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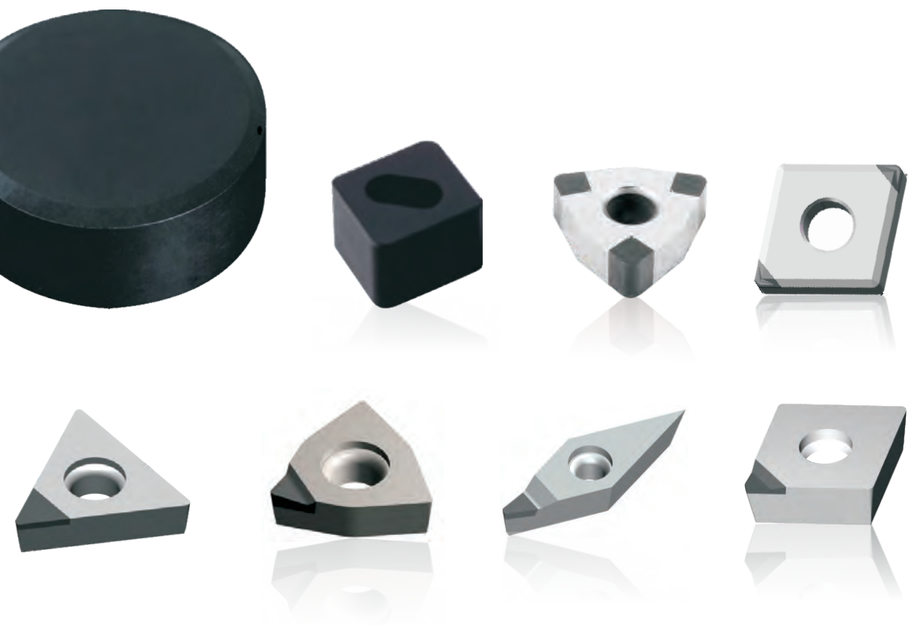
PCBN PCD standard inserts

Substantially improve cutting efficiency and tool life



Subverting the tradition Enlightening the future

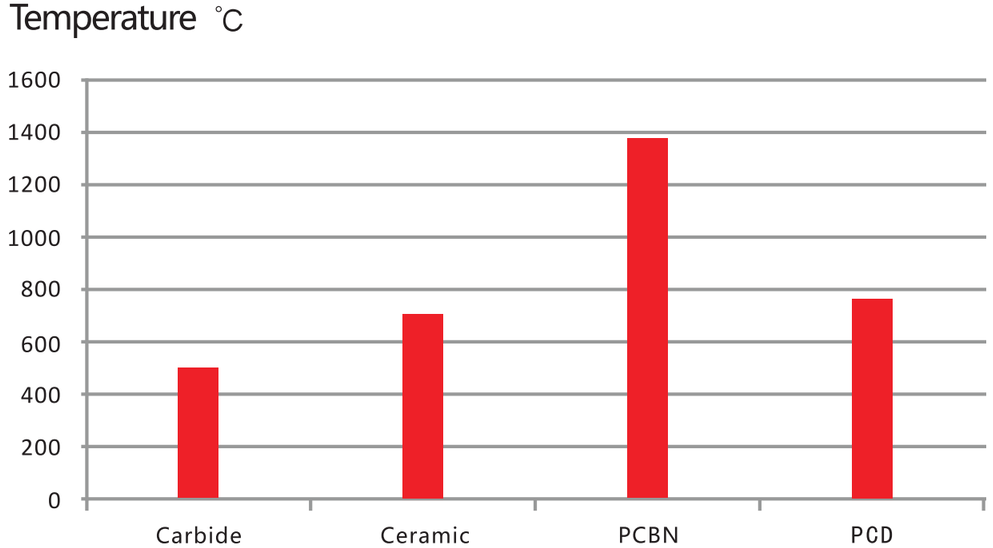
ISO9001/ISO14001/ISO45001 Certified

Contents

CBN features

Cubic boron nitride (CBN) is a kind of excellent insert material with high hardness, high thermal resistance and high chemical inert. It is suitable for materials hard to machining, such as hardened steel, cast iron,high temperature alloy and power metallurgy etc.CBN inserts can process workpieces with outstanding surface roughness and maintain long life, high efficiency and stable performance due to high temperature resistance, high hardness and strong cutting force resistance and low friction coefficient etc.

Contrast for high temperature resistance of main insert materials



Advantages innovative PCB inserts

● Excellent cost performance
The tool life of It is more than 10 times that of carbide inserts, and price is 6-8 times. Funik PCBN inserts can achieve longer time interval and less frequency of inserts replacement so as to reduce large amount of inserts cost.

● Higher machini efficiency
The efficiency of CBN inserts is 5-10 times that of carbide inserts, which greatly improves equipment productivity and reduces fixed investment in machine equipment.

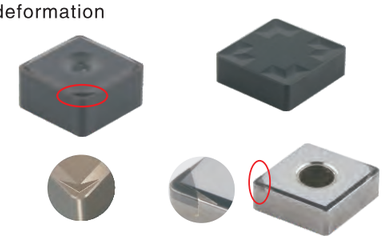
● Better surface quality
Workpiece surface roughness and dimensional accuracy processed by PCBN inserts can reach grinding performance so as to reduce investment in equipment by turning instead of grinding.

● Excellent universality
CBN inserts can be used for both dry and wet cutting;
PCBN inserts one grade can be used to process various materials.

New technology of innovative PCBN inserts

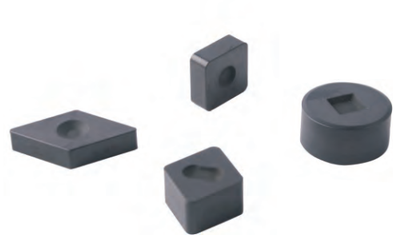
• Chip breaker

- Control chip flow direction to maintain surface quality
- Avoid chips twisted to improve production efficiency
- Reduce cutting force temperature to increase inserts life
- Increase sharpness of cutting edge to avoid workpiece deformation



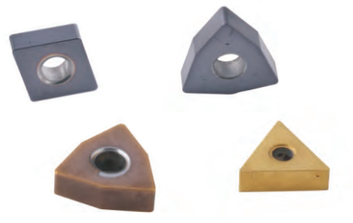
• Fastening dimple

- Improve processing stability to ensure machining accuracy
- Profile and other multi-directional cutting to improve inserts performance
- Reduce processing vibration to increase inserts life



• Coating

- Improve heat and wear resistance to increase inserts life
- Improve lubricity to ensure surface quality



Grade and application industry of innovative PCBN inserts

Grade	Machining mode	Workpiece material	Features direction	Application industry
FBN7600 FBS7600	Rough	Combined impact and wear resistance: High nickel chromium and high hardness alloy cast iron, Gray cast iron,High manganese steel	Impact resistance ↑ / Wear resistance ↓	Roll,Slurry pump,Brake disc, Rolling mortar wall etc
FBN3500	Rough	Excellent impact and wear resistance: High nickel chromium and high hardness alloy cast iron, Gray cast iron,High manganese steel		Roll,Slurry pump,Brake disc, Rolling mortar wall etc
FBN7000 FBS7000	Semi finishing Finishing	Excellent comprehensive performance and good universality: Gray cast iron,Hard cast iron,Hardened steel (>45HRC)		Brake disc,Brake drum,Compressor parts, Gear,Bearing etc
FBN7200 FBS7200	Rough Finishing	Excellent wear resistance: Gray cast iron		Brake disc,Brake drum, Compressor parts etc.
FBN9000	Rough Semi finishing	Excellent impact resistance: Hardened steel,Cast high speed steel,Surfacing material	Impact resistance ↑ / Wear resistance ↓	Large gear,Mine machinery,Roll etc
FBN9500 FBS9500	Finishing	Hardened steel with hardness>45HRC		Gear, Bearing etc

Grade and application industry of innovative FBK inserts

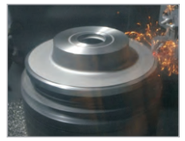
Grade	Machining mode	Workpiece material	Features direction	Cutting speed Vc(m/min)	Coolant
FBK7510	Continuous to heavy interrupted finishing	Gray cast iron	Impact resistance ↑ / Wear resistance ↓	600-1200	Dry,wet
		Surface hardened alloy		600-1200	Dry,wet
FBK7520	Continuous to medium interrupted finishing	Gray cast iron		600-1200	Dry,wet
		Powder metallurgy		90-200	
FBK7530	Continuous to light interrupted finishing	Powder metallurgy		90-200	Dry
FBK9540	Continuous high speed finishing	Hardened steel	Impact resistance ↓ / Wear resistance ↑	180-300	Dry,wet
FBK9550	Continuous, light interrupted finishing	Bearing steel, Cemented steel		100-175	Dry,wet
FBK9560	Continuous, heavy interrupted finishing	Cemented steel		100-200	Dry

Grade and application industry of innovative PCBN milling inserts

Grade	Machining mode	Application range	Application industry
FBN7025	Rough,finishing	Suitable for rough,semi finishing,and finishing milling of gray cast iron etc. Suitable for rough,semi finishing,finishing milling of hard cast iron etc. Suitable for rough milling,semifinishing,finishing milling of hardened steel etc.	Automotive,Roll,Machine tool,Mould etc

Application cases of innovative PCBN inserts in automotive industry

Application cases of innovative PCBN inserts in automotive industry



Workpiece: Brake disc
Material: HT250, HB200
Insert: FBN6600 CNGN120712
Cutting parameters: ap=2-3mm f=0.6-0.8mm/r Dry cut

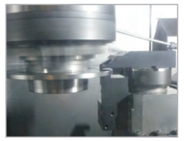
Inserts comparison	Cutting speed Vc	Efficiency	Life
a Japanese carbide	300m/min	5min/pc	100pcs/edge
Funik PCBN	800m/min	1min/pc	800pcs/edge

The efficiency of Funik PCBN inserts is 5 times that of a Japanese carbide inserts, and life is 8 times.

Workpiece: Brake drum
Material:HT250, HB190-210
Insert:FBN6600 CNMN120716
Cutting parameters: ap=2-3mm, f=0.45mm/r

Inserts comparison	Cutting speed Vc	Efficiency	Life
a Japanese carbide	280m/min	12min/pc	10pcs/edge
Funik PCBN	700m/min	3min/pc	90pcs/edge

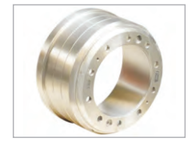
The efficiency of Funik PCBN inserts is 4 times that of a Japanese carbide inserts, and life is 9 times.



Workpiece: Brake disc
Material: HT250, HB200
Insert: FBN6200 SCGN090408FC-45
Cutting parameters: ap=0.3mm f=0.35mm/r Dry cut

Inserts comparison	Cutting speed Vc	Efficiency	Life
an European ceramic	300m/min	40sec/pc	40pcs/edge
Funik PCBN	800m/min	10sec/pc	200pcs/edge

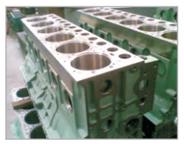
The efficiency of Funik PCBN inserts is 4 times that of an European ceramic inserts, and life is 5 times.



Workpiece: Brake drum
Material:HT250, HB190-210
Insert: FBS6200 WNGA080412
Cutting parameters: ap=0.5mm, f=0.3mm/r

Inserts comparison	Cutting speed Vc	Efficiency	Life
a Japanese carbide	310m/min	4min/pc	10pcs/edge
Funik PCBN	780m/min	1min/pc	90pcs/edge

The efficiency of Funik PCBN inserts is 4 times that of a Japanese carbide inserts, and life is 9 times.



Workpiece: Cylinder top surface
Milling cutter: FME02-D250-SN09-25
Milling insert: FBN6025 SNEN091412ENS-M08
Wiper inserts: FBN6025 SNEX120412ZZ

Inserts comparison	Cutting speed Vc	Efficiency	Life
a Germany carbide	180m/min	20min/pc	100pcs/edge
Funik PCBN	630m/min	2min/pc	400pcs/edge

The efficiency of Funik PCBN milling inserts is 10 times that of a Germany carbide inserts, and life is 4 times.

Workpiece: Cylinder liner
Material: Boron cast iron, HB270-300
Insert: FBS6200 SNGA120412
Cutting parameter: ap=0.3mm, f=0.2mm/r Dry cut

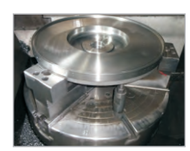
Inserts comparison	Cutting speed Vc	Efficiency	Life
a Japanese coated alloy	480m/min	39sec/pc	26pcs/edge
Funik PCBN	880m/min	21sec/pc	100pcs/edge

The efficiency of Funik PCBN inserts is 1.85 times that of a Japanese coated alloy inserts, and life is 3.8times.

Workpiece: automotive wheel hub bearing unit
Material:65Mn, HRC58-63
Insert: FBS8300C06 VNGA160408
Cutting parameter: ap=0.15mm, f=0.1mm/r Dry cut

Inserts comparison	Cutting speed Vc	Efficiency	Life
An European CBN	120m/min	6min/pc	40pcs/edge
Funik PCBN	185m/min	3min/pc	205pcs/edge

The efficiency of Funik PCBN inserts is 2 times that of an European CBN inserts, and life is 5times.

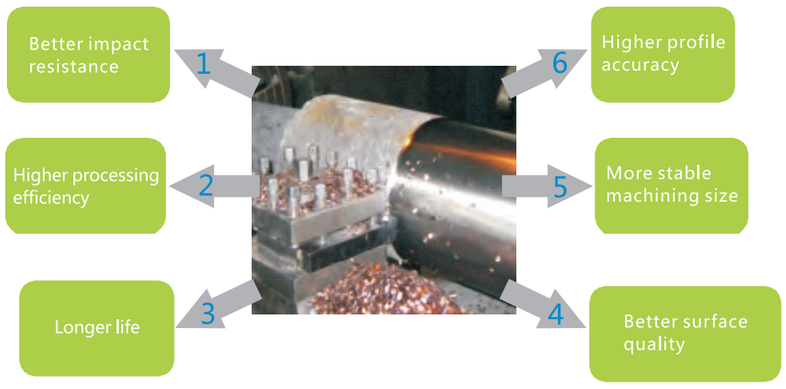


Workpiece: Flywheel
Material:HT250, HB190
Insert:FBN6200 RCMX090700Y
Cutting parameter: ap=0.5mm, f=0.2mm/r Dry cut

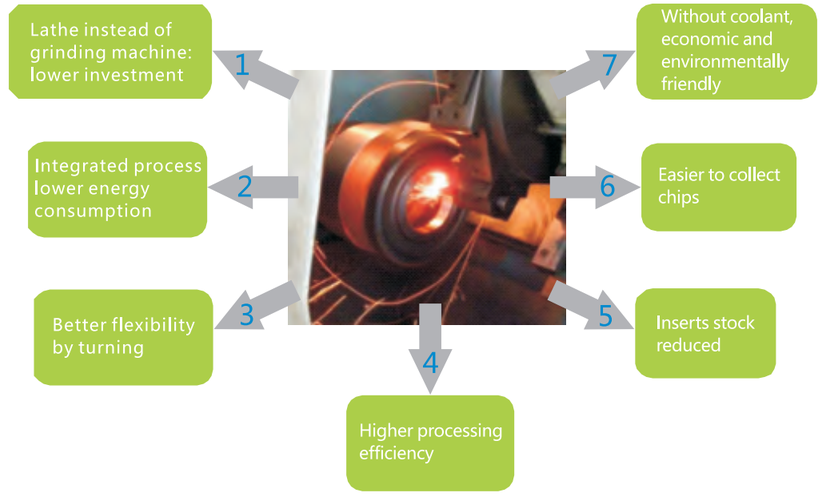
Inserts comparison	Cutting speed Vc	Efficiency	Life
Other CBN	300m/min	40sec/pc	80pcs/edge
Funik PCBN	500m/min	12sec/pc	400pcs/edge

The efficiency of Funik PCBN inserts is 3 times that of an European CBN inserts, and life is 5 times.

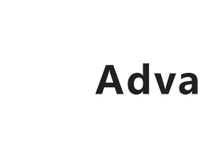
Advantages of PCBN inserts turning high hardness alloy cast iron



Advantages of PCBN inserts for finishing turning hardened steel instead of grinding



Application cases of innovative PCBN inserts in metallurgical roll industry



Workpiece:Roll
Material:High carbon semi-steel, HSD72
Insert:FBN6500 SNGN150702
Cutting parameters:ap=8mm, f=0.6-0.8mm/r

Inserts comparison	Cutting speed Vc	Efficiency	Life
Carbide	15m/min	4hrs/pc	1pcs/edge
Funik PCBN	76m/min	2hrs/pc	6pcs/edge

The efficiency of Funik PCBN inserts is 2 times that of carbide inserts, and life is 6 times.

Workpiece:Roll
Material:High carbon semi-steel, HSD72
Insert:FBN6500 BL12K1-B
Cutting parameters:ap=8mm, f=0.6-0.8mm/r

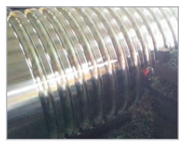
Inserts comparison	Cutting speed Vc	Efficiency	Life
Carbide	10m/min	24hrs/pc	6grooves/edge
Funik PCBN	50m/min	4hrs/pc	24grooves/edge

The efficiency of Funik PCBN inserts is 6 times that of carbide inserts, and life is 4 times.

Workpiece:Roll
Material:High chromium alloy cast iron, HSD75
Insert:FBN6500 SNMN201020
Cutting parameters:ap=4mm, f=0.6mm/r

Inserts comparison	Cutting speed Vc	Efficiency	Life
Carbide	5m/min	15hrs/pc	1/4pc/edge
Funik PCBN	35m/min	1.5hrs/pc	1pc/edge

The efficiency of Funik PCBN inserts is 10 times that of carbide inserts, and life is 4 times.



Workpiece:Roll
Material:High speed steel, HSD85
Insert:FBN6200 RCMX090700 S05020
Cutting parameters:ap=1.0mm, f=0.5mm/r

Inserts comparison	Cutting speed Vc	Efficiency	Life
Ceramic insert	20m/min	3hrs/pc	0.2pc/edge
Funik PCBN	60m/min	1hrs/pc	1pc/edge

The efficiency of Funik PCBN inserts is 3 times that of ceramic inserts, and life is 5 times.

Workpiece:Roll
Material:High nickel chromium, HSD80
Insert:FBN6500 RNGN200700
Cutting parameters:ap=4-5mm, f=0.6mm/r

Inserts comparison	Cutting speed Vc	Efficiency	Life
Carbide	10m/min	3hrs/pc	1pc/edge
Funik PCBN	52m/min	0.5hrs/pc	3pc/edge

The efficiency of Funik PCBN inserts is 6 times that of carbide inserts, and life is 3 times.

Workpiece:Roll
Material:High Chromium Steel, HSD75
Insert:FBN6500 RNGN201000 S05020
Cutting parameters:ap=8mm, f=0.6-0.8mm/r

Inserts comparison	Cutting speed Vc	Efficiency	Life
Carbide	10m/min	24hrs/pc	0.2pc/edge
Funik PCBN	45m/min	8hrs/pc	1pc/edge

The efficiency of Funik PCBN inserts is 3 times that of carbide inserts, and life is 5 times.

Application cases of PCBN inserts in gear and bearing industry

Workpiece:Three driven gear
Material:20CrMnTiH, HRC58-62
Insert:FBK9550 CNGA120408-2S
Cutting parameters:ap=0.07mm, f=0.08mm/r

Inserts comparison	Cutting speed Vc	Efficiency	Life (pc/edge)
A Japanese PCBN	100m/min	20sec/pc	200
Funik PCBN	150m/min	10sec/pc	400

The efficiency of Funik PCBN inserts is 2 times that of a Japanese PCBN inserts, and life is 2 times.

Workpiece:Eccentric shaft
Material:20Cr, HRC60
Insert:FBK9550 WNGA080404
Cutting parameters:ap=0.2mm, f=0.6mm/r

Inserts comparison	Cutting speed Vc	Efficiency	Life (pc/edge)
A Japanese PCBN	133m/min	100pcs/hr	500 (Ra0.6) 800 (Ra0.8)
Funik PCBN	151m/min	120pcs/hr	700 (Ra0.6) 1200 (Ra0.8)

The efficiency of Funik PCBN inserts is 1.2 times that of a Japanese PCBN inserts, and life is 1.5times.

Workpiece:Intermediate shaft
Material:20CrMnTiH, HRC58-62
Insert:FBK9540 CNGA120408KD-2L wiper
Cutting parameters:ap=0.25mm, f=0.1mm/r

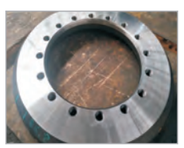
Inserts comparison	Cutting speed Vc	Efficiency	Life (pc/edge)
An European PCBN	200m/min	30sec/pc	100
Funik PCBN	200m/min	30sec/pc	300

The life of Funik PCBN inserts is 3 times that of an European PCBN inserts.

Workpiece:Cylindrical gear
Material:22CrMoH2, HRC58-62
Insert:FBK9550C07 CNGA120408-2S
Cutting parameters:ap=0.1-0.2mm, f=0.11m/r

Inserts comparison	Cutting speed Vc	Efficiency	Life (pc/edge)
A Japanese PCBN	180m/min	30sec/pc	40
Funik PCBN	180m/min	30sec/pc	60

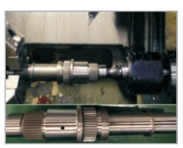
The life of Funik PCBN inserts is 1.5 times that of a Japanese PCBN inserts.



Workpiece:Spiral bevel gear
Material:20CrMnTiH, HRC58-63
Insert:FBK9560 CNGA120408-2L30
Cutting parameters:ap=0.1mm, f=0.12mm/r

Inserts comparison	Cutting speed Vc	Efficiency	Life (pc/edge)
An European PCBN	90m/min	60sec/pc	10
Funik PCBN	180m/min	40sec/pc	20

The efficiency of Funik PCBN inserts is 1.5 times that of a Japanese PCBN inserts, and life is 2 times.

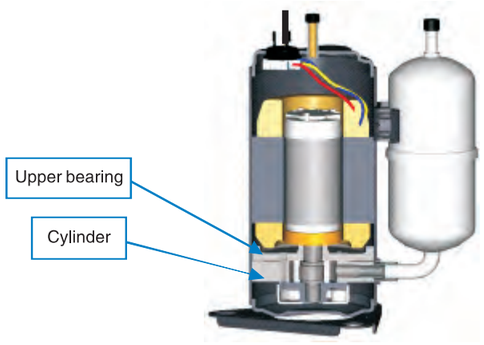


Workpiece:Transmission shaft
Material:20CrMo, HRC60-65
Insert:FBK9560 VNGA160408
Cutting parameters:ap=0.1mm, f=0.15mm/r Wet cut

Inserts comparison	Cutting speed Vc	Efficiency	Life (pc/edge)
A Japanese PCBN	100m/min	30sec/pc	100
Funik PCBN	150m/min	15sec/pc	145

The efficiency of Funik PCBN inserts is 2 times that of a Japanese PCBN inserts, and life is 1.45 times.

Application cases of PCBN inserts in air conditioner compressor industry



Workpiece:Upper bearing
Material:HT200, HB170-210
Insert:FBS6200 WNGA080408
Cutting parameters:ap=2.5mm, f=0.25mm/r

Inserts comparison	Cutting speed Vc	Efficiency	Life
A Japanese PCBN	380m/min	72sec/pc	100pcs/edge
Funik PCBN	570m/min	45sec/pc	500pcs/edge

The efficiency of Funik PCBN inserts is 1.6 times that of a Japanese coated alloy, and life is 5 times.

Workpiece:Cylinder
Material:HT200, HB170-210
Insert:FBN6000 WNGA080412
Cutting parameters:ap=2mm, f=0.2mm/r Wet cut

Inserts comparison	Cutting speed Vc	Efficiency	Life
A Japanese PCBN	260m/min	58sec/pc	20pcs/edge
Funik PCBN	400m/min	37sec/pc	80pcs/edge

The efficiency of Funik PCBN inserts is 1.5 times that of a Japanese coated alloy, and life is 4 times.

Applications of PCBN inserts in machine tool, mine and construction machinery industry

Workpiece:Machine table
Material:HT250, HRC50-55
Insert:FBN6025 SNEN1207ENS-M08
Cutting parameters:ap=1.5mm, fz=0.1mm/z Dry cut

Inserts comparison	Cutting speed Vc	Efficiency	Cost
Grinding	35m/min	1hr/pc	20rmb/pc
Funik PCBN	185m/min	0.25hr/pc	15rmb/pc

The efficiency of Funik PCBN inserts is 4 times that of grinding, and machining cost is 3/4 times.

Workpiece:Slewing ring
Material:42CrMo, HRC47-55
Insert:FBN8000 RCMX090700V
Cutting parameters:ap=1mm, f=0.25mm/r

Inserts comparison	Cutting speed Vc	Efficiency	Life
Ceramic inserts	120m/min	1.2hr/pc	4pcs/edge
Funik PCBN	150m/min	1hr/pc	12pcs/edge

The efficiency of Funik PCBN inserts is 1.2 times that of ceramic inserts, and life is 3 times.

Workpiece:Slide plate
Material:Surfacing, HRC52-62
Insert:FBN6025 RNMN120700
Cutting parameters:ap=0.5mm, fz=0.1mm/z Dry milling

Inserts comparison	Cutting speed Vc	Life
Ceramic	150m/min	1pc/edge
Funik PCBN	180m/min	2pcs/edge

The efficiency of Funik PCBN inserts is 1.2 times that of ceramic inserts, and life is 2 times.

Workpiece:Rolling mortar wall
Material:High manganese steel, HB240
Insert:FBN6600 SNMN150716
Cutting parameters:ap=6mm, f=0.4mm/r

Inserts comparison	Cutting speed Vc	Efficiency	Life
A China PCBN	30m/min	2sec/pc	0.8pc/edge
Funik PCBN	60m/min	1sec/pc	1pc/edge

The efficiency of Funik PCBN inserts is 2 times that of a china PCBN inserts, and life is 1.25 times.

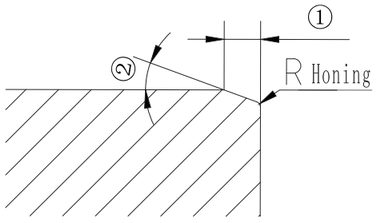
Naming standard of PCBN inserts cutting edge

Single chamfer

S 020 20

① ②

① Chamfer width, 020 means 0.2mm
② Chamfer angle, 20 means 20°

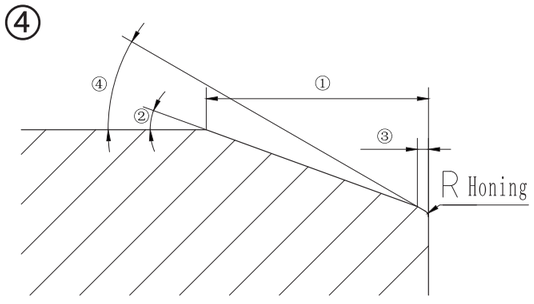


Double chamfer

P 200 20 / 010 30

① ② ③ ④

① Total chamfer width
② 2nd chamfer angle
③ 1st chamfer width
④ 1st chamfer width

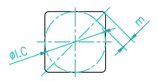


Cutting edge preparation			Main function
Code	Cutting edge preparation	Drawing	
F	Sharp edge		Sharp edge can help to improve surface roughness, and is not easy to cause vibration marks. Over sharp will result in slightly worse durability, so sharp edge is only used for machining general cast iron which requires high roughness.
E	Honing		Honing can reduce micro chipping, improve integrity of cutting edge, and increase tool life. The heavier honing, the better cutting edge shape and strength, but the cutting resistance and cutting heat would increase. Heavy honing can be used under conditions of enough system rigidity and machine tool powder or interrupted cutting.
T	Chamfer		Chamfer helps to improve impact resistance of cutting edge. Compared with S cutting edge, it helps to improve surface quality and ensure dimensional stability.
S	Chamfer+Honing		The cutting edge strength and comprehensive performance are the best. And it is most widely used in CBN inserts. S05020 is often used in turning alloy hard cast iron; S02020 is often used in gray cast iron; S01020 is often used in hardened steel.
K	Double chamfer		Recommendation for large machining allowance interrupted turning so as to obtain better impact resistance.
P	Double chamfer +Honing		Recommendation for large machining allowance interrupted turning to obtain better impact resistance and better strength than K edge.

inserts model naming standard

Shape code	Insert	Shape	Angle
S	□	Square	90°
T	△	Regular triangle	60°
C	◇	rhombus	80°
D			55°
E			75°
M			86°
V			35°
W	⬠	Convex triangle	80°
H	⬡	Regular hexagon	120°
O	○	Regular octagon	135°
P	⬠	Regular pentagon	108°
L	▭	Rectangle	90°
A	▱	Parallelogram	85°
B			82°
N/K			55°
R	○	Round	-

Shape



For even edge

For odd edge

Insert with wiper

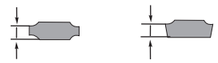
Code	Tip height m (mm)	Φ I.C (mm)	Thickness S (mm)	Code	Tip height m (mm)	Φ I.C (mm)	Thickness S (mm)
A	±0.005	±0.025	±0.025	J	±0.005	±0.05- ±0.13	±0.025
F	±0.005	±0.013	±0.025	K	±0.013	±0.05- ±0.13	±0.025
C	±0.013	±0.025	±0.025	L	±0.025	±0.05- ±0.13	±0.025
H	±0.013	±0.013	±0.025	M	±0.08 - ±0.18	±0.05- ±0.13	±0.13
E	±0.025	±0.025	±0.025	N	±0.08 - ±0.18	±0.05- ±0.13	±0.025
G	±0.025	±0.025	±0.13	U	±0.13- ±0.38	±0.08- ±0.25	±0.13

Tolerance

inserts model naming standard

Inscribed circle (mm)	Cutting edge length C	D	S	T	V	W	R
3.97				06			03
4. 76				08			04
5.0							05
5.56				09	09		05
6.0							06
6.35	06	07	06	11	11	04	06
7.94	08	09					07
8.0							08
9.525	09	11	09	16	16	06	09
10.0							10
12.0							12
12.7	12	15	12	22	22	08	12
15.875	16		15	27			15
16.0		19					16
19.05	19		19	33			19
20.0							20
25.0	25	25					25
25.4			25				25
31.75							31
32							32

Insert size (mm)



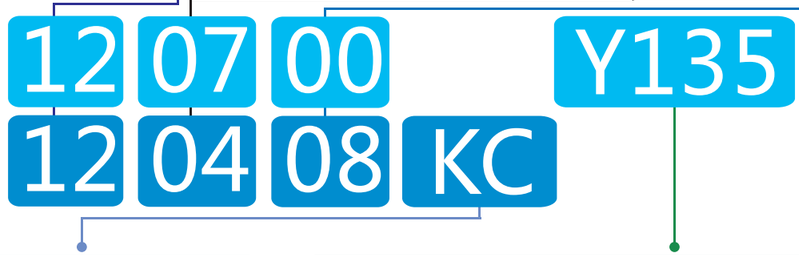
* Thickness refers to the height between inserts bottom and the highest part of cutting edge.

Code	Thickness (mm)	Code	Thickness (mm)
01	1.59	06	6.35
T1	1.98	07	7.94
02	2.38	08	8.0
T2	2.58	09	9.52
03	3.18	10	10.0
T3	3.97	11	11.11
04	4.76	12	12.0
05	5.56	12	12.70

Thickness (mm)

Code	Radius (mm)
00	Sharp or round insert
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	Other

Radius code



Clearance angle

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

Chip breaker and fixing form

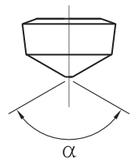
Code	About hole	Chip breaker	Sketch	Code	About hole	Chip breaker	Sketch
N	No	No		B	70°–90° counter bore on single side	No	
R		Single side chip breaker		H		Single side chip breaker	
F		Double sides chip breaker		C	70°–90° counter bore on both sides	No	
A	Round straight hole	No		J		Double sides chip breaker	
M		Single side chip breaker		O	Fastening dimple	Round	
G		Double sides chip breaker					
W	40°–60° counter bore on single side	No		S		Square	
T		Single side chip breaker					
Q	40°–60° counter bore on both sides	No		L		Long strip	
U		Double sides chip breaker					
				X	Other fixed and chip breaker styles requires drawing or more information.		

Any marks

Main cutting edge style, cutting direction or chip breaker type.
Blank means no other marks.

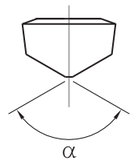
Cone or pyramid bottom

Y:Cone bottom



Y means cone bottom, and 135 refers to cone angle 135 °
If cone angle is 120 °, it can be blank.
For example: The model of 120 °cone bottom insert, can be RCMX120700Y or RCMX120700Y120.
Cone angle must be marked clearly if cone bottom angle is not 120°.
For example: Model of 135°cone bottom inserts is RCMX120700Y135

Pyramid bottom



V means pyramid bottom,and 135 refers to pyramid angle 135 °
If pyramid angle is 120 °, it can be blank.
For example: The model of 120 °pyramid bottom insert can be as RCMX120700V or RCMX120700V120.
Pyramid angle must be marked clearly if cone bottom angle is not 120°.
For example: Model of 135°pyramid bottom insert is RCMX120700V135

Remarks : If model shows no V or Y, for example RCMX120700,it indicates V bottom.

Oder example and instruction for innovative PCBN insert

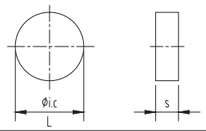
FBN	7600	C04	RCGX120700Y135			S05020
FBK	9540	C06	CNGA120408KC	-2	S	S02020
FBN: solid PCBN inserts FBS: full corner brazed PCBN inserts FBK: Tipped brazed PCBN inserts	Grade P4	Coatings types, blank if no coating.	Specification P11-12	Effective number of cutting edge, 1 cutting edge can be blank. - 2 indicates 2 effective cutting edges FBN/FBS can be blank.	FBK inserts effective cutting edge length. S: Standard edge length (short). N: Standard edge length (long) L : Special effective edge length.For example: L35 indicates an 3.5 mm effective edge length.	Edge form P10

ZEUS

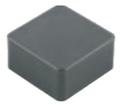
Innovative PCBN inserts

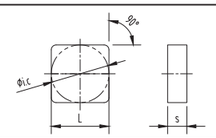
Turning

FBN series solid inserts



Model	Dimension(mm)				Standard cutting edge	Grade					
ISO	L	Φ i.c	s	r		FBN6500	FBN6600	FBN6000	FBN6200	FBN8000	FBN8300
RNMN 060400	6	6.35	4.76	0	S02020 S05020 S10020	●	●	●	●	●	●
RNMN 090300	9	9. 525	3. 18	0		●	●	●	●	●	●
RNMN 090400	9	9.525	4.76	0		●	●	●	●	●	●
RNMN 120400	12	12.7	4.76	0		●	●	●	●	●	●
RNMN 120600	12	12.7	6.35	0		●	●	●	●	●	●
RNMN 120700	12	12.7	7.94	0		●	●	●	●	●	●
RNMN 150700	15	15.875	7.94	0		●	●		●	●	●
RNMN 160700	16	16	7.94	0		●	●		●	●	●
RNMN 190700	19	19.05	7.94	0		●	●		●	●	●
RNMN 200700	20	20	7.94	0		●	●		●	●	●
RNMN 201000	20	20	10	0		●	●		●	●	●
RNMN 250600	25	25.4	6.35	0		●			●	●	●
RNMN 250700	25	25.4	7.94	0		●			●	●	●
RNMN 251000	25	25.4	10	0		●			●	●	●
RNMN 251200	25	25.4	12	0		●			●	●	●

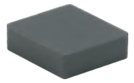


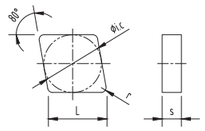


Model	Dimension(mm)				Standard cutting edge	Grade					
ISO	L	Φ i.c	s	r		FBN6500	FBN6600	FBN6000	FBN6200	FBN8000	FBN8300
SNMN 090304	9	9.525	3.18	0.4	S02020 S05020 S10020	●	●	●	●	●	●
SNMN 090308	9	9.525	3.18	0.8		●	●	●	●	●	●
SNMN 090312	9	9.525	3.18	1.2		●	●	●	●	●	●
SNMN 090404	9	9.525	4.76	0.4		●	●	●	●	●	●
SNMN 090408	9	9.525	4.76	0.8		●	●	●	●	●	●
SNMN 090412	9	9.525	4.76	1.2		●	●	●	●	●	●
SNMN 120404	12	12.7	4.76	0.4		●	●	●	●	●	●
SNMN 120408	12	12.7	4.76	0.8		●	●	●	●	●	●
SNMN 120712	12	12.7	7.94	1.2		●	●	●	●	●	●
SNMN 150704	15	15.875	7.94	0.4		●	●		●	●	●
SNMN 150708	15	15.875	7.94	0.8		●	●		●	●	●
SNMN 201020	20	20	10	2.0		●	●		●	●	●
SNMN 201024	20	20	10	2.4		●	●		●	●	●

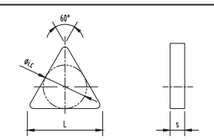
Remarks: ● Products available
Customized cutting edge is available.

FBN series solid inserts





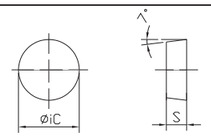
Model	Dimension(mm)				Standard cutting edge	Grade					
ISO	L	Φ i.c	s	r		FBN6500	FBN6600	FBN6000	FBN6200	FBN8000	FBN8300
CNMN 090404	9	9.525	4.76	0.4	S02020	●		●	●	●	●
CNMN 090408	9	9.525	4.76	0.8		●	●	●	●	●	●
CNMN 090412	9	9.525	4.76	1.2		●	●	●	●	●	●
CNMN 120404	12	12.7	4.76	0.4		●	●	●	●	●	●
CNMN 120408	12	12.7	4.76	0.8		●	●	●	●	●	●
CNMN 120412	12	12.7	4.76	1.2		●	●	●	●	●	●
CNMN 120704	12	12.7	7.94	0.4		●	●	●	●	●	●
CNMN 120708	12	12.7	7.94	0.8		●	●	●	●	●	●
CNMN 120712	12	12.7	7.94	1.2		●		●	●	●	●
CNMN 160708	16	15.875	7.94	0.8		●		●	●	●	●
CNMN 160712	16	15.875	7.94	1.2		●		●	●	●	●
CNMN 160716	16	15.875	7.94	1.6		●		●	●	●	●



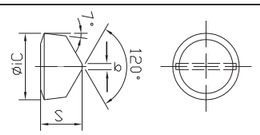
Model	Dimension(mm)				Standard cutting edge	Grade					
ISO	L	Φ i.c	s	r		FBN6500	FBN6600	FBN6000	FBN6200	FBN8000	FBN8300
TNGN110304	11	6.35	3.18	0.4	S01020 S02020	●	●	●	●	●	●
TNGN110308	11	6.35	3.18	0.8		●	●	●	●	●	●
TNGN110312	11	6.35	3.18	1.2		●	●	●	●	●	●
TNGN160404	16	9.25	4.76	0.4		●	●		●	●	●
TNGN160408	16	9.25	4.76	0.8		●	●		●	●	●
TNGN160412	16	9.25	4.76	1.2		●	●		●	●	●

Remarks: ● Products available
Customized cutting edge is available.

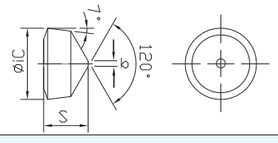
FBN series solid inserts



Model	Dimension(mm)				Standard cutting edge	Grade					
ISO	L	Φ i.c	s	r		FBN6500	FBN6600	FBN6000	FBN6200	FBN8000	FBN8300
RCMN 060400	6	6.35	4.76	0	S02020 S05020 S10020	●	●	●	●	●	●
RCMN 090400	9	9.525	4.76	0		●	●	●	●	●	●
RCMN 090600	9	9.525	6.35	0		●	●	●	●	●	●
RCMN 120600	12	12.7	6.35	0		●	●	●	●	●	●
RCMN 120700	12	12.7	7.94	0		●	●	●	●	●	●
RCMN 150700	15	15.875	7.94	0		●	●		●	●	●
RCMN 190700	19	19.05	7.94	0		●	●		●	●	●



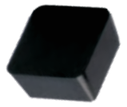
Model	Dimension(mm)				Standard cutting edge	Grade					
ISO	L	Φ i.c	s	b		FBN6500	FBN6600	FBN6000	FBN6200	FBN8000	FBN8300
RCMX 060400V	6	6.35	4.76	0.8	S02020 S05020 S10020 S20020	●	●	●	●	●	●
RCMX 060600V	6	6.35	6.35	0.8		●	●	●	●	●	●
RCMX 090700V	9	9.525	7.94	1		●	●	●	●	●	●
RCMX 120700V	12	12.7	7.94	2		●	●	●	●	●	●
RCMX 151000V	15	15.875	10.0	2		●	●		●	●	●
RCMX 191000V	19	19.05	10.0	2		●	●		●	●	●
RCMX 201200V	20	20.0	12.0	2		●	●		●	●	●
RCMX 251200V	25	25.4	12.0	2		●	●		●	●	●

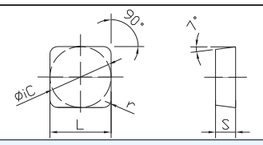


Model	Dimension(mm)				Standard cutting edge	Grade					
ISO	L	Φ i.c	s	b		FBN6500	FBN6600	FBN6000	FBN6200	FBN8000	FBN8300
RCMX060400Y	6	6.35	4.76	0.6	S02020 S05020 S10020 S20020	●	●	●	●	●	●
RCMX060500Y	6	6.35	5.0	0.6		●	●	●	●	●	●
RCMX060700Y	6	6.35	7.94	0.6		●	●	●	●	●	●
RCMX090700Y	9	9.525	7.94	1		●	●	●	●	●	●
RCMX120700Y	12	12.7	7.94	1.2		●	●	●	●	●	●

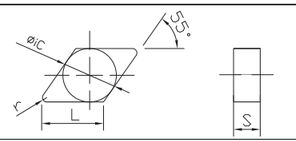
Remarks: ● Products available
Customized cutting edge is available.

FBN series solid inserts

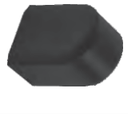


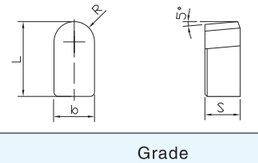


Model	Dimension(mm)				Standard cutting edge	Grade					
ISO	L	Φ i.c	s	r		FBN6500	FBN6600	FBN6000	FBN6200	FBN8000	FBN8300
SCGN 090304	9	9.525	3.18	0.4	T01020 S01020 S02020		●	●	●		
SCGN 090308	9	9.525	3.18	0.8			●	●	●		
SCGN 090312	9	9.525	3.18	1.2			●	●	●		
SCGN 090404	9	9.525	4.76	0.4			●	●	●		
SCGN 090408	9	9.525	4.76	0.8			●	●	●		
SCGN 090412	9	9.525	4.76	1.2			●	●	●		



Model	Dimension(mm)				Standard cutting edge	Grade					
ISO	L	Φ i.c	s	r		FBN6500	FBN6600	FBN6000	FBN6200	FBN8000	FBN8300
DNUN110404	11	9.525	4.76	0.4	S01020 S02020				●		
DNUN110408	11	9.525	4.76	0.8					●		
DNUN110412	11	9.525	4.76	1.2					●		
DNUN110604	11	9.525	6.35	0.4					●		
DNUN110608	11	9.525	6.35	0.8					●		
DNUN110612	11	9.525	6.35	1.2					●		

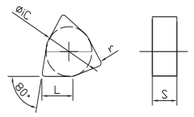




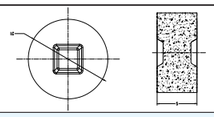
Model	Dimension(mm)				Standard cutting edge	Grade					
ISO	R	b	L	S		FBN6500	FBN6600	FBN6000	FBN6200	FBN8000	FBN8300
STB10K1	4.6	9.2	17	8.0	S10020	●	●			●	
BL12K1-B	5.55	11.1	17	8.0		●	●			●	
BL14K1-B	6.5	13.0	17	8.0		●	●			●	

Remarks: ● Products available
Customized cutting edge is available.

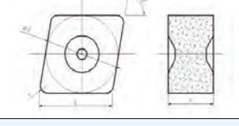
FBN series solid inserts



Model	Dimension(mm)				Standard cutting edge	Grade					
ISO	L	Φ i.c	s	r		FBN6500	FBN6600	FBN6000	FBN6200	FBN8000	FBN8300
WNMN 080404	8	12.7	4.76	0.4	S02020	●	●	●	●	●	●
WNMN 080408	8	12.7	4.76	0.8		●	●	●	●	●	●
WNMN 080412	8	12.7	4.76	1.2		●	●	●	●	●	●
WNMN 080604	8	12.7	6.35	0.4		●	●	●	●	●	●
WNMN 080608	8	12.7	6.35	0.8		●	●	●	●	●	●
WNMN 080612	8	12.7	6.35	1.2		●	●	●	●	●	●



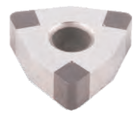
Model	Dimension(mm)			Standard cutting edge	Grade					
ISO	L	Φ i.c	s		FBN6500	FBN6600	FBN6000	FBN6200	FBN8000	FBN8300
RNMS090600	9	9.525	6.35	S02020	●	●	●	●	●	●
RNMS120700	12	12.7	7.94		●	●	●	●	●	●
RNMS150700	15	15.875	7.94		●	●	●	●	●	●
RNMS201000	20	20	10		●	●	●	●	●	●

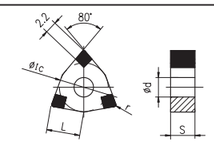


Model	Dimension(mm)				Standard cutting edge	Grade					
ISO	L	Φ i.c	s	r		FBN6500	FBN6600	FBN6000	FBN6200	FBN8000	FBN8300
CNM0120704	12	12.7	7. 94	0.4	S02020		●	●	●	●	●
CNM0120708	12	12.7	7. 94	0.8			●	●	●	●	●
CNM0120712	12	12.7	7. 94	1.2			●	●	●	●	●

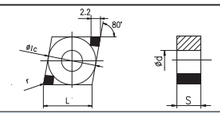
Remarks: ● Products available
Customized cutting edge is available.

FBS series full corner brazed inserts

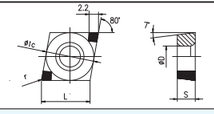




Model	Dimension(mm)					Standard cutting edge	Grade		
ISO	L	Φ i.c	s	Φ d	r		FBS6000	FBS6200	FBS8300
WNGA080404	8	12.7	4.76	5.16	0.4	S01020 S02020	●	●	●
WNGA080408	8	12.7	4.76	5.16	0.8		●	●	●
WNGA080412	8	12.7	4.76	5.16	1.2		●	●	●



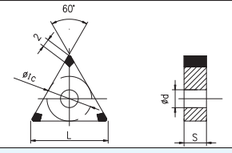
Model	Dimension(mm)					Standard cutting edge	Grade		
ISO	L	Φ i.c	s	Φd	r		FBS6000	FBS6200	FBS8300
CNGA120404	12	12.7	4.76	5.16	0.4	S01020 S02020	●	●	●
CNGA120408	12	12.7	4.76	5.16	0.8		●	●	●
CNGA120412	12	12.7	4.76	5.16	1.2		●	●	●
CNGA160404	16	15.875	4.76	5.16	0.4		●	●	●
CNGA160408	16	15.875	4.76	5.16	0.8		●	●	●
CNGA160412	16	15.875	4.76	5.16	1.2		●	●	●



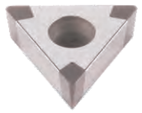
Model	Dimension(mm)					Standard cutting edge	Grade		
ISO	L	Φ i.c	s	Φd	r		FBS6000	FBS6200	FBS8300
CCGW09T304	9	9.525	3.97	4.4	0.4	S01020 S02020	●	●	●
CCGW09T308	9	9.525	3.97	4.4	0.8		●	●	●
CCGW09T312	9	9.525	3.97	4.4	1.2		●	●	●
CCGW120404	12	12.7	4.76	5.5	0.4		●	●	●
CCGW120408	12	12.7	4.76	5.5	0.8		●	●	●
CCGW120412	12	12.7	4.76	5.5	1.2		●	●	●

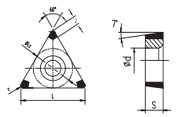
Remarks: ● Products available
Customized cutting edge is available.

FBS series full corner brazed inserts

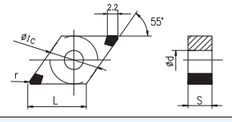


Model	Dimension(mm)					Standard cutting edge	Grade		
ISO	L	Φ i.c	s	Φ d	r		FBS6000	FBS6200	FBS8300
TNGA160404	16	9.525	4.76	3.81	0.4	S01020 S02020	●	●	●
TNGA160408	16	9.525	4.76	3.81	0.8		●	●	●
TNGA160412	16	9.525	4.76	3.81	1.2		●	●	●





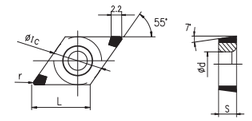
Model	Dimension(mm)					Standard cutting edge	Grade		
ISO	L	Φ i.c	s	Φ d	r		FBS6000	FBS6200	FBS8300
TCGW110304	11	6.35	3.18	2.8	0.4	S01020 S02020	●	●	●
TCGW110308	11	6.35	3.18	2.8	0.8		●	●	●
TCGW110312	11	6.35	3.18	2.8	1.2		●	●	●



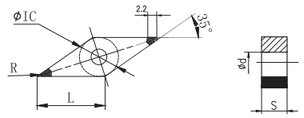
Model	Dimension(mm)					Standard cutting edge	Grade		
ISO	L	Φ i.c	s	Φ d	r		FBS6000	FBS6200	FBS8300
DNGA110404	11	9.525	4.76	3.81	0.4	S01020 S02020	●	●	●
DNGA110408	11	9.525	4.76	3.81	0.8		●	●	●
DNGA110412	11	9.525	4.76	3.81	1.2		●	●	●
DNGA150404	15	12.7	4.76	5.16	0.4		●	●	●
DNGA150408	15	12.7	4.76	5.16	0.8		●	●	●
DNGA150412	15	12.7	4.76	5.16	1.2		●	●	●

Remarks: ● Products available
Customized cutting edge is available.

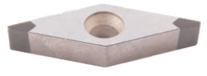
FBS series full corner brazed inserts

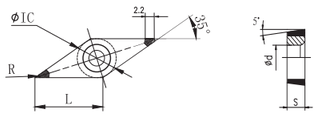


Model	Dimension(mm)					Standard cutting edge	Grade		
ISO	L	Φ i.c	s	Φ d	r		FBS6000	FBS6200	FBS8300
DCGW11T304	11	9.525	3.97	4.4	0.4	S01020 S02020	●	●	●
DCGW11T308	11	9.525	3.97	4.4	0.8		●	●	●
DCGW11T312	11	9.525	3.97	4.4	1.2		●	●	●



Model	Dimension(mm)					Standard cutting edge	Grade		
ISO	L	Φ i.c	s	Φ d	r		FBS6000	FBS6200	FBS8300
VNGA160404	16	9.525	4.76	3.81	0.4	S01020 S02020	●	●	●
VNGA160408	16	9.525	4.76	3.81	0.8		●	●	●
VNGA160412	16	9.525	4.76	3.81	1.2		●	●	●

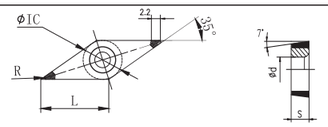




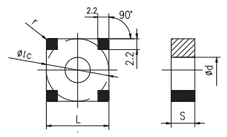
Model	Dimension(mm)					Standard cutting edge	Grade		
ISO	L	Φ i.c	s	Φ d	r		FBS6000	FBS6200	FBS8300
VBGW160404	16	9.525	4.76	4.4	0.4	S01020 S02020	●	●	●
VBGW160408	16	9.525	4.76	4.4	0.8		●	●	●
VBGW160412	16	9.525	4.76	4.4	1.2		●	●	●

Remarks: ● Products available
Customized cutting edge is available.

FBS series full corner brazed inserts



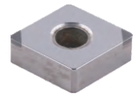
Model	Dimension(mm)					Standard cutting edge	Grade		
ISO	L	Φ i.c	s	Φ d	r		FBS6000	FBS6200	FBS8300
VCGW160404	16	9.525	4.76	4.4	0.4	S01020 S02020	●	●	●
VCGW160408	16	9.525	4.76	4.4	0.8		●	●	●
VCGW160412	16	9.525	4.76	4.4	1.2		●	●	●

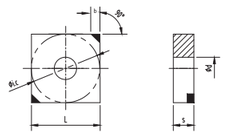


Model	Dimension(mm)					Standard cutting edge	Grade		
ISO	L	Φ i.c	s	Φ d	r		FBS6000	FBS6200	FBS8300
SNGA120404	12	12.7	4.76	5.16	0.4	S01020 S02020	●	●	●
SNGA120408	12	12.7	4.76	5.16	0.8		●	●	●
SNGA120412	12	12.7	4.76	5.16	1.2		●	●	●

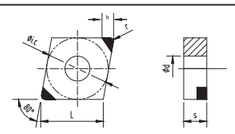
Remarks: ● Products available
Customized cutting edge is available.

FBK series super finishing tip brazed inserts

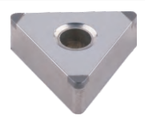


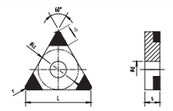


Model	Dimension(mm)					b		Standard cutting edge	Grade					
ISO	L	Φ i.c	s	Φ d	r	S	N		7510	7520	7530	9540	9550	9560
SNGA120404-2S	12	12.7	4.76	5.16	0.4	2.5	3.3	T01020 T02020 S01020 S02020	●	●	●	●	●	●
SNGA120408-2S	12	12.7	4.76	5.16	0.8	2.3	3.2		●	●	●	●	●	●
SNGA120412-2S	12	12.7	4.76	5.16	1.2	2.2	3.1		●	●	●	●	●	●



Model	Dimension(mm)					b		Standard cutting edge	Grade					
ISO	L	Φ i.c	s	Φ d	r	S	N		7510	7520	7530	9540	9550	9560
CNGA120404-2S	12	12.7	4.76	5.15	0.4	2.5	3.3	T01020 T02020 S01020 S02020	●	●	●	●	●	●
CNGA120408-2S	12	12.7	4.76	5.15	0.8	2.3	3.1		●	●	●	●	●	●
CNGA120412-2S	12	12.7	4.76	5.15	1.2	2.2	3.0		●	●	●	●	●	●

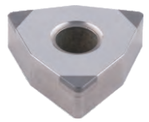


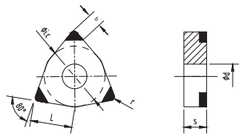


Model	Dimension(mm)					b		Standard cutting edge	Grade					
ISO	L	Φ i.c	s	Φ d	r	S	N		7510	7520	7530	9540	9550	9560
TNGA160404-3S	16	9.525	4.76	3.81	0.4	2.3	3.3	T01020 T02020 S01020 S02020	●	●	●	●	●	●
TNGA160408-3S	16	9.525	4.76	3.81	0.8	2	3.0		●	●	●	●	●	●
TNGA160412-3S	16	9.525	4.76	3.81	1.2	1.7	2.7		●	●	●	●	●	●
TNGA160416-3S	16	9.525	4.76	3.81	1.6		2.4		●	●	●	●	●	●

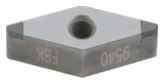
Remarks: ● The standard cutting length is A standard, please remark in order if B standard required.
Customized cutting edge is available.

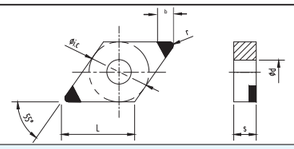
FBK series super finishing tip brazed inserts



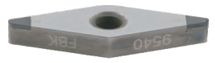


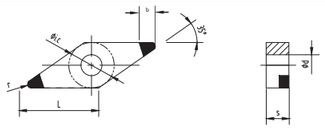
Model	Dimension(mm)							Standard cutting edge	Grade					
ISO	L	Φ i.c	s	Φ d	r	b A	b B		7510	7520	7530	9540	9550	9560
WNGA060404-3S	6	9.525	4.76	3.81	0.4	2.5	3.3	T01020	●	●	●	●	●	●
WNGA060408-3S	6	9.525	4.76	3.81	0.8	2.3	3.1	T02020	●	●	●	●	●	●
WNGA080404-3S	8	12.7	4.76	5.16	0.4	2.5	3.3	S01020	●	●	●	●	●	●
WNGA080408-3S	8	12.7	4.76	5.16	0.8	2.3	3.1	S02020	●	●	●	●	●	●
WNGA080412-3S	8	12.7	4.76	5.16	1.2	2.2	3.0		●	●	●	●	●	●





Model	Dimension(mm)							Standard cutting edge	Grade					
ISO	L	Φ i.c	s	Φ d	r	b A	b B		7510	7520	7530	9540	9550	9560
DNGA110404-2S	11	9.525	4.76	3.81	0.4	2.5	3.3	T01020	●	●	●	●	●	●
DNGA110408-2S	11	9.525	4.76	3.81	0.8	2.1	2.9	T02020	●	●	●	●	●	●
DNGA150404-2S	15	12.7	4.76	5.16	0.4	2.5	3.3	S01020	●	●	●	●	●	●
DNGA150408-2S	15	12.7	4.76	5.16	0.8	2.1	2.9	S02020	●	●	●	●	●	●
DNGA150412-2S	15	12.7	4.76	5.16	1.2	1.8	2.5		●	●	●	●	●	●

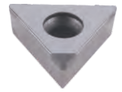


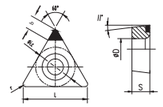


Model	Dimension(mm)							Standard cutting edge	Grade					
ISO	L	Φ i.c	s	Φ d	r	b A	b B		7510	7520	7530	9540	9550	9560
VNGA160404-2S	16	9.525	4.76	3.81	0.4	2.8	3.5	T01020	●	●	●	●	●	●
VNGA160408-2S	16	9.525	4.76	3.81	0.8	2	2.7	T02020	●	●	●	●	●	●
VNGA160412-2S	16	9.525	4.76	3.81	1.2	1.3	1.9	S01020	●	●	●	●	●	●
								S02020	●	●	●	●	●	●

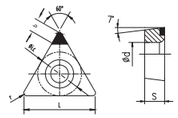
Remarks: ● The standard cutting length is A standard, please remark in order if B standard required.
Customized cutting edge is available.

FBK series super finishing tip brazed inserts





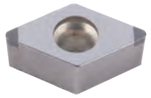
Model	Dimension(mm)							Standard cutting edge	Grade					
ISO	L	Φ i.c	s	Φ d	r	b A	b B		7510	7520	7530	9540	9550	9560
TPGW110304	11	6.35	3.18	3.3	0.4	2.1		T01020	●	●	●	●	●	●
TPGW110308	11	6.35	3.18	3.3	0.8	1.8		T02020	●	●	●	●	●	●
TPGW160304	16	9.525	3.18	4.4	0.4	2.3	3.3	S01020	●	●	●	●	●	●
TPGW160308	16	9.525	3.18	4.4	0.8	2	3.0	S02020	●	●	●	●	●	●
TPGW16T304	16	9.525	3.97	4.4	0.4	2.3	3.3		●	●	●	●	●	●
TPGW16T308	16	9.525	3.97	4.4	0.8	2	3.0		●	●	●	●	●	●
TPGW16T312	16	9.525	3.97	4.4	1.2	1.7	2.7		●	●	●	●	●	●
TPGW160404	16	9.525	4.76	4.4	0.4	2.3	3.3		●	●	●	●	●	●
TPGW160408	16	9.525	4.76	4.4	0.8	2	3.0		●	●	●	●	●	●

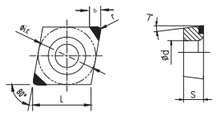


Model	Dimension(mm)							Standard cutting edge	Grade					
ISO	L	Φ i.c	s	Φ d	r	b A	b B		7510	7520	7530	9540	9550	9560
TCGW110304	11	6.35	3.18	2.8	0.4	2.1		T01020	●	●	●	●	●	●
TCGW110308	11	6.35	3.18	2.8	0.8	1.8		T02020	●	●	●	●	●	●
TCGW16T304	16	9.525	3.97	4.4	0.4	2.3	3.3	S01020	●	●	●	●	●	●
TCGW16T308	16	9.525	3.97	4.4	0.8	2	3.0	S02020	●	●	●	●	●	●
TCGW16T312	16	9.525	3.97	4.4	1.2	1.7	2.7		●	●	●	●	●	●

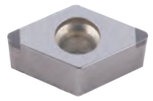
Remarks: ● The standard cutting length is A standard, please remark in order if B standard required.
Customized cutting edge is available.

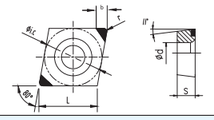
FBK series super finishing tip brazed inserts





Model	Dimension(mm)							Standard cutting edge	Grade					
ISO	L	Φ i.c	s	Φ d	r	b A	b B		7510	7520	7530	9540	9550	9560
CCGW09T304-2S	9	9.525	3.97	4.4	0.4	2.5	3.3	T01020	●	●	●	●	●	●
CCGW09T308-2S	9	9.525	3.97	4.4	0.8	2.3	3.1		●	●	●	●	●	●
CCGW09T312-2S	9	9.525	3.97	4.4	1.2	2.2	3.0	T02020	●	●	●	●	●	●
CCGW120404-2S	12	12.7	4.76	5.5	0.4	2.5	3.3	S01020	●	●	●	●	●	●
CCGW120408-2S	12	12.7	4.76	5.5	0.8	2.3	3.1		●	●	●	●	●	●
CCGW120412-2S	12	12.7	4.76	5.5	1.2	2.2	3.0	S02020	●	●	●	●	●	●

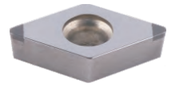


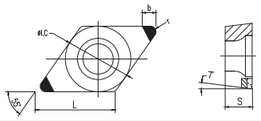


Model	Dimension(mm)							Standard cutting edge	Grade					
ISO	L	Φ i.c	s	Φ d	r	b A	b B		7510	7520	7530	9540	9550	9560
CPGW090304-2S	9	9.525	3.18	4.4	0.4	2.5	3.3	T01020	●	●	●	●	●	●
CPGW090308-2S	9	9.525	3.18	4.4	0.8	2.3	3.0		●	●	●	●	●	●
CPGW090312-2S	9	9.525	3.18	4.4	1.2	2.2	3.0	T02020	●	●	●	●	●	●
CPGW09T304-2S	9	9.525	3.97	4.4	0.4	2.5	3.3	S01020	●	●	●	●	●	●
CPGW09T308-2S	9	9.525	3.97	4.4	0.8	2.3	3.1		●	●	●	●	●	●
CPGW09T312-2S	9	9.525	3.97	4.4	1.2	2.2	3.0	S02020	●	●	●	●	●	●

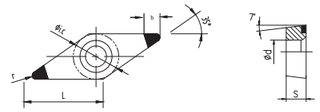
Remarks: ● The standard cutting length is A standard, please remark in order if B standard required.
Customized cutting edge is available.

FBK series super finishing tip brazed inserts

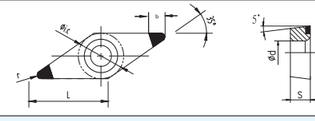




Model	Dimension(mm)							Standard cutting edge	Grade					
ISO	L	Φ i.c	s	Φ d	r	b A	b B		7510	7520	7530	9540	9550	9560
DCGW11T304-2S	11	9.525	3.97	4.4	0.4	2.5	3.3	T01020 T02020 S01020 S02020	●	●	●	●	●	●
DCGW11T308-2S	11	9.525	3.97	4.4	0.8	2.1	2.9		●	●	●	●	●	●



Model	Dimension(mm)							Standard cutting edge	Grade					
ISO	L	Φ i.c	s	Φ d	r	b A	b B		7510	7520	7530	9540	9550	9560
VCGW110304	11	6.35	3.18	2.8	0.4	2.8	3.5	T01020	●	●	●	●	●	●
VCGW110308	11	6.35	3.18	2.8	0.8	2	2.7		●	●	●	●	●	●
VCGW110312	11	6.35	3.18	2.8	1.2	1.3	1.9	T02020	●	●	●	●	●	●
VCGW160404-2S	16	9.525	4.76	4.4	0.4	2.8	3.5	S01020	●	●	●	●	●	●
VCGW160408-2S	16	9.525	4.76	4.4	0.8	2	2.7		●	●	●	●	●	●
VCGW160412-2S	16	9.525	4.76	4.4	1.2	1.3	1.9	S02020	●	●	●	●	●	●

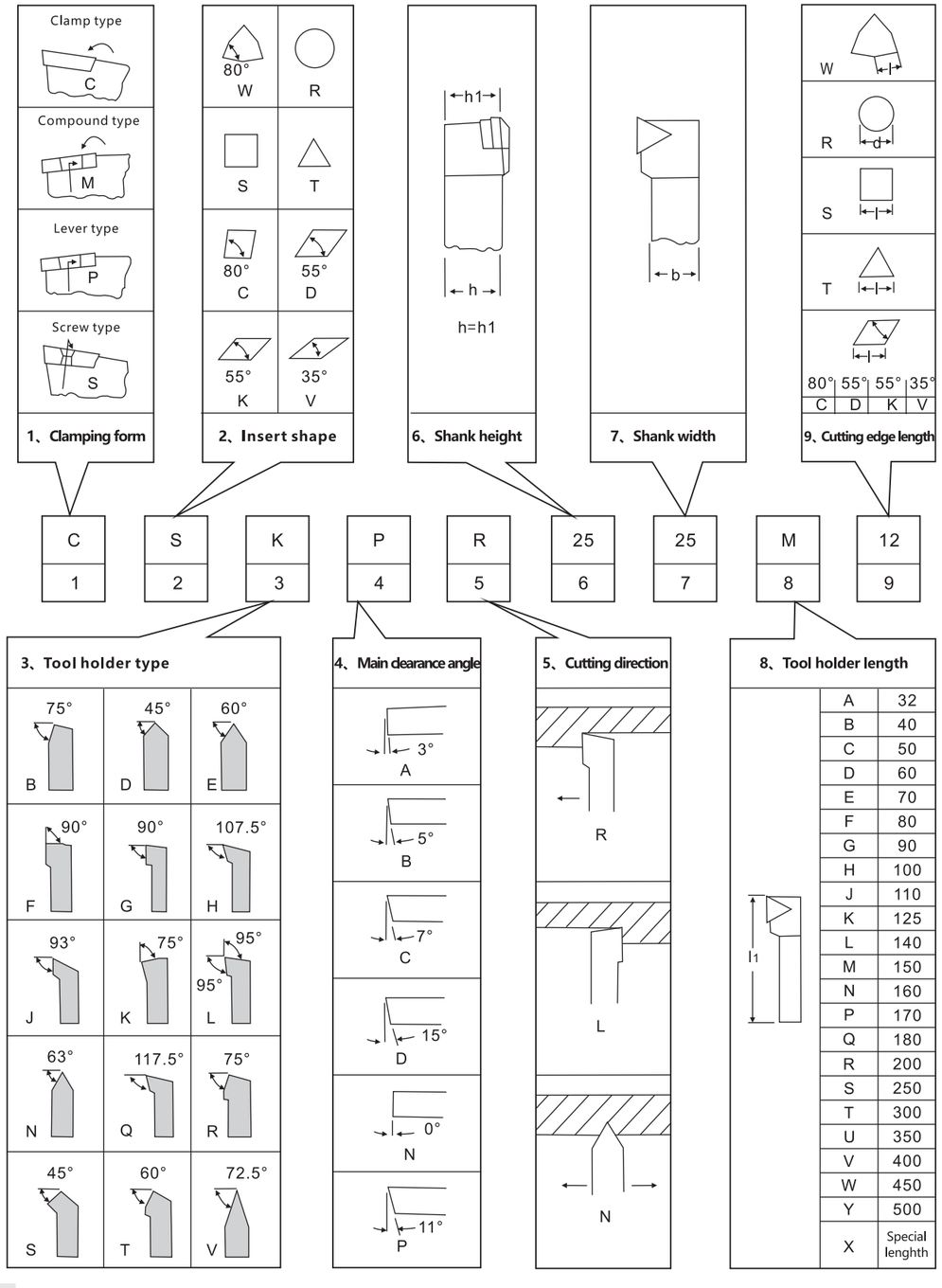


Model	Dimension(mm)							Standard cutting edge	Grade					
ISO	L	Φ i.c	s	Φ d	r	b A	b B		7510	7520	7530	9540	9550	9560
VBGW110304	11	6.35	3.18	2.8	0.4	2.8	3.5	T01020	●	●	●	●	●	●
VBGW110308	11	6.35	3.18	2.8	0.8	2	2.7		●	●	●	●	●	●
VBGW110312	11	6.35	3.18	2.8	1.2	1.3	1.9	T02020	●	●	●	●	●	●
VBGW160404-2S	16	9.525	4.76	4.4	0.4	2.8	3.5	S01020	●	●	●	●	●	●
VBGW160408-2S	16	9.525	4.76	4.4	0.8	2	2.7		●	●	●	●	●	●
VBGW160412-2S	16	9.525	4.76	4.4	1.2	1.3	1.9	S02020	●	●	●	●	●	●

Remarks: ● The standard cutting length is A standard, please remark in order if B standard required.
Customized cutting edge is available.

Naming standard of ISO indexable external surface turning tool holder

Naming standard of ISO indexable external surface turning tool holder



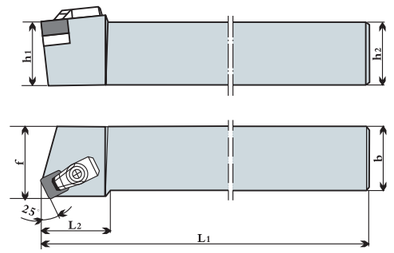
ZEUS

innovative PCBN cutting tools

Tool holder series

25° Tool holder

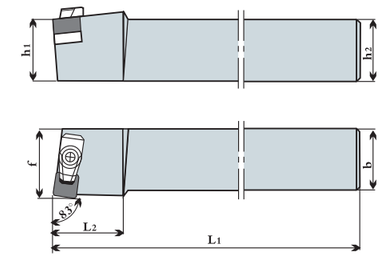
Application



Specification	h1=h2	b	L1	L2	f			
CSXNR/L3232P12-25	32	32	170	42	35	YS12M4	S12Y	SNMN1207
CSXNR/L3232P15-25	32	32	170	47	36.2	YS15M4	S15Y	SNMN1507
CSXNR/L3535R12-25	35	35	200	40	40	YS12M4	S12Y	SNMN1207
CSXNR/L3535R15-25	35	35	200	40	40	YS15M4	S15Y	SNMN1507
CSXNR/L4040S12-25	40	40	250	48	45	YS15M4	S15Y	SNMN1507
CSXNR/L4040S20-25	40	40	250	53	45	YS20M4	S20Y	SNMN2010
CSXNR/L5050T15-25	50	50	300	48	55	YS15M4	S15Y	SNMN1507
CSXNR/L5050T20-25	50	50	300	53	55	YS20M4	S20Y	SNMN2010

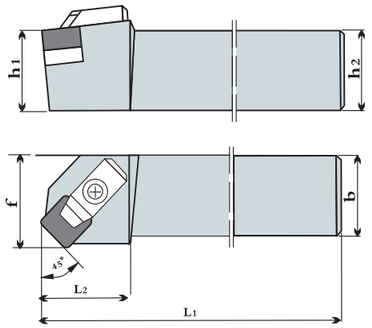
83° Tool holder

Application



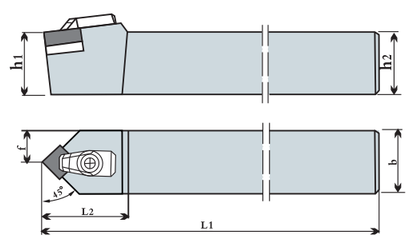
Specification	h1=h2	b	L1	L2	f			
CSXNR/L3232P12-83	32	32	170	36	36	YS12M4	S12Y	SNMN1207
CSXNR/L3540R15-83	35	40	200	35	45	YS15M4	S15Y	SNMN1507
CSXNR/L4040S15-83	40	40	250	40	45	YS15M4	S15Y	SNMN1507
CSXNR/L5050T20-83	50	50	300	42	55	YS20M4	S20Y	SNMN2010

45° Tool holder



Specification	h1=h2	b	L1	L2	f			
CSSNR/L2525P12	25	25	170	32	32	YS12M4	S12Y	SNMN1204
CSSNR/L3232P12	32	32	200	35	36	YS12M4	S12Y	SNMN1207
CSSNR/L3235R15	32	32	200	42	39.2	YS15M4	S15Y	SNMN1507
CSSNR/L4040S12	40	40	250	40	44.3	YS12M4	S12Y	SNMN1207
CSSNR/L4040S15	40	40	250	45	45	YS15M4	S15Y	SNMN1507
CSSNR/L4040S20	40	40	250	48	46	YS20M4	S20Y	SNMN2010
CSSNR/L5050T15	50	50	300	44	55	YS20M4	S15Y	SNMN1507
CSSNR/L5050T20	50	50	300	50	58	YS20M4	S20Y	SNMN2010

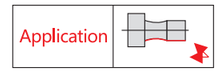
Middle laying 45° Tool holder

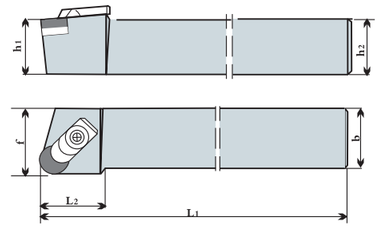


Specification	h1=h2	b	L1	L2	f			
CSDNN3232P12	32	32	170	48	16	YS12M4	S12Y	SNMN1207
CSDNN4040S15	40	40	250	52	20	YS15M4	S15Y	SNMN1507
CSDNN5050T20	50	50	300	58	25	YS20M4	S20Y	SNMN2010

innovative PCBN cutting tools
Tool holder series

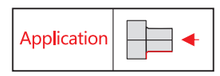
Arc tool holder

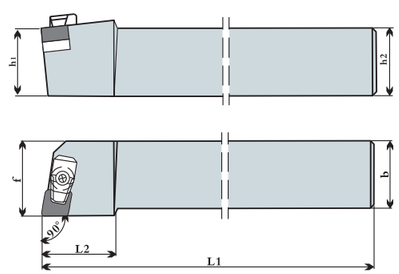




Specification	h1=h2	b	L1	L2	f			
CRGNR/L3232P12	32	32	170	40	37	GR12M4	R12G	RNMN120400
CRGNR/L3232P15	32	32	170	40	37	GR15M4	R15G	RNMN150700
CRGNR/L4040S20	40	40	250	42	45	GR20M4	R20G	RNMN200700
CRGNR/L5050T20	50	50	300	42	55	GR20M4	R20G	RNMN200700
CRGNR/L5050T20	50	50	300	42	55	GR20M4	R20G	RNMN201000
CRGNR/L5050T25	50	50	300	46	55	GR25M4	R25G	RNMN251000

90° Tool holder

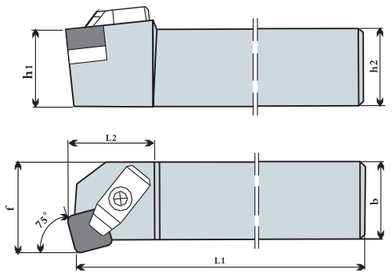




Specification	h1=h2	b	L1	L2	f			
CCGNR/L3232P12	32	32	170	35	36	YC12M4	C12Y	CNMN1207
CCGNR/L4040S16	40	40	250	40	45	YC16M4	C16Y	CNMN1207

Front **75°**tool holder

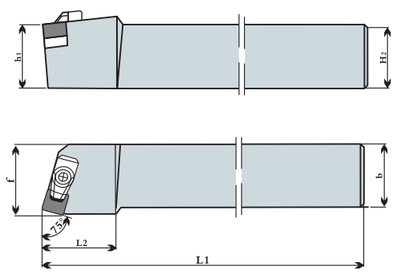
Application



Specification	h1=h2	b	L1	L2	f			
CSKNR/L3232P12	32	32	170	40	39	YS12M4	S12Y	SNMN1207
CSKNR/L3232P15	32	32	170	45	40	YS15M4	S15Y	SNMN1507
CSKNR/L4040S15	40	40	250	46	49	YS15M4	S15Y	SNMN1507
CSKNR/L4040S20	40	40	250	50	50	YS20M4	S20Y	SNMN2010
CSKNR/L5050T15	50	50	300	46	60	YS15M4	S15Y	SNMN1507
CSKNR/L5050T20	50	50	300	50	60	YS20M4	S20Y	SNMN2010

75°tool holder

Application

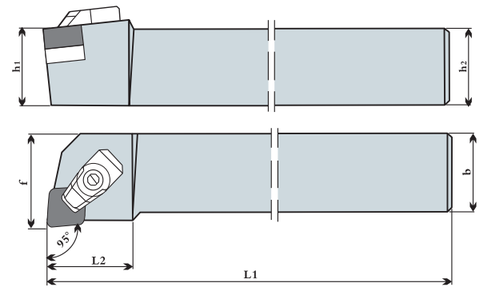


Specification	h1=h2	b	L1	L2	f			
CSRNR/L3232P12	32	32	170	36	36	YS12M4	S12Y	SNMN1207
CSRNR/L4040S15	40	40	250	45	45	YS15M4	S15Y	SNMN1507
CSRNR/L5050T20	50	50	300	45	56	YS20M4	S20Y	SNMN2010

innovative PCBN cutting tools
Tool holder series

95°tool holder

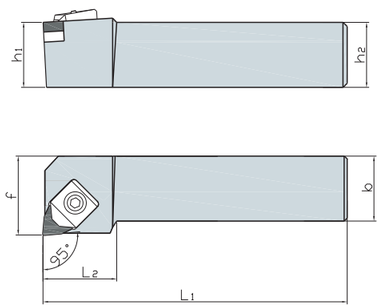
Application



Specification	h1=h2	b	L1	L2	f			
CCLNR/L3232P12	32	32	170	34	36	YC12M4	C12Y	CNMN1207
CCLNR/L4040S16	40	40	250	40	45	YC16M4	C16Y	CNMN1207

95°tool holder

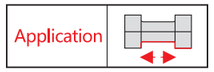
Application

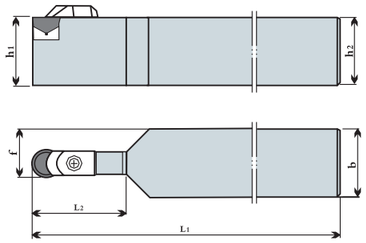


Specification	h1=h2	b	L1	L2	f			
CWLNR/L2525M	25	25	150	33	32	GW12M4	W12G	WNMN0804

innovative PCBN cutting tools
Tool holder series

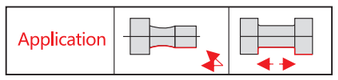
Middle laying tool holder

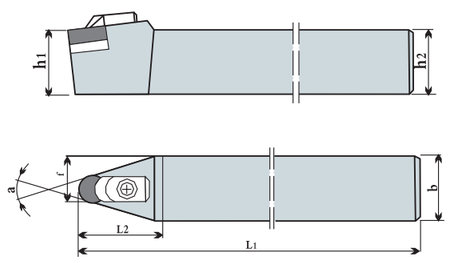




Specification	h1=h2	b	L1	L2	f			
CRDCN3225P09-A	32	25	170	29	17.2	RCV09	R09Y	RCGX090700
CRDCN3225P12-A	32	25	170	33	18.8	RCV12	R12Y	RCGX120700
CRDCN4040S15-ID	40	40	250	38	27.9	RCV15	R15Y	RCGX151000
CRDCN5040T19-ID	50	40	300	45	29.5	RCV19	R19Y	RCGX191000
CRDCN5040T20-ID	50	40	300	45	30	RCV20	R20Y	RCGX201200
CRDCN5040T25-ID	50	40	300	45	30	RCV25	R25Y	RCGX251200

Middle laying Arc tool holder

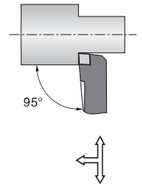


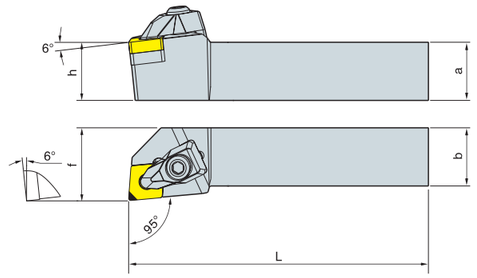


Specification	h1=h2	b	L1	L2	f	a			
CRDNN3232P12	32	32	170	64	22.35	20°	GR12M4	R12G	RNMN120400
CRDNN4040S15	40	40	250	80	27.93	20°	GR15M4	R15G	RNMN150700
CRDNN5050T20	50	50	300	99	35	20°	GR20M4	R20G	RNMN201000
CRDNN3232P12	32	32	170	46	22.35	30°	GR12M4	R12G	RNMN120400
CRDNN4040S15	40	40	250	57	27.93	30°	GR15M4	R15G	RNMN150700
CRDNN5050T20	50	50	300	70	35	30°	GR20M4	R20G	RNMN201000

innovative PCBN cutting tools
Conventional external turning tool holder series for hole type inserts

95° TCLNR/L

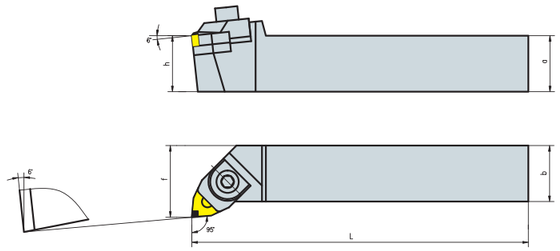




- Order instructions:
  1pc TCLNR 2525M12
  1pc TCLNL 2525M12
  *R=Right land L=left hand
- Tool holder doesn't include insert.

Model	Size (mm)					Corner radius	Inserts	Shim	Shim screw	Clamp	Clamp screw	Spring	Wrench
	a	b	L	h	f								
TCLNR/L 2020 K12	20	20	125	20	25	0.8	CN□□1204□□	TC1204	B40100J	TCL04	MS 05020	SP 713	S4L\T15F
TCLNR/L 2525 M12	25	25	150	25	32								
TCLNR/L 3225 P12	32	25	170	32	32								
TCLNR/L 3232 P12	32	32	170	32	40								

95° WWLNR/L



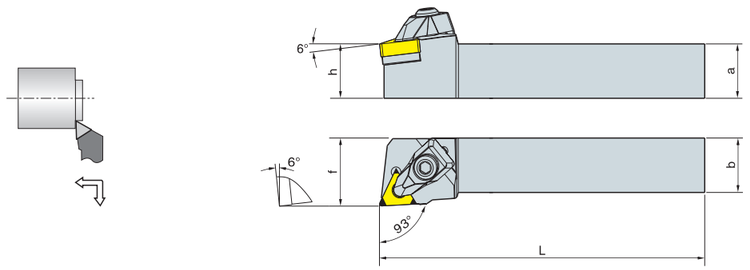
- Order instructions:
  1pc WWLNR 2525M08
  1pc WWLNL 2525M08
  *R=Right land L=left hand
- Tool holder doesn't include insert.

Model	Size (mm)					Corner radius	Inserts	Shim	Locating pin	Clamp	Clamp screw	Wrench
	a	b	L	h	f							
WWLNR/L 2020 K08	20	20	125	20	25	0.8	WN□□0804□□	Mw0804	MSPS619	MCLS2008	MS 06023	S3L\S4L
WWLNR/L 2525 M08	25	25	150	25	32							
WWLNR/L 3232 P08	32	32	170	32	40							
WWLNR/L 4040 R08	40	40	200	40	40							

innovative PCBN cutting tools

Conventional external turning tool holder series for hole type inserts

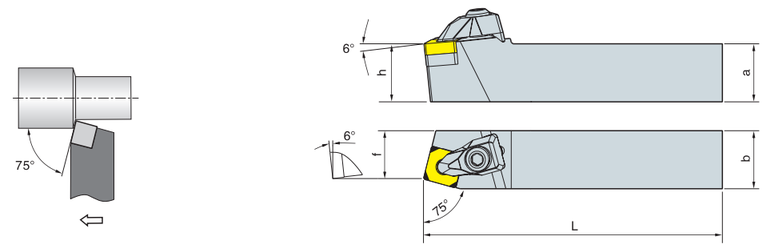
93° TTJNR/L



- Order instructions:
  1pc TTJNR 2525M16
  1pc TTJNL 2525M16
  *R=Right land L=left hand
- Tool holder doesn’ t include insert.

Model	Size (mm)					Corner radius	Inserts	Shim	Shim screw	Clamp	Clamp screw	Spring	Wrench
	a	b	L	h	f								
TTJNR/L 2020 K16	20	20	125	20	25	0.8	TN○○1604○○	TT1603	B40100J	TCL03	MS 04017	SP 608	S3L\T15F
TTJNR/L 2525 M16	25	25	150	25	32								
TTJNR/L 3232 P16	32	32	170	32	40								
TTJNR/L 3232 P22	32	32	170	32	40	0.8	TN○○2204○○	TT2204	B40100J	TCL04	MS 05020	SP 713	S4L\T15F
TTJNR/L 4040 R22	40	40	200	40	50								

75° TSBNR/L



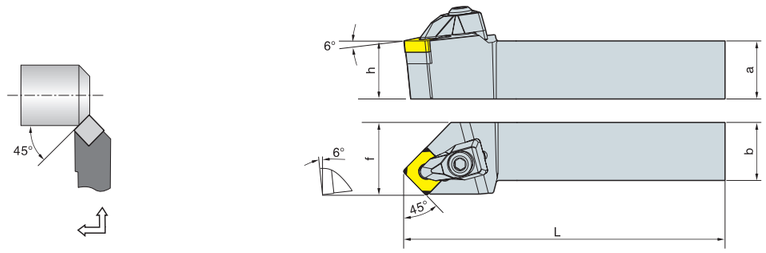
- Order instructions:
  1pc TSBNR 2525M12
  1pc TSBNL 2525M12
  *R=Right land L=left hand
- Tool holder doesn’ t include insert.

Model	Size (mm)					Corner radius	Inserts	Shim	Shim screw	Clamp	Clamp screw	Spring	Wrench
	a	b	L	h	f								
TSBNR/L 2020 K12	20	20	125	20	17	0.8	SN○○1204○○	TS1204	B40100J	TCL04	MS 05020	SP 713	S4L\T15F
TSBNR/L 2525 M12	25	25	150	25	22								
TSBNR/L 3232 P12	32	32	170	32	29								

innovative PCBN cutting tools

Conventional external turning tool holder series for hole type inserts

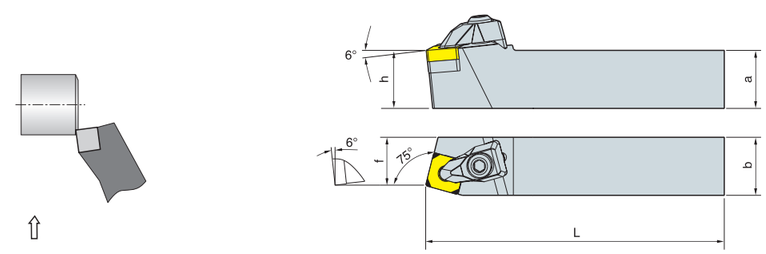
45° TSSNR/L



- Order instructions:
  1pc TSSNR 2525M12
  1pc TSSNL 2525M12
  *R=Right land L=left hand
- Tool holder doesn’ t include insert.

Model	Size (mm)					Corner radius	Inserts	Shim	Shim screw	Clamp	Clamp screw	Spring	Wrench
	a	b	L	h	f								
TSSNR/L 2020 K12	20	20	125	20	25	0.8	SN○○1204○○	TS1204	B40100J	TCL04	MS 05020	SP 713	S4L\T15F
TSSNR/L 2525 M12	25	25	150	25	32								
TSSNR/L 3232 P12	32	32	170	32	40								

75° TSKNR/L



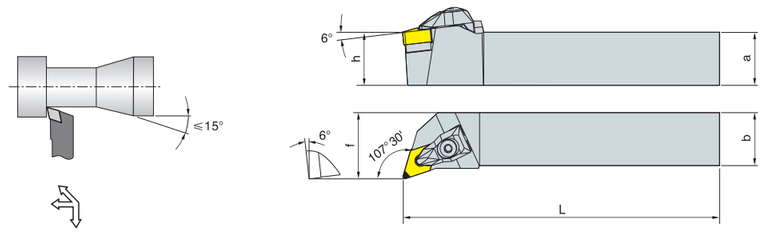
- Order instructions:
  1pc TSKNR 2525M12
  1pc TSKNL 2525M12
  *R=Right land L=left hand
- Tool holder doesn’ t include insert.

Model	Size (mm)					Corner radius	Inserts	Shim	Shim screw	Clamp	Clamp screw	Spring	Wrench
	a	b	L	h	f								
TSBNR/L 2020 K12	20	20	125	20	17	0.8	SN○○1204○○	TS1204	B40100J	TCL04	MS 05020	SP 713	S4L\T15F
TSBNR/L 2525 M12	25	25	150	25	22								
TSBNR/L 3232 P12	32	32	170	32	29								

innovative PCBN cutting tools

Conventional external turning tool holder series for hole type inserts

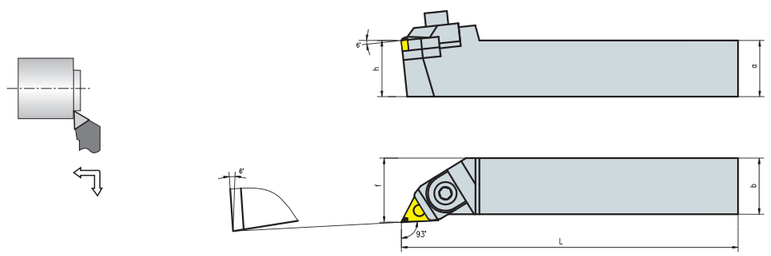
107°30′ TDQNR/L



- Order instructions:
  1pc TDQNR 2525M11
  1pc TDQNL 2525M11
  *R=Right land L=left hand
- Tool holder doesn′t include insert.

Model	Size (mm)					Corner radius	Inserts	Shim	Shim screw	Clamp	Clamp screw	Spring	Wrench
	a	b	L	h	f								
TDQNR/L 2020 K15	20	20	125	20	25	0.8	DN○○1506○○ DN○○1504○○	TD1504 TD1506	B40100J	TCL04	MS 05020	SP 713	S4L\T15F
TDQNR/L 2525 M15	25	25	150	25	32								
TDQNR/L 3232 P15	32	32	170	32	40								
TDQNR/L 4040 R15	40	40	200	40	50								

93° WTJNR/L



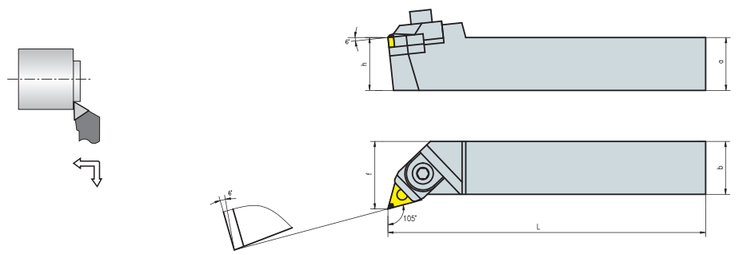
- Order instructions:
  1pc WTJNR 2525M16
  1pc WTJNL 2525M16
  *R=Right land L=left hand
- Tool holder doesn′t include insert.

Model	Size (mm)					Corner radius	Inserts	Shim	Locating pin screw	Side screw	Clamp	Clamp screw	Wrench
	a	b	L	h	f								
WTJNR/L 1616 K16	16	16	125	16	20	0.8	TN○○1604○○	MTS1603	MSPS515	CS 06011	MCLS1608	MS 05026	S3L\S4L
WTJNR/L 2020 K16	20	20	125	20	25								
WTJNR/L 2525 M16	25	25	150	25	32								
WTJNR/L 3232 P16	32	32	170	32	40								
WTJNR/L 3232 P16	32	32	170	32	40	0.8	TN○○2204○○	MTS2204	MSPS719	CS 06011	MCLS2210	MS 06028	S3L\S4L
WTJNR/L 4040 R16	40	40	200	40	50								

innovative PCBN cutting tools

Conventional external turning tool holder series for hole type inserts

105° WTQNR/L



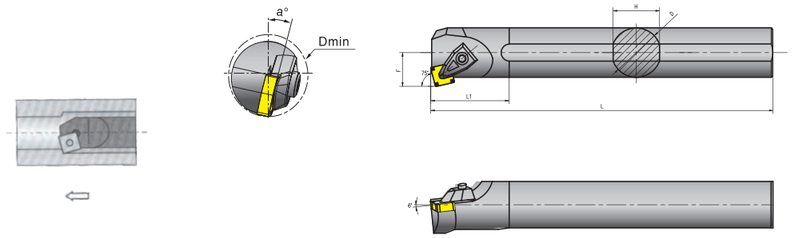
- Order instructions:
  1pc WTQNR 2525M16
  1pc WTQNL 2525M16
  *R=Right land L=left hand
- Tool holder doesn′t include insert.

Model	Size (mm)					Corner radius	Inserts	Shim	Locating pin screw	Side screw	Clamp	Clamp screw	Wrench
	a	b	L	h	f								
WTQNR/L 1616 H16	16	16	100	16	20	0.8	TN○○1604○○	MTS1603	MSPS515	CS 06011	MCLS1608	MS 05026	S3L\S4L
WTQNR/L 2020 K16	20	20	125	20	25								
WTQNR/L 2525 M16	25	25	150	25	32								
WTQNR/L 3232 P16	32	32	170	32	40								
WTQNR/L 3232 P22	40	32	170	32	50	0.8	TN○○2204○○	MTS2204	MSPS719	CS 06011	MCLS2210	MS 06028	S3L\S4L
WTQNR/L 4040 R22	40	40	200	40	50								

innovative PCBN cutting tools

Conventional internal hole turning tool holder series

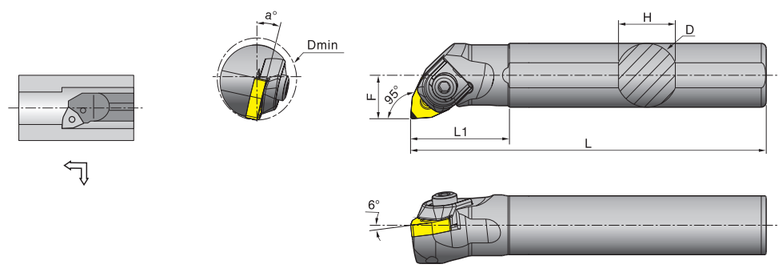
75° TSKNR/L



- Order instructions:
  1pc S25R-D32-TSKNR-12
  1pc S25R-D32-TSKNL-12
  *R=Right land L=left hand
- Tool holder doesn't include insert.

Model	Size (mm)						Corner radius	Inserts	Shim	Shim screw	Clamp	Clamp screw	Spring	Wrench
	D	L	L1	F	H	Dmin								
S25R-D32-TSKNR/L-12	25	200	40	17	23	32	0.8	SN○○1204○○	–	–	TCL04	MS 05020	SP713	S4L\T15F
S32R-D40-TSKNR/L-12	32	250	50	22	30	40			TS1204	B40100J				
S40R-D50-TSKNR/L-12	40	300	55	25	37	50								
S50R-D60-TSKNR/L-12	50	350	60	33	47	60								

95° WWLNR/L



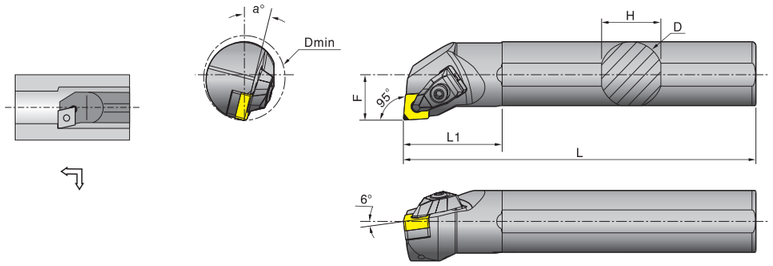
- Order instructions:
  1pc S25R-D32-WWLNR-08
  1pc S25R-D32-WWLNL-08
  *R=Right land L=left hand
- Tool holder doesn't include insert.

Model	Size (mm)						Corner radius	Inserts	Shim	Locating pin	Clamp	Clamp screw	Wrench
	D	L	L1	F	H	Dmin							
S25R-D32-WWLNR/L-08	25	200	40	17	23	32	0.8	WN○○0804○○	----	MSPS614	MCLS2008	MS 06023	S3L\S4L
S32S-D40-WWLNR/L-08	32	250	50	22	30	40			MW0804	MSPS617			
S40T-D50-WWLNR/L-08	40	300	55	25	37	50							
S50U-D60-WWLNR/L-08	50	350	60	33	47	60							

innovative PCBN cutting tools

Conventional internal hole turning tool holder series

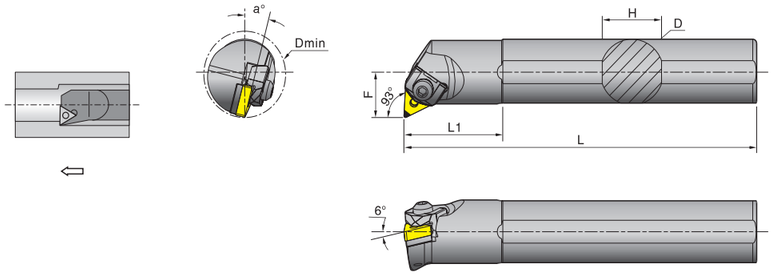
95° TCLNR/L



- Order instructions:
  1pc S25R-D32-TCLNR-12
  1pc S25R-D32-TCLNL-12
  *R=Right land L=left hand
- Tool holder doesn't include insert.

Model	Size (mm)						Corner radius	Inserts	Shim	Shim screw	Clamp	Clamp screw	Spring	Wrench
	D	L	L1	F	H	Dmin								
S25R-D32-TCLNR/L-12	25	200	40	17	23	32	0.8	CN○○1204○○	–	–	TCL04	MS 05020	SP713	S4L\T15F
S32S-D40-TCLNR/L-12	32	250	50	22	30	40			TC1204	B40100J				
S40T-D50-TCLNR/L-12	40	300	55	25	37	50								
S50U-D60-TCLNR/L-12	50	350	60	33	47	60								

93° WTUNR/L

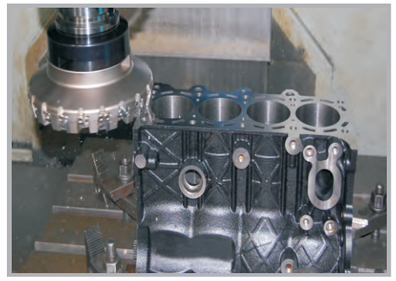


- Order instructions:
  1pc S25R-D32-WTUNR-16
  1pc S25R-D32-WTUNL-16
  *R=Right land L=left hand
- Tool holder doesn't include insert.

Model	Size (mm)						Corner radius	Inserts	Shim	Locating pin	Clamp	Clamp screw	Wrench
	D	L	L1	F	H	Dmin							
S25R-D32-WTUNR/L-16	25	200	40	17	23	32	0.8	TN○○1604○○	–	MSPS 511	MCLS1608	MS 05026	S3L\S4L
S32S-D40-WTUNR/L-16	32	250	50	22	30	40			MTS1603	MSPS 514			
S40T-D50-WTUNR/L-16	40	300	55	25	37	50							
S50U-D60-WTUNR/L-16	50	350	60	33	47	60							

innovative PCBN cutting tools

Milling



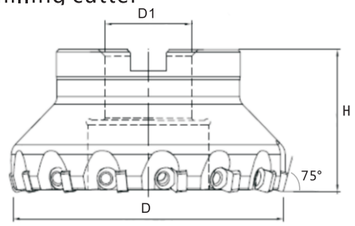
Compared with carbide inserts and ceramic inserts, PCBN inserts have outstanding advantages in milling cast iron and hardened steel as below:

- Longer tool life
- Higher production efficiency
- Better cost efficiency

innovative PCBN cutting tools

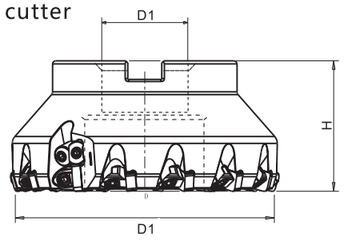
Face milling cutter series

Indexable PCBN high efficient face milling cutter



Specification	Teeth No.	Dimension			Insert model	Spare parts		
		Φ D	Φ D1	H		Wedge	Double head screw	Wrench
FME01-063-A22-SN09-07	7	63	22	40	SNEN0904ENS	FME01-1	FME01-2	FME01-3
FME01-080-A27-SN09-09	9	80	27	50				
FME01-100-B32-SN09-12	12	100	32	50				
FME01-125-B40-SN09-14	14	125	40	63				
FME01-160-B40-SN09-18	18	160	40	63				
FME01-200-C60-SN09-24	24	200	60	63				
FME01-250-C60-SN09-30	30	250	60	63				
FME01-315-D60-SN09-36	36	315	60	70				

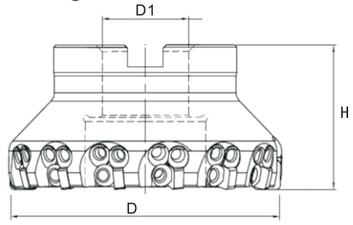
Indexable PCBN precise face milling cutter



Specification	Teeth No.		Dimension			Insert model		Spare parts			
	Milling inserts	Wiper inserts	Φ D	Φ D1	H	Milling inserts	Wiper inserts	Wedge	Adjustment block	Double head screw	Wrench
FME02-063-A22-SN09-07	6	1	63	22	40	SNEN0904ENS	SNEX1204ZZ	FME02-1	FME02-2	FME02-3	FME02-4
FME02-080-A27-SN09-09	8	1	80	27	50						
FME02-100-B32-SN09-12	10	2	100	32	50						
FME02-125-B40-SN09-14	12	2	125	40	63						
FME02-160-B40-SN09-18	15	3	160	40	63						
FME02-200-C60-SN09-24	20	4	200	60	63						
FME02-250-C60-SN09-30	25	5	250	60	63						
FME02-315-D60-SN09-36	30	6	315	60	70						

innovative PCBN cutting tools

Indexable PCBN super finishing face milling cutter

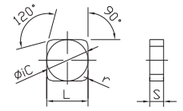


Specification	Teeth No.		Dimension			Insert model		Spare parts			
	Milling inserts	Wiper inserts	Φ D	Φ D1	H	Milling inserts	Wiper inserts	Wedge	Adjustment block	Double head screw	Wrench
FME03-063-A22-SN09-07	6	1	63	22	40	SNEN0904ENS	SNEX1204ZZ	FME03-1	FME03-2	FME03-3	FME03-4
FME03-080-A27-SN09-09	8	1	80	27	50						
FME03-100-B32-SN09-12	10	2	100	32	50						
FME03-125-B40-SN09-14	12	2	125	40	63						
FME03-160-B40-SN09-18	15	3	160	40	63						
FME03-200-C60-SN09-24	20	4	200	60	63						
FME03-250-C60-SN09-30	25	5	250	60	63						
FME03-315-D60-SN09-36	30	6	315	60	70						

innovative PCBN milling inserts

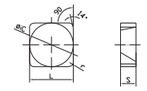
Higher CNC grinding precision, better professional design of milling cutting edge, more strict super finishing cutting edge contribute to Funik PCBN milling inserts with better performance.

Milling insert



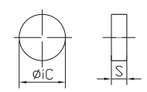
Model	Dimension (mm)				Grade		
ISO	L	Φ i.c	s	r	FBN6500	FBN6025	
SNEN0903ENS	9	9.525	3.18	0.8		●	
SNEN0904ENS	9	9.525	4.76	0.8		●	
SNEN1204ENS	12	12.7	4.76	1.2		●	
SNEN1207ENS	12	12.7	7.94	1.2		●	
SNEN120712	12	12.7	7.94	1.2		●	
SNEN19T6ENS	19	19.05	6.8	1.6	●		

Wiper insert



Model	Dimension (mm)				Grade		
ISO	L	Φ i.c	s	r	FBN6025		
SNEX1203ZZ	12	12.7	3.18	1.2	●		
SNEX1204ZZ	12	12.7	4.76	1.2	●		

Milling insert

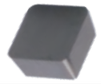


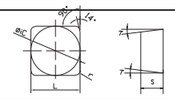
Model	Dimension (mm)				Grade		
ISO	L	Φ i.c	s	r	FBN6025		
RNEN090300	9	9.525	3.18	0	●		
RNEN090400	9	9.525	4.76	0	●		
RNEN120400	12	12.76	4.76	0	●		
RNEN120700	12	12.76	7.94	0	●		

Remarks: ● Products available
Customized cutting edge is available.

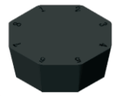
innovative PCBN milling inserts

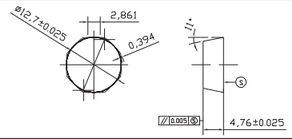
Higher CNC grinding precision, better professional design of milling cutting edge, more strict super finishing cutting edge contribute to Funik PCBN milling inserts with better performance.

Milling insert 



Model	Dimension (mm)				Grade		
ISO	L	Φ i.c	s	r	FBN6500		
SCEN090412	9	9.525	4·76	1.2		●	
SCEN120412	12	12·7	4·76	1.2			
SCEN150712	15	15.875	7.94	1.2	●		

Milling insert 



Model	Dimension (mm)		Grade		
ISO	Φ i.c	s	FBN6025		
OPHN0504ZZH-A57	12.7	4.76	●		
OPHX0504ZZH-A57	12.7	4.76	●		

Remarks: ● Products available
Customized cutting edge is available.

Recommended cutting parameters for PCBN inserts

Conventional cutting parameters of Funik PCBN turning inserts

Workpiece	Material	Hardness	Cutting speed Vc(m/min)	Cutting depth Ap(mm)	Feed rate f(mm/r)	Recommended style
Gear	20CrMnTi	58-65HRC	100-320	0.1-0.5	0.05-0.2	FBK
Bearing	Gcr15	55-65HRC	100-220	0.1-0.5	0.05-0.2	FBK\FBS\FBN
Large gear	40CrMo	310-360HB	40-120	0.5-5.0	0.2-1.0	FBN
	18CrNiMo	58-62HRC	60-120	0.3-1	0.1-0.3	FBN
Slewing bearing	42CrMo	55-62HRC	80-220	0.2-2.0	0.1-0.5	FBN
Brake disc	HT250	220-260HB	500-1200	0.2-0.5	0.1-0.4	FBN\FBS
			400-1200	0.5-3	0.1-0.4	FBN\FBS
Brake drum			350-1200	0.2-0.5	0.1-0.4	FBN\FBS
			280-1200	0.5-3	0.1-0.4	FBN\FBS
Compressor bearing			500-1200	0.3-2.5	0.2-0.4	FBN\FBS
Cylinder liner	Boron copper cast iron	180-260HB	500-800	0.1-0.3	0.1-0.2	FBN\FBS\FBK
		180-260HB	150-500	0.3-1.0	0.1-0.3	FBN\FBS\FBK
Roll	High nickel chromium	78HSD	30-50	1.0-8.0	0.5-1.5	FBN
	High chromium iron	75HSD	30-45	1.0-10.0		FBN
	High chromium steel	75HSD	20-60	1.0-10.0		FBN
	High speed steel	88HSD	30-60	0.3-3.0		FBN
	High carbon semi-steel	70HSD	45-80	1.0-10.0		FBN
	Chilled cast iron	67HSD	40-60	1.0-10.0		FBN
Slurry pump	Wear resistance white cast iron	50-60HRC	50-100	0.5-4	0.2-0.5	FBN
Rolling mortar wall	High manganese steel	300-500HB	80-200	0.5-8	0.2-0.5	FBN

Conventional cutting parameters of Funik PCBN milling inserts

Material	Hardness	tool cutting edge angle (kr)	Cutting speed Vc(m/min)	Cutting depth ap(mm)	Cutting speed f(mm/z)	Coolant
Gray cast iron	200HB	75°	500-2000	0.50-5.0	0.1-0.2	Dry cut
Gray cast iron	55HRC	75°	150-300	0.5-2.0	0.05-0.2	Dry cut
Hardened steel	60HRC	75°	80-200	0.2-0.5	0.05-0.1	Dry cut

Notes: The specific cutting parameters should be adjusted according to following factors: rigidity and power of machine tool, inserts size and thickness, workpiece material, hardness, shape, machining allowance and insert durability etc.

Possible factors for tool life of PCBN inserts to machining gray cast iron

- The casting blank should be properly dealt with aging treatment, and general natural aging time should exceed 10 days;
- Ferrite content in casting blank should≤10%;
- Sulphur content should≥0.05%;

Above factors may possibly reduce tool life in multiple times.

Grade and application of innovative PCD inserts

Grade:FCD5685

Application features: continuous-interrupted

Application scope: low silicon aluminum alloy, carbon fiber composite material, and titanium alloy.

Application industry: aluminum alloy super finishing industry, aerospace spare parts

Grade:FCD5610

Application features: continuous- interrupted

Application scope: medium and low silicon aluminum alloy, graphite, metal matrix composite, wood-based composites.

Application industry: automotive spare parts, graphite mould, woodworking, plastic glass fiber

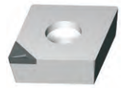
Grade:FCD5632

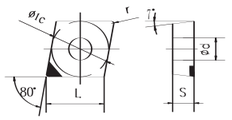
Application features: continuous- interrupted

Application scope: high silicon aluminum alloy, graphite mould, woodworking, metal matrix composite, wood-based composites.

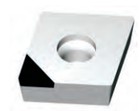
Application industry: automotive spare parts, graphite mould, woodworking

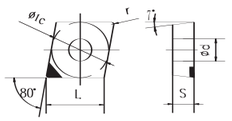
innovative PCD inserts



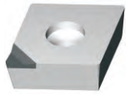


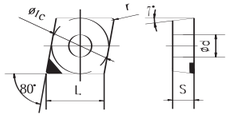
Model	Dimension		Edge No.	Grade		
ISO	Φ i.c	S		FCD5685	FCD5610	FCD5632
CCGX060202 CCGX060204 CCGX060208	6.35	2.38	1		●	
CCGX09T302 CCGX09T304 CCGX09T308	9.525	3.18	1		●	
CCGX120402 CCGX120404 CCGX120408	12.7	4.76	1		●	





Model	Dimension		Edge No.	Grade		
ISO	Φ i.c	S		FCD5685	FCD5610	FCD5632
CCGW060202 CCGW060204 CCGW060208	6.35	2.38	1		●	
CCGW09T302 CCGW09T304 CCGW09T308	9.525	3.18	1		●	
CCGW120402 CCGW120404 CCGW120408	12.7	4.76	1		●	

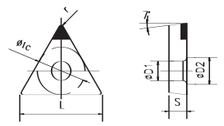




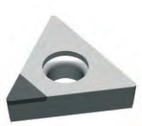
Model	Dimension		Edge No.	Grade		
ISO	Φ i.c	S		FCD5685	FCD5610	FCD5632
CCGT060202 CCGT060204 CCGT060208	6.35	2.38	1		●	
CCGT09T302 CCGT09T304 CCGT09T308	9.525	3.18	1		●	
CCGT120402 CCGT120404 CCGT120408	12.7	4.76	1		●	

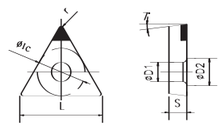
Remarks: ● Give priority to recommended products

innovative PCD inserts

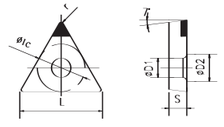


Model	Dimension		Edge No.	Grade		
ISO	Φ i.c	S		FCD5685	FCD5610	FCD5632
TCGX090202 TCGX090204 TCGX090208	5.56	2.38	1		●	
TCGX110202 TCGX110204 TCGX110208	6.35	2.38	1		●	
TCGX16T302 TCGX16T304 TCGX16T308	9.525	3.97	1		●	





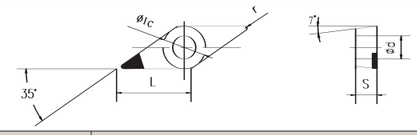
Model	Dimension		Edge No.	Grade		
ISO	Φ i.c	S		FCD5685	FCD5610	FCD5632
TCGW090202 TCGW090204 TCGW090208	5.56	2.38	1		●	
TCGW110202 TCGW110204 TCGW110208	6.35	2.38	1		●	
TCGW16T302 TCGW16T304 TCGW16T308	9.525	3.97	1		●	



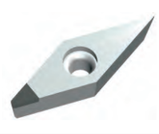
Model	Dimension		Edge No.	Grade		
ISO	Φ i.c	S		FCD5685	FCD5610	FCD5632
TCGT090202 TCGT090204 TCGT090208	5.56	2.38	1		●	
TCGT110202 TCGT110204 TCGT110208	6.35	2.38	1		●	
TCGT16T302 TCGT16T304 TCGT16T308	9.525	3.97	1		●	

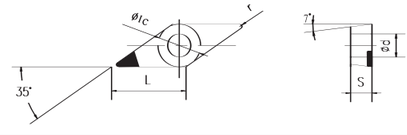
Remarks: ● Give priority to recommended products

innovative PCD inserts

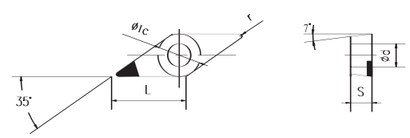


Model	Dimension		Edge No.	Grade		
ISO	Φ i.c	S		FCD5685	FCD5610	FCD5632
VCGX110302 VCGX110304 VCGX110308	6.35	3.18	1		●	
VCGX160402 VCGX160404 VCGX160408	9.525	4.76	1		●	





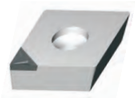
Model	Dimension		Edge No.	Grade		
ISO	Φ i.c	S		FCD5685	FCD5610	FCD5632
VCGW110302 VCGW110304 VCGW110308	6.35	3.18	1		●	
VCGW160402 VCGW160404 VCGW160408	9.525	4.76	1		●	

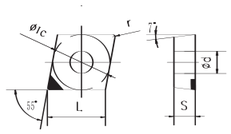


Model	Dimension		Edge No.	Grade		
ISO	Φ i.c	S		FCD5685	FCD5610	FCD5632
VCGT110302 VCGT110304 VCGT110308	6.35	3.18	1		●	
VCGT160402 VCGT160404 VCGT160408	9.525	4.76	1		●	

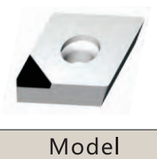
Remarks: ● Give priority to recommended products

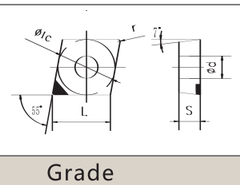
innovative PCD inserts



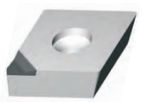


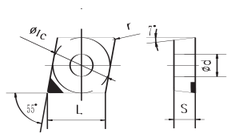
Model	Dimension		Edge No.	Grade		
ISO	Φ i.c	S		FCD5685	FCD5610	FCD5632
DCGX070202 DCGX070204 DCGX070208	6.35	2.38	1		●	
DCGX11T302 DCGX11T304 DCGX11T308	9.525	3.97	1		●	





Model	Dimension		Edge No.	Grade		
ISO	Φ i.c	S		FCD5685	FCD5610	FCD5632
DCGW070202 DCGW070204 DCGW070208	6.35	2.38	1		●	
DCGW11T302 DCGW11T304 DCGW11T308	9.525	3.97	1		●	

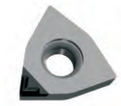


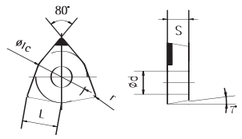


Model	Dimension		Edge No.	Grade		
ISO	Φ i.c	S		FCD5685	FCD5610	FCD5632
DCGT070202 DCGT070204 DCGT070208	6.35	2.38	1		●	
DCGT11T302 DCGT11T304 DCGT11T308	9.525	3.97	1		●	

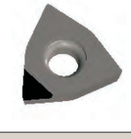
Remarks: ● Give priority to recommended products

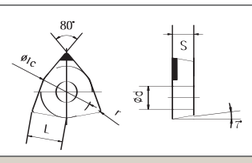
innovative PCD inserts



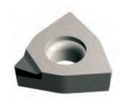


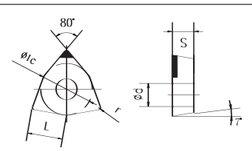
Model	Dimension		Edge No.	Grade		
ISO	Φ i.c	S		FCD5685	FCD5610	FCD5632
WCGX040202 WCGX040204 WCGX040208	6.35	2.38	1		●	
WCGX06T302 WCGX06T304 WCGX06T308	9.525	3.97	1		●	
WCGX080402 WCGX080404 WCGX080408	12.7	4.76	1		●	





Model	Dimension		Edge No.	Grade		
ISO	Φ i.c	S		FCD5685	FCD5610	FCD5632
WCGW040202 WCGW040204 WCGW040208	6.35	2.38	1		●	
WCGW06T302 WCGW06T304 WCGW06T308	9.525	3.97	1		●	
WCGW080402 WCGW080404 WCGW080408	12.7	4.76	1		●	





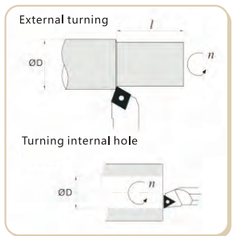
Model	Dimension		Edge No.	Grade		
ISO	Φ i.c	S		FCD5685	FCD5610	FCD5632
WCGT040202 WCGT040204 WCGT040208	6.35	2.38	1		●	
WCGT06T302 WCGT06T304 WCGT06T308	9.525	3.97	1		●	
WCGT080402 WCGT080404 WCGT080408	12.7	4.76	1		●	

Remarks: ● Give priority to recommended products

Notes for using innovative PCBN and PCD inserts

Conventional cutting parameters formula

Turning

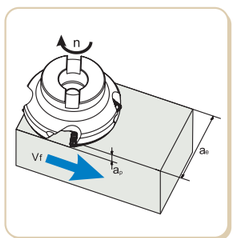


$$Vc = \frac{\pi * D * n}{1000} \quad (m/min)$$

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

Formula:Vc:Cutting speed (m/min)
n:Spindle speed (rev/min)
D:Workpiece diameter (mm)
Vf: Feed speed(mm/min)
f:Feed amount per revolution(mm/r)

Milling



$$Vc = \frac{\pi * Dc * n}{1000} \quad (m/min)$$

$$fz = \frac{V_f}{n * Z} \quad (mm/z)$$

Formula:Vc: Cutting speed (m/min)
n:Spindle speed (rev/min)
Dc: Nominal diameter of milling cutter(mm)
Z: Inserts teeth No.
Vf: Feed speed(mm/min)
fz:Feed amount per tooth(mm/z)

Notes for inserts installation

- Through clean inserts and inserts slot
- Check the soundness and abrasion of shim
- Check the fastening reliability of shim
- Check the smoothness of clamp pressing surface
- Ensure insert tightly fits with the positioning slot
- Regularly replace shim, clamp and all fixed screws
- Avoid using cutter body with worn inserts slot
- Maintain minimum overhang of tool holder
- Don't suddenly stop when insert tip is not cut out during processing

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