WORLDIA
SHAPING YOUR WORLD
WITH DIAMOND

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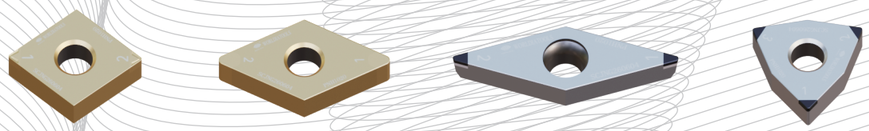
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WORLDIA

PCBN Turning Inserts

Coating/ Wiper / Chip-breaker

H K S



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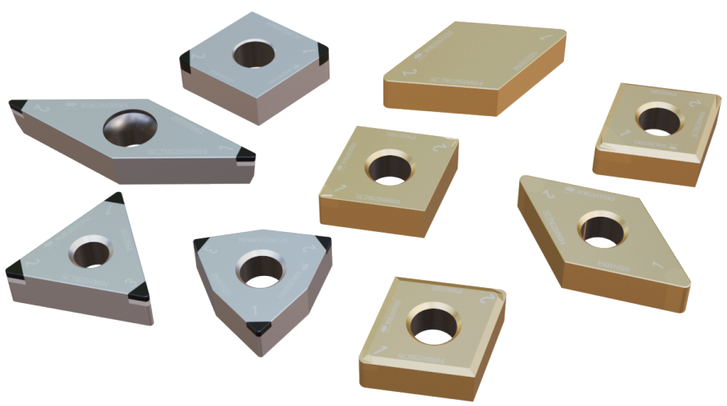
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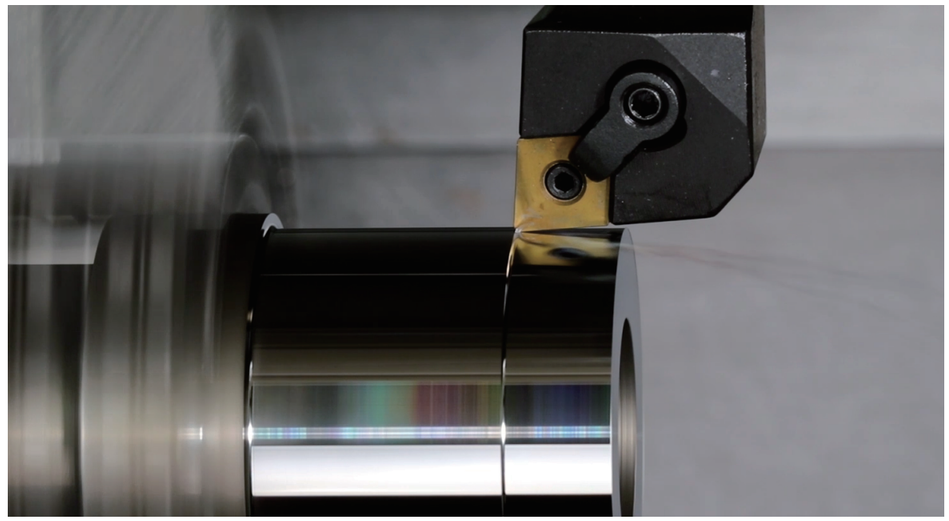
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Worldia PCBN Overview

Coating/ Wiper / Chip-breaker



Introduction:

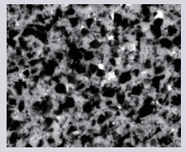
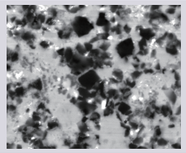
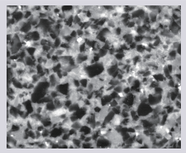
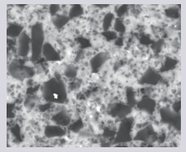
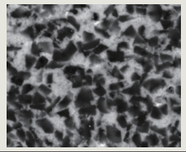
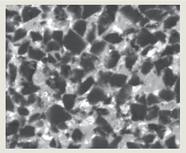
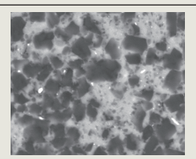
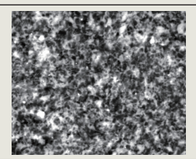
Cubic boron nitride (CBN) is the second hardest material in the world invented successfully in1957; the microhardness of CBN's single crystal is HV8000-9000 while the hardness of PCBN is HV2500-5000, so it is considerably better abrasive resistance than cemented carbide and ceramics. With a higher ability of oxidation resistance within 1000 °C, CBN will not have any chemical reaction with ferrous material at 1200-1300 °C. So it is unique for CBN material dry cutting ferrous materials. The principal application areas for CBN cutting tools are hardened steels, cast irons and sintered irons as well as powder metallurgy components.

Turning hardened steel with PCBN tools has the following advantages over grinding methods：1.Low Cost. Reducing the cost of purchasing new machine tools. It allows for complex surfaces to be finished at once, which shortens the production cycle.2.High Quality. Improving the dimensional and geometrical tolerance with once-champing machining. 3. Environmentally. Using PCBN cutting tools for dry cutting is environmentally friendly and promotes resource recycling.

PCBN Material Introduction H

Hardened steel / Cast iron / Powder metallurgy

Hardened Steel Machining

Grade	Content（%）	Grain（μm）	Bond	Structure	Features
★**PNH0120**	45-50	0.5-2	TiC+TiCN		Widely suitable for continuous finishing of hardened steel
PNH0122	45-50	0.5-3	TiN		Suitable for high-speed and continuous cutting with a small safety margin featuring excellent wear resistance
PNH0124	45-50	0.5-2	TiN		Suitable for continuous finishing of hardened steel with better toughness
★**PNH1020**	50-55	0.5-2	TiCN		A universal cutting material is suitable for both continuous and interrupted cutting of hardened steel
PNH1022	50-55	0.5-3	TiCN		Suitable for both continuous and interrupted cutting of hardened steel with excellent wear resistance and high-temperature resistance
PNH1024	55-60	1-4	TiN		Suitable for continuous to interrupted cutting with high-feed and high-speed featuring excellent toughness
★**PNH2016**	60-65	0.5-3	TiN		Suitable for interrupted cutting as well as removing carburized layers with excellent toughness and high temperature resistance
PNH2018	60-65	0.5-1	TiN		Suitable for light to medium interrupted cutting for high hardness hardened steel with excellent edge anti-breakage performance

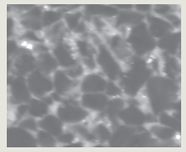
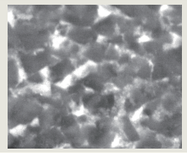
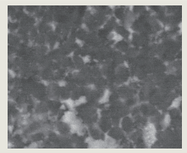
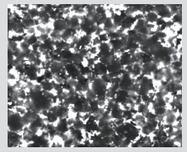
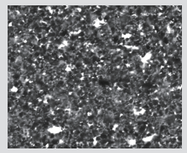
★ This mark indicates this material is the preferred material, depending on the actual working condition

PCBN Material Introduction H

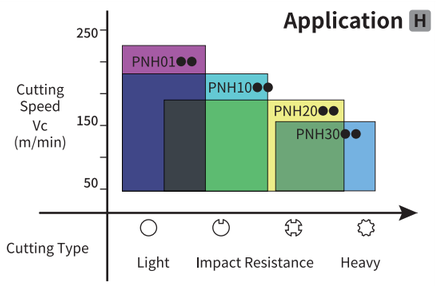
Hardened steel / Cast iron / Powder metallurgy

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Hardened Steel Machining

Grade	Content（%）	Grain（μm）	Bond	Structure	Features
PNH2024	65-70	2-4	TiN		Suitable for high-feed and heavy interrupted cutting with a large safety margin featuring excellent toughness and high-temperature resistance
PNH2026	70-75	2-4	TiN		The solid PCBN inserts are suitable for heavy roughing of hardened steel with better toughness
PNH2028	65-70	2-4	TiN		The solid PCBN inserts are suitable for continuous to interrupted and heavy cutting of hardened steel with better high-temperature resistance
★**PNH3019**	85-90	1-2	Metallic compound		Suitable for heavy interrupted of hardened steel with excellent fracture resistance and toughness.
PNH3020	85-90	5-30	Metallic compound		Suitable for continuous to interrupted cutting with a large safety margin and high-feedfeaturing excellent impact resistance and wear resistance.
PNH3023	90-95	0.5-1	Metallic compound		Suitable for heavy interrupted cutting of hardened steel with excellent toughness and fracture resistance.

Application H



Cutting Data Recommendation

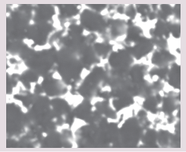
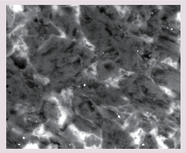
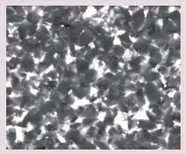
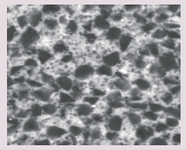
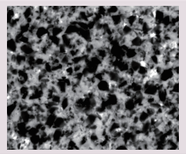
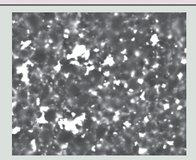
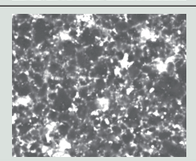
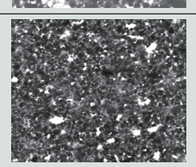
PCBN Grade	Cutting Data Recommendation		
	Cutting Speed Vc(m/min)	Feed Rate f(mm/rev)	Cutting Depth ap(mm)
PNH01●●	180(50-250)	0.03-0.25	0.05-0.3
PNH10●●	150(50-200)	0.03-0.25	0.05-0.5
PNH20●●	120(50-180)	0.03-0.25	0.05-1.2
PNH30●●	100(50-150)	0.03-0.25	0.05-3

★ This mark indicates this material is the preferred material, depending on the actual working condition

PCBN Material Introduction K

Hardened steel / Cast iron / Powder metallurgy

Cast Iron Machining

Grade	Content（%）	Grain（μm）	Bond	Structure	Features
★**PNK0107**	90-95	3-5	Metallic compound		Suitable for continuous and interrupted cutting of gray iron with excellent toughness
PNK0110	85-90	4-10	Metallic compound		Suitable for heavy-duty cutting during rough machining of gray iron featuring exceptional wear resistance
PNK0118	90-95	2-4	Metallic compound		The solid PCBN insert is suitable for finishing of gray iron
★**PNK0122**	50-55	0.5-2	Special ceramic bond		Suitable for both continuous and interrupted finishing of ductile iron featuring excellent high-temperature resistance
PNK0126	50-55	1-2	Special ceramic bond		Suitable for continuous finishing of ductile iron at high cutting speeds featuring excellent toughness and high-temperature resistance
★**PNK3003**	85-90	1-2	Metallic compound		Widely suitable for finishing and semi-finishing of gray iron
PNK3007	85-90	1-4	Metallic compound		Suitable for interrupted cutting of gray iron with excellent toughness,
PNK3013	90-95	0.5-1.5	Metallic compound		Ultra-micro grain size PCBN with excellent toughness and sharp edges for stable gray iron finishing

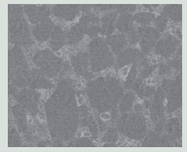
★ This mark indicates this material is the preferred material, depending on the actual working condition

PCBN Material Introduction K

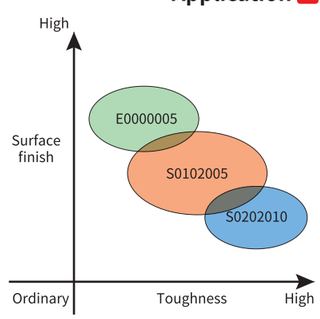
Hardened steel / Cast iron / Powder metallurgy

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Cast Iron Machining

Grade	Content（%）	Grain（μm）	Bond	Structure	Features
PNK3020	85-90	4-30	Metallic compound		The solid PCBN insert with excellent wear resistance is suitable for rough machining of cast iron

Application K



Sharp Cutting Edge：E0000005
Standard Cutting Edge：S0102005
Strong Cutting Edge：S0202010

Cutting Data Recommendation

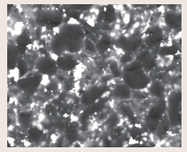
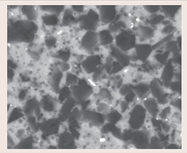
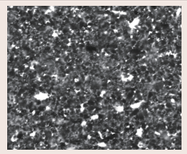
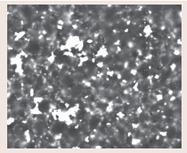
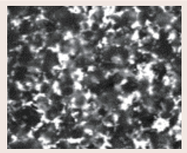
Material to be machined		PCBN Grade	Cutting Recommendation		
Material	Specification		Cutting Speed Vc(m/min)	Feed Rate f(mm/rev)	Cutting Depth ap(mm)
Cast Iron	HT200-300	**PNK0110**	350-1000	0.1-0.5	0.1-0.5
		PNK0118	350-1200	0.1-05	0.1-1
		PNK0107	350-1200	0.1-0.5	0.1-0.5
		PNK3003	350-1200	0.1-0.5	0.1-0.5
		PNK3007	350-1200	0.1-0.5	0.1-0.5
		PNK3013	350-1200	0.1-0.5	0.1-0.5
		PNK3020	350-1000	0.1-0.5	0.1-3
Ductile Iron	QT500-700	**PNK0122**	250-350	0.1-0.3	0.1-0.5
		PNK0126	300-600	0.1-0.3	0.1-0.5

★ This mark indicates this material is the preferred material, depending on the actual working condition

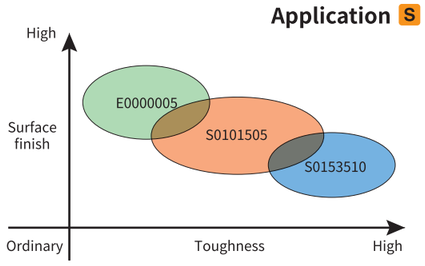
PCBN Material Introduction S

Hardened steel / Cast iron / Powder metallurgy

Powder metallurgy Machining

Grade	Content（%）	Grain（μm）	Bond	Structure	Features
PNS0117	85-90	1-4	Metallic compound		Suitable for continuous processing in powder metallurgy with excellent anti-cracking resistance and outstanding chemical stability
★ **PNS0126**	60-65	0.5-3	TiN		Suitable for hardening of powder metallurgy with excellent high-temperature resistance
PNS2005	90-95	0.5-1.5	Metallic compound		Suitable for finishing and interrupted cutting of powder metallurgy with excellent toughness and sharpness
★ **PNS2017**	85-95	1-2	Metallic compound		A universal grade for machining powder metallurgy
PNS2019	85-90	1-3	Metallic compound		Suitable for interrputed cutting of powder metallurgy featuring excellent toughness and wear resistance

Application S



Sharp Cutting Edge：E0000005
Standard Cutting Edge：S0101505
Strong Cutting Edge：S0153510

Cutting Data Recommendation

PCBN Grade	Cutting Recommendation		
	Cutting Speed Vc(m/min)	Feed Rate f(mm/rev)	Cutting Depth ap(mm)
PNS0117	450-800	0.1-0.3	0.1-0.7
PNS0126	150-300	0.1-0.3	0.1-0.7
PNS2005	450-800	0.1-0.3	0.1-0.7
PNS2017	450-800	0.1-0.3	0.1-0.7
PNS2019	450-800	0.1-0.3	0.1-0.7

★ This mark indicates this material is the preferred material, depending on the actual working condition

Application Case Studies and Worldia Recommendations

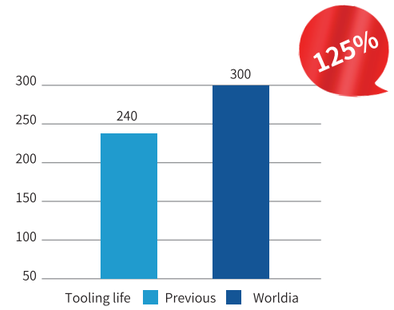
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PNH0120

Workpiece: Hollow input shaft
Hardness: 80HRAmin
Cooling type: Liquid coolant
Surface finish: Ra1.2
Workpiece material: 20CrNiMo
Machining part: Inner hole
Machining condition: Continuous cutting
Allowance: 0.15mm



	Previous	Worldia
Insert	CCGW09T308-2N	CCGW09T308-2N
Grade	PCBN	PNH0120
Cutting edge	-	S0102005 SLWG22C3
Coating	Coated	C3
Ap(mm)	0.1	0.1
Vc(m/min)	160	160
Feed(mm/rev)	0.15	0.15

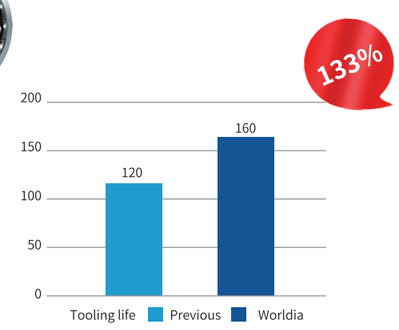


PNH1022

Workpiece: Bearing outer ring
Hardness: HRC48-62
Cooling type: Liquid coolant
Surface finish: Ra1.6
Workpiece material:G20CrNiMo
Machining part: End face& Outer diameter
Machining condition: Continuous cutting
Allowance：1.1mm for outer circle/ 1.7mm for end face



	Previous	Worldia
Insert	CNGA120408-2N	CNGA120408-2N
Grade	PCBN	PNH1022
Cutting edge	——	S0153510 SLST30CE
Coating	Coated	CE
Ap(mm)	0.3	0.3
Vc(m/min)	180	180
Feed(mm/rev)	0.25	0.25

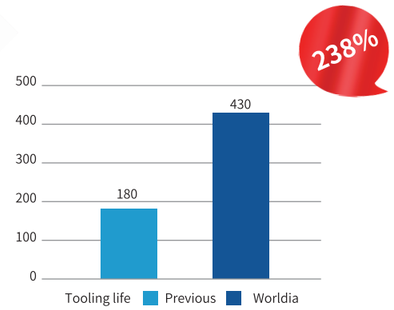


PNH1024

Workpiece: Wheel bearing
Hardness: HRC58～62
Cooling type: Liquid coolant
Surface finish: Ra1.6
Workpiece material: Hardened steel
Machining part: Ball track
Machining condition: Continuous finishing
Allowance: 0.15mm



	Previous	Worldia
Insert	VNGA160408-4N	VNGA160408-4N
Grade	PCBN	PNH1024
Cutting edge	——	S0153510 SLST22CE
Coating	Coated	CE
Ap(mm)	0.15	0.15
Vc(m/min)	250	250
Feed(mm/rev)	0.16	0.16



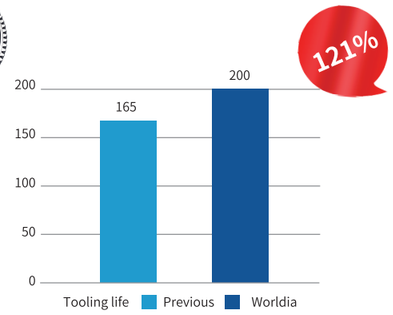
Application Case Studies and Worldia Recommendations

PNH2016

Workpiece: Pump drive wheel
Hardness: 680HV1
Cooling type: Liquid coolant
Surface finish: Rz6.3
Workpiece material: 16MnCr5
Machining part: End face& Inner hole & Chamfer
Operation type: Continuous cutting
Allowance：0.15mm



	Previous	Worldia
Insert	VCGW110304-2N	VCGW110304-2N
Grade	PCBN	PNH2016
Cutting edge	——	S0152510 SLST22C3
Coating	Coated	C3
Ap(mm)	0.08	0.08
Vc(m/min)	120	120
Feed(mm/rev)	0.15	0.15

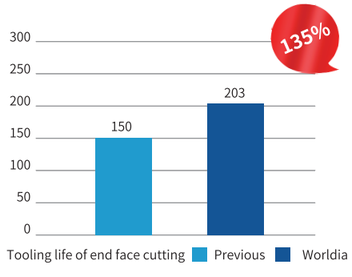


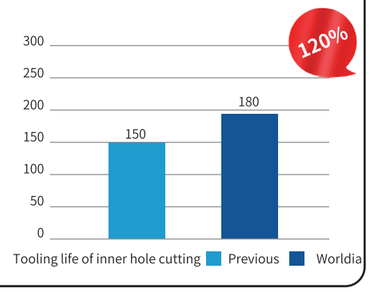
PNH2024

Workpiece: Reducer gear
Hardness: HRC58～62
Operation type: Continuous and heavy interrupted cutting
Surface finish: Ra0.8
Workpiece material: 20CrMoT i
Machining part: End face/ Inner hole
Cooling type: Liquid coolant
Machining allowance: 0.15mm

	Previous	Worldia
Insert	CNGA120408	CNGA120408
Grade	PCBN	PNH2024
Cutting edge	——	S0152510 SLST22C3
Coating	Coated	C3
Ap(mm)	0.25	0.25
Vc(m/min)	150	150
Feed(mm/rev)	0.25	0.25





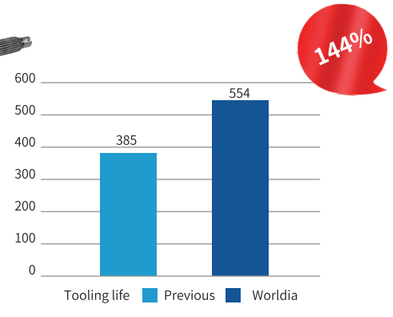


PNH3019

Workpiece: Outer star wheel
Hardness: HRC58～62
Cooling type: Air cooling
Surface finish: Ra0.8
Workpiece material: UC1-Q
Machining part: Ball surface
Machining condition: Heavy intterrupted cutting
Allowance: 0.2mm



	Previous	Worldia
Insert	TNGA160416-3N	TNGA160416-3N
Grade	PCBN	PNH3019
Cutting edge	——	S0152510 SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.2	0.2
Vc(m/min)	160	160
Feed(mm/rev)	0.12	0.12



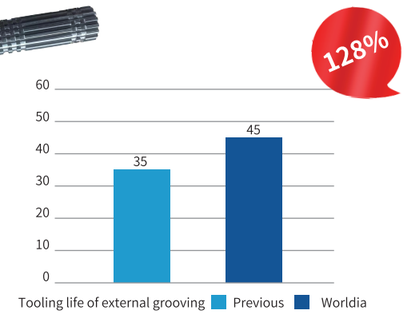
Application Case Studies and Worldia Recommendations

PNH3023

Workpiece: Spindle
Hardness: HRC58～62
Cooling type: Dry cutting
Surface finish: Ra0.8
Workpiece material: ETN22-X
Machining part: End face
Machining condition: Heavy interrupted cutting
Machining allowance: 0.2mm



	Previous	Worldia
Insert	VNGA160404-2N	VNGA160404-2N
Grade	PCBN	PNH3023
Cutting edge	——	S0152510 SLST22C3
Coating	Coated	C3
Ap(mm)	0.2	0.2
Vc(m/min)	90	90
Feed(mm/rev)	0.06	0.06

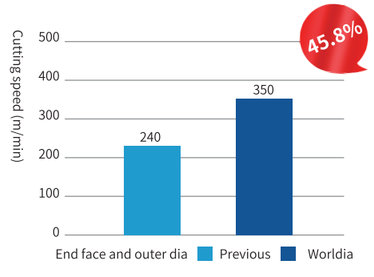


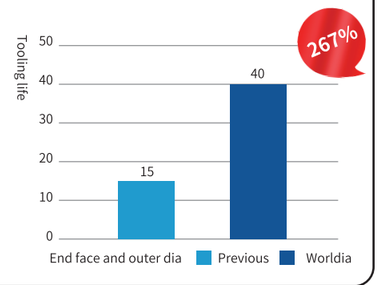
PNK0122

Workpiece: Differential
Hardness: HB220-240
Workpiece material: Ductile iron600-3
Machining part: End face / Outer dia
Machining condition: Continuous and interrupted cutting
Surface finish: Ra3.2
Cooling type: Liquid coolant
Allowance: 0.6mm

	Previous	Worldia
Insert	CNGA120412-2N	CNGA120412-2N
Grade	Carbide	PNK0122
Cutting edge	——	S0202010 SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.6	0.6
Vc(m/min)	240	350
Feed(mm/rev)	0.3	0.3





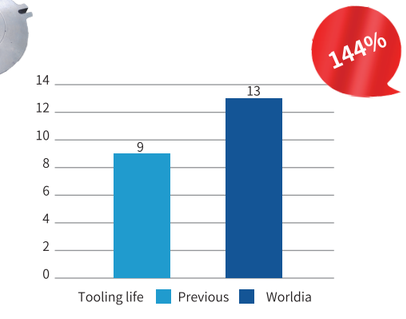


PNK0122

Workpiece: Scroll
Hardness: HB190～220
Cooling type: Liquid coolant
Surface finish: Ra0.7
Workpiece material: QT500
Machining part: End face
Machining condition: Interrupted finishing
Flatness: 0.02



	Previous	Worldia
Insert	DCGW11T308-2N	DCGW11T308-2N
Grade	PCBN	PNK0122
Cutting edge	——	S0102005 SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.15	0.15
Vc(m/min)	550	550
Feed(mm/rev)	0.1	0.1

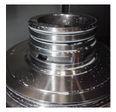


Application Case Studies and Worldia Recommendations

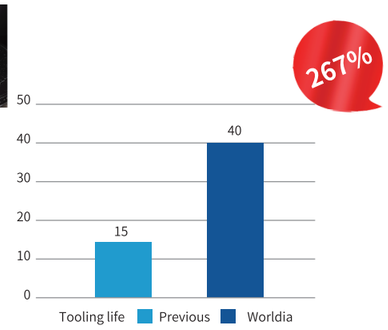
PNK0126

Workpiece: Bush bearing
Hardness: HB217-269
Cooling type: Liquid coolant
Surface finish: Ra2.0

Workpiece material: QT700
Machining part: Outer diameter & End face
Allowance: 0.2mm



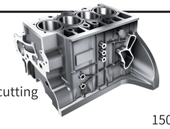
	Previous	Worldia
Insert	DNCA150408-2N	DNCA150408-2N
Grade	PCBN	PNK0126
Cutting edge	——	S0102005 SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.2	0.2
Vc(m/min)	130	130
Feed(mm/rev)	0.2	0.2



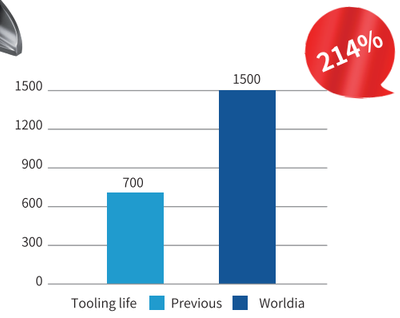
PNK3003

Workpiece: Cylinder block
Hardness: HB190-220
Cooling type: Dry cutting
Surface finish: Rz10~20

Workpiece material: HT250
Machining part: Inner hole
Machining condition: Continuous cutting
Allowance: 0.065/0.2mm



	Previous	Worldia
Insert	CCGW09T308-2N	CCGW09T308-2N
Grade	PCBN	PNK3003
Cutting edge	——	S0102005 SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.065/0.2	0.065/0.2
Vc(m/min)	745	745
Feed(mm/rev)	0.15	0.15

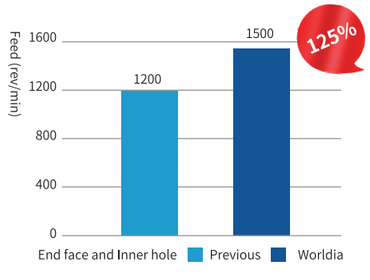


PNS2005

Workpiece: Gear Hub
Hardness: HB180~220
Workpiece material: Powder metallurgy
Machining part: End face / Inner hole
Machining condition: Interrupted Cutting
Surface finish: Ra6.3
Cooling type: Dry Cutting
Machining allowance: 0.15mm

	Previous	Worldia
Insert	VCGW110306	VCGW110306
Grade	PCBN	PNS2005
Cutting edge	——	S0101505 SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.15	0.15
Vc(m/min)	1200	1500
Feed(mm/rev)	0.05	0.05







Application Case Studies and Worldia Recommendations

WORLDIA

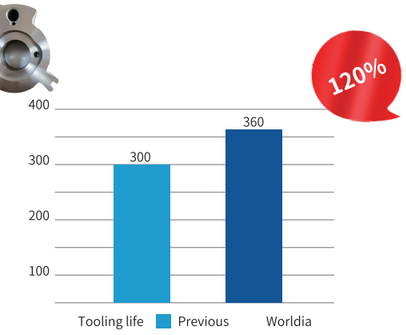
PNS2007

Workpiece: Rotor
Hardness: HRC58~62
Cooling type: Liquid coolant
Surface finish: Rz6.3

Workpiece material: Powder metallurgy
Machining part: End face and inner hole
Machining condition: Continuous and interrupted cutting
Machining allowance: 0.2mm



	Previous	Worldia
Insert	DCGW11T302-2N	DCGW11T302-2N
Grade	PCBN	PNS2007
Cutting edge	——	S0101505 SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.2	0.2
Vc(m/min)	250	250
Feed(mm/rev)	0.06	0.06



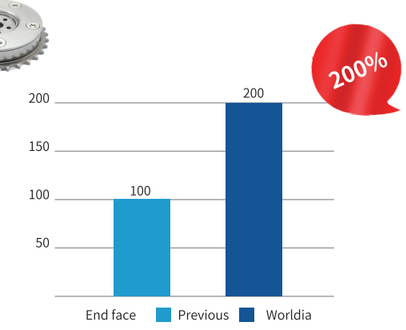
PNS2019

Workpiece: Timing camshaft sprocket
Hardness: HB180~220
Cooling type: Dry Cutting
Surface finish: Ra1.2

Workpiece material: Powder metallurgy
Machining part: End face
Machining condition: Light interrupted cutting
Flatness: 0.02



	Previous	Worldia
Insert	DCGW11T308-2N	DCGW11T308-2N
Grade	PCBN	PNS2019
Cutting edge	——	S0153510 SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.1	0.1
Vc(m/min)	1900	2400
Feed(mm/rev)	0.09	0.07



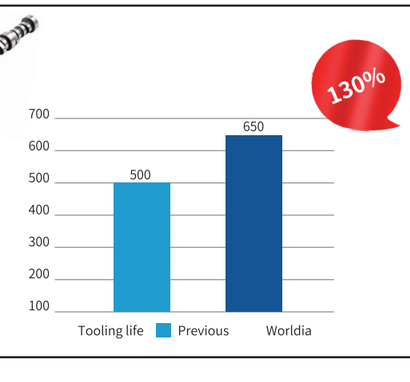
PNS2019

Workpiece: Camshaft
Hardness: HB180~220
Cooling type: Liquid coolant
Surface finish: Ra0.8

Workpiece material: Powder metallurgy
Machining part: End face
Machining condition: Continuous finishing
Flatness: 0.3



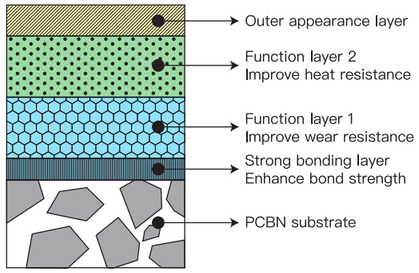
	Previous	Worldia
Insert	VBGW160408-2N	VBGW160408-2N
Grade	PCBN	PNS2019
Cutting edge	——	S0101505 SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.3	0.3
Vc(m/min)	210	210
Feed(mm/rev)	0.1	0.1



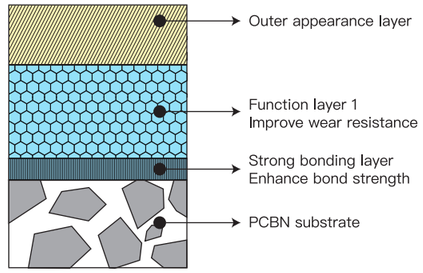
Coating Introduction

CE Coating/ C3 Coating

Applying a PVD coating on the CBN surface can extend the lifespan of tools and enhance precision, particularly in the case of hardened steel machining.

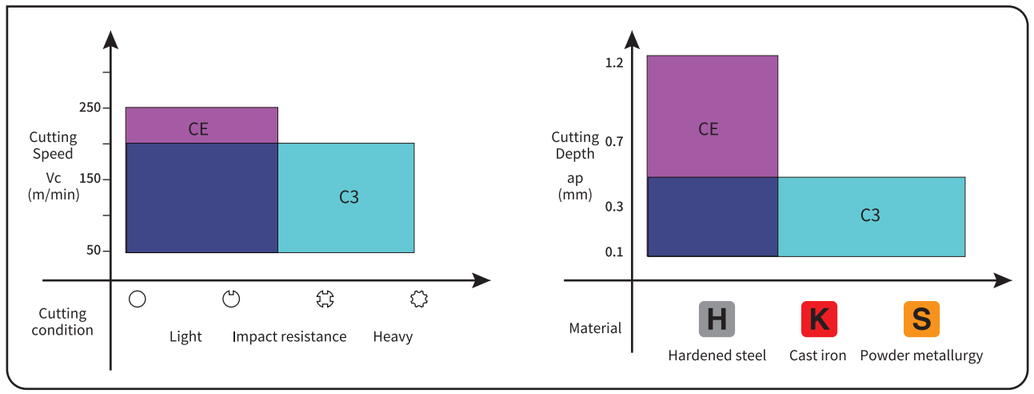


CE Coating



C3 Coating

■Application of CE/ C3 Coating

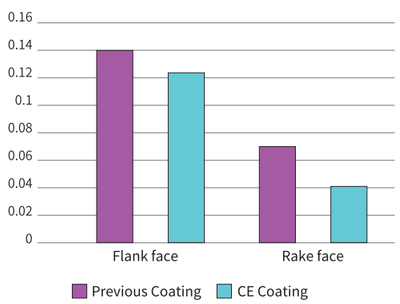


■Cutting Performance of CE/ C3 Coating

Material: GCr15 Hardness: HRC58-62
Cutting speed: 220m/min Cutting depth: 0.1mm Feed: 0.12mm/rev Dry cutting

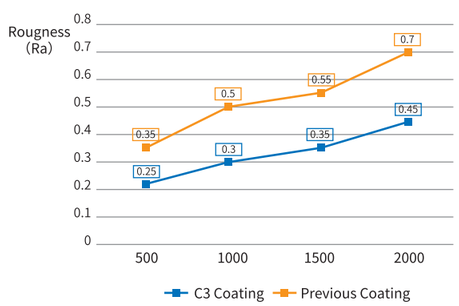


Flank face Rake face



Wear resistance comparison of CE/previous coating

Material:GCr15 Hardness:HRC58-62
Cutting speed:150m/min Cutting depth:0.15mm Feed:0.1mm/rev Dry cutting



Wear resistance comparison of C3/previous coating

Wiper Introduction

Hardened steel, cast iron，powder metallurgy

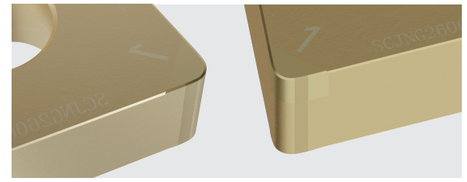
Wiper Insert

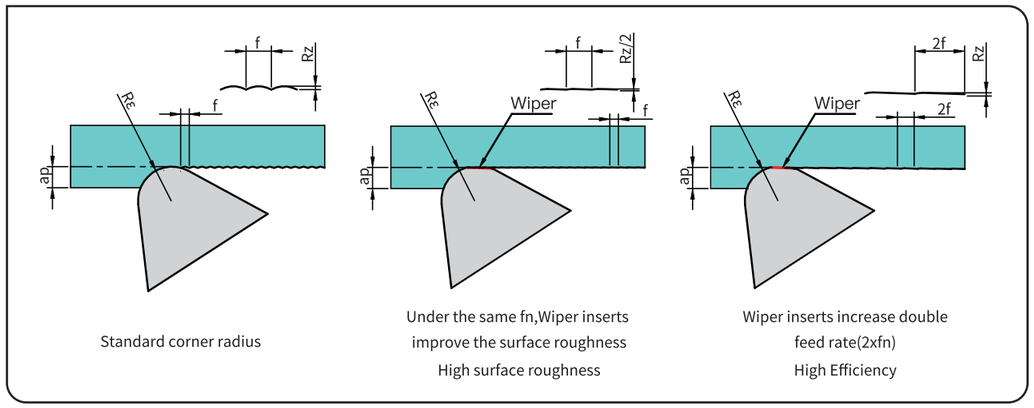
●Good surface roughness:

Surface roughness can be significantly improved under the same machining conditions, resulting in higher machining quality.

●High efficiency

The feed rate can be significantly increased to meet the same surface roughness requirements, resulting in improved machining efficiency.





Standard corner radius

Under the same fn,Wiper inserts improve the surface roughness
High surface roughness

Wiper inserts increase double feed rate(2xfn)
High Efficiency

■Calculation of theoretical value of machined surface roughness for standard corner inserts

$$R_z = \frac{f^2}{8r_\varepsilon} * 1000$$

R_z(μm)：Theoretical surface roughness
f(mm/rev)：Feed per revolution
re(mm)：Radius of the tip circle

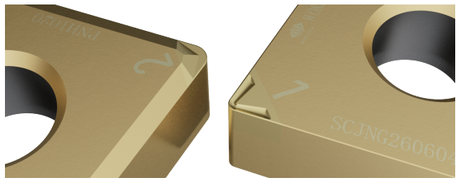
Tip radius r (mm)	Roughness requirements Ra(μm)				
	0.2	0.4	0.8	1.6	3.2
	Feed f (mm/rev)				
02	0.036	0.05	0.072	0.101	0.143
04	0.05	0.072	0.101	0.143	0.202
08	0.072	0.101	0.143	0.202	0.286
12	0.088	0.124	0.175	0.248	0.351
16	0.101	0.143	0.202	0.286	0.405
0.4/0.8/1.2Wiper	0.16	0.226	0.315	0.426	0.575

Note

- Wiper inserts are suitable for highly rigid machines and workpieces with high cutting resistance.
- It is important to use the appropriate type of holder with wiper inserts.
- Using the reverse cutting direction with wiper inserts is not recommended.

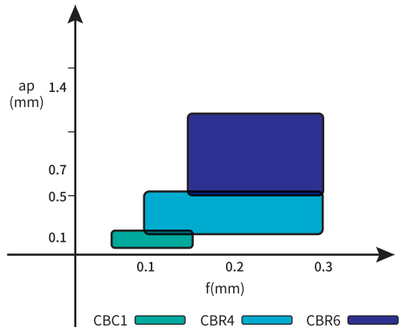
Chip Breaker Introduction

CBC1/CBR4

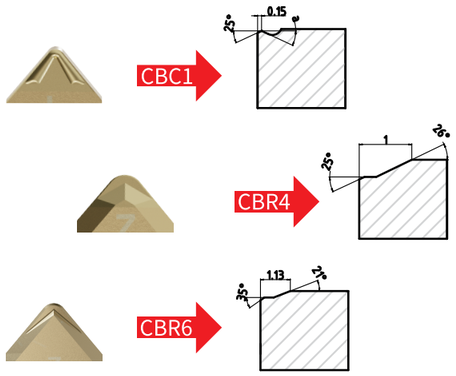


In the cutting process, long continuous chip will cause many problems such as long chip will be wrapped around the surface of the work piece, the surface is scratched, the tool life is unstable, repeated positioning is not accurate, the manipulator can not work normally, the automatic detection system can not work well etc.
Worldia' standard inserts with CBC1,CBC4 and CBC6 chip breaker, are suitable for finishing, semi-finishing, roughing as well as for removing carburized layers during roughing.
CBC1 is suitable for finishing chipbreaking, CBR4 is suitable for semi-finishing and roughing, and CBR6 is suitable for roughing and high-efficiency machining with large allowances and high feed rates.
When combined with Worldia's C3 and CE coatings, these chipbreaker inserts can fully leverage their excellent heat and wear resistance, thereby extending the tool life.

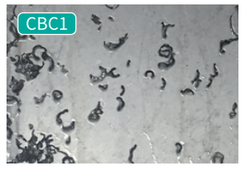
■Application



■Structure



■Cutting performance



Workpiece Material：GCr15　HRC58-62
Parameter：CNGM120408-2N SLCBC122C3
Cutting Data：Vc=150m/min　f=0.12mm/rev　ap=0.15mm



Workpiece Material：20CrMoTi　HRC58
Parameter：DNGM150408-2N SLCBR430C3
Cutting Data：Vc=160m/min　f=0.15mm/rev　ap=0.4mm



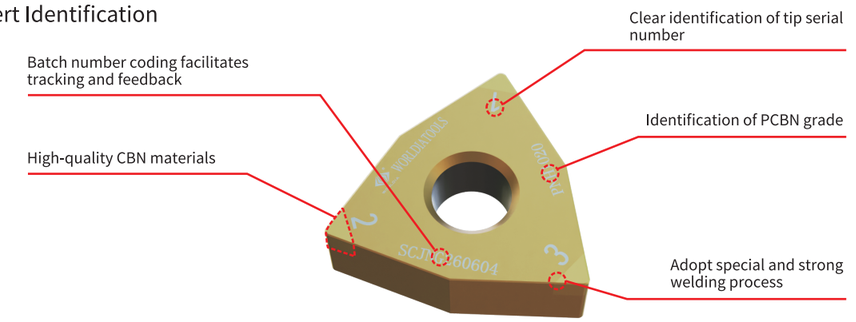
Workpiece Material：20CrMoTi　HRC58-62
Parameter：CNGA120408-2N SLCBR640CE
Cutting Data：Vc=130m/min　f=0.15mm/rev　ap=1.3　干切

Identification Code and Package Instruction

Hardened steel, cast iron powder metallurgy

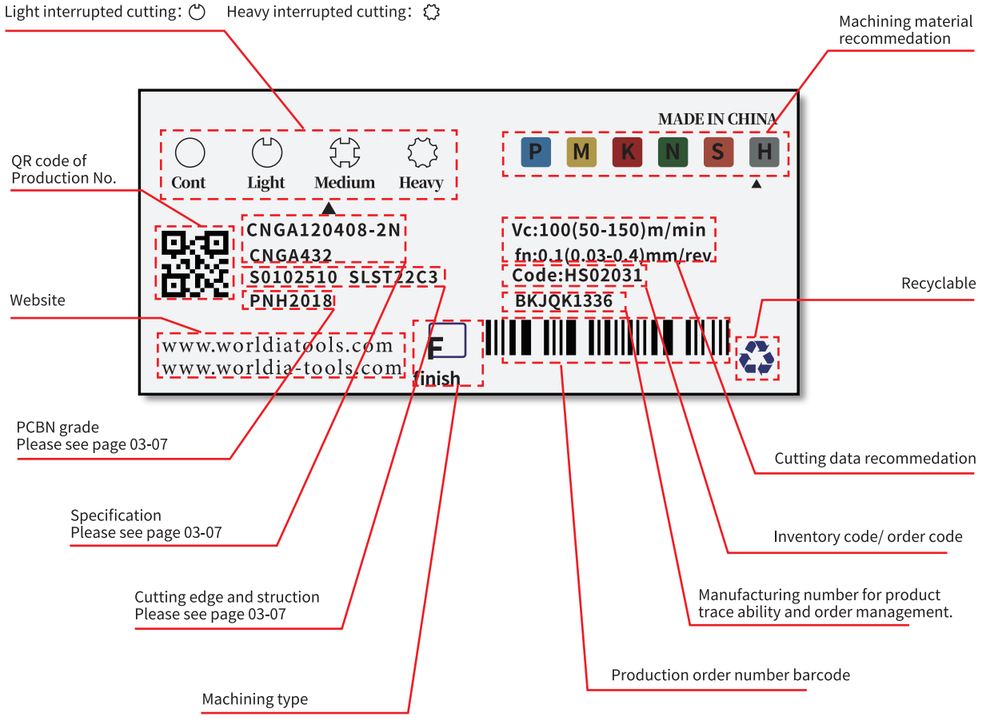
WORLDIA

■Insert Identification



■Label Identification

Continuous cutting: ○　Medium interrupted cuttting:
Light interrupted cutting:　Heavy interrupted cutting:



Nomenclature

Rule of Worldia PCBN Insert Code

ISO

1	2	3	4	5	6	7		8	9		10	11	12	13		14	15	16	17	
C	C	M	W	09	T3	04	-	2	N		S	010	20	05		CB	ST	30	S	PNH1020

1 Shape; 2 Clearance Angle; 3 Tolerance-ISO; 4 Standard, Chipbreaker; 5 Inscribed Circle Dia.; 6 Thickness; 7 Tip radius; 8 Edges; 9 Cutting Direction; 10 Cutting Edge Design; 11 Chamfered Width; 12 Chamfered Angle; 13 Honed Size; 14 Type; 15 Cutting Edge Design; 16 Cutting Edge Length; 17 Surface Treatment

1.Shape

H	Hexagon	120°	C	Diamond	80°
O	Octagonal	135°	D		55°
P	Pentagon	108°	E		75°
R	Round		M		86°
S	Square	90°	V		35°
T	Triangle	60°	W	Hexagon	80°
			L	Rectangular	90°
			A	Diamond	85°
			B		82°
			K		55°

2.Clearance Angle

3°	A	20°	E	11°	P
5°	B	25°	F	X°	O
7°	C	30°	G		
15°	D	0°	N		

3.Tolerance-ISO

Code	Tolerance m	Tolerance s	Tolerance IC	Code	inch m	inch ic	inch s
C	±0.013	±0.025	±0.025	C	±.0005	±.001	±.001
H	±0.013	±0.025	±0.013	H	±.0005	±.0005	±.001
E	±0.025	±0.025	±0.025	E	±.001	±.001	±.001
G	±0.025	±0.13	±0.025	G	±.001	±.001	±.005
K	±0.013	±0.025	±0.05~±0.13	K	±.0005	±.002-.005	±.001
M	±0.08~±0.18	±0.13	±0.05~±0.13	M	±.002-.005	±.002-.005	±.005
U	±0.13~±0.38	±0.13	±0.08~±0.25	U	±.005-.012	±.005-.010	±.005

4.Standard, Chipbreaker

N		G		B	
R		W		H	
F		T		C	
A		Q		J	
M		U	Others		X

5.Inscribed Circle Dia.

ISO Edge length (accoring insert shape) C	D	R	S	T	V	W	Inscribed Circle Dia. mm	ANSI Code	IC Size inch
S4	04	03	03	06	-	02	3.97	(1.2)	5/32
04	05	04	04	08	08	S3	4.76	(1.5)	3/16
05	06	05	05	09	09	03	5.56	(1.8)	7/32
-	-	06	-	-	-	-	6	-	-
06	07	06	06	11	11	04	6.35	2	1/4
08	09	07	07	13	13	05	7.94	(2.5)	5/16
-	-	08	-	-	-	-	8	-	-
09	11	09	09	16	16	06	9.525	3	3/8
-	-	10	-	-	-	-	10	-	-
-	-	12	-	-	-	-	12	-	-
12	15	12	12	22	22	08	12.7	4	1/2
16	19	15	15	27	27	10	15.875	5	5/8
-	-	16	-	-	-	-	16	-	-
19	23	19	19	33	33	13	19.05	6	3/4
-	-	20	-	-	-	-	20	-	-
22	27	22	22	38	38	15	22.225	7	7/8
-	-	25	-	-	-	-	25	-	-
25	31	25	25	44	44	17	25.4	8	1
32	38	31	31	54	54	21	31.75	10	1-1/4
-	-	32	-	-	-	-	32	-	-

6.Thickness

ISO Code	ISO Size mm	ANSI Code	ANSI Size inch
S		S	
01	1.59	1	1/16
02	2.38	(1.5)	3/32
T2	2.78	-	-
03	3.18	2	1/8
T3	3.97	(2.5)	5/32
04	4.76	3	3/16
05	5.56	(3.5)	7/32
06	6.35	4	1/4
07	7.94	5	5/16
09	9.525	6	3/8

7.Tip radius

ISO Code	ISO Size mm	ANSI Code	ANSI Size inch
Rε		Rε	
00	sharp	00	.000
003	0.03	(0.1)	.001
01	0.1	(0.2)	.004
02	0.2	(0.5)	.008
04	0.4	1	1/64
08	0.8	2	1/32
12	1.2	3	3/64
16	1.6	4	1/16
20	2.0	5	5/64
24	2.4	6	3/32
28	2.8	7	7/64
32	3.2	8	1/8
M00	Round		circular

Nomenclature

Rule of Worldia PCBN Insert Code

WORLDIA

ANSI

1	2	3	4	5	6	7	8	9		10	11	12	13		14	15	16	17	
C	C	M	W	3	(2.5)	1	-1	N		S	010	20	05		CB	ST	30	S	PNH1020

Shape; Clearance Angle; Tolerance-ISO; Standard, Chipbreaker; Inscribed Circle Dia.; Thickness; Tip radius; Edges; Cutting Direction; Cutting Edge Design; Chamfered Width; Chamfered Angle; Honed Size; Type; Cutting Edge Design; Cutting Edge Length; Surface Treatment

8.Edges

Code	1	2	3	4	6	8
Edges	1 dege	2 deges	3 deges	4 deges	5 deges	6 deges

9.Cutting Direction

Code	R	L	N

10.Cutting Edge Design

E	T	S	F
Honed	Chamfered	Chamfered+Honed	Sharp Edge

11.Chamfered Width

Code	000	005	010	015	020	030
Size	-	0.05	0.1	0.15	0.2	0.3

12.Chamfered Angle

Code	α	00	10	15	20	25	30	35	45
Size	°	-	10	15	20	25	30	35	45

13.Honed Size

Code	00	02	05	10	20	30

14.Type

SF	SL	SS	CB	CS	SWW	SWU
Full Face	Solid Tipped Corner	Solid CBN	Standard Tipped Corners	Standard Full Edge	Solid Tipped Corners Type "W"	Solid Tipped Corners Type "U"

15.Cutting Edge Design

ST	WG	CB
Nose Radius	Wiper	Chip Breaker

16. Cutting Edge Length

Code	Ap	22	25	28	30	40
Size		2.2	2.5	2.8	3.0	4.0

17.Surface Treatment

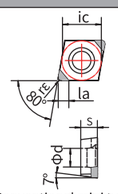
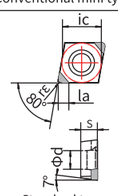
S	Uncoated
C3	Coated
CE	Coated

PCBN insert -Hardened Steel

Tipped Inserts

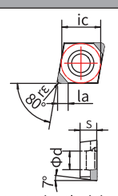
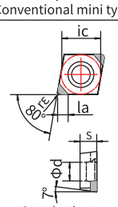
CC — 80° rhombic-Positive-With hole — **PCBN Positive**

H				
Applications	○	○	⚙	⚙
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	CCGW060202-2N	CCGW2(1.5) (0.5) -2N		□□ST22S	2	6.35	2.8	2.38	0.2	2.2
	060204-2N	2(1.5)1-2N							0.4	
	060208-2N	2(1.5)2-2N							0.8	
	CCGW060202-2N	CCGW2(1.5) (0.5) -2N		□□WGR22S	2				0.2	
	060204-2N	2(1.5)1-2N							0.4	
	060208-2N	2(1.5)2-2N							0.8	
	CCGW060202-2N	CCGW2(1.5) (0.5) -2N		□□CBR422S	2				0.2	
	060204-2N	2(1.5)1-2N							0.4	
	060208-2N	2(1.5)2-2N							0.8	
 Standard type	CCGW060202-2N	CCGW2(1.5) (0.5) -2N		□□ST30S	2	6.35	2.8	2.38	0.2	3.0
	060204-2N	2(1.5)1-2N							0.4	
	060208-2N	2(1.5)2-2N							0.8	
	CCGW060202-2N	CCGW2(1.5) (0.5) -2N		□□WGR30S	2				0.2	
	060204-2N	2(1.5)1-2N							0.4	
	060208-2N	2(1.5)2-2N							0.8	
	CCGW060202-2N	CCGW2(1.5) (0.5) -2N		□□CBR430S	2				0.2	
	060204-2N	2(1.5)1-2N							0.4	
	060208-2N	2(1.5)2-2N							0.8	

CC — 80° rhombic-Positive-With hole — **PCBN Positive**

H				
Applications	○	○	⚙	⚙
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	CCGW09T304-2N	CCGW3(2.5)1-2N		□□ST22S	2	9.525	4.4	3.97	0.4	2.2
	09T308-2N	3(2.5)2-2N							0.8	
	09T312-2N	3(2.5)3-2N							1.2	
	CCGW09T304-2N	CCGW3(2.5)1-2N		□□WGR22S	2				0.4	
	09T308-2N	3(2.5)2-2N							0.8	
	09T312-2N	3(2.5)3-2N							1.2	
	CCGW09T304-2N	CCGW3(2.5)1-2N		□□CBR422S	2				0.4	
	09T308-2N	3(2.5)2-2N							0.8	
	09T312-2N	3(2.5)3-2N							1.2	
 Standard type	CCGW09T304-2N	CCGW3(2.5)1-2N		□□ST30S	2	9.525	4.4	3.97	0.4	3.0
	09T308-2N	3(2.5)2-2N							0.8	
	09T312-2N	3(2.5)3-2N							1.2	
	CCGW09T304-2N	CCGW3(2.5)1-2N		□□WGR30S	2				0.4	
	09T308-2N	3(2.5)2-2N							0.8	
	09T312-2N	3(2.5)3-2N							1.2	
	CCGW09T304-2N	CCGW3(2.5)1-2N		□□CBR430S	2				0.4	
	09T308-2N	3(2.5)2-2N							0.8	
	09T312-2N	3(2.5)3-2N							1.2	

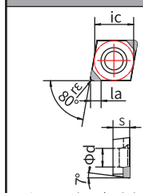
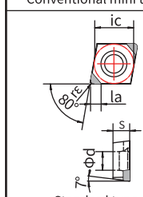
PCBN insert -Hardened Steel

Tipped Inserts

WORLDIA

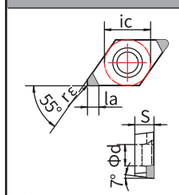
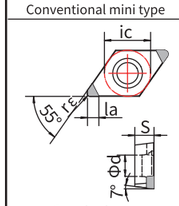
CC — 80° rhombic-Positive-With hole — **PCBN Positive**

H				
Applications	○	○	⚙	⚙
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	CCGW120404-2N	CCGW431-2N		□□ST22S	2	12.7	5.5	4.76	0.4	2.2
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
	CCGW120404-2N	CCGW431-2N		□□WGR22S	2				0.4	
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
	CCGW120404-2N	CCGW431-2N		□□CBR422S	2				0.4	
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
 Standard type	CCGW120404-2N	CCGW431-2N		□□ST30S	2	12.7	5.5	4.76	0.4	3.0
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
	CCGW120404-2N	CCGW431-2N		□□WGR30S	2				0.4	
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
	CCGW120404-2N	CCGW431-2N		□□CBR430S	2				0.4	
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	

DC — 55°rhombic-Positive-With hole — **PCBN Positive**

H				
Applications	○	○	⚙	⚙
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

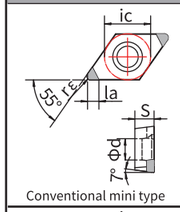
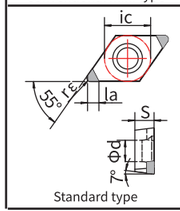
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	DCGW070202-2N	DCGW2(1.5)(0.5)-2N		□□ST22S	2	6.35	2.8	2.38	0.2	2.2
	070204-2N	2(1.5)1-2N							0.4	
	070208-2N	2(1.5)2-2N							0.8	
	DCGW070202-2N	DCGW2(1.5)(0.5)-2N		□□WGR22S (107.5°)	2				0.2	
	070204-2N	2(1.5)1-2N							0.4	
	070208-2N	2(1.5)2-2N							0.8	
	DCGW070202-2N	DCGW2(1.5)(0.5)-2N		□□CBR422S	2				0.2	
	070204-2N	2(1.5)1-2N							0.4	
	070208-2N	2(1.5)2-2N							0.8	
 Standard type	DCGW070202-2N	DCGW2(1.5)(0.5)-2N		□□ST30S	2	6.35	2.8	2.38	0.2	3.0
	070204-2N	2(1.5)1-2N							0.4	
	070208-2N	2(1.5)2-2N							0.8	
	DCGW070202-2N	DCGW2(1.5)(0.5)-2N		□□WGR30S (107.5°)	2				0.2	
	070204-2N	2(1.5)1-2N							0.4	
	070208-2N	2(1.5)2-2N							0.8	
	DCGW070202-2N	DCGW2(1.5)(0.5)-2N		□□CBR430S	2				0.2	
	070204-2N	2(1.5)1-2N							0.4	
	070208-2N	2(1.5)2-2N							0.8	

PCBN insert -Hardened Steel

Tipped Inserts

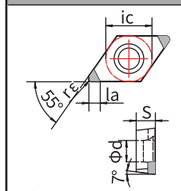
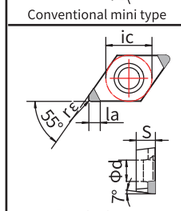
DC — 55°rhombic-Positive-With hole — PCBN Positive

H				
Applications	○	◔	✲	✲
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	DCGW11T304-2N	DCGW3(2.5)1-2N		□□ST22S	2	9.525	4.4	3.97	0.4	2.2
	11T308-2N	3(2.5)2-2N							0.8	
	11T312-2N	3(2.5)3-2N							1.2	
	DCGW11T304-2N	DCGW3(2.5)1-2N		□□WGR22S (107.5°)	2				0.4	
	11T308-2N	3(2.5)2-2N							0.8	
	11T312-2N	3(2.5)3-2N							1.2	
	DCGW11T304-2N	DCGW3(2.5)1-2N		□□CBR422S	2				0.4	
	11T308-2N	3(2.5)2-2N							0.8	
	11T312-2N	3(2.5)3-2N							1.2	
 Standard type	DCGW11T304-2N	DCGW3(2.5)1-2N		□□ST30S	2	9.525	4.4	3.97	0.4	3.0
	11T308-2N	3(2.5)2-2N							0.8	
	11T312-2N	3(2.5)3-2N							1.2	
	DCGW11T304-2N	DCGW3(2.5)1-2N		□□WGR30S (107.5°)	2				0.4	
	11T308-2N	3(2.5)2-2N							0.8	
	11T312-2N	3(2.5)3-2N							1.2	
	DCGW11T304-2N	DCGW3(2.5)1-2N		□□CBR430S	2				0.4	
	11T308-2N	3(2.5)2-2N							0.8	
	11T312-2N	3(2.5)3-2N							1.2	

DC — 55°rhombic-Positive-With hole — PCBN Positive

H				
Applications	○	◔	✲	✲
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	DCGW150404-2N	DCGW431-2N		□□ST22S	2	12.7	5.5	4.76	0.4	2.2
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
	DCGW150404-2N	DCGW431-2N		□□WGR22S (107.5°)	2				0.4	
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
	DCGW150404-2N	DCGW431-2N		□□CBR422S	2				0.4	
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
 Standard type	DCGW150404-2N	DCGW431-2N		□□ST30S	2	12.7	5.5	4.76	0.4	3.0
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
	DCGW150404-2N	DCGW431-2N		□□WGR30S (107.5°)	2				0.4	
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
	DCGW150404-2N	DCGW431-2N		□□CBR430S	2				0.4	
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	

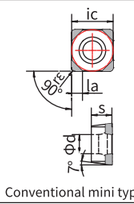
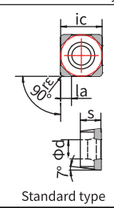
PCBN insert -Hardened Steel

Tipped Inserts

WORLDIA

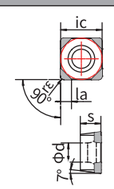
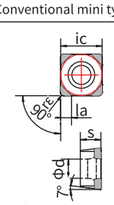
SC — 90°Square-Positive-With hole — PCBN Positive

H				
Applications	○	◔	✲	✲
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	SCGW09T304-4N	SCGW3(2.5)1-4N		□□ST22S	4	9.525	4.4	3.97	0.4	2.2
	09T308-4N	3(2.5)2-4N							0.8	
	09T312-4N	3(2.5)3-4N							1.2	
	SCGW09T304-4N	SCGW3(2.5)1-4N		□□CBR422S	4				0.4	
	09T308-4N	3(2.5)2-4N							0.8	
	09T312-4N	3(2.5)3-4N							1.2	
 Standard type	SCGW09T304-4N	SCGW3(2.5)1-4N		□□ST30S	4	9.525	4.4	3.97	0.4	3.0
	09T308-4N	3(2.5)2-4N							0.8	
	09T312-4N	3(2.5)3-4N							1.2	
	SCGW09T304-4N	SCGW3(2.5)1-4N		□□CBR430S	4				0.4	
	09T308-4N	3(2.5)2-4N							0.8	
	09T312-4N	3(2.5)3-4N							1.2	

SC — 90°Square-Positive-With hole — PCBN Positive

H				
Applications	○	◔	✲	✲
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

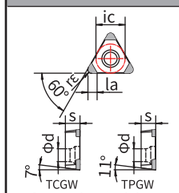
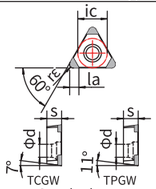
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	SCGW120404-4N	SCGW431-4N		□□ST22S	4	12.7	5.5	4.76	0.4	2.2
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
	SCGW120404-4N	SCGW431-4N		□□CBR422S	4				0.4	
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
 Standard type	SCGW120404-4N	SCGW431-4N		□□ST30S	4	12.7	5.5	4.76	0.4	3.0
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
	SCGW120404-4N	SCGW431-4N		□□CBR430S	4				0.4	
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	

PCBN insert -Hardened Steel

Tipped Inserts

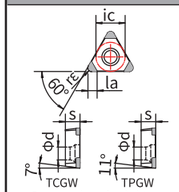
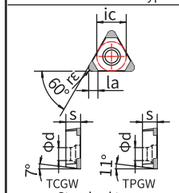
TC/TP — 60°Square-Positive-With hole — **PCBN Positive**

H				
Applications	○	○	⚙	⚙
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	TCGW080202-3N	TCGW(1.5)(1.5)(0.5)-3N		□□ST22S	3	4.76	2.4	2.38	0.2	2.2
	080204-3N	(1.5)(1.5)1-3N							0.4	
	TPGW080202-3N	TPGW(1.5)(1.5)(0.5)-3N		□□ST22S	3	4.76	2.4	2.38	0.2	
	080204-3N	(1.5)(1.5)1-3N							0.4	
 Standard type	TCGW080202-3N	TCGW(1.5)(1.5)(0.5)-3N		□□ST30S	3	4.76	2.4	2.38	0.2	3.0
	080204-3N	(1.5)(1.5)1-3N							0.4	
	TPGW080202-3N	TPGW(1.5)(1.5)(0.5)-3N		□□ST30S	3	4.76	2.4	2.38	0.2	
	080204-3N	(1.5)(1.5)1-3N							0.4	

TC/TP — 60°Square-Positive-With hole — **PCBN Positive**

H				
Applications	○	○	⚙	⚙
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	TCGW090202-3N	TCGW(1.8)(1.5)(0.5)-3N		□□ST22S	3	5.56	2.4	2.38	0.2	2.2
	090204-3N	(1.8)(1.5)1-3N							0.4	
	090208-3N	(1.8)(1.5)2-3N							0.8	
	TPGW090202-3N	TPGW(1.8)(1.5)(0.5)-3N		□□ST22S	3	5.56	2.8	2.38	0.2	
	090204-3N	(1.8)(1.5)1-3N							0.4	
	090208-3N	(1.8)(1.5)2-3N							0.8	
 Standard type	TCGW090202-3N	TCGW(1.8)(1.5)(0.5)-3N		□□ST30S	3	5.56	2.4	2.38	0.2	3.0
	090204-3N	(1.8)(1.5)1-3N							0.4	
	090208-3N	(1.8)(1.5)2-3N							0.8	
	TPGW090202-3N	TPGW(1.8)(1.5)(0.5)-3N		□□ST30S	3	5.56	2.8	2.38	0.2	
	090204-3N	(1.8)(1.5)1-3N							0.4	
	090208-3N	(1.8)(1.5)2-3N							0.8	

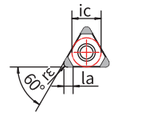
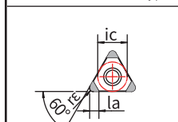
PCBN insert -Hardened Steel

Tipped Inserts

WORLDIA

TC/TP — 60°Square-Positive-With hole — **PCBN Positive**

H				
Applications	○	○	⚙	⚙
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

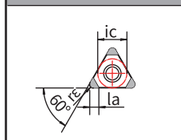
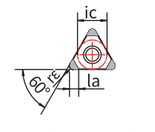
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	TCGW110302-3N	TCGW22(0.5)-3N		□□ST22S	3	6.35	2.8	3.18	0.2	2.2
	110304-3N	221-3N							0.4	
	110308-3N	222-3N							0.8	
	TCGW110302-3N	TCGW22(0.5)-3N		□□CBR422S	3				0.2	
	110304-3N	221-3N							0.4	
	110308-3N	222-3N							0.8	
	TPGW110302-3N	TPGW22(0.5)-3N		□□ST22S	3	6.35	3.3	3.18	0.2	
	110304-3N	221-3N							0.4	
	110308-3N	222-3N							0.8	
	TPGW110302-3N	TPGW22(0.5)-3N		□□CBR422S	3				0.2	
	110304-3N	221-3N							0.4	
	110308-3N	222-3N							0.8	
 Standard type	TCGW110302-3N	TCGW22(0.5)-3N		□□ST30S	3	6.35	2.8	3.18	0.2	3.0
	110304-3N	221-3N							0.4	
	110308-3N	222-3N							0.8	
	TCGW110302-3N	TCGW22(0.5)-3N		□□CBR430S	3				0.2	
	110304-3N	221-3N							0.4	
	110308-3N	222-3N							0.8	
	TPGW110302-3N	TPGW22(0.5)-3N		□□ST30S	3	6.35	3.3	3.18	0.2	
	110304-3N	221-3N							0.4	
	110308-3N	222-3N							0.8	
	TPGW110302-3N	TPGW22(0.5)-3N		□□CBR430S	3				0.2	
	110304-3N	221-3N							0.4	
	110308-3N	222-3N							0.8	

PCBN insert -Hardened Steel

Tipped Inserts

TC/TP — 60°Square-Positive-With hole — **PCBN Positive**

H				
Applications	○	○	⚙	⚙
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	TCGW160304-3N	TCGW321-3N		□□ST22S	3	9.525	4.4	3.18	0.4	2.2
	160308-3N	322-3N							0.8	
	160312-3N	323-3N							1.2	
	TCGW160304-3N	TCGW321-3N		□□CBR422S	3				0.4	
	160308-3N	322-3N							0.8	
	160312-3N	323-3N							1.2	
	TPGW160304-3N	TPGW321-3N		□□ST22S	3				0.4	
	160308-3N	322-3N							0.8	
	160312-3N	323-3N							1.2	
	TPGW160304-3N	TPGW321-3N		□□CBR422S	3				0.4	
	160308-3N	322-3N							0.8	
	160312-3N	323-3N							1.2	
 Standard type	TCGW160304-3N	TCGW321-3N		□□ST30S	3	9.525	4.4	3.18	0.4	3.0
	160308-3N	322-3N							0.8	
	160312-3N	323-3N							1.2	
	TCGW160304-3N	TCGW321-3N		□□CBR430S	3				0.4	
	160308-3N	322-3N							0.8	
	160312-3N	323-3N							1.2	
	TPGW160304-3N	TPGW321-3N		□□ST30S	3				0.4	
	160308-3N	322-3N							0.8	
	160312-3N	323-3N							1.2	
	TPGW160304-3N	TPGW321-3N		□□CBR430S	3				0.4	
	160308-3N	322-3N							0.8	
	160312-3N	323-3N							1.2	

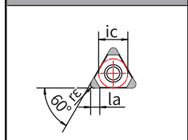
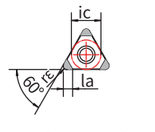
PCBN insert -Hardened Steel

Tipped Inserts

TC/TP — 60°Square-Positive-With hole — **PCBN Positive**

WORLDIA

H				
Applications	○	○	⚙	⚙
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

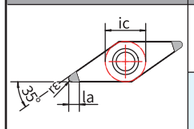
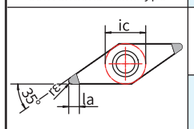
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	TCGW160404-3N	TCGW331-3N		□□ST22S	3	9.525	4.4	4.76	0.4	2.2
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	
	TCGW160404-3N	TCGW331-3N		□□CBR422S	3				0.4	
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	
	TPGW160404-3N	TPGW331-3N		□□ST22S	3				0.4	
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	
	TPGW160404-3N	TPGW331-3N		□□CBR422S	3				0.4	
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	
 Standard type	TCGW160404-3N	TCGW331-3N		□□ST30S	3	9.525	4.4	4.76	0.4	3.0
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	
	TCGW160404-3N	TCGW331-3N		□□CBR430S	3				0.4	
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	
	TPGW160404-3N	TPGW331-3N		□□ST30S	3				0.4	
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	
	TPGW160404-3N	TPGW331-3N		□□CBR430S	3				0.4	
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	

PCBN insert -Hardened Steel

Tipped Inserts

VB/VC — 35°rhombic-Positive-With hole — **PCBN Positive**

H				
Applications	○	○	⚙	⚙
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 VBGW VCGW Conventional mini type	VBGW110302-2N	VBGW22(0.5)-2N		□□ST22S	2	6.35	2.8	3.18	0.2	2.2
	110304-2N	221-2N							0.4	
	110308-2N	222-2N							0.8	
	VBGW110302-2N	VBGW22(0.5)-2N		□□CBR422S	2				0.2	
	110304-2N	221-2N							0.4	
	110308-2N	222-2N							0.8	
	VCGW110302-2N	VCGW22(0.5)-2N		□□ST22S	2				0.2	
	110304-2N	221-2N							0.4	
	110308-2N	222-2N							0.8	
	VCGW110302-2N	VCGW22(0.5)-2N		□□CBR422S	2				0.2	
	110304-2N	221-2N							0.4	
	110308-2N	222-2N							0.8	
 VBGW VCGW Standard type	VBGW110302-2N	VBGW22(0.5)-2N		□□ST30S	2	6.35	2.8	3.18	0.2	3.0
	110304-2N	221-2N							0.4	
	110308-2N	222-2N							0.8	
	VBGW110302-2N	VBGW22(0.5)-2N		□□CBR430S	2				0.2	
	110304-2N	221-2N							0.4	
	110308-2N	222-2N							0.8	
	VCGW110302-2N	VCGW22(0.5)-2N		□□ST30S	2				0.2	
	110304-2N	221-2N							0.4	
	110308-2N	222-2N							0.8	
	VCGW110302-2N	VCGW22(0.5)-2N		□□CBR430S	2				0.2	
	110304-2N	221-2N							0.4	
	110308-2N	222-2N							0.8	

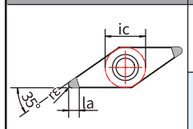
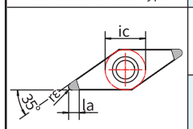
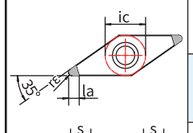
PCBN insert -Hardened Steel

Tipped Inserts

VB/VC — 35°rhombic-Positive-With hole — **PCBN Positive**

WORLDIA

H				
Applications	○	○	⚙	⚙
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

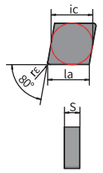
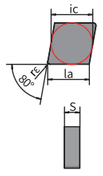
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 VBGW VCGW Conventional mini type	VBGW160404-2N	VBGW331-2N		□□ST22S	2	9.525	4.4	4.76	0.4	2.2
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	VBGW160404-2N	VBGW331-2N		□□CBR422S	2				0.4	
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	VCGW160404-2N	VCGW331-2N		□□ST22S	2				0.4	
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	VCGW160404-2N	VCGW331-2N		□□CBR422S	2				0.4	
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
 VBGW VCGW Standard type	VBGW160404-2N	VBGW331-2N		□□ST30S	2	9.525	4.4	4.76	0.4	3.0
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	VBGW160404-2N	VBGW331-2N		□□CBR430S	2				0.4	
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	VCGW160404-2N	VCGW331-2N		□□ST30S	2				0.4	
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	VCGW160404-2N	VCGW331-2N		□□CBR430S	2				0.4	
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
 VBGW VCGW long cutting edge	VBGW160404-2N	VBGW331-2N		□□ST40S	2	9.525	4.4	4.76	0.4	4.0
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	160416-2N	334-2N							1.6	
	VBGW160404-2N	VBGW331-2N		□□CBR640S	2				0.4	
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	160416-2N	334-2N							1.6	
	VCGW160404-2N	VCGW331-2N		□□ST40S	2				0.4	
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	160416-2N	334-2N							1.6	
	VCGW160404-2N	VCGW331-2N		□□CBR640S	2				0.4	
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	160416-2N	334-2N							1.6	

PCBN insert -Hardened Steel

Solid/ Tipped Inserts

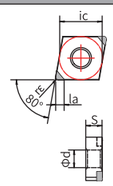
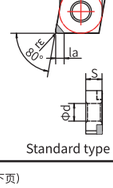
CN | 80° rhombic-Negative-Solid | PCBN Negative

H	
Applications	
Structure	SS
Material code	PNH2026 PNH2028
Cutting edge	S0102010 S0202020
Coating	S/C3/CE

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	CNGN090304-4N	CNGN321-4N		SSST90S	4	9.525	—	3.18	0.4	9
	090308-4N	322-4N							0.8	
	090312-4N	323-4N							1.2	
	CNGN090304-4N	CNGN321-4N		SSWGR90S	4				0.4	
	090308-4N	322-4N							0.8	
	090312-4N	323-4N							1.2	
	CNGN090304-4N	CNGN321-4N		SSCBR490S	4				0.4	
	090308-4N	322-4N							0.8	
	090312-4N	323-4N							1.2	
	CNGN090404-4N	CNGN331-4N		SSST90S	4	9.525	—	4.76	0.4	9
	090408-4N	332-4N							0.8	
	090412-4N	333-4N							1.2	
	CNGN090404-4N	CNGN331-4N		SSWGR90S	4				0.4	
	090408-4N	332-4N							0.8	
	090412-4N	333-4N							1.2	
	CNGN090404-4N	CNGN331-4N		SSCBR490S	4				0.4	
	090408-4N	332-4N							0.8	
	090412-4N	333-4N							1.2	

CN | 80° rhombic-Negative-With hole | PCBN Negative

H				
Applications	○			
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	CNGA120404-2N	CNGA431-2N		□□ST22S	2	12.7	5.16	5.16	0.4	2.2
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
	CNGA120404-2N	CNGA431-2N		□□WGR22S	2				0.4	
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
	CNGA120404-2N	CNGA431-2N		□□CBR422S	2				0.4	
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
 Standard type	CNGA120404-2N	CNGA431-2N		□□ST30S	2	12.7	5.16	5.16	0.4	3.0
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
	CNGA120404-2N	CNGA431-2N		□□WGR30S	2				0.4	
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
	CNGA120404-2N	CNGA431-2N		□□CBR430S	2				0.4	
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	

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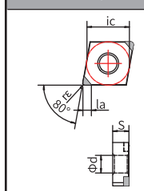
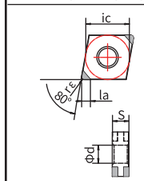
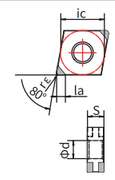
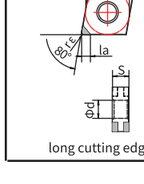
PCBN insert -Hardened Steel

Tipped insert

WORLDIA

CN | 80° rhombic-Negative-With hole | PCBN Negative

H				
Applications	○			
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

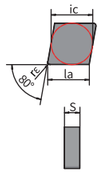
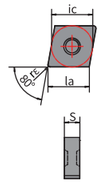
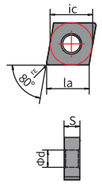
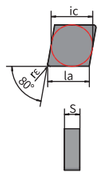
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 long cutting edge	CNGA120408-2N	CNGA432-2N		□□ST40S	2	12.7	5.16	4.76	0.8	4.0
	120412-2N	433-2N							1.2	
	120416-2N	434-2N							1.6	
	CNGA120408-2N	CNGA432-2N		□□WGR40S	2				0.8	
	120412-2N	433-2N							1.2	
	120416-2N	434-2N							1.6	
	CNGA120408-2N	CNGA432-2N		□□CBR640S	2				0.8	
	120412-2N	433-2N							1.2	
	120416-2N	434-2N							1.6	
 Conventional mini type	CNGA120404-4N	CNGA431-4N		□□ST22S	4	12.7	5.16	4.76	0.4	2.2
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
	CNGA120404-4N	CNGA431-4N		□□WGR22S	4				0.4	
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
	CNGA120404-4N	CNGA431-4N		□□CBR422S	4				0.4	
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
 Standard type	CNGA120404-4N	CNGA431-4N		□□ST30S	4	12.7	5.16	4.76	0.4	3.0
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
	CNGA120404-4N	CNGA431-4N		□□WGR30S	4				0.4	
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
	CNGA120404-4N	CNGA431-4N		□□CBR430S	4				0.4	
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
 long cutting edge	CNGA120408-4N	CNGA432-4N		□□ST40S	4	12.7	5.16	4.76	0.8	4.0
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGA120408-4N	CNGA432-4N		□□WGR40S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGA120408-4N	CNGA432-4N		□□CBR640S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	

PCBN insert -Hardened Steel

Solid Inserts

CN | 80° rhombic-Negative-Solid | PCBN Negative

H	
Applications	
Structure	SS
Material code	PNH2026 PNH2028
Cutting edge	S0102010 S0202020
Coating	S/C3/CE

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	CNGN120408-4N	CNGN432-4N		SSST120S	4	12.7	—	4.76	0.8	12
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGN120408-4N	CNGN432-4N		SSWGR120S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGN120408-4N	CNGN432-4N		SSCBR6120S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGX120408-4N	CNGX432-4N		SSST120S	4	12.7	—	4.76	0.8	12
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGX120408-4N	CNGX432-4N		SSWGR120S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGX120408-4N	CNGX432-4N		SSCBR6120S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGA120408-4N	CNGA432-4N		SSST120S	4	12.7	5.16	4.76	0.8	12
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGA120408-4N	CNGA432-4N		SSWGR120S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGA120408-4N	CNGA432-4N		SSCBR6120S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGN120608-4N	CNGN442-4N		SSST120S	4	12.7	—	6.35	0.8	12
	120612-4N	443-4N							1.2	
	120616-4N	444-4N							1.6	
	CNGN120608-4N	CNGN442-4N		SSWGR120S	4				0.8	
	120612-4N	443-4N							1.2	
	120616-4N	444-4N							1.6	
	CNGN120608-4N	CNGN442-4N		SSCBR6120S	4				0.8	
	120612-4N	443-4N							1.2	
	120616-4N	444-4N							1.6	

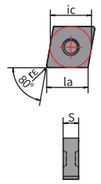
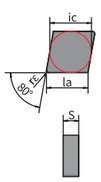
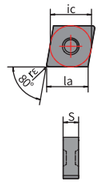
PCBN insert -Hardened Steel

Solid/ full length insert

WORLDIA

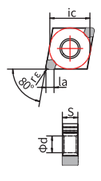
CN | 80° rhombic-Negative-Solid | PCBN Negative

H	
Applications	
Structure	SS
Material code	PNH2026 PNH2028
Cutting edge	S0102010 S0202020
Coating	S/C3/CE

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	CNGX120608-4N	CNGX442-4N		SSST120S	4	12.7	—	6.35	0.8	12
	120612-4N	443-4N							1.2	
	120616-4N	444-4N							1.6	
	CNGX120608-4N	CNGX442-4N		SSWGR120S	4				0.8	
	120612-4N	443-4N							1.2	
	120616-4N	444-4N							1.6	
	CNGX120608-4N	CNGX442-4N		SSCBR6120S	4				0.8	
	120612-4N	443-4N							1.2	
	120616-4N	444-4N							1.6	
	CNGN120708-4N	CNGN452-4N		SSST120S	4	12.7	—	7.94	0.8	12
	120712-4N	453-4N							1.2	
	120716-4N	454-4N							1.6	
	CNGN120708-4N	CNGN452-4N		SSWGR120S	4				0.8	
	120712-4N	453-4N							1.2	
	120716-4N	454-4N							1.6	
	CNGN120708-4N	CNGN452-4N		SSCBR6120S	4				0.8	
	120712-4N	453-4N							1.2	
	120716-4N	454-4N							1.6	
	CNGX120708-4N	CNGX452-4N		SSST120S	4	12.7	—	7.94	0.8	12
	120712-4N	453-4N							1.2	
	120716-4N	454-4N							1.6	
	CNGX120708-4N	CNGX452-4N		SSWGR120S	4				0.8	
	120712-4N	453-4N							1.2	
	120716-4N	454-4N							1.6	
	CNGX120708-4N	CNGX452-4N		SSCBR6120S	4				0.8	
	120712-4N	453-4N							1.2	
	120716-4N	454-4N							1.6	

CN | 80° rhombic-Negative-Solid | PCBN Negative

H			
Applications			
Structure	SWU	SWU	SWU
Material code	PNH0120 PNH0124	PNH2016 PNH2024	PNH3020
Cutting edge	S0102010 S0202020		
Coating	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	CNGA120408-4N	CNGA432-4N		SWUST25S	4	12.7	5.16	4.76	0.8	2.5
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGA120408-4N	CNGA432-4N		SWUWGR25S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGA120408-4N	CNGA432-4N		SWUCBR425S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	

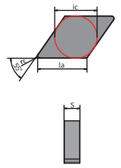
PCBN insert -Hardened Steel

Solid/ Tipped Inserts

DN 55°rhombic-Negative-Solid

PCBN Negative

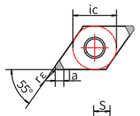
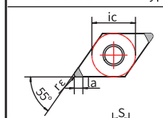
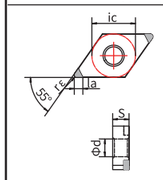
H	
Applications	
Structure	SS
Material code	PNH2026 PNH2028
Cutting edge	S0102010 S0202020
Coating	S/C3/CE

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	DNGN110404-4N	DNGN331-4N		SSST110S	4	9.525	—	4.76	0.4	11
	110408-4N	332-4N							0.8	
	110412-4N	333-4N							1.2	
	DNGN110404-4N	DNGN331-4N		SSCBR4110S	4				0.4	
	110408-4N	332-4N							0.8	
	110412-4N	333-4N							1.2	

DN 55°rhombic-Negative-With hole

PCBN Negative

H				
Applications				
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	DNGA150404-2N	DNGA431-2N		□□ST22S	2	12.7	5.16	4.76	0.4	2.2
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
	DNGA150404-2N	DNGA431-2N		□□WGR22S (107.5°)	2				0.4	
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
	DNGA150404-2N	DNGA431-2N		□□CBR422S	2				0.4	
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
 Standard type	DNGA150404-2N	DNGA431-2N		□□ST30S	2	12.7	5.16	4.76	0.4	3.0
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
	DNGA150404-2N	DNGA431-2N		□□WGR30S (107.5°)	2				0.4	
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
	DNGA150404-2N	DNGA431-2N		□□CBR430S	2				0.4	
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
 long cutting edge	DNGA150408-2N	DNGA432-2N		□□ST40S	2	12.7	5.16	4.76	0.8	4.0
	150412-2N	433-2N							1.2	
	150416-2N	434-2N							1.6	
	DNGA150408-2N	DNGA432-2N		□□WGR40S (107.5°)	2				0.8	
	150412-2N	433-2N							1.2	
	150416-2N	434-2N							1.6	
	DNGA150408-2N	DNGA432-2N		□□CBR640S	2				0.8	
	150412-2N	433-2N							1.2	
	150416-2N	434-2N							1.6	

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PCBN insert -Hardened Steel

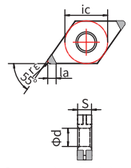
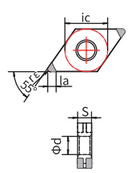
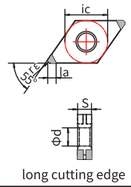
Tipped insert

WORLDIA

DN 55°rhombic-Negative-with hole

PCBN Negative

H				
Applications				
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

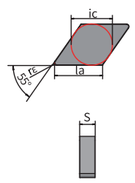
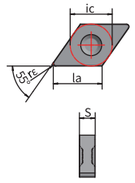
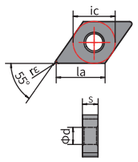
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	DNGA150404-4N	DNGA431-4N		□□ST22S	4	12.7	5.16	4.76	0.4	2.2
	150408-4N	432-4N							0.8	
	150412-4N	433-4N							1.2	
	DNGA150404-4N	DNGA431-4N		□□WGR22S (107.5°)	4				0.4	
	150408-4N	432-4N							0.8	
	150412-4N	433-4N							1.2	
	DNGA150404-4N	DNGA431-4N		□□CBR422S	4				0.4	
	150408-4N	432-4N							0.8	
	150412-4N	433-4N							1.2	
 Standard type	DNGA150404-4N	DNGA431-4N		□□ST30S	4	12.7	5.16	4.76	0.4	3.0
	150408-4N	432-4N							0.8	
	150412-4N	433-4N							1.2	
	DNGA150404-4N	DNGA431-4N		□□WGR30S (107.5°)	4				0.4	
	150408-4N	432-4N							0.8	
	150412-4N	433-4N							1.2	
	DNGA150404-4N	DNGA431-4N		□□CBR430S	4				0.4	
	150408-4N	432-4N							0.8	
	150412-4N	433-4N							1.2	
 long cutting edge	DNGA150408-4N	DNGA432-4N		□□ST40S	4	12.7	5.16	4.76	0.8	4.0
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	
	DNGA150408-4N	DNGA432-4N		□□WGR40S (107.5°)	4				0.8	
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	
	DNGA150408-4N	DNGA432-4N		□□CBR640S	4				0.8	
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	

PCBN insert -Hardened Steel

Solid/ full length insert

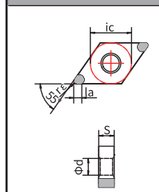
DN — 55°rhombic-Negative-Solid — PCBN Negative

H	
Applications	
Structure	SS
Material code	PNH2028
Cutting edge	S0102010 S0202020
Coating	S/C3/CE

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	DNGN150408-4N	DNGN432-4N		SSST150S	4	12.7	—	4.76	0.8	15
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	
	DNGN150408-4N	DNGN432-4N		SSCBR6150S	4				0.8	
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	
	DNGX150408-4N	DNGX432-4N		SSST150S	4	12.7	—	4.76	0.8	15
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	
	DNGX150408-4N	DNGX432-4N		SSCBR6150S	4				0.8	
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	
	DNGA150408-4N	DNGA432-4N		SSST150S	4	12.7	5.16	4.76	0.8	15
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	
	DNGA150408-4N	DNGA432-4N		SSCBR6150S	4				0.8	
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	

DN — 55°rhombic-Negative-full length — PCBN Negative

H		
Applications		
Structure	SWU	SWU
Material code	PNH0120 PNH0124	PNH2016 PNH2024
Cutting edge	S0102010 S0202020	
Coating	S/C3/CE	S/C3/CE

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	DNGA150408-4N	DNGA432-4N		SWUST25S	4	12.7	5.16	4.76	0.8	2.5
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	
	DNGA150408-4N	DNGA432-4N		SWUCBR425S	4				0.8	
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	

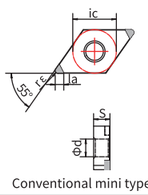
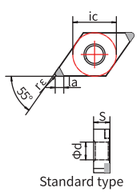
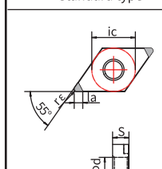
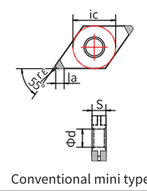
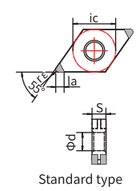
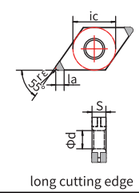
PCBN insert -Hardened Steel

Tipped insert

WORLDIA

DN — 55°rhombic-Negative-with hole — PCBN Negative

H				
Applications	○			
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

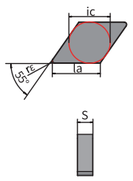
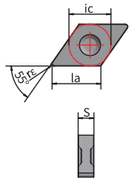
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	DNGA150604-2N	DNGA441-2N		□□ST22S	2	12.7	5.16	6.35	0.4	2.2
	150608-2N	442-2N							0.8	
	150612-2N	443-2N							1.2	
	DNGA150604-2N	DNGA441-2N		□□WGR22S (107.5°)	2				0.4	
	150608-2N	442-2N							0.8	
	150612-2N	443-2N							1.2	
	DNGA150604-2N	DNGA441-2N		□□CBR422S	2				0.4	
	150608-2N	442-2N							0.8	
	150612-2N	443-2N							1.2	
 Standard type	DNGA150604-2N	DNGA441-2N		□□ST30S	2	12.7	5.16	6.35	0.4	3.0
	150608-2N	442-2N							0.8	
	150612-2N	443-2N							1.2	
	DNGA150604-2N	DNGA441-2N		□□WGR30S (107.5°)	2				0.4	
	150608-2N	442-2N							0.8	
	150612-2N	443-2N							1.2	
	DNGA150604-2N	DNGA441-2N		□□CBR430S	2				0.4	
	150608-2N	442-2N							0.8	
	150612-2N	443-2N							1.2	
 long cutting edge	DNGA150608-2N	DNGA442-2N		□□ST40S	2	12.7	5.16	6.35	0.8	4.0
	150612-2N	443-2N							1.2	
	150616-2N	444-2N							1.6	
	DNGA150608-2N	DNGA442-2N		□□WGR40S (107.5°)	2				0.8	
	150612-2N	443-2N							1.2	
	150616-2N	444-2N							1.6	
	DNGA150608-2N	DNGA442-2N		□□CBR640S	2				0.8	
	150612-2N	443-2N							1.2	
	150616-2N	444-2N							1.6	
 Conventional mini type	DNGA150604-4N	DNGA441-4N		□□ST22S	4	12.7	5.16	6.35	0.4	2.2
	150608-4N	442-4N							0.8	
	150612-4N	443-4N							1.2	
	DNGA150604-4N	DNGA441-4N		□□WGR22S (107.5°)	4				0.4	
	150608-4N	442-4N							0.8	
	150612-4N	443-4N							1.2	
	DNGA150604-4N	DNGA441-4N		□□CBR422S	4				0.4	
	150608-4N	442-4N							0.8	
	150612-4N	443-4N							1.2	
 Standard type	DNGA150604-4N	DNGA441-4N		□□ST30S	4	12.7	5.16	6.35	0.4	3.0
	150608-4N	442-4N							0.8	
	150612-4N	443-4N							1.2	
	DNGA150604-4N	DNGA441-4N		□□WGR30S (107.5°)	4				0.4	
	150608-4N	442-4N							0.8	
	150612-4N	443-4N							1.2	
	DNGA150604-4N	DNGA441-4N		□□CBR430S	4				0.4	
	150608-4N	442-4N							0.8	
	150612-4N	443-4N							1.2	
 long cutting edge	DNGA150608-4N	DNGA442-4N		□□ST40S	4	12.7	5.16	6.35	0.8	4.0
	150612-4N	443-4N							1.2	
	150616-4N	444-4N							1.6	
	DNGA150608-4N	DNGA442-4N		□□WGR40S (107.5°)	4				0.8	
	150612-4N	443-4N							1.2	
	150616-4N	444-4N							1.6	
	DNGA150608-4N	DNGA442-4N		□□CBR640S	4				0.8	
	150612-4N	443-4N							1.2	
	150616-4N	444-4N							1.6	

PCBN insert -Hardened Steel

Solid/ full length insert

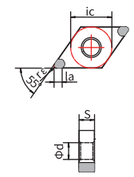
DN — 55°rhombic-Negative-Solid — PCBN Negative

H	
Applications	
Structure	SS
Material code	PNH2028
Cutting edge	S0102010 S0202020
Coating	S/C3/CE

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	DNGN150608-4N	DNGN442-4N		SSST150S	4	12.7	—	6.35	0.8	15
	150612-4N	443-4N							1.2	
	150616-4N	444-4N							1.6	
	DNGN150608-4N	DNGN442-4N		SSCBR6150S	4				0.8	
	150612-4N	443-4N							1.2	
	150616-4N	444-4N							1.6	
	DNGX150608-4N	DNGX442-4N		SSST150S	4	12.7	—	6.35	0.8	15
	150612-4N	443-4N							1.2	
	150616-4N	444-4N							1.6	
	DNGX150608-4N	DNGX442-4N		SSCBR6150S	4				0.8	
	150612-4N	443-4N							1.2	
	150616-4N	444-4N							1.6	

DN — 55°rhombic-Negative-Full length — PCBN Negative

H		
Applications		
Structure	SWU	SWU
Material code	PNH0120 PNH0124	PNH2016 PNH2024
Cutting edge	S0102010	S0202020
Coating	S/C3/CE	S/C3/CE

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	DNGA150608-4N	DNGA442-4N		SWUST25S	4	12.7	5.16	6.35	0.8	2.5
	150612-4N	443-4N							1.2	
	150616-4N	444-4N							1.6	
	DNGA150608-4N	DNGA442-4N		SWUCBR425S	4				0.8	
	150612-4N	443-4N							1.2	
	150616-4N	444-4N							1.6	

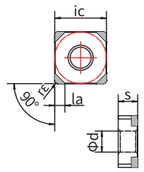
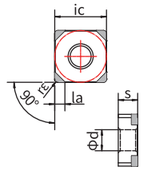
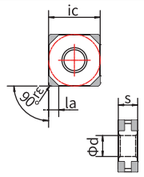
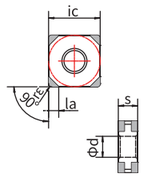
PCBN insert -Hardened Steel

Tipped insert

WORLDIA

SN — 90° square-Negative-With hole — PCBN Negative

H				
Applications				
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	SNGA090304-4N	SNGA321-4N		□□ST22S	4	9.525	3.81	3.18	0.4	2.2
	090308-4N	322-4N							0.8	
	090312-4N	323-4N							1.2	
	SNGA090304-4N	SNGA321-4N		□□CBR422S	4				0.4	
	090308-4N	322-4N							0.8	
	090312-4N	323-4N							1.2	
 Standard type	SNGA090304-4N	SNGA321-4N		□□ST30S	4	9.525	3.81	3.18	0.4	3.0
	090308-4N	322-4N							0.8	
	090312-4N	323-4N							1.2	
	SNGA090304-4N	SNGA321-4N		□□CBR430S	4				0.4	
	090308-4N	322-4N							0.8	
	090312-4N	323-4N							1.2	
 Conventional mini type	SNGA090304-8N	SNGA321-8N		□□ST22S	8	9.525	3.81	3.18	0.4	2.2
	090308-8N	322-8N							0.8	
	090312-8N	323-8N							1.2	
	SNGA090304-8N	SNGA321-8N		□□CBR422S	8				0.4	
	090308-8N	322-8N							0.8	
	090312-8N	323-8N							1.2	
 Standard type	SNGA090304-8N	SNGA321-8N		□□ST30S	8	9.525	3.81	3.18	0.4	3.0
	090308-8N	322-8N							0.8	
	090312-8N	323-8N							1.2	
	SNGA090304-8N	SNGA321-8N		□□CBR430S	8				0.4	
	090308-8N	322-8N							0.8	
	090312-8N	323-8N							1.2	

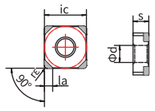
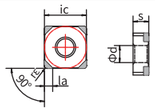
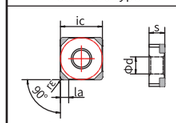
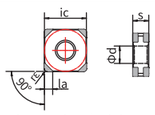
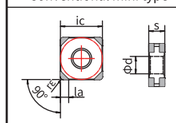
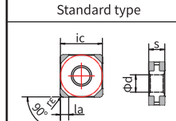
PCBN insert -Hardened Steel

Tipped insert

SN 90° square-Negative-With hole

PCBN Negative

H				
Applications	○	○	⚙	⚙
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	SNGA120404-4N	SNGA431-4N		□□ST22S	4	12.7	5.16	4.76	0.4	2.2
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
	SNGA120404-4N	SNGA431-4N		□□CBR422S	4				0.4	
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
 Standard type	SNGA120404-4N	SNGA431-4N		□□ST30S	4	12.7	5.16	4.76	0.4	3.0
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
	SNGA120404-4N	SNGA431-4N		□□CBR430S	4				0.4	
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
 long cutting edge	SNGA120408-4N	SNGA432-4N		□□ST40S	4	12.7	5.16	4.76	0.8	4.0
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	SNGA120408-4N	SNGA432-4N		□□CBR640S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
 Conventional mini type	SNGA120404-8N	SNGA431-8N		□□ST22S	8	12.7	5.16	4.76	0.4	2.2
	120408-8N	432-8N							0.8	
	120412-8N	433-8N							1.2	
	SNGA120404-8N	SNGA431-8N		□□CBR422S	8				0.4	
	120408-8N	432-8N							0.8	
	120412-8N	433-8N							1.2	
 Standard type	SNGA120404-8N	SNGA431-8N		□□ST30S	8	12.7	5.16	4.76	0.4	3.0
	120408-8N	432-8N							0.8	
	120412-8N	433-8N							1.2	
	SNGA120404-8N	SNGA431-8N		□□CBR430S	8				0.4	
	120408-8N	432-8N							0.8	
	120412-8N	433-8N							1.2	
 long cutting edge	SNGA120408-8N	SNGA432-8N		□□ST40S	8	12.7	5.16	4.76	0.8	4.0
	120412-8N	433-8N							1.2	
	120416-8N	434-8N							1.6	
	SNGA120408-8N	SNGA432-8N		□□CBR640S	8				0.8	
	120412-8N	433-8N							1.2	
	120416-8N	434-8N							1.6	

PCBN insert -Hardened Steel

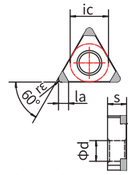
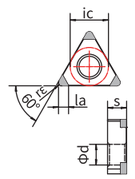
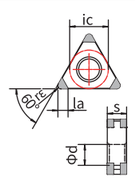
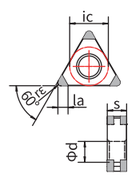
Tipped insert

WORLDIA

TN 60°Square-Negative-With hole

PCBN Negative

H				
Applications	○	○	⚙	⚙
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

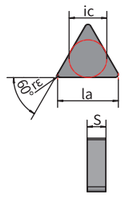
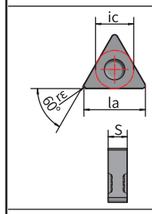
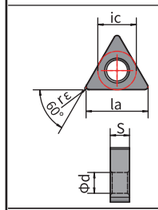
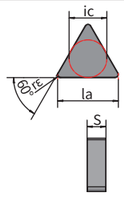
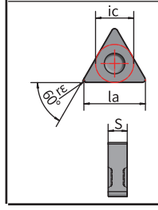
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	TNGA160404-3N	TNGA331-3N		□□ST22S	3	9.525	3.81	4.76	0.4	2.2
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	
	TNGA160404-3N	TNGA331-3N		□□CBR422S	3				0.4	
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	
 Standard type	TNGA160404-3N	TNGA331-3N		□□ST30S	3	9.525	3.81	4.76	0.4	3.0
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	
	TNGA160404-3N	TNGA331-3N		□□CBR430S	3				0.4	
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	
 Conventional mini type	TNGA160404-6N	TNGA331-6N		□□ST22S	6	9.525	3.81	4.76	0.4	2.2
	160408-6N	332-6N							0.8	
	160412-6N	333-6N							1.2	
	TNGA160404-6N	TNGA331-6N		□□CBR422S	6				0.4	
	160408-6N	332-6N							0.8	
	160412-6N	333-6N							1.2	
 Standard type	TNGA160404-6N	TNGA331-6N		□□ST30S	6	9.525	3.81	4.76	0.4	3.0
	160408-6N	332-6N							0.8	
	160412-6N	333-6N							1.2	
	TNGA160404-6N	TNGA331-6N		□□CBR430S	6				0.4	
	160408-6N	332-6N							0.8	
	160412-6N	333-6N							1.2	

PCBN insert -Hardened Steel

Solid insert

TN | 60°Square-Negative-Solid | PCBN Negative

H	
Applications	
Structure	SS
Material code	PNH2026 PNH2028
Cutting edge	S0102010 S0202020
Coating	S/C3/CE

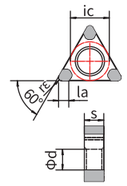
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	TNGN160408-6N	TNGN332-6N		SSST160S	6	9.525	—	4.76	0.8	16
	160412-6N	333-6N							1.2	
	160416-6N	334-6N							1.6	
	TNGN160408-6N	TNGN332-6N		SSCBR6160S	6				0.8	
	160412-6N	333-6N							1.2	
	160416-6N	334-6N							1.6	
	TNGX160408-6N	TNGX332-6N		SSST160S	6	9.525	—	4.76	0.8	16
	160412-6N	333-6N							1.2	
	160416-6N	334-6N							1.6	
	TNGX160408-6N	TNGX332-6N		SSCBR6160S	6				0.8	
	160412-6N	333-6N							1.2	
	160416-6N	334-6N							1.6	
	TNGA160408-6N	TNGA332-6N		SSST160S	6	9.525	3.81	4.76	0.8	16
	160412-6N	333-6N							1.2	
	160416-6N	334-6N							1.6	
	TNGA160408-6N	TNGA332-6N		SSCBR6160S	6				0.8	
	160412-6N	333-6N							1.2	
	160416-6N	334-6N							1.6	
	TNGN160708-6N	TNGN352-6N		SSST160S	6	9.525	—	7.94	0.8	16
	160712-6N	353-6N							1.2	
	160716-6N	354-6N							1.6	
	TNGN160708-6N	TNGN352-6N		SSCBR6160S	6				0.8	
	160712-6N	353-6N							1.2	
	160716-6N	354-6N							1.6	
	TNGX160708-6N	TNGX352-6N		SSST160S	6	9.525	—	7.94	0.8	16
	160712-6N	353-6N							1.2	
	160716-6N	354-6N							1.6	
	TNGX160708-6N	TNGX352-6N		SSCBR6160S	6				0.8	
	160712-6N	353-6N							1.2	
	160716-6N	354-6N							1.6	

PCBN insert -Hardened Steel

Full length insert

TN | 60°Square-Negative-Full length | PCBN Negative

H		
Applications		
Structure	SWU	SWU
Material code	PNH0120 PNH0124	PNH2016 PNH2024
Cutting edge	S0102010 S0202020	
Coating	S/C3/CE	S/C3/CE

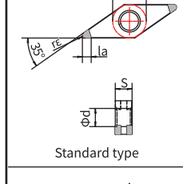
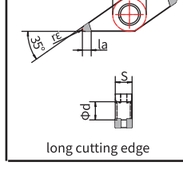
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	TNGA160408-6N	TNGA332-6N		SWUST25S	6	9.525	3.81	4.76	0.8	2.5
	160412-6N	333-6N							1.2	
	160416-6N	334-6N							1.6	
	TNGA160408-6N	TNGA332-6N		SWUCBR625S	6				0.8	
	160412-6N	333-6N							1.2	
	160416-6N	334-6N							1.6	

PCBN insert -Hardened Steel

Tipped insert

VN	35°rhombic-Negative-With hole
	PCBN Negative

H				
Applications	◯			
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	VNGA160404-2N	VNGA331-2N		□□ST22S	2	9.525	3.81	4.76	0.4	2.2
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	VNGA160404-2N	VNGA331-2N		□□CBR422S	2				0.4	
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
 Standard type	VNGA160404-2N	VNGA331-2N		□□ST30S	2	9.525	3.81	4.76	0.4	3.0
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	VNGA160404-2N	VNGA331-2N		□□CBR430S	2				0.4	
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
long cutting edge	VNGA160408-2N	VNGA332-2N		□□ST40S	2	9.525	3.81	4.76	0.8	4.0
	160412-2N	333-2N							1.2	
	160416-2N	334-2N							1.6	
	VNGA160408-2N	VNGA332-2N		□□CBR640S	2				0.8	
	160412-2N	333-2N							1.2	
	160416-2N	334-2N							1.6	
Conventional mini type	VNGA160404-4N	VNGA331-4N		□□ST22S	4	9.525	3.81	4.76	0.4	2.2
	160408-4N	332-4N							0.8	
	160412-4N	333-4N							1.2	
	VNGA160404-4N	VNGA331-4N		□□CBR422S	4				0.4	
	160408-4N	332-4N							0.8	
	160412-4N	333-4N							1.2	
Standard type	VNGA160404-4N	VNGA331-4N		□□ST30S	4	9.525	3.81	4.76	0.4	3.0
	160408-4N	332-4N							0.8	
	160412-4N	333-4N							1.2	
	VNGA160404-4N	VNGA331-4N		□□CBR430S	4				0.4	
	160408-4N	332-4N							0.8	
	160412-4N	333-4N							1.2	
long cutting edge	VNGA160408-4N	VNGA332-4N		□□ST40S	4	9.525	3.81	4.76	0.8	4.0
	160412-4N	333-4N							1.2	
	160416-4N	334-4N							1.6	
	VNGA160408-4N	VNGA332-4N		□□CBR640S	4				0.8	
	160412-4N	333-4N							1.2	
	160416-4N	334-4N							1.6	

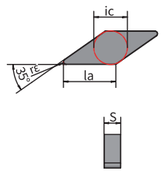
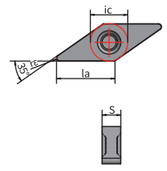
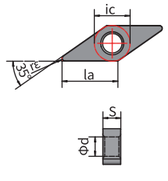
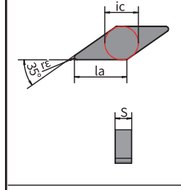
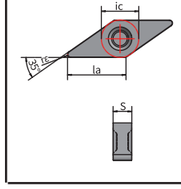
PCBN insert -Hardened Steel

Solid insert

WORLDIA

VN	35°rhombic-Negative-Solid
	PCBN Negative

H	
Applications	◯
Structure	SS
Material code	PNH2028
Cutting edge	S0102010 S0202020
Coating	S/C3/CE

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	VNGN160408-4N	VNGN332-4N		SSST160S	4	9.525	—	4.76	0.8	16
	160412-4N	333-4N							1.2	
	160416-4N	334-4N							1.6	
	VNGN160408-4N	VNGN332-4N		SSCBR6160S	4				0.8	
	160412-4N	333-4N							1.2	
	160416-4N	334-4N							1.6	
	VNGX160408-4N	VNGX332-4N		SSST160S	4	9.525	—	4.76	0.8	16
	160412-4N	333-4N							1.2	
	160416-4N	334-4N							1.6	
	VNGX160408-4N	VNGX332-4N		SSCBR6160S	4				0.8	
	160412-4N	333-4N							1.2	
	160416-4N	334-4N							1.6	
	VNGA160408-4N	VNGA332-4N		SSST160S	4	9.525	3.81	4.76	0.8	16
	160412-4N	333-4N							1.2	
	160416-4N	334-4N							1.6	
	VNGA160408-4N	VNGA332-4N		SSCBR6160S	4				0.8	
	160412-4N	333-4N							1.2	
	160416-4N	334-4N							1.6	
	VNGN160708-4N	VNGN352-4N		SSST160S	4	9.525	—	7.94	0.8	16
	160712-4N	353-4N							1.2	
	160716-4N	354-4N							1.6	
	VNGN160708-4N	VNGN352-4N		SSCBR6160S	4				0.8	
	160712-4N	353-4N							1.2	
	160716-4N	354-4N							1.6	
	VNGX160708-4N	VNGX352-4N		SSST160S	4	9.525	—	7.94	0.8	16
	160712-4N	353-4N							1.2	
	160716-4N	354-4N							1.6	
	VNGX160708-4N	VNGX352-4N		SSCBR6160S	4				0.8	
	160712-4N	353-4N							1.2	
	160716-4N	354-4N							1.6	

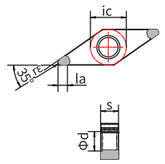
PCBN insert -Hardened Steel

Full length insert

VN 35°rhombic-Negative-Full length

PCBN Negative

H		
Applications	○	◔ ⚙
Structure	SWU	SWU
Material code	PNH0120 PNH0124	PNH2016 PNH2024
Cutting edge	S0102010 S0202020	
Coating	S/C3/CE	S/C3/CE

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	VNGA160408-4N	VNGA332-4N		SWUST25S	4	9.525	3.81	4.76	0.8	2.5
	160412-4N	333-4N							1.2	
	160416-4N	334-4N							1.6	
	VNGA160408-4N	VNGA332-4N		SWUCBR625S	4				0.8	
	160412-4N	333-4N							1.2	
	160416-4N	334-4N							1.6	

PCBN insert -Hardened Steel

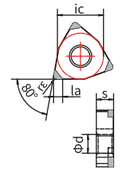
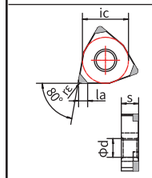
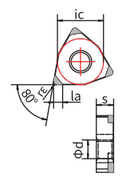
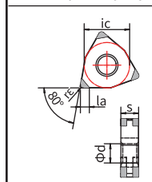
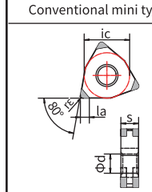
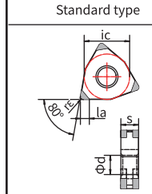
Tipped insert

WORLDIA

WN 80°hexagonal-Negative-With hole

PCBN Negative

H				
Applications	○	◔	⚙	⚙
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

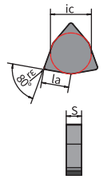
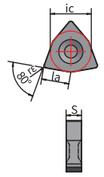
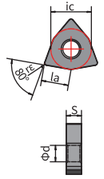
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	WNGA080404-3N	WNGA431-3N		□□ST22S	3	12.7	5.16	4.76	0.4	2.2
	080408-3N	432-3N							0.8	
	080412-3N	433-3N							1.2	
	WNGA080404-3N	WNGA431-3N		□□WGR22S	3				0.4	
	080408-3N	432-3N							0.8	
	080412-3N	433-3N							1.2	
	WNGA080404-3N	WNGA431-3N		□□CBR422S	3				0.4	
	080408-3N	432-3N							0.8	
	080412-3N	433-3N							1.2	
 Standard type	WNGA080404-3N	WNGA431-3N		□□ST30S	3	12.7	5.16	4.76	0.4	3.0
	080408-3N	432-3N							0.8	
	080412-3N	433-3N							1.2	
	WNGA080404-3N	WNGA431-3N		□□WGR30S	3				0.4	
	080408-3N	432-3N							0.8	
	080412-3N	433-3N							1.2	
	WNGA080404-3N	WNGA431-3N		□□CBR430S	3				0.4	
	080408-3N	432-3N							0.8	
	080412-3N	433-3N							1.2	
 long cutting edge	WNGA080408-3N	WNGA432-3N		□□ST40S	3	12.7	5.16	4.76	0.8	4.0
	080412-3N	433-3N							1.2	
	080416-3N	434-3N							1.6	
	WNGA080408-3N	WNGA432-3N		□□WGR40S	3				0.8	
	080412-3N	433-3N							1.2	
	080416-3N	434-3N							1.6	
	WNGA080408-3N	WNGA432-3N		□□CBR640S	3				0.8	
	080412-3N	433-3N							1.2	
	080416-3N	434-3N							1.6	
 Conventional mini type	WNGA080404-6N	WNGA431-6N		□□ST22S	6	12.7	5.16	4.76	0.4	2.2
	080408-6N	432-6N							0.8	
	080412-6N	433-6N							1.2	
	WNGA080404-6N	WNGA431-6N		□□WGR22S	6				0.4	
	080408-6N	432-6N							0.8	
	080412-6N	433-6N							1.2	
	WNGA080404-6N	WNGA431-6N		□□CBR422S	6				0.4	
	080408-6N	432-6N							0.8	
	080412-6N	433-6N							1.2	
 Standard type	WNGA080404-6N	WNGA431-6N		□□ST30S	6	12.7	5.16	4.76	0.4	3.0
	080408-6N	432-6N							0.8	
	080412-6N	433-6N							1.2	
	WNGA080404-6N	WNGA431-6N		□□WGR30S	6				0.4	
	080408-6N	432-6N							0.8	
	080412-6N	433-6N							1.2	
	WNGA080404-6N	WNGA431-6N		□□CBR430S	6				0.4	
	080408-6N	432-6N							0.8	
	080412-6N	433-6N							1.2	
 long cutting edge	WNGA080408-6N	WNGA432-6N		□□ST40S	6	12.7	5.16	4.76	0.8	4.0
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGA080408-6N	WNGA432-6N		□□WGR40S	6				0.8	
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGA080408-6N	WNGA432-6N		□□CBR640S	6				0.8	
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	

PCBN insert -Hardened Steel

Solid/full length insert

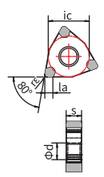
WN — 80°hexagonal-Negative-Solid — PCBN Negative

H	
Applications	
Structure	SS
Material code	PNH2026 PNH2028
Cutting edge	S0102010 S0202020
Coating	S/C3/CE

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	WNGN080408-6N	WNGN432-6N		SSST80S	6	12.7	—	4.76	0.8	8
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGN080408-6N	WNGN432-6N		SSWGR80S	6				0.8	
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGN080408-6N	WNGN432-6N		SSCBR680S	6				0.8	
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGX080408-6N	WNGX432-6N		SSST80S	6	12.7	—	4.76	0.8	8
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGX080408-6N	WNGX432-6N		SSWGR80S	6				0.8	
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGX080408-6N	WNGX432-6N		SSCBR680S	6				0.8	
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGA080408-6N	WNGA432-6N		SSST80S	6	12.7	5.16	4.76	0.8	8
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGA080408-6N	WNGA432-6N		SSWGR80S	6				0.8	
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGA080408-6N	WNGA432-6N		SSCBR680S	6				0.8	
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	

WN — 80°hexagonal-Negative-Full length — PCBN Negative

H		
Applications		
Structure	SWU	SWU
Material code	PNH0120 PNH0124	PNH2016 PNH2024
Cutting edge	S0102010 S0202020	
Coating	S/C3/CE	S/C3/CE

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	WNGA080408-6N	WNGA432-6N		SWUST25S	6	12.7	5.16	4.76	0.8	2.5
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGA080408-6N	WNGA432-6N		SWUWGR25S	6				0.8	
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGA080408-6N	WNGA432-6N		SWUCBR625S	6				0.8	
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	

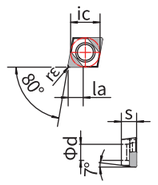
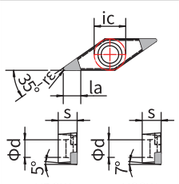
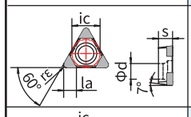
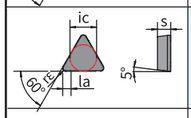
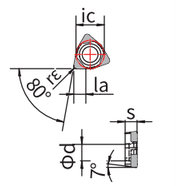
PCBN insert -Hardened Steel

Tipped insert

WORLDIA

C/V T/W — Microminiature insert — PCBN Positive

H		
Applications		
Structure	SL	SL
Material code	PNH0120	PNH2018
Cutting edge	S0102010 S0202020	
Coating	S/C3/CE	

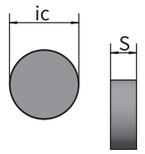
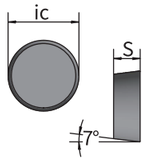
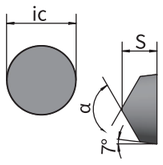
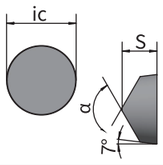
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	CCGW030102-2N	—		□□ST18S	2	3.5	1.9	1.8	0.2 / 0.4	1.8
	030104-2N	—								
	CCGW040102-2N	CCGW(1.5)1(0.5)-2N		□□ST18S	2	4.3	2.2	1.8	0.2 / 0.4	1.8
	040104-2N	(1.5)11-2N								
 VBGW VCGW	VCGW070202-2N	VCGW(1.2)(1.5)(0.5)-2N		□□ST22S	2	3.97	2.2	2.38	0.2 / 0.4	2.2
	070204-2N	(1.2)(1.5)1-2N								
	VBGW070202-2N	VBGW(1.2)(1.5)(0.5)-2N		□□ST22S	2	3.97	2.2	2.38	0.2 / 0.4	2.2
	070204-2N	(1.2)(1.5)1-2N								
	TCGW06T102-2N	—		□□ST18S	3	3.97	2.2	1.98	0.2 / 0.4	1.8
	06T104-2N	—								
	TBGN060104-3N	TBGN(1.2)11-3N		SFST40S	3	3.97	—	1.59	0.2 / 0.4	6.0
	060104-3N	TBGN(1.2)11-3N								
	WCGW020102-3N	WCGW(1.2)1(0.5)-3N		□□ST17S	3	3.97	2.2	1.59	0.2 / 0.4	1.7
	020104-3N	(1.2)11-3N								

PCBN insert -Hardened Steel

Solid insert

RN/RC — Circular-Solid — PCBN Circular

H		
Applications		
Structure	SS	SS
Material code	PNH2026 PNH2028	PNH3020(S≤4.76mm)
Cutting edge	S0102010 S0202020	
Coating	S/C3/CE	S/C3/CE

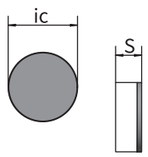
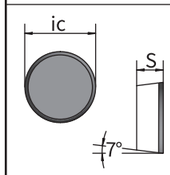
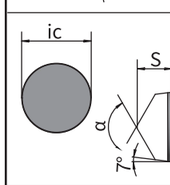
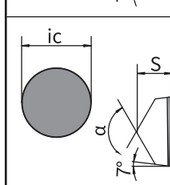
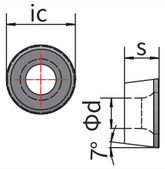
Shape	ISO	ANSI	Tips forming	Cutting edges	ic	Φd	S	r	la
	RNGN060300	RNGN22	SSST64S	—	6.35	—	3.18	—	—
	RNGN090300	RNGN32	SSST95S		9.525		3.18		
	RNGN090400	RNGN33	SSST95S		9.525		4.76		
	RNGN120300	RNGN42	SSST127S		12.7		3.18		
	RNGN120400	RNGN43	SSST127S		12.7		4.76		
	RNGN120700	RNGN45	SSST127S		12.7		7.94		
	RNGN150700	RNGN55	SSST159S		15.875		7.94		
	RNGN190400	RNGN63	SSST190S		19.05		4.76		
	RNGN190700	RNGN65	SSST190S		19.05		7.94		
	RNGN200800	—	SSST200S		20		8		
	RNGN201000	—	SSST200S		20		10		
	RNGN250400	RNGN83	SSST254S		25.4		4.76		
	RNGN250700	RNGN85	SSST254S		25.4		7.94		
	RCGN0603MO	—	SSST60S		6		3.18		
	RCGN060300	RCGN22	SSST64S		6.35		3.18		
	RCGN090300	RCGN32	SSST95S		9.525		3.18		
	RCGN090400	RCGN33	SSST95S		9.525		4.76		
	RCGN120300	RCGN42	SSST127S		12.7		3.18		
	RCGN120400	RCGN43	SSST127S		12.7		4.76		
	RCGN120700	RCGN45	SSST127S		12.7		7.94		
	RCGX060400	RCGX23	SSST64S		6.35		4.76		
	RCGX060500	RCGX2(3.5)	SSST64S		6.35		5.56		
	RCGX090400	RCGX33	SSST95S		9.525		4.76		
	RCGX100400	—	SSST100S		10		4.76		
	RCGX120700	RCGX45	SSST127S		12.7		7.94		
	RCGX150700	RCGX55	SSST190S		15.875		7.94		
	RCGX191000	—	SSST190S		19.05		10		
	RCGX201200	—	SSST200S		20		12		
	RCGX060400-V	RCGX23	SSST64S		6.35		4.76		
	RCGX080400-V	—	SSST80S		8		4.76		

PCBN insert -Hardened Steel

Full face insert

RN/RC — Circular-Full face — PCBN Circular

H		
Applications		
Structure	SF	SF
Material code	PNH3013	PNH3023
Cutting edge	S0102010 S0202020	
Coating	S/C3/CE	

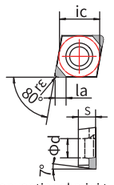
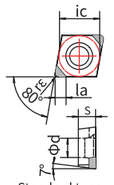
Shape	ISO	ANSI	Tips forming	Cutting edges	ic	Φd	S	r	la
	RNGN060300	RNGN22	SFST64S	—	6.35	—	3.18	—	—
	RNGN090300	RNGN32	SFST95S		9.525		3.18		
	RNGN090400	RNGN33	SFST95S		9.525		4.76		
	RNGN120300	RNGN42	SFST127S		12.7		3.18		
	RNGN120400	RNGN43	SFST127S		12.7		4.76		
	RNGN120700	RNGN45	SFST127S		12.7		7.94		
	RNGN150700	RNGN55	SFST159S		15.875		7.94		
	RCGN0603MO	—	SFST60S		6		3.18		
	RCGN060300	RCGN22	SFST65S		6.35		3.18		
	RCGN090300	RCGN32	SFST95S		9.525		3.18		
	RCGN090400	RCGN33	SFST95S		9.525		4.76		
	RCGN120300	RCGN42	SFST127S		12.7		3.18		
	RCGN120400	RCGN43	SFST127S		12.7		4.76		
	RCGN120700	RCGN45	SFST127S		12.7		7.94		
	RCGX060400	RCGX23	SFST65S		6.35		4.76		
	RCGX060500	RCGX2(3.5)	SFST65S		6.35		5.56		
	RCGX090400	RCGX33	SFST95S		9.525		4.76		
	RCGX100400	—	SFST100S		10		4.76		
	RCGX120700	RCGX45	SFST127S		12.7		7.94		
	RCGX060400-V	RCGX23	SFST65S		6.35		4.76		
	RCGX080400-V	—	SFST80S		8		4.76		
	RCGW050200	RCGW(1.8)(1.5)	SFST56S		5.56		2.38		
	RCGW060300	RCGW22	SFST64S		6.35		3.18		

PCBN insert-Cast Iron

Tipped insert

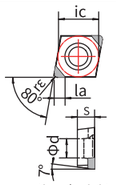
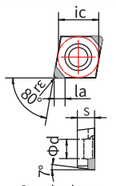
CC — 80° rhombic-Positive-With hole — PCBN Positive

K				
Applications	○ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	CCGW060202-2N	CCGW2(1.5) (0.5) -2N		□□ST22S	2	6.35	2.8	2.38	0.2	2.2
	060204-2N	2(1.5)1-2N							0.4	
	060208-2N	2(1.5)2-2N							0.8	
	CCGW060202-2N	CCGW2(1.5) (0.5) -2N		□□WGR22S	2				0.2	
	060204-2N	2(1.5)1-2N							0.4	
	060208-2N	2(1.5)2-2N							0.8	
 Standard type	CCGW060202-2N	CCGW2(1.5) (0.5) -2N		□□ST30S	2	6.35	2.8	2.38	0.2	3.0
	060204-2N	2(1.5)1-2N							0.4	
	060208-2N	2(1.5)2-2N							0.8	
	CCGW060202-2N	CCGW2(1.5) (0.5) -2N		□□WGR30S	2				0.2	
	060204-2N	2(1.5)1-2N							0.4	
	060208-2N	2(1.5)2-2N							0.8	

CC — 80° rhombic-Positive-With hole — PCBN Positive

K				
Applications	○ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	CCGW09T304-2N	CCGW3(2.5)1-2N		□□ST22S	2	9.525	4.4	3.97	0.4	2.2
	09T308-2N	3(2.5)2-2N							0.8	
	09T312-2N	3(2.5)3-2N							1.2	
	CCGW09T304-2N	CCGW3(2.5)1-2N		□□WGR22S	2				0.4	
	09T308-2N	3(2.5)2-2N							0.8	
	09T312-2N	3(2.5)3-2N							1.2	
 Standard type	CCGW09T304-2N	CCGW3(2.5)1-2N		□□ST30S	2	9.525	4.4	3.97	0.4	3.0
	09T308-2N	3(2.5)2-2N							0.8	
	09T312-2N	3(2.5)3-2N							1.2	
	CCGW09T304-2N	CCGW3(2.5)1-2N		□□WGR30S	2				0.4	
	09T308-2N	3(2.5)2-2N							0.8	
	09T312-2N	3(2.5)3-2N							1.2	

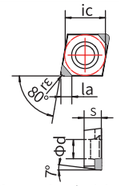
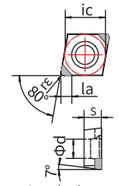
PCBN insert-Cast Iron

Tipped insert

WORLDIA®

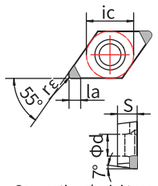
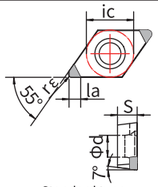
CC — 80° rhombic-Positive-With hole — PCBN Positive

K				
Applications	○ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	CCGW120404-2N	CCGW431-2N		□□ST22S	2	12.7	5.5	4.76	0.4	2.2
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
	CCGW120404-2N	CCGW431-2N		□□WGR22S	2				0.4	
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
 Standard type	CCGW120404-2N	CCGW431-2N		□□ST30S	2	12.7	5.5	4.76	0.4	3.0
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
	CCGW120404-2N	CCGW431-2N		□□WGR30S	2				0.4	
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	

DC — 55°rhombic-Positive-With hole — PCBN Positive

K				
Applications	○ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	DCGW070202-2N	DCGW2(1.5)(0.5)-2N		□□ST22S	2	6.35	2.8	2.38	0.2	2.2
	070204-2N	2(1.5)1-2N							0.4	
	070208-2N	2(1.5)2-2N							0.8	
	DCGW070202-2N	DCGW2(1.5)(0.5)-2N		□□WGR22S (107.5°)	2				0.2	
	070204-2N	2(1.5)1-2N							0.4	
	070208-2N	2(1.5)2-2N							0.8	
 Standard type	DCGW070202-2N	DCGW2(1.5)(0.5)-2N		□□ST30S	2	6.35	2.8	2.38	0.2	3.0
	070204-2N	2(1.5)1-2N							0.4	
	070208-2N	2(1.5)2-2N							0.8	
	DCGW070202-2N	DCGW2(1.5)(0.5)-2N		□□WGR30S (107.5°)	2				0.2	
	070204-2N	2(1.5)1-2N							0.4	
	070208-2N	2(1.5)2-2N							0.8	

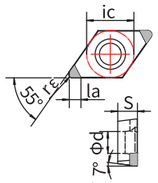
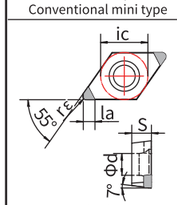
PCBN insert-Cast Iron

Tipped insert

DC 55°rhombic-Positive-With hole

PCBN Positive

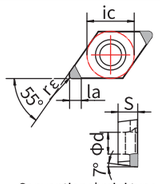
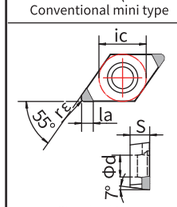
K				
Applications	○ ⟳		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	DCGW11T304-2N	DCGW3(2.5)1-2N		□□ST22S	2	9.525	4.4	3.97	0.4	2.2
	11T308-2N	3(2.5)2-2N							0.8	
	11T312-2N	3(2.5)3-2N							1.2	
	DCGW11T304-2N	DCGW3(2.5)1-2N		□□WGR22S (107.5°)	2				0.4	
	11T308-2N	3(2.5)2-2N							0.8	
	11T312-2N	3(2.5)3-2N							1.2	
 Standard type	DCGW11T304-2N	DCGW3(2.5)1-2N		□□ST30S	2	9.525	4.4	3.97	0.4	3.0
	11T308-2N	3(2.5)2-2N							0.8	
	11T312-2N	3(2.5)3-2N							1.2	
	DCGW11T304-2N	DCGW3(2.5)1-2N		□□WGR30S (107.5°)	2				0.4	
	11T308-2N	3(2.5)2-2N							0.8	
	11T312-2N	3(2.5)3-2N							1.2	

DC 55°rhombic-Positive-With hole

PCBN Positive

K				
Applications	○ ⟳		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	DCGW150404-2N	DCGW431-2N		□□ST22S	2	12.7	5.5	4.76	0.4	2.2
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
	DCGW150404-2N	DCGW431-2N		□□WGR22S (107.5°)	2				0.4	
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
 Standard type	DCGW150404-2N	DCGW431-2N		□□ST30S	2	12.7	5.5	4.76	0.4	3.0
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
	DCGW150404-2N	DCGW431-2N		□□WGR30S (107.5°)	2				0.4	
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	

PCBN insert-Cast Iron

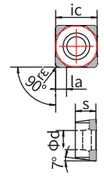
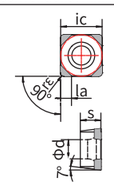
Solid/ Tipped insert

WORLDIA

SC 90°Square-Positive-With hole

PCBN Positive

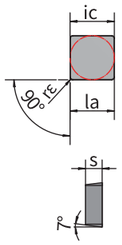
K				
Applications	○ ⟳		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	SCGW09T304-4N	SCGW3(2.5)1-4N		□□ST22S	4	9.525	4.4	3.97	0.4	2.2
	09T308-4N	3(2.5)2-4N							0.8	
	09T312-4N	3(2.5)3-4N							1.2	
 Standard type	SCGW09T304-4N	SCGW3(2.5)1-4N		□□ST30S	4	9.525	4.4	3.97	0.4	3.0
	09T308-4N	3(2.5)2-4N							0.8	
	09T312-4N	3(2.5)3-4N							1.2	

SC 90°Square-Positive-Solid

PCBN Positive

K		
Applications	○ ⟳	⚙ ⚙
Structure	SS	SS
Material code	PNK0110 PNK0118	PNH3020(S≤4.76mm)
Cutting edge	E0000005 S0102005 S0202020	
Coating	S/C3	

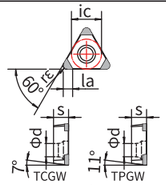
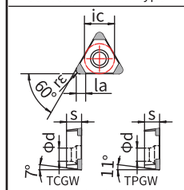
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	SCGN090304-4N	SCGN321-4N		SSST95S	4	9.525	—	3.18	0.4	9.525
	090308-4N	322-4N							0.8	
	090312-4N	323-4N							1.2	
	SCGN090404-4N	SCGN331-4N		SSST95S	4	9.525	—	4.76	0.4	9.525
	090408-4N	332-4N							0.8	
	090412-4N	333-4N							1.2	
	SCGN120408-4N	SCGN432-4N		SSST127S	4	12.7	—	4.76	0.8	12.7
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	

PCBN insert-Cast Iron

Tipped insert

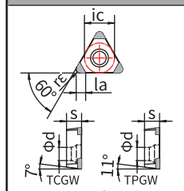
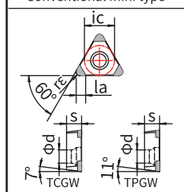
TC/TP 60°Square-Positive-With hole — PCBN Positive

K				
Applications	○ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	TCGW080202-3N	TCGW(1.5)(1.5)(0.5)-3N		□□ST22S	3	4.76	2.4	2.38	0.2	2.2
	080204-3N	(1.5)(1.5)1-3N							0.4	
	TPGW080202-3N	TPGW(1.5)(1.5)(0.5)-3N		□□ST22S	3	4.76	2.4	2.38	0.2	
	080204-3N	(1.5)(1.5)1-3N							0.4	
 Standard type	TCGW080202-3N	TCGW(1.5)(1.5)(0.5)-3N		□□ST30S	3	4.76	2.4	2.38	0.2	3.0
	080204-3N	(1.5)(1.5)1-3N							0.4	
	TPGW080202-3N	TPGW(1.5)(1.5)(0.5)-3N		□□ST30S	3	4.76	2.4	2.38	0.2	
	080204-3N	(1.5)(1.5)1-3N							0.4	

TC/TP 60°Square-Positive-With hole — PCBN Positive

K				
Applications	○ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

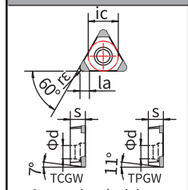
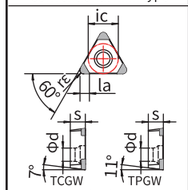
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	TCGW090202-3N	TCGW(1.8)(1.5)(0.5)-3N		□□ST22S	3	5.56	2.4	2.38	0.2	2.2
	090204-3N	(1.8)(1.5)1-3N							0.4	
	090208-3N	(1.8)(1.5)2-3N							0.8	
	TPGW090202-3N	TPGW(1.8)(1.5)(0.5)-3N		□□ST22S	3	5.56	2.8	2.38	0.2	
	090204-3N	(1.8)(1.5)1-3N							0.4	
	090208-3N	(1.8)(1.5)2-3N							0.8	
 Standard type	TCGW090202-3N	TCGW(1.8)(1.5)(0.5)-3N		□□ST30S	3	5.56	2.4	2.38	0.2	3.0
	090204-3N	(1.8)(1.5)1-3N							0.4	
	090208-3N	(1.8)(1.5)2-3N							0.8	
	TPGW090202-3N	TPGW(1.8)(1.5)(0.5)-3N		□□ST30S	3	5.56	2.8	2.38	0.2	
	090204-3N	(1.8)(1.5)1-3N							0.4	
	090208-3N	(1.8)(1.5)2-3N							0.8	

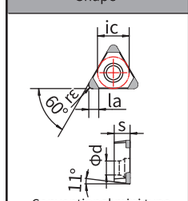
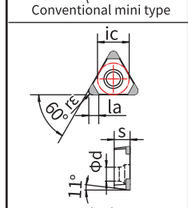
PCBN insert-Cast Iron

Tipped insert

TC/TP 60°Square-Positive-With hole — PCBN Positive

K				
Applications	○ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	TCGW110302-3N	TCGW22(0.5)-3N		□□ST22S	3	6.35	2.8	3.18	0.2	2.2
	110304-3N	221-3N							0.4	
	110308-3N	222-3N							0.8	
	TPGW110302-3N	TPGW22(0.5)-3N		□□ST22S	3	6.35	3.3	3.18	0.2	
	110304-3N	221-3N							0.4	
	110308-3N	222-3N							0.8	
 Standard type	TCGW110302-3N	TCGW22(0.5)-3N		□□ST30S	3	6.35	2.8	3.18	0.2	3.0
	110304-3N	221-3N							0.4	
	110308-3N	222-3N							0.8	
	TPGW110302-3N	TPGW22(0.5)-3N		□□ST30S	3	6.35	3.3	3.18	0.2	
	110304-3N	221-3N							0.4	
	110308-3N	222-3N							0.8	

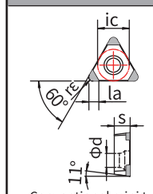
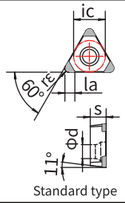
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	TPGW160304-3N	TPGW321-3N		□□ST22S	3	9.525	4.4	3.18	0.4	2.2
	160308-3N	322-3N							0.8	
	160312-3N	323-3N							1.2	
 Standard type	TPGW160304-3N	TPGW321-3N		□□ST30S	3	9.525	4.4	3.18	0.4	3.0
	160308-3N	322-3N							0.8	
	160312-3N	323-3N							1.2	

PCBN insert-Cast Iron

Tipped insert

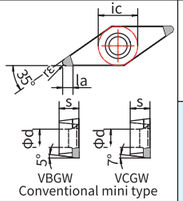
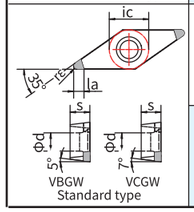
TP — 60°Square-Positive-With hole — PCBN Positive

K				
Applications	○ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	TPGW160404-3N	TPGW331-3N		□□ST22S	2	9.525	4.4	4.76	0.4	2.2
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	
 Standard type	TPGW160404-3N	TPGW331-3N		□□ST30S	2	9.525	4.4	4.76	0.4	3.0
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	

VB/VC — 35°rhombic-Positive-With hole — PCBN Positive

K				
Applications	○ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 VBGW VCGW Conventional mini type	VBGW110302-2N	VBGW22(0.5)-2N		□□ST22S	2	6.35	2.8	3.18	0.2	2.2
	110304-2N	221-2N							0.4	
	110308-2N	222-2N							0.8	
	VCGW110302-2N	VCGW22(0.5)-2N		□□ST22S	2	6.35	2.8	3.18	0.2	
	110304-2N	221-2N							0.4	
	110308-2N	222-2N							0.8	
 VBGW VCGW Standard type	VBGW110302-2N	VBGW22(0.5)-2N		□□ST30S	2	6.35	2.8	3.18	0.2	3.0
	110304-2N	221-2N							0.4	
	110308-2N	222-2N							0.8	
	VCGW110302-2N	VCGW22(0.5)-2N		□□ST30S	2	6.35	2.8	3.18	0.2	
	110304-2N	221-2N							0.4	
	110308-2N	222-2N							0.8	

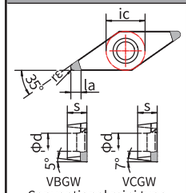
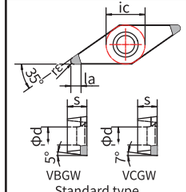
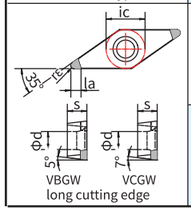
PCBN insert-Cast Iron

Tipped insert

WORLDIA

VB/VC — 35°rhombic-Positive-With hole — PCBN Positive

K				
Applications	○ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

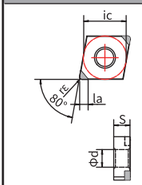
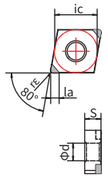
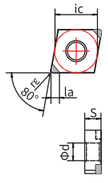
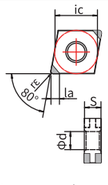
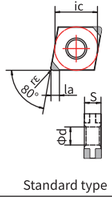
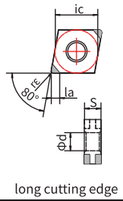
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 VBGW VCGW Conventional mini type	VBGW160404-2N	VBGW331-2N		□□ST22S	2	9.525	4.4	4.76	0.4	2.2
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	VCGW160404-2N	VCGW331-2N		□□ST22S	2				0.4	
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
 VBGW VCGW Standard type	VBGW160404-2N	VBGW331-2N		□□ST30S	2	9.525	4.4	4.76	0.4	3.0
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	VCGW160404-2N	VCGW331-2N		□□ST30S	2				0.4	
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
 VBGW VCGW long cutting edge	VBGW160404-2N	VBGW331-2N		□□ST40S	2	9.525	4.4	4.76	0.4	4.0
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	160416-2N	334-2N							1.6	
	VCGW160404-2N	VCGW331-2N		□□ST40S	2				0.4	
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
	160416-2N	334-2N							1.6	

PCBN insert-Cast Iron

Tipped insert

CN | 80° rhombic-Negative-With hole | PCBN Negative

K				
Applications	○ ⟳		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	CNGA120404-2N	CNGA431-2N		□□ST22S	2	12.7	5.16	4.76	0.4	2.2
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
	CNGA120404-2N	CNGA431-2N		□□WGR22S	2				0.4	
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
 Standard type	CNGA120404-2N	CNGA431-2N		□□ST30S	2	12.7	5.16	4.76	0.4	3.0
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
	CNGA120404-2N	CNGA431-2N		□□WGR30S	2				0.4	
	120408-2N	432-2N							0.8	
	120412-2N	433-2N							1.2	
 long cutting edge	CNGA120408-2N	CNGA432-2N		□□ST40S	2	12.7	5.16	4.76	0.8	4.0
	120412-2N	433-2N							1.2	
	120416-2N	434-2N							1.6	
	CNGA120408-2N	CNGA432-2N		□□WGR40S	2				0.8	
	120412-2N	433-2N							1.2	
	120416-2N	434-2N							1.6	
 Conventional mini type	CNGA120404-4N	CNGA431-4N		□□ST22S	4	12.7	5.16	4.76	0.4	2.2
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
	CNGA120404-4N	CNGA431-4N		□□WGR22S	4				0.4	
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
 Standard type	CNGA120404-4N	CNGA431-4N		□□ST30S	4	12.7	5.16	4.76	0.4	3.0
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
	CNGA120404-4N	CNGA431-4N		□□WGR30S	4				0.4	
	120408-4N	432-4N							0.8	
	120412-4N	433-4N							1.2	
 long cutting edge	CNGA120408-4N	CNGA432-4N		□□ST40S	4	12.7	5.16	4.76	0.8	4.0
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGA120408-4N	CNGA432-4N		□□WGR40S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	

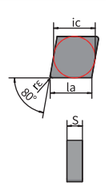
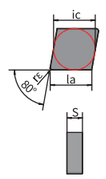
PCBN insert-Cast Iron

Solid insert

WORLDIA®

CN | 80° rhombic-Negative-Solid | PCBN Negative

K		
Applications	○ ⟳	⚙ ⚙
Structure	SS	SS
Material code	PNK0110 PNK0118	PNH3020(S≤4.76mm)
Cutting edge	E0000005 S0102005 S0202020	
Coating	S/C3	

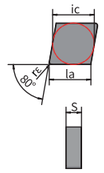
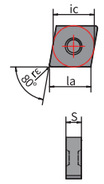
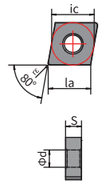
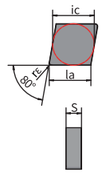
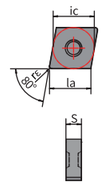
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	CNGN090304-4N	CNGN321-4N		SSST90S	4	9.525	—	3.18	0.4	9
	090308-4N	322-4N							0.8	
	090312-4N	323-4N							1.2	
	CNGN090304-4N	CNGN321-4N		SSWGR90S	4				0.4	
	090308-4N	322-4N							0.8	
	090312-4N	323-4N							1.2	
	CNGN090404-4N	CNGN331-4N		SSST90S	4	9.525	—	4.76	0.4	9
	090408-4N	332-4N							0.8	
	090412-4N	333-4N							1.2	
	CNGN090404-4N	CNGN331-4N		SSWGR90S	4				0.4	
	090408-4N	332-4N							0.8	
	090412-4N	333-4N							1.2	

PCBN insert-Cast Iron

Solid insert

CN — 80° rhombic-Negative-Solid — PCBN Negative

K		
Applications	◯ ↻	⚙ ⚙
Structure	SS	SS
Material code	PNK0110 PNK0118	PNH3020(S≤4.76mm)
Cutting edge	E0000005 S0102005 S0202020	
Coating	S/C3	

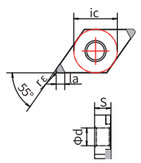
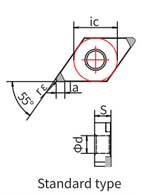
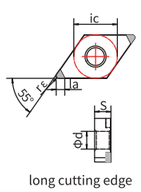
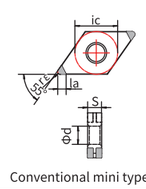
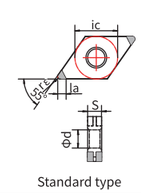
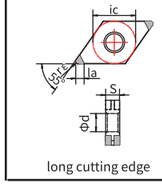
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	CNGN120408-4N	CNGN432-4N		SSST120S	4	12.7	—	4.76	0.8	12
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGN120408-4N	CNGN432-4N		SSWGR120S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGX120408-4N	CNGX432-4N		SSST120S	4	12.7	—	4.76	0.8	12
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGX120408-4N	CNGX432-4N		SSWGR120S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGA120408-4N	CNGA432-4N		SSST120S	4	12.7	5.16	4.76	0.8	12
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGA120408-4N	CNGA432-4N		SSWGR120S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGN120708-4N	CNGN452-4N		SSST120S	4	12.7	—	7.94	0.8	12
	120712-4N	453-4N							1.2	
	120716-4N	454-4N							1.6	
	CNGN120708-4N	CNGN452-4N		SSWGR120S	4				0.8	
	120712-4N	453-4N							1.2	
	120716-4N	454-4N							1.6	
	CNGX120708-4N	CNGX452-4N		SSST120S	4	12.7	—	7.94	0.8	12
	120712-4N	453-4N							1.2	
	120716-4N	454-4N							1.6	
	CNGX120708-4N	CNGX452-4N		SSWGR120S	4				0.8	
	120712-4N	453-4N							1.2	
	120716-4N	454-4N							1.6	

PCBN insert-Cast Iron

Tipped insert

DN — 55°rhombic-Negative-With hole — PCBN Negative

K				
Applications	◯ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	DNGA150404-2N	DNGA431-2N		□□ST22S	2	12.7	5.16	4.76	0.4	2.2
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
	DNGA150404-2N	DNGA431-2N		□□WGR22S (107.5°)	2				0.4	
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
 Standard type	DNGA150404-2N	DNGA431-2N		□□ST30S	2	12.7	5.16	4.76	0.4	3.0
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
	DNGA150404-2N	DNGA431-2N		□□WGR30S (107.5°)	2				0.4	
	150408-2N	432-2N							0.8	
	150412-2N	433-2N							1.2	
 long cutting edge	DNGA150408-2N	DNGA432-2N		□□ST40S	2	12.7	5.16	4.76	0.8	4.0
	150412-2N	433-2N							1.2	
	150416-2N	434-2N							1.6	
	DNGA150408-2N	DNGA432-2N		□□WGR40S (107.5°)	2				0.8	
	150412-2N	433-2N							1.2	
	150416-2N	434-2N							1.6	
 Conventional mini type	DNGA150404-4N	DNGA431-4N		□□ST22S	4	12.7	5.16	4.76	0.4	2.2
	150408-4N	432-4N							0.8	
	150412-4N	433-4N							1.2	
	DNGA150404-4N	DNGA431-4N		□□WGR22S (107.5°)	4				0.4	
	150408-4N	432-4N							0.8	
	150412-4N	433-4N							1.2	
 Standard type	DNGA150404-4N	DNGA431-4N		□□ST30S	4	12.7	5.16	4.76	0.4	3.0
	150408-4N	432-4N							0.8	
	150412-4N	433-4N							1.2	
	DNGA150404-4N	DNGA431-4N		□□WGR30S (107.5°)	4				0.4	
	150408-4N	432-4N							0.8	
	150412-4N	433-4N							1.2	
 long cutting edge	DNGA150408-4N	DNGA432-4N		□□ST40S	4	12.7	5.16	4.76	0.8	4.0
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	
	DNGA150408-4N	DNGA432-4N		□□WGR40S (107.5°)	4				0.8	
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	

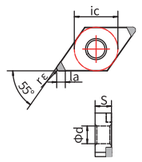
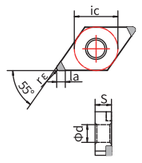
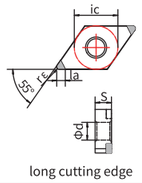
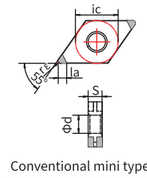
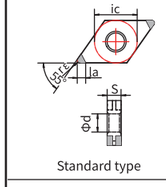
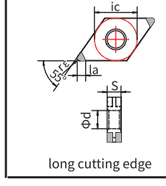
PCBN insert-Cast Iron

Tipped insert

DN 55°rhombic-Negative-With hole

PCBN Negative

K				
Applications	○ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	DNGA150604-2N	DNGA441-2N		□□ST22S	2	12.7	5.16	6.35	0.4	2.2
	150608-2N	442-2N							0.8	
	150612-2N	443-2N							1.2	
	DNGA150604-2N	DNGA441-2N		□□WGR22S (107.5°)	2				0.4	
	150608-2N	442-2N							0.8	
	150612-2N	443-2N							1.2	
 Standard type	DNGA150604-2N	DNGA441-2N		□□ST30S	2	12.7	5.16	6.35	0.4	3.0
	150608-2N	442-2N							0.8	
	150612-2N	443-2N							1.2	
	DNGA150604-2N	DNGA441-2N		□□WGR30S (107.5°)	2				0.4	
	150608-2N	442-2N							0.8	
	150612-2N	443-2N							1.2	
 long cutting edge	DNGA150608-2N	DNGA442-2N		□□ST40S	2	12.7	5.16	6.35	0.8	4.0
	150612-2N	443-2N							1.2	
	150616-2N	444-2N							1.6	
	DNGA150608-2N	DNGA442-2N		□□WGR40S (107.5°)	2				0.8	
	150612-2N	443-2N							1.2	
	150616-2N	444-2N							1.6	
 Conventional mini type	DNGA150604-4N	DNGA441-4N		□□ST22S	4	12.7	5.16	6.35	0.4	2.2
	150608-4N	442-4N							0.8	
	150612-4N	443-4N							1.2	
	DNGA150604-4N	DNGA441-4N		□□WGR22S (107.5°)	4				0.4	
	150608-4N	442-4N							0.8	
	150612-4N	443-4N							1.2	
 Standard type	DNGA150604-4N	DNGA441-4N		□□ST30S	4	12.7	5.16	6.35	0.4	3.0
	150608-4N	442-4N							0.8	
	150612-4N	443-4N							1.2	
	DNGA150604-4N	DNGA441-4N		□□WGR30S (107.5°)	4				0.4	
	150608-4N	442-4N							0.8	
	150612-4N	443-4N							1.2	
 long cutting edge	DNGA150608-4N	DNGA442-4N		□□ST40S	4	12.7	5.16	6.35	0.8	4.0
	150612-4N	443-4N							1.2	
	150616-4N	444-4N							1.6	
	DNGA150608-4N	DNGA442-4N		□□WGR40S (107.5°)	4				0.8	
	150612-4N	443-4N							1.2	
	150616-4N	444-4N							1.6	

PCBN insert-Cast Iron

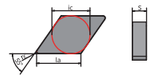
Solid insert

WORLDIA

DN 55°rhombic-Negative-Solid

PCBN Negative

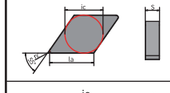
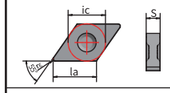
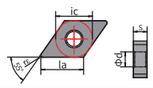
K		
Applications	○ ↻	⚙ ⚙
Structure	SS	SS
Material code	PNK0110 PNK0118	PNH3020(S≤4.76mm)
Cutting edge	E0000005 S0102005 S0202020	
Coating	S/C3	

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	DNGN110404-4N	DNGN331-4N		SSST110S	4	9.525	—	4.76	0.4	11
	110408-4N	332-4N							0.8	
	110412-4N	333-4N							1.2	

DN 55°rhombic-Negative-Solid

PCBN Negative

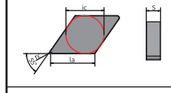
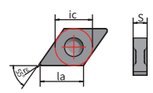
K		
Applications	○ ↻	⚙ ⚙
Structure	SS	SS
Material code	PNK0110 PNK0118	PNH3020(S≤4.76mm)
Cutting edge	E0000005 S0102005 S0202020	
Coating	S/C3	

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	DNGN150408-4N	DNGN432-4N		SSST150S	4	12.7	—	4.76	0.8	15
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	
	DNGX150408-4N	DNGX432-4N		SSST150S	4				0.8	
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	
	DNGA150408-4N	DNGA432-4N		SSST150S	4	12.7	5.16	4.76	0.8	15
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	

DN 55°rhombic-Negative-Solid

PCBN Negative

K		
Applications	○ ↻	⚙ ⚙
Structure	SS	SS
Material code	PNK0110 PNK0118	PNH3020(S≤4.76mm)
Cutting edge	E0000005 S0102005 S0202020	
Coating	S/C3	

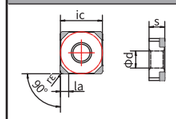
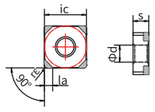
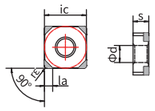
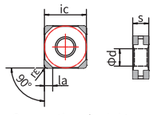
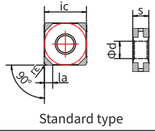
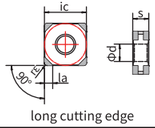
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	DNGN150608-4N	DNGN442-4N		SSST150S	4	12.7	—	6.35	0.8	15
	150612-4N	443-4N							1.2	
	150616-4N	444-4N							1.6	
	DNGX150608-4N	DNGX442-4N		SSST150S	4				0.8	
	150612-4N	443-4N							1.2	
	150616-4N	444-4N							1.6	

PCBN insert-Cast Iron

Tipped insert

SN — 90° square-Negative-With hole — PCBN Negative

K				
Applications	○ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

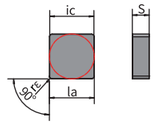
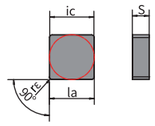
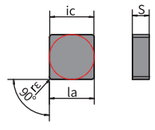
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	SNGA120404-4N 120408-4N 120412-4N	SNGA431-4N 432-4N 433-4N		□□ST22S	4	12.7	5.16	4.76	0.4 0.8 1.2	2.2
 Standard type	SNGA120404-4N 120408-4N 120412-4N	SNGA431-4N 432-4N 433-4N		□□ST30S	4	12.7	5.16	4.76	0.4 0.8 1.2	3.0
 long cutting edge	SNGA120408-4N 120412-4N 120416-4N	SNGA432-4N 433-4N 434-4N		□□ST40S	4	12.7	5.16	4.76	0.8 1.2 1.8	4.0
 Conventional mini type	SNGA120404-8N 120408-8N 120412-8N	SNGA431-8N 432-8N 433-8N		□□ST22S	8	12.7	5.16	4.76	0.4 0.8 1.2	2.2
 Standard type	SNGA120404-8N 120408-8N 120412-8N	SNGA431-8N 432-8N 433-8N		□□ST30S	8	12.7	5.16	4.76	0.4 0.8 1.2	3.0
 long cutting edge	SNGA120408-8N 120412-8N 120416-8N	SNGA432-8N 433-8N 434-8N		□□ST40S	8	12.7	5.16	4.76	0.8 1.2 1.6	4.0

PCBN insert-Cast Iron

Solid insert

SN — 90° square-Negative-Solid — PCBN Negative

K		
Applications	○ ↻	⚙ ⚙
Structure	SS	SS
Material code	PNK0110 PNK0118	PNH3020(S≤4.76mm)
Cutting edge	E0000005 S0102005 S0202020	
Coating	S/C3	

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	SNGN090304-8N 90308-8N 90312-8N	SNGN321-8N 322-8N 323-8N		SSST95S	8	9.525	—	3.18	0.4 0.8 1.2	9.525
	SNGN090404-8N 90408-8N 90412-8N	SNGN331-8N 332-8N 333-8N		SSST95S	8	9.525	—	4.76	0.4 0.8 1.2	
	SNGN120408-8N 120412-8N 120416-8N	SNGN432-8N 433-8N 434-8N		SSST127S	8	12.7	—	4.76	0.8 1.2 1.6	12.7
	SNGX120408-8N 120412-8N 120416-8N	SNGX432-8N 433-8N 434-8N		SSST127S	8				0.8 1.2 1.6	
	SNGA120408-8N 120412-8N 120416-8N	SNGA432-8N 433-8N 434-8N		SSST127S	8	12.7	5.16	4.76	0.8 1.2 1.6	
	SNGN120708-8N 120712-8N 120716-8N	SNGN452-8N 453-8N 454-8N		SSST127S	8	12.7	—	7.94	0.8 1.2 1.6	12.7
	SNGX120708-8N 120712-8N 120716-8N	SNGX452-8N 453-8N 454-8N		SSST127S	8				0.8 1.2 1.6	
	SNGN150708-8N 150712-8N 150716-8N	SNGN552-8N 553-8N 554-8N		SSST127S	8	15.875	—	7.94	0.8 1.2 1.6	15.875
	SNGX150708-8N 150712-8N 150716-8N	SNXN552-8N 553-8N 554-8N		SSST127S	8				0.8 1.2 1.6	

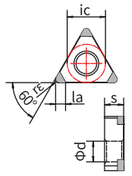
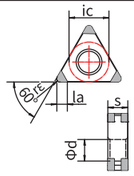
PCBN insert-Cast Iron

Tipped insert

TN 60°Square-Negative-With hole

PCBN Negative

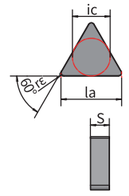
K				
Applications	○ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	TNGA160404-3N	TNGA331-3N		□□ST22S	3	9.525	3.81	4.76	0.4	2.2
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	
	TNGA160404-6N	TNGA331-6N		□□ST22S	6				0.4	
	160408-6N	332-6N							0.8	
	160412-6N	333-6N							1.2	
 Standard type	TNGA160404-3N	TNGA331-3N		□□ST30S	3	9.525	3.81	4.76	0.4	3.0
	160408-3N	332-3N							0.8	
	160412-3N	333-3N							1.2	
	TNGA160404-6N	TNGA331-6N		□□ST30S	6				0.4	
	160408-6N	332-6N							0.8	
	160412-6N	333-6N							1.2	

TN 60°Square-Negative-With hole

PCBN Negative

K		
Applications	○ ↻	⚙ ⚙
Structure	SS	SS
Material code	PNK0110 PNK0118	PNH3020(S≤4.76mm)
Cutting edge	E0000005 S0102005 S0202020	
Coating	S/C3	

图示	ISO	ANSI	刀片结构		刃数	ic	Φd	S	r	la
	TNGN160408-6N	TNGN332-6N		SSST160S	6	9.525	—	4.76	0.8	16
	160412-6N	333-6N							1.2	
	160416-6N	334-6N							1.6	

PCBN insert-Cast Iron

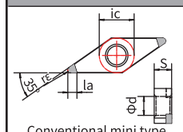
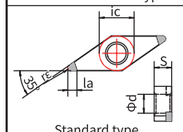
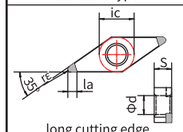
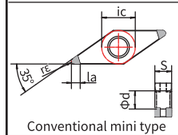
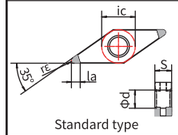
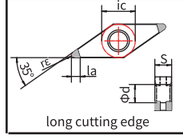
Tipped insert

WORLDIA

VN 35°rhombic-Negative-With hole

PCBN Negative

K				
Applications	○ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	VNGA160404-2N	VNGA331-2N		□□ST22S	2	9.525	3.81	4.76	0.4	2.2
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
 Standard type	VNGA160404-2N	VNGA331-2N		□□ST30S	2	9.525	3.81	4.76	0.4	3.0
	160408-2N	332-2N							0.8	
	160412-2N	333-2N							1.2	
 long cutting edge	VNGA160408-2N	VNGA332-2N		□□ST40S	2	9.525	3.81	4.76	0.8	4.0
	160412-2N	333-2N							1.2	
	160416-2N	334-2N							1.6	
 Conventional mini type	VNGA160404-4N	VNGA331-4N		□□ST22S	4	9.525	3.81	4.76	0.4	2.2
	160408-2N	332-4N							0.8	
	160412-4N	333-4N							1.2	
 Standard type	VNGA160404-4N	VNGA331-4N		□□ST30S	4	9.525	3.81	4.76	0.4	3.0
	160408-2N	332-4N							0.8	
	160412-4N	333-4N							1.2	
 long cutting edge	VNGA160408-4N	VNGA332-4N		□□ST40S	4	9.525	3.81	4.76	0.8	4.0
	160412-2N	333-4N							1.2	
	160416-4N	334-4N							1.6	

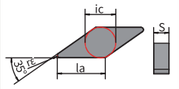
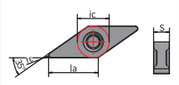
PCBN insert-Cast Iron

Tipped insert

VN 35°rhombic-Negative-Solid

PCBN Negative

K		
Applications	◯ ↻	⚙ ⚙
Structure	SS	SS
Material code	PNK0110 PNK0118	PNK3020
Cutting edge	E0000005 S0102005 S0202020	
Coating	S/C3	

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	VNGN160408-4N	VNGN332-4N		SSST160S	4	9.525	—	4.76	0.8	16
	160412-4N	333-4N							1.2	
	160416-4N	334-4N							1.6	
	VNGX160408-4N	VNGX332-4N		SSST160S	4				0.8	
	160412-4N	333-4N							1.2	
	160416-4N	334-4N							1.6	

PCBN insert-Cast Iron

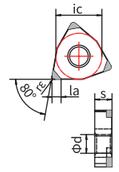
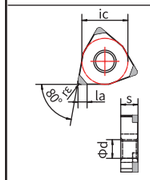
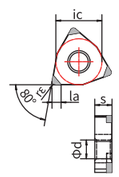
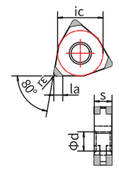
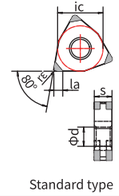
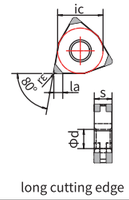
Tipped insert

WORLDIA

WN 80°hexagonal-Negative-With hole

PCBN Negative

K				
Applications	◯ ↻		⚙ ⚙	
Structure	SL	CB	SL	CB
Material code	PNK0126	PNK0107	PNK0122	PNK3003 PNK3007 PNK3013
Cutting edge	S0102005 S0202010			
Coating	S/C3			

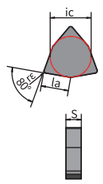
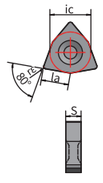
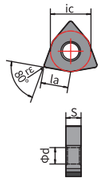
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	WNGA080404-3N	WNGA431-3N		□□ST22S	3	12.7	5.16	4.76	0.4	2.2
	080408-3N	432-3N							0.8	
	080412-3N	433-3N							1.2	
	WNGA080404-3N	WNGA431-3N		□□WGR22S	3				0.4	
	080408-3N	432-3N							0.8	
	080412-3N	433-3N							1.2	
 Standard type	WNGA080404-3N	WNGA431-3N		□□ST30S	3	12.7	5.16	4.76	0.4	3.0
	080408-3N	432-3N							0.8	
	080412-3N	433-3N							1.2	
	WNGA080404-3N	WNGA431-3N		□□WGR30S	3				0.4	
	080408-3N	432-3N							0.8	
	080412-3N	433-3N							1.2	
 long cutting edge	WNGA080408-3N	WNGA432-3N		□□ST40S	3	12.7	5.16	4.76	0.8	4.0
	080412-3N	433-3N							1.2	
	080416-3N	434-3N							1.6	
	WNGA080408-3N	WNGA432-3N		□□WGR40S	3				0.8	
	080412-3N	433-3N							1.2	
	080416-3N	434-3N							1.6	
 Conventional mini type	WNGA080404-6N	WNGA431-6N		□□ST22S	6	12.7	5.16	4.76	0.4	2.2
	080408-6N	432-6N							0.8	
	080412-6N	433-6N							1.2	
	WNGA080404-6N	WNGA431-6N		□□WGR22S	6				0.4	
	080408-6N	432-6N							0.8	
	080412-6N	433-6N							1.2	
 Standard type	WNGA080404-6N	WNGA431-6N		□□ST30S	6	12.7	5.16	4.76	0.4	3.0
	080408-6N	432-6N							0.8	
	080412-6N	433-6N							1.2	
	WNGA080404-6N	WNGA431-6N		□□WGR30S	6				0.4	
	080408-6N	432-6N							0.8	
	080412-6N	433-6N							1.2	
 long cutting edge	WNGA080408-6N	WNGA432-6N		□□ST40S	6	12.7	5.16	4.76	0.8	4.0
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGA080408-6N	WNGA432-6N		□□WGR40S	6				0.8	
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	

PCBN insert-Cast Iron

Solid insert

WN — 80°hexagonal-Negative-Solid — PCBN Negative

K		
Applications	◯ ⟳	⚙ ⚙
Structure	SS	SS
Material code	PNK0110 PNK0118	PNH3020(S≤4.76mm)
Cutting edge	E0000005 S0102005 S0202020	
Coating	S/C3	

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	WNGN080408-6N	WNGN432-6N		SSST80S	6	12.7	—	4.76	0.8	8
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGN080408-6N	WNGN432-6N		SSWGR80S	6				0.8	
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGX080408-6N	WNGX432-6N		SSST80S	6	12.7	—	4.76	0.8	8
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGX080408-6N	WNGX432-6N		SSWGR80S	6				0.8	
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGA080408-6N	WNGA432-6N		SSST80S	6	12.7	5.16	4.76	0.8	8
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	
	WNGA080408-6N	WNGA432-6N		SSWGR80S	6				0.8	
	080412-6N	433-6N							1.2	
	080416-6N	434-6N							1.6	

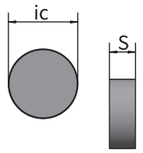
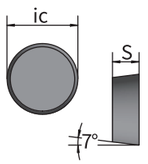
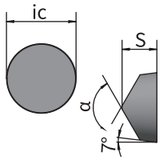
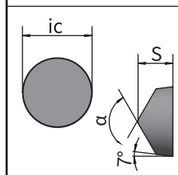
PCBN insert-Cast Iron

Solid insert

WORLDIA

RN/RC — Circular-Solid — PCBN Circular

K		
Applications	◯ ⟳	⚙ ⚙
Structure	SS	SS
Material code	PNK0110 PNK0118	PNH3020(S≤4.76mm)
Cutting edge	E0000005 S0102005 S0202020	
Coating	S/C3	

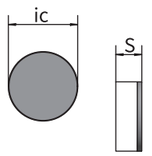
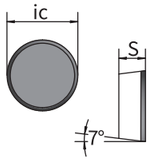
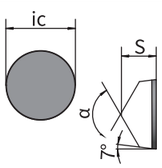
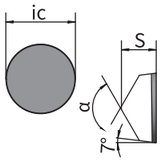
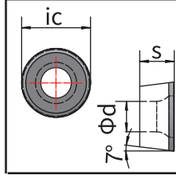
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	RNGN060300	RNGN22		SSST64S	—	6.35	—	3.18	—	—
	RNGN090300	RNGN32		SSST95S		9.525		3.18		
	RNGN090400	RNGN33		SSST95S		9.525		4.76		
	RNGN120300	RNGN42		SSST127S		12.7		3.18		
	RNGN120400	RNGN43		SSST127S		12.7		4.76		
	RNGN120700	RNGN45		SSST127S		12.7		7.94		
	RNGN150700	RNGN55		SSST159S		15.875		7.94		
	RNGN190400	RNGN63		SSST190S		19.05		4.76		
	RNGN190700	RNGN65		SSST190S		19.05		7.94		
	RNGN200800	—		SSST200S		20		8		
	RNGN201000	—		SSST200S		20		10		
	RNGN250400	RNGN83		SSST254S		25.4		4.76		
	RNGN250700	RNGN85		SSST254S		25.4		7.94		
	RCGN0603MO	—		SSST60S	—	6	—	3.18	—	—
	RCGN060300	RCGN22		SSST64S		6.35		3.18		
	RCGN090300	RCGN32		SSST95S		9.525		3.18		
	RCGN090400	RCGN33		SSST95S		9.525		4.76		
	RCGN120300	RCGN42		SSST127S		12.7		3.18		
	RCGN120400	RCGN43		SSST127S		12.7		4.76		
	RCGN120700	RCGN45		SSST127S		12.7		7.94		
	RCGX060400	RCGX23		SSST64S	—	6.35	—	4.76	—	—
	RCGX060500	RCGX2(3.5)		SSST64S		6.35		5.56		
	RCGX090400	RCGX33		SSST95S		9.525		4.76		
	RCGX100400	—		SSST100S		10		4.76		
	RCGX120700	RCGX45		SSST127S		12.7		7.94		
	RCGX150700	RCGX55		SSST190S		15.875		7.94		
	RCGX191000	—		SSST190S		19.05		10		
	RCGX201200	—		SSST200S		20		12		
	RCGX060400-V	RCGX23		SSST64S	—	6.35	—	4.76	—	—
	RCGX080400-V	—		SSST80S		8		4.76		

PCBN insert-Cast Iron

Full face insert

RN/RC — Circular-Full face — PCBN Circular

K		
Applications	○ ↻	⚙ ⚙
Structure	SS	SS
Material code	PNK0107	PNK3003 PNK3007
Cutting edge	E0000005 S0102005 S0202020	
Coating	S/C3	

Shape	ISO	ANSI	Tips forming	Cutting edges	ic	Φd	S	r	la
	RNGN060300	RNGN22	 SFST64S	—	6.35	—	3.18	—	—
	RNGN090300	RNGN32	SFST95S		9.525		3.18		
	RNGN090400	RNGN33	SFST95S		9.525		4.76		
	RNGN120300	RNGN42	SFST127S		12.7		3.18		
	RNGN120400	RNGN43	SFST127S		12.7		4.76		
	RNGN120700	RNGN45	SFST127S		12.7		7.94		
	RNGN150700	RNGN55	SFST159S		15.875		7.94		
	RCGN0603MO	—	 SFST60S	—	6	—	3.18	—	—
	RCGN060300	RCGN22	SFST65S		6.35		3.18		
	RCGN090300	RCGN32	SFST95S		9.525		3.18		
	RCGN090400	RCGN33	SFST95S		9.525		4.76		
	RCGN120300	RCGN42	SFST127S		12.7		3.18		
	RCGN120400	RCGN43	SFST127S		12.7		4.76		
	RCGN120700	RCGN45	SFST127S		12.7		7.94		
	RCGX060400	RCGX23	 SFST65S	—	6.35	—	4.76	—	—
	RCGX060500	RCGX2(3.5)	SFST65S		6.35		5.56		
	RCGX090400	RCGX33	SFST95S		9.525		4.76		
	RCGX100400	—	SFST100S		10		4.76		
	RCGX120700	RCGX45	SFST127S		12.7		7.94		
	RCGX060400-V	RCGX23	 SFST65S	—	6.35	—	4.76	—	—
	RCGX080400-V	—	SFST80S		8		4.76		
	RCGW050200	RCGW(1.8)(1.5)	 SFST56S	—	5.56	—	2.38	—	—
	RCGW060300	RCGW22	SFST64S		6.35		3.18		

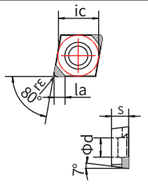
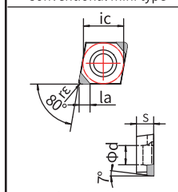
PCBN insert-Powder Metallurgy

Tipped insert

WORLDIA

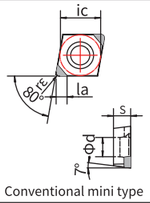
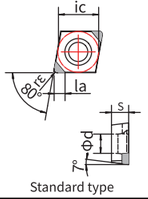
CC — 80° rhombic-Positive-With hole — PCBN Positive

S			
Applications	○	↻	⚙ ⚙
Structure	SL	CB	CB
Material code	PNS0126	PNS0117	PNS2005 PNS2007 PNS2019
Cutting edge	E0000005 S0101505 S0153510		
Coating	S/C3		

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	CCGW060204-2N	CCGW2(1.5)1-2N		□□ST22S	2	6.35	2.8	2.38	0.4	2.2
	060208-2N	2(1.5)2-2N							0.8	
	CCGW060204-2N	CCGW2(1.5)1-2N		□□WGR22S	2				0.4	
	060208-2N	2(1.5)2-2N							0.8	
 Standard type	CCGW060204-2N	CCGW2(1.5)1-2N		□□ST30S	2	6.35	2.8	2.38	0.4	3.0
	060208-2N	2(1.5)2-2N							0.8	
	CCGW060204-2N	CCGW2(1.5)1-2N		□□WGR30S	2				0.4	
	060208-2N	2(1.5)2-2N							0.8	

CC — 80° rhombic-Positive-With hole — PCBN Positive

S			
Applications	○	↻	⚙ ⚙
Structure	SL	CB	CB
Material code	PNS0126	PNS0117	PNS2005 PNS2007 PNS2019
Cutting edge	E0000005 S0101505 S0153510		
Coating	S/C3		

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	CCGW09T304-2N	CCGW3(2.5)1-2N		□□ST22S	2	9.525	4.4	3.97	0.4	2.2
	09T308-2N	3(2.5)2-2N							0.8	
	CCGW09T304-2N	CCGW3(2.5)1-2N		□□WGR22S	2				0.4	
	09T308-2N	3(2.5)2-2N							0.8	
 Standard type	CCGW09T304-2N	CCGW3(2.5)1-2N		□□ST30S	2	9.525	4.4	3.97	0.4	3.0
	09T308-2N	3(2.5)2-2N							0.8	
	CCGW09T304-2N	CCGW3(2.5)1-2N		□□WGR30S	2				0.4	
	09T308-2N	3(2.5)2-2N							0.8	

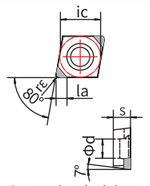
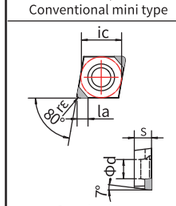
PCBN insert-Powder Metallurgy

Tipped insert

CC 80° rhombic-Positive-With hole

PCBN Positive

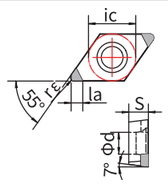
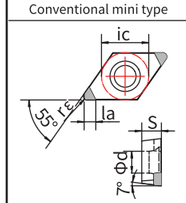
S			
Applications	◯	↻	⚙
Structure	SL	CB	CB
Material code	PNS0126	PNS0117	PNS2005 PNS2007 PNS2019
Cutting edge	E0000005 S0101505 S0153510		
Coating	S/C3		

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	CCGW120404-2N 120408-2N	CCGW431-2N 432-2N		□□ST22S	2	12.7	5.5	4.76	0.4 0.8	2.2
	CCGW120404-2N 120408-2N	CCGW431-2N 432-2N		□□WGR22S	2				0.4 0.8	
 Standard type	CCGW120404-2N 120408-2N	CCGW431-2N 432-2N		□□ST30S	2	12.7	5.5	4.76	0.4 0.8	3.0
	CCGW120404-2N 120408-2N	CCGW431-2N 432-2N		□□WGR30S	2				0.4 0.8	

DC 55°rhombic-Positive-With hole

PCBN Positive

S			
Applications	◯	↻	⚙
Structure	SL	CB	CB
Material code	PNS0126	PNS0117	PNS2005 PNS2007 PNS2019
Cutting edge	E0000005 S0101505 S0153510		
Coating	S/C3		

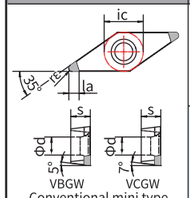
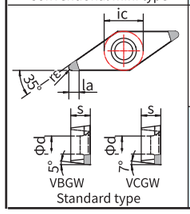
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	DCGW070204-2N 070208-2N	DCGW2(1.5)1-2N 2(1.5)2-2N		□□ST22S	2	6.35	2.8	2.38	0.4 0.8	2.2
	DCGW070204-2N 070208-2N	DCGW2(1.5)1-2N 2(1.5)2-2N		□□WGR22S (107.5°)	2				0.4 0.8	
 Standard type	DCGW070204-2N 070208-2N	DCGW2(1.5)1-2N 2(1.5)2-2N		□□ST30S	2	6.35	2.8	2.38	0.4 0.8	3.0
	DCGW070204-2N 070208-2N	DCGW2(1.5)1-2N 2(1.5)2-2N		□□WGR30S (107.5°)	2				0.4 0.8	

PCBN insert-Powder Metallurgy

Tipped insert

VB/VC — 35°rhombic-Positive-With hole — PCBN Positive

S			
Applications	◯	◔	⚙
Structure	SL	CB	CB
Material code	PNS0126	PNS0117	PNS2005 PNS2007 PNS2019
Cutting edge	E0000005 S0101505 S0153510		
Coating	S/C3		

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 VBGW VCGW Conventional mini type	VBGW160404-2N	VBGW331-2N		□□ST22S	2	9.525	4.4	4.76	0.4	2.2
	160408-2N	332-2N							0.8	
	VCGW160404-2N	VCGW331-2N		□□ST22S	2				0.4	
	160408-2N	332-2N							0.8	
 VBGW VCGW Standard type	VBGW160404-2N	VBGW331-2N		□□ST30S	2	9.525	4.4	4.76	0.4	3.0
	160408-2N	332-2N							0.8	
	VCGW160404-2N	VCGW331-2N		□□ST30S	2				0.4	
	160408-2N	332-2N							0.8	

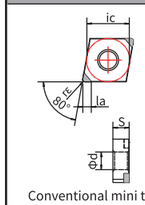
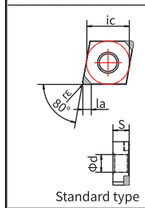
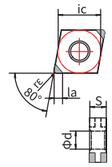
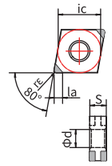
PCBN insert-Powder Metallurgy

Tipped insert

WORLDIA®

CN — 80° rhombic-Negative-With hole — PCBN Negative

S			
Applications	◯	◔	⚙
Structure	SL	CB	CB
Material code	PNS0126	PNS0117	PNS2005 PNS2007 PNS2019
Cutting edge	E0000005 S0101505 S0153510		
Coating	S/C3		

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	CNGA120404-2N	CNGA431-2N		□□ST22S	2	12.7	5.16	4.76	0.4	2.2
	120408-2N	432-2N							0.8	
	CNGA120404-2N	CNGA431-2N		□□WGR22S	2				0.4	
	120408-2N	432-2N							0.8	
 Standard type	CNGA120404-2N	CNGA431-2N		□□ST30S	2	12.7	5.16	4.76	0.4	3.0
	120408-2N	432-2N							0.8	
	CNGA120404-2N	CNGA431-2N		□□WGR30S	2				0.4	
	120408-2N	432-2N							0.8	
 Conventional mini type	CNGA120404-4N	CNGA431-4N		□□ST22S	4	12.7	5.16	4.76	0.4	2.2
	120408-4N	432-4N							0.8	
	CNGA120404-4N	CNGA431-4N		□□WGR22S	4				0.4	
	120408-4N	432-4N							0.8	
 Standard type	CNGA120404-4N	CNGA431-4N		□□ST30S	4	12.7	5.16	4.76	0.4	3.0
	120408-4N	432-4N							0.8	
	CNGA120404-4N	CNGA431-4N		□□WGR30S	4				0.4	
	120408-4N	432-4N							0.8	

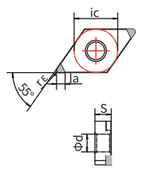
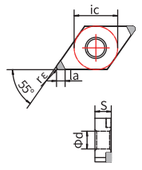
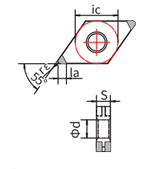
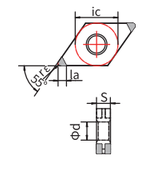
PCBN insert-Powder Metallurgy

Tipped insert

DN 55°rhombic-Negative-With hole

PCBN Negative

S			
Applications	◯	⟳	⚙⚙
Structure	SL	CB	CB
Material code	PNS0126	PNS0117	PNS2005 PNS2007 PNS2019
Cutting edge	E0000005 S0101505 S0153510		
Coating	S/C3		

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	DNGA150404-2N	DNGA431-2N		□□ST22S	2	12.7	5.16	6.35	0.4	2.2
	150408-2N	432-2N							0.8	
	DNGA150404-2N	DNGA431-2N		□□WGR22S (107.5°)	2				0.4	
	150408-2N	432-2N							0.8	
	DNGA150404-2N	DNGA431-2N		□□ST30S	2	12.7	5.16	6.35	0.4	3.0
	150408-2N	432-2N							0.8	
	DNGA150404-2N	DNGA431-2N		□□WGR30S (107.5°)	2				0.4	
	150408-4N	432-4N							0.8	
 Conventional mini type	DNGA150404-4N	DNGA431-4N		□□ST22S	4	12.7	5.16	6.35	0.4	2.2
	150408-4N	432-4N							0.8	
	DNGA150404-4N	DNGA431-4N		□□WGR22S (107.5°)	4				0.4	
	150408-4N	432-4N							0.8	
 Standard type	DNGA150404-4N	DNGA431-4N		□□ST30S	4	12.7	5.16	6.35	0.4	3.0
	150408-4N	432-4N							0.8	
	DNGA150404-4N	DNGA431-4N		□□WGR30S (107.5°)	4				0.4	
	150408-4N	432-4N							0.8	

PCBN insert-Powder Metallurgy

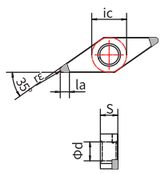
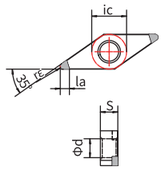
Tipped insert

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VN 35°rhombic-Negative-With hole

PCBN Negative

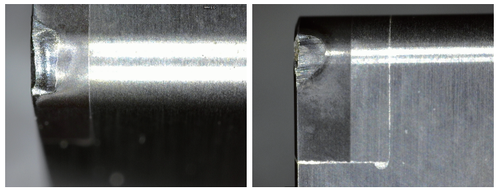
S			
Applications	◯	⟳	⚙⚙
Structure	SL	CB	CB
Material code	PNS0126	PNS0117	PNS2005 PNS2007 PNS2019
Cutting edge	E0000005 S0101505 S0153510		
Coating	S/C3		

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
 Conventional mini type	VNGA160404-2N	VNGA331-2N		□□ST22S	2	9.525	3.81	4.76	0.4	2.2
	160408-2N	332-2N							0.8	
	VNGA160404-4N	VNGA331-4N		□□ST22S	4				0.4	
	160408-4N	332-4N							0.8	
 Standard type	VNGA160404-2N	VNGA331-2N		□□ST30S	2	9.525	3.81	4.76	0.4	3.0
	160408-2N	332-2N							0.8	
	VNGA160404-4N	VNGA331-4N		□□ST30S	4				0.4	
	160408-4N	332-4N							0.8	

Insert Wear Causes and Solutions

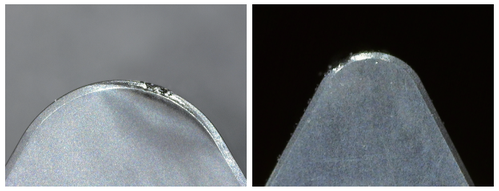
wear on the rake face, breakage of the cutting edge, crescent wear, chipping

■Wear on the rake face



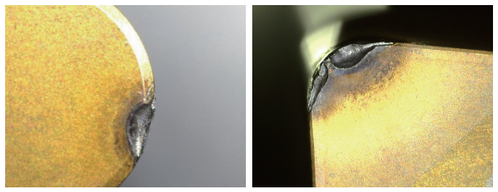
Causes: Excessive cutting speed
Insufficient wear resistance of the material
Low Feed rate
Solutions: Reduce cutting speed
Select a material with higher wear resistance
Adjust the feed to match the cutting speed and depth (increase the feed)

■Breakage of the cutting edge



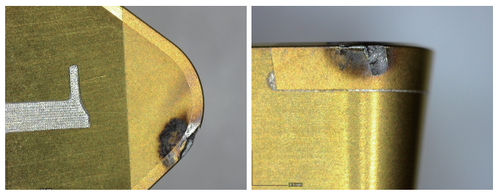
Causes: Hard material
Vibration
Excessive feed rate or cutting depth
Interrupted cutting
Chip damage
Solutions: Reduce cutting speed
Select a material with higher wear resistance
Adjust the feed to match the cutting speed and depth (increase the feed)

■Crescent wear



Causes: Excessive cutting speed and/or feed rate
Insufficient wear resistance of the material
Insufficient coolant supply
Solutions: Reduce cutting speed and/or feed.rate
Optimize the coolant supply by increasing the coolant flow and pressure
Use a material with higher wear resistance for crescent

■Chipping



Causes: Excessive pressure on inserts
Insufficient stability
Small corners
Excessive breakage at the cutting depth of the edge
Solutions: Use tougher materials
Use chamfered inserts
Increase the corners of the inserts

Dry/ Wet Cutting Recommendation

Dry/ Wet Cutting

The coolant plays a lubricating and cooling role when cutting with PCBN tools, minimizing heat damage to the insert. This is especially important during continuous high-speed cutting under heavy loads. However, during interrupted cutting, the use of coolant can create thermal stress on the inserts and lead to cracking. Therefore, it is recommended to use dry cutting for interrupted cutting.

Spindle Speed Recommendation

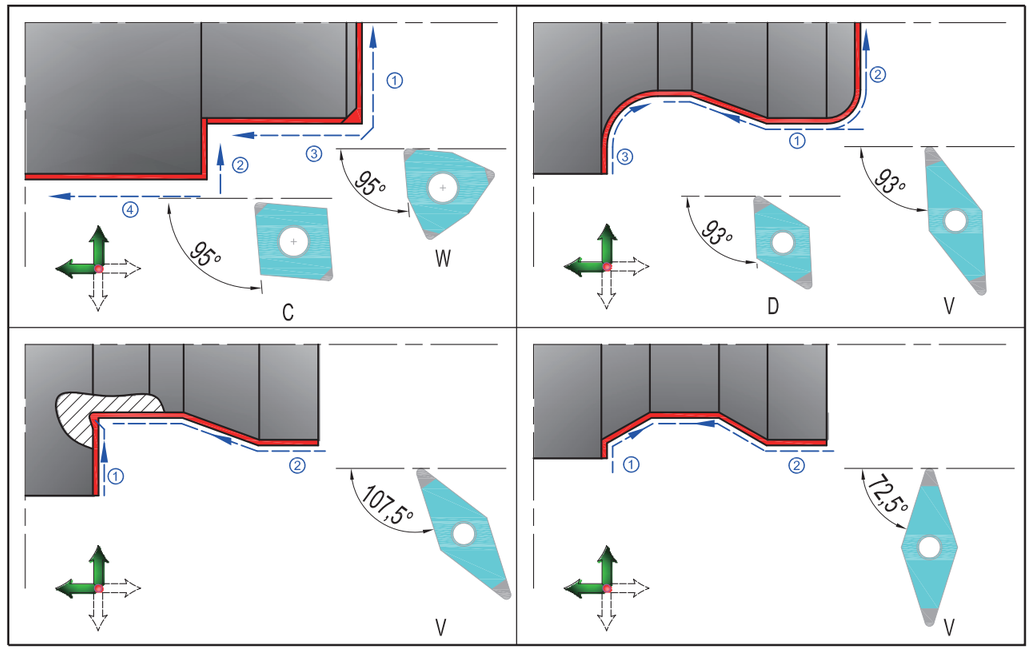
Cutting speed——Workpiece/Tool Diameter

Cutting speed Vc(m/min)	Workpiece/Tool Diameter（mm）													
	12	16	20	25	32	50	63	80	100	125	160	175	200	250
80	2123	1592	1274	1019	796	510	404	318	255	204	159	146	127	102
90	2389	1791	1433	1146	896	573	455	358	287	229	179	164	143	115
100	2654	1990	1592	1274	995	637	506	398	318	255	199	182	159	127
110	2919	2189	1752	1401	1095	701	556	438	350	280	219	200	175	140
120	3185	2389	1911	1529	1194	764	607	478	382	306	239	218	191	153
140	3715	2787	2229	1783	1393	892	708	557	446	357	279	255	223	178
160	4246	3185	2548	2038	1592	1019	809	637	510	408	318	291	255	204
180	4777	3583	2866	2293	1791	1146	910	717	573	459	358	328	287	229
200	5308	3981	3185	2548	1990	1274	1011	796	637	510	398	364	318	255
220	5839	4379	3503	2803	2189	1401	1112	876	701	561	438	400	350	280
240	6369	4777	3822	3057	2389	1529	1213	955	764	611	478	437	382	306
260	6900	5175	4140	3312	2588	1656	1314	1035	828	662	518	473	414	331
280	7431	5573	4459	3567	2787	1783	1415	1115	892	713	557	510	446	357
300		5971	4777	3822	2986	1911	1517	1194	955	764	597	546	478	382
400						2548	2022	1592	1274	1019	796	728	637	510
600						3822	3033	2389	1911	1529	1194	1092	955	764
800						5096	4044	3185	2548	2038	1592	1456	1274	1019
1000						6369	5055	3981	3185	2548	1990	1820	1592	1274

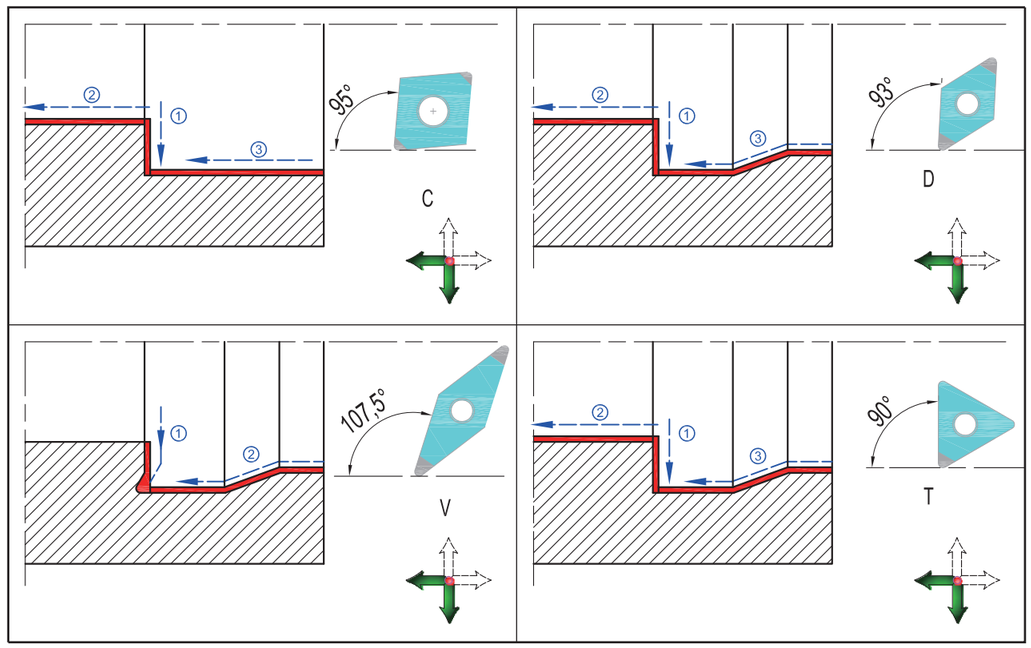
Cutting Direction Recommendation

Recommended cutting direction for turning hardened steel with PCBN tools

■External machining



■Internal machining



Comparison Table of Metal Material

Steel grade comparison table

WORLDIA

Steel grade comparison table						
Description	China	Japan	America	England	Germany	France
	GB	JIS	AISI/SAE	BS	DIN	NF
Carbon Steel	08 10	S10C	1010	040A10 045A10 045M10	C10E C10R	XC10
		S12C	1012	040A12		XC12
	15	S15C	1015	055M15	C15E C15R	
		S17C	1017			XC18
	20	S20C	1020	070M20 C22 C22E C22R	C22 C22E C22R	C22 C22E C22R
		S22C	1023			
	25	S25C	1025	C25 C25E C22R	C25 C25E C22R	C25 C25E C22R
		S28C	1029			
	30	S30C	1030	080A30 080M30 C30 C30E C30R	C30 C30E C30R	C30 C30E C30R
		S33C				
	35	S35C	1035	C35 C35E C35R	C35 C35E C35R	C35 C35E C35R
		S38C	1038			
	40	S40C	1039 1040	080M40 C40 C40E C40R	C40 C40E C40R	C40 C40E C40R
		S43C	1042 1043	080A42		
	45	S45C	1045 1046	C45 C45E C45R	C45 C45E C45R	C45 C45E C45R
		S48C		080A47		
	50	S50C	1049	080M50 C50 C50E C50R	C50 C50E C50R	C50 C50E C50R
		S53C	1050 1053			
	55	S55C	1055	070M55 C55 C55E	C55 C55E C55R	C55 C55E C55R
	60	S58C	1059 1060	C55R C60 C60E	C60 C60E	C60 C60E
		S09CK		C60R 045A10	C60R C10E	C60R XC10
				045M10		
	15F	S15CK			C15E	XC12
		S20CK				XC18

Comparison Table of Metal Material

Steel grade comparison table

Steel grade comparison table						
Description	China	Japan	America	England	Germany	France
	GB	JIS	AISI/SAE	BS	DIN	NF
Ni-Cr Steel		SNC236			36NiCr6	
	12CrNi2	SNC415			14NiCr10	
	30CrNi3	SNC631			36NiCr10	
	12Cr2Ni4	SNC815		655M13	15NiCr13	
	37CrNi3	SNC836			31NiCr14	
Ni-Cr-Mo Steel	20CrNiMo	SNCM220	8615 8617 8620 8622	805A20 805M20 805A22 805M22	20NiCrMo2 20NiCrMoS2	20NCD 2
		SNCM240	8637 8640		40NiCrMo2-2	
		SNCM415				
	18CrNiMnMoA	SNCM420	4320		17NiCrMo6-4	
		SNCM431			30CrNiMo8	
	40CrNiMoA	SNCM439	4340		40NiCrMo6	
		SNCM447			34CrNiMo6	
		SNCM616				
		SNCM625				
		SNCM630				
		SNCM815				
Chromium Steel	15Cr 15GrA	SCr415			17Cr3 17CrS3	
	20Cr	SCr420	5120			
	30Cr	SCr430	5130 5132	34Cr4 34CrS4	34Cr4 34CrS4	34Cr4 34CrS4
	35Cr	SCr435	5132	37Cr4 37CrS4	37Cr4 37CrS4	37Cr4 37CrS4
	40Cr	SCr440	5140	530M40 41Cr4 41CrS4	41Cr4 41CrS4	41Cr4 41CrS4
	45Cr 50Cr	SCr445				
Cr-Mo Steel	15CrMo	SCM415			15CrMo4	
	20CrMo	SCM418			18CrMo4 18CrMoS4	
		SCM420		708M20	20CrMo5	
		SCM421				
	30CrMo 30CrMoA	SCM430	4130			
		SCM432				
	35CrMo	SCM435	4137	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4
	42CrMo	SCM440	4140 4142	708M40 709M40 42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4
		SCM445	4145 4147			
		SCM822				

Comparison Table of Metal Material

Steel grade comparison table

WORLDIA

Steel grade comparison table						
Description	China	Japan	America	England	Germany	France
	GB	JIS	AISI/SAE	BS	DIN	NF
Mn-Cr Steel	20Mn2	SMn420	1522	150M19	20Mn5	
	30Mn2 35Mn2	SMn433	1536	150M36	34Mn5	
	40Mn2	SMn438	1541	150M36	36Mn5	
	45Mn2	SMn443	1541			
	15CrMn	SMnC420	5115		16MnCr5	
	40GrMn	SMnC443	5140			
Hardened Steel		SMn420H	1522H			
		SMn433H				
		SMn438H	1541H			
		SMn443H	1541H			
		SMnC420H				
		SMnC443H				
	15Cr1H	SCr415H			17Cr3 17CrS3	
	20Cr1H	SCr420H	5120H		17Cr3	
		SCr430H	5130H 5132H	34Cr4 34CrS4	34Cr4 34CrS4	34Cr4 34CrS4
		SCr435H	5135H	37Cr4 37CrS4	37Cr4 37CrS4	37Cr4 37CrS4
	40CrH	SCr440H	5140H	41Cr4 41CrS4	41Cr4 41CrS4	41Cr4 41CrS4
	15CrMoH	SCM415H	4118H		15CrMo5	
		SCM418H			18CrMo4 18CrMoS4	
	20CrMoH	SCM420H	4118H	708H20	18CrMo4	
		SCM435H	4135H 4137H	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4
	42CrMoH	SCM440H	4140H 4142H	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4
		SCM445H	4145H 4147H			
		SCM822H				
		SNC415H				
		SNC631H				
	12Cr2Ni4H	SNC815H		655H13	15NiCr13	
	20CrNiMoH	SNCM220H	8617H 8620H 8622H	805H17 805H20 805H22	21NiCrMo2	20N CD 2
	20CrNi2MoH	SNCM420H	4320H		20NiCrMoS6-4	
SGP	GCr4	SUJ1	51100			
	GCr15	SUJ2	52100		100Cr6	100Cr6
	GCr15SiMn	SUJ3	ASTM A 485 Grade 1			
	GCr15SiMo	SUJ4				
	GCr18Mo	SUJ5				

Comparison Table of Metal Material

Cast iron grade comparison table

Cast iron grade comparison table						
Description	China	Japan	America	England	Germany	France
	GB	JIS	AISI/SAE	BS	DIN	NF
Grey Iron	HT100	FC100	NO.20	100	GG10	
	HT150	FC150	NO.30	150	GG15	FGL150
	HT200	FC200	NO.35	200	GG20	FGL200
	HT250	FC250	NO.45	250	GG25	FGL250
	HT300	FC300	NO.50	300	GG30	FGL300
	HT350	FC350	NO.60	350	GG35	FGL350
					GG40	FGL400
Ductile Iron	QT400-18	FCD400	60-40-18	400/17	GGG40	FGS370-17
	QT450-10	FCD450	65-45-12	420/12		FGS400-12
	QT500-7	FCD500	70-50-05	500/7	GGG50	FGS500-7
	QT600-3	FCD600	80-60-03	600/7	GGG60	FGS600-2
	QT700-2	FCD700	100-70-03	700/2	GGG70	FGS700-2
	QT800-2	FCD800	120-90-02	800/2	GGG80	FGS800-2
	QT900-2			900/2		

Precautions of How to Use Turning Tools

Hazard and Countermeasure

Products	Hazard	Countermeasure
All Turning Tools	Cutting tools have sharp cutting edges, which may cause injury if handled	※Take precautions such as wearing gloves especially when handling tools and during installation
	Improper use of tools and application of inappropriate cutting conditions may cause the tool to break and be expelled from the machine providing risk of injury.	※Ensure safety guards and goggles are used ※Use tools under recommended cutting conditions ※Refer to handling explanatory notes and catalogues
	Impact load and rapid increase of cutting resistance due to excessive wear may cause the tool to break and be expelled from the machine providing risk of injury.	※Wear personal protective equipment when using tools, e.g. gloves and safety glasses ※Replace tools timely
	Expelled hot chips produced in cutting produces risk of injuries and burns	※Wear personal protective equipment when using tools, e.g. gloves and safety glasses ※During swarf removal and machine cleaning ensure the machine is stopped and wear gloves. Please use tools under safety circumstance.
	Cutting tools and workpieces become extremely hot during cutting.Touching them with bare hands may cause burns	※Wear personal protective equipment when using tools, e.g. gloves and safety glasses
	Sparks, hot chips and heat generation during cutting caused by tool breakage provides a risk of igniting a fire	※Do not use in places where there is a danger of flammability or explosion ※Take fire prevention measures when using non-water soluble cutting tools
	Using machines, chucks, and tools with poor balance at high revolutionsmay cause tools to break providing risk of injuries	※Ensure safety guards and goggles are used ※Be sure there is no vibration or unusual noise before starting the operation
	Handling machined parts with burrs using bare hands may cause injuries	※Do not touching them with bare hands
Welding and Clamping Tools	If inserts and spare parts are not held securely, they may become loose and be expelled producing risk of injuries	※Ensure inserts are brazed securely before using tools. ※Do not use them under conditions which produce very high temperature over melting point
	The inserts are in danger of damaging after several brazes	※Use them strictly for the prescribed application
	Machinery or tools may break if used in applications not recommended by the manufacturer	※Use them strictly for the prescribed application
	If the inserts are not securely fastened during machining, there is a risk of it becoming loose, damaged, or unusable.	※Ensure that there are no foreign objects present before installing the inserts. ※Confirm stability and use only the tools prescribed application by the manufacturer.
	Clamping inserts and spare parts too tightly by using tools such as extension pipes may cause them to break and be expelled	※Do not use any auxiliary tool such as extension pipes ※Please use the suitable wrench
	When applying high cutting speed, spare parts and inserts may be expelled due to centrifugal force. Pay special attention to safety	※Use tools under recommended cutting conditions ※Refer to handling explanatory notes and catalogues

NOTE: This catalogue provides essential safety precautions for the proper use of our company's products.
For further information, please refer to the guideline, catalogues or contact support team. We are not responsible for any accidents from the any unauthorized modifications.