wide range of applications. Stainless steel continuous cutting and interrupted cutting.

N Process on Non-ferrous metals

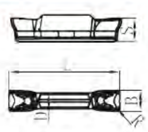
Grade	ISO classification	Surface colour	Applications Recommended
BU810	N10 (N05-N15)		Uncoated carbde grade, with good sharpness , best used for aluminum cutting process and aluminum interruped cutting process.
BK10	N10 (N10-N20)		High wear resistance, the use of high strength, suitable for machining of chilled alloy cast iron and steel, and ordinary cast iron processing.
BPG05B	N05 (N05-N10)	Cyan-blue gray dark	PVD coated carbide grade for milling typical hardened steel and plastic mold steel,processing hardness above HRC36.

S Heat Resistant alloys

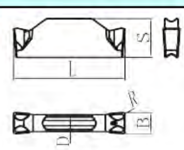
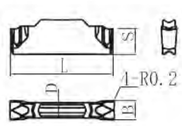
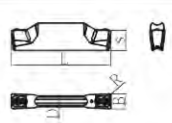
Grade	ISO classification	Surface colour	Applications Recommended
BPG118	S05-S15	Purple yellow	CVD coated carbide grade for gray cast iron and ductile cast iron semi-finishing to roughing milling, mainly used in dry conditions. Under low to medium cutting speed the cutting tools can have a long tool life.
BPG218	S15(S15-S30)	Purple yellow	PVD coated carbide grade have good ability to avoid built-up edge and good resistance to plastic deformation capacity. For unstable conditions, such as long cutting edge, clogging, deep shoulder milling, long overhang, milling processes. Light milling of stainless steel; combine grinding blade for viscous and hardening materials; moderate speed milling of heat resistant alloys; hardened parts milling at low feed and medium-speed.

The basic shape of inserts		Type		Dimension (mm)					Grade recommended						
									CVD coating grade		PVD coating grade			Uncoated grade	
				B	R	L	D/a	S	BPS253	BPS371	BPG05B	BPG20B	BPG30B	BU810	BU820
		MGGN	200-LH	2	0.2	16	1.5	3.5			★			★	
			300-LH	3	0.2	21	2.35	4.8			★			★	
			400-LH	4	0.3	21	3.3	4.8			★			★	
			500-LH	5	0.3	25.86	4.12	5.8			★			★	
			600-LH	6	0.4	26	5	5.8			★			★	
		MGMN	200-L	2	0.2	16	1.2	3.5	★			★			
			250-L	2.5	0.2	16	1.6	3.5	★			★			
			300-L	3	0.3	21	2.35	4.8	★			★			
			400-L	4	0.3	21	3.3	4.8	★			★			
			500-L	5	0.3	26	4.1	5.8	★			★			
		MGMN	200-H	2	0.2	16	1.2	3.5	★			★			
			250-H	2.5	0.2	18.5	2	3.85	★			★			
			300-H	3	0.3	21	2.35	4.8	★			★			
			400-H	4	0.3	21	3.3	4.8	★			★			
			500-H	5	0.3	26	4.1	5.8	★			★			
		MGGN	200-6D	2	0.2	16	6°	3.5	★			★			
			250-6D	2.5	0.2	18.5	6°	3.85	★			★			
			300-6D	3	0.4	21	6°	4.8	★			★			
			400-6D	4	0.4	21	6°	4.8	★			★			
			500-6D	5	0.4	26	6°	5.8	★			★			
		MGGN	200-30D	2	0.2	16	30°	3.5	★			★			
			250-30D	2.5	0.2	18.5	30°	3.85	★			★			
			300-30D	3	0.4	21	30°	4.8	★			★			
			400-30D	4	0.4	21	30°	4.8	★			★			
			500-30D	5	0.4	26	30°	5.8	★			★			

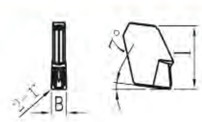
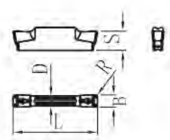
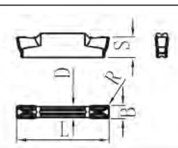
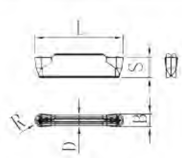
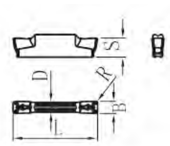
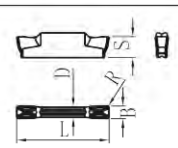
★ Recommended grade ☆ Optional grade

The basic shape of inserts		Type	Dimension（mm）					Material recommended									
								CVD coating grade			PVD coating grade					Uncoated grade	
			B	R	L	D	S	BPC122	BPS321	BPS411	BPG108	BPG05B	BPG20B	BPG25B	BPG30B	BK10	BU810
		GR/LIP300-M	3	0.30	19	2.1	5.4									☆	★
		GR/LIP400-M	4	0.40	18.93	2.85	5.85	★	☆		★	★	★	★	☆		
		GR/LIP500-M	5	0.40	19	3.4	5.75		☆	★	☆		★	★	☆		

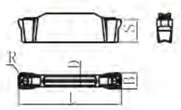
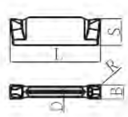
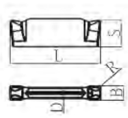
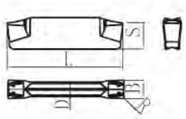
Provide modular tool bar system for details: P152

The basic shape of inserts		Type	Dimension（mm）					Grade recommended							
								CVD coating grade		PVD coating grade			Uncoated grade		
			B	R	L	D	S	BPS253	BPS371	BPG20B	BPU206	BPG308	BU810	BU820	BP35
		TDJ2	2	0.2	20	1.7	3.9	★		★					
		TDJ3	3	0.2	20	2.4	4	★		★					
		TDJ4	4	0.3	19.76	3	4.05	★		★					
		TDJ5	5	0.3	25	4	4.89	☆		☆					
		TDC2	2	0.2	20	1.7	3.84	★		★					
		TDC3	3	0.2	20	2.4	4	★		★					
		TDC4	4	0.3	20	3	4.03	★		★					
		TDC5	5	0.3	25	4	4.89	★		★					
		TDT2	2	0.2	20	1.7	3.9	★		★					
		TDT3	3	0.2	20	2.4	4	★		★					
		TDT4	4	0.3	19.76	3	4.05	★		★					
		TDT5	5	0.3	25	4	4.89	☆		☆					

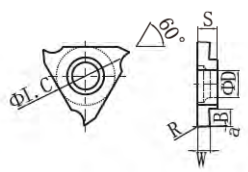
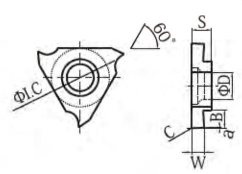
★ Recommended grade ☆ Optional grade

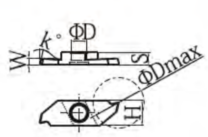
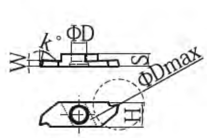
The basic shape of inserts		Type		Dimension (mm)					Grade recommended							
									CVD coating grade		PVD coating grade			Uncoated grade		
				B	R	L	D	S	BPS253	BPS371	BPG20B	BPU206	BPG308	BU810	BU820	BP35
		BP	200	2.2	9.3	0.2			★		★					
			300	3.1	11.3	0.2			★		★					
			400	4.1	11.3	0.25			★		★					
			500	5.1	11.4	0.3			★		★					
		MGMN	200-M	2	0.2	16	1.2	3.5	★		★					
			250-M	2.5	0.2	18.5	2	3.85	★		★					
			300-M	3	0.4	21	2.35	4.8	★		★					
			400-M	4	0.4	21	3.3	4.8	★		★					
			500-M	5	0.8	26	4.1	5.8	★		★					
			600-M	6	0.8	26	5	5.8	★		★					
		MGMN	150-G	1.5	0.15	16	1.2	3.5	★		★					
			200-G	2	0.2	16	1.6	3.5	★		★					
			300-G	3	0.4	21	2.35	4.8	★		★					
			400-G	4	0.4	21	3.3	4.8	★		★					
		MRMN	200-M	2	1	16	1.5	3.5	★		★					
			300-M	3	1.5	21	2.35	4.8	★		★					
			400-M	4	2	21	3.3	4.8	★		★					
			500-M	5	2.5	25.86	4.12	5.8	★		★					
			600-M	6	3	26	5	5.8	★		★					
		MGGN	200-M	2	0.2	16	1.5	3.5	★		★					
			300-M	3	0.4	21	2.35	4.8	★		★					
			400-M	4	0.4	21	3.3	4.8	★		★					
			500-M	5	0.8	25.86	4.12	5.8	★		★					
			600-M	6	0.8	26	5	5.8	★		★					
		MGGN	150-G	1.5	0.15	16	1.2	3.5	★		★					
			200-G	2	0.2	16	1.6	3.5	★		★					
			300-G	3	0.4	21	2.35	4.8	★		★					
			400-G	4	0.4	21	3.3	4.8	★		★					

★ Recommended grade ☆ Optional grade

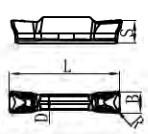
The basic shape of inserts		Type	Dimension（mm）					Grade recommended							
								CVD coating grade		PVD coating grade			Uncoated grade		
			B	R	L	D	S	BPS253	BPS371	BPG20B	BPU206	BPG308	BU810	BU820	BP35
		N123E2-0200-0004-BGF	2	0.4	20.6	1.63	4.44	★		★					
		N123E2-0260-0008-BGF	2.6	0.8	20.7	2	4.52	★		★					
		N123G2-0318-0008-GF	3.18	0.8	20.7	2.31	4.52	★		★					
		N123J2-0500-0004-BTF	5	0.4	25.2	4.3	4.6	★		★					
		DGN2202J	2.2	0.2	19.8	1.9	-	★		★					
		DGR_L2202J	2.2	0.2	20.8	1.84	-	★		★					
		DGR/L2202J-6D	2.2	0.2	20.6	1.84	6	★		★					
		DGR/L2200JS-6D	2.2	0.02	20.3	1.84	6	★		★					
		DGR/L2200JS-15D	2.2	0.02	20.3	1.84	15	★		★					
		DGN3102C	3.1	0.2	20	2.4	-	★		★					
		MGME 400-F	4	0.2	25.35	3.23	5.71	★		★					

★ Recommended grade ☆ Optional grade

The basic shape of inserts		Type		Dimension (mm)						Grade recommended							
										CVD coating grade		PVD coating grade			Uncoated grade		
				ΦI.C	S	Φd	B	W	R/C	BPS253	BPS371	BPG20B	BPU206	BPG308	BU810	BU820	BP35
		TGF32R/L	-033-005	9.525	3.18	4.4	0.8	0.33	0.05			★			★		
			-050-005	9.525	3.18	4.4	1.2	0.50	0.05			★			★		
			-065-010	9.525	3.18	4.4	2.0	0.65	0.10			★			★		
			-075-010	9.525	3.18	4.4	2.0	0.75	0.10			★			★		
			-100-010	9.525	3.18	4.4	2.0	1.00	0.10			★			★		
			-120-010	9.525	3.18	4.4	2.0	1.20	0.10			★			★		
			-125-010	9.525	3.18	4.4	2.0	1.25	0.10			★			★		
			-150-010	9.525	3.18	4.4	2.0	1.50	0.10			★			★		
			-175-010	9.525	3.18	4.4	2.0	1.75	0.10			★			★		
			-200-010	9.525	3.18	4.4	2.0	2.00	0.10			★			★		
		TGF32R/L	-075-C010	9.525	3.18	4.4	2.0	0.75	C0.1			★			★		
			-100-C010	9.525	3.18	4.4	2.0	1.00	C0.1			★			★		
			-120-C010	9.525	3.18	4.4	2.0	1.20	C0.1			★			★		
			-125-C010	9.525	3.18	4.4	2.0	1.25	C0.1			★			★		
			-150-C010	9.525	3.18	4.4	2.0	1.50	C0.1			★			★		
			-175-C010	9.525	3.18	4.4	2.0	1.75	C0.1			★			★		
			-200-C010	9.525	3.18	4.4	2.0	2.00	C0.1			★			★		

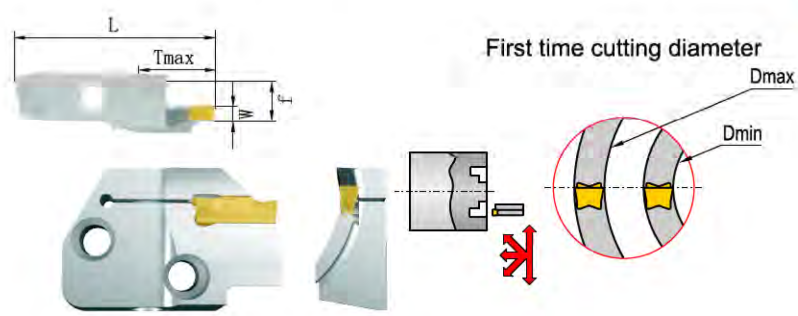
The basic shape of inserts		Type		Dimension (mm)								Grade recommended						
												CVD coating grade		PVD coating grade			Uncoated grade	
				最大切削直径	S	W	D	H	α	k	R	BPS253	BPS371	BPG20B	BPU206	BPG308	BU810	BU820
		KGF12R/L	-050-15-00	5	3.0	0.50	4.4	8.0	15°	0°	0.05			★			☆	
			-070-15-00	8	3.0	0.70	4.4	8.0	15°	0°	0.05			★			☆	
			-100-15-00	12	3.0	1.00	4.4	8.0	15°	0°	0.05			★			☆	
			-125-15-00		3.0	1.25	4.4	8.0	15°	0°	0.05			★			☆	
			-150-15-00		3.0	1.50	4.4	8.0	15°	0°	0.05			★			☆	
			-175-15-00		3.0	1.75	4.4	8.0	15°	0°	0.05			★			☆	
			-200-15-00		3.0	2.00	4.4	8.0	15°	0°	0.05			★			☆	
		KGF12R/L	-050-15-08	5	3.0	0.50	4.4	8.0	15°	8°	0.05			★			☆	
			-070-15-08	8	3.0	0.70	4.4	8.0	15°	8°	0.05			★			☆	
			-100-15-08		3.0	1.00	4.4	8.0	15°	8°	0.05			★			☆	
			-125-15-08	12	3.0	1.25	4.4	8.0	15°	8°	0.05			★			☆	
			-150-15-08		3.0	1.50	4.4	8.0	15°	8°	0.05			★			☆	
			-175-15-08		3.0	1.75	4.4	8.0	15°	8°	0.05			★			☆	
			-200-15-08		3.0	2.00	4.4	8.0	15°	8°	0.05			★			☆	

★ Recommended grade ☆ Optional grade

Insert shape		Type	Dimension（mm）					Material recommended									
								CVD coating grade			PVD coating grade					Uncoating grade	
			B	R	L	D	S	BPC122	BPS321	BPS411	BPG108	BPG05B	BPG20B	BPG25B	BPG30B	BK10	BU810
		GR/LIP300-M	3	0.30	19	2.1	5.4									☆	★
		GR/LIP400-M	4	0.40	18.93	2.85	5.85	★	☆		★	★	★	★	☆		
		GR/LIP500-M	5	0.40	19	3.4	5.75		☆	★	☆		★	★	☆		

		BPS321	BPS411	BPG05B	BPG20B	BPG30A	BU810
Application	P:steel	★	★	★	★	☆	
	M:stainless steel		☆	★	★	★	
	K:cast iron		★		☆		★
	N:non-ferrous metal						★

★Recommended grade and always stock available　　☆Recommended grade and produce according to order



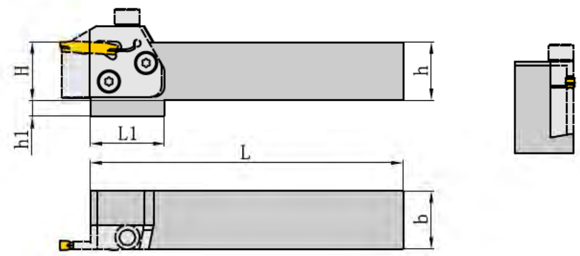
cutter head	size					Parts	Fit cutter body
left hand	W	Tmax	L	Dmin～Dmax	F	Inserts	
GDIR/L300025-12BG	3	12	48	25～30	10.3	GRIP300···	GDXL/R GDYL/R
GDIR/L300030-12BG		12	48	30～40			
GDIR/L300040-12BG		12	48	40～65			
GDIR/L300065-20BG		20	56	65～115			
GDIR/L300115-20BG		20	56	115～400			
GDIR/L400025-12BG	4	12	48	25～31	10.4	GRIP400···	GDXL/R GDYL/R
GDIR/L400031-12BG		12	48	31～44			
GDIR/L400044-16BG		16	52	44～58			
GDIR/L400058-16BG		16	52	58～88			
GDIR/L400088-16BG		16	52	88～175			
GDIR/L400175-22BG		22	58	175～800			
GDIR/L500040-16BG	5	16	52	40～50	10.5	GRIP500···	GDXL/R GDYL/R
GDIR/L500050-16BG		16	52	50～75			
GDIR/L500075-16BG		16	52	75～110			
GDIR/L500110-16BG		16	52	110～200			
GDIR/L500200-22BG		22	58	200～800			

Block-based grooving holder

new products 2015

Vertical holder body（0°）

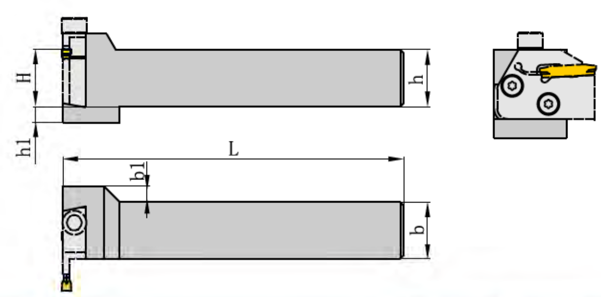

right hand



Type		size						Screw	Wrench	Fit cutter body
Left hand	right hand	h	b	H	L	L1	h1			
GDXL2020K	GDXR2020K	20	20	20	110	32	12	SIC060160	LT25	GDIL/R GDAL/R
GDXL2525M	GDXR2525M	25	25	25	135	32	7			
GDXL3225P	GDXR3225P	32	25	32	155	32	-			
GDXL3232P	GDXR3232P	32	32	32	155	32	-			
GDXL4040R	GDXR4040R	40	40	40	185	32	-			

horizontal holder body（0°）


right hand



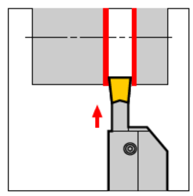
Type		size						Screw	Wrench	Fit cutter body
Left hand	right hand	h	b	H	L	b1	h1			
GDYL2020K	GDYR2020K	20	20	20	125	12	12	SIC060160	LT25	GDIL/R GDAL/R
GDYL2525M	GDYR2525M	25	25	25	150	7	7			
GDYL3225P	GDYR3225P	32	25	32	170	-	-			
GDYL3232P	GDYR3232P	32	32	32	170	-	-			
GDYL4040R	GDYR4040R	40	40	40	200	-	-			

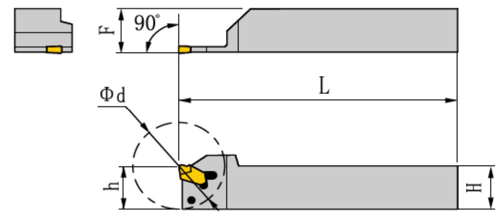
Note: the inserts head direction is in the opposite direction,for e.g:right head inserts should fit left head cutter body.

- Supply details: holder body is packed with spare parts, not including the cutter head and the inserts
- Order sample: GDYL4040R 1 pcs
- The cutter head and inserts need to be ordered separately

C3 Grooving tools

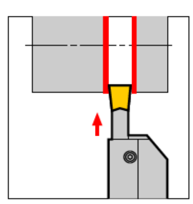
ZQ

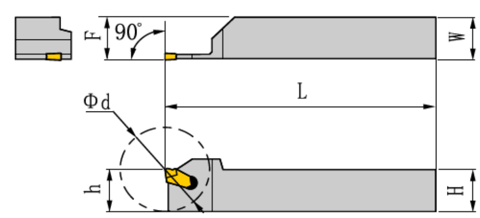




Type		Stock Item R	Stock Item L	Recommended inserts	Application: External Grooving, Parting off Φd	H	F	L	h	α°	Parts: Screw	Parts: Wrench
ZQ	1616R/L-03	●	●	BP300	30	16	16	100	16	16.3	M3.5×9	T-15
	2020R/L-03	●	●		38	20	20	125	20	20.3		
	2525R/L-03	●	●		38	25	25	150	25	25.3		
	2020R/L-04	●	●	BP400	38	20	20	125	20	20.4		
	2525R/L-04	●	●		38	25	25	150	25	25.4		

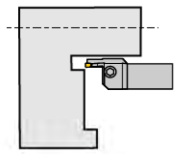
SPH

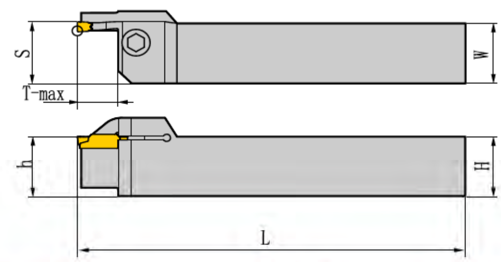




Type		Stock Item R	Stock Item L	Recommended inserts	Application: Parting off H=(h)	W	L	Φd	F(max)	Parts: Wrench
SPH	316R/L			BP300,300R/L	16	16	100	32	16.3	L5.0
	320R/L			BP300,300R/L	20	20	120	40	20.3	
	420R/L			BP400,400R/L	20	20	120	50	20.4	
	520R/L			BP500,500R/L	20	20	120	60	20.5	
	325R/L			BP300,300R/L	25	25	150	50	25.3	
	425R/L			BP400,400R/L	25	25	150	60	25.4	
	525R/L			BP500,500R/L	25	25	150	70	25.5	

● stock item ○ be preparing for stock the others can be made to order



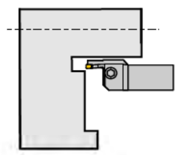


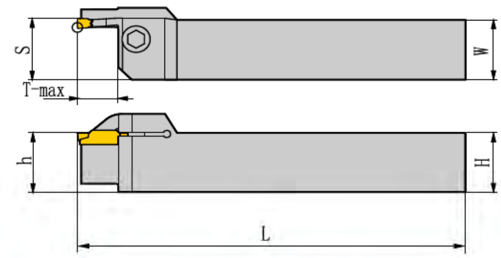
Type		Stock Item R	Stock Item L	Recommended inserts	Application External Grooving, Turning H=(h)	W	L	S	T(max)	Parts Screw	Parts Wrench
MGEHR/L	1616-1.5	○		MGMN150-G	16	16	100	16.25	14.5	LTX0512	L2.0
	2020-1.5	○			20	20	125	20.25	14.5		
	2525-1.5	○			25	25	150	25.25	14.5		
	1212-2.0			MGMN200-G	12	12	100	14.25	14.5	BHA0616	L5.0
	1616-2.0	○	○		16	16	100	16.25	14.5		
	2020-2.0	○	○		20	20	125	20.25	14.5		
	2525-2.0	○	○		25	25	150	25.25	14.5		
	1616-2.5	○	○	MGMN250-G	16	16	100	16.3	16.5	MHA0512	L4.0
	2020-2.5	○	○		20	20	125	20.3	16.5		
	2525-2.5	○	○		25	25	150	25.3	16.5		
	1616-3.0	●	●	MGMN300-M MRMN300-M	16	16	100	16.35	18.5	BHA0616	L5.0
	2020-3.0	●	●		20	20	125	20.4	18		
	2020-3.0-T10	●			20	20	125	20.4	10		
	2525-3.0	●	●		25	25	150	25.4	18		
	2525-3.0-T10	●			25	25	150	25.4	10		
	3232-3.0	●	●		32	32	170	32.4	18		
	3233-3.0-T10				32	32	170	32.4	10		
	2020-4.0	●	●	MGMN400-M MRMN400-M	20	20	125	20.4	18		
	2020-4.0-T10	●			20	20	125	20.5	10		
	2525-4.0	●	●		25	25	150	25.4	18		
	2525-4.0-T10	●	●		25	25	150	25.4	10		
	3232-4.0	●	●		32	32	170	32.4	18		
	3232-4.0-T10				32	32	170	32.4	10		
	2020-5	○	○	MGMN500-M MRMN500-M	20	20	150	20.5	23		
	2020-5-T15				20	20	150	20.5	15		
	2525-5	○	○		25	25	150	25.5	23		
	2525-5-T15				25	25	150	25.5	15		
	3232-5	○	○		32	32	170	32.5	23		
	3232-5-T15				32	32	170	32.5	15		

● stock item ○ be preparing for stock the others can be made to order

C Parting Grooving

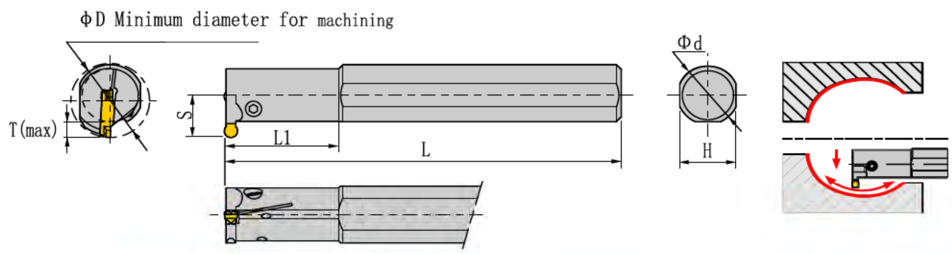
C3 Grooving tools





Type		Stock Item R	Stock Item L	Recommended inserts	Application External Grooving, Turning H=(h)	W	L	S	T(max)	Parts Screw	Parts Wrench
MGEHR/L	2020 -6	○	○	MGMN600-M MRMN600-M	20	20	125	20.6	23	BHA0616	L5.0
	2020 -6-T15				20	20	125	20.6	15		
	2525 -6				25	25	150	25.6	23		
	2525 -6-T15				25	25	150	25.6	15		
	3232 -6				32	32	170	32.6	23		
	3232 -6-T15				32	32	170	32.6	15		
	2525 -8			MRMN800-M	25	25	150	26.1	28		
	2525 -8-T15				25	25	150	26.1	15		
	3232 -8				32	32	170	33.1	28		
	3232 -8-T15				32	32	170	33.1	16		
	2525 -6A			MRGN600-A	25	25	150	25.6	23		
	2525-6A-T15				25	25	150	25.6	15		
	3232 -6A				32	32	170	32.6	23		
	3232-6A-T15				32	32	170	32.6	15		
	2525 -8A			MNGN800-A	25	25	150	26.1	28		
	2525-8A-T15				25	25	150	26.1	16		
	3232 -8A				32	32	170	33.1	28		
	3232-8A-T15				32	32	170	33.1	16		

● stock item ○ be preparing for stock the others can be made to order



Type		Stock Item R	Stock Item L	Recommended inserts	Application: Internal Grooving, Turning ΦD	Φd	L	L1	T(max)	H	S	Parts: Screw	Parts: Wrench
MGIVR/L	2020-1.5	○		MGMN150-G	20	16	125	35	4	15	11.3	MHB0310	L2.5
	2525-1.5	○			25	20	150	45	4	18	13.1	MHA0512	L4.0
	3925-1.5				29	25	200	45	4	23	16.2		
	2016-2.0	○		MGMN200-G	20	16	125	35	5	15	12.4	MHB0310	L2.5
	2520-2.0	○			25	20	150	45	5	18	14	MHA0512	L4.0
	2925-2.0	○			29	25	200	45	5	23	17.2		
	2016-2.5			MGMN250-G	20	16	125	35	6	15	12.5	MHB0310	L2.5
	2520-2.5	○			25	20	150	45	6	18	15.1	MHA0512	L4.0
	2925-2.5	○			29	25	200	45	6	23	18.2		
	2520-3.0	●	●	MGMN300-M MRMN300-M	25	20	150	45	6	18	15.6	MHA0512	L4.0
	3125-3.0	●	●		31	25	200	45	6	25	18.9		
	3732-3.0	●	●		37	32	250	65	6	30	21.5		
	2520-4.0	●	●	MGMN400-M MRMN400-M	25	20	150	45	6	18	15.6		
	3125-4.0	●			31	25	200	45	6	23	18.9		
	3732-4.0	●			37	32	250	65	6	30	21.5		
	3125-5	○		MGMN500-M MRMN500-M	31	25	200	45	8	25	19.5		
	3732-5	○			37	32	250	65	8	30	21.5		
	3125-6			MGMN600-M MRMN600-M	31	25	200	45	8	23	19.4		
	3732-6				37	32	250	65	8	30	21.5		
	3732-8			MRMN800-M	37	32	250	65	10	30	23.4		
	3540-8				45	40	300	70	10	37	27.2		
	3125-6A			MRGN600-A	31	25	200	45	8	23	19.4		
	3732-6A				37	32	250	65	8	30	21.5		
	3732-8A			MNGN800-A	37	32	250	65	10	30	23.4		
	4540-8A				45	40	300	70	10	37	27.2		

● stock item ○ be preparing for stock the others can be made to order

D Milling

D1 List of milling inserts

Inserts for face milling	166	TEHW16T3*	SEKT1204AZFN-*	SEKT13T3AEFN-*	HNGX0906ANSN-*	ONGX080608-*		
	170	RPMW**MOE	RDMT**MO-V1	RPMT**MOE-BJS	RCHT**MO-SM	LNKX**PN-**	TMR/L**-WM	CDE**
	173	TPCW**PDR/L	TPMR**	TPMR**-3	TPKR**PDR	TPKN**PPR/L	TPKN**PPR/L-D2	TPKN**PDR-SU
	175	TPKN**PDR-3	TPAN**PPN	TPAN**PPN-D2	SPCW**EDR/L	SPKW**EDFR/L	SEEW**AFN	SEKT**AESN
	177	SEET**T3-DR	SDET**-RF	SNAN1**ANN	SNAN**ENN			
	179	SPCN**APN	SPGN**	SPKN**ZETR/L	SPKN**EDL-D2	SPKN**EDFR/L	SPKN**EDFR/L-D2	SPAN**EDR/L
	181	SDHW**AEFN	SPAN**EDR/L	SPMR**	SEMN**AFTN	SEKR**AZ-YM	SPEX**EDR/L	OPHN**ZZN
	183	OFER**NN	HEEN**	OFMT**NN	172 SOGX**EN-XN			
Inserts for heavy-cutting milling	186	CNE**	CDE**L05	LNE**TL-Φ4.1	LNE**-02	N**-1	SNE**-01	LND424-DA
	188	SNE**-4R3	LNE**-02	SN**R10-P50	LNE**-02	SN**R10-P50	SN**R6.5	GLOL20021R5

D1 List of milling inserts

Inserts for heavy-cutting milling	190	 SN**RK13-ING	 LNHX**	 NXE**-104	 DIN**-M			
Inserts for square shoulder milling	192	 APMT**PDER-H2	 APMT**PDER-H8	 APMT**PDER-M2	 APMT**R-EM	 BR390**-PM	 BR390**-PL	 APKT**-LHC
	192	 GNMU**ZZR-M1						
Inserts for shallow hole drilling	196	 APMT**T-WT	 SPMG**-ZV	 WCGX**-ZV	 WCGX**-ZS			
Inserts for profile milling	197	 SDMT**-DM	 WPGT**ZSR	 ZDGW**T2R10	 SPMT**			
Inserts for chamfer milling	197	 SPMT**						

D1 List of milling inserts

Aluminum processing	185							
		RCGT**MO-LHC	APKT**PDER-LH	APKT**PDFR-G2C	APEX**FR-LHC	APKT**FR-LHC	APKT**T4PDFR-LH1C	LDHT**PDFR-LHC
Others	198							
		P22215-**	P28*	P284*	P2800-*	P2816-1	P2894-*	P2803-1*
	198							
		P28451-1	P2922*	P28467-*	P28475-*	P270*	P2703-*R	P270*
	200							
		P2603-*						

D2 Grade for milling inserts

P Process steel

Grade	ISO classification	Surface colour	Applications Recommended
BPG05B	P05(P01-P15)	Cyan-blue gray dark	With high hot hardness and good resistance to plastic deformation. Suitable for high speed cutting and finishing process of austenitic stainless steel, quenched steel and carbon steel
BPG20B	P15(P10-P20)	Cyan-blue gray dark	PVD coated micro-grain carbide.Use for a variety of stainless steel finishing at medium to low cutting speed. When need excellent edge strength and high surface quality, provide the perfect ride cutting. A high thermal shock resistance. Suitable for light interrupted cuts.
BPG308	P20(P15-P30)	Purple yellow	PVD coated carbide grade , for example, the long cutting edge, clogging, deep shoulder milling, long overhang, milling processes. or an alternative of toughness processes. Combining the peripheral-edge grinding blade, preferred for viscous material, such as low carbon steel.
BPG217	P20(P15-P30)	Yellow	Using high strength, high wear resistance and owe loss Phase Equilibrium ultrafine grain substrate with PVD TiAlN coating, suitable for most of the material machining,can achieve a stable turning and milling.
BPS321	P30(P25-P40)	Black/yellow	High-strength matrix combined with AL2O3 coating suitable for steel and cast iron milling.
BPS322	P30(P25-P40)	Black	High-strength matrix combined with AL_2O_3 coating suitable for steel and cast iron milling.
BPS411	P40(P35-P50)	Black/yellow	Toughness coated carbide grade for steel milling in demanding process.For vertical milling and shoulder milling, the grade BPS411 should be working in stable conditions, such as short overhangs, surface milling, shallow shoulder milling.For toughness process,BPS411 is the best choice. suitable for mixed materials small batch production. Whether the coolant supply is excellent.
BPS412	P40(P35-P50)	Black	Toughness coated carbide grade for steel milling in demanding process.For vertical milling and shoulder milling, the grade BPS413 should be working in stable conditions, such as short overhangs, surface milling, shallow shoulder milling.For toughness process, BPS413 is the best choice.suitable for mixed materials small batch production. Whether the coolant supply is excellent.

D2 Grade for milling inserts

K Process on cast iron

Grade	ISO classification	Surface colour	Applications Recommended
BPG05B	P05(P01-P15) M10(M05-M15) K10(K05-K15)	Cyan-blue gray dark	With high hot hardness and good resistance to plastic deformation. Suitable for high speed cutting and finishing process of austenitic stainless steel, quenched steel and carbon steel
BPG108	K05-K15	Purple yellow	PVD coated carbide grade for gray cast iron and ductile iron medium to rough milling in wet conditions. In the medium to high cutting speeds,can predictor the tool-life.
BPC122	K15(K10-K25)	Black	CVD-coated cemented carbide, the hard substrate coated with a smooth and wear-resistant coating, can bear harsh intermittent cutting conditions. Universal grade for all cast iron roughing cutting at low to medium speed.
BPS321	K30(K25-K35)	Black/yellow	Coated carbide grade for toughness demanding operating conditions to work at low speed, medium load and reload processing.

M Process on stainless steel

Grade	ISO classification	Surface colour	Applications Recommended
BPG05B	P05(P01-P15) M10(M05-M15)	Cyan-blue gray dark	PVD coated carbide grade for milling typical hardened steel and plastic mold steel, processing hardness above HRC36.
BPG20B	M15(M10-M25)	Cyan-blue gray dark	PVD coated carbide grade for light milling of stainless steel. Combine grinding blade preferred for viscous and work hardening materials.
BPG318	M25(M15-M30)	Purple yellow	PVD coated carbide grade for medium to high-speed stainless steel (austenitic) milling. Combined with positive rake angle trough also applies to the heat-resistant materials and titanium alloys.
BPG40B	M35(M25-M40)	Cyan-blue gray dark	Coated carbide grade for medium speed milling abrasive trends stainless steel, such as casting parts, ferritic / martensitic stainless steel, and PH steel.
BPS411	M40(M30-M40)	Black/yellow	Coated carbide grade for stainless steel castings heavy machining process.

D3 Code key for indexable milling inserts

Insert shape

Insert Shape / Code		
85° A	82° B	80° C
55° D	75° E	H
55° K	L	86° M
O	P	R
S		35° V
80° W	Others Z	

Chipbreaker and clamping system

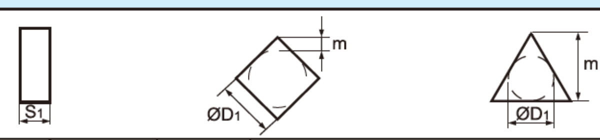
Metric							
Code	With/Without hole	With/Without chipbreaker	Section plane of Insert	Code	With/Without hole	With/Without chipbreaker	Section plane of
B	With	Without	>65°	N	Without	Without	
H	With	Single-side	>65°	R	Without	Single-side	
C	With	Without	>65°	F	Without	Double-side	
J	With	Double-side	>65°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

S P K N

Clearance angle of main cutting edge

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

Allowed tolorence



Code	m (mm) tolerance range	Inscribed circle ØD1 Tolerance (mm)	Thickness S1 Tolerance(mm)
A	±0.005	±0.025	±0.025
F	±0.005	±0.013	±0.025
C	±0.013	±0.025	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.005	±0.05-±0.13	±0.025
K	±0.013	±0.05-±0.13	±0.025
L	±0.025	±0.05-±0.13	±0.025
M	±0.08-±0.18	±0.05-±0.13	±0.13
N	±0.08-±0.18	±0.05-±0.13	±0.025
U	±0.13-±0.38	±0.08-±0.25	±0.13

(Reference) details of M-class tolerance (identifed by shape and size)

● Nose height tolerance (mm)

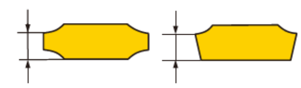
Inscribed circle	T	S	C (80°)	K (55°)	V (35°)	R
6.35	±0.08	±0.08	±0.08	±0.11	±0.16	---
9.525	±0.08	±0.08	±0.08	±0.11	±0.16	---
12.7	±0.13	±0.13	±0.13	±0.15	---	---
15.875	±0.15	±0.15	±0.15	±0.18	---	---
19.05	±0.15	±0.15	±0.15	±0.18	---	---
25.4	---	±0.18	---	---	---	---

● · Tolerance of Inscribed Circle ØD1 (mm)

Inscribed circle	T	S	C (80°)	K (55°)	V (35°)	R
6.35	±0.05	±0.05	±0.05	±0.05	±0.05	---
9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
12.7	±0.08	±0.08	±0.08	±0.08	---	±0.08
15.875	±0.10	±0.10	±0.10	±0.10	---	±0.10
19.05	±0.10	±0.10	±0.10	±0.10	---	±0.10
25.4	---	±0.13	---	---	---	±0.13

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

Length of cutting edge



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

Code	Insert thickness (mm)
00	0.79
T0	0.99
01	1.59
T1	1.98
02	2.38
T2	2.78
03	3.18
T3	3.97
04	4.76
T4	4.96
05	5.56
T5	5.95
06	6.35
T6	6.75
07	7.94
09	9.52
T9	9.72
11	11.11
12	12.70

Insert thickness

12 04 AF T N -

Wiper

Kr		αn	
A	45°	A	3°
D	60°	B	5°
E	75°	C	7°
F	85°	D	15°
P	90°	E	20°
Z	Others	F	25°
		G	30°
		N	0°
		P	11°
		Z	Others

Chamfer (mm)

F	0-5°	0-0.10	K
E	1-10°	1-0.15	P
T	2-15°	2-0.20	W
S	3-20°	3-0.25	No mark
	4-25°	4-0.30	
	5-30°	5-0.35	
		6-0.40	
		7-0.45	

Chipbreaker code

Cutting direction

R	Right hand
L	Left hand
N	Neutral

Indexable aluminum alloy face milling insterts

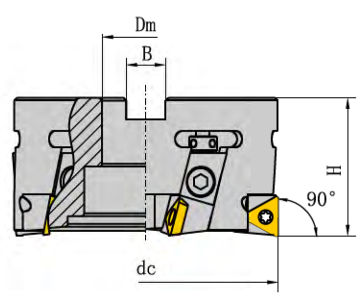
Inserts shape	Type	Dimension (mm)				Material recommended												
						CVD coating grade	PVD coating grade							Uncoating grade				
		I.C	S	d	a	BPS321	BPS411	BPG05B	BPG05B	BPG20B	BPG308	BPG25B	BPG30A	BP20	BP35	BK10	BU810	BU820
	TEHW16T3PEFR								★	★	☆					☆	★	
	SEKT1204AZFN-LH2					☆			☆								★	

		BPS321	BPS411	BPG05B	BPG20B	BPG30A	BU810
Application	P:steel	★	★	★	☆	☆	
	M:stainless steel	☆	★	★	★	★	
	K:cast iron	★		☆			★
	N:non-ferrous metal						★

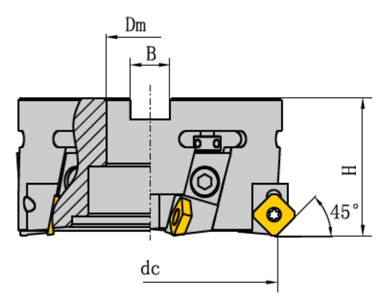
★ Recommended grade and always stock available ☆ Recommended grade and produce according to order

Kr=90°

Type Ⅰ

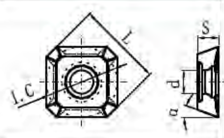


Type Ⅱ



Type	Size (mm)				Teeth	Inserts	Screw	Wrench	Clamp	Screw	Wrench	Screw	Type
	dc	Dm	B	H	Z								
SA90-63R4TE16-P22AL	63	22	10.4	50	4	TEHW16T3PEFR TEHW16T3PEFR-PCD	SIC035080	FT15	STGER14CA-16	SCC060250	S5	SAC060145	Ⅰ
SA90-80R4TE16-P27AL	80	27	12.4	50	4								
SA90-100R6TE16-S32AL	100	32	14.4	50	6								
SA90-125R8TE16-S40AL	125	40	16.4	50	8								
SA90-160R10TE16-T40AL	160	40	16.4	50	10								
SA90-200R12TE16-T60AL	200	60	25.7	63	12								
SA90-250R16TE16-T60AL	250	60	25.7	63	16								
SA90-315R20TE16-U60AL	315	60	25.7	63	20								
SA45-63R4SE12-P22AL	63	22	10.4	50	4	SE..1204AZ..	SIC035080	FT15	SSSDR14CA-09	SCC060250	S5	SAC060145	Ⅱ
SA45-80R4SE12-P27AL	80	27	12.4	50	4								
SA45-100R6SE12-S32AL	100	32	14.4	50	6								
SA45-125R8SE12-S40AL	125	40	16.4	50	8								
SA45-160R10SE12-T40AL	160	40	16.4	50	10								
SA45-200R12SE12 -T60AL	200	60	25.7	63	12								
SA45-250R16SE12-T60AL	250	60	25.7	63	16								
SA45-315R20SE12-U60AL	315	60	25.7	63	20								

★ Recommended grade ☆ Optional grade

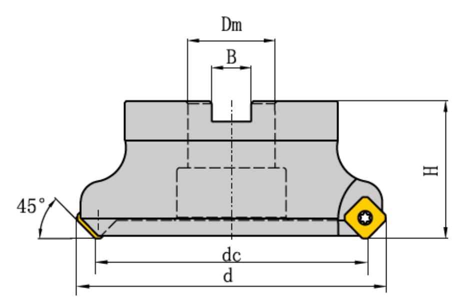
Inserts shape		Type	Dimension (mm)				Material recommended												
							CVD coating grade		PVD coating grade						Uncoating grade				
			I.C	S	d	a	BPS321	BPS411	BPG05B	BPG05B	BPG20B	BPG308	BPG25B	BPG30A	BP20	BP35	BK10	BU810	BU820
		SEKT13T3AEFN-LHC	13.4	3.97	4.4	20°						☆					☆	★	
		SEKT13T3AEFN-JF	13.4	3.97	4.4	20°				★		☆							
		SEMT13T3AGSN-JM	13.4	3.97	4.4	20°	☆	★			★								
		SEMT13T3AGSN-JH	13.4	3.97	4.4	20°	★	☆			★								

		BPS321	BPS411	BPG05B	BPG20B	BPG30A	BU810
Application	P:steel	★	★	★	★	☆	
	M:stainless steel		☆	★	★	★	
	K:cast iron		★		☆		★
	N:non-ferrous metal						★

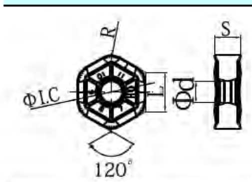
★ Recommended grade and always stock available ☆ Recommended grade and produce according to order

Indexable face milling insterts

Kr=45°

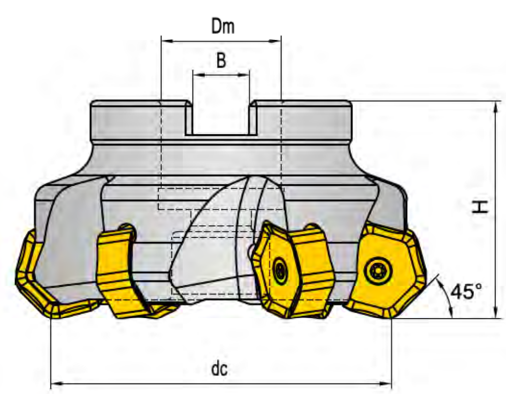


Type	Size (mm)					Teeth	Inserts	Screw	Wrench	Weight (kg)
	dc	Dm	d	B	H	Z				
SA45-50R3SE13-P22	50	22	63.4	10.4	40	3	SE..13T3..	SID040110	FT15	0.42
SA45-63R4SE13-P22	63	22	76.4	10.4	40	4				0.52
SA45-80R4SE13-P27	80	27	93.4	12.4	50					1.10
SA45-100R5SE13-S32	100	32	113.4	14.4	50	5				1.50
SA45-125R6SE13-S40	125	40	138.4	16.4	63	6				2.72
SA45-160R7SE13-T40	160	40	173.4	16.4	63	7				3.97
SA45-200R8SE13-T60	200	60	213.4	25.7	63	8				5.33
SA45-250R10SE13-T60	250	60	263.4	25.7	63	10				8.29

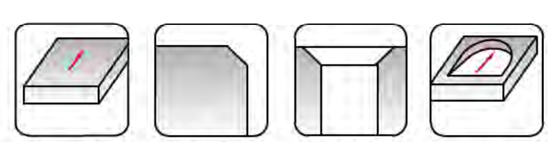
Insert shape		Type	Dimension（mm）				Material recommended									
							CVD coating grade			PVD coating grade					Uncoating grade	
			I.C	S	d	r	BPC122	BPS321	BPS411	BPG108	BPG05B	BPG20B	BPG25B	BPG30B	BK10	BU810
		HNGX0906ANSN-L	16.5	6.35	4.9										☆	★
		HNGX0906ANSN-F	16.5	6.35	4.9		☆			★	★					
		HNGX0906ANSN-M	16.5	6.35	4.9			☆	★	☆		☆	☆			
		HNGX0906ANSN-R	16.5	6.35	4.9			☆	★				☆	☆		
		XNGX0906ANSN	16.5	6.35	4.9							★				

Application		BPS321	BPS411	BPG05B	BPG20B	BPG30A	BU810
	P:steel	★	★	★	★	☆	
	M:stainless steel		☆	★	★	★	
	K:cast iron		★		☆		★
	N:non-ferrous metal						★

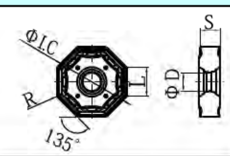
★ Recommended grade and always stock available ☆ Recommended grade and produce according to order



Type	Size(mm)				Teeth	Internal cooling state	Inserts	Screw	Wrench
	dc	Dm	B	H	Z				
SA45-50R4HN09-P22	50	22	10.4	40	4	Yes	HNGX 0906..	SIC035120	WT15
SA45-63R6HN09-P22	63	22	10.4	40	6	Yes			
SA45-80R6HN09-P27	80	27	12.4	50	6	Yes			
SA45-100R8HN09-S32	100	32	14.4	50	8	Yes			
SA45-125R10HN09-S40	125	40	16.4	63	10	Yes			
SA45-160R12HN09-T40	160	40	16.4	63	12	No			
SA45-200R10HN09-T60	200	60	25.7	63	10	No			

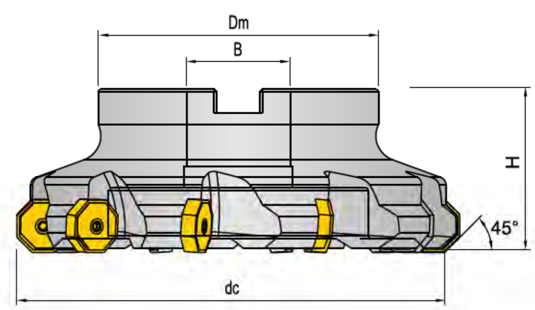


face mills chamfer opening to the corner ramping

Insert shape		Type	Dimension（mm）				Material recommended									
							CVD coating grade	PVD coating grade							Uncoating grade	
			I.C	S	d	r	BPC122	BPS321	BPS411	BPG108	BPG05B	BPG20B	BPG25B	BPG30B	BK10	BU810
		ONGX080608-L	20.2	6.00	5.3	0.8									☆	★
		ONGX080608-F	20.2	6.00	5.3	0.8	☆			★	★					
		ONGX080608-M	20.2	6.00	5.3	0.8		☆	★	☆		☆	☆			
		ONGX080608-R	20.2	6.00	5.3	0.8		☆	★				☆	☆		

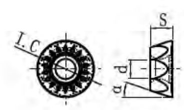
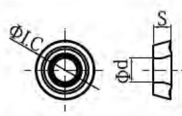
		BPS321	BPS411	BPG05B	BPG20B	BPG30A	BU810
Application	P:steel	★	★	★	★	☆	
	M:stainless steel		☆	★	★	★	
	K:cast iron		★		☆		★
	N:non-ferrous metal						★

★ Recommended grade and always stock available ☆ Recommended grade and produce according to order



Type	Size(mm)				Teeth	Inserts	Screw	Wrench
	dc	Dm	B	H	Z			
SA45-63R5ON08-P22	63	22	10.4	40	5	ONGX080608..	SIC050140	WT20
SA45-80R6ON08-P27	80	27	12.4	50	6			
SA45-100R7ON08-S32	100	32	14.4	63	7			
SA45-125R8ON08-S40	125	40	16.4	63	8			
SA45-160R10ON08-T40	160	40	16.4	63	10			
SA45-200R12ON08-T60	200	60	25.7	63	12			
SA45-250R14ON08-T60	250	60	25.7	63	14			
SA45-315R16ON08-U60	315	60	25.7	80	16			

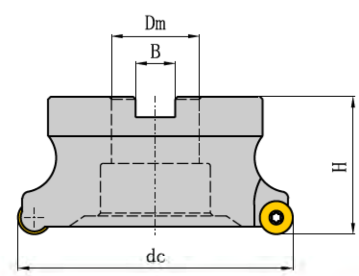
Type	Size(mm)				Teeth	Inserts	Screw	Wrench	Wedge
	dc	Dm	B	H	Z				
WA45-80R10ON08-P27	80	27	12.4	50	10	ONGX080608..	SEC060200	S3	W1006Y
WA45-100R14ON08-S32	100	32	14.4	63	14				
WA45-125R18ON08-S40	125	40	16.4	63	18				
WA45-160R22ON08-T40	160	40	16.4	63	22				
WA45-200R28ON08-T60	200	60	25.7	63	28				
WA45-250R36ON08-T60	250	60	25.7	63	36				
WA45-315R46ON08-U60	315	60	25.7	80	46				

Inserts shape		Type	Dimension（mm）						Material recommended												
									CVD coating grade		PVD coating grade						Uncoating grade				
			ΦI.C	S	Φd	α			BPS153	BPS253	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		RPMT0803MOE-BJS	8	3.18	3.4	11°							★	☆		☆		☆		☆	
		RPMT10T3MOE-BJS	10	3.97	4.4	11°							★	☆		☆		☆		☆	
		RPMT1204MOE-BJS	12	4.76	4.4	11°							★	☆		☆		☆		☆	
		RPHT0803MO-SM	08	3.18	3.4	11°				☆		☆	★	☆							
		RPHT1204MO-MM	12	4.76	4.4	11°				☆		☆	★	☆							
		RPHT1606MO-ML	16	6.35	4.4	11°				☆		☆	★	☆							

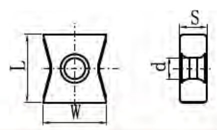
Application		BPS321	BPS411	BPG05B	BPG20B	BPG30A	BU810
	P:steel	★	★	★	★	☆	
	M:stainless steel		☆	★	★	★	
	K:cast iron		★		☆		★
	N:non-ferrous metal						★
	S:High temperature alloy					★	

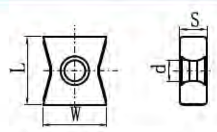
★ Recommended grade and always stock available　　☆ Recommended grade and produce according to order

Indexable R face milling insterts



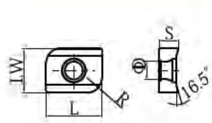
Type	Size(mm)				Teeth	Inserts	Screw	Wrench	Weight (kg)
	dc	Dm	B	H	Z				
SA00-63R3RP12-P22	63	22	10.4	40	3	RP..1204..	SIC035080	FT15	0.46
SA00-63R4RP12-P22					4				0.44
SA00-63R5RP12-P22					5				0.44
SA00-80R4RP12-P27	80	27	12.4	50	4				0.88
SA00-80R6RP12-P27					6				0.89
SA00-100R4RP12-S32	100	32	14.4	50	4				1.39
SA00-100R6RP12-S32					6				1.37
SA00-63R3RP16-P22	63	22	10.4	40	3	RP..1605..	SID040110	FT15	0.38
SA00-63R4RP16-P22					4				0.37
SA00-80R4RP16-P27	80	27	12.4	50	4				0.87
SA00-80R5RP16-P27					5				0.86
SA00-100R4RP16-S32	100	32	14.4	50	4				1.27
SA00-100R6RP16-S32					6				1.30
SA00-125R5RP16-S40	125	40	16.4	63	5				2.59
SA00-125R6RP16-S40					6				2.52

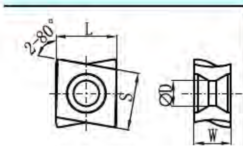
Insert shape		Type	Dimension (mm)					Material recommended							
								CVD coating grade		PVD coating grade			Uncoating grade		
			L	W	S	d	R	BPS321	BPS411	BPG108	BPG20B	BPG30C	BK10	BU810	BU820
		LNKG1206EN-1	12.7	11.3	6.35	4.4					★				
		LNKG1206EN-2	12.7	11.3	6.35	4.4					★				
		LNKG1206EN-3	12.7	11.3	6.35	4.4					★				
		LNKG1206EN-LH	12.7	11.3	6.35	4.4							☆	★	

Insert shape		Type	Dimension (mm)				Material recommended							
							CVD coating grade		PVD coating grade			Uncoating grade		
			L	W	S	d	BPS321	BPS411	BPG108	BPG20B	BPG30C	BK10	BU810	BU820
		LNKX1506PN-N-MM	15	13.9	6	4.6				★				
		LNKX1506PN-N-MR	15	13.9	6	4.6				★				

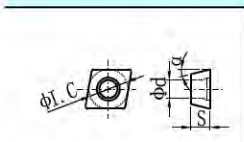
		BPS321	BPS411	BPG05B	BPG20B	BPG30A	BU810
Application	P:steel	★	★	★	★	☆	
	M:stainless steel		☆	★	★	★	
	K:cast iron		★		☆		★
	N:non-ferrous metal						★

★ Recommended grade and always stock available ☆ Recommended grade and produce according to order

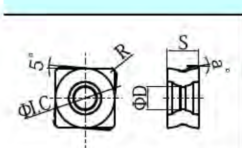
Insert shape		Type	Dimension (mm)					Material recommended												
								CVD coating grade		PVD coating grade						Uncoating grade				
			I.W	L	S	Φd	r	BPS153	BPS253	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		TMR/L331.1A-155015-WM	11.5	14.5	4.95	4.6	1.52				★		☆		☆					
		TMR/L331.1A-155025-WM	11.5	14.5	4.95	4.6	2.29				★		☆		☆					
		TMR/L331.1A-155030-WM	11.5	14.5	4.95	4.6	3.05				★		☆		☆					
		TMR/L331.1A-155035-WM	11.5	14.5	4.95	4.6	3.5				★		☆		☆					
		TMR/L331.1A-155050-WM	11.5	14.5	4.95	4.6	4.83				★		☆		☆					
		TMR/L331.1A-155055-WM	11.5	14.5	4.95	4.6	6.35				★		☆		☆					

Insert shape		Type	Dimension（mm）				Material recommended							
							CVD coating grade		PVD coating grade			Uncoating grade		
			L	W	S	d	BPS321	BPS411	BPG108	BPG20B	BPG30C	BK10	BU810	BU820
		LNHT0804PNR-1										☆		
		LNHT1006ENR							★			☆		
		LNHT110708PNR							★			☆		
		LNHT110716PNR							★			☆		

★ Recommended grade and always stock available ☆ Recommended grade and produce according to order

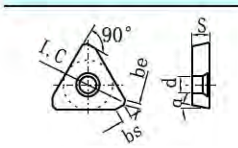
Insert shape		Type	Dimension（mm）				Material recommended							
							CVD coating grade		PVD coating grade			Uncoating grade		
			L	W	S	d	BPS321	BPS411	BPG108	BPG20B	BPG30C	BK10	BU810	BU820
		CDE060308										☆		
		CDE09T304							★			☆		
		CDE09T304L-1							★			☆		
		CDE09T310							★			☆		

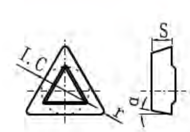
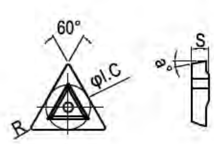
★ Recommended grade and always stock available ☆ Recommended grade and produce according to order

Inserts shape		Type	Dimension（mm）						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade				
			ΦI.C	S	r	α			BPS253	BPS321	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		SOGX1206EN-XN	12	4.76	0.8	9°					★			★	☆		☆		☆			

★ Recommended grade and always stock available ☆ Recommended grade and produce according to order

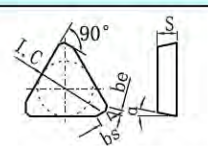
D4 Inserts for face milling

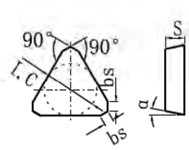
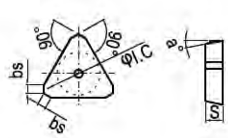
Inserts shape		Type	Dimension (mm)						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade					
			I.C	S	d	bs	be	α	BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		TPCW2204PDR/L	12.7	4.76	5.5	1.4	0.7	11°						★	☆		☆		☆			
		TPCW2204PPR/L	12.7	4.76	5.5	1.4	0.7	11°						★	☆		☆		☆			

Inserts shape		Type	Dimension (mm)						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade					
			I.C	S	r	α			BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		TPMR090204	5.56	2.38	0.4	11°								★			☆		☆			
		TPMR110304	6.35	3.18	0.4	11°								★			☆		☆			
		TPMR160304	9.525	3.18	0.4	11°								★			☆		☆			
		TPMR160308	9.525	3.18	0.8	11°								★			☆		☆			
		TPMR220404	12.7	4.76	0.4	11°								★			☆		☆			
		TPMR220408	12.7	4.76	0.8	11°								★			☆		☆			
		TPMR090204-3	5.56	2.38	0.4	11°								★			☆		☆			
		TPMR110304-3	6.35	3.18	0.4	11°								★			☆		☆			
		TPMR160304-3	9.525	3.18	0.4	11°								★			☆		☆			
		TPMR160308-3	9.525	3.18	0.8	11°								★			☆		☆			
		TPMR220404-3	12.7	4.76	0.4	11°								★			☆		☆			
		TPMR220408-3	12.7	4.76	0.8	11°								★			☆		☆			

★ Recommended grade ☆ Optional grade

D4 Inserts for face milling

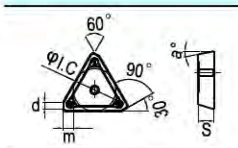
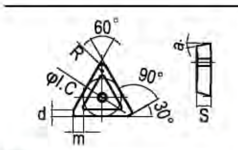
Inserts shape		Type	Dimension (mm)						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade				
			I.C	S	bs	be	α		BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		TPKR1603PDR	9.525	3.18	1.2	0.7	11°							★	☆		☆		☆			
		TPKR2204PDR	12.7	4.76	1.4	0.7	11°							★	☆		☆		☆			

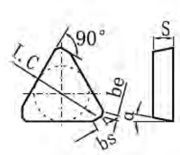
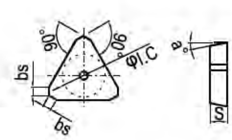
Inserts shape		Type	Dimension (mm)						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade				
			I.C	S	bs	α			BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		TPKN1603PPR/L	9.525	3.18	1.2	11°								★	☆		☆		☆			
		TPAN1603PDR/L	9.525	3.18	1.3	11°								★	☆		☆		☆			
		TPCN1603PDR/L	9.525	3.18	1.3	11°								★	☆		☆		☆			
		TPKN1603PDR/L	9.525	3.18	1.2	11°								★	☆		☆		☆			
		TECN1603PER/L	9.525	3.18	2	20°								★	☆		☆		☆			
		TPAN2204PDR/L	12.7	4.76	1.4	11°								★	☆		☆		☆			
		TPCN2204PDR/L	12.7	4.76	1.4	11°								★	☆		☆		☆			
		TPKN2204PDR/L	12.7	4.76	1.4	11°								★	☆		☆		☆			
		TDKN2204PDR/L	12.7	4.76	1.4	15°								★	☆		☆		☆			
		TEKN2204PDTR/L	12.7	4.76	1.4	20°								★	☆		☆		☆			
		TFAN2203PFR/L	12.7	3.18	2.5	25°								★	☆		☆		☆			
		TPKN1603PPR/L-D2	9.525	3.18	1.2	11°								★	☆		☆		☆			
		TPAN1603PDR/L-D2	9.525	3.18	1.3	11°								★	☆		☆		☆			
		TPCN1603PDR/L-D2	9.525	3.18	1.3	11°								★	☆		☆		☆			
		TPKN1603PDR/L-D2	9.525	3.18	1.2	11°								★	☆		☆		☆			
		TECN1603PER/L-D2	9.525	3.18	2	20°								★	☆		☆		☆			
		TPAN2204PDR/L-D2	12.7	4.76	1.4	11°								★	☆		☆		☆			
		TPCN2204PDR/L-D2	12.7	4.76	1.4	11°								★	☆		☆		☆			
		TPKN2204PDR/L-D2	12.7	4.76	1.4	11°								★	☆		☆		☆			
		TDKN2204PDR/L-D2	12.7	4.76	1.4	15°								★	☆		☆		☆			
		TEKN2204PDTR/L-D2	12.7	4.76	1.4	20°								★	☆		☆		☆			
		TFAN2203PFR/L-D2	12.7	3.18	2.5	25°								★	☆		☆		☆			

★ Recommended grade ☆ Optional grade

D Milling

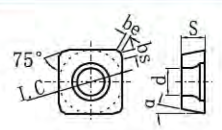
D4 Inserts for face milling

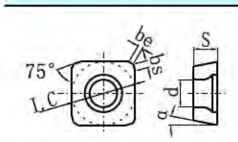
Inserts shape		Type	Dimension（mm）						Material recommended													
									CVD coating grade			PVD coating grade						Uncoating grade				
			I.C	S	d	α			BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		TPKN2204PDR-SU	12.7	4.76	1.4	11°								★	☆		☆		☆			
		TPKN2204PDR-3	12.7	4.76	1.4	11°								★	☆		☆		☆			

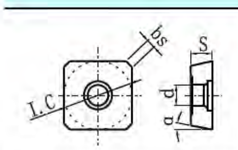
Inserts shape		Type	Dimension（mm）						Material recommended													
									CVD coating grade			PVD coating grade						Uncoating grade				
			I.C	S	bs	α			BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		TPAN1103PPN	6.35	3.18	0.7	11°								★	☆		☆		☆			
		TPCN1103PPN	6.35	3.18	0.7	11°								★	☆		☆		☆			
		TPKN1103PPN	6.35	3.18	0.7	11°								★	☆		☆		☆			
		TPAN1603PPN	9.525	3.18	1.2	11°								★	☆		☆		☆			
		TPCN1603PPN	9.525	3.18	1.2	11°								★	☆		☆		☆			
		TPKN1603PPN	9.525	3.18	1.2	11°								★	☆		☆		☆			
		TPAN2204PPN	12.7	4.76	1.3	11°								★	☆		☆		☆			
		TPCN2204PPN	12.7	4.76	1.3	11°								★	☆		☆		☆			
		TPKN2204PPN	12.7	4.76	1.3	11°								★	☆		☆		☆			
		TPAN1603PPN-D2	9.525	3.18	1.2	11°								★	☆		☆		☆			
		TPCN1603PPN-D2	9.525	3.18	1.2	11°								★	☆		☆		☆			
		TPKN1603PPN-D2	9.525	3.18	1.2	11°								★	☆		☆		☆			
		TPAN2204PPN-D2	12.7	4.76	1.3	11°								★	☆		☆		☆			
		TPCN2204PPN-D2	12.7	4.76	1.3	11°								★	☆		☆		☆			
		TPKN2204PPN-D2	12.7	4.76	1.3	11°								★	☆		☆		☆			

★ Recommended grade ☆ Optional grade

D4 Inserts for face milling

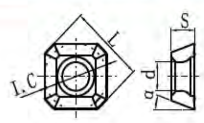
Inserts shape	Type	Dimension（mm）						Material recommended													
								CVD coating grade			PVD coating grade						Uncoating grade				
		I.C	S	d	a	bs	be	BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
 	SPCW1504EDR/L	15.875	4.76	5.5	11°	1.5	1						★	☆		☆		☆			
	SPCW1504EPR/L	15.875	4.76	5.5	11°	1.5	1						★	☆		☆		☆			

Inserts shape	Type	Dimension（mm）						Material recommended													
								CVD coating grade			PVD coating grade						Uncoating grade				
		I.C	S	d	a	bs	be	BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
 	SPKW1204EDFR/L	12.7	4.76	5.5	11°	1.4	1						★	☆		☆		☆			
	SPKW1204EDSR/L	12.7	4.76	5.5	11°	1.4	1						★	☆		☆		☆			
	SPKW1204EDTR/L	12.7	4.76	5.5	11°	1.4	1						★	☆		☆		☆			

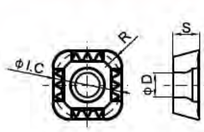
Inserts shape	Type	Dimension（mm）					Material recommended													
							CVD coating grade			PVD coating grade						Uncoating grade				
		I.C	S	d	a	bs	BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
 	SEEW1504AFN	15.875	4.76	5.5	20°	2.85						★	☆		☆		☆			

★ Recommended grade ☆ Optional grade

D4 Inserts for face milling

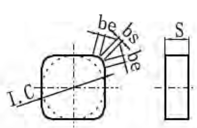
Inserts shape		Type	Dimension (mm)					Material recommended													
								CVD coating grade			PVD coating grade						Uncoating grade				
			I.C	S	d	α	L	BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		SEKT1204AESN	12.7	4.76	5.5	20°	15.23						★	☆		☆		☆			

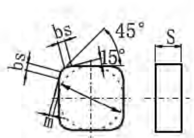
Inserts shape		Type	Dimension (mm)					Material recommended													
								CVD coating grade			PVD coating grade						Uncoating grade				
			I.C	S	d	α	R	BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		SEET12T3-DR	12.7	4.76	5.5	20°	2.4						★	☆		☆		☆			

Inserts shape		Type	Dimension (mm)					Material recommended													
								CVD coating grade			PVD coating grade						Uncoating grade				
			I.C	S	d	α	R	BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		SDET120408-RF	12.7	4.76	4.4	15°	0.8						★	☆		☆		☆			
		SDET120412-RF	12.7	4.76	4.4	15°	1.2						★	☆		☆		☆			
		SDET120416-RF	12.7	4.76	4.4	15°	1.6						★	☆		☆		☆			
		SDET120420-RF	12.7	4.76	4.4	15°	2.0						★	☆		☆		☆			
		SDET120424-RF	12.7	4.76	4.4	15°	2.4						★	☆		☆		☆			
		SDET120432-RF	12.7	4.76	4.4	15°	3.2						★	☆		☆		☆			

★ Recommended grade ☆ Optional grade

D4 Inserts for face milling

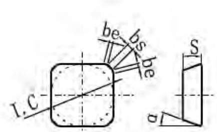
Inserts shape		Type	Dimension (mm)						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade					
			I.C	S	a	bs	be		BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		SNAN1204ANN	12.7	4.76	0°	2								★	☆		☆		☆			
		SNCN1204ANN	12.7	4.76	0°	2								★	☆		☆		☆			
		SNKN1204ANN	12.7	4.76	0°	2								★	☆		☆		☆			
		SNAN1504ANN	15.875	4.76	0°	2.5								★	☆		☆		☆			
		SNCN1504ANN	15.875	4.76	0°	2.5								★	☆		☆		☆			
		SNKN1504ANN	15.875	4.76	0°	2.5								★	☆		☆		☆			
		SNAN1904ANN	19.05	4.76	0°	3								★	☆		☆		☆			
		SNCN1904ANN	19.05	4.76	0°	3								★	☆		☆		☆			
		SNKN1904ANN	19.05	4.76	0°	3								★	☆		☆		☆			
		SNCN1904ADSN	19.05	4.76	1°	4	0.5							★	☆		☆		☆			

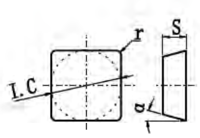
Inserts shape		Type	Dimension (mm)						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade					
			I.C	S	bs	m			BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		SNAN1204ENN	12.7	4.76	1.4	0.8								★	☆		☆		☆			
		SNCN1204ENN	12.7	4.76	1.4	0.8								★	☆		☆		☆			
		SNKN1204ENN	12.7	4.76	1.4	0.8								★	☆		☆		☆			
		SNAN1504ENN	15.875	4.76	1.4	1.5								★	☆		☆		☆			
		SNCN1504ENN	15.875	4.76	1.4	1.5								★	☆		☆		☆			
		SNKN1504ENN	15.875	4.76	1.4	1.5								★	☆		☆		☆			
		SNAN1904ENN	19.05	4.76	2	1.3								★	☆		☆		☆			
		SNCN1904ENN	19.05	4.76	2	1.3								★	☆		☆		☆			
		SNKN1905ENN	19.05	4.76	2	1.3								★	☆		☆		☆			

D Milling

★ Recommended grade ☆ Optional grade

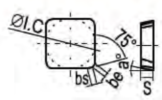
D4 Inserts for face milling

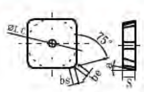
Inserts shape	Type	Dimension（mm）						Material recommended													
								CVD coating grade			PVD coating grade						Uncoating grade				
		I.C	S	a	bs	be		BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
 	SPCN1204APN	12.7	4.76	11°	2.22								★	☆		☆		☆			
	SECN1203AEN	12.7	3.18	20°	2.48								★	☆		☆		☆			
	SEEN1203AFFN	12.7	3.18	20°	1.8								★	☆		☆		☆			
	SEKN1203AFTN	12.7	3.18	20°	1.8								★	☆		☆		☆			
	SEKN1203AFTN-1	12.7	3.18	20°	2.46	r1							★	☆		☆		☆			
	SEMN1204AEN	12.7	4.76	20°	2.1								★	☆		☆		☆			
	SEKN1204AFN	12.7	4.76	20°	1.8								★	☆		☆		☆			
	SEKN1204AFTN	12.7	4.76	20°	1.8								★	☆		☆		☆			
	SPKN1504AFTN	15.875	4.76	11°	1.8	1							★	☆		☆		☆			
	SDKN1504AEN	15.875	4.76	15°	1.9								★	☆		☆		☆			
	SEKN1504AFN	15.875	4.76	20°	1.6								★	☆		☆		☆			
	SEKN1504AFTN	15.875	4.76	20°	1.6								★	☆		☆		☆			
	SPCN1904APN	19.05	4.76	11°	4.48								★	☆		☆		☆			

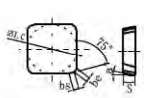
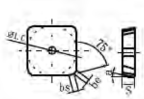
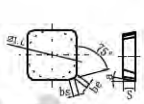
Inserts shape	Type	Dimension（mm）						Material recommended													
								CVD coating grade			PVD coating grade						Uncoating grade				
		I.C	S	a	r			BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
 	SPGN090304	9.525	3.18	11°	0.4				★				★	☆		☆		☆			
	SPGN090308	9.525	3.18	11°	0.8				★				★	☆		☆		☆			
	SPGN120308	12.7	3.18	11°	0.8				★				★	☆		☆		☆			
	SPEN120408	12.7	4.76	11°	0.8				★				★	☆		☆		☆			
	SPGN120404	12.7	4.76	11°	0.4				★				★	☆		☆		☆			
	SPGN120408	12.7	4.76	11°	0.8				★				★	☆		☆		☆			
	SPEN150412	15.875	4.76	11°	1.2				★				★	☆		☆		☆			
	SPEN190416	19.05	4.76	11°	1.6				★				★	☆		☆		☆			

★ Recommended grade ☆ Optional grade

D4 Inserts for face milling

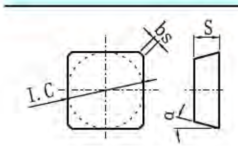
Inserts shape		Type	Dimension (mm)						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade					
			I.C	S	a	bs	be		BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		SPKN1204ZETR/L	12.7	4.76	11°	1.93	0.6			★				★	☆		☆		☆			
		SPCN1504ZETR/L	15.875	4.76	11°	2	1			★				★	☆		☆		☆			
		SPKN1504ZEFR/L	15.875	4.76	11°	2	0.8			★				★	☆		☆		☆			

Inserts shape		Type	Dimension (mm)						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade					
			I.C	S	bs	m			BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		SPKN1504EDL-D2	15.875	4.76	11°	1.4				★				★	☆		☆		☆			

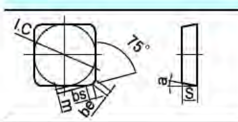
Inserts shape		Type	Dimension (mm)						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade					
			I.C	S	a	bs	be		BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		SPKN1203EDFR/L	12.7	3.18	11°	1.4				★				★	☆		☆		☆			
		SPKN1203EDER/L	12.7	3.18	11°	1.4				★				★	☆		☆		☆			
		SPKN1504EDFR/L	15.875	4.76	11°	1.4				★				★	☆		☆		☆			
		SPKN1504EDER/L	15.875	4.76	11°	1.4				★				★	☆		☆		☆			
		SPKN1203EDFR/L-D2	12.7	3.18	11°	1.4				★				★	☆		☆		☆			
		SPKN1203EDER/L-D2	12.7	3.18	11°	1.4				★				★	☆		☆		☆			
		SPKN1504EDFR/L-D2	15.875	4.76	11°	1.4				★				★	☆		☆		☆			
		SPKN1504EDER/L-D2	15.875	4.76	11°	1.4				★				★	☆		☆		☆			
		SPAN1203EDR/L	12.7	3.18	11°	1.4				★				★	☆		☆		☆			
		SPCN1203EDR/L	12.7	3.18	11°	1.4				★				★	☆		☆		☆			
		SPKN1203EDR/L	12.7	3.18	11°	1.4				★				★	☆		☆		☆			

★ Recommended grade ☆ Optional grade

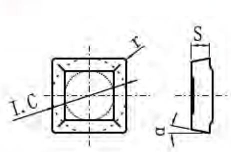
D4 Inserts for face milling



Inserts shape	Type	Dimension (mm)						Material recommended														
								CVD coating grade			PVD coating grade						Uncoating grade					
		I.C	S	a	bs			BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
	SDHW0903AEFN	9.53	3.18	15°	0.75				★				★	☆		☆		☆			



Inserts shape	Type	Dimension (mm)						Material recommended														
								CVD coating grade			PVD coating grade						Uncoating grade					
		I.C	S	a	bs			BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
	SPAN1203EDR/L	12.7	3.18	11°	1.4				★				★	☆		☆		☆			
	SPCN1203EDR/L	12.7	3.18	11°	1.4				★				★	☆		☆		☆			
	SPKN1203EDR/L	12.7	3.18	11°	1.4				★				★	☆		☆		☆			

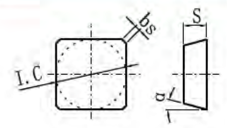


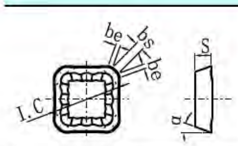
Inserts shape	Type	Dimension (mm)						Material recommended														
								CVD coating grade			PVD coating grade						Uncoating grade					
		I.C	S	a	r			BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
	SPMR090304	9.525	3.18	11°	0.4				★				★	☆		☆		☆			
	SPMR09T304	9.525	3.97	11°	0.4				★				★	☆		☆		☆			
	SPMR090308	9.525	3.18	11°	0.8				★				★	☆		☆		☆			
	SPMR120304	12.7	3.18	11°	0.4				★				★	☆		☆		☆			
	SPMR120308	12.7	3.18	11°	0.8				★				★	☆		☆		☆			
	SPMR120312	12.7	3.18	11°	1.2				★				★	☆		☆		☆			

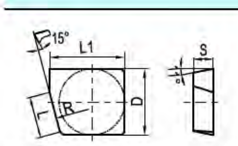
D Milling

★ Recommended grade ☆ Optional grade

D4 Inserts for face milling

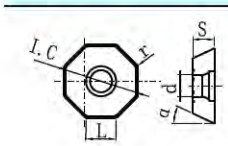
Inserts shape		Type	Dimension (mm)						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade					
			I.C	S	α	L			BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		SEMN1203AFTN	12.7	3.18	20°	15.7				★				★	☆		☆		☆			

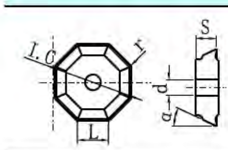
Inserts shape		Type	Dimension (mm)						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade					
			I.C	S	a	bs	be		BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		SEKR1203AZ-YM	12.7	3.18	20°	1.6	0.8			★				★	☆		☆		☆			
		SEKR12T3AZ-YM	12.7	3.98	20°	1.6	0.8			★				★	☆		☆		☆			
		SEKR1204AZ-YM	12.7	4.76	20°	1.6	0.8			★				★	☆		☆		☆			
		SEKR1504AZ-YM	15.875	4.76	20°	1.6	0.8			★				★	☆		☆		☆			

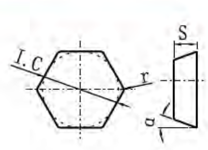
Inserts shape		Type	Dimension (mm)						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade					
			I.C	S	a	R	L1		BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		SPEX1203EDR/L	12.7	3.18	11°	500	15							★	☆		☆		☆			
		SPKX1504EDFR/L	15.88	4.76	11°	500	19.37							★	☆		☆		☆			

★ Recommended grade ☆ Optional grade

D4 Inserts for face milling

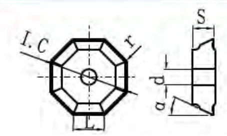
Inserts shape	Type	Dimension（mm）						Material recommended													
								CVD coating grade			PVD coating grade						Uncoating grade				
		L	I.C	S	r	α		BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
 	OPHN0504ZZN	5.26	12.7	4.76	0.4	11°				★			★	☆		☆		☆			
	OFEW05T305	5.3	12.8	3.97	4.4	25°				★			★	☆		☆		☆			

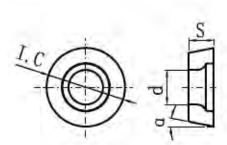
Inserts shape	Type	Dimension（mm）						Material recommended													
								CVD coating grade			PVD coating grade						Uncoating grade				
		L	I.C	S	d	r	α	BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
 	OFER070405NN	7.46	18	4.76	2.3	0.5	25°			★			★	☆		☆		☆			

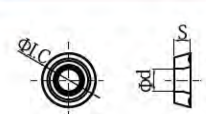
Inserts shape	Type	Dimension（mm）						Material recommended													
								CVD coating grade			PVD coating grade						Uncoating grade				
		ΦI.C	S	r	α			BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
 	HEEN532	15.875	4.76	0.8	20°					★			★	☆		☆		☆			
	HDEN0625	6	2.48		15°					★			★	☆		☆		☆			

★ Recommended grade ☆ Optional grade

D4 Inserts for face milling

Inserts shape		Type	Dimension (mm)						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade					
			L	ΦI.C	S	Φd	r	α	BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		OFMT05T305NN	5.26	12.7	3.97	4.4	0.5	25°						★	☆		☆		☆			
		OFMT070405NN	7.46	18	4.76	5.5	0.5	25°						★	☆		☆		☆			

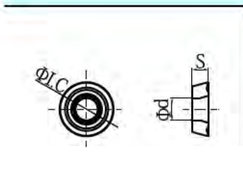
Inserts shape		Type	Dimension (mm)						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade					
			ΦI.C	S	Φd	α			BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		RPMW0803MOE	8	3.18	3.4	11°								★	☆		☆		☆			
		RPMW1003MOE	10	3.18	4.4	11°								★	☆		☆		☆			
		RPMW10T3MOE	10	3.97	4.4	11°								★	☆		☆		☆			
		RPMW10T3MOT	10	3.97	4.4	11°								★	☆		☆		☆			
		RPMW1204MOE	12	4.76	4.4	11°								★	☆		☆		☆			
		RPMW1204MOT	12	4.76	4.4	11°								★	☆		☆		☆			

Inserts shape		Type	Dimension (mm)						Material recommended														
									CVD coating grade			PVD coating grade						Uncoating grade					
			ΦI.C	S	Φd	α			BPS253	BPS321	BPS411	BPG05B	BPG118	BPG218	BPG318	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		RCHT0803MO-SM	08	3.18	3.4	7°					☆		☆	★	☆							
		RCHT1204MO-MM	12	4.76	4.4	7°					☆		☆	★	☆							
		RCHT1606MO-ML	16	6.35	4.4	7°					☆		☆	★	☆							

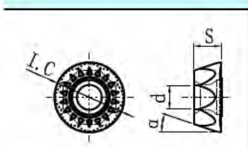
D Milling

★ Recommended grade ☆ Optional grade

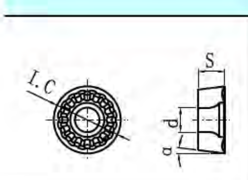
D4 Inserts for face milling




Inserts shape	Type	Dimension（mm）						Material recommended													
								CVD coating grade			PVD coating grade						Uncoating grade				
		ΦI.C	S	Φd	α			BPS153	BPS253	BPS411	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
	RDMT0802MO-V1	8	2.38	3.4	15°								★	☆		☆		☆		☆	
	RDMT0803MO-V1	8	3.18	3.4	15°								★	☆		☆		☆		☆	
	RDMT1003MO-V1	10	3.18	4.4	15°								★	☆		☆		☆		☆	
	RDMT10T3MO-V1	10	3.97	4.4	15°								★	☆		☆		☆		☆	
	RDMT1204MO-V1	12	4.76	4.4	15°								★	☆		☆		☆		☆	



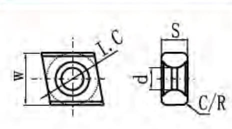

Inserts shape	Type	Dimension（mm）						Material recommended												
								CVD coating grade		PVD coating grade						Uncoating grade				
		ΦI.C	S	Φd	α			BPS153	BPS253	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
	RPMT0803MOE-BJS	8	3.18	3.4	11°							★	☆		☆		☆		☆	
	RPMT10T3MOE-BJS	10	3.97	4.4	11°							★	☆		☆		☆		☆	
	RPMT1204MOE-BJS	12	4.76	4.4	11°							★	☆		☆		☆		☆	

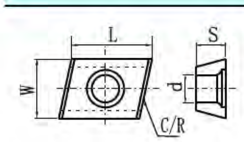


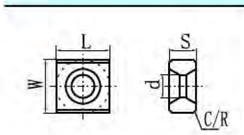

Inserts shape	Type	Dimension（mm）						Material recommended												
								CVD coating grade		PVD coating grade						Uncoating grade				
		ΦI.C	S	Φd	α			BPS153	BPS253	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
	RCGT0602MO-LHC	6	2.38	2.5	7°								☆				☆		★	
	RCGT0803MO-LHC	8	3.18	3.4	7°								☆				☆		★	
	RCGT1003MO-LHC	10	3.18	4	7°								☆				☆		★	
	RCGT10T3MO-LHC	10	3.97	4.4	7°								☆				☆		★	
	RCGT12T3MO-LHC	12	3.97	4.4	7°								☆				☆		★	

★ Recommended grade ☆ Optional grade

D5 Inserts for heavy-cutting milling

Insert shape		Type	Dimension (mm)						Material recommended												
									CVD coating grade				PVD coating grade				Uncoating grade				
			ΦI.C	W	S	d	C/R		BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820
		CNE44102	12.7	12.7	6.35	5.4	C0.5			☆				★	★			★			☆
		CNE323-405	12.7	9.525	4.76	4.3	C0.5			☆				★	★			★			☆
		CNE44-405	12.7	12.7	6.35	5.5	C0.5			☆				★	★			★			☆
		CNE454-4R1	16.3	14.288	6.35	5.5	R1.0			☆				★	★			★			☆

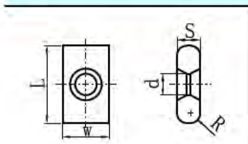
Insert shape		Type	Dimension (mm)					Material recommended												
								CVD coating grade				PVD coating grade				Uncoating grade				
			L	W	S	d	C/R	BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820
		CDE323L05	12.7	9.525	4.76	4.5	C1.0		☆				★	★			★			☆
		CDE323L05	12.7	9.525	4.76	4.5	C1.0		☆				★	★			★			☆

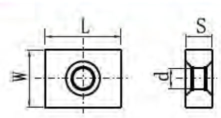
Insert shape		Type	Dimension (mm)					Material recommended												
								CVD coating grade				PVD coating grade				Uncoating grade				
			L	W	S	d	C/R	BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820
		LNE0904TL-Φ4.1	9.53	9.53	4.76	4.1	C0.5		☆				★	★			★			☆

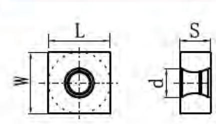
D Milling

★ Recommended grade ☆ Optional grade

D5 Inserts for heavy-cutting milling

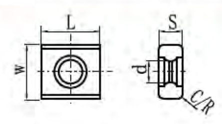
Insert shape		Type	Dimension（mm）						Material recommended												
									CVD coating grade				PVD coating grade				Uncoating grade				
			L	W	S	d	C/R		BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820
		LNE434-02	19.05	14.29	6.35	5.4	C1.0			☆				★	★			★			☆
		N18404-JH	15.875	12.7	7.94	5.5	C0.4			☆				★	★			★			☆

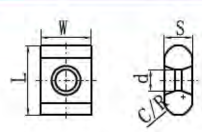
Insert shape		Type	Dimension（mm）						Material recommended												
									CVD coating grade				PVD coating grade				Uncoating grade				
			L	W	S	d			BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820
		N18-1	15.875	12.7	7.94	5.5				☆				★	★			★			☆
		L19.05x14.3x6.35-R7-Φ5.35	19.05	14.29	6.35	5.35				☆				★	★			★			☆

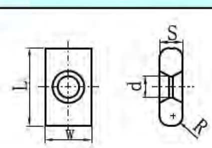
Insert shape		Type	Dimension（mm）						Material recommended												
									CVD coating grade				PVD coating grade				Uncoating grade				
			L	W	S	d			BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820
		SNE33-01	9.525	9.525	4.76	4.4				☆				★	★			★			☆
		SNC44	12.7	12.7	6.35	4.4				☆				★	★			★			☆
		SNC55	15.875	15.875	7.94	5.5				☆				★	★			★			☆

★ Recommended grade ☆ Optional grade

D5 Inserts for heavy-cutting milling

Insert shape		Type	Dimension (mm)						Material recommended													
									CVD coating grade				PVD coating grade				Uncoating grade					
			L	W	S	Φd1	R		BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820
		LND424-DA	13	12.7	6.35	6	2.0			☆				★	★			★			☆
		N136	15.875	12.7	7.94	5.5	2.0			☆				★	★			★			☆

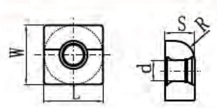
Insert shape		Type	Dimension (mm)						Material recommended													
									CVD coating grade				PVD coating grade				Uncoating grade					
			L	W	S	d	C/R		BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820
		SNE1507-4R3	15.88	15.88	7.94	5.5	R3.0			☆				★	★			★			☆
		LNC305-YT	17.46	12.7	7.15	5.5	R5.0			☆				★	★			★			☆

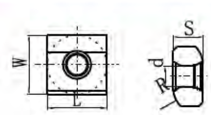
Insert shape		Type	Dimension (mm)						Material recommended													
									CVD coating grade				PVD coating grade				Uncoating grade					
			L	W	S	d	R		BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820
		LNE323-02	15.875	9.525	4.76	4.4	2			☆				★	★			★			☆
		LND624-DA	15.5	12.7	7.35	6	2.80			☆				★	★			★			☆

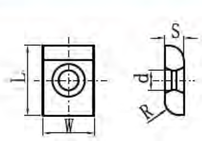
★ Recommended grade ☆ Optional grade

D Milling

D5 Inserts for heavy-cutting milling

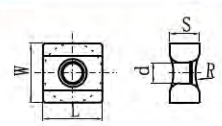
Insert shape		Type	Dimension（mm）						Material recommended												
									CVD coating grade				PVD coating grade				Uncoating grade				
			L	W	S	d	R		BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820
		SN155R10-P50	15.875	15.875	7.94	5.5	10			☆				★	★			★			☆
		SN55R8-EB50	16.875	16.875	7.94	5.5	8			☆				★	★			★			☆

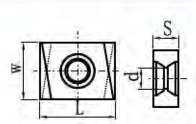
Insert shape		Type	Dimension（mm）						Material recommended												
									CVD coating grade				PVD coating grade				Uncoating grade				
			L	W	S	d	R		BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820
		SN55R6.5	15.875	15.875	7.94	5.5	6.5			☆				★	★			★			☆
		SN55R40	15.875	15.875	7.94	5.5	40			☆				★	★			★			☆

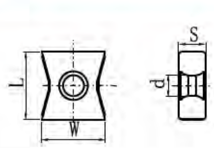
Insert shape		Type	Dimension（mm）						Material recommended												
									CVD coating grade				PVD coating grade				Uncoating grade				
			L	W	S	d	R		BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820
		GLOL20021R5	15.28	12.7	7.94	5.4	5.0			☆				★	★			★			☆
		N182R5-JH	15.875	12.7	7.94	5.5	5.0			☆				★	★			★			☆
		LNC306-YT	15.875	12.7	7.15	5.5	4.7			☆				★	★			★			☆
		FNC334-103T05-W	23.5	11.5	6.4	4.4	6.5			☆				★	★			★			☆
		FNC484-103	51	14.3	6.3	5.6	6.3			☆				★	★			★			☆

★ Recommended grade ☆ Optional grade

D5 Inserts for heavy-cutting milling

Insert shape		Type	Dimension (mm)					Material recommended												
								CVD coating grade				PVD coating grade				Uncoating grade				
			L	W	S	d	R	BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820
		SN55RK13-ING	15.875	15.875	7.93	5.5	12.7		☆				★	★			★			☆
		SN55-R15-R00P50	15.875	15.875	7.93	5.5	15		☆				★	★			★			☆

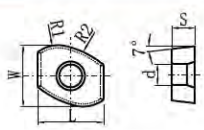
Insert shape		Type	Dimension (mm)				Material recommended												
							CVD coating grade				PVD coating grade				Uncoating grade				
			L	W	S	d	BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820
		LNHX1906	19	14.3	6.35	5.3		☆				★	★			★			☆
		LNHX2509	25.4	14.3	9.5	5.5		☆				★	★			★			☆

Insert shape		Type	Dimension (mm)				Material recommended												
							CVD coating grade				PVD coating grade				Uncoating grade				
			L	W	S	d	BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820
		NXE324-104	12.7	11.89	6.35	4.5		☆				★	★			★			☆
		NXE324-R16	13.1	12.3	6.75	4.4		☆				★	★			★			☆
		LNKG1206TN-1	12.7	12.3	6.35	4.4		☆				★	★			★			☆
		LNKG1206EN-2	12.7	12.3	6.35	4.4		☆				★	★			★			☆
		LNKX1506PN-N-MM	15	13.9	6	4.6		☆				★	★			★			☆

D Milling

★ Recommended grade ☆ Optional grade

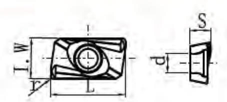
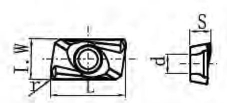
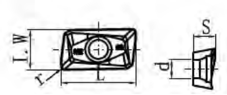
D5 Inserts for heavy-cutting milling

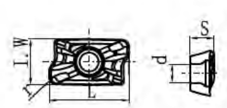
Insert shape		Type	Dimension（mm）						Material recommended														
									CVD coating grade				PVD coating grade				Uncoating grade						
			L	W	S	d	R1	R2	BPS153	BPS253	BPS321	BPS411	BPG05B	BPG20B	BPG30B	BPG40A	BP20	BP35	BK10	BU810	BU820		
		DIN7168-M	15.875	14.53	6	5.4	8.0	22		☆				★	★			★			☆		

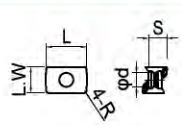
★ Recommended grade ☆ Optional grade

D Milling

D6 Inserts for square shoulder milling

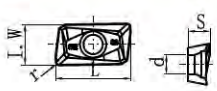
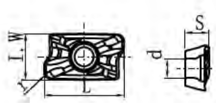
Insert shape	Type	Dimension（mm）						Material recommended														
								CVD coating grade		PVD coating grade						Uncoating grade						
		I.W	L	S	Φd	r		BPS153	BPS253	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
 	APMT1135PDER-H2	6.2	11.21	3.5	2.8	0.8						★	☆		☆					
	APMT1604PDER-H2	9.28	17.15	4.76	4.4	0.8						★	☆		☆					
 	APMT160432PDER-H8	9.33	16.31	4.76	4.4	3.2						★	☆		☆					
 	APMT1135PDER-M2	6.2	11.21	3.5	2.8	0.8						★	☆		☆					
	APMT1604PDER-M2	9.28	17.15	4.76	4.4	0.8						★	☆		☆					

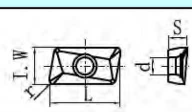
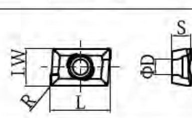
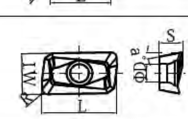
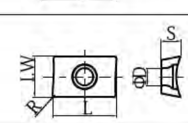
Insert shape	Type	Dimension（mm）						Material recommended														
								CVD coating grade		PVD coating grade						Uncoating grade						
		I.W	L	S	Φd	r		BPS153	BPS253	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
 	APMT1135PDER-EM	6.24	11.2	3.5	2.8	0.8						★	☆		☆					
	APMT1604PDER-EM	9.41	17.24	5.28	4.4	0.8						★	☆		☆					
	APMT170508R-EM	10.63	18.54	5.56	4.4	0.8						★	☆		☆					
	APMT170516R-EM	10.63	18.54	5.56	4.4	1.6						★	☆		☆					

Insert shape	Type	Dimension（mm）						Material recommended														
								CVD coating grade		PVD coating grade						Uncoating grade						
		I.W	L	S	Φd	r		BPS153	BPS253	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
 	GNMU110605ZZR-M1	7.08	11	5.18	3.8	0.5					☆	★	☆		☆				★	

★ Recommended grade ☆ Optional grade

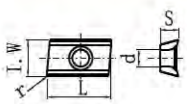
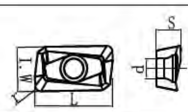
D6 Inserts for square shoulder milling

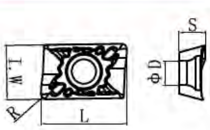
Insert shape		Type	Dimension（mm）					Material recommended												
								CVD coating grade		PVD coating grade						Uncoating grade				
			LW	L	S	Φd	r	BPS153	BPS253	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		BR390-11T308-PM	6.9	11.72	3.58	2.8	0.8					★	☆		☆					
		BR390-11T331-PM	6.9	11.86	3.6	2.8	3.1					★	☆		☆					
		R390-170408-PM	9.6	17.82	4.76	4.12	0.8					★	☆		☆					
		BR390-11T308-PL	6.9	11.72	3.58	2.8	0.8					★	☆		☆					
		R390-170450-PL	9.6	17.82	4.76	4.12	5					★	☆		☆					

Insert shape		Type	Dimension（mm）					Material recommended												
								CVD coating grade		PVD coating grade						Uncoating grade				
			LW	L	S	Φd	r	BPS153	BPS253	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		APKT11T304-LHC	6.5	12.24	3.6	2.8	0.4				☆		☆		☆				★	
		APKT11T308-LHC	6.5	12.24	3.6	2.8	0.8				☆		☆		☆				★	
		APKT1035PDER-LH	6.7	11	3.5	2.8	0.4				☆		☆		☆				★	
		APKT1135PDFR-G2C	6.2	11.3	3.5	2.8	0.8				☆		☆		☆				★	
		APKT1604PDFR-G2C	9.26	17	4.76	4.4	0.8				☆		☆		☆				★	
		APEX100304FR-LHC	6.6	10.3	3.18	2.8	0.4				☆		☆		☆				★	

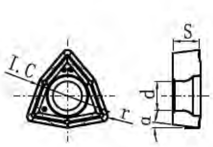
★ Recommended grade ☆ Optional grade

D6 Inserts for square shoulder milling

Insert shape		Type	Dimension (mm)						Material recommended												
									CVD coating grade		PVD coating grade						Uncoating grade				
			I.W	L	S	Φd	r		BPS153	BPS253	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		APKT160402FR-LHC	9.8	16.88	4.76	4.4	0.2					☆		☆		☆				★	
		APKT160404PDFR-LHC	9.8	16.88	4.76	4.4	0.4					☆		☆		☆				★	
		APKT160408PDFR-LHC	9.8	16.88	4.76	4.4	0.8					☆		☆		☆				★	
		APKT160416PDFR-LHC	9.8	16.88	4.76	4.4	1.6					☆		☆		☆				★	
		APKT16T4PDFR-LH1C	9.5	17	4.96	4.4	0.8														
		APKT1652PDFR-LH2C	9.8	16.88	4.76	4.4	3.2					☆		☆		☆				★	

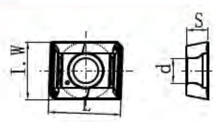
Insert shape		Type	Dimension (mm)						Material recommended												
									CVD coating grade		PVD coating grade						Uncoating grade				
			I.W	L	S	Φd	r		BPS153	BPS253	BPG05B	BPG108	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		LDHT1504PDFR-LHC	9.9	15.2	4.76	4.4	0.8					☆		☆		☆				★	

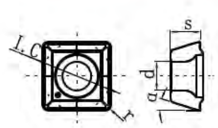
D7 Inserts for shallow hole drilling

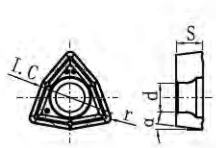
Insert shape		Type	Dimension (mm)						Material recommended									
									CVD coating grade			PVD coating grade			Uncoating grade			
			ΦI.C	S	Φd	R	α		BPS251	BPS253		BPU200	BPG20B	BPG30B	BP35	BK10	BU810	BU820
		WCGX030204-ZS	5.56	2.38	2.8	0.4	7°		★	★			★			☆	☆	
		WCGX030208-ZS	5.56	2.38	2.8	0.8	7°		★	★			★			☆	☆	
		WCGX040204-ZS	6.35	2.38	3	0.4	7°		★	★			★			☆	☆	
		WCGX040208-ZS	6.35	2.38	3	0.8	7°		★	★			★			☆	☆	
		WCGX050304-ZS	7.94	3.18	3.4	0.4	7°		★	★			★			☆	☆	
		WCGX050308-ZS	7.94	3.18	3.4	0.8	7°		★	★			★			☆	☆	
		WCGX06T304-ZS	9.525	3.97	4.4	0.4	7°		★	★			★			☆	☆	
		WCGX06T308-ZS	9.525	3.97	4.4	0.8	7°		★	★			★			☆	☆	
		WCGX080404-ZS	12.7	4.76	5.5	0.4	7°		★	★			★			☆	☆	
		WCGX080408-ZS	12.7	4.76	5.5	0.8	7°		★	★			★			☆	☆	
		WCGX080412-ZS	12.7	4.76	5.5	1.2	7°		★	★			★			☆	☆	

★ Recommended grade ☆ Optional grade

D7 Inserts for shallow hole drilling

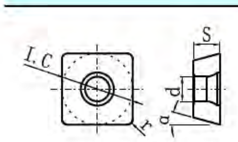
Insert shape		Type	Dimension（mm）						Material recommended									
									CVD coating grade			PVD coating grade			Uncoating grade			
			I.W	L	S	d			BPS251	BPS253		BPU200	BPG20B	BPG30B	BP35	BK10	BU810	BU820
		APMT1504T-WT	15.88	12.7	4.76	5.5			★	★			★					

Insert shape		Type	Dimension（mm）						Material recommended									
									CVD coating grade			PVD coating grade			Uncoating grade			
			ΦI.C	S	d	r	a°		BPS251	BPS253		BPU200	BPG20B	BPG30B	BP35	BK10	BU810	BU820
		SPMG050204-ZV	5.56	2.38	2.5	0.4	11°		★				★				☆	
		SPMG060204-ZV	6.35	2.38	2.8	0.4	11°		★				★				☆	
		SPMG07T308-ZV	7.94	3.97	2.8	0.8	11°		★				★				☆	
		SPMT090408-ZV	9.8	4.3	4.1	0.8	11°		★				★				☆	
		SPMG110408-ZV	11.5	4.76	4.4	0.8	11°		★				★				☆	
		SPMG140512-ZV	14.3	5.56	5.5	1.2	11°		★				★				☆	

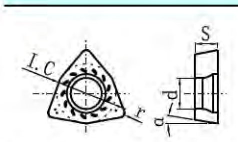
Insert shape		Type	Dimension（mm）						Material recommended									
									CVD coating grade			PVD coating grade			Uncoating grade			
			ΦI.C	S	Φd	R	α		BPS251	BPS253		BPU200	BPG20B	BPG30B	BP35	BK10	BU810	BU820
		WCGX030204-ZV	5.56	2.38	2.5	0.4	7°		★	★			★			☆	☆	
		WCGX030208-ZV	5.56	2.38	2.5	0.8	7°		★	★			★			☆	☆	
		WCGX040204-ZV	6.35	2.38	2.8	0.4	7°		★	★			★			☆	☆	
		WCGX040208-ZV	6.35	2.38	2.8	0.8	7°		★	★			★			☆	☆	
		WCGX050304-ZV	7.94	3.18	3.4	0.4	7°		★	★			★			☆	☆	
		WCGX050308-ZV	7.94	3.18	3.4	0.8	7°		★	★			★			☆	☆	
		WCGX06T304-ZV	9.525	3.97	4.4	0.4	7°		★	★			★			☆	☆	
		WCGX06T308-ZV	9.525	3.97	4.4	0.8	7°		★	★			★			☆	☆	
		WCGX080404-ZV	12.7	4.76	5.5	0.4	7°		★	★			★			☆	☆	
		WCGX080408-ZV	12.7	4.76	5.5	0.8	7°		★	★			★			☆	☆	
		WCGX080412-ZV	12.7	4.76	5.5	1.2	7°		★	★			★			☆	☆	

★ Recommended grade ☆ Optional grade

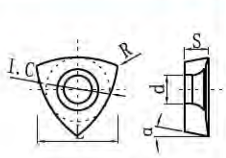
D8 Inserts for profile milling



Type	Dimension (mm)					Material recommended: CVD coating grade				PVD coating grade					Uncoating grade				
	I.C	S	d	r	a°	BPS153	BPS253	BPS321	BPS411	BPG10A	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
SDMT09T312-DM	9.525	3.97	4	1.2	15°				★		★	☆		☆					
SDMT120412-DM	12.7	4.76	4.4	1.2	15°				★		★	☆		☆					



Type	Dimension (mm)					Material recommended: CVD coating grade				PVD coating grade					Uncoating grade				
	I.C	S	d	r	a°	BPS153	BPS253	BPS321	BPS411	BPG10A	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
WPGT050315ZSR	7.94	3.5	4	1.5	11°				★		★	☆		☆					
WPGT060415ZSR	9.525	4.2	4.4	1.5	11°				★		★	☆		☆					
WPGT080615ZSR	12.85	6.35	5.5	1.5	11°				★		★	☆		☆					
WPGT090725ZSR	15	7	5.5	2.5	11°				★		★	☆		☆					

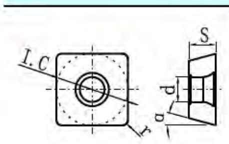


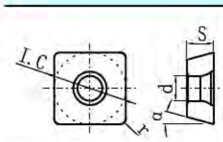
Type	Dimension (mm)						Material recommended: CVD coating grade				PVD coating grade						Uncoating grade				
	ΦI.C	S	Φd	L	R	a°	BPS153	BPS253	BPS303	BPC102	BPG05B	BPG10A	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
ZDGW08T2R10	6.75	2.78	2.8	8.4	10	15			★	☆			★	☆		☆		☆			
ZDGW1103R12.5	8.5	3.18	2.8	10.6	12.5	15			★	☆			★	☆		☆		☆			
ZDGW13T3R16	10.5	3.97	4.4	13.2	16	15			★	☆			★	☆		☆		☆			
ZPGW2204R20	12.7	4.76	5.5	16.1	20	11			★	☆			★	☆		☆		☆			
ZPGW2204R25	12.7	4.76	5.5	16.9	25	11			★	☆			★	☆		☆		☆			
ZPGW2204R31	12.7	4.76	5.5	17.6	31.5	11			★	☆			★	☆		☆		☆			

★ Recommended grade ☆ Optional grade

D Milling

D9 Inserts for profile milling

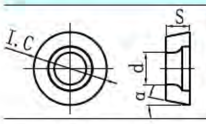
Insert shape		Type	Dimension（mm）						Material recommended														
									CVD coating grade				PVD coating grade						Uncoating grade				
			ΦI.C	S	Φd	L	R	a°	BPS153	BPS253	BPS303	BPC102	BPG05B	BPG10A	BPG20B	BPG308	BPG25B	BPG30B	BP20	BP35	BK10	BU810	BU820
		SPMT060304	6.35	3.18	2.8	6.35	0.4	11°			★	☆			★	☆		☆		☆			
		SPMT120408	12.7	4.76	5.5	12.7	0.8	11°			★	☆			★	☆		☆		☆			
		SDMT090308	9.525	3.18	4.4	9.525	0.8	15°			★	☆			★	☆		☆		☆			

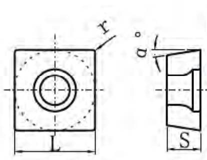
Inserts shape		Type	Dimension（mm）						Material recommended																
									CVD coating grade				PVD coating grade					Cermet		Uncoating grade					
			I.C	S	d	r	a°		BPS153	BPS253	BPS303	BPC102	BPU106	BPU200	BPU206	BPG208	BPG308	BN201	BN301	BP20	BP35	BK10	BU810	BU820
		SPMT120408	12.7	4.76	5.5	0.8	11°		★	★	★	★												

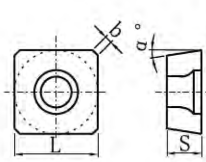
D Milling

★ Recommended grade ☆ Optional grade

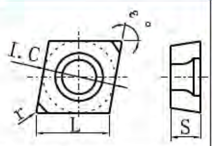
D10 Others

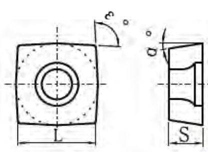
Insert shape		Type	Dimension（mm）			
			I.C	S	a	d
		P22215-00	8	2.38	14°	3.4
		P22215-14	12	4.76	11°	5.5

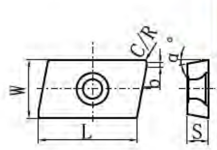
Insert shape		Type	Dimension（mm）			
			L	S	a°	r
		P2801-0	9.52	3.18	14	0.8
		P2808-1	12.7	4.76	11	0.8
		P2809-1	12.7	4.76	11	0.8
		P28415-00	6.35	3.18	11	0.4
		P28415-0	9.52	3.18	14	0.8
		P28495-1	12.7	4.76	11	0.8
		P2800-0	9.52	3.18	11	0.8
		P2800-2	15.88	4.76	11	1.2
		P2816-1	12.7	4.76	11	C0.7

Insert shape		Type	Dimension（mm）			
			L	S	a°	b
		P2894-1	12.7	4.76	20	2
		P2894-2	15.88	4.76	20	2.1
		P2803-1R	12.7	4.76	11	1.4
		P2803-1L	12.7	4.76	11	1.4
		P28451-1	1.27	4.76	11	1.4

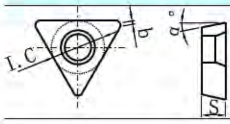
D10 Others

Insert shape		Type	Dimension (mm)					
			I.C	L	S	a°	ε°	r
		P29221-04	6.35	6.45	2.38	7	80	0.4
		P29221-14	9.525	9.67	3.97	7	80	0.4
		P29223-02	6.35	6.45	2.38	7	80	0.2
		P29223-12	9.525	9.525	3.97	7	80	0.2

Insert shape		Type	Dimension (mm)			
			L	S	a°	ε°
		P28467-1	6.35	2.38	14	90
		P28467-2	7.8	3.18	14	90
		P28467-3	9.52	3.97	11	96
		P28467-4	11	3.97	11	96
		P28467-5	12.7	4.76	11	96
		P28467-6	15	4.76	11	96
		P28467-7	17.6	5.56	11	96
		P28475-1	6.35	2.38	14	90
		P28475-2	7.8	3.18	14	90
		P28475-3	9.52	3.97	11	96
		P28475-4	11	3.97	11	96
		P28475-5	12.7	4.76	11	96
		P28475-6	15	4.76	11	96
		P28475-7	17.6	5.56	11	96

Insert shape		Type	Dimension (mm)					
			L	W	S	a°	C/R	b
		P2700-0	8.3	8.3	3.18	11	R0.5	
		P2700-3R	15	9.52	3.18	14	R0.8	
		P2700-3L	15	9.52	3.18	14	R0.8	
		P2703-3R	15	9.52	3.18	14		1.4
		P2703-4R	20	12.7	4.76	11		1.5
		P2706-3R	15.88	12.7	4.76	11	C1.1	
		P2706-4R	20	12.7	4.76	11	C0.8	
		P2706-4L	20	12.7	4.76	11	C0.8	
		P2707-3R	15.88	12.7	4.76	11	C1.1	
		P2707-4R	20	12.7	4.76	11	C0.8	
		P2707-4L	20	12.7	4.76	11	C0.8	

D10 Others

Insert shape		Type	Dimension（mm）			
			I.C	S	a°	b
		P2603-2	9.52	4.76	11	1.2
		P2603-3	12.7	4.76	11	1.2

D Milling

D12 Milling Technical information

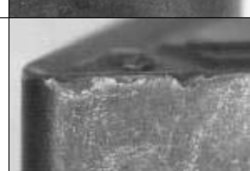
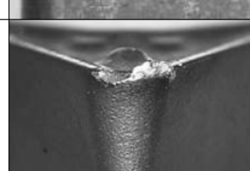
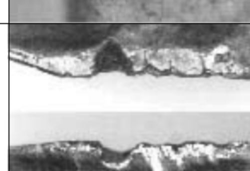
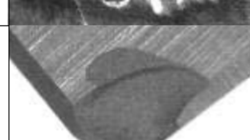
a Common problems and solutions for milling

Failure description			Selection of tool material: higher hardness Material	Selection of tool material: Material with perfect toughness	Cutting condition: Cutting speed	Cutting condition: Feed rate	Cutting condition: Cutting depth	Cutting condition: Change the diameter and width of milling tools	Cutting condition: Cutting liquid	Tool shape: Rake angle	Tool shape: Approach angle	Tool shape: Strength of cutting edge	Tool shape: Number of teeth	Tool shape: Increase the chip pocket	Tool shape: Examine the geometry shape of Minor cutting edge	Tool shape: Check the run-out of end face	Tool shape: Improve the rigidity of tool	Machine tool clamping: Clamping system of workpiece	Machine tool clamping: Overhang of tool	Machine tool clamping: Power, gap
Fracture of tool nose	Severe abrasion of clearance face	Improper cutting condition			↓				✓											
		Improper geometry shape of cutting edge	✓							↑		↑								
	Severe abrasion of rake face	Improper cutting condition			↓	↓	↓		✓											
		Improper geometry shape of cutting edge	✓							↑	↑	↑								
	Fracture of cutting edge	Improper cutting condition				↑	↑													
		Improper geometry shape of cutting edge		✓							↑	↑			✓	✓	✓	✓	✓	✓
	Thermal cracking	Improper cutting condition			↑	↑	↑		✓											
		Improper geometry shape of cutting edge								↓		↑								
	Build-up edge	Improper cutting condition			↓	↓			✓											
		Improper geometry shape of cutting edge								↓		↑								
Machining precision	Coarse surface	Abrasion of tool produces great vibration of milling tool	✓		↓	↑	↑		✓			↑			Wiper	✓				
	Causing burr	Improper cutting condition			↑	↑	↑	✓												
		Improper geometry shape of cutting edge								↓	↓	↑			✓					
	Side collapse	Improper cutting condition				↑	↑													
		Improper geometry shape of cutting edge								↓	↑	↑	↓		✓		✓			
	Worse planeness and parallelism	Improper geometry shape of cutting edge				↑	↑			↓	↓		↑		✓	✓	✓	✓	✓	
Others	Great vibration	Cutting condition Improper technology			↑	↑	↑	✓		↓	↓	↑					✓	✓	✓	✓
	Chippings are twisting and jamming	Improper cutting condition			↓	↓		✓	✓				↑							
		Improper geometry shape of cutting edge								↓			↑	✓						

D Milling

D12 Milling Technical information

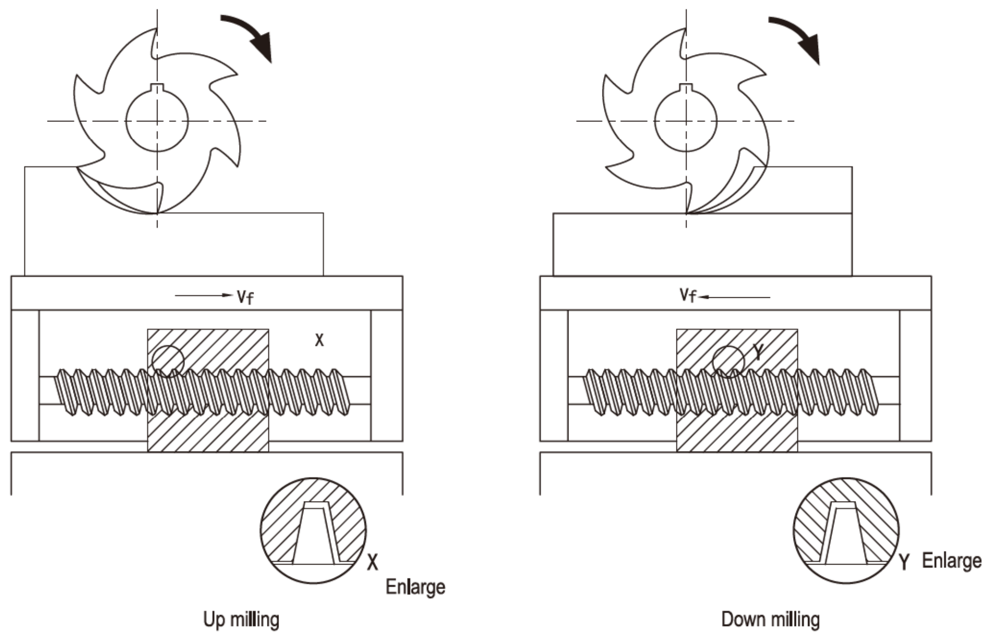
b Questions and solutions

The problem of representation		Phenomenon	Reason	Solutions
Blade wear		reduction of surface roughness and size for finishing	The cutting speed is too high The service life of the cutter end	Lower cutting speed The use of abrasion resistance and better material
A boundary wear		Burrs Cutting resistance	The amount of feed is too large and the cutting speed is too high	Improve the edge sharpness Lower cutting speed The use of thermal shock resistance of materials
Crater wear		Chip control deterioration Finishing the surface deterioration(Terry)	Cutting speed is too high	Improve the edge sharpness Lower cutting speed The use of thermal shock resistance of materials
Plastic deformation		Workpiece size change Blade damage	Cutting load is too high Cutter material mismatch	The use of high hardness material Reduce the amount of feed and cutting depth
Wear damage		The rapid deterioration of processing surface,Workpiece size tolerance	The cutting speed is too high	Reduce the preset tool life The use of abrasion resistance and better material
Surface roughness		Cutting resistance Surface deterioration	The amount of feed is too large Cutting vibration knife Blade low toughness.	Reduce the amount of feed and cutting depth The use of rigid and better tools The use of higher material toughness
Sticking to the knife and built-up edge cause chipping		Surface deterioration Cutting resistance	The cutting speed is too low	Increasing the cutting speed Enhance the sharpness (anterior horn, chamfer)
Mechanical abrasion		Accidental damage Tool life instability	The amount of feed and depth of cut is too large Cutting vibration knife	The use of higher material toughness Increase chamfer Increas the radius of the cutter tip The use of rigid and better tools
Thermal cracking damage		By the thermal cycle and damage Occurring in intermittent cutting and milling	The amount of feed is too large and the cutting speed is too high	Reduce the amount of feed Reduce the cutting speed The use of dry cutting
Chipping		Appearing for high hardness material machining Appearing in vibration knife cutting	Blade low toughness. Tool less rigid	The use of high hardness material (TiC ceramics and CBN) The use of rigid and better tools Change the blade tip.

D
Milling

D12 Milling Technical information

C Difference and selection between down milling and up milling



Down milling (also called down milling): the feed direction of workpiece is the same as the milling rotation at the connecting position.

Up milling (also called up milling): the feed direction of workpiece is opposite to the milling rotation at the connecting position.

In down milling, the major force of cutting edge is compressive stress; in up milling, cutting edge bears the tensile stress. The compressive strength of cemented carbide material is larger than its tensile strength. In down milling, chip becomes thin from thick gradually , cutting edge and workpiece press each other. The friction between edge and workpiece is small, thus can reduce the abrasion of edge , the hardening of workpiece surface and the surface roughness (Ra). In up milling, chip becomes thick from thin gradually. When insert cutting into the workpiece, it generates strong friction and more heat than down milling, and make workpiece surface harden.

In up milling, because horizontal direction of cutting force that milling cutter conducting on workpiece is opposite to the feed direction of workpiece, therefore the lead screw of work table joints closely with one side of screw nut. In down milling,the direction of cutting force is same as the feed direction. When edge's radial force on workpiece is big enough to some extend , the work table will bounce left and right, thus make the gap fall behind. The gap will return to front side along with the continuing rotation of lead screw. At this moment the work table stops motion, however it will bounce left and right again when the radial cutting force is big enough to some extend again. The periodical bounce of work table will cause poor surface quality of workpiece and tool breakage.

When use end mills for down milling, every time the edges begin the cutting at workpiece surface, therefore end mills are not suitable for machining the workpiece with hardened surface.

Up milling is recommended for milling the thin-wall components or square milling with the demand of high precision.

D Milling

D12 Milling Technical information

d Pitch selection

Pitch is the distance between one point on one cutting edge and the same point on the next edge. Milling cutters are mainly classified into coarse, close and extra close pitches,

Stability of operation		
L (Low)	M (Medium)	H (High)
Coarse pitch  Differential pitch	Close pitch 	Extra close pitch 
When the milling width is equal to diameter of cutter, the machining system is stable and main power of machine is sufficient,selecting coarse pitch can achieve high productive efficiency.	General milling function and multiple mixed productions	When the milling width is less than diameter of cutter, cutting by maximum edges can achieve high productive efficiency.

Selection of approach angle

The approach angle is composed by insert and tool body, Chip thickness, cutting forces and tool-life are affected especially by the approach thickness and spreads the cutting area between cutting edge and workpiece for a given feed rate.

A smaller approach angle also guarantee that it is stable entrying into or exiting workpiece,to protect the cutting edge and extend tool life.However this will increase higher axial cutting forces on the workpiece, thus is not suitable for machining thin workpiece such as thin plate.

Approach angle	Feed rate per tooth	Real maximum cutting depth
90°	f_z	$h_{ex}=f_z\times \sin kr$
75°	f_z	$h_{ex}=0.96\times f_z$
60°	f_z	$h_{ex}=0.86\times f_z$
45°	f_z	$h_{ex}=0.707\times f_z$
Round insert	f_z	$h_{ex}=\frac{\sqrt{iC^2\times(iC-2a_p)^2}}{iC}\times f_z$

D Milling

D12 Milling Technical information

e General formula

Vc :	cutting speed(m/min)	Vf :	feed rate of worktable (feed speed)(mm/min)	Q :	metal removal rate(cm3/min)
Dc :	nominal diameter of milling tool(mm)	fz :	feed rate per tooth(mm/z)	fn :	feed rate per revolution (mm/rev)
n :	spindle speed(rev/min)	π :	circumference ratio≈3. 14	L :	Real cutting distance(mm)
Zn :	number of teeth	Tc :	machining time(min)		

- Cutting speed

$$V_c = \frac{\pi \times D_c \times n}{1000} \quad (m/min)$$

- Spindle speed

$$n = \frac{1000 \times V_c}{\pi \times D_c} \quad (rev/min)$$

- Feed rate of worktable (feed speed) (mm/min)

$$V_f = f_z \times n \times z_n$$

- Feed rate per tooth

$$f_z = \frac{V_f}{n \times Z_n} \quad (mm/z)$$

- Feed rate per revolution

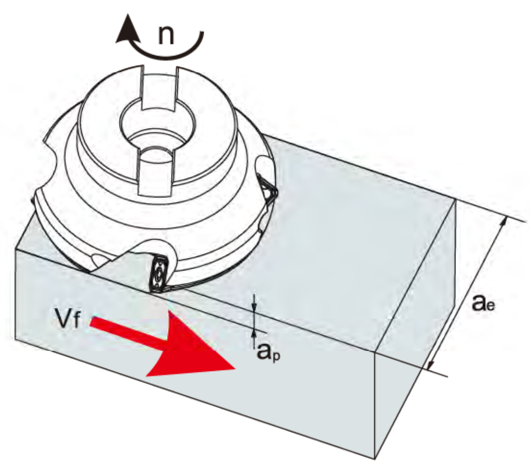
$$f_n = \frac{V_f}{n} \quad (mm/rev)$$

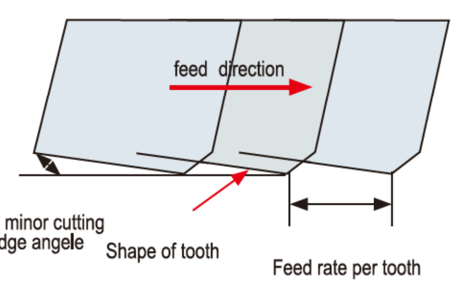
- Machining time

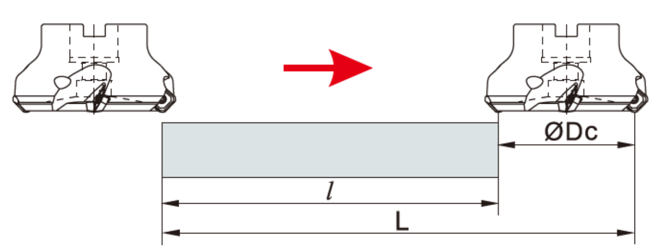
$$T_c = \frac{L}{V_f} \quad (min)$$

- Metal removal rate

$$Q = \frac{a_p \times a_e \times V_f}{1000} \quad (cm^3/min)$$



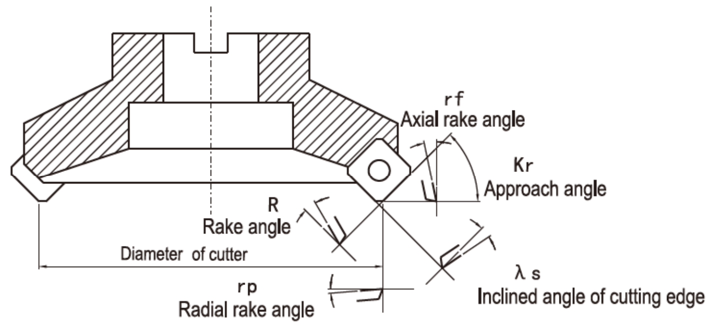




D12 Milling Technical information

f Function of each part in face milling

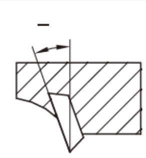
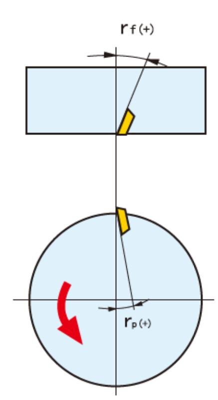
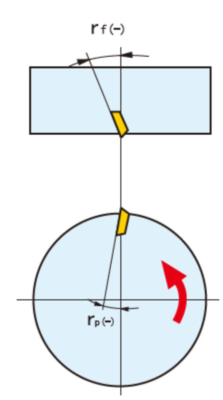
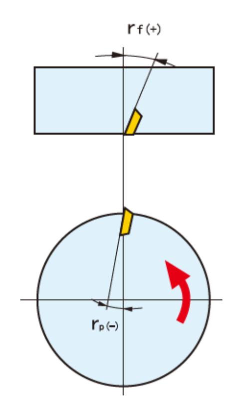
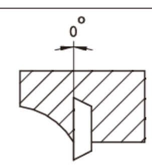
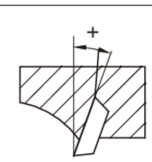
Main angles of face mills



Main angles of face mills

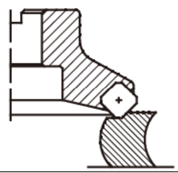
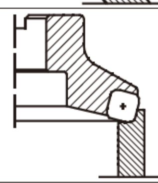
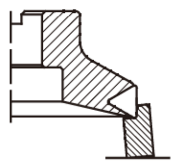
Designation	Function	Effect		
r_f Axial rake angle rf	Determining the chip direction	negative angle, excellent capability of chip removal		
r_p Radial rake angle rp	Determining whether the cutting is light and fast or not	Positive angle, good cutting performance		
Kr Approach angle Kr	Determining the chip direction thickness	Kr↑, chip thickness↑; Kr↓, chip thickness↓		
R Rake angle R	Determining whether the cutting is light and fast or not	Poor cutting performance, high strength of high strength of cutting edge	(—) ←0→ (+)	Good cutting performance, cutting edge
λs Inclined angle of cutting edge	Determining the chip direction	Poor cutting performance, high strength of high strength of cutting edge	(—) ←0→ (+)	Good cutting performance, low strength of cutting edge

Characteristics of different rake angles combined

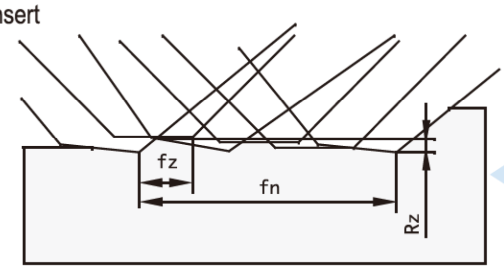
		Double positive	Double negative	One positive, one negative
Negative rake angle				
0° rake angle				
Positive rake angle				
r_f Axial rake angle rf		+	—	+
r_p Radial rake angle rp		+	—	—
Applicable material machined	P	√		√
	M	√		√
	K		√	√
	N	√		
	S	√		√

D12 Milling Technical information

g Cutting performances of different approach angles

Approach angle	Schematic diagram	Instruction
45°		Axial force is the largest. It will bend when machining thin-wall workpiece, and reduces the precision of workpiece. It is benefit to avoid fringe breakage of workpiece when machining cast iron
75°		The main purpose is to resolve the radial cutting force, it is often used for general face milling.
90°		The axial force is zero in theory, suitable for milling thin plate workpiece.

Wiper insert

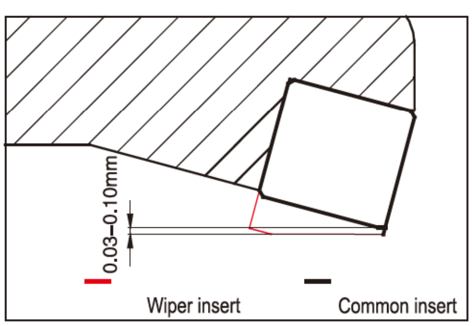


It has axial and radial run out because of tools and inserts exist manufacturing tolerance. The axial runout lead to poor surface roughness.

Solution

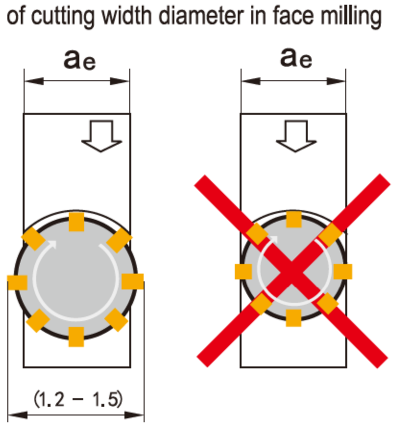
Assembling wiper inserts

usage



The wiper insert must protrude below the other inserts by 0.03-0.10 mm at axial direction, only that the wiping function can take into effect. Generally speaking, a cutter can just assemble only one wiper insert. If the diameter of cutter is much bigger or cutter's feed rate per revolution is bigger than the length of wiper edge, 2 to 3 wiper inserts can be assembled.

Selection of cutting width diameter in face milling



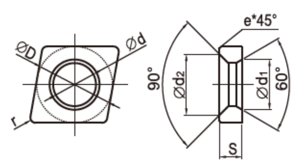
Dc : Tool cutting diameter

ae : Cutting width

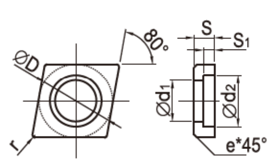
Generally speaking, the relation between cutting width and diameter is Dc=(1.2—1.5) ae. In the machining practice, it need to avoid coincidence of tool center and workpiece center as much as possible.

E Shim

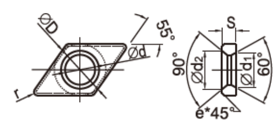
E1 C*A

Shim shape	Type	D	S	d	r	d1	d2	e	applicative inserts
	C12A	11.7	3.18	6.1	0.8	7.3	8.5	0.5	CNMM/G12
	C16A	14.88	4.76	7.1	1.2	8.5	10	0.5	CNMM/G16
	C19A	18.05	6.35	8.7	1.6	10.3	11.5	0.5	CNMM/G19
	C16BP	15.6	4.76	7.9	1.6	9.58	11.3	0.5	CNMM/G16
	C19BP	18.8	4.76	10	1.6	12	12.1	0.5	CNMM/G19

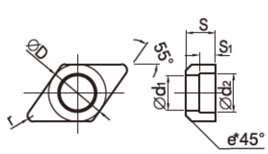
E2 C*B

Shim shape	Type	D	S	r	d1	d2	S1	e	applicative inserts
	C12B	11.7	3.18	0.8	6.6	8	1.5	0.5	CNMM/G12
	C16B	14.88	4.76	1.2	7.6	9	2	0.5	CNMM/G16
	C19B	18.05	4.76	1.6	8.6	10	2	0.5	CNMM/G19
	MC0903	9.3	3.18	0.8	5.8	6.5	1.87	0.2	CNMM/G09
	MC1204	12.5	4.76	1.2	7.4	8.1	2.77	0.2	CNMM/G12
	MC1604	15.5	4.76	2	9.8	10.8	2.2	0.3	CNMM/G16
	MC1904	18.65	4.76	1.25	8	12.25	2.5	0.5	CNMM/G19
	ICSN-332	9.14	4.76	0.8	5.94	6.63	3.43	0.5	CNMM/G09**08
	ICSN-432	12.32	4.76	0.8	7.52	8.2	2.59	0.5	CNMM/G12**08
	SM-303	12.32	4.76	0.79	6.76	9.14	2.49	0.5	CNMM/G12**08
	ICSN-433	12.32	4.76	1.27	7.52	8.2	2.59	0.5	CNMM/G12**12
	ICSN-443	12.32	5.3	1.27	7.52	8.2	3.05	0.5	CNMM/G12**12
	ICSN-533	15.49	4.76	1.27	9.86	10.97	2.59	0.5	CNMM/G16**12
	SM-304	18.67	4.76	1.27	8.48	11.71	2.49	0.5	CNMM/G19**12
	ICSN-633	18.67	4.76	1.27	11.43	12.29	2.59	0.5	CNMM/G19**12
	C0903B	9.13	9.13	0.8	5.85	6.7	1.75	0.5	CNMM/G09
	SC1203	12.2	3.18	0.8	6.95	8.05	1.75	0.2	
	SC1204	12.2	4.76	0.8	7.4	7.8	2.25	0.5	
	C1203B	12.3	3.18	1.27	7.35	8.3	1.75	0.5	
	C1203B	12.3	12.3	1.27	7.35	8.3	1.75	0.5	CNMM/G12
	SMC-432	12.4	4.8	0.8	7.35	8.1	2.3	0.5	
	MSC-432	12.4	4.8	1.2	7.25	8	2.6	0.5	
	C1204	12.5	4.76	1.2	7.4	8.25	3.25	0.8	
	M-C16B	14.88	4.76	1.2	7.8	9	2.8	0.5	
	SC1604	15.2	4.76	1.2	7.95	9.05	2.05	0.2	CNMM/G16
	C1604B	15.48	4.76	1.27	9.85	10.9	2.65	0.5	
	SCN-64	18.7	4.76	1.6	9.4	10.8	2.4	0.5	

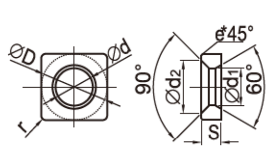
E3 D*A

Shim shape	Type	D	S	d	r	d1	d2	e	applicative inserts
	D15TA	11.7	3.18	6.1	1.2	7.3	8.5	0.2	DNMM/G15
	D15A	11.7	4.76	6.1	1.2	7.3	8.5	0.2	
	D19A	14.88	4.76	7.1	1.2	8.5	10	0.2	DNMM/G19
	TD1503	11.65	3.18	6.8	0.8	8.6		0.5	DNMM/G15

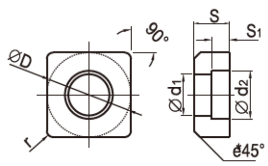
E4 D*B

Shim shape	Type	D	S	r	d1	d2	S1	e	applicative inserts
	D15TB	11.7	3.18	1.2	6.6	8	1.5	0.2	DNMM/G15
	D15B	11.7	4.76	1.2	6.6	8	1.5	0.2	
	D19B	14.88	4.76	1.2	7.6	9	2	0.2	DNMM/G19
	MD1504	12.5	4.76	0.8	7.4	8.1	2.77	0.2	DNMM/G15
	MD1506	12.5	6.35	0.8	7.4	8.1	4.28	0.2	
	IDSN-322	9.14	3.18	0.8	5.94	6.63	1.85	0.5	DNMM/G11**12
	IDSN-433	12.32	4.76	1.27	7.52	8.2	2.59	0.5	DNMM/G15**12
	IDSN-533	15.49	4.76	1.27	9.86	10.97	2.59	0.5	DNMM/G19**12
	D1103B	9.13	3.18	0.8	5.85	6.7	1.75	0.5	
	MD11	9.4	3.3	1.2	5.8	6.6	2	0.2	
	D1504B	12.32	4.76	1.27	7.35	8.3	2.65	0.5	
	SMD-432	12.4	6.46	0.8	7.45	8.16	4.4	0.5	
	SD1503	12.2	3.18	0.8	6.95	8.05	1.75	0.5	
	SD1506	12.2	6.35	0.8	7.25	8.05	4.05	0.5	DNMM/G15
	MSD-432	12.5	4.8	0.8	7.3	8	2.6	0.5	
	D1504	12.5	4.76	1	7.4	8.25	3.25	0.8	
	MD15	12.5	4.76	1.2	7.4	8.3	3	0.2	

E5 S*A

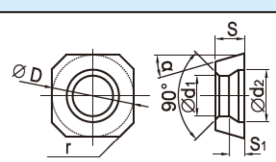
Shim shape	Type	D	S	d	r	d1	d2	e	applicative inserts
	S09A	8.53	3.18	4.6	0.4	5.6	6.6	0.2	SNMM/G09
	S12A	11.7	3.18	6.1	0.8	7.3	8.5	0.2	SNMM/G12
	S15A	14.88	4.76	7.1	1.2	8.5	10	0.2	SNMM/G15
	S19A	18.05	6.35	8.7	1.6	10.3	11.5	0.2	SNMM/G19
	S22A	21.23	6.35	8.7	1.6	10.3	11.5	0.2	SNMM/G22
	S25A	24.4	6.35	10.1	2.4	12	13	0.2	SNMM/G25
	S09BP	8.5	3.18	4.9	0.8	6.8	6.5	0.3	SNMM/G09
	SC42	12.5	3.18	6.9	1.2	8.5	8	0.5	

E6 S*B



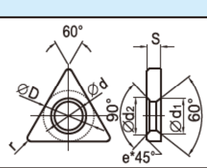
Shim shape	Type	D	S	r	d1	d2	S1	e	applicative inserts
	S09B	8.53	3.18	0.4	5.6	7	1.5	0.2	SNMM/G09
	S12B	11.7	3.18	0.8	6.6	8	1.5	0.2	SNMM/G12
	S15B	14.88	4.76	1.2	7.6	9	2	0.2	SNMM/G15
	S19B	18.05	6.35	1.6	8.6	10	2	0.2	SNMM/G19
	S22B	21.23	7.93	1.6	9.6	11	2.5	0.2	SNMM/G22
	S25B	24.4	7.93	2.4	9.6	11	2.5	0.2	SNMM/G25
	MS0903	9.3	3.18	0.8	5.8	6.5	1.87	0.2	SNMM/G09
	MS1204	12.5	4.76	0.8	7.4	8.1	2.77	0.2	SNMM/G12
	ISSN-322	9.14	3.18	0.8	5.94	6.63	1.85	0.5	SNMM/G09**08
	ISSN-332	9.14	4.76	0.8	5.94	6.63	3.43	0.5	
	ISSN-432	12.32	4.76	0.79	7.52	8.2	2.59	0.5	SNMM/G12**08
	ISSN-433	12.32	4.76	1.27	7.52	8.2	2.59	0.5	SNMM/G12**12
	ISSN-443	12.32	5.3	1.27	7.52	8.2	2.59	0.5	
	ISSN-533	15.49	4.76	1.27	9.86	10.97	2.59	0.5	SNMM/G15**12
	ISSN-633	18.67	4.76	1.27	11.43	12.29	2.59	0.5	SNMM/G19**12
	ISSN-846	25.02	6.35	2.4	14.66	15.88	2.72	0.5	SNMM/G25**24
	S0903B	9.13	3.18	0.8	5.85	6.7	1.75	0.5	SNMM/G09
	SS1203	12.2	3.18	1.2	6.95	8.05	1.75	0.2	
	S1203B	12.32	3.18	1.27	7.35	8.3	1.75	0.5	
	M-S15B	14.88	4.76	1.2	7.8	9	2.8	0.5	SNMM/G15
	S1504B	15.48	4.76	0.8	9.85	10.9	2.65	0.5	

E7 SE*



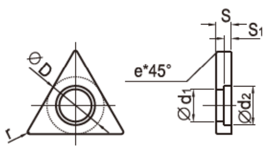
Shim shape	Type	D	S	r	d1	d2	S1	α	applicative inserts
	SEF12	10.5	3	2X45°	5.4	6.7	1.2		SEKT12
	SE445	10.3	3.18	2.5x45°	5.1	6.6	1.68	16°	SEKT12

E8 T*A

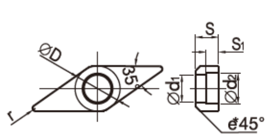


Shim shape	Type	D	S	d	r	d1	d2	e	applicative inserts
	T16A	8.53	3.18	4.6	0.4	5.6	6.6	0.2	TNMM/G16
	T22A	11.7	3.18	6.1	0.8	7.3	8.5	0.2	TNMM/G22
	T27A	14.88	4.76	7.1	1.2	8.5	10	0.2	TNMM/G27

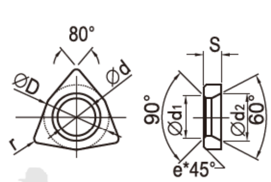
E9 T*B

Shim shape	Type	D	S	r	d1	d2	S1	e	applicative inserts
	T16B	8.53	3.18	0.4	5.6	7	1.5	0.2	TNMM/G16
	T22B	11.7	3.18	0.8	6.6	8	1.5	0.2	TNMM/G22
	T27B	14.88	4.76	1.2	7.6	9	2	0.2	TNMM/G27
	MT1603	9.2	3.18	0.8	5.8	6.5	1.87	0.2	TNMM/G16
	MT2204	12.5	4.76	1.2	7.3	8	2.7	0.4	TNMM/G22
	ITSN-322	9.14	3.18	0.8	5.94	6.63	1.85	0.5	TNMM/G16**08
	ITSN-323	9.14	3.18	1.27	5.94	6.63	1.85	0.5	TNMM/G16**12
	ITSN-333	9.14	4.76	1.27	5.94	6.63	3.43	0.5	TNMM/G16**12
	ITSN-432	12.32	4.76	0.79	7.52	8.2	2.59	0.5	TNMM/G22**08
	ITSN-433	12.32	4.76	1.27	7.52	8.2	2.59	0.5	TNMM/G22**12
	ITSN-534	15.49	4.76	1.57	9.86	10.72	2.59	0.5	TNMM/G27**16
	ITSN-538	15.49	4.76	3.18	9.86	10.72	2.59	0.5	TNMM/G27**32
	ITSN-636	18.67	4.76	2.39	11.43	12.29	2.59	0.5	TNMM/G33**24
	ST1603	9	3.18	0.8	5.95	7.05	1.75	0.2	
	ST1603B	9.13	3.18	1.27	5.85	6.7	1.75	0.5	
	T1603B	9.13	3.18	1.27	5.85	6.7	1.75	0.5	
	T1603	9.4	3.3	1	5.8	6.9	2	0.5	
	T2204B	12.3	3.18	1.27	7.35	8.3	1.75	0.5	
	T2203B	12.3	3.18	1.27	7.35	8.3	1.75	0.5	

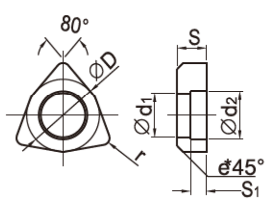
E10 V*B

Shim shape	Type	D	S	r	d1	d2	S1	e	applicative inserts
	IVSN-322	9.14	3.18	0.79	5.94	6.63	1.85	0.5	VNMM/G16**08
	IVSN-433	12.32	4.76	1.57	7.52	8.2	2.59	0.5	VNMM/G22**12
	SMV-321	8.3	3.2	0.8/0.2	5.4	6.5	1.7	0.5	
	MSV-321	8.6	3.2	0.8/0.2	5.6	6.6	1.5	0.5	
	SV1603	9	3.18	0.8	5.95	7.05	1.75	0.5	
	SMV-322	9.1	3.2	0.8/0.2	5.8	6.6	1.7	0.5	VNMM/G16
	V1603B	9.14	3.18	0.79	5.85	6.7	1.75	0.5	
	SM-310	9.14	3.18	0.79	5.41	7.11	1.78	0.5	
	MSV-322	9.3	3.2	0.8/0.2	5.8	6.4	1.9	0.5	

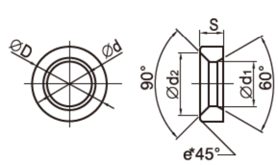
E11 W*A

Shim shape	Type	D	S	d	r	d1	d2	e	applicative inserts
	W08A	11.7	3.18	6.1	0.8	7.3	8.5	0.2	WNMM/G08
	W10A	14.88	4.76	7.1	1.2	8.5	10	0.2	WNMM/G10
	W13A	18.05	6.35	8.7	1.6	10.3	11.5	0.2	WNMM/G13
	SW317	9.35	2.7	5	0.8	6.3	6.6	0.5	
	TW0803	11.65	3.18	6.9	0.8	7.9	8.6	0.5	WNMM/G08
	SW42	12.5	3.18	6.9	1.2	8.5	8	0.5	

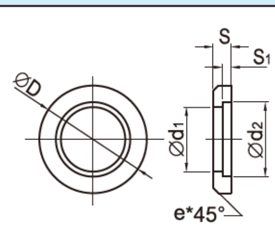
E12 W*B

Shim shape	Type	D	S	r	d1	d2	S1	e	applicative inserts
	W8B	11.7	3.18	0.8	6.6	8	1.5	0.2	WNMM/G08
	W10B	14.88	4.76	1.2	7.6	9	2	0.2	WNMM/G10
	W13B	18.05	6.35	1.6	8.6	10	2	0.2	WNMM/G13
	MW0603	9.3	3.18	0.6	5.75	6.45	1.85	0.2	WNMM/G06
	MW0804	12.6	4.76	0.8	7.4	8.1	2.77	0.2	WNMM/G08
	IWSN-322	9.14	3.18	0.8	5.94	6.63	1.85	0.5	WNMM/G06
	IWSN-432	12.32	4.76	0.8	7.52	8.2	2.59	0.5	WNMM/G08**08
	IWSN-433	12.32	4.76	1.19	7.52	8.2	2.59	0.5	WNMM/G08**12
	W0603B	9.13	3.18	0.8	5.85	6.7	1.75	0.3	WNMM/G06
	SW0803	12.2	3.18	0.8	6.95	8.05	1.75	0.5	
	SMW-432	12.3	4.8	1.2	7.4	8.2	2.6	0.5	WNMM/G08
	W0803B	12.32	3.18	1.19	7.35	8.3	1.75	0.3	
	WW08	12.4	4.76	0.8	6.6	8.4	2.25	0.5	
	MSW-432	12.8	4.8	0.8	7.3	8.1	2.6	0.5	
	W1004B	15.48	4.76	0.8	9.85	10.9	2.65	0.3	WNMM/G10

E13 R*A

Shim shape	Type	D	S	d	d1	d2	e	applicative inserts
	R10A	9	3.18	4.6	5.6	6.6	0.2	RNMM/G10
	R12A	11	3.18	6.1	7.3	8.5	0.2	RNMM/G12
	R16A	15	4.76	7.1	8.5	10	0.2	RNMM/G16
	R20A	19	6.35	8.7	10.3	11.5	0.2	RNMM/G20
	R22A	21	6.35	8.7	10.3	11.5	0.2	RNMM/G22
	R25A	24	6.35	10.1	12	13	0.2	RNMM/G25

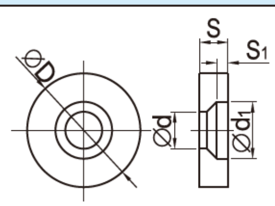
E14 R*B

Shim shape	Type	D	S	d1	d2	S1	e	applicative inserts
	R09B	9.4	4.76	4.6	5.8	2	0.2	RNMM/G10
	R12B	12.5	4.76	6.1	7.4	2	0.2	
	IRSN-43	12.47	4.77	7.34	8	2.24	0.76	RNMM/G12
	IRSN-44	12.47	6.41	7.34	8	2.24	0.76	
	IRSN-62	18.77	3.18	11.25	13.03	1.53	0.76	RNMM/G19
	R1003B	9.6	3.18	5.85	6.7	1.75	0.3	RNMM/G10
	R1203B	11.6	3.18	7.35	8.3	1.75	0.3	
	R1604B	15.6	4.76	9.85	10.9	2.65	0.3	RNMM/G16

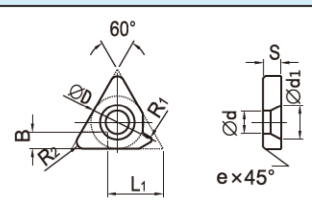
E

Shim

E15 KT*

Shim shape	Type	D	S	S1	d	d1				applicative inserts
	KTS20	13	5	2.5	4.5	6				
	KTS25	15	5	2.5	5.5	7				
	KTS32	20	5	2	6.5	10				
	KTS40	25	8	0	6.5	14.5				
	KTS50	30	8	0	6.5	14.5				

E16 STM*(L*)

Shim shape	Type		D	S	e	d	d1	R1	R2	L1	
	LW-16LT	LW-16RT	9.5	3.18	0.5	4.1	6.1	0.5	1.25	10	
	LT16R-3.0	LT16L-3.0	9.13	3.18	0.5	5.55	6.6	0.1	0.8	7.29	
	STM16		9.4	3.18	0.5	4		0.4	2	4.65	
	MT16-M		9.25	3.18	0.5	5.6		0.5	0.5		
	STM16L	STM16R	9.4	3.18	0.5	4.1		0.4	2	4.65	
	STM22L	STM22R	12.5	3.97	0.5	5.2		0.5	1.8	5.3	

F Technical information

F1 Cemented Carbide products safety standard

1、Features of cemented carbide materials

Cemented carbide cutting tools are mainly comprised by W, C,Co, N, Ti, Si, Al, O etc elements and other chemical compound,and come into shape after sintering and a series of subsequent machining. Cemented carbide tool possesses good chemical stability and high strength, it is the ideal tool to cut most of metals and high strength nonmetals.

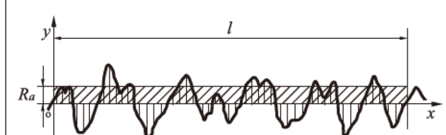
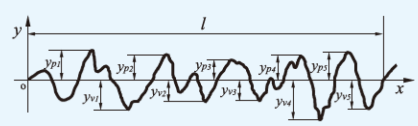
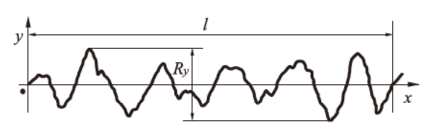
2、Cautions for safty use cemented carbide tools

1) Cemented carbide is hard and frangible material, it is easy to generate brittle rupture and breakage because of larger force or partial stress, which causing sharp cutting edge.
2) Most of cemented carbide are mainly comprised of W and Co, which with high density. In the process of transport and storage, special treatment should be done for great heavy goods and handle them with care.
3) Cemented carbide and steel have different thermal expansion coefficients. In order to avoid breakage caused by concentrated stress, the welding should be made in suitable temperature.
4) Cemented carbide tools should be stored in the dry environment where is far away from the corrosive atmosphere.
5) In the cutting process, it is unavoidable to generate chips and brittle discs etc, please make sure the labor protection articles are prepared before machining.
6) If coolant is used in the cutting process, please select correct coolant to prolong the machine and tool lives.
7) Please stop using the tool when it's generating crackle in the machining process.
8) The long use of cemented carbide tool will lead to cutting edge passivation and lower strength, however,please make sure to regrind by professional person
9) Please collect the broken tools and chips properly,in case hurting other people.

F2 Cautions for safty use cutting tools

Danger	Protective measure
Direct touch with the sharp cutting edges may cause injuries.	Please use gloves etc labor protection articles when assemble or disassemble cutting tools on machine.
Improper use of tools may cause the tool breakage and be expelled from machine, thus will generate injuries	Please read catalogue and safety standard before operating. Please wear safeguard glasses and protective clothes.
Rapid increase of cutting resistance due to excessive abrasion and severe impact may lead to breakage of tool and spatter of chips, thus cause injuries to operator.	Change the tool with excessive abrasion without delay Please wear safeguard glasses and protective clothes.
In cutting process, hot chips may generate risk of scald and scuffing. In cutting process, sparks and hot chips may cause risks of fire and explosion.	Please use tools such as plier to clear away the chips in time. Please wear safeguard glasses and protective clothes
At high speed, the machine will vibrate severely because of poor balance of holder etc., And may cause tool breakage.	Clear away the inflammable and explosive materials in the cutting area. Please make sure the fire extinguishers are prepared.
Burrs on workpiece are very sharp and easy to cause injuries. If directly machine the workpiece held un-firmly, it will cause tool breakage and splash of workpiece.	Check whether the machine is loose or has any abnormal noise before cutting. Please wear safeguard glasses and protective clothes.
If inserts or spare parts are not clamped properly, they may become loose and fly out ,which cause risk of injuries.	Don't touch the burrs on the workpiece with bare hand.
If inserts and tool are clamped too tightly by screw and clamp, it may have the risk of breakage and splash.	Please wear protective gloves and clothes. Make sure the workpiece is clamped firmly.
Inserts or spare parts may be expelled due to inertial centrifugal force at high cutting speed.	Please wear safeguard glasses and protective clothes. Use the suitable tools to set inserts, and make sure the inserts and spare parts are clamped firmly before machining.
Milling cutters have sharp cutting edges. Direct touch with them may cause injuries.	Please not clamp tools too tightly by sleeve
In rotating cutting, clothes, gloves etc are easy to be wringed to the machine at high speed, thus cause casualties	Use the tools within recommended cutting conditions. Please wear safeguard glasses and protective clothes.
	For your safety, please wear protective gloves if need to touch inserts.
Off-center or poor balance of tools in rotating machining will cause vibration, breakage and splash of tool, thus will cause injuries.	Please use the tools within the range of recommended rotating speed. Check and adjust machine balance periodically.
When cutting at high speed, the chips flying out rapidly may cause injuries.	Please use protective cover, screen etc safeguard goods. Please wear safeguard glasses ,protective clothes and gloves.
Using the extremely small drill is easy to cause tool breakage and splash, and hard to take out the broken part.	Reduce tool vibration and conduct machining at suitable speed. Please wear safeguard glasses ,protective clothes and gloves.
Machine and tools may be damaged if they are used out of specified purposes, thus may cause other risks.	Please use them strictly according to instructions and specified purposes.

F3 Surface roughness

Type	Code	Calculate method	Calculate Example
Arithmetic average deviation of profi le	Ra	Within sampling length l, the arithmetic average absolute value of profile deviation is In the formula, the profile deviation y is the distance between profile points and reference line in the measuring direction.Reference line is the profile least-square average line O. This line divide the profile and make the sum of squares of profile deviation to be the minimum within the sampling length.	 Arithmetic average deviation of profi le
Irregularity ten-point high	Rz	Within sampling length l, the sum of the average value of heights of five highest profile peak and the depths of five deepest profile valleys In the formula, ypi means the height of 'i',the highest profile peak. In the formula,yvi means the depth of 'i'the deepest profile Valley.Maximum height of profile Ry: the distance between the top profile peak line and the bottom profile valley line in the longitudinal direction within the sampling length l.	 Irregularity ten-point high
Maximum height of profile	Ry	The distance between the inner profile peak line and the bottom profile valley line in the longitudinal direction within the sampling length l. Top profile peak line is the line that parallels to the reference line and passes through the highest point of profile peak. Bottom profile line is the line that parallels to the reference line and passes through the lowest point of profile valley	 Maximum height of profile

The value Of Sampling leng 1 and rva1uation length 1n

Ra/um	Rz/um	1/mm	1n=51/mm
> 0.008~0.02	≧0.025~0.10	0.08	0.4
> 0.02~0.1	□0.1~0.50	0.25	1.25
> 0.1~0.2	□0.50~10.0	0.8	4.0
> 0.2~10.0	> 10.1~0.50	2.5	12.5
> 10.0~80.0	> 50~320	8.0	40.0

Carbon steel

China	Japan	Germany		Great Britain		France	Italy	Spain	Sweden	USA
GB	JIS	W.-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE
15	STKM12A/STKM12C/S15C	1.0038/1.0401/1.1141	RSt.37-2/C15/Ck15	4360 40 C/080M15	– /32C	E24-2Ne/CC12/XC12	– /C15, C16/C16	– /F.111/C15K	1311/1350/1370	A570.36/1015
20	-	1.0402	C22	050A20	2C	CC20	C20,C21	F.112	1450	1020
Y13	-	1.0736	9SMn36	240M07	1B	S300	CF9SMn36	12SMn35	-	1215
Y15	SUM22	1.0715	9SMn28	230M07	1A	S250	CF9SMn28	F.2111/11SMn28	1912	1213
25	S25C	1.1158	Ck25	-	-	-	-	-	-	1025
35	-	1.0501	C35	060A35	-	CC35	C35	F.113	1550	1035
45	-	1.0503	C45	080M46	-	CC45	C45	F.114	1650	1045
40Mn	-	1.1157	40Mn4	150M36	15	35M5	-	-	-	1039
35Mn2	SMn438(H)	1.1167	36Mn5	-	-	40M5	-	36Mn5	2120	1335
30Mn	SCMn1	1.117	28Mn6	150M28	14A	20M5	C28Mn	-	-	1330
35Mn	S35C	1.1183	Cf35	060A35	-	XC38TS	C36	-	1572	1035
Ck45	S45C	1.1191	Ck45	080M46	-	XC42	C45	C45K	1672	1045
50	S50C	1.1213	Cf53	060A52	-	XC48TS	C53	-	1674	1050
55	– /S55C	1.0535/1.1203	C55/Ck55	070M55	9/ –	– /XC55	C55/C50	– /C55K	1655/ –	1055
60	-	1.0601	C60	080A62	43D	CC55	C60	-	-	1060
60Mn	S58C	1.1221	Ck60	080A62	43D	XC60	C60	-	1678	1060

Stainless steel (austenitic type)

China	Japan	Germany		Great Britain		France	Italy	Spain	Sweden	USA
GB	JIS	W.-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE
OCr19Ni10	SUS304L	1.4306	X2CrNi1911	304S11	-	Z2CN18.10	X2CrNi18.11	-	2352	304L
OCr18Ni9	SUS304	1.435	X5CrNi189	304S11	58E	Z6CN18.09	X5CrNi1810	F.3551/F.3541/F.3504	2332	304
1Cr18Ni9MoZr	SUS303	1.4305	X12CrNiS188	303S21	58M	Z10CNF18.09	X10CrNiS18.09	F.3508	2346	303
Cr17Ni7	SUS301	1.431	X12CrNi177	-	-	Z12CN17.07	X12CrNi1707	F.3517	2331	301
0Cr17Ni11Mo2	SUS316	1.4401	X5CrNiMo1810	316S16	58J	Z6CND17.11	X5CrNiMo1712	F.3543	2347	316
OCr17Ni13Mo	SUS316LN	1.4429	X2CrNiMoN1813	-	-	Z2CND17.13	-	-	2375	316LN
OCr27Ni12Mo3	SCS16/SUS316L	1.4435	X2CrNiMo1812	316S13	-	Z2CND17.12	X2CrNiMo1712	-	2353	316L
OOCr19Ni13Mo	SUS317L	1.4438	X2CrNiMo1816	317S12	-	Z2CND19.15	X2CrNiMo1816	-	2367	317L
1Cr18NI9Ti	SUS321	1.4541	X10CrNiTi189	321S12	58B	Z6CNT18.10	X6CrNiTi1811	F.3553/F.3523	2337	321
1Cr18Ni11Nb	SUS347	1.455	X10CrNiNb189	347S17	58F	Z6CNNb18.10	X6CrNiNb1811	F.3552/F.3524	2338	347
Cr18Ni12Mo2T	-	1.4571	X10CrNiMoTi1810	320S17	58J	Z6CNDT17.12	X6CrNiMoTi1712	F.3535	2350	316Ti
1Cr23Ni13	SUH309	1.4828	X15CrNiSi2012	309S24	-	Z15CNS20.12	X6CrNi2520	-	-	309
OCr25Ni20	SUH310	1.4845	X12CrNi2521	310S24	-	Z12CN2520	X6CrNi2520	F.331	2361	310S
1Cr18Ni9Ti	SUS321	1.4878	X12CrNiTi189	321S32	58B, 58C	Z6CNT18.12B	X6CrNiTi18 11	F.3523	-	321

F4 Comparison table of metal materials from different countries

Alloy steel

China	Japan	Germany		Great Britain		France	Italy	Spain	Sweden	USA
GB	JIS	W.-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE
55Si2Mn	-	1.0904	55Si7	250A53	45	55S7	55Si8	56Si7	2085	9255
Gr15 45G	SUJ2	1.3505	100Cr6	534A99	31	100C6	100Cr6	F.131	2258	ASTM52100
15Cr	SCr415(H)	1.7015	15Cr3	523M15	-	12C3	-	-	-	5015
40Cr	SCr440	1.7045	42Cr4	-	-	-	-	42Cr4	2245	5140
20CrMn	SUP9(A)	1.7176	55Cr3	527A60	48	55C3	-	-	-	5155
40CrNiMoA	-	1.6582	34CrNiMo6	817M40	24	35NCD6	35NiCrMo6(KB)	-	2541	4340
35Cr	SCr430(H)	1.7033	34Cr4	530A32	18B	32C4	34Cr4(KB)	35Cr4	-	5132
40Cr	SCr440(H)	1.7035	41Cr4	530M40	18	42C4	41Cr4	42Cr4	-	5140
18CrMn	-	1.7131	16MnCr5	(527M20)	-	16MC5	16MnCr5	16MnCr5	2511	5115
30CrMn	SCM420/SCM430	1.7218	25CrMo4	1717CDS110/708M20	-	25CD4	25CrMo4(KB)	55Cr3	2225	4130
35CrMo	SCM432/SCCRM3	1.722	34CrMo4	708A37	19B	35CD4	35CrMo4	34CrMo4	2234	4137/4135
40CrMoA	SCM440	1.7223	41CrMo4	708M40	19A	42CD4TS	41CrMo4	42CrMo4	2244	4140/4142
42CrMo/42CrMnMo	SCM440(H)	1.7225	42CrMo4	708M40	19A	42CD4	42CrMo4	42CrMo4	2244	4140
50CrVA	SUP10	1.8159	50CrV4	735A50	47	50CV4	50CrV4	51CrV4	2230	6150
CrV,/9SiCr	-	1.2067	100Cr6	BL3	-	Y100C6	-	100Cr6	-	L3
CrWMo	SKS31/SKS2,/SKS3	1.2419	105WCr6	-	-	105WC13	100WCr6/107WCr5KU	105WCr5	2140	-
5CrNiMo	SKT4	1.2713	55NiCrMoV6	BH224/5	-	55NCDV7	-	F.520.S	-	L6
Cr12	SKD1	1.208	X210Cr12	BD3	-	Z200C12	X210Cr13KU/X250Cr12KU	X210Cr12	-	D3 /ASTM D3
40CrMoV5	SKD61	1.2344	X40CrMoV51/X40CrMoV51	BH13	-	Z40CDV5	X35CrMoV05KU/X40CrMoV51KU	X40CrMoV5	2242	H13/ASTM H13
100CrMoV5	SKD12	1.2363	X100CrMoV51	BA2	-	Z100CDV5	X100CrMoV51KU	X100CrMoV5	2260	A2
30WCrV9	SKD5	1.2581	X30WCrV93	BH21	-	Z30WCV9	X28W09KU	X30WCrV9	-	H21
V	SKS43	1.2833	100V1	BW2	-	Y1105V	-	-	-	W210
W18Cr4VCo5	SKH3	1.3255	S18-1-2-5	BT4	-	Z80WKCV	X78WCo1805KU	HS18-1-1-5	-	T4
X45CrSi93	SUH1	1.4718	X45CrSi93	401S45	52	Z45CS9	X45CrSi8	F.322	-	HW3
M2	SKH9,	SKH51	1.3343	S6/5/2	BM2	-	Z85WDCV	HS6-5-2-2	F.5603	2722
M7	-	1.3348	S	2002/9/2	-	-	-	HS2-9-2	HS2-9-2	2782

Heat-resistant steel

China	Japan	Germany		Great Britain		France	Italy	Spain	Sweden	USA
GB	JIS	W.-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE
-	SUH330	1.4864	X12NiCrSi3616	-	-	Z12NCS35.16	-	-	-	330
-	SCH15	1.4865	G-X40NiCrSi3818	330C11	-	-	XG50NiCr3919	-	-	HT,HT50

F4 Comparison table of metal materials from different countries

Stainless Steel(Ferrite type/Martensitic type)

China	Japan	Germany		Great Britain		France	Italy	Spain	Sweden	USA
GB	JIS	W.-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE
OCr13/1Cr12	SUS403	1.4	X7Cr13	403S17	-	Z6C13	X6Cr13	F.3110	2301	403
1Cr13	SUS410	1.4006	X10Cr13	410S21	56A	Z10C14	X12Cr13	F.3401	2302	410
1Cr17	SUS430	1.4016	X8Cr17	430S15	60	Z8C17	X8Cr17	F.3113	2320	430
4Cr13	SUS420J2	1.4034	X46Cr13	420S45	56D	Z40CM/Z38C13M	X40Cr14	F.3405	2304	-
1Cr17Ni2	SUS431	1.4057	X22CrNi17	431S29	57	Z15CNi6.02	X16CrNi16	F.3427	2321	431
Y1Cr17	SUS430F	1.4104	X12CrMoS17	-	-	Z10CF17	X10CrS17	F.3117	2383	430F
1Cr17Mo	SUS434	1.4113	X6CrMo17	434S17	-	Z8CD17.01	X8CrMo17	-	2325	434
OCr13Al	SUS405	1.4724	X10CrA113	403S17	-	Z10C13	X10CrA112	F.311	-	405
Cr17	SUS430	1.4742	X10CrA118	430S15	60	Z10CAS18	X8Cr17	F.3113	-	430
5Cr2Mn9Ni4N	SUH35	1.4871	X53CrMnNiN219	349S54	-	Z52CMN21.09	X53CrMnNiN219	-	-	EV8

Gray cast iron

China	Japan	Germany		Great Britain		France	Italy	Spain	Sweden	USA
GB	JIS	W.-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE
HT150	FC150	0.6015	GG15	Grade150	-	Ft15 D	G15	FG15	115	No 25 B
HT200	FC200	0.602	GG20	Grade220	-	Ft20 D	G20	-	120	No 30 B
HT250	FC250	0.6025	GG25	Grade260	-	Ft25 D	G25	FG25	125	No 35 B
HT300	FC300	0.603	GG30	Grade300	-	Ft30 D	G30	FG30	130	No 45 B
HT350	FC350	0.6035	GG35	Grade350	-	Ft35 D	G35	FG35	135	No 50 B
HT400	-	0.604	GG40	Grade400	-	Ft40 D	-	-	140	No 55 B

Nodular cast iron

China	Japan	Germany		Great Britain		France	Italy	Spain	Sweden	USA
GB	JIS	W.-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE
QT400-18	FCD400	0.704	GGG 40	SNG 420/12	-	FCS 400-12	GS 370-17	FGE 38-17	07 17-02	60-40-18
QT500-7	FCD500	0.705	GGG 50	SNG 500/7	-	FGS 500-7	GS 500	FGE 50-7	07 27-02	80-55-06
QT600-3	FCD600	-	GGG 60	SNG 600/3	-	FGS 600-3	-	-	07 32-03	-
QT700-18	FCD700	0.707	GGG 70	SNG 700/2	-	FGS 700-2	GS 700-2	FGS 70-2	07 37-01	100-70-03

F5 Comparison table of Grade

Turning materails comparison table

Category	Use classification code: classification	Use classification code: code	CDBP	SANDVIK	ISCAR	KENNAMETAL	TaeguTec	WALTER	MITSUBISHI	SUMITOMO	TUNGALOY	KYOCERA	KORLOY	SECO	ZCC. CT
Turning	K	K01	BPC052	GC3205	IC5005 IC4028	KCK05 KC9315	TT1300	WAK10	UC5105	AC405K AC410K	T5105 T5010	CA4505 CA4010	NC6105 NC305K	TK1000	YBD052 YBD102
		K10 K20	BPC102 BPS101	GC3210	IC5010 IC5100	KCK15 KC9325	TT7310	WAK20	UC5115	AC420K	T5115 T5125	CA4515 CA4115 CA4120	NC6110 NC6010	TK2000	YBD252 YBC252
	P	P01 P10	BPS051 BPS101	GC4205 GC4215	IC8150 IC9150	KCP05 KCP10	TT8115	WPP05 WPP10	UE6105 UE6110	AC700G AC810P	T9005 T9115	CA5505 CA5515	NC3010	TP0500 TP1500	YBC151 YBC152
		P20	BPS251	GC4225 GC4025	IC8250 IC9250	KCP25 KC9125	TT8125 TT5100	WPP20 WAP20	UE6020	AC820P PAC2000	T9125	CA5525 CR7025	NC3015 NC3120 NC3020	TP2000 TP2500	YBC251 YBC252
		P30	BPS371	GC4235 GC4035	IC8350 IC9350	KCP30 KCP40 KC9140	TT8135 TT7100	WPP30 WAP30	UE6035 UH6400	AC830P AC3000	T9135	CA5535 CR9025	NC3030 NC500H	TP3000 TP3500	YBC351 YBM351
	M	M10	BPG05B	GC2015	IC907	KCM15	TT9215	WAM10	US7020 VP05RT	AC610M AC510U	T6020	CA6515	PC8110 NC9020	TM2000 TP200	YBG201
		M20	BPG20B	C2025	IC9300	KCM25	TT9225	WAM20	US735	AC630M AC520U	T6030	CA6525	NC9025	CP500	YBG202
		M30	BPG30B	GC2035	IC3028	KCM35	TT9235 TT8020	WAM30	UH6400	AC630M AC530U		PR630	NCS330 PC9030	TM4000 TP400	YBG203
							GC3215		AC2000					KCK20	
	S	S05 S15	BPG118 BPG218	GCS05F GC1105 GC1115	IC907	KC5510	TT5080	WSM10	VP05RT VP10RT	AC510U	AH110	PR1005 PR930	PC8110	TH1000 TH1500 TS2000 TS2500	
		S25	BPG318	GC1125	IC908	KC5525	TT9080	WSM20 WSM30	VP15TF VP20RT	AC520U	AH120	PR1025 PR1125 PR1225	PC5300 PC9530	CP500	

F5 Comparison table of Grade

Milling materails comparison table

Category	Use classification code: classification	code	CDBP	SANDVIK	ISCAR	KENNAMETAL	TaeguTec	WALTER	MiTSUBiSHi	SUMITOMO	TUNGALOY	KYOCERA	KORLOY	SECO	ZCC. CT
Milling	K	K01	BPG108	GC3220	IC410	KC915M	TT6800		MP8010					T150M	
				GC3020	IC810		TT6080	WKK25	VP10TF	ACZ310		PR510	PC6510	MK2000	YBG102
		K10	BPC122	GC1020	IC910					ACK200		PR610	PC215K		YBD152
		K20	BPS321							ACK300		PR905			YBD152
	P	P10	BPG05B	GC4220	IC950		TT6800	WAM10	F7030	ACP100		PR830	PC3500	MP2500	YBG252
		P20	BPG20B	GC4020			TT7080	WAM20				PR1025	PC3535	T250M	
							TT7030	WKP25				PR1225	PC3525		
											AH725		PC130		
				GC4230	IC808	KC522M	TT9080	WAM30	VP15TF	ACP200	GH330	PR1225	PC9530	F30M	YBG202
		P30	BPG25B	GC4030	IC908	KC635M	TT9030								YBM251
			BPS321	GC4240	IC830	KC725M	TT8020	WKP35	VP30RT	ACP300		PR1225	NCM325	F40M	
		P40	BPS411	GC4040	IC928	KC735M	TT8080	WSP45	F7030	ACZ350	AH730	PR1230	NCM335	T350M	YBM351
						KC935M	TT7800				AH140		PC3545		
	M	M10	BPG05B	GC1010	IC808	KC522M	TT9080	WAM30	VP15TF	ACP200	AH120	PR1025		F30M	YBG202
		M20	BPG20B	GC1030	IC908	KC525M	TT9030	WQM35				PR1225			YBG205
		M25	BPG30B	GC2030								PR905			
		M30	BPG25B				TT8020								YBG302
		M40	BPG40A	GC2040	IC830	KC725M	TT8020	WXM35	VP30RF	ACP300	AH130	PR1535		F40M	
					IC928		TT8080	WSM35							
								WSP45							

F5 Comparison table of Grade

Cemented carbide

Category	Use classification code: classification	Use classification code: code	CDBP	SANDVIK	ISCAR	KENNAMETAL	TaeguTec	WALTER	MITSUBISHI	SUMITOMO	TUNGALOY	KYOCERA	DIJET	HITACHI	KORLOY	SECO	ZCC. CT
Turning	P	P01													ST05		
		P10	BP10	S1P	IC70	P10	P10			ST10P	TX10S		SRT	WS10	ST10		YC10
		P20	BP20	SMA	IC70 IC50M	K125M TTM	P20		UTi20T	ST20E	TX20 TX25		SRT DX30	EX35	ST20		
		P30	BP35	SM30	IC50M IC54	GK K600 TTR	P30		UTi20T	A30 A30N	TX30 UX30	PW30	SR30 DX30	EX35 EX40	ST30A		
		P40		S6	IC54	G13				ST40E	TX40		SR30 DX35	EX45			YC40
	M	M10	BM10	H10A		K313	M10			EH510 U10E	TU10		UMN	WA10B	U10	890	YC10
		M20	BM15A BM25A	H13A	IC08	K68 KMF K125M TTM	M20		UTi20T	EH520 U2	TU20 UX30		DX25 UMS	EX35	U20	HX 883	
		M30		H10F SM30	IC08 IC28	K600 TTR			UTi20T	A30 A30N	UX30		DX25 UMS	EX40 EX45	ST30A		YC40
		M40		S6	IC128	G13	M40				TU40		UM40	EX45	U40		
	K	K01		H1P		K605			UTi05T	H1 H2	TH03 KS05F		KG03	WH05	H02		YD051
		K10	BK10 BU810 BK10UF	H1P H10 HM	IC20	K313 K110M THM THM-U	K10		HTi10	EH10 EH510	G1F TH10	KW10	KG10 KT9	WH10	H01	890	YD101
		K20	BU820 BK20UF	H13A	IC20 IC10	K715 KMF K600	K20		UTi20T	G10E EH20 EH520	G2F KS15F G2 KS20	GW10	CR1 KG20	WH20	G10	890 HX 883	YD201
		K30	BU820 BK30UF		IC10 IC28	THR			UTi20T	G10E	G3		KG30		G3	883	
	N	N01		H10 H13A		K605				H1 H2	KS05F		KG03				
		N10	BU810 BK10UF			K313 K110M THM THM-U	K10	WK10	HTi10	EH10 EH510	TH10 H10T		KG10 KT9		H01	890 H15	YD101
		N20	BU820 BK30UF			K715 KMF K600	K20			G10E EH20 EH520	KS15F		CR1 KG20			HX KX 883 H15 H25	YD201
		N30				G13 THR							KG30			H25	
	S	S01							RT9005				KG03				
		S10		H10 H10A H10F H13A		K10 K313 THM	K10		RT9005 RT9010	EH10 EH510	KS05F TH10		FZ05 KG10		H01	890	YD101
		S20				K715 KMF			RT9010 TF15	EH20 EH520	KS15F KS20		FZ15 KG20			890 883 HX H25	
		S30				G13 K600 THR			TF15				KG30				

F5 Comparison table of Grade

Carbide materials

ISO Classification			CDBP	SANDVIK	ISCAR	KENNAMETAL	TaeguTec	WALTER	MITSUBISHI	SUMITOMO	TUNGALOY	KYOCERA	DIJET	HITACHI	KORLOY	SECO	ZCC. CT
Milling	P	P10	BP10	S1P									SRT				YC10
		P20	BP20		IC50M IC28	K125	P10		UTi20T	A30N	TX25		SRT DX30	EX35	ST20		
		P30	BP35		IC50M IC28	GX K600	P20		UTi20T	A30N	UX30	PW30	SR30 DX30	EX35 EX40	ST30A		
		P40			IC28		P30					PW30	SR30	EX45	ST40		YC40
	M	M10				K110M	M10						UMN		U10		YC10
		M20	BM15A BM25A			K313	M20		UTi20T	A30N			DX25 UMS	EX35	U20		
		M30			IC28	KFM K600			UTi20T	A30N	UX30		DX25 UMS	EX40 EX45			YC40
		M40			IC28		M40				TU40			EX45	U40		
	K	K01							UTi05T				KG03		H01		YD051
		K10	BU810 BK10	H1P	IC20	K110M K313	K10	WK10	HTi10	G10E	TH10	KW10	KG10	WH10	H05 H10		YD101
		K20	BU820		IC20 IC10	KFM	K20		UTi20T	G10E			KT9 CR1 KG20	WH20	G10	HX	YD201
		K30	BU820		IC10 IC28				UTi20T				KG30				

F5 Comparison table of chipbreaker for turning insert

Comparison table for chipbreaker of positive inserts

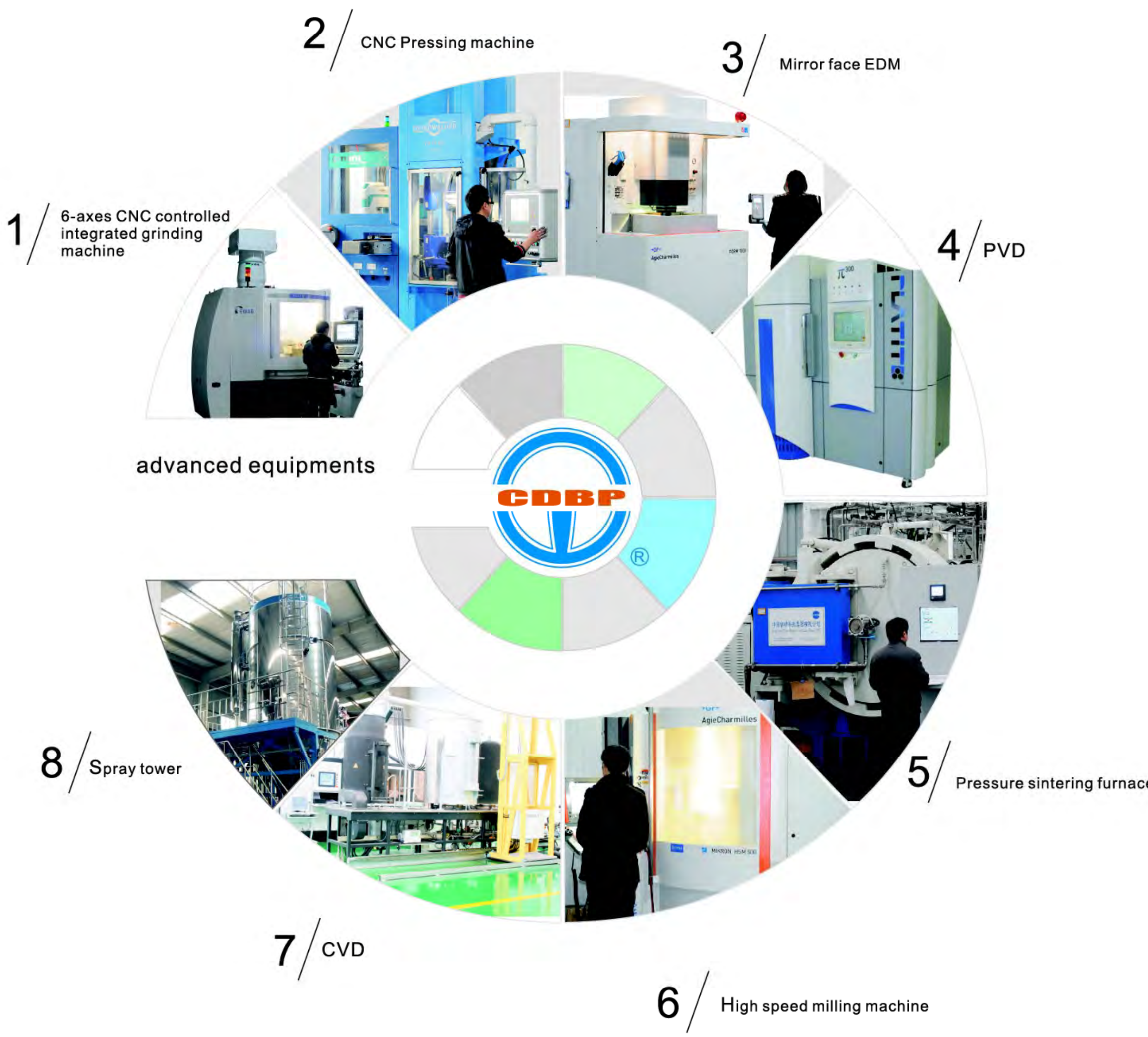
ISO Classification	Processing range	CDBP	ZCCT	SANDVIK	KORLOY	TaeguTec	WALTER	SECO	MISTUBISHI	SUMITOMO	KENNAMETAL	DIJET	HITACHI	TUNGALOY	KYOCERA	VALANTTE
P	Finishing	FW	SF HF	UF PF	HFP	FA FG	PF4	FF1 F1	FV SV	FP LU SU SK	11 UF LF		JQ	01 PF FS	GP XP VF	PF4 JQ JZ
	Finishing(Fix light blade)			WK W WP			PF	W-F1	SW	LUW	FW					
	Semi finishing	MD	HM	UM PM	HMP C25	MT CMX	PS5 PM5	F2	MV	MU	MF	FT	JE	PM 23 24	HQ XQ GK	PM2 PM4
	Semi finishing(Fix light blade)			WM			PM		MW		MW					
M	Finishing	FW	EF	MF	HFP	FA FG	PF4		SV					SS		1A 2A
	Semi finishing	MD	EM	MM	HMP C25	MT CMX	PS5 PM5		MV							PM2 PM4
K	Semi finishing	MD	HM HR HM HR No slot	KF KM KR	HMP C25	MT CMX	MW PS5 PM5		No slot GH	No slot GH		FT		No slot GH	No slot GH	PM2 PM4
S	Finishing, semi finishing						PF4 PS5 PM5		FJ	SC	LF HP					PM2 1A 2A
N	General cutting	LH	LH	AL	TA AK MA	FL	PM2			AG	HP	ALU ACB		PP	A3	1L 1A 2A

F6 Comparison table of chipbreaker for turning insert

Comparison table for chipbreaker of negative inserts

ISO Classification	Processing range	CDBP	ZCCCT	SANDVIK	KORLOY	TaeguTec	WALTER	SECO	MISTUBISHI	SUMITOMO	KENNAMETAL	DIJET	HITACHI	TUNGALOY	KYOCERA	VALANTTE
P	Super finishing			QF	HU		NF3	FF1	PK FH FY	FA FL	UF FF		FE	01 TF ZF	DP GP VF XP XP-T	F1
	Finishing	FW	DF	PF MF	HF	FG	NS6	MF2	C SA SH	SU LU SX	LF FN	PF UR UA UT	BE CE	NS 27 TS AS	HQ CQ	F2(2B) F5(5C)
			SF		HF				SY					17	XQ XS	
	Finishing(Fix light blade)		WG	WP WF	HW		NF	W-MF2	SW	LUW	FW			AFW ASW	WP WQ	
	Semi finishing	MD	DM PM	PM QM SM	HA HC HM	MC ML MP	NM4 NM6	MF3 M3 M5	MV MA MH	GU UG UX	MG MN	PG UB	AB AY AE	NM ZM TM DM 37	CJ GS PS HS PT CS	F3 F4(8A) M2(2C) M3 M4 M5(5B) M6 M7 55 M8
	Semi finishing(Fix light blade)		WG	WM			NM	W-M3	MW	GUW	MW					
	Rough machining(Fix light blade)		DR(Double-sides)	PR		MT MG	NM9	MR7	GH	MU MX	RN	UD GG	AR RE	TH	GT HT	
	Light load balancing	RA	DR(Single) HDR	QR PR HR	HR HH	RT RH	NR6	R4 R6 R7 PR9	HZ HX HV	MP HG HP	MR RM RH	UC	HX HE	57 65 TU	HX	R3 R4 R6(9A) R7(9B) R9(9C)
M	Finishing	LH SJ	EF	MF	HA	FG SF	NF4		FS	SU	K FP		SE	SS	GU	F1 F2(2B) F5(5C)
	Semi finishing	SN	EM	MM	HS	ML MP	NM4		MS ES	EX UP	P MP	SF SG	DE	SA SM S	SU HU ST	F3 F4(8A) M2(2C) M3 M4 M5(5B) M6 M7 55 M8
	Rough machining	RA	ER	MR	GS HM	MT RH	NR4	M5 MR7	GH HZ	MP	RP					R3 R4 R6(9A) R7(9B) R9(9C)
K	Finishing	U CX	PM	KF	No chip breaker	FG	MA		Grind all edges	UZ	FN			CM	Grind all edges C	F2(2B)
	Semi finishing	U CQ	PM	KM	full peripheral groove	MC MT MG	MA NM5		Grind all edges	UX	Grind all edges UN			Grind all edges	ZS GC	M5(5B) M6 M8
	Rough machining	GH RA No chip breaker	No chip breaker	KR	GR HR GH	RT RH	MA		No chip breaker	No chip breaker					No chip breaker	R3 R4 R7(9B)
S	Finishing		NF			SF	NF4	56 R6	FJ		FS K					F5(5C) M2(2C)
	Semi finishing		NM	NGP 23			NM4	MF1	MJ	SU	NGP			SA		M4 M5(5B) M7 55
	Rough machining			SR			NR4	M1	GJ		MS					
N		LH														

Concentrate on CNC inserts, accomplish international brands!



our advanced equipments

CDBP CUTTING TOOLS

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