



PCBN Turning Inserts

Coating/ Wiper / Chip-breaker



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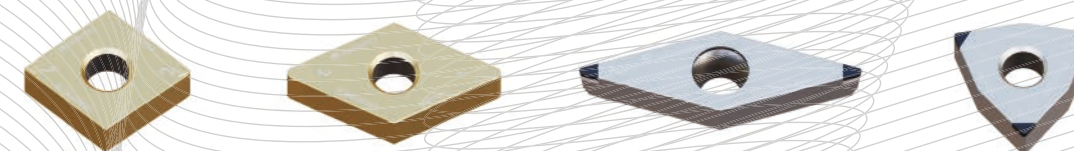
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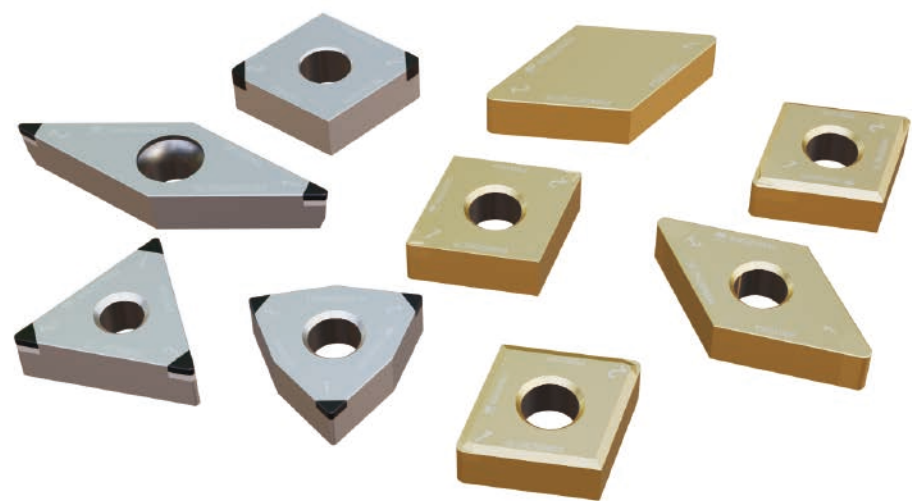
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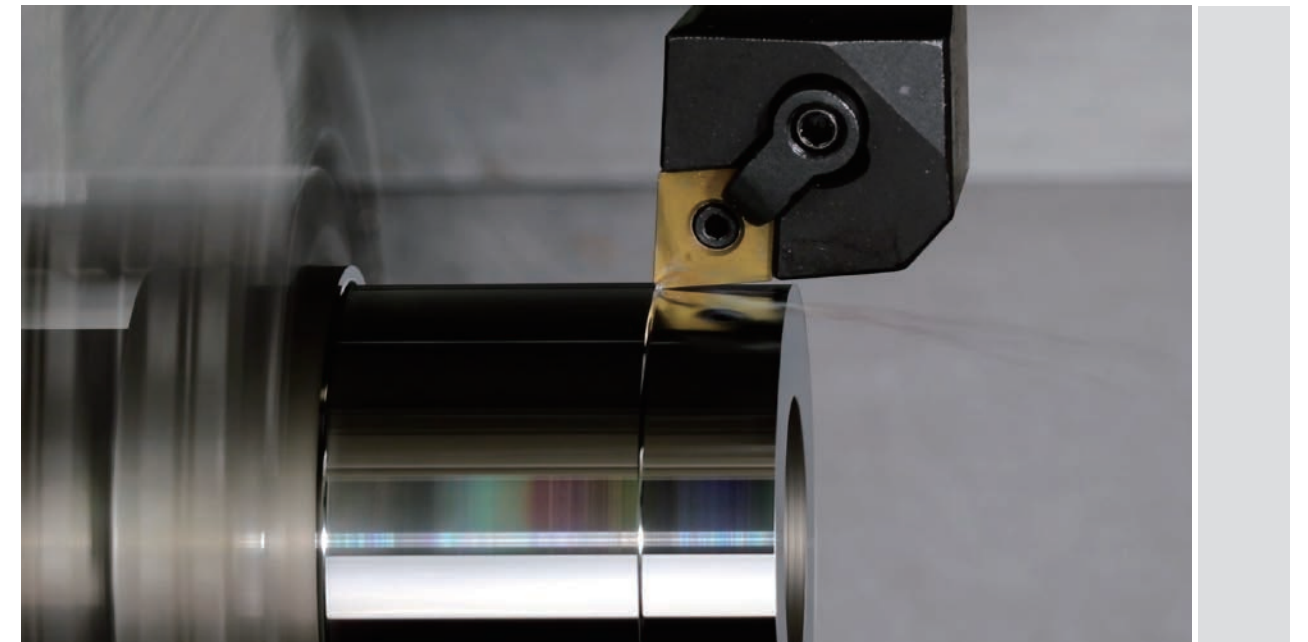
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Worldia PCBN Overview

Coating/ Wiper / Chip-breaker



Introduction:

Cubic boron nitride (CBN) is the second hardest material in the world invented successfully in 1957; 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

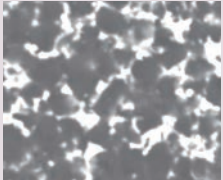
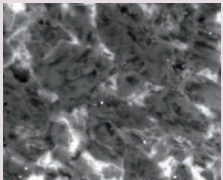
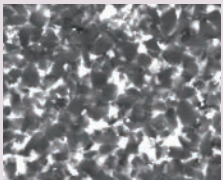
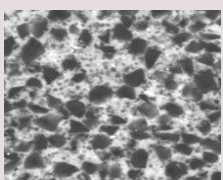
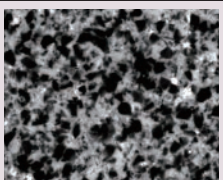
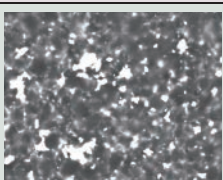
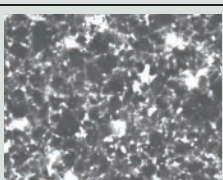
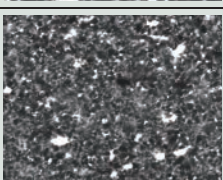
Hardened Steel Machining

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-feed featuring 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		
 Cutting Type	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

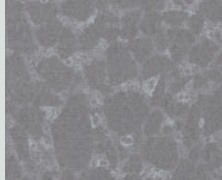
★ This mark indicates this material is the preferred material, depending on the actual working condition

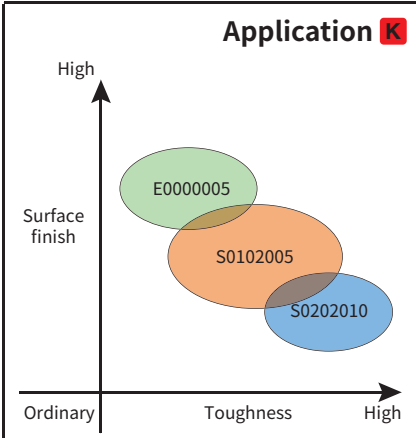
Cast Iron Machining

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

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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

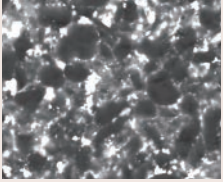
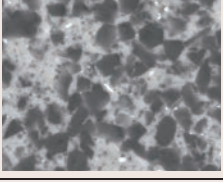
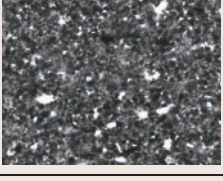
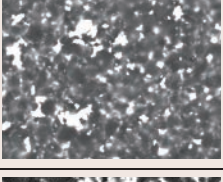
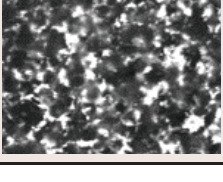
Application K  High Surface finish Ordinary Toughness High Sharp Cutting Edge: E0000005 Standard Cutting Edge: S0102005 Strong Cutting Edge: S0202010	Cutting Data Recommendation					
	Material to be machined		PCBN Grade	Cutting Recommendation		
	Material	Specification		Cutting Speed Vc(m/min)	Feed Rate 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	0.1-0.5	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
	Ductile Iron	QT500-700	PNK3020	350-1000	0.1-0.5	0.1-3
			PNK0122	250-350	0.1-0.3	0.1-0.5
			PNK0126	300-600	0.1-0.3	0.1-0.5

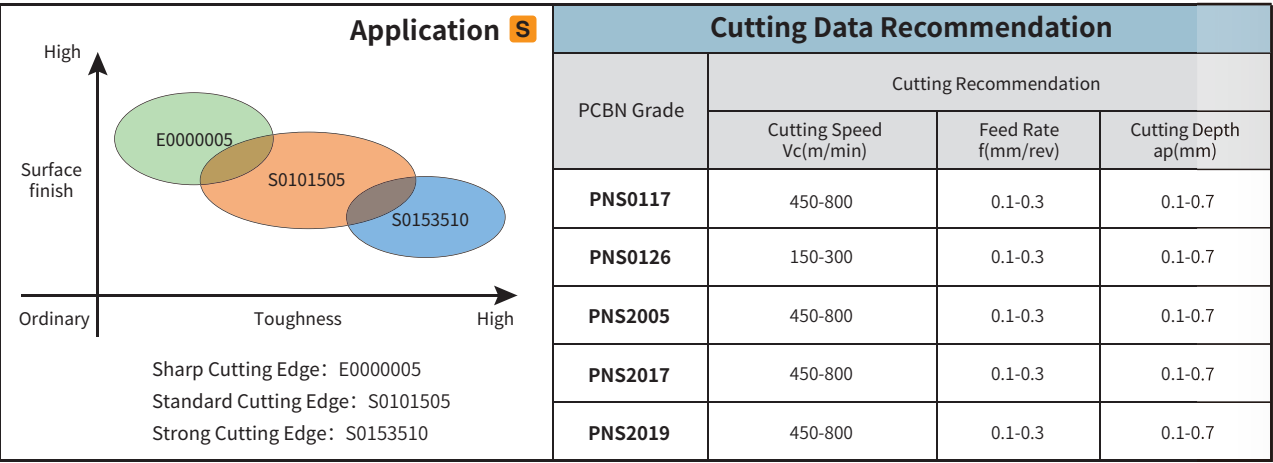
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PCBN Material Introduction **S**

Hardened steel / Cast iron / Powder metallurgy

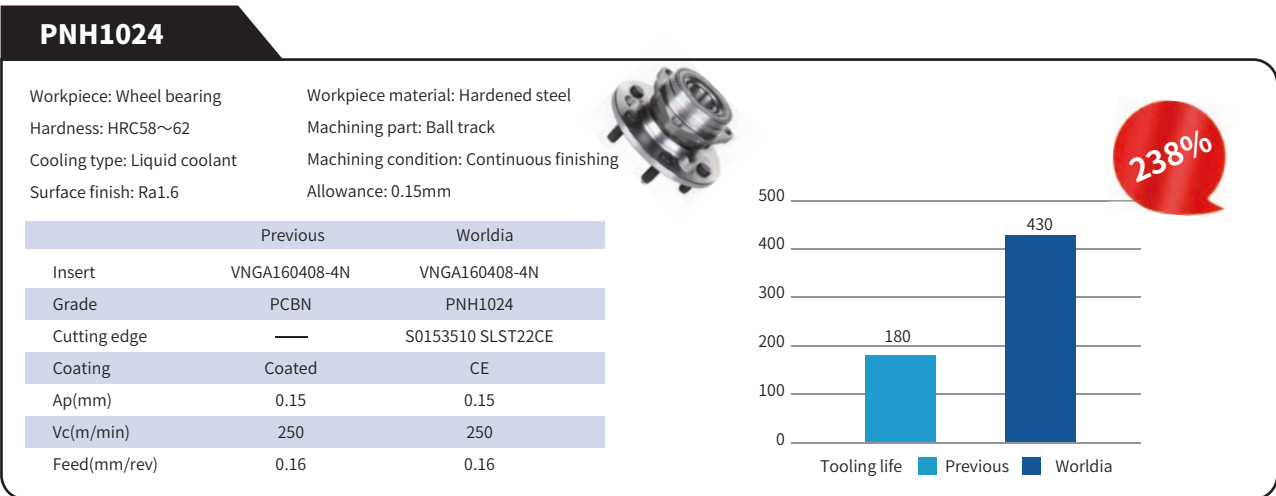
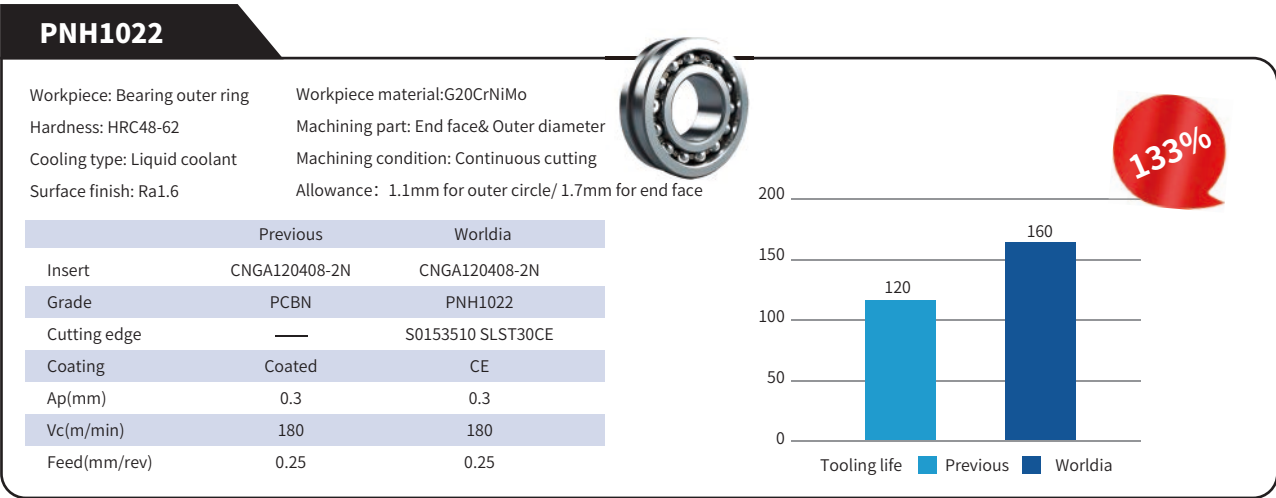
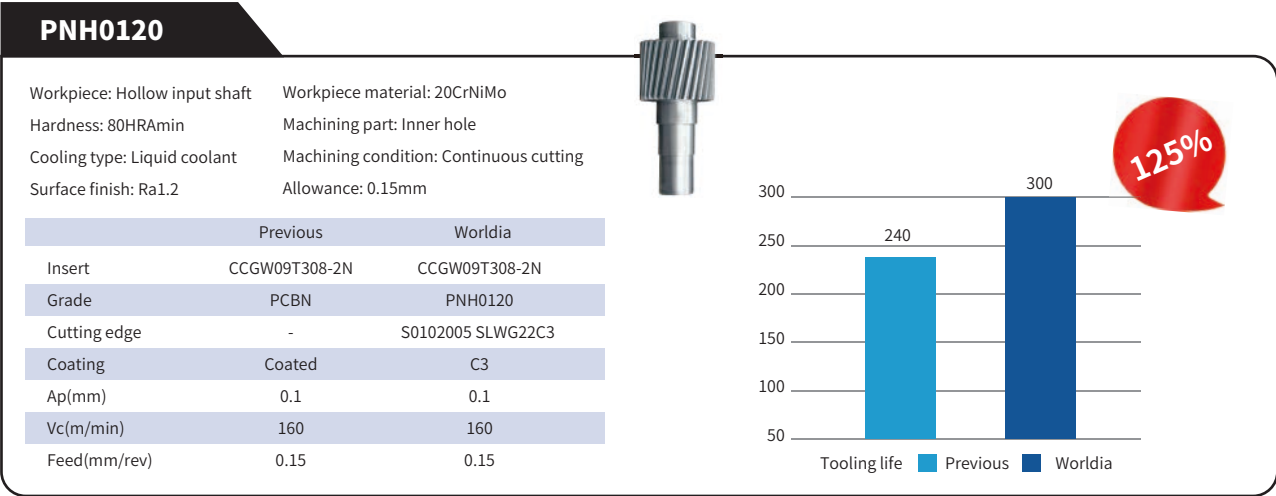
Powder metallurgy Machining

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 interrupted cutting of powder metallurgy featuring excellent toughness and wear resistance



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

Application Case Studies and Worldia Recommendations



Application Case Studies and Worldia Recommendations

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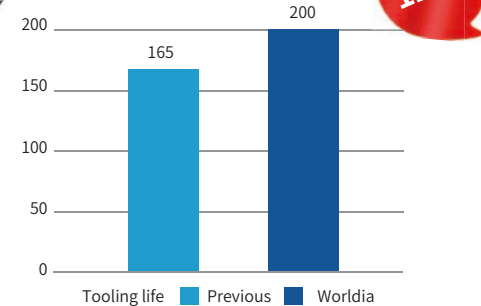
PNH2016

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



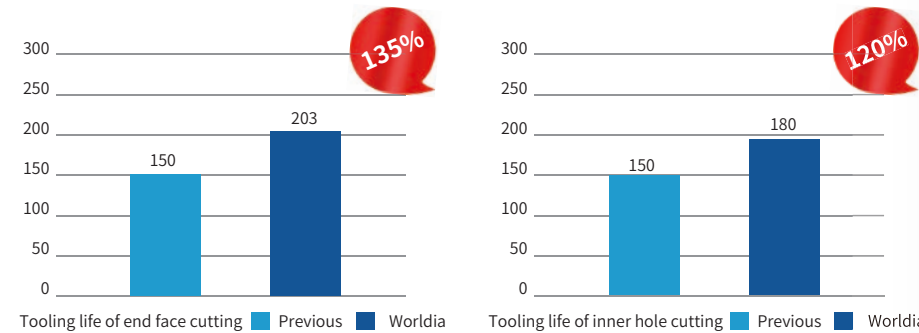
	Previous	Worldia
Insert	VCGW110304-2N	VCGW110304-2N
Grade	PCBN	PNH2016
Cutting edge	—	S0152510 SLST22C3
Coating	Coated	C3
Ap(mm)	0.08	0.08
Vc(m/min)	120	120
Feed(mm/rev)	0.15	0.15



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



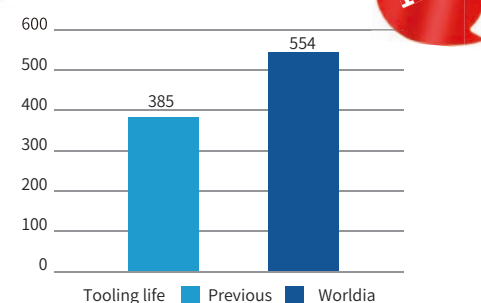
PNH3019

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 interrupted 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



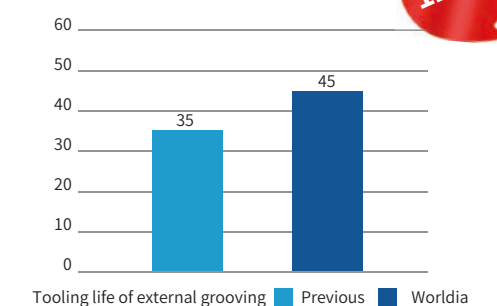
PNH3023

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



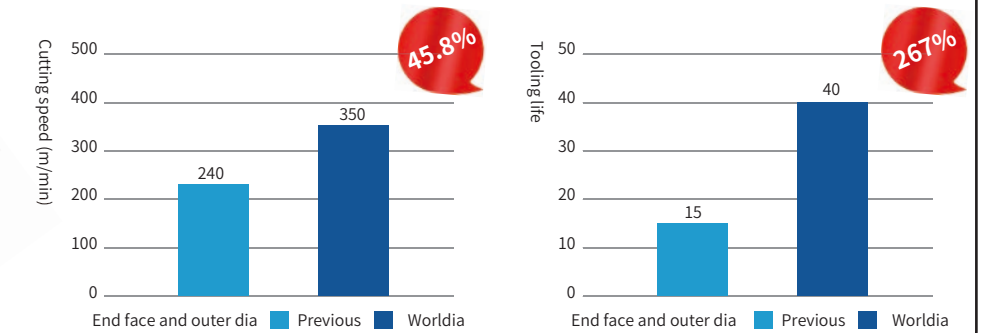
	Previous	Worldia
Insert	VNGA160404-2N	VNGA160404-2N
Grade	PCBN	PNH3023
Cutting edge	—	S0152510 SLST22C3
Coating	Coated	C3
Ap(mm)	0.2	0.2
Vc(m/min)	90	90
Feed(mm/rev)	0.06	0.06



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



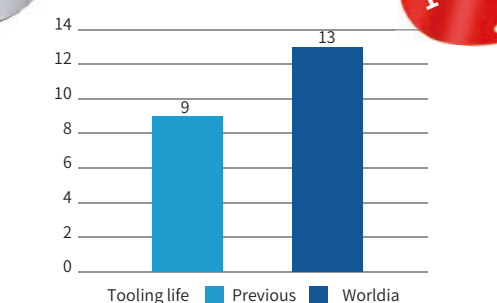
PNK0122

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

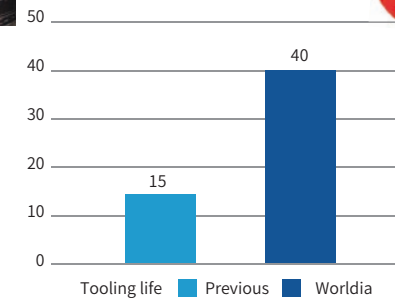
PNK0126

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



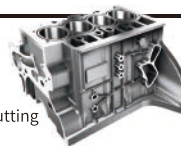
	Previous	Worldia
Insert	DNCA150408-2N	DNCA150408-2N
Grade	PCBN	PNK0126
Cutting edge	—	S0102005 SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.2	0.2
Vc(m/min)	130	130
Feed(mm/rev)	0.2	0.2



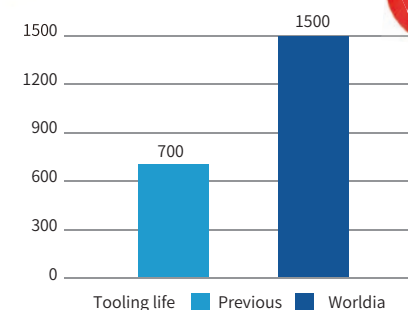
PNK3003

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



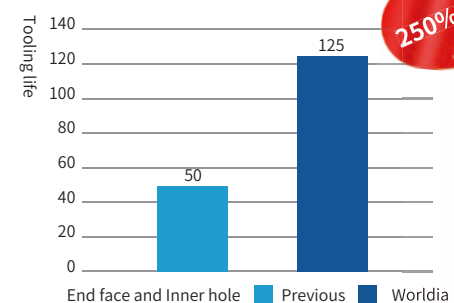
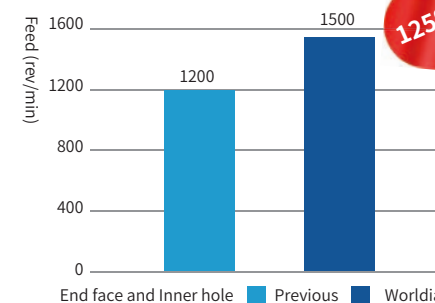
	Previous	Worldia
Insert	CCGW09T308-2N	CCGW09T308-2N
Grade	PCBN	PNK3003
Cutting edge	—	S0102005 SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.065/0.2	0.065/0.2
Vc(m/min)	745	745
Feed(mm/rev)	0.15	0.15



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

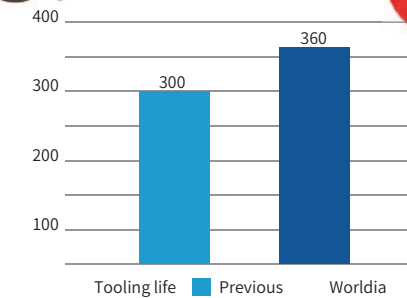
PNS2007

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



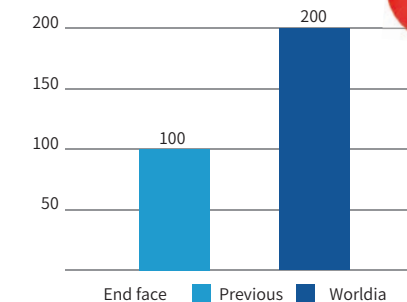
PNS2019

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



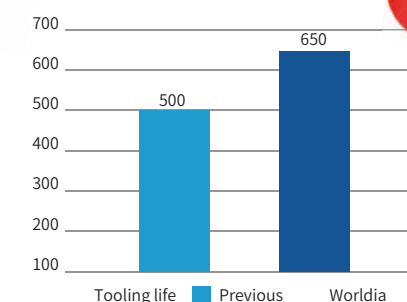
PNS2019

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



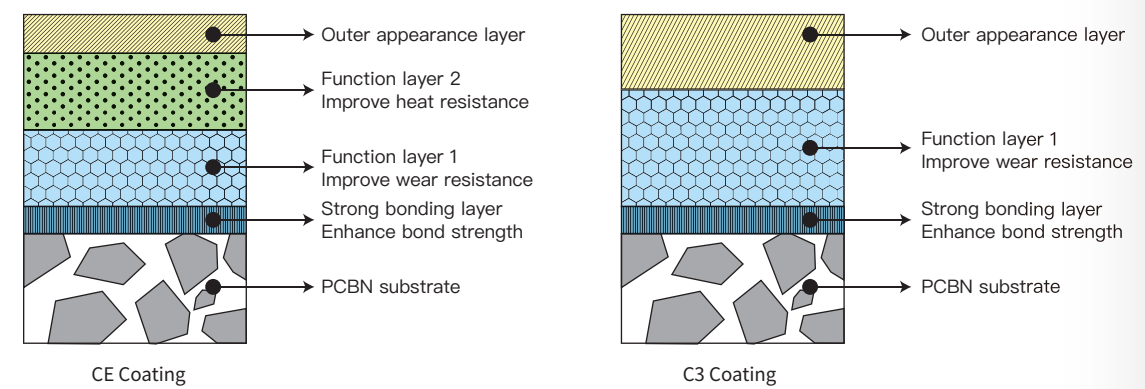
	Previous	Worldia
Insert	VBGW160408-2N	VBGW160408-2N
Grade	PCBN	PNS2019
Cutting edge	—	S0101505 SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.3	0.3
Vc(m/min)	210	210
Feed(mm/rev)	0.1	0.1



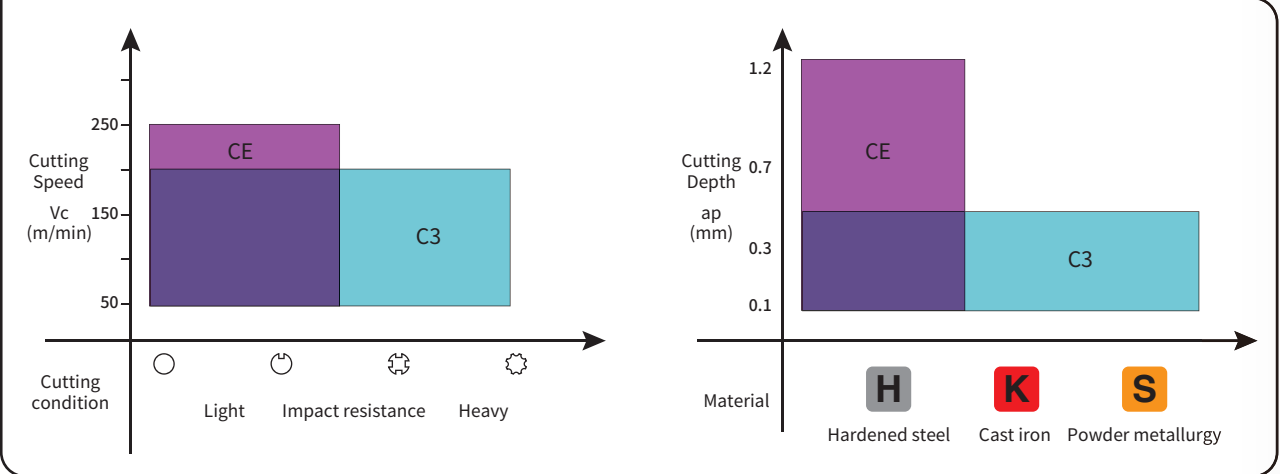
Coating Introduction

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.

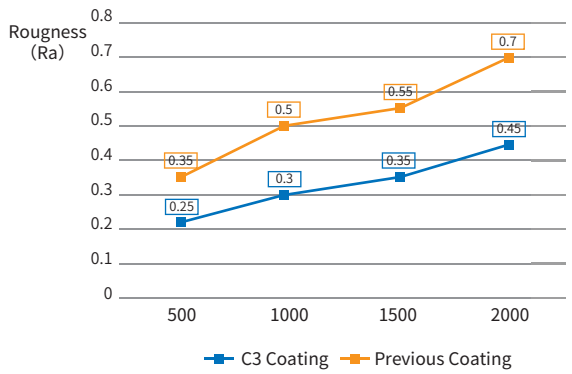
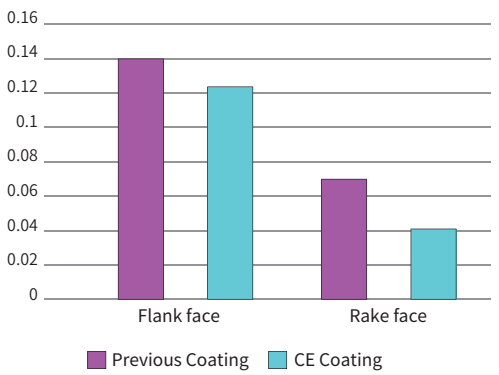
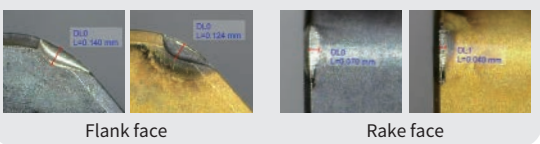


Application of CE/ C3 Coating



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
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

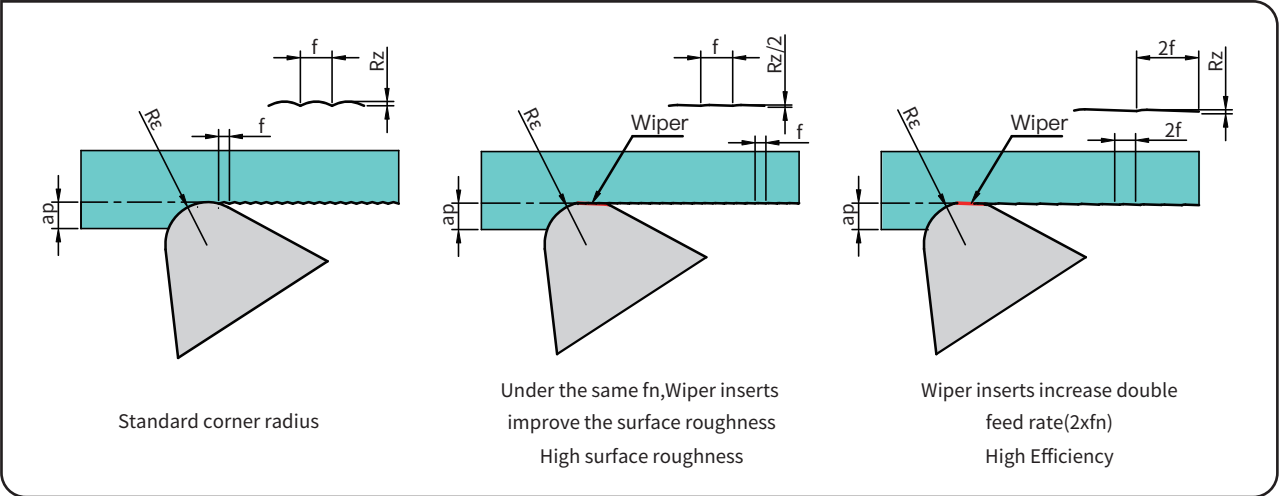
Wiper Introduction

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.



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

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

$R_z(\mu m)$: Theoretical surface roughness
 $f(mm/rev)$: Feed per revolution
 $r_\epsilon(mm)$: 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.

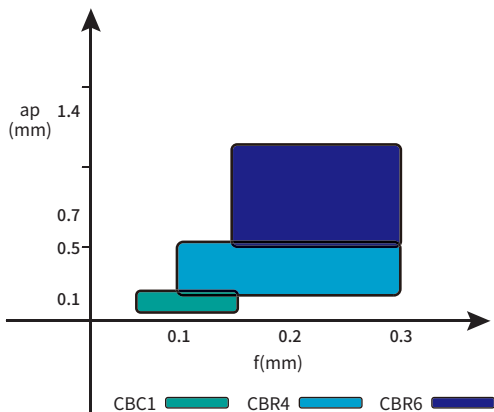
Chip Breaker Introduction

CBC1/CBR4

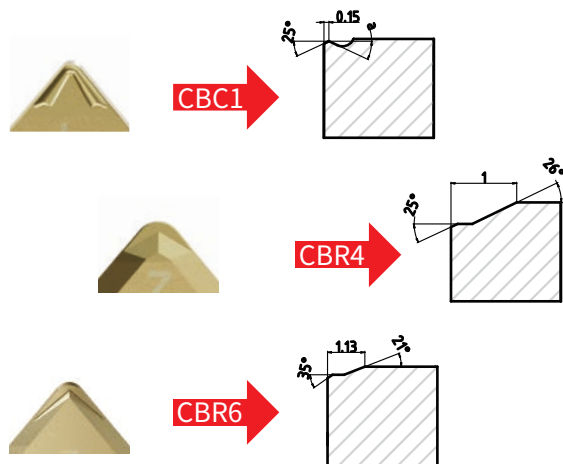


In the cutting process, long continuous chip will cause many problems such as long chip will be wrapped around the surface of the work piece, the surface is scratched, the tool life is unstable, repeated positioning is not accurate, the manipulator can not work normally, the automatic detection system 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



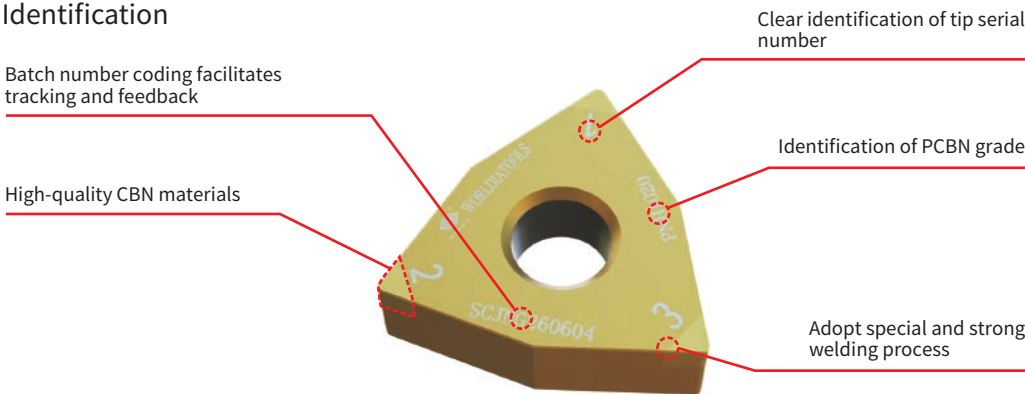
Workpiece Material: 20CrMoTi HRC58-62
Parameter: CNGA120408-2N SLCBR640CE
Cutting Data: Vc=130m/min f=0.15mm/rev ap=1.3 干切

Identification Code and Package Instruction

Hardened steel, cast iron powder metallurgy

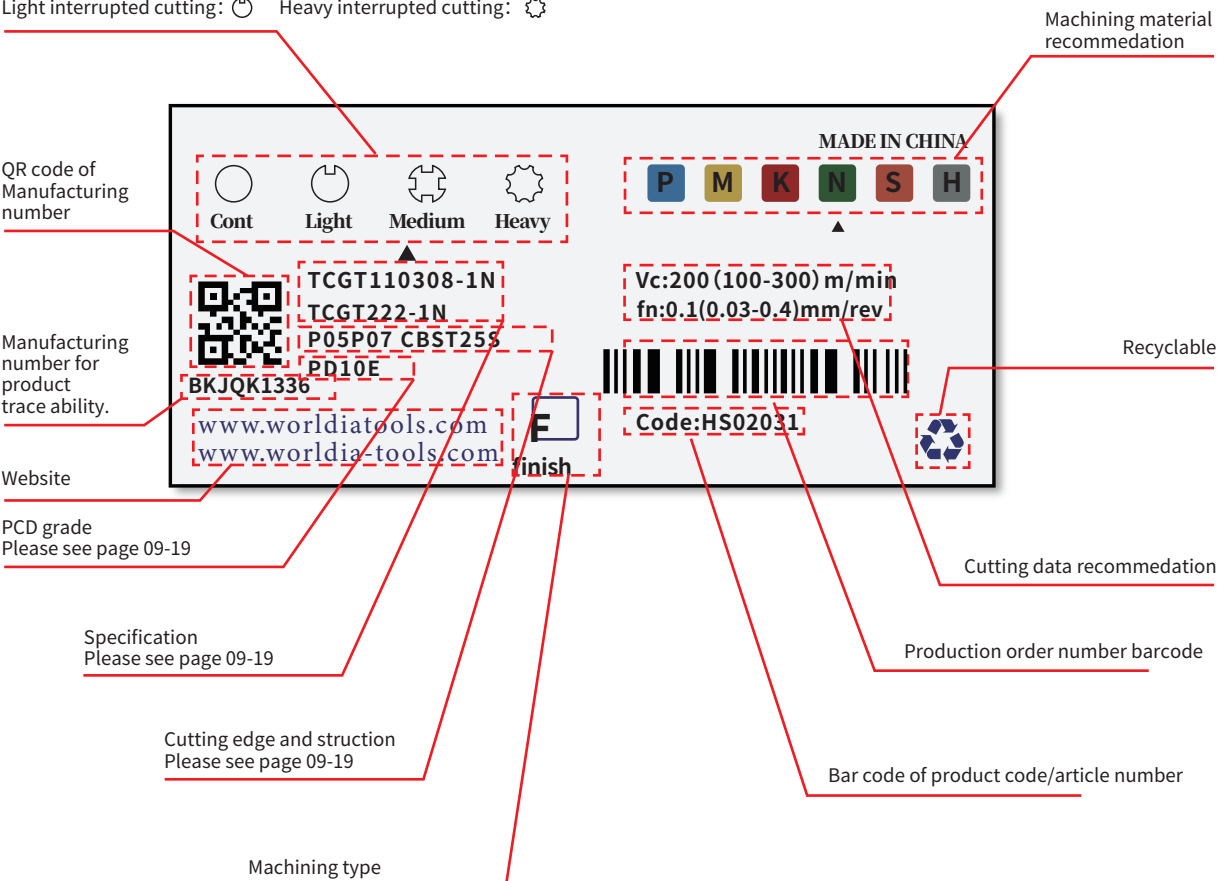


Insert Identification



Label Identification

Continuous cutting: ○ Medium interrupted cutting: ⚙
Light interrupted cutting: ☺ Heavy interrupted cutting: ⚙



Nomenclature

Rule of Worldia PCBN Insert Code

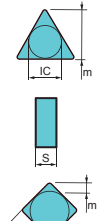
ISO

Standard,Chipbreaker				Edges		Chamfered Angle		Cutting Edge Length									
Clearance Angle		Thickness		Cutting Edge Design		Type											
C	C	M	W	09	T3	04	-2	N	S	010	20	05	CB	ST	30	S	PNH1020
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Shape		Inscribed Circle Dia.		Cutting Direction		Honed Size		Surface Treatment									
Tolerance-ISO		Tip radius		Chamfered Width		Cutting Edge Design											

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

2.Clearance Angle			
	A		E
	B		F
	C		G
	D		N
			P
			O

4.Standard, Chipbreaker			
	N		G
	R		W
	F		T
	A		Q
	M		U
			Others
			X

3.Tolerance-ISO								
	Code	Tolerance			Code	inch		
		m	s	IC		m	ic	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	

5.Inscribed Circle Dia.									
ISO								ANSI	
Edge length (accoring insert shape)							Inscribed Circle Dia.	Code	IC Size
C	D	R	S	T	V	W	mm		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		ANSI	
Code	Size	Code	Size
S	mm	S	inch
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		ANSI	
Code	Size	Code	Size
R _e	mm	R _e	inch
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

ANSI	Standard,Chipbreaker				Edges		Chamfered Angle		Cutting Edge Length								
	Clearance Angle		Thickness		Cutting Edge Design		Type										
	C	C	M	W	3	(2.5)	1-1	N	S	010	20	05	CB	ST	30	S	PNH1020
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Shape		Inscribed Circle Dia.		Cutting Direction		Honed Size		Surface Treatment								
	Tolerance-ISO		Tip radius		Chamfered Width		Cutting Edge Design										

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		□□WGR22S	2				0.4	
	060208-2N	2(1.5)2-2N		□□CBR422S	2				0.8	
	CCGW060202-2N	CCGW2(1.5)(0.5)-2N		□□ST30S	2				0.2	
	060204-2N	2(1.5)1-2N		□□WGR30S	2				0.4	
	060208-2N	2(1.5)2-2N		□□CBR430S	2				0.8	
	CCGW060202-2N	CCGW2(1.5)(0.5)-2N		□□ST30S	2				0.2	
	060204-2N	2(1.5)1-2N		□□WGR30S	2				0.4	
	060208-2N	2(1.5)2-2N		□□CBR430S	2				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		□□WGR30S	2				0.4	
	060208-2N	2(1.5)2-2N		□□CBR430S	2				0.8	
	CCGW060202-2N	CCGW2(1.5)(0.5)-2N		□□ST30S	2				0.2	
	060204-2N	2(1.5)1-2N		□□WGR30S	2				0.4	
	060208-2N	2(1.5)2-2N		□□CBR430S	2				0.8	
	CCGW060202-2N	CCGW2(1.5)(0.5)-2N		□□ST30S	2				0.2	
	060204-2N	2(1.5)1-2N		□□WGR30S	2				0.4	
	060208-2N	2(1.5)2-2N		□□CBR430S	2				0.8	

NOTE: The inserts with corner radius of R0.2 are only available in C3 coated or uncoated

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		□□WGR22S	2				0.8	
	09T312-2N	3(2.5)3-2N		□□CBR422S	2				1.2	
	CCGW09T304-2N	CCGW3(2.5)1-2N		□□ST30S	2				0.4	
	09T308-2N	3(2.5)2-2N		□□WGR30S	2				0.8	
	09T312-2N	3(2.5)3-2N		□□CBR430S	2				1.2	
	CCGW09T304-2N	CCGW3(2.5)1-2N		□□ST30S	2				0.4	
	09T308-2N	3(2.5)2-2N		□□WGR30S	2				0.8	
	09T312-2N	3(2.5)3-2N		□□CBR430S	2				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		□□WGR30S	2				0.8	
	09T312-2N	3(2.5)3-2N		□□CBR430S	2				1.2	
	CCGW09T304-2N	CCGW3(2.5)1-2N		□□ST30S	2				0.4	
	09T308-2N	3(2.5)2-2N		□□WGR30S	2				0.8	
	09T312-2N	3(2.5)3-2N		□□CBR430S	2				1.2	
	CCGW09T304-2N	CCGW3(2.5)1-2N		□□ST30S	2				0.4	
	09T308-2N	3(2.5)2-2N		□□WGR30S	2				0.8	
	09T312-2N	3(2.5)3-2N		□□CBR430S	2				1.2	

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	CCGW120404-2N	CCGW431-2N		□□ST22S	2	12.7	5.5	4.76	0.4	2.2
	120408-2N	432-2N		□□WGR22S	2				0.8	
	120412-2N	433-2N		□□CBR422S	2				1.2	
	CCGW120404-2N	CCGW431-2N		□□ST30S	2				0.4	
	120408-2N	432-2N		□□WGR30S	2				0.8	
	120412-2N	433-2N		□□CBR430S	2				1.2	
	CCGW120404-2N	CCGW431-2N		□□ST30S	2				0.4	
	120408-2N	432-2N		□□WGR30S	2				0.8	
	120412-2N	433-2N		□□CBR430S	2				1.2	
 Standard type	CCGW120404-2N	CCGW431-2N		□□ST30S	2	12.7	5.5	4.76	0.4	3.0
	120408-2N	432-2N		□□WGR30S	2				0.8	
	120412-2N	433-2N		□□CBR430S	2				1.2	
	CCGW120404-2N	CCGW431-2N		□□ST30S	2				0.4	
	120408-2N	432-2N		□□WGR30S	2				0.8	
	120412-2N	433-2N		□□CBR430S	2				1.2	
	CCGW120404-2N	CCGW431-2N		□□ST30S	2				0.4	
	120408-2N	432-2N		□□WGR30S	2				0.8	
	120412-2N	433-2N		□□CBR430S	2				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		□□WGR22S (107.5°)	2				0.4	
	070208-2N	2(1.5)2-2N		□□CBR422S	2				0.8	
	DCGW070202-2N	DCGW2(1.5)(0.5)-2N		□□ST30S	2				0.2	
	070204-2N	2(1.5)1-2N		□□WGR30S (107.5°)	2				0.4	
	070208-2N	2(1.5)2-2N		□□CBR430S	2				0.8	
	DCGW070202-2N	DCGW2(1.5)(0.5)-2N		□□ST30S	2				0.2	
	070204-2N	2(1.5)1-2N		□□WGR30S (107.5°)	2				0.4	
	070208-2N	2(1.5)2-2N		□□CBR430S	2				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		□□WGR30S (107.5°)	2				0.4	
	070208-2N	2(1.5)2-2N		□□CBR430S	2				0.8	
	DCGW070202-2N	DCGW2(1.5)(0.5)-2N		□□ST30S	2				0.2	
	070204-2N	2(1.5)1-2N		□□WGR30S (107.5°)	2				0.4	
	070208-2N	2(1.5)2-2N		□□CBR430S	2				0.8	
	DCGW070202-2N	DCGW2(1.5)(0.5)-2N		□□ST30S	2				0.2	
	070204-2N	2(1.5)1-2N		□□WGR30S (107.5°)	2				0.4	
	070208-2N	2(1.5)2-2N		□□CBR430S	2				0.8	

NOTE: The inserts with corner radius of R0.2 are only available in C3 coated or uncoated

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			2	9.525	4.4	3.97	0.4	2.2
	11T308-2N	3(2.5)2-2N			2				0.8	
	11T312-2N	3(2.5)3-2N			2				1.2	
	DCGW11T304-2N	DCGW3(2.5)1-2N			2				0.4	
	11T308-2N	3(2.5)2-2N			2				0.8	
	11T312-2N	3(2.5)3-2N			2				1.2	
	DCGW11T304-2N	DCGW3(2.5)1-2N			2				0.4	
	11T308-2N	3(2.5)2-2N			2				0.8	
	11T312-2N	3(2.5)3-2N			2				1.2	
 Standard type	DCGW11T304-2N	DCGW3(2.5)1-2N			2	9.525	4.4	3.97	0.4	3.0
	11T308-2N	3(2.5)2-2N			2				0.8	
	11T312-2N	3(2.5)3-2N			2				1.2	
	DCGW11T304-2N	DCGW3(2.5)1-2N			2				0.4	
	11T308-2N	3(2.5)2-2N			2				0.8	
	11T312-2N	3(2.5)3-2N			2				1.2	
	DCGW11T304-2N	DCGW3(2.5)1-2N			2				0.4	
	11T308-2N	3(2.5)2-2N			2				0.8	
	11T312-2N	3(2.5)3-2N			2				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			2	12.7	5.5	4.76	0.4	2.2
	150408-2N	432-2N			2				0.8	
	150412-2N	433-2N			2				1.2	
	DCGW150404-2N	DCGW431-2N			2				0.4	
	150408-2N	432-2N			2				0.8	
	150412-2N	433-2N			2				1.2	
	DCGW150404-2N	DCGW431-2N			2				0.4	
	150408-2N	432-2N			2				0.8	
	150412-2N	433-2N			2				1.2	
 Standard type	DCGW150404-2N	DCGW431-2N			2	12.7	5.5	4.76	0.4	3.0
	150408-2N	432-2N			2				0.8	
	150412-2N	433-2N			2				1.2	
	DCGW150404-2N	DCGW431-2N			2				0.4	
	150408-2N	432-2N			2				0.8	
	150412-2N	433-2N			2				1.2	
	DCGW150404-2N	DCGW431-2N			2				0.4	
	150408-2N	432-2N			2				0.8	
	150412-2N	433-2N			2				1.2	

PCBN insert -Hardened Steel

Tipped Inserts

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			4	9.525	4.4	3.97	0.4	2.2
	09T308-4N	3(2.5)2-4N			4				0.8	
	09T312-4N	3(2.5)3-4N			4				1.2	
	SCGW09T304-4N	SCGW3(2.5)1-4N			4				0.4	
	09T308-4N	3(2.5)2-4N			4				0.8	
	09T312-4N	3(2.5)3-4N			4				1.2	
	SCGW09T304-4N	SCGW3(2.5)1-4N			4				0.4	
	09T308-4N	3(2.5)2-4N			4				0.8	
	09T312-4N	3(2.5)3-4N			4				1.2	
 Standard type	SCGW09T304-4N	SCGW3(2.5)1-4N			4	9.525	4.4	3.97	0.4	3.0
	09T308-4N	3(2.5)2-4N			4				0.8	
	09T312-4N	3(2.5)3-4N			4				1.2	
	SCGW09T304-4N	SCGW3(2.5)1-4N			4				0.4	
	09T308-4N	3(2.5)2-4N			4				0.8	
	09T312-4N	3(2.5)3-4N			4				1.2	
	SCGW09T304-4N	SCGW3(2.5)1-4N			4				0.4	
	09T308-4N	3(2.5)2-4N			4				0.8	
	09T312-4N	3(2.5)3-4N			4				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			4	12.7	5.5	4.76	0.4	2.2
	120408-4N	432-4N			4				0.8	
	120412-4N	433-4N			4				1.2	
	SCGW120404-4N	SCGW431-4N			4				0.4	
	120408-4N	432-4N			4				0.8	
	120412-4N	433-4N			4				1.2	
	SCGW120404-4N	SCGW431-4N			4				0.4	
	120408-4N	432-4N			4				0.8	
	120412-4N	433-4N			4				1.2	
 Standard type	SCGW120404-4N	SCGW431-4N			4	12.7	5.5	4.76	0.4	3.0
	120408-4N	432-4N			4				0.8	
	120412-4N	433-4N			4				1.2	
	SCGW120404-4N	SCGW431-4N			4				0.4	
	120408-4N	432-4N			4				0.8	
	120412-4N	433-4N			4				1.2	
	SCGW120404-4N	SCGW431-4N			4				0.4	
	120408-4N	432-4N			4				0.8	
	120412-4N	433-4N			4				1.2	

PCBN insert -Hardened Steel

Tipped Inserts

TC/TP	60°Square-Positive-With hole PCBN Positive	H			
		Applications			
		Structure	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
	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
	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

NOTE: The inserts with corner radius of R0.2 are only available in C3 coated or uncoated

TC/TP	60°Square-Positive-With hole PCBN Positive	H			
		Applications			
		Structure	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
	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
 Standard type	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
 Standard type	090208-3N	(1.8)(1.5)2-3N							0.8

NOTE: The inserts with corner radius of R0.2 are only available in C3 coated or uncoated

PCBN insert -Hardened Steel

Tipped Inserts



TC/TP	60°Square-Positive-With hole PCBN Positive	H			
		Applications			
		Structure	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
	110304-3N	221-3N							0.4
	110308-3N	222-3N							0.8
	TPGW110302-3N	TPGW22(0.5)-3N		□□CBR422S	3	6.35	3.3	3.18	0.2
 Standard type	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
 Standard type	110308-3N	222-3N							0.8
	TCGW110302-3N	TCGW22(0.5)-3N		□□ST30S	3	6.35	2.8	3.18	0.2
	110304-3N	221-3N							0.4
	110308-3N	222-3N							0.8
 Standard type	TPGW110302-3N	TPGW22(0.5)-3N		□□CBR430S	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		□□ST30S	3	6.35	3.3	3.18	0.2
 Standard type	110304-3N	221-3N							0.4
	110308-3N	222-3N							0.8

NOTE: The inserts with corner radius of R0.2 are only available in C3 coated or uncoated

PCBN insert -Hardened Steel

Tipped Inserts

TC/TP	60°Square-Positive-With hole PCBN Positive	H			
		Applications			
		Structure	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

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

PCBN insert -Hardened Steel

Tipped Inserts

TC/TP	60°Square-Positive-With hole PCBN Positive	H			
		Applications			
		Structure	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

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

PCBN insert -Hardened Steel

Tipped Inserts

VB/VC	35°rhombic-Positive-With hole PCBN Positive	H			
		Applications			
		Structure	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

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

NOTE: The inserts with corner radius of R0.2 are only available in C3 coated or uncoated

PCBN insert -Hardened Steel

Tipped Inserts

VB/VC	35°rhombic-Positive-With hole PCBN Positive	H			
		Applications			
		Structure	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

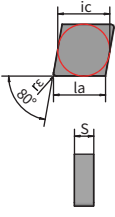
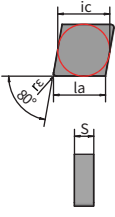
Shape	ISO	ANSI	Tips forming	Cutting edges	ic	φd	S	r	la
 Conventional mini type	VBGW160404-2N	VBGW331-2N		□□ST22S	2	9.525	4.4	4.76	0.4
	160408-2N	332-2N							0.8
	160412-2N	333-2N							1.2
	VBGW160404-2N	VBGW331-2N		□□CBR422S	2	9.525	4.4	4.76	0.4
	160408-2N	332-2N							0.8
	160412-2N	333-2N							1.2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

PCBN insert -Hardened Steel

Solid/ Tipped Inserts

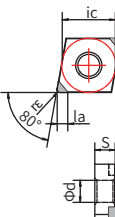
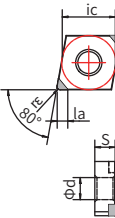
CN	80° rhombic-Negative-Solid
	PCBN Negative

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		SSWGR90S	4				0.8	
	090312-4N	323-4N			4				1.2	
	CNGN090304-4N	CNGN321-4N		SSWGR90S	4				0.4	
	090308-4N	322-4N		SSWGR90S	4				0.8	
	090312-4N	323-4N			4				1.2	
	CNGN090304-4N	CNGN321-4N		SSCBR490S	4				0.4	
	090308-4N	322-4N		SSCBR490S	4				0.8	
	090312-4N	323-4N			4				1.2	
	CNGN090404-4N	CNGN331-4N		SSST90S	4	9.525	—	4.76	0.4	9
	090408-4N	332-4N		SSWGR90S	4				0.8	
	090412-4N	333-4N			4				1.2	
	CNGN090404-4N	CNGN331-4N		SSWGR90S	4				0.4	
	090408-4N	332-4N		SSWGR90S	4				0.8	
	090412-4N	333-4N			4				1.2	
	CNGN090404-4N	CNGN331-4N		SSCBR490S	4				0.4	
	090408-4N	332-4N		SSCBR490S	4				0.8	
	090412-4N	333-4N			4				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
	CNGA120404-2N	CNGA431-2N		□□ST22S	2	12.7	5.16	5.16	0.4	2.2
	120408-2N	432-2N		□□WGR22S	2				0.8	
	120412-2N	433-2N			2				1.2	
	CNGA120404-2N	CNGA431-2N		□□WGR22S	2				0.4	
	120408-2N	432-2N		□□WGR22S	2				0.8	
	120412-2N	433-2N			2				1.2	
	CNGA120404-2N	CNGA431-2N		□□CBR422S	2				0.4	
	120408-2N	432-2N		□□CBR422S	2				0.8	
	120412-2N	433-2N			2				1.2	
	CNGA120404-2N	CNGA431-2N		□□ST30S	2	12.7	5.16	5.16	0.4	3.0
	120408-2N	432-2N		□□ST30S	2				0.8	
	120412-2N	433-2N			2				1.2	
	CNGA120404-2N	CNGA431-2N		□□WGR30S	2				0.4	
	120408-2N	432-2N		□□WGR30S	2				0.8	
	120412-2N	433-2N			2				1.2	
	CNGA120404-2N	CNGA431-2N		□□CBR430S	2				0.4	
	120408-2N	432-2N		□□CBR430S	2				0.8	
	120412-2N	433-2N			2				1.2	

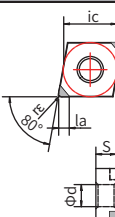
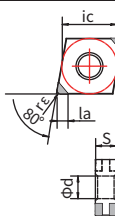
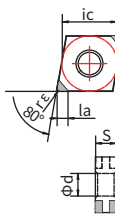
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PCBN insert -Hardened Steel

Tipped insert

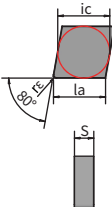
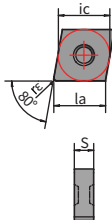
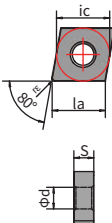
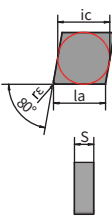
CN	80° rhombic-Negative-With hole
	PCBN Negative

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
	CNGA120408-2N	CNGA432-2N		□□ST40S	2	12.7	5.16	4.76	0.8	4.0
	120412-2N	433-2N		□□WGR40S	2				1.2	
	120416-2N	434-2N			2				1.6	
	CNGA120408-2N	CNGA432-2N		□□WGR40S	2				0.8	
	120412-2N	433-2N		□□WGR40S	2				1.2	
	120416-2N	434-2N			2				1.6	
	CNGA120408-2N	CNGA432-2N		□□CBR640S	2				0.8	
	120412-2N	433-2N		□□CBR640S	2				1.2	
	120416-2N	434-2N			2				1.6	
	CNGA120404-4N	CNGA431-4N		□□ST22S	4	12.7	5.16	4.76	0.4	2.2
	120408-4N	432-4N		□□WGR22S	4				0.8	
	120412-4N	433-4N			4				1.2	
	CNGA120404-4N	CNGA431-4N		□□WGR22S	4				0.4	
	120408-4N	432-4N		□□WGR22S	4				0.8	
	120412-4N	433-4N			4				1.2	
	CNGA120404-4N	CNGA431-4N		□□CBR422S	4				0.4	
	120408-4N	432-4N		□□CBR422S	4				0.8	
	120412-4N	433-4N			4				1.2	
	CNGA120404-4N	CNGA431-4N		□□ST30S	4	12.7	5.16	4.76	0.4	3.0
	120408-4N	432-4N		□□WGR30S	4				0.8	
	120412-4N	433-4N			4				1.2	
	CNGA120404-4N	CNGA431-4N		□□WGR30S	4				0.4	
	120408-4N	432-4N		□□WGR30S	4				0.8	
	120412-4N	433-4N			4				1.2	
	CNGA120404-4N	CNGA431-4N		□□CBR430S	4				0.4	
	120408-4N	432-4N		□□CBR430S	4				0.8	
	120412-4N	433-4N			4				1.2	
	CNGA120408-4N	CNGA432-4N		□□ST40S	4	12.7	5.16	4.76	0.8	4.0
	120412-4N	433-4N		□□ST40S	4				1.2	
	120416-4N	434-4N			4				1.6	
	CNGA120408-4N	CNGA432-4N		□□WGR40S	4				0.8	
	120412-4N	433-4N		□□WGR40S	4				1.2	
	120416-4N	434-4N			4				1.6	
	CNGA120408-4N	CNGA432-4N		□□CBR640S	4				0.8	
	120412-4N	433-4N		□□CBR640S	4				1.2	
	120416-4N	434-4N			4				1.6	

PCBN insert -Hardened Steel

Solid Inserts

CN	80° rhombic-Negative-Solid		H							
	PCBN Negative		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		SSWGR120S	4				1.2	
	120416-4N	434-4N		SSCBR6120S	4				1.6	
	CNGN120408-4N	CNGN432-4N		SSST120S	4				0.8	
	120412-4N	433-4N		SSWGR120S	4				1.2	
	120416-4N	434-4N		SSCBR6120S	4				1.6	
	CNGN120408-4N	CNGN432-4N		SSST120S	4				0.8	
	120412-4N	433-4N		SSWGR120S	4				1.2	
	120416-4N	434-4N		SSCBR6120S	4				1.6	
	CNGX120408-4N	CNGX432-4N		SSST120S	4	12.7	—	4.76	0.8	12
	120412-4N	433-4N		SSWGR120S	4				1.2	
	120416-4N	434-4N		SSCBR6120S	4				1.6	
	CNGX120408-4N	CNGX432-4N		SSST120S	4				0.8	
	120412-4N	433-4N		SSWGR120S	4				1.2	
	120416-4N	434-4N		SSCBR6120S	4				1.6	
	CNGX120408-4N	CNGX432-4N		SSST120S	4				0.8	
	120412-4N	433-4N		SSWGR120S	4				1.2	
	120416-4N	434-4N		SSCBR6120S	4				1.6	
	CNGA120408-4N	CNGA432-4N		SSST120S	4	12.7	5.16	4.76	0.8	12
	120412-4N	433-4N		SSWGR120S	4				1.2	
	120416-4N	434-4N		SSCBR6120S	4				1.6	
	CNGA120408-4N	CNGA432-4N		SSST120S	4				0.8	
	120412-4N	433-4N		SSWGR120S	4				1.2	
	120416-4N	434-4N		SSCBR6120S	4				1.6	
	CNGA120408-4N	CNGA432-4N		SSST120S	4				0.8	
	120412-4N	433-4N		SSWGR120S	4				1.2	
	120416-4N	434-4N		SSCBR6120S	4				1.6	
	CNGN120608-4N	CNGN442-4N		SSST120S	4	12.7	—	6.35	0.8	12
	120612-4N	443-4N		SSWGR120S	4				1.2	
	120616-4N	444-4N		SSCBR6120S	4				1.6	
	CNGN120608-4N	CNGN442-4N		SSST120S	4				0.8	
	120612-4N	443-4N		SSWGR120S	4				1.2	
	120616-4N	444-4N		SSCBR6120S	4				1.6	
	CNGN120608-4N	CNGN442-4N		SSST120S	4				0.8	
	120612-4N	443-4N		SSWGR120S	4				1.2	
	120616-4N	444-4N		SSCBR6120S	4				1.6	

PCBN insert -Hardened Steel

Solid/ full length insert



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		SSWGR120S	4				1.2	
	120616-4N	444-4N		SSCBR6120S	4				1.6	
	CNGX120608-4N	CNGX442-4N		SSST120S	4				0.8	
	120612-4N	443-4N		SSWGR120S	4				1.2	
	120616-4N	444-4N		SSCBR6120S	4				1.6	
	CNGX120608-4N	CNGX442-4N		SSST120S	4				0.8	
	120612-4N	443-4N		SSWGR120S	4				1.2	
	120616-4N	444-4N		SSCBR6120S	4				1.6	
	CNGN120708-4N	CNGN452-4N		SSST120S	4	12.7	—	7.94	0.8	12
	120712-4N	453-4N		SSWGR120S	4				1.2	
	120716-4N	454-4N		SSCBR6120S	4				1.6	
	CNGN120708-4N	CNGN452-4N		SSST120S	4				0.8	
	120712-4N	453-4N		SSWGR120S	4				1.2	
	120716-4N	454-4N		SSCBR6120S	4				1.6	
	CNGN120708-4N	CNGN452-4N		SSST120S	4				0.8	
	120712-4N	453-4N		SSWGR120S	4				1.2	
	120716-4N	454-4N		SSCBR6120S	4				1.6	
	CNGX120708-4N	CNGX452-4N		SSST120S	4	12.7	—	7.94	0.8	12
	120712-4N	453-4N		SSWGR120S	4				1.2	
	120716-4N	454-4N		SSCBR6120S	4				1.6	
	CNGX120708-4N	CNGX452-4N		SSST120S	4				0.8	
	120712-4N	453-4N		SSWGR120S	4				1.2	
	120716-4N	454-4N		SSCBR6120S	4				1.6	
	CNGX120708-4N	CNGX452-4N		SSST120S	4				0.8	
	120712-4N	453-4N		SSWGR120S	4				1.2	
	120716-4N	454-4N		SSCBR6120S	4				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	

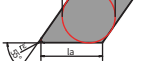
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	φd	S	r	la
	CNGA120408-4N	CNGA432-4N		SWUST25S	4	12.7	5.16	4.76	0.8	2.5
	120412-4N	433-4N		SWUWGR25S	4				1.2	
	120416-4N	434-4N		SWUCBR425S	4				1.6	
	CNGA120408-4N	CNGA432-4N		SWUST25S	4				0.8	
	120412-4N	433-4N		SWUWGR25S	4				1.2	
	120416-4N	434-4N		SWUCBR425S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

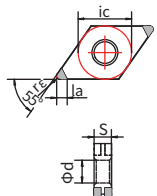
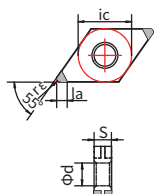
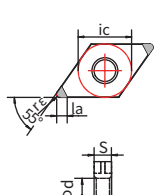
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PCBN insert -Hardened Steel

Tipped insert

DN	55°rhombic-Negative-with hole	
	PCBN Negative	

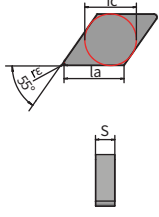
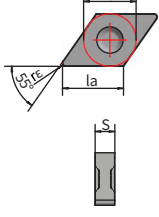
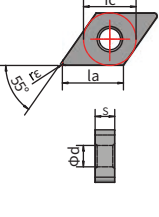
H				
Applications				
Structure	SL	SL	SL	CB
Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024	PNH3019 PNH3023
Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520	S0102005 S0153510
Coating	S/C3/CE	S/C3/CE	S/C3/CE	S/C3

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	

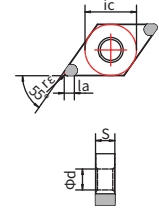
PCBN insert -Hardened Steel

Solid/ full length insert

DN	55°rhombic-Negative-Solid		H	
	PCBN Negative		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	12.7	—	4.76	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	12.7	—	4.76	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	12.7	5.16	4.76	0.8	
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	

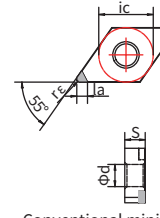
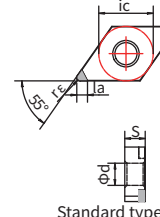
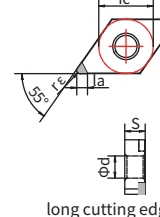
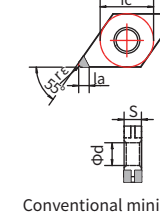
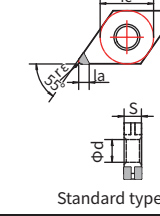
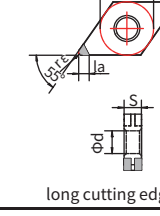
DN	55°rhombic-Negative-full length		H	
	PCBN Negative		Applications	
			Structure	SWU
			Material code	PNH0120 PNH0124 PNH2016 PNH2024
			Cutting edge	S0102010 S0202020
			Coating	S/C3/CE

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	12.7	5.16	4.76	0.8	
	150412-4N	433-4N							1.2	
	150416-4N	434-4N							1.6	

PCBN insert -Hardened Steel

Tipped insert

DN	55°rhombic-Negative-with hole		H			
	PCBN Negative		Applications			
			Structure	SL	SL	CB
			Material code	PNH0120 PNH0122 PNH0124	PNH1020 PNH1022 PNH1024	PNH2016 PNH2018 PNH2024
			Cutting edge	S0054505 S0102005 S0152510	S0152510 S0153510	S0152510 S0153510 S0203520
			Coating	S/C3/CE	S/C3/CE	S/C3/CE

Shape	ISO	ANSI	Tips forming		Cutting edges	ic	φd	S	r	la
	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	12.7	5.16	6.35	0.4	
	150608-2N	442-2N							0.8	
	150612-2N	443-2N							1.2	
	DNGA150604-2N	DNGA441-2N		□□CBR422S	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		□□CBR430S	2	12.7	5.16	6.35	0.4	
	150608-2N	442-2N							0.8	
	150612-2N	443-2N							1.2	
	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	12.7	5.16	6.35	0.8	
	150612-2N	443-2N							1.2	
	150616-2N	444-2N							1.6	
	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	12.7	5.16	6.35	0.4	
	150608-4N	442-4N							0.8	
	150612-4N	443-4N							1.2	
	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	12.7	5.16	6.35	0.4	
	150608-4N	442-4N							0.8	
	150612-4N	443-4N							1.2	
	DNGA150604-4N	DNGA441-4N		□□CBR430S	4	12.7	5.16	6.35	0.4	4.0
	150608-4N	442-4N							0.8	
	150612-4N	443-4N							1.2	
	DNGA150608-4N	DNGA442-4N		□□ST40S	4	12.7	5.16	6.35	0.8	
	150612-4N	443-4N							1.2	
	150616-4N	444-4N							1.6	
	DNGA150608-4N	DNGA442-4N		□□WGR40S (107.5°)	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		□□CBR640S	4	12.7	5.16	6.35	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		H							
	PCBN Negative		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		H							
	PCBN Negative		Applications							
			Structure	SWU						
			Material code	PNH0120 PNH0124 PNH2016 PNH2024						
			Cutting edge	S0102010 S0202020						
			Coating	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

SN	90° square-Negative-With hole		H							
	PCBN Negative		Applications							
			Structure	SL						
			Material code	PNH0120 PNH0122 PNH0124 PNH1020 PNH1022 PNH1024 PNH2016 PNH2018 PNH2024 PNH3019 PNH3023						
			Cutting edge	S0054505 S0102005 S0152510 S0152510 S0153510 S0203520 S0102005 S0153510						
			Coating	S/C3/CE						

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

PCBN insert -Hardened Steel

Tipped insert

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

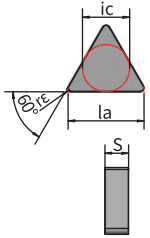
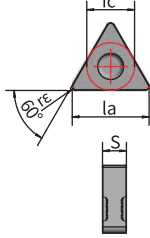
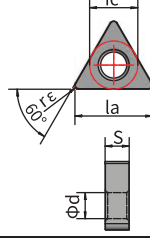
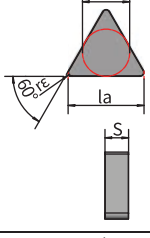
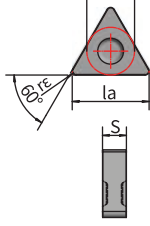
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	φd	S	r	la
 Conventional mini type	TNGA160404-3N	TNGA331-3N		□□ST22S	3	9.525	3.81	4.76	0.4	2.2
	160408-3N	332-3N		□□ST22S	3				0.8	
	160412-3N	333-3N		□□ST22S	3				1.2	
	TNGA160404-3N	TNGA331-3N		□□CBR422S	3				0.4	
	160408-3N	332-3N		□□CBR422S	3				0.8	
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

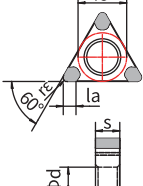
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	φd	S	r	la
	TNGN160408-6N	TNGN332-6N		SSST160S	6	9.525	—	4.76	0.8	16
	160412-6N	333-6N							1.2	
	160416-6N	334-6N							1.6	
	TNGN160408-6N	TNGN332-6N		SSCBR6160S	6				0.8	
	160412-6N	333-6N			1.2					
	160416-6N	334-6N			1.6					
	TNGX160408-6N	TNGX332-6N		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			
Material code	PNH0120 PNH0122 PNH0124 PNH1020 PNH1022 PNH1024 PNH2016 PNH2018 PNH2024 PNH3019 PNH3023			
Cutting edge	S0054505 S0102005 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			2	9.525	3.81	4.76	0.4	2.2
	160408-2N	332-2N			2				0.8	
	160412-2N	333-2N			2				1.2	
	VNGA160404-2N	VNGA331-2N			2				0.4	
	160408-2N	332-2N			2				0.8	
	160412-2N	333-2N			2				1.2	
 Standard type	VNGA160404-2N	VNGA331-2N			2	9.525	3.81	4.76	0.4	3.0
	160408-2N	332-2N			2				0.8	
	160412-2N	333-2N			2				1.2	
	VNGA160404-2N	VNGA331-2N			2				0.4	
	160408-2N	332-2N			2				0.8	
	160412-2N	333-2N			2				1.2	
 long cutting edge	VNGA160408-2N	VNGA332-2N			2	9.525	3.81	4.76	0.8	4.0
	160412-2N	333-2N			2				1.2	
	160416-2N	334-2N			2				1.6	
	VNGA160408-2N	VNGA332-2N			2				0.8	
	160412-2N	333-2N			2				1.2	
	160416-2N	334-2N			2				1.6	
 Conventional mini type	VNGA160404-4N	VNGA331-4N			4	9.525	3.81	4.76	0.4	2.2
	160408-4N	332-4N			4				0.8	
	160412-4N	333-4N			4				1.2	
	VNGA160404-4N	VNGA331-4N			4				0.4	
	160408-4N	332-4N			4				0.8	
	160412-4N	333-4N			4				1.2	
 Standard type	VNGA160404-4N	VNGA331-4N			4	9.525	3.81	4.76	0.4	3.0
	160408-4N	332-4N			4				0.8	
	160412-4N	333-4N			4				1.2	
	VNGA160404-4N	VNGA331-4N			4				0.4	
	160408-4N	332-4N			4				0.8	
	160412-4N	333-4N			4				1.2	
 long cutting edge	VNGA160408-4N	VNGA332-4N			4	9.525	3.81	4.76	0.8	4.0
	160412-4N	333-4N			4				1.2	
	160416-4N	334-4N			4				1.6	
	VNGA160408-4N	VNGA332-4N			4				0.8	
	160412-4N	333-4N			4				1.2	
	160416-4N	334-4N			4				1.6	

PCBN insert -Hardened Steel

Solid insert

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
 Conventional mini type	VNGN160408-4N	VNGN332-4N			4	9.525	—	4.76	0.8	16
	160412-4N	333-4N			4				1.2	
	160416-4N	334-4N			4				1.6	
	VNGN160408-4N	VNGN332-4N			4				0.8	
	160412-4N	333-4N			4				1.2	
	160416-4N	334-4N			4				1.6	
 Standard type	VNGX160408-4N	VNGX332-4N			4	9.525	—	4.76	0.8	16
	160412-4N	333-4N			4				1.2	
	160416-4N	334-4N			4				1.6	
	VNGX160408-4N	VNGX332-4N			4				0.8	
	160412-4N	333-4N			4				1.2	
	160416-4N	334-4N			4				1.6	
 long cutting edge	VNGA160408-4N	VNGA332-4N			4	9.525	3.81	4.76	0.8	16
	160412-4N	333-4N			4				1.2	
	160416-4N	334-4N			4				1.6	
	VNGA160408-4N	VNGA332-4N			4				0.8	
	160412-4N	333-4N			4				1.2	
	160416-4N	334-4N			4				1.6	
 Conventional mini type	VNGN160708-4N	VNGN352-4N			4	9.525	—	7.94	0.8	16
	160712-4N	353-4N			4				1.2	
	160716-4N	354-4N			4				1.6	
	VNGN160708-4N	VNGN352-4N			4				0.8	
	160712-4N	353-4N			4				1.2	
	160716-4N	354-4N			4				1.6	
 Standard type	VNGX160708-4N	VNGX352-4N			4	9.525	—	7.94	0.8	16
	160712-4N	353-4N			4				1.2	
	160716-4N	354-4N			4				1.6	
	VNGX160708-4N	VNGX352-4N			4				0.8	
	160712-4N	353-4N			4				1.2	
	160716-4N	354-4N			4				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	

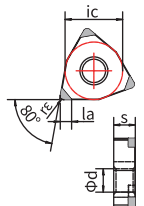
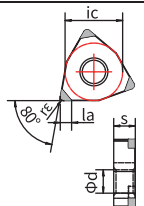
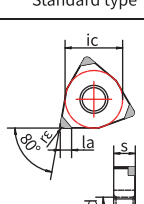
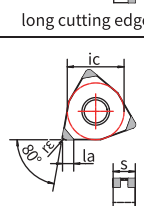
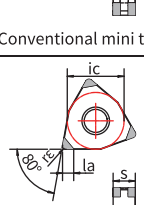
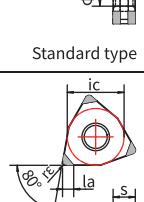
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	φd	S	r	la			
	VNGA160408-4N	VNGA332-4N		SWUST25S	4	9.525	3.81	4.76	0.8	2.5			
	160412-4N	333-4N							1.2				
	160416-4N	334-4N							1.6				
	VNGA160408-4N	VNGA332-4N		SWUCBR625S	4				0.8				
	160412-4N	333-4N							1.2				
	160416-4N	334-4N							1.6				

PCBN insert -Hardened Steel

Tipped insert

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	

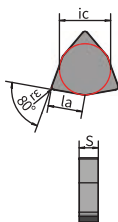
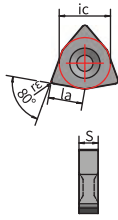
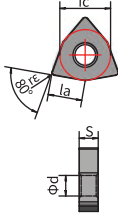
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	φd	S	r	la
 Conventional mini type	WNGA080404-3N	WNGA431-3N		□□ST22S	3	12.7	5.16	4.76	0.4	2.2
	080408-3N	432-3N							0.8	
	080412-3N	433-3N							1.2	
	WNGA080404-3N	WNGA431-3N		□□WGR22S	3				0.4	
	080408-3N	432-3N							0.8	
	080412-3N	433-3N							1.2	
	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

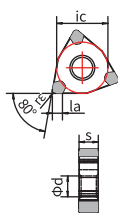
WN	80°hexagonal-Negative-Solid
	PCBN Negative

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			SSWGR80S				6		1.2					
	080416-6N	434-6N							SSCBR680S		6	1.6				
	WNGN080408-6N	WNGN432-6N	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						SSWGR80S					6		1.2
		080416-6N	434-6N											SSCBR680S		6
WNGX080408-6N		WNGX432-6N	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			SSWGR80S				6						1.2
		080416-6N	434-6N							SSCBR680S						6
	WNGA080408-6N	WNGA432-6N	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
Material code	PNH0120 PNH0124 PNH2016 PNH2024
Cutting edge	S0102010 S0202020
Coating	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

C/V T/W	Microminiature insert
	PCBN Positive

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

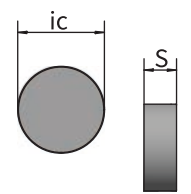
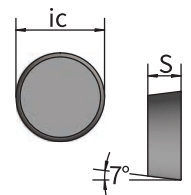
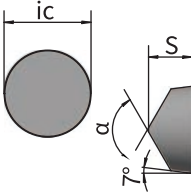
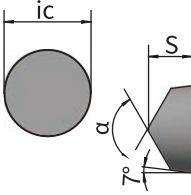
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	φd	S	r	la
	CCGW030102-2N	—		□□ST18S	2	3.5	1.9	1.8	0.2	1.8
	030104-2N	—							0.4	
	CCGW040102-2N	CCGW(1.5)1(0.5)-2N		□□ST18S	2	4.3	2.2	1.8	0.2	1.8
	040104-2N	(1.5)11-2N							0.4	
	VCGW070202-2N	VCGW(1.2)(1.5)(0.5)-2N		□□ST22S	2	3.97	2.2	2.38	0.2	2.2
	070204-2N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

NOTE: The inserts with corner radius of R0.2 are only available in C3 coated or uncoated

PCBN insert -Hardened Steel

Solid insert

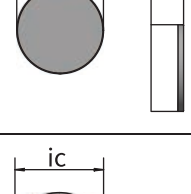
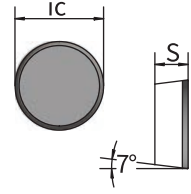
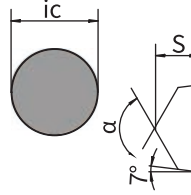
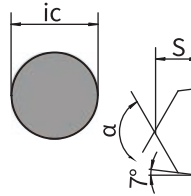
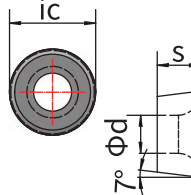
RN/RC	Circular-Solid		
	PCBN Circular		
	H		
	Applications		
	Structure	SS	SS
Material code	PNH2026 PNH2028	PNH3020(S≤4.76mm)	
Cutting edge	S0102010 S0202020		
Coating	S/C3/CE	S/C3/CE	

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

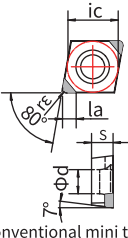
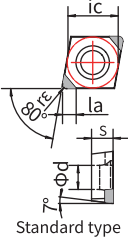
Tipped insert

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			

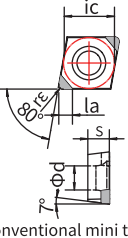
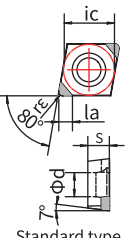
Shape	ISO	ANSI	Tips forming	Cutting edges	ic	φd	S	r	la
 Conventional mini type	CCGW060202-2N	CCGW2(1.5)(0.5)-2N			6.35	2.8	2.38	0.2	2.2
	060204-2N	2(1.5)1-2N						0.4	
	060208-2N	2(1.5)2-2N						0.8	
	CCGW060202-2N	CCGW2(1.5)(0.5)-2N						0.2	
	060204-2N	2(1.5)1-2N						0.4	
	060208-2N	2(1.5)2-2N						0.8	
 Standard type	CCGW060202-2N	CCGW2(1.5)(0.5)-2N			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						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			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						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			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						0.4	
	09T308-2N	3(2.5)2-2N						0.8	
	09T312-2N	3(2.5)3-2N						1.2	

PCBN insert-Cast Iron

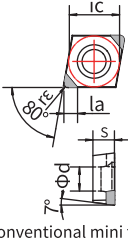
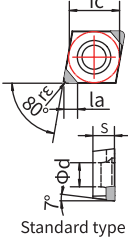
Tipped insert

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			

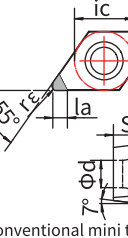
Shape	ISO	ANSI	Tips forming	Cutting edges	ic	φd	S	r	la
 Conventional mini type	CCGW120404-2N	CCGW431-2N			12.7	5.5	4.76	0.4	2.2
	120408-2N	432-2N						0.8	
	120412-2N	433-2N						1.2	
	CCGW120404-2N	CCGW431-2N						0.4	
	120408-2N	432-2N						0.8	
	120412-2N	433-2N						1.2	
 Standard type	CCGW120404-2N	CCGW431-2N			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						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			

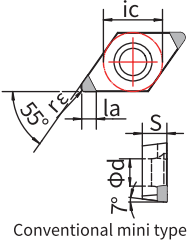
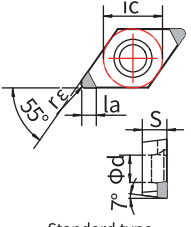
Shape	ISO	ANSI	Tips forming	Cutting edges	ic	φd	S	r	la
 Conventional mini type	DCGW070202-2N	DCGW2(1.5)(0.5)-2N			6.35	2.8	2.38	0.2	2.2
	070204-2N	2(1.5)1-2N						0.4	
	070208-2N	2(1.5)2-2N						0.8	
	DCGW070202-2N	DCGW2(1.5)(0.5)-2N						0.2	
	070204-2N	2(1.5)1-2N						0.4	
	070208-2N	2(1.5)2-2N						0.8	
 Standard type	DCGW070202-2N	DCGW2(1.5)(0.5)-2N			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						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

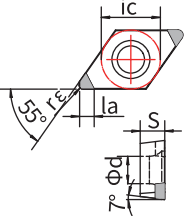
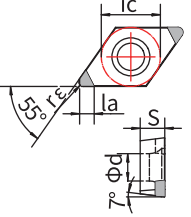
DC	55°rhombic-Positive-With hole
	PCBN Positive

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°)					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°)					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			

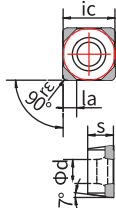
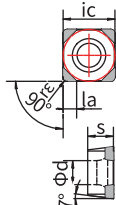
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	φd	S	r	la		
 Conventional mini type	DCGW150404-2N	DCGW431-2N		□□ST22S	2	12.7	5.5	4.76	0.4	2.2		
	150408-2N	432-2N							0.8			
	150412-2N	433-2N							1.2			
	DCGW150404-2N	DCGW431-2N		□□WGR22S (107.5°)					0.4			
	150408-2N	432-2N							0.8			
	150412-2N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

PCBN insert-Cast Iron

Solid/ Tipped insert

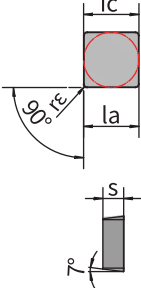
SC	90°Square-Positive-With hole
	PCBN Positive

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 080204-3N	TCGW(1.5)(1.5)(0.5)-3N (1.5)(1.5)1-3N		□□ST22S	3	4.76	2.4	2.38	0.2
									0.4
									2.2
	TPGW080202-3N 080204-3N	TPGW(1.5)(1.5)(0.5)-3N (1.5)(1.5)1-3N		□□ST22S	3	4.76	2.4	2.38	0.2
									0.4
									3.0
 Standard type	TCGW080202-3N 080204-3N	TCGW(1.5)(1.5)(0.5)-3N (1.5)(1.5)1-3N		□□ST30S	3	4.76	2.4	2.38	0.2
									0.4
									3.0
	TPGW080202-3N 080204-3N	TPGW(1.5)(1.5)(0.5)-3N (1.5)(1.5)1-3N		□□ST30S	3	4.76	2.4	2.38	0.2
									0.4
									3.0

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 090204-3N 090208-3N	TCGW(1.8)(1.5)(0.5)-3N (1.8)(1.5)1-3N (1.8)(1.5)2-3N		□□ST22S	3	5.56	2.4	2.38	0.2
									0.4
									2.2
	TPGW090202-3N 090204-3N 090208-3N	TPGW(1.8)(1.5)(0.5)-3N (1.8)(1.5)1-3N (1.8)(1.5)2-3N		□□ST22S	3	5.56	2.8	2.38	0.2
									0.4
									3.0
 Standard type	TCGW090202-3N 090204-3N 090208-3N	TCGW(1.8)(1.5)(0.5)-3N (1.8)(1.5)1-3N (1.8)(1.5)2-3N		□□ST30S	3	5.56	2.4	2.38	0.2
									0.4
									3.0
	TPGW090202-3N 090204-3N 090208-3N	TPGW(1.8)(1.5)(0.5)-3N (1.8)(1.5)1-3N (1.8)(1.5)2-3N		□□ST30S	3	5.56	2.8	2.38	0.2
									0.4
									3.0

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 110304-3N 110308-3N	TCGW22(0.5)-3N 221-3N 222-3N		□□ST22S	3	6.35	2.8	3.18	0.2
									0.4
									2.2
	TPGW110302-3N 110304-3N 110308-3N	TPGW22(0.5)-3N 221-3N 222-3N		□□ST22S	3	6.35	3.3	3.18	0.2
									0.4
									3.0
 Standard type	TCGW110302-3N 110304-3N 110308-3N	TCGW22(0.5)-3N 221-3N 222-3N		□□ST30S	3	6.35	2.8	3.18	0.2
									0.4
									3.0
	TPGW110302-3N 110304-3N 110308-3N	TPGW22(0.5)-3N 221-3N 222-3N		□□ST30S	3	6.35	3.3	3.18	0.2
									0.4
									3.0

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			

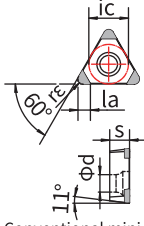
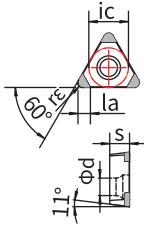
Shape	ISO	ANSI	Tips forming	Cutting edges	ic	φd	S	r	la
 Conventional mini type	TPGW160304-3N 160308-3N 160312-3N	TPGW321-3N 322-3N 323-3N		□□ST22S	3	9.525	4.4	3.18	0.4
									0.8
									2.2
	TPGW160304-3N 160308-3N 160312-3N	TPGW321-3N 322-3N 323-3N		□□ST30S	3	9.525	4.4	3.18	0.4
									0.8
			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

PCBN insert-Cast Iron

Tipped insert

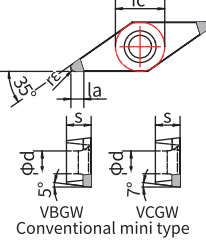
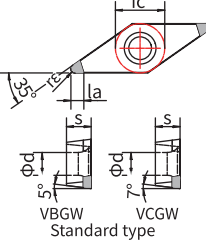
TP	60°Square-Positive-With hole
	PCBN Positive

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			

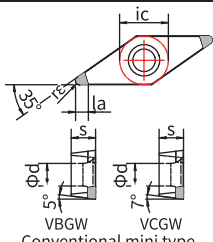
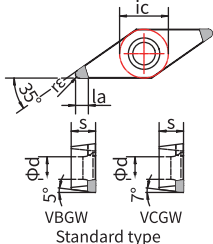
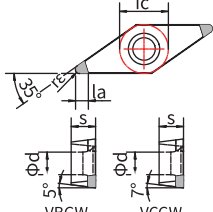
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	φd	S	r	la
 VBGW Conventional mini type	VBGW110302-2N	VBGW22(0.5)-2N		□□ST22S	2	6.35	2.8	3.18	0.2	2.2
	110304-2N	221-2N							0.4	
	110308-2N	222-2N							0.8	
	VCGW110302-2N	VCGW22(0.5)-2N		□□ST22S	2	6.35	2.8	3.18	0.2	
	110304-2N	221-2N							0.4	
	110308-2N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

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 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 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 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

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		

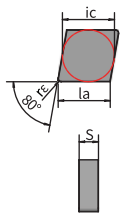
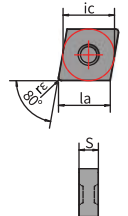
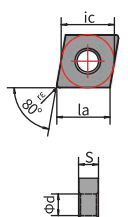
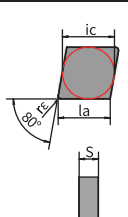
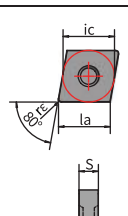
Shape	ISO	ANSI	Tips forming	Cutting edges	ic	φd	S	r	la
 Conventional mini type	CNGN090304-4N	CNGN321-4N	 SSST90S	4	9.525	—	3.18	0.4	9
	090308-4N	322-4N						0.8	
	090312-4N	323-4N						1.2	
	CNGN090304-4N	CNGN321-4N	 SSWGR90S	4				0.4	
	090308-4N	322-4N						0.8	
	090312-4N	323-4N						1.2	
 Standard type	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	

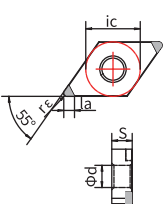
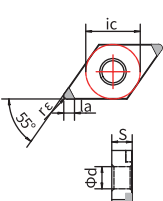
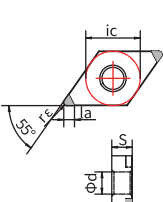
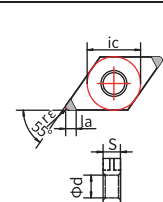
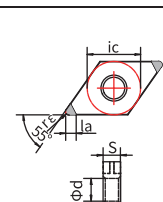
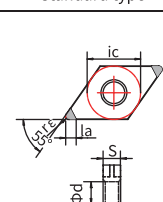
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	Φd	S	r	la
	CNGN120408-4N	CNGN432-4N		SSST120S	4	12.7	—	4.76	0.8	12
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGN120408-4N	CNGN432-4N		SSWGR120S	4				0.8	
	120412-4N	433-4N							1.2	
	120416-4N	434-4N							1.6	
	CNGX120408-4N	CNGX432-4N		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

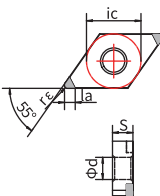
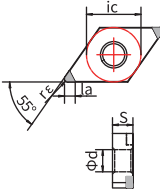
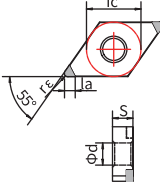
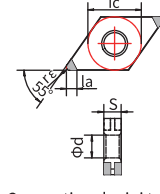
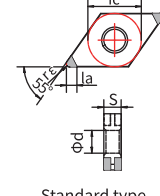
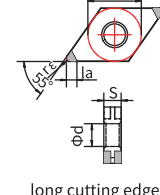
Tipped insert

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°)					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°)					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°)					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°)					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°)					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°)					0.8			
	150612-4N	443-4N							1.2			
	150616-4N	444-4N							1.6			

PCBN insert-Cast Iron

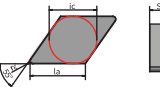
Solid insert

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	

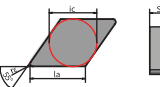
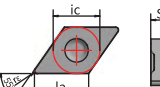
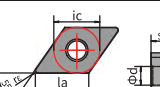
Shape	ISO	ANSI	Tips forming	Cutting edges	ic	φd	S	r	la
	DNGN110404-4N	DNGN331-4N		SSST110S	4	9.525	—	0.4	11
	110408-4N	332-4N						0.8	
	110412-4N	333-4N						1.2	

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	

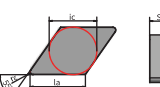
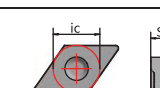
Shape	ISO	ANSI	Tips forming	Cutting edges	ic	φd	S	r	la
	DNGN150408-4N	DNGN432-4N		SSST150S	4	—	4.76	0.8	15
	150412-4N	433-4N						1.2	
	150416-4N	434-4N						1.6	
	DNGX150408-4N	DNGX432-4N		SSST150S	4	—	4.76	0.8	15
	150412-4N	433-4N						1.2	
	150416-4N	434-4N						1.6	
	DNGA150408-4N	DNGA432-4N		SSST150S	4	12.7	5.16	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	—	6.35	0.8	15
	150612-4N	443-4N						1.2	
	150616-4N	444-4N						1.6	
	DNGX150608-4N	DNGX442-4N		SSST150S	4	—	6.35	0.8	15
	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	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	
 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	
 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							1.8	
 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	
 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	
 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	

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		

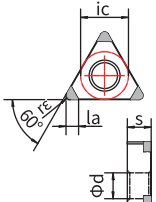
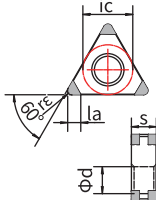
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	φd	S	r	la
 Conventional mini type	SNGN090304-8N	SNGN321-8N		SSST95S	8	9.525	—	3.18	0.4	9.525
	90308-8N	322-8N							0.8	
	90312-8N	323-8N							1.2	
	SNGN090404-8N	SNGN331-8N		SSST95S	8	9.525	—	4.76	0.4	
	90408-8N	332-8N							0.8	
	90412-8N	333-8N							1.2	
 Standard type	SNGN120408-8N	SNGN432-8N		SSST127S	8	12.7	—	4.76	0.8	12.7
	120412-8N	433-8N							1.2	
	120416-8N	434-8N							1.6	
	SNGX120408-8N	SNGX432-8N		SSST127S	8	12.7	—	4.76	0.8	
	120412-8N	433-8N							1.2	
	120416-8N	434-8N							1.6	
	SNGA120408-8N	SNGA432-8N		SSST127S	8	12.7	5.16	4.76	0.8	
	120412-8N	433-8N							1.2	
	120416-8N	434-8N							1.6	
 Long cutting edge	SNGN120708-8N	SNGN452-8N		SSST127S	8	12.7	—	7.94	0.8	12.7
	120712-8N	453-8N							1.2	
	120716-8N	454-8N							1.6	
	SNGX120708-8N	SNGX452-8N		SSST127S	8	12.7	—	7.94	0.8	
	120712-8N	453-8N							1.2	
	120716-8N	454-8N							1.6	
	SNGN150708-8N	SNGN552-8N		SSST127S	8	15.875	—	7.94	0.8	
	150712-8N	553-8N							1.2	
	150716-8N	554-8N							1.6	
	SNGX150708-8N	SNGX552-8N		SSST127S	8	15.875	—	7.94	0.8	
	150712-8N	553-8N							1.2	
	150716-8N	554-8N							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	9.525	3.81	4.76	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	9.525	3.81	4.76	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	

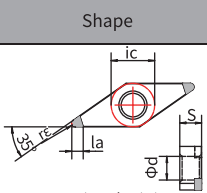
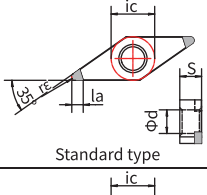
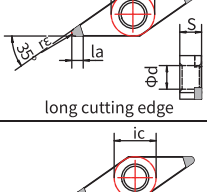
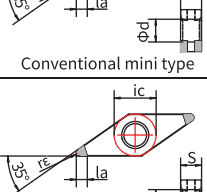
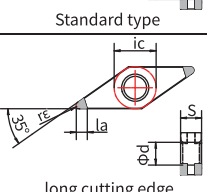
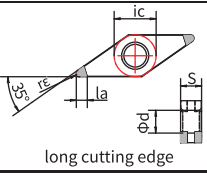
图示	ISO	ANSI	刀片结构	刃数	ic	φd	S	r	la
 TNGN160408-6N	TNGN160408-6N	TNGN332-6N		6	9.525	—	4.76	0.8	16
	160412-6N	333-6N						1.2	
	160416-6N	334-6N						1.6	

PCBN insert-Cast Iron

Tipped insert

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		

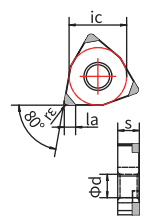
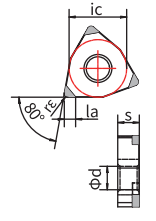
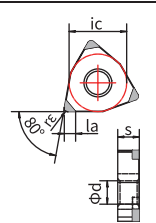
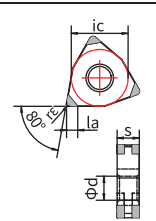
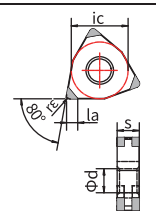
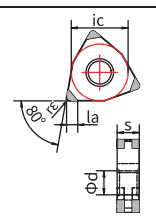
Shape	ISO	ANSI	Tips forming	Cutting edges	ic	φd	S	r	la
	VNGN160408-4N	VNGN332-4N		4	9.525	—	4.76	0.8	16
	160412-4N	333-4N						1.2	
	160416-4N	334-4N						1.6	
	VNGX160408-4N	VNGX332-4N		4	9.525	—	4.76	0.8	16
	160412-4N	333-4N						1.2	
	160416-4N	334-4N						1.6	

PCBN insert-Cast Iron

Tipped insert

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				

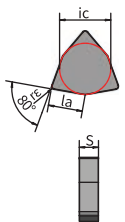
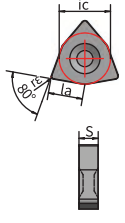
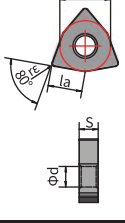
Shape	ISO	ANSI	Tips forming		Cutting edges	ic	φd	S	r	la
 Conventional mini type	WNGA080404-3N	WNGA431-3N		□□ST22S	3	12.7	5.16	4.76	0.4	2.2
	080408-3N	432-3N							0.8	
	080412-3N	433-3N							1.2	
	WNGA080404-3N	WNGA431-3N		□□WGR22S	3				0.4	
	080408-3N	432-3N							0.8	
	080412-3N	433-3N							1.2	
 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	

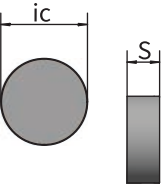
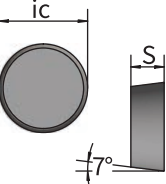
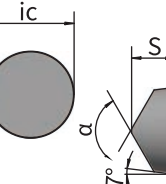
Shape	ISO	ANSI	Tips forming	Cutting edges	ic	φd	S	r	la
	WNGN080408-6N	WNGN432-6N		SSST80S	6	12.7	—	4.76	0.8
	080412-6N	433-6N							1.2
	080416-6N	434-6N							1.6
	WNGN080408-6N	WNGN432-6N		SSWGR80S	6	12.7	—	4.76	0.8
	080412-6N	433-6N							1.2
	080416-6N	434-6N							1.6
	WNGX080408-6N	WNGX432-6N	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

PCBN insert-Cast Iron

Solid insert

RN/RC	Circular-Solid
	PCBN Circular

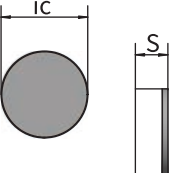
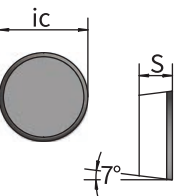
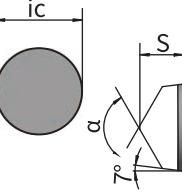
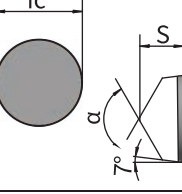
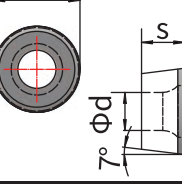
K		
Applications	 	 
Structure	SS	SS
Material code	PNK0110 PNK0118	PNH3020(S≤4.76mm)
Cutting edge	E0000005 S0102005 S0202020	
Coating	S/C3	

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

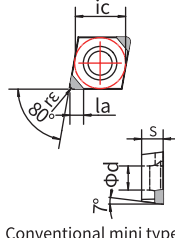
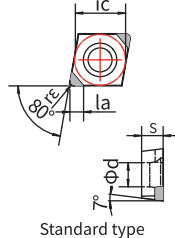
RN/RC	Circular-Full face
	PCBN Circular
K	
Applications	 
Structure	SS SS
Material code	PNK0107 PNK3003 PNK3007
Cutting edge	E0000005 S0102005 S0202020
Coating	S/C3

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		

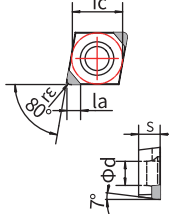
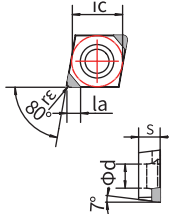
PCBN insert-Powder Metallurgy

Tipped insert

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		□□ST22S					0.8	
	CCGW060204-2N	CCGW2(1.5)1-2N		□□WGR22S	2				0.4	
	060208-2N	2(1.5)2-2N		□□WGR22S					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		□□ST30S					0.8	
	CCGW060204-2N	CCGW2(1.5)1-2N		□□WGR30S	2				0.4	
	060208-2N	2(1.5)2-2N		□□WGR30S					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								
	CCGW09T304-2N	CCGW3(2.5)1-2N		□□WGR22S	2				0.8	
	09T308-2N	3(2.5)2-2N							0.4	
 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	CCGW431-2N	 □□ST22S	2	12.7	5.5	4.76	0.4	2.2
	120408-2N	432-2N	 □□WGR22S	2				0.8	
	CCGW120404-2N	CCGW431-2N	 □□ST30S	2				0.4	
	120408-2N	432-2N	 □□WGR30S	2				0.8	
 Standard type	CCGW120404-2N	CCGW431-2N	 □□ST30S	2	12.7	5.5	4.76	0.4	3.0
	120408-2N	432-2N	 □□WGR30S	2				0.8	
	CCGW120404-2N	CCGW431-2N	 □□ST30S	2				0.4	
	120408-2N	432-2N	 □□WGR30S	2				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	DCGW2(1.5)1-2N	 □□ST22S	2	6.35	2.8	2.38	0.4	2.2
	070208-2N	2(1.5)2-2N	 □□WGR22S (107.5°)	2				0.8	
	DCGW070204-2N	DCGW2(1.5)1-2N	 □□ST30S	2				0.4	
	070208-2N	2(1.5)2-2N	 □□WGR30S (107.5°)	2				0.8	
 Standard type	DCGW070204-2N	DCGW2(1.5)1-2N	 □□ST30S	2	6.35	2.8	2.38	0.4	3.0
	070208-2N	2(1.5)2-2N	 □□WGR30S (107.5°)	2				0.8	
	DCGW070204-2N	DCGW2(1.5)1-2N	 □□ST30S	2				0.4	
	070208-2N	2(1.5)2-2N	 □□WGR30S (107.5°)	2				0.8	

PCBN insert-Powder Metallurgy

Tipped insert

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	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	 □□WGR22S (107.5°)	2				0.8	
	DCGW11T304-2N	DCGW3(2.5)1-2N	 □□ST30S	2				0.4	
	11T308-2N	3(2.5)2-2N	 □□WGR30S (107.5°)	2				0.8	
 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	 □□WGR30S (107.5°)	2				0.8	
	DCGW11T304-2N	DCGW3(2.5)1-2N	 □□ST30S	2				0.4	
	11T308-2N	3(2.5)2-2N	 □□WGR30S (107.5°)	2				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 Conventional mini type	VBGW160404-2N	VBGW331-2N			9.525	4.4	4.76	0.4	2.2
	160408-2N	332-2N						0.8	
	VCGW160404-2N	VCGW331-2N						0.4	
	160408-2N	332-2N						0.8	
 VBGW Standard type	VBGW160404-2N	VBGW331-2N			9.525	4.4	4.76	0.4	3.0
	160408-2N	332-2N						0.8	
	VCGW160404-2N	VCGW331-2N						0.4	
	160408-2N	332-2N						0.8	

PCBN insert-Powder Metallurgy

Tipped insert

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			12.7	5.16	4.76	0.4	2.2
	120408-2N	432-2N						0.8	
	CNGA120404-2N	CNGA431-2N						0.4	
	120408-2N	432-2N						0.8	
 Standard type	CNGA120404-2N	CNGA431-2N			12.7	5.16	4.76	0.4	3.0
	120408-2N	432-2N						0.8	
	CNGA120404-2N	CNGA431-2N						0.4	
	120408-2N	432-2N						0.8	
 Conventional mini type	CNGA120404-4N	CNGA431-4N			12.7	5.16	4.76	0.4	2.2
	120408-4N	432-4N						0.8	
	CNGA120404-4N	CNGA431-4N						0.4	
	120408-4N	432-4N						0.8	
 Standard type	CNGA120404-4N	CNGA431-4N			12.7	5.16	4.76	0.4	3.0
	120408-4N	432-4N						0.8	
	CNGA120404-4N	CNGA431-4N						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	
	150408-2N	432-2N						0.8	
	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	
	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

VN

35°rhombic-Negative-With hole

PCBN Negative

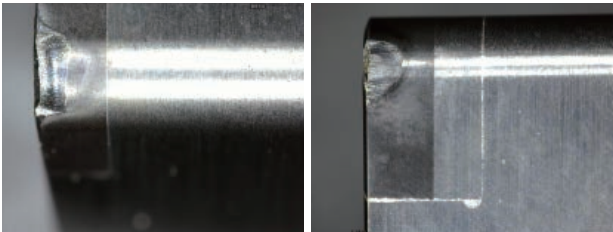
S			
Applications			
Structure	SL	CB	CB
Material code	PNS0126	PNS0117	PNS2005 PNS2007 PNS2019
Cutting edge	E0000005 S0101505 S0153510		
Coating	S/C3		

Shape	ISO	ANSI	Tips forming	Cutting edges	ic	φd	S	r	la
	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	
	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

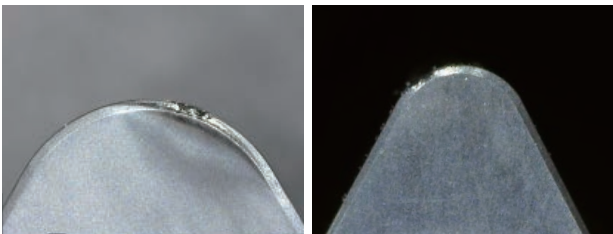
wear on the rake face, breakage of the cutting edge, crescent wear, chipping

■Wear on the rake face



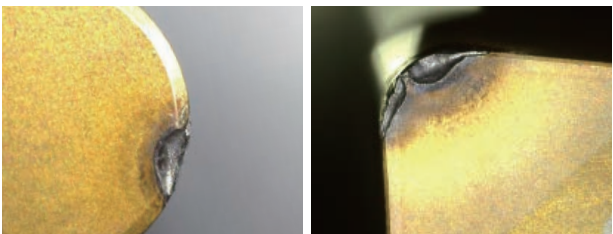
- Causes: Excessive cutting speed
Insufficient wear resistance of the material
Low Feed rate
- Solutions: Reduce cutting speed
Select a material with higher wear resistance
Adjust the feed to match the cutting speed and depth
(increase the feed)

■Breakage of the cutting edge



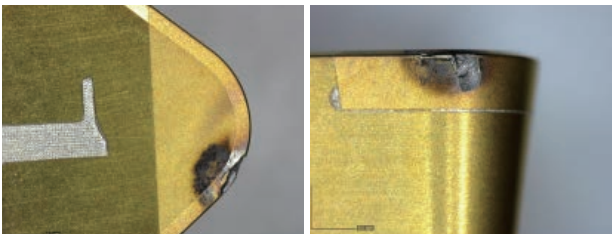
- Causes: Hard material
Vibration
Excessive feed rate or cutting depth
Interrupted cutting
Chip damage
- Solutions: Reduce cutting speed
Select a material with higher wear resistance
Adjust the feed to match the cutting speed and depth
(increase the feed)

■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

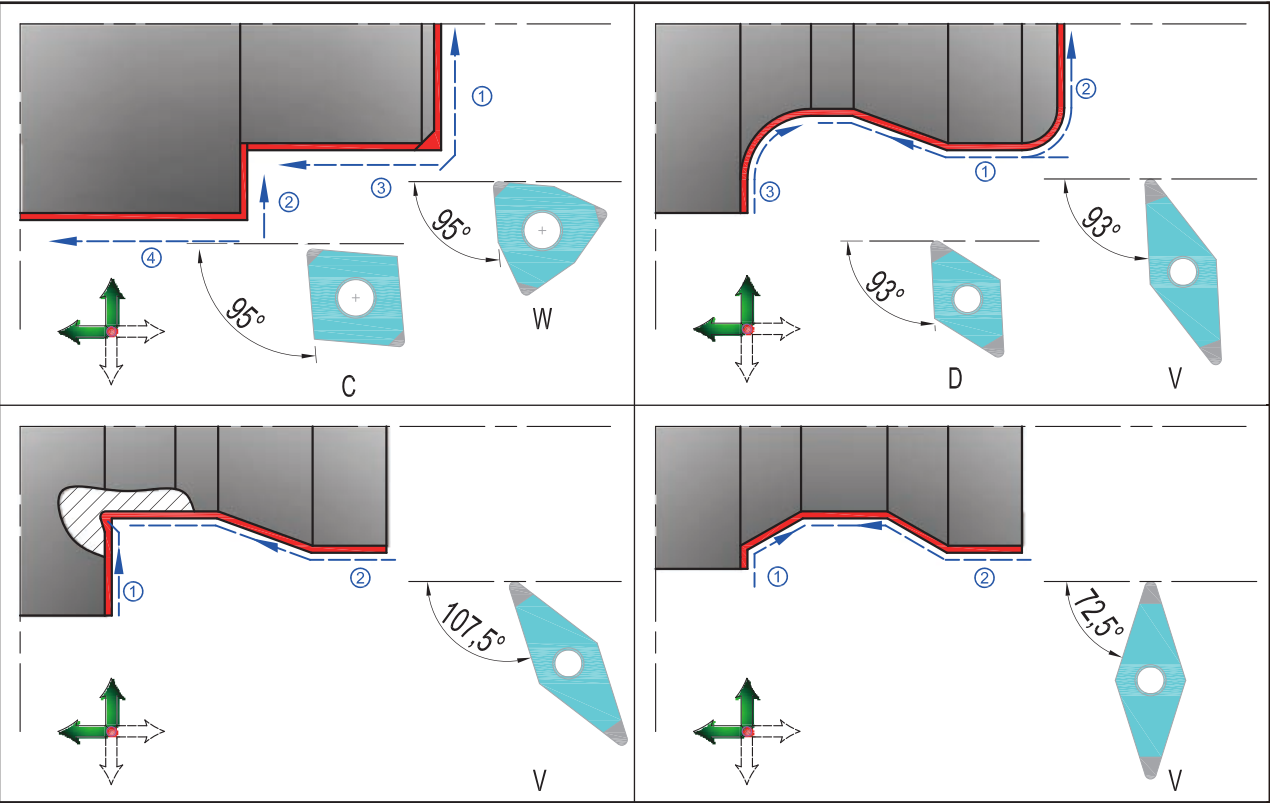
Cutting speed—Workpiece/Tool Diameter

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

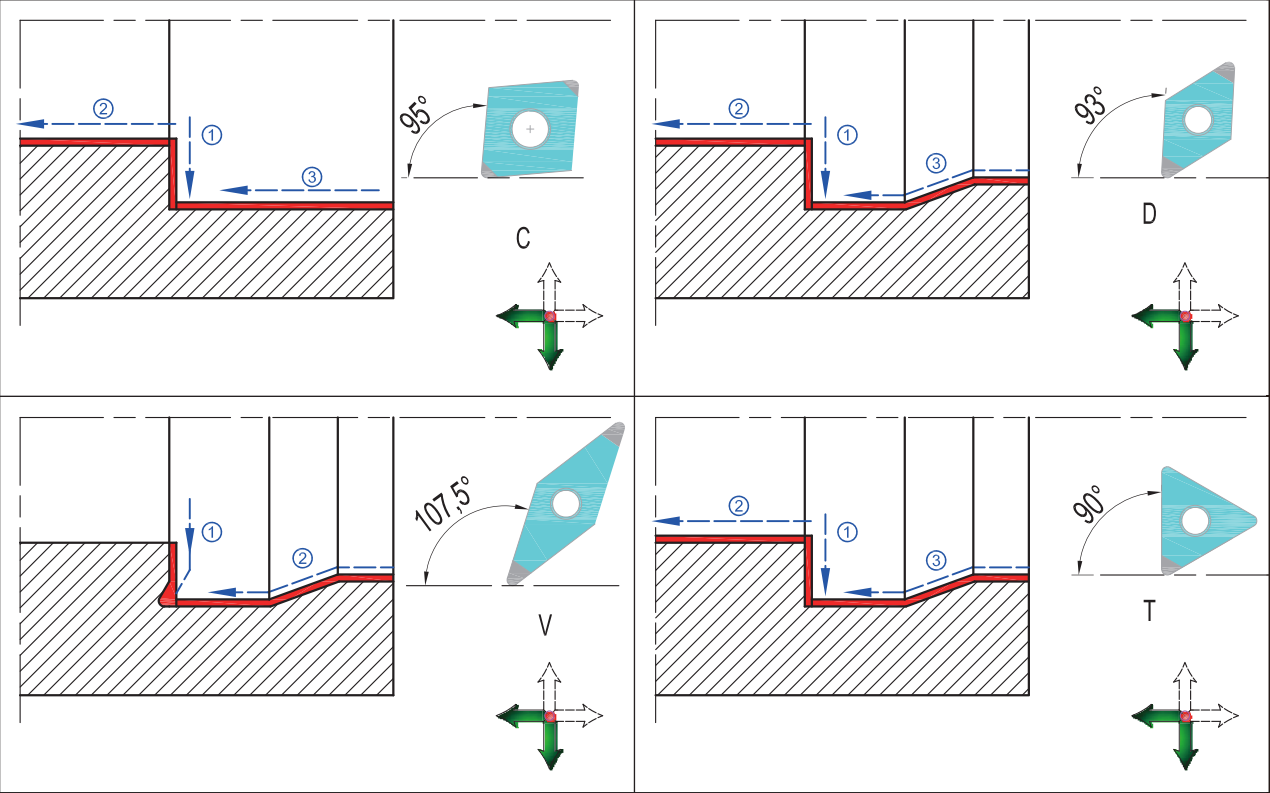
Cutting Direction Recommendation

Recommended cutting direction for turning hardened steel with PCBN tools

External machining



Internal machining



Comparison Table of Metal Material

Steel grade comparison table



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 045M10	C60R C10E	C60R XC10
	15F	S15CK S20CK			C15E	XC12 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



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.



