

Complete Range of PCBN Turning Inserts

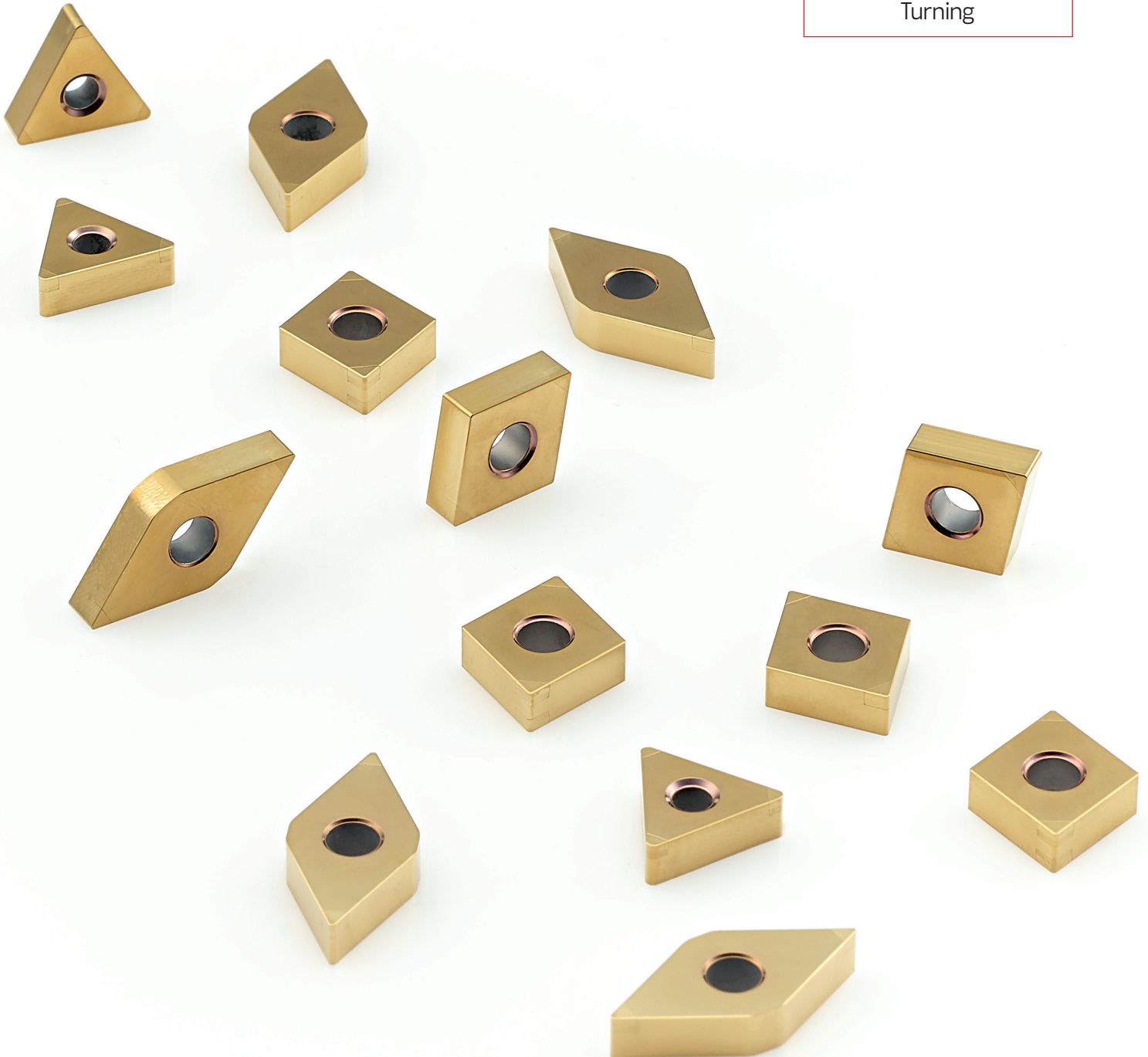


PalbitUSA.com



PCBN
Turning

NEW



SINCE 1916

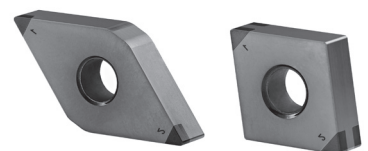
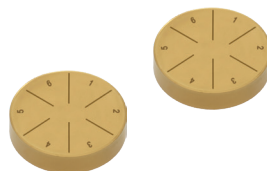
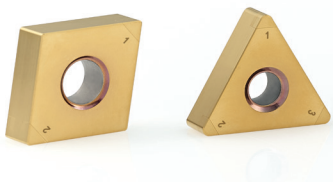
PCBN GRADE SELECTION

Polycrystalline Cubic Boron Nitride (PCBN) is a synthetic material that results from a high-temperature, high-pressure (HTHP) process. When PCBN tips are brazed to a carbide insert, a powerful cutting tool is born.

PCBN inserts are ideal for use in the finishing and semi-finishing processes of hardened steels (45-68 HRC), as well as with hard cast iron and heat-resistant superalloys (HRSA).

Grade Descriptions

Grade	Code	Characteristics	Application
PBY603	Y5	Low PCBN content grade with medium grain size and ceramic binder. Great wear and abrasion resistance.	<ul style="list-style-type: none"> For continuously and lightly interrupted cutting of Hardened Steel (H01-H10) Finishing abrasive high strength cast irons Can also be used to machine HRSA (S01-S10)
PBY620	Y4	Low PCBN content grade with medium grain size which provides enhanced crater and flank wear resistance with an excellent balance of toughness	<ul style="list-style-type: none"> For moderately to heavily interrupted turning of all hardened steels (H10-H20)
PBH920	S4	High PCBN with excellent abrasion resistance	<ul style="list-style-type: none"> For machining all types of cast iron (K01-K30) First choice for machining ferrous powder metals Can also be used to machine HRSA (S20-S30)
PBY930	W3	High abrasive wear resistance High impact toughness	<ul style="list-style-type: none"> For Cast Iron with high Nickel (Ni) and Chrome content (pumps and engine blocks)
PBY940	W4	High fracture toughness High thermal conductivity	<ul style="list-style-type: none"> For Alloy Steels with high content of Cr, gray cast irons and hardened steels with Ni



PCBN

Specifications

Code Key

Negative Inserts

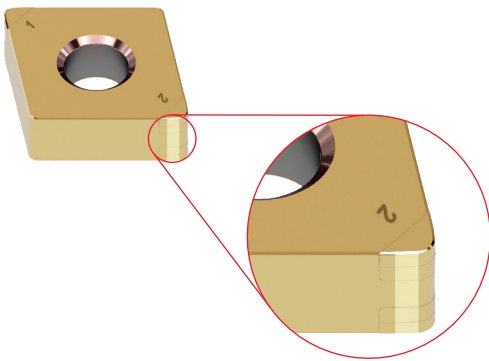
Positive Inserts

GEOMETRY SELECTION

Insert geometry and edge preparation are extremely important in hard part turning because they have a significant impact on tool life and productivity. Palbit's product range includes standard wiper inserts. The standard nose radius generates the lowest cutting force and has the lowest stability requirements while the wiper provides an excellent combination of high productivity and excellent surface finish.

A large nose radius provides greater edge strength and, therefore, extended tool life. For this reason, it is advisable to use the largest allowable nose radius for meeting the requirements of any given process.

WIPER INSERT



Wiper inserts can contribute to process improvement through:

- Improved surface finish quality by using standard cutting data
- Maintaining surface finish quality at a substantially higher feed rate

	Standard ($r_{\epsilon} = 0,8\text{mm}$)	Wiper ($r_{\epsilon} = 0,8\text{mm}$)
Insert Type		
Surface Roughness (R_a)	0,81 μm	0,42 μm

Note:

This values were achieved under these cutting conditions:

H Steel HRC60 | $V_c = 130 \text{ m/min}$ | $f_n = 0,12 \text{ mm/rev}$ | $a_p = 0,2 \text{ mm}$ | $\lambda = 2,5 \text{ mm}$ / ISO 4287

FORMULAS FOR SURFACE ROUGHNESS CALCULATIONS

$$R_a = 0,032 \times \frac{f_n^2}{r_{\epsilon}} \times 1000 \text{ } \mu\text{m}$$

$$R_t = 3,91 \times R_a \text{ } \mu\text{m}$$

R_a - Mean Surface Roughness (μm)

R_t - Roughness Total Height (μm)

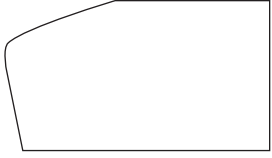

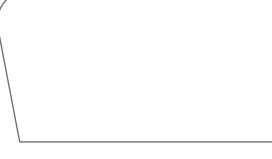

f_n - Feed Rate (mm/rev)

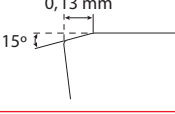

r_{ϵ} - Insert Radius (mm)

EDGE PREPARATION SELECTION

The most important criterion for the stability of cutting edge tool life is to define the correct cutting edge preparation. Doing so helps to achieve the best results most economically.

Edge Preparation

Cutting Force Edge Strength ↑ + ↓ -	S-Land 	S – Preparation with chamfer and honing <ul style="list-style-type: none"> - First choice for hard part turning - Stronger edge than T-land, with more resistance to chipping and fracture, resulting in more predictable tool life - Generates consistent surface finish - Critical in interrupted cutting and when using large depth of cut - Feed rate must be greater than hone size
	T-Land 	T – Preparation with chamfer <ul style="list-style-type: none"> - T-land is a common edge preparation for PCBN - Preferred choice for cast iron - Good alternative to S-land in hard part turning when reduced cutting forces and tighter tolerances are required
	E-Land 	E – Preparation with edge honing <ul style="list-style-type: none"> - Recommended for HRSA finishing operation - Honing helps strengthen the edge, giving resistance to chipping and fracturing - Feed rates must be greater than the hone size to allow actual cutting action to take place and prevent rubbing
	F-Land 	F – Preparation without honing <ul style="list-style-type: none"> - Sharp cutting edge - F - Standard is a common edge preparation for PCD - Recommended for aluminium or other non-ferrous materials

Honing Types	Specifications
S3515 For interrupted machining	
S2513 For general purpose machining	  Difficult Conditions
S1513 For stable continuous machining	  Average Conditions

 Good Conditions

Note: Based on our experience, to provide the best possible solution for each application, it is sometimes necessary to conduct several tests to determine the ideal edge preparation.

CHIP-BREAKERS: CUSTOM-MADE

Our laser machining and grinding technology can provide a wide range of custom solutions that offer the highest cutting edge quality.

PCBN: RECOMMENDED CUTTING DATA

Workpiece Material	Recommend Grade for PCBN			VC (m/min)	
	PBH920	PBY603	PBY620		
Hardened Steel (HRC 45-68) Tool-Steel, Case Hardened Steel, Continuous Cut (recommended without coolants)		⊗		Semi-finish	80 - 200
				Finish	80 - 180
Hardened Steel (HRC 45-68) Tool-Steel, Case Hardened Steel, Interrupted Cut (recommended without coolants)	○		⊗	Semi-finish	70 - 180
				Finish	70 - 160
Gray Cast Iron	⊗			Semi-finish	500 - 1000
				Finish	600 - 2000
High-Temperature Alloys (Inconel, Waspaloy, Hastelloy) Exotic and High Nickel + Cobalt-Based	⊗	⊗		Finish	50 - 300

⊗ Recommended ○ Second choice

ISO PCBN INSERTS: CODE KEY

PCBN

Specifications

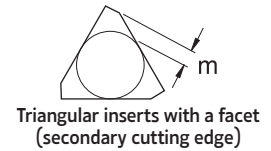
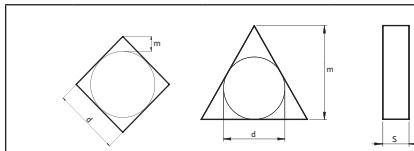
Code Key

Negative Inserts

Positive Inserts

H		M	
O		V	
P		W	
S		L	
T		A	
C		B	
D		K	
E		R	
F		X	Special

1 - Insert Shape Symbol



Symbol	m (mm)	d (mm)	s (mm)
A	±0.005	±0.025	±0.025
F	±0.005	±0.013	±0.025
C	±0.013	±0.025	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.005	±0.05~±0.13	±0.025
K*	±0.013	±0.05~±0.13	±0.025
L*	±0.025	±0.05~±0.13	±0.025
M*	±0.08~±0.20	±0.05~±0.13	±0.13
N*	±0.08~±0.20	±0.05~±0.13	±0.025
U*	±0.13~±0.38	±0.08~±0.25	±0.13

Detailed Dimensions of M-Class Inserts Insert Height Tolerances (mm)					
Inscribed Circle	T	S	C	D	V
6.35	±0.08	-	-	-	-
9.525	±0.08	±0.08	±0.11	±0.10	±0.13
12.70	±0.13	±0.13	±0.13	±0.15	-
15.875	±0.15	±0.15	±0.15	±0.18	-
19.05	±0.15	±0.15	±0.15	±0.18	-
25.40	-	±0.18	-	-	-
31.75	-	±0.25	-	-	-

Inscribed Circle Tolerances (mm)					
Inscribed Circle	T	S	C	D	V
6.35	±0.05	-	-	-	-
9.525	±0.05	±0.05	±0.05	±0.05	±0.05
12.70	±0.08	±0.08	±0.08	±0.08	±0.08
15.875	±0.10	±0.10	±0.10	±0.10	±0.10
19.05	-	-	-	-	±0.10
25.40	-	±0.13	-	-	±0.10
31.75	-	±0.20	-	-	±0.12

As a rule, the sides of these inserts are sintered. Tolerance differs with insert size. For the accuracy of M-Class inserts, refer to the table at right.

A	B	C	D	E
F	G	N	P	O
				Other clearance angle

2 - Normal Clearance Symbol



4 - Insert Symbol									
Symbol	Type	Hole Type	Chipbreaker	Shape	Symbol	Type	Hole Type	Chipbreaker	Shape
W	With Hole	Round hole one countersink (40°-60°)	Without chipbreaker		G	With Hole	Round Hole	Chipbreaker on both sides	
T			Chipbreaker on one side		N	Without Hole	-	Without Chipbreaker	
A	With Hole	Round hole	Without chipbreaker		R	Without Hole	-	Chipbreaker on one side	
M			Chipbreaker on one side		X	-	-	-	On request

R's	35° V's	55° D's	80° C's	90° S's	60° T's	80° W's	IC		ANSI
							mm	inch	Symbol
-	06	04	-	03	06	02	3.97	5/32	1.20
-	08	05	04	04	08	L3	4.76	3/16	1.50
-	09	06	05	05	09	03	5.56	7/32	1.80
06**	-	-	-	-	-	-	6.00	0.236	
06*	11	07	06	06	11	04	6.35	1/4	2.00
07*	13	09	08	07	13	05	7.94	5/16	2.50
08*	-	-	-	-	-	-	8.00	0.315	
09*	16	11	09	09	16	06	9.525	3/8	3.00
10**	-	-	-	-	-	-	10.00	0.394	
12**	-	-	-	-	-	-	12.00	0.472	
12*	22	15	12	12	22	08	12.70	1/2	4.00
15*	27	19	16	15	27	10	15.875	5/8	5.00
16**	-	-	-	-	-	-	16.00	0.63	
19*	33	23	19	19	33	13	19.05	3/4	6.00
20**	-	-	-	-	-	-	20.00	0.787	
25**	-	-	-	-	-	-	25.00	0.984	
25*	44	31	25	25	44	17	25.40	1.00	8.00
31*	54	38	32	31	54	21	31.75	1 1/4	10.00
32**	-	-	-	-	-	-	32.00	1.26	

* ANSI designation only
(Radius Designation is R00)

** Metric designation only
(Radius Designation is M0)

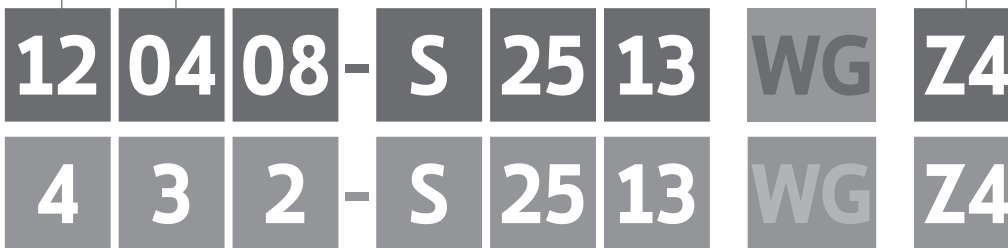
According to International Standard ISO 1832 - 2012(E)

"Indexable inserts for cutting tools - Designation"

ISO	mm	ANSI	inch
01	1.59	1	0.062
T1	1.98	1.2	0.078
02	2.38	1.5	0.094
03	3.18	2	0.125
T3	3.97	2.5	0.156
04	4.76	3	0.188
05	5.56	3.5	0.219
06	6.35	4	0.250
07	7.94	5	0.312
09	9.52	6	0.375
12	12.70	8	0.500

5 - Insert Size Symbol

6 - Insert Thickness Symbol



12 - Tip Type	
Z1 (1 tip)	Z6 (6 tips)
Z2 (2 tips)	Z8 (8 tips)
Z3 (3 tips)	FL (Full edge left)
Z4 (4 tips)	FR (Full edge right)
Z5 (5 tips)	S - Solid

*11 - Wiper	
WG	General Wiper
*Used only when required	


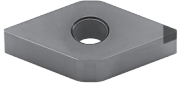


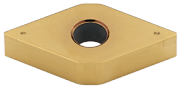



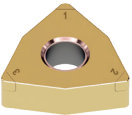
7 - Insert Corner Symbol			
ISO	mm	inch	ANSI
00	Sharp nose		0
01	0.10	.004	0.2
02	0.20	.008	0.5
04	0.40	.015	1
08	0.80	.032	2
12	1.2	.047	3
16	1.6	.062	4
20	2.0	.078	5
24	2.4	.094	6
28	2.8	.109	7
32	3.2	.125	8
00 (inch or M0/metric)	Round insert		0

8 - Cutting Edge Information		
Shape	Honing	Symbol
	No honing	F
	With honing	E
	Chamfered No honing	T
	Chamfered with honing	S

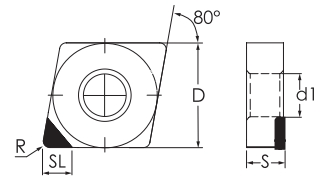
9 - Angle of Chamfer	
05	05°
10	10°
15	15°
20	20°
25	25°
30	30°
35	35°

10 - Width of Chamfer	
05	0.05 mm
10	0.10 mm
13	0.13 mm
15	0.15 mm
20	0.20 mm
25	0.25 mm
30	0.30 mm
35	0.35 mm
40	0.40 mm


NEGATIVE INSERTS OVERVIEW

SINGLE TIP	CNGA Z1	DNGA Z1					SOLID CBN	RNGN S NEW
								
	Size 12	Size 15						Size 06 09 12
	Page 8	Page 9						Page 11
MULTIPLE TIPS	CNGA Z2 Z4	DNGA Z2 Z4	SNGA Z4	TNGA Z3 Z6	VNGA Z2	WNGA Z3 Z6		
								
	Size 12	Size 11 15	Size 12	Size 16	Size 16	Size 08		
	Page 9	Page 10	Page 12	Page 13	Page 14	Page 15		

CN = RHOMBIC 80° NEGATIVE



CNGA Z1 - SINGLE TIP

	(1) Geometry Code	(2) Grade Code		K			H			Dimensions (mm)					Cutting Conditions				
				S4	Y5	Y4													
				ISO Reference	ANSI Reference	PBH920	PBY603	PBY620	Z	D	S	R	d1	SL	ap (mm)	Min	Max	fn (mm/r)	Min
	1124300	CNGA 120404-S2513 Z1	CNGA 431-S2513 Z1	○			1	12.70	4.76	0.40	5.16	2.50	0.15	0.08	0.50	0.08	0.05	0.20	
	1124111	CNGA 120408-S2513 Z1	CNGA 432-S2513 Z1	⊗			1	12.70	4.76	0.80	5.16	2.00	0.20	0.08	0.50	0.10	0.08	0.30	
	1124301	CNGA 120412-S2513 Z1	CNGA 433-S2513 Z1	○			1	12.70	4.76	1.20	5.16	2.30	0.25	0.08	0.50	0.12	0.08	0.30	
	1124302	CNGA 120416-S2513 Z1	CNGA 434-S2513 Z1	○			1	12.70	4.76	1.60	5.16	2.20	0.30	0.05	0.50	0.15	0.08	0.30	

⊗ Stock Items

○ Available Upon Request

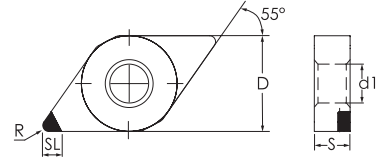
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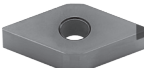
NEGATIVE INSERTS

SINGLE | MULTIPLE TIPS

DN - RHOMBIC 55° NEGATIVE

DNGA Z1 - SINGLE TIP



	(1) Geometry Code	(2) Grade Code			Dimensions (in)							Cutting Conditions						
		ISO Reference	ANSI Reference	K H			Z	D	S	R	d1	SL	ap (in)	Min	Max	fn (in/r)	Min	Max
				S4	Y5	Y4												
	1124306	DNGA 150404-S2513 Z1	DNGA 431-S2513 Z1	○	○	1	12.70	4.76	0.40	5.16	2.50	0.15	0.08	0.50	0.08	0.05	0.20	
	1124112	DNGA 150408-S2513 Z1	DNGA 432-S2513 Z1	⊗	○	1	12.70	4.76	0.80	5.16	2.50	0.20	0.08	0.50	0.10	0.08	0.30	
	1124536	DNGA 150412-S2513 Z1	DNGA 433-S2513 Z1	○	○	1	12.70	4.76	1.20	5.16	2.20	0.25	0.08	0.50	0.12	0.08	0.30	
	1124307	DNGA 150608-S2513 Z1	DNGA 442-S2513 Z1	○		1	12.70	6.35	0.80	5.16	2.50	0.20	0.08	0.50	0.10	0.08	0.30	
	1124308	DNGA 150612-S2513 Z1	DNGA 443-S2513 Z1	○		1	12.70	6.35	1.20	5.16	2.20	0.25	0.08	0.50	0.12	0.08	0.30	

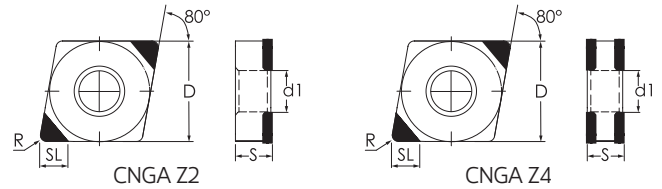
⊗ Stock Items



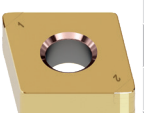
○ Available Upon Request

Insert Order Code: (1) Geometry Code + (2) Grade Code

CN - RHOMBIC 80° NEGATIVE

CNGA Z2 | CNGA Z4 - MULTIPLE TIPS



	(1) Geometry Code	(2) Grade Code			Dimensions (in)							Cutting Conditions						
		ISO Reference	ANSI Reference	K H			Z	D	S	R	d1	SL	ap (in)	Min	Max	fn (in/r)	Min	Max
				S4	Y5	Y4												
	1124343	CNGA 120402-S2513 Z2	CNGA 431.5-S2513 Z2	○		2	12.70	4.76	0.20	5.16	2.60	0.15	0.08	0.38	0.05	0.05	0.20	
	1124344	CNGA 120404-S2513 Z2	CNGA 431-S2513 Z2	⊗	⊗	2	12.70	4.76	0.40	5.16	2.50	0.15	0.08	0.40	0.08	0.05	0.20	
	1124175	CNGA 120408-S2513 Z2	CNGA 432-S2513 Z2	⊗	⊗	2	12.70	4.76	0.80	5.16	2.40	0.20	0.08	0.50	0.10	0.08	0.30	
	1124568	CNGA 120408-S3515 Z2	CNGA 432-S3515 Z2		⊗	2	12.70	4.76	0.80	5.16	2.40	0.20	0.08	0.50	0.10	0.08	0.30	
	1124468	CNGA 120412-S2513 Z2	CNGA 433-S2513 Z2	⊗	⊗	2	12.70	4.76	1.20	5.16	2.30	0.25	0.08	0.50	0.12	0.08	0.30	
	1124569	CNGA 120412-S3515 Z2	CNGA 433-S3515 Z2		○	2	12.70	4.76	1.20	5.16	2.30	0.25	0.08	0.50	0.12	0.08	0.30	
	1124474	CNGA 120404-S2513 Z4	CNGA 431-S2513 Z4		⊗	4	12.70	4.76	0.40	5.16	2.50	0.15	0.08	0.40	0.08	0.05	0.20	
	1124692	CNGA 120408-S1513 Z4	CNGA 432-S1513 Z4		○	4	12.70	4.76	0.80	5.16	2.40	0.20	0.08	0.50	0.10	0.08	0.30	
	1124134	CNGA 120408-S2513 Z4	CNGA 432-S2513 Z4	○	⊗	4	12.70	4.76	0.80	5.16	2.40	0.20	0.08	0.50	0.10	0.08	0.30	
	1124570	CNGA 120408-S3515 Z4	CNGA 432-S3515 Z4		○	4	12.70	4.76	0.80	5.16	2.40	0.20	0.08	0.50	0.10	0.08	0.30	
	1124475	CNGA 120412-S2513 Z4	CNGA 433-S2513 Z4		⊗	4	12.70	4.76	1.20	5.16	2.30	0.25	0.08	0.50	0.12	0.08	0.30	
	1124571	CNGA 120412-S3515 Z4	CNGA 433-S3515 Z4		○	4	12.70	4.76	1.20	5.16	2.30	0.25	0.08	0.50	0.12	0.08	0.30	
	1124534	CNGA 120404-S1513 WG Z4	CNGA 431-S1513 WG Z4		○	4	12.70	4.76	0.40	5.16	2.40	0.15	0.08	0.50	0.08	0.05	0.20	
	1124535	CNGA 120404-S2513 WG Z4	CNGA 431-S2513 WG Z4		○	4	12.70	4.76	0.40	5.16	2.40	0.15	0.08	0.50	0.08	0.05	0.20	
	1124517	CNGA 120408-S1513 WG Z4	CNGA 432-S1513 WG Z4		⊗	4	12.70	4.76	0.80	5.16	2.40	0.20	0.08	0.50	0.10	0.08	0.30	
	1124518	CNGA 120408-S2513 WG Z4	CNGA 432-S2513 WG Z4		⊗	4	12.70	4.76	0.80	5.16	2.40	0.20	0.08	0.50	0.10	0.08	0.30	

⊗ Stock Items

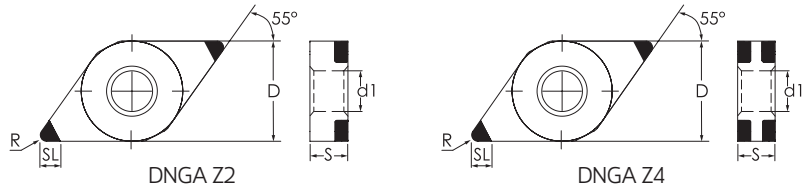
○ Available Upon Request

Insert Order Code: (1) Geometry Code + (2) Grade Code

NEGATIVE INSERTS

MULTIPLE TIPS

DN - RHOMBIC 55° NEGATIVE



DNGA Z2 | DNGA Z4

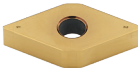
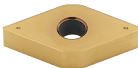
PCBN

Specifications

Code Key

Negative Inserts

Positive Inserts

	(1) Geometry Code	(2) Grade Code		K			H			Dimensions (mm)						Cutting Conditions					
				S4	Y5	Y4	S4	Y5	Y4												
				ISO Reference	ANSI Reference	PBH920	PBY603	PBY620	Z	D	S	R	d1	SL	ap (mm)	Min	Max	fn (mm/r)	Min	Max	
	1124616	DNGA 110404-S2513 Z2	DNGA 331-S2513 Z2	⊗	⊗		2	9.525	4.76	0.40	3.81	2.5	0.1	0.08	0.4	0.08	0.05	0.20			
	1124615	DNGA 110408-S2513 Z2	DNGA 332-S2513 Z2	⊗	⊗		2	9.525	4.76	0.80	3.81	2.0	0.15	0.08	0.4	0.10	0.08	0.30			
	1124617	DNGA 110412-S2513 Z2	DNGA 333-S2513 Z2	⊗	⊗		2	9.525	4.76	1.20	3.81	2.0	0.2	0.08	0.4	0.15	0.08	0.30			
	1124482	DNGA 150404-S2513 Z2	DNGA 431-S2513 Z2	⊗	⊗		2	12.70	4.76	0.40	5.16	2.50	0.15	0.08	0.50	0.08	0.05	0.20			
	1124483	DNGA 150408-S2513 Z2	DNGA 432-S2513 Z2	⊗	⊗		2	12.70	4.76	0.80	5.16	2.10	0.20	0.08	0.50	0.10	0.08	0.30			
	1124537	DNGA 150412-S2513 Z2	DNGA 433-S2513 Z2	○	○		2	12.70	4.76	1.20	5.16	2.20	0.25	0.08	0.50	0.12	0.08	0.30			
	1124348	DNGA 150604-S2513 Z2	DNGA 441-S2513 Z2	⊗	⊗	⊗	2	12.70	6.35	0.40	5.16	2.50	0.15	0.08	0.50	0.08	0.05	0.20			
	1124177	DNGA 150608-S2513 Z2	DNGA 442-S2513 Z2	⊗	⊗	⊗	2	12.70	6.35	0.80	5.16	2.10	0.20	0.08	0.50	0.10	0.08	0.30			
	1124572	DNGA 150608-S3515 Z2	DNGA 442-S3515 Z2		○		2	12.70	6.35	0.80	5.16	2.10	0.20	0.08	0.50	0.10	0.08	0.30			
	1124377	DNGA 150612-S2513 Z2	DNGA 443-S2513 Z2	⊗	⊗	⊗	2	12.70	6.35	1.20	5.16	2.00	0.25	0.08	0.50	0.12	0.08	0.30			
1124573	DNGA 150612-S3515 Z2	DNGA 443-S3515 Z2		○		2	12.70	6.35	1.20	5.16	2.00	0.25	0.08	0.50	0.12	0.08	0.30				
	1124479	DNGA 150604-S2513 Z4	DNGA 441-S2513 Z4	⊗	○		4	12.70	6.35	0.40	5.16	2.50	0.15	0.08	0.40	0.08	0.05	0.20			
	1124133	DNGA 150608-S2513 Z4	DNGA 442-S2513 Z4	○	⊗	○	4	12.70	6.35	0.80	5.16	2.10	0.20	0.08	0.50	0.10	0.08	0.30			
	1124575	DNGA 150608-S3515 Z4	DNGA 442-S3515 Z4		○		4	12.70	6.35	0.80	5.16	2.10	0.20	0.08	0.50	0.10	0.08	0.30			
	1124480	DNGA 150612-S2513 Z4	DNGA 443-S2513 Z4	⊗	○		4	12.70	6.35	1.20	5.16	2.00	0.25	0.08	0.50	0.12	0.08	0.30			
	1124576	DNGA 150612-S3515 Z4	DNGA 443-S3515 Z4		○		4	12.70	6.35	1.20	5.16	2.00	0.25	0.08	0.50	0.12	0.08	0.30			

⊗ Stock Items


○ Available Upon Request

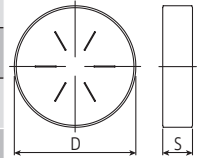
Insert Order Code: (1)Geometry Code + (2)Grade Code

NEGATIVE INSERTS

RNGN | SOLID CBN



	(1) Geometry Code	(2) Grade Code		W3	W4	Dimensions (mm)		Cutting Conditions						Drawing
		ISO Reference	ANSI Reference	PB930	PB940	D	S	ap (mm)	Min	Max	fn (mm/r)	Min	Max	
	1124631	RNGN 060300-S2020 S	RNGN 220-S2020 S	<input checked="" type="radio"/>	<input checked="" type="radio"/>	6.35	3.18	0.15	0.08	0.50	0.12	0.08	0.30	
	1124630	RNGN 090300-S2020 S	RNGN 320-S2020 S	<input checked="" type="radio"/>	<input checked="" type="radio"/>	9.53	3.18	0.20	0.08	0.50	0.15	0.08	0.30	
	1124629	RNGN 120300-S2020 S	RNGN 420-S2020 S	<input checked="" type="radio"/>	<input checked="" type="radio"/>	12.70	3.18	0.30	0.08	0.50	0.20	0.08	0.30	
	1124699	RNGN 120400-S2020 S	RNGN 430-S2020 S	<input checked="" type="radio"/>	<input checked="" type="radio"/>	12.70	4.76	0.30	0.08	0.50	0.20	0.08	0.30	



Stock Items

Available Upon Request

Insert Order Code: (1)Geometry Code + (2)Grade Code

REGROUND INSERTS

Repair Code	(2) Grade Code Reference Referência Referencia	W3	W4	Final Dimensions (mm)		Raw Material
		PB930	PB940	D	S	
		3120072	RNGN 06(2.18)00-S2020S(0603)	<input type="radio"/>	<input type="radio"/>	
3120058	RNGN 060200-S2020 S (0903)	<input type="radio"/>	<input type="radio"/>	6.35	2.38	RNGN 090300-S2020 S
3120068	RNGN 060300-S2020 S (0903)	<input type="radio"/>	<input type="radio"/>	6.35	3.18	RNGN 090300-S2020 S
3120071	RNGN 060300-S2020 S (1203)	<input type="radio"/>	<input type="radio"/>	6.35	3.18	RNGN 120300-S2020 S
3120057	RNGN 090300-S2020 S (1203)	<input type="radio"/>	<input type="radio"/>	9.53	3.18	RNGN 120300-S2020 S
3120070	RNGN 090400-S2020 S (1204)	<input type="radio"/>	<input type="radio"/>	9.53	4.76	RNGN 120400-S2020 S
3120056	RNGN 120300-S2020 S (1204)	<input type="radio"/>	<input type="radio"/>	12.70	3.18	RNGN 120400-S2020 S

Stock Items

Available Upon Request

Insert Order Code: (1)Geometry Code + (2)Grade Code

PCBN

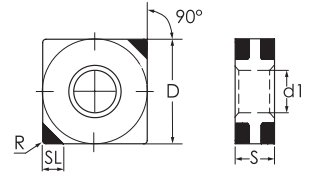
Specifications

Code Key

Negative Inserts

Positive Inserts

SN = SQUARE 90° NEGATIVE



SNGA Z4

PCBN

Specifications

Code Key

Negative Inserts

Positive Inserts

	(1) Geometry Code	(2) Grade Code		K			H			Dimensions (mm)						Cutting Conditions					
				S4	Y5	Y4	S4	Y5	Y4												
				ISO Reference	ANSI Reference	PBH920	PBY603	PBY620	Z	D	S	R	d1	SL	ap (mm)	Min	Max	fn (mm/r)	Min	Max	
	1124178	SNGA 120404-S2513 Z4	SNGA 431-S2513 Z4	○	○	⊗	4	12.70	4.76	0.40	5.16	2.40	0.15	0.08	0.40	0.08	0.05	0.20			
	1124538	SNGA 120404-T2513 Z4	SNGA 431-T2513 Z4	○			4	12.70	4.76	0.40	5.16	2.40	0.15	0.08	0.40	0.08	0.05	0.20			
	1124354	SNGA 120408-S2513 Z4	SNGA 432-S2513 Z4	○	○	⊗	4	12.70	4.76	0.80	5.16	2.00	0.20	0.08	0.50	0.10	0.08	0.30			
	1124577	SNGA 120408-S3515 Z4	SNGA 432-S3515 Z4	○		○	4	12.70	4.76	0.80	5.16	2.00	0.20	0.08	0.50	0.10	0.08	0.30			
	1124433	SNGA 120408-T2513 Z4	SNGA 432-T2513 Z4	⊗			4	12.70	4.76	0.80	5.16	2.00	0.20	0.08	0.50	0.10	0.08	0.30			
	1124539	SNGA 120412-S2513 Z4	SNGA 433-S2513 Z4	○	○	⊗	4	12.70	4.76	1.20	5.16	2.30	0.25	0.08	0.50	0.12	0.08	0.30			
	1124578	SNGA 120412-S3515 Z4	SNGA 433-S3515 Z4	○		○	4	12.70	4.76	1.20	5.16	2.30	0.25	0.08	0.50	0.12	0.08	0.30			
	1124540	SNGA 120412-T2513 Z4	SNGA 433-T2513 Z4	○			4	12.70	4.76	1.20	5.16	2.30	0.25	0.08	0.50	0.12	0.08	0.30			

⊗ Stock Items

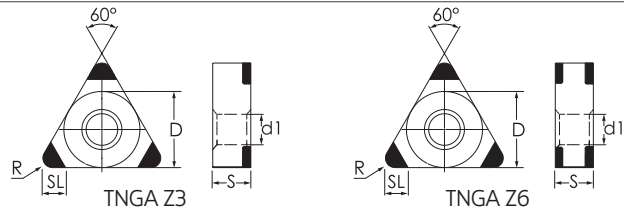
○ Available Upon Request

Insert Order Code: (1)Geometry Code + (2)Grade Code



NEGATIVE INSERTS

MULTIPLE TIPS

TN = TRIANGULAR 60° NEGATIVE



TNGA Z3 | TNGA Z6

	(1) Geometry Code	(2) Grade Code		K			H			Dimensions (mm)						Cutting Conditions					
				S4	Y5	Y4	S4	Y5	Y4												
				ISO Reference	ANSI Reference	PBH920	PBY603	PBY620	Z	D	S	R	d1	SL	ap (mm)	Min	Max	fn (mm/r)	Min	Max	
	1124357	TNGA 160404-S2513 Z3	TNGA 331-S2513 Z3	○	⊗	⊗	3	9.53	4.76	0.40	3.81	2.30	0.15	0.08	0.50	0.08	0.05	0.20			
	1124179	TNGA 160408-S2513 Z3	TNGA 332-S2513 Z3	○	⊗	⊗	3	9.53	4.76	0.80	3.81	2.00	0.20	0.08	0.50	0.10	0.08	0.30			
	1124579	TNGA 160408-S3515 Z3	TNGA 332-S3515 Z3			○	3	9.53	4.76	0.80	3.81	2.00	0.20	0.08	0.50	0.10	0.08	0.30			
	1124469	TNGA 160412-S2513 Z3	TNGA 333-S2513 Z3	○	⊗	⊗	3	9.53	4.76	1.20	3.81	2.00	0.25	0.08	0.60	0.12	0.08	0.30			
	1124746	TNGA 160412-S3515 Z3	TNGA 333-S3515 Z3			⊗	3	9.53	4.76	1.20	3.81	2.00	0.25	0.08	0.60	0.12	0.08	0.30			
	1124603	TNGA 160416-S2513 Z3	TNGA 334-S2513 Z3		⊗	⊗	3	9.53	4.76	1.6	3.81	3.00	0.30	0.08	0.70	0.14	0.10	0.35			
	1124604	TNGA 160420-S2513 Z3	TNGA 335-S2513 Z3		⊗	⊗	3	9.53	4.73	2.0	3.81	3.00	0.35	0.10	0.55	0.16	0.10	0.40			
	1124477	TNGA 160404-S2513 Z6	TNGA 331-S2513 Z6	⊗	⊗	○	6	9.53	4.76	0.40	3.81	2.30	0.15	0.08	0.50	0.08	0.05	0.20			
	1124097	TNGA 160408-S2513 Z6	TNGA 332-S2513 Z6	⊗	⊗	○	6	9.53	4.76	0.80	3.81	2.00	0.20	0.08	0.50	0.10	0.08	0.30			
	1124581	TNGA 160408-S3515 Z6	TNGA 332-S3515 Z6			○	6	9.53	4.76	0.80	3.81	2.00	0.20	0.08	0.50	0.10	0.08	0.30			
	1124478	TNGA 160412-S2513 Z6	TNGA 333-S2513 Z6		⊗	○	6	9.53	4.76	1.20	3.81	2.00	0.25	0.08	0.60	0.12	0.08	0.30			
	1124582	TNGA 160412-S3515 Z6	TNGA 333-S3515 Z6			○	6	9.53	4.76	1.20	3.81	2.00	0.25	0.08	0.60	0.12	0.08	0.30			

⊗ Stock Items

○ Available Upon Request

Insert Order Code: (1) Geometry Code + (2) Grade Code

PCBN

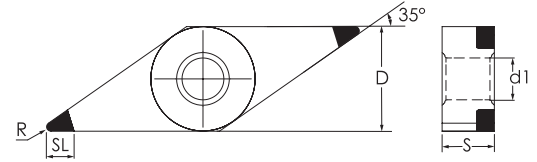
Specifications

Code Key

Negative Inserts

Positive Inserts

VN - RHOMBIC 35° NEGATIVE



VNGA Z2

PCBN

	⁽¹⁾ Geometry Code	ISO Reference	ANSI Reference	K			H			Dimensions (mm)						Cutting Conditions					
				S4	Y5	Y4	S4	Y5	Y4												
				PBH920	PBY603	PBY620	Z	D	S	R	d1	SL	ap (mm)	Min	Max	fn (mm/r)	Min	Max			
	1124361	VNGA 160402-S2513 Z2	VNGA 331.5-S2513 Z2	○			2	9.53	4.76	0.20	3.81	3.00	0.13	0.08	0.50	0.05	0.20				
	1124163	VNGA 160404-S2513 Z2	VNGA 331-S2513 Z2	○	⊗	⊗	2	9.53	4.76	0.40	3.81	2.80	0.15	0.08	0.50	0.08	0.20				
	1124098	VNGA 160408-S2513 Z2	VNGA 332-S2513 Z2	○	⊗	⊗	2	9.53	4.76	0.80	3.81	2.00	0.20	0.08	0.50	0.10	0.08	0.30			
	1124470	VNGA 160412-S2513 Z2	VNGA 333-S2513 Z2	○	⊗	⊗	2	9.53	4.76	1.20	3.81	1.90	0.25	0.08	0.50	0.12	0.08	0.30			

⊗ Stock Items

○ Available Upon Request

Insert Order Code: ⁽¹⁾ Geometry Code + ⁽²⁾ Grade Code

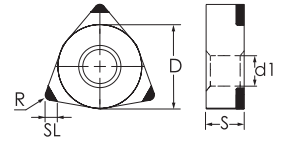
Specifications

Code Key

Negative Inserts

Positive Inserts

WN - TRIGON 80° NEGATIVE



WNGA Z3 | WNGA Z6

	(1) Geometry Code	ISO Reference	ANSI Reference	(2) Grade Code			Dimensions (mm)						Cutting Conditions					
				S4	Y5	Y4	Z	D	S	R	d1	SL	ap (mm)	Min	Max	fn (mm/r)	Min	Max
				PBH920	PBY603	PBY620												
	1124471	WNGA 080404-S2513 Z3	WNGA 431-S2513 Z3	⊙	⊙	⊙	3	12.70	4.76	0.40	5.16	2.30	0.15	0.08	0.40	0.08	0.05	0.20
	1124472	WNGA 080408-S2513 Z3	WNGA 432-S2513 Z3	⊙	⊙	⊙	3	12.70	4.76	0.80	5.16	2.00	0.20	0.08	0.50	0.10	0.08	0.30
	1124583	WNGA 080408-S3515 Z3	WNGA 432-S3515 Z3			⊙	3	12.70	4.76	0.80	5.16	2.00	0.20	0.08	0.50	0.10	0.08	0.30
	1124473	WNGA 080412-S2513 Z3	WNGA 433-S2513 Z3	⊙	⊙	⊙	3	12.70	4.76	1.20	5.16	2.00	0.25	0.08	0.60	0.12	0.08	0.30
	1124584	WNGA 080412-S3515 Z3	WNGA 433-S3515 Z3			⊙	3	12.70	4.76	1.20	5.16	2.00	0.25	0.08	0.60	0.12	0.08	0.30
	1124589	WNGA 080404-S2513 Z6	WNGA 431-S2513 Z6		⊙	⊙	6	12.70	4.76	1.20	5.16	2.00	0.25	0.08	0.40	0.12	0.08	0.30
	1124588	WNGA 080408-S2513 Z6	WNGA 432-S2513 Z6		⊙	⊙	6	12.70	4.76	0.80	5.16	2.00	0.20	0.08	0.50	0.10	0.08	0.30
	1124585	WNGA 080408-S3515 Z6	WNGA 432-S3515 Z6			⊙	6	12.70	4.76	0.80	5.16	2.00	0.20	0.08	0.50	0.10	0.08	0.30
	1124587	WNGA 080412-S2513 Z6	WNGA 433-S2513 Z6		⊙	⊙	6	12.70	4.76	0.40	5.16	2.30	0.15	0.08	0.60	0.08	0.05	0.20
	1124586	WNGA 080412-S3515 Z6	WNGA 433-S3515 Z6			⊙	6	12.70	4.76	1.20	5.16	2.00	0.25	0.08	0.60	0.12	0.08	0.30

⊙ Stock Items

○ Available Upon Request

Insert Order Code: (1) Geometry Code + (2) Grade Code

PCBN

Specifications

Code Key



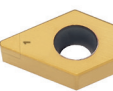


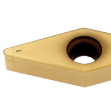
Negative Inserts

Positive Inserts

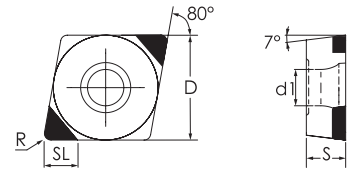
POSITIVE INSERTS OVERVIEW

PCBN

Specifications

SINGLE TIP	TPGW Z1				
					
	Size 11 Page 18				
MULTIPLE TIPS	CCGW Z2	DCGW Z2	TCGW TPGW Z3	VBGW Z2	VCGW Z2
					
	Size 06 09 Page 16	Size 07 11 Page 17	Size 09 11 Page 18	Size 11 16 Page 19	Size 16 Page 19

CC - RHOMBIC 80° POSITIVE



CCGW Z2

Code Key	(1) Geometry Code	(2) Grade Code		H		Dimensions (mm)						Cutting Conditions					
		ISO Reference	ANSI Reference	Y5	Y4	Z	D	S	R	d1	SL	ap (mm)	Min	Max	fn (mm/r)	Min	Max
				PBY603	PBY620												
	1124605	CCGW 060202-S1513 Z2	CCGW 21.50.5-S1513 Z2	⊗	⊗	2	6.35	2.38	0.20	2.80	2.00	0.15	0.05	0.20	0.08	0.05	0.20
	1124635	CCGW 060202-S2513 Z2	CCGW 21.50.5-S2513 Z2	⊗	⊗	2	6.35	2.38	0.20	2.80	2.40	0.15	0.05	0.20	0.08	0.05	0.20
	1124606	CCGW 060204-S1513 Z2	CCGW 21.51-S1513 Z2	⊗	⊗	2	6.35	2.38	0.40	2.80	2.00	0.15	0.05	0.40	0.08	0.05	0.25
	1124555	CCGW 060204-S2513 Z2	CCGW 21.51-S2513 Z2	⊗	⊗	2	6.35	2.38	0.40	2.80	2.00	0.15	0.05	0.40	0.08	0.05	0.25
	1124607	CCGW 060208-S1513 Z2	CCGW 21.52-S1513 Z2	⊗	⊗	2	6.35	2.38	0.80	2.80	2.00	0.20	0.08	0.50	0.10	0.08	0.30
	1124636	CCGW 060208-S2513 Z2	CCGW 21.52-S2513 Z2	⊗	⊗	2	6.35	2.38	0.80	2.80	2.40	0.20	0.08	0.50	0.10	0.08	0.30
	1124638	CCGW 09T302-S2513 Z2	CCGW 32.50.5-S2513 Z2	⊗	⊗	2	9.53	3.97	0.20	4.40	2.50	0.15	0.05	0.20	0.08	0.05	0.20
	1124640	CCGW 09T304-S2513 Z2	CCGW 32.51-S2513 Z2	⊗	⊗	2	9.53	3.97	0.40	4.40	2.50	0.20	0.08	0.40	0.10	0.05	0.25
	1124632	CCGW 09T308-S2513 Z2	CCGW 32.52-S2513 Z2	⊗	⊗	2	9.53	3.97	0.80	4.40	2.50	0.20	0.08	0.50	0.10	0.08	0.30
	1124637	CCGW 09T302-S2513 WG Z2	CCGW 32.50.5-S2513 WG Z2	○	○	2	9.53	3.97	0.20	4.40	2.40	0.15	0.05	0.20	0.08	0.05	0.20
	1124639	CCGW 09T304-S2513 WG Z2	CCGW 32.51-S2513 WG Z2	⊗	⊗	2	9.53	3.97	0.40	4.40	2.40	0.20	0.08	0.40	0.10	0.05	0.25
	1124641	CCGW 09T308-S2513 WG Z2	CCGW 32.52-S2513 WG Z2	⊗	⊗	2	9.53	3.97	0.80	4.40	2.40	0.20	0.08	0.50	0.10	0.08	0.30
	1124608	CCGW 09T302-S1513 Z2	CCGW 32.50.5-S1513 Z2	⊗	⊗	2	9.53	3.97	0.20	4.40	2.00	0.15	0.05	0.20	0.08	0.05	0.20
	1124609	CCGW 09T304-S1513 Z2	CCGW 32.51-S1513 Z2	⊗	⊗	2	9.53	3.97	0.40	4.40	2.00	0.20	0.08	0.40	0.10	0.05	0.25
	1124610	CCGW 09T308-S1513 Z2	CCGW 32.52-S1513 Z2	⊗	⊗	2	9.53	3.97	0.80	4.40	2.00	0.20	0.08	0.50	0.10	0.08	0.30



Negative Inserts

Positive Inserts

⊗ Stock Items

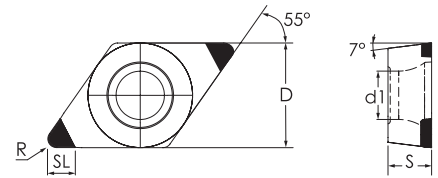
○ Available Upon Request

Insert Order Code: (1) Geometry Code + (2) Grade Code

POSITIVE INSERTS

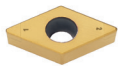
MULTIPLE TIPS

DC = RHOMBIC 55° POSITIVE



DCGW Z2

	(1) Geometry Code	(2) Grade Code		H		Dimensions (mm)						Cutting Conditions					
		ISO Reference	ANSI Reference	Y5	Y4	Z	D	S	R	d1	SL	ap (mm)	Min	Max	fn (mm/r)	Min	Max
				PBY603	PBY620												
	1124642	DCGW 070202-S1513 Z2	DCGW 21.50.5-S1513 Z2	⊗	○	2	6.35	2.38	0.20	2.80	2.50	0.15	0.08	0.20	0.08	0.05	0.20
	1124611	DCGW 070202-S2513 Z2	DCGW 21.50.5-S2513 Z2	⊗	⊗	2	6.35	2.38	0.20	2.80	2.00	0.15	0.08	0.20	0.08	0.05	0.20
	1124643	DCGW 070204-S1513 Z2	DCGW 21.51-S1513 Z2	⊗	○	2	6.35	2.38	0.40	2.80	2.50	0.15	0.08	0.40	0.08	0.05	0.25
	1124436	DCGW 070204-S2513 Z2	DCGW 21.51-S2513 Z2	⊗	⊗	2	6.35	2.38	0.40	2.80	2.40	0.15	0.08	0.40	0.08	0.05	0.25
	1124644	DCGW 070208-S1513 Z2	DCGW 21.52-S1513 Z2	○	○	2	6.35	2.38	0.80	2.80	2.00	0.20	0.08	0.50	0.10	0.08	0.30
	1124612	DCGW 070208-S2513 Z2	DCGW 21.52-S2513 Z2	⊗	⊗	2	6.35	2.38	0.80	2.80	2.50	0.20	0.08	0.50	0.10	0.08	0.30
	1124613	DCGW 11T302-S2513 Z2	DCGW 32.50.5-S2513 Z2	⊗	⊗	2	9.53	3.97	0.20	4.40	2.70	0.15	0.08	0.20	0.08	0.05	0.20
	1124554	DCGW 11T304-S2513 Z2	DCGW 32.51-S2513 Z2	⊗	⊗	2	9.53	3.97	0.40	4.40	2.50	0.20	0.08	0.40	0.10	0.05	0.25
	1124744	DCGW 11T304-S3515 Z2	DCGW 32.51-S3515 Z2		⊗	2	9.53	3.97	0.40	4.40	2.50	0.20	0.08	0.40	0.10	0.05	0.25
	1124614	DCGW 11T308-S2513 Z2	DCGW 32.52-S2513 Z2	⊗	⊗	2	9.53	3.97	0.80	4.40	2.00	0.20	0.08	0.50	0.10	0.08	0.30
	1124745	DCGW 11T308-S3515 Z2	DCGW 32.52-S3515 Z2		⊗	2	9.53	3.97	0.80	4.40	2.00	0.20	0.08	0.50	0.10	0.08	0.30
	1124645	DCGW 11T302-S1513 Z2	DCGW 32.50.5-S1513 Z2	⊗	○	2	9.53	3.97	0.20	4.40	2.70	0.15	0.08	0.20	0.08	0.05	0.20
	1124647	DCGW 11T304-S1513 Z2	DCGW 32.51-S1513 Z2	⊗	○	2	9.53	3.97	0.40	4.40	2.50	0.20	0.08	0.40	0.10	0.05	0.25
	1124649	DCGW 11T308-S1513 Z2	DCGW 32.52-S1513 Z2	○	○	2	9.53	3.97	0.80	4.40	2.00	0.20	0.08	0.50	0.10	0.08	0.30



⊗ Stock Items

○ Available Upon Request

Insert Order Code: (1) Geometry Code + (2) Grade Code

PCBN

Specifications

Code Key

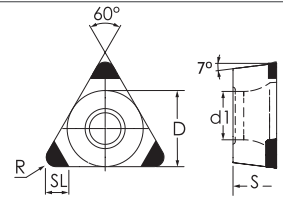
Negative Inserts

Positive Inserts


POSITIVE INSERTS

MULTIPLE TIPS

TC - TRIANGULAR 60° POSITIVE



TCGW Z3

	(1) Geometry Code	(2) Grade Code		H		Dimensions (mm)						Cutting Conditions					
		ISO Reference	ANSI Reference	Y5	Y4	Z	D	S	R	d1	SL	ap (mm)	Min	Max	fn (mm/r)	Min	Max
				PBY603	PBY620												
	1124715	TCGW 110204-S2513 Z3	TCGW 21.51-S2513 Z3	○		3	6.35	2.38	0.20	4.40	2.50	0.15	0.08	0.40	0.08	0.05	0.20
	1124434	TCGW 16T304-S2513 Z3	TCGW 32.51-S2513 Z3	⊗	⊗	3	9.53	3.97	0.40	4.40	2.50	0.15	0.08	0.45	0.08	0.05	0.20
	1124651	TCGW 16T308-S2513 Z3	TCGW 32.52-S2513 Z3	⊗	⊗	3	9.53	3.97	0.80	4.40	2.00	0.20	0.08	0.45	0.10	0.08	0.30

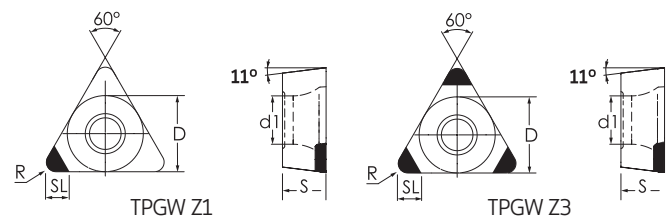
⊗ Stock Items

○ Available Upon Request



Insert Order Code: (1) Geometry Code + (2) Grade Code

Specifications

TP - TRIANGULAR 60° POSITIVE



TPGW Z1 | TPGW Z3

	(1) Geometry Code	(2) Grade Code		H		Dimensions (mm)						Cutting Conditions					
		ISO Reference	ANSI Reference	Y5	Y4	Z	D	S	R	d1	SL	ap (mm)	Min	Max	fn (mm/r)	Min	Max
				PBY603	PBY620												
	1124657	TPGW 110302-S2513 Z1	TPGW 220.5-S2513 Z1	○	○	1	6.35	2.38	0.20	2.80	2.40	0.15	0.08	0.20	0.08	0.05	0.15
	1124660	TPGW 110304-S2513 Z1	TPGW 221-S2513 Z1	⊗	○	1	6.35	2.38	0.40	2.80	2.30	0.15	0.08	0.40	0.08	0.05	0.20
	1124598	TPGW 110308-S2513 Z1	TPGW 222-S2513 Z1	⊗	⊗	1	6.35	2.38	0.80	2.80	2.40	0.20	0.08	0.45	0.10	0.08	0.20
	1124652	TPGW 090202-S1513 Z3	TPGW 1.81.50.5-S1513 Z3	⊗	○	3	5.56	2.38	0.20	2.50	2.50	0.10	0.08	0.20	0.08	0.05	0.15
	1124653	TPGW 090202-S2513 Z3	TPGW 1.81.50.5-S2513 Z3	⊗	○	3	5.56	2.38	0.20	2.50	2.50	0.10	0.05	0.20	0.08	0.05	0.15
	1124654	TPGW 090204-S1513 Z3	TPGW 1.81.51-S1513 Z3	⊗	○	3	5.56	2.38	0.40	2.50	2.30	0.15	0.08	0.40	0.08	0.05	0.15
	1124655	TPGW 090204-S2513 Z3	TPGW 1.81.51-S2513 Z3	⊗	⊗	3	5.56	2.38	0.40	2.50	2.30	0.15	0.08	0.40	0.08	0.05	0.15
	1124658	TPGW 110302-S2513 Z3	TPGW 220.5-S2513 Z3	⊗	⊗	3	6.35	2.38	0.20	2.80	2.40	0.15	0.08	0.20	0.08	0.05	0.15
	1124661	TPGW 110304-S2513 Z3	TPGW 221-S2513 Z3	⊗	⊗	3	6.35	2.38	0.40	2.80	2.30	0.15	0.08	0.40	0.08	0.05	0.20
	1124663	TPGW 110308-S2513 Z3	TPGW 222-S2513 Z3	○	⊗	3	6.35	2.38	0.80	2.80	2.00	0.20	0.08	0.50	0.10	0.08	0.20
	1124656	TPGW 110302-S1513 Z3	TPGW 220.5-S1513 Z3	⊗	○	3	6.35	2.38	0.20	2.80	2.40	0.15	0.08	0.20	0.08	0.05	0.15
	1124659	TPGW 110304-S1513 Z3	TPGW 221-S1513 Z3	⊗	○	3	6.35	2.38	0.40	2.80	2.30	0.15	0.08	0.40	0.08	0.05	0.20
	1124662	TPGW 110308-S1513 Z3	TPGW 222-S1513 Z3	○	○	3	6.35	2.38	0.80	2.80	2.00	0.20	0.08	0.50	0.10	0.08	0.20

⊗ Stock Items

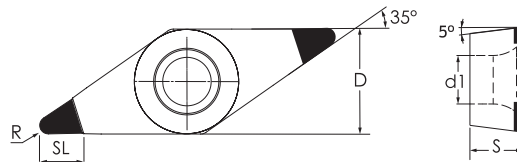
○ Available Upon Request

Insert Order Code: (1) Geometry Code + (2) Grade Code


Negative Inserts

Positive Inserts

VB - RHOMBIC 35° POSITIVE



VBGW Z2

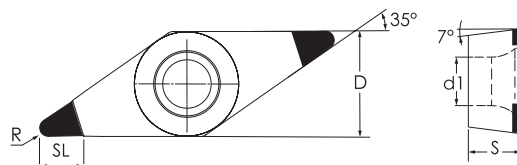
	(1) Geometry Code	(2) Grade Code		H		Dimensions (mm)						Cutting Conditions					
		ISO Reference	ANSI Reference	Y5	Y4	Z	D	S	R	d1	SL	ap (mm)	Min	Max	fn (mm/r)	Min	Max
				PBY603	PBY620												
	1124664	VBGW 110302-S2513 Z2	VBGW 220.5-S2513 Z2	⊗	⊗	2	6.35	3.18	0.20	2.80	3.20	0.10	0.08	0.20	0.05	0.05	0.15
	1124665	VBGW 110304-S2513 Z2	VBGW 221-S2513 Z2	⊗	⊗	2	6.35	3.18	0.40	2.80	2.80	0.15	0.08	0.40	0.08	0.05	0.20
	1124666	VBGW 110308-S2513 Z2	VBGW 222-S2513 Z2	○	⊗	2	6.35	3.18	0.80	2.80	2.00	0.15	0.08	0.50	0.10	0.08	0.25
	1124618	VBGW 160402-S2513 Z2	VBGW 330.5-S2513 Z2	⊗	⊗	2	9.53	4.76	0.20	4.40	2.00	0.10	0.08	0.20	0.08	0.05	0.15
	1124619	VBGW 160404-S2513 Z2	VBGW 331-S2513 Z2	⊗	⊗	2	9.53	4.76	0.40	4.40	2.00	0.15	0.08	0.40	0.08	0.05	0.20
	1124620	VBGW 160408-S2513 Z2	VBGW 332-S2513 Z2	⊗	⊗	2	9.53	4.76	0.80	4.40	2.00	0.20	0.08	0.50	0.10	0.08	0.30
	1124621	VBGW 160402-S1513 Z2	VBGW 330.5-S1513 Z2	⊗	⊗	2	9.53	4.76	0.20	4.40	2.00	0.10	0.08	0.20	0.08	0.05	0.15
	1124622	VBGW 160404-S1513 Z2	VBGW 331-S1513 Z2	⊗	⊗	2	9.53	4.76	0.40	4.40	2.00	0.15	0.08	0.40	0.08	0.05	0.20
	1124623	VBGW 160408-S1513 Z2	VBGW 332-S1513 Z2	⊗	⊗	2	9.53	4.76	0.80	4.40	2.00	0.20	0.08	0.50	0.10	0.08	0.30

⊗ Stock Items


○ Available Upon Request

Insert Order Code: (1) Geometry Code + (2) Grade Code

VC - RHOMBIC 35° POSITIVE



VCGW Z2

	(1) Geometry Code	(2) Grade Code		H		Dimensions (mm)						Cutting Conditions					
		ISO Reference	ANSI Reference	Y5	Y4	Z	D	S	R	d1	SL	ap (mm)	Min	Max	fn (mm/r)	Min	Max
				PBY603	PBY620												
	1124667	VCGW 160404-S2513 Z2	VCGW 331-S2513 Z2	⊗	⊗	2	9.53	4.76	0.40	4.40	2.80	0.15	0.08	0.40	0.08	0.05	0.20
	1124668	VCGW 160408-S2513 Z2	VCGW 332-S2513 Z2	⊗	⊗	2	9.53	4.76	0.80	4.40	2.00	0.20	0.08	0.50	0.10	0.08	0.30

⊗ Stock Items

○ Available Upon Request

Insert Order Code: (1) Geometry Code + (2) Grade Code

PCBN

Specifications

Code Key

Negative Inserts

Positive Inserts



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