

Chapter Composition of T-CBN (PCBN) and T-DIA (PCD) Tools

- ◆ T-CBN and T-DIA TAC inserts are arranged by shape as follows: C(80°) → D(55°) → S(90°) → T(60°) → V(35°) → W(80°)
- ◆ In the same shape, inserts are arranged as follows: Negative inserts (Multi-corner → Single-corner) Positive inserts (Multi-corner → Single-corner)

Indicates stocked grades
Shown in coloured columns
according to ISO application code

H Hard Materials
S Superalloys
K Cast Iron

Cat. No. of T-CBN TAC inserts

Chapter title

Indicates negative or positive

Appearance of inserts

Indicates insert dimensions

Applicable TAC toolholders

Indicates application area and specifications

Symbols of stock status

Specifications of edge preparation

Reference pages of relating items

Specification	Shape	Cat. No.	Stocked grades						Dimensions (mm)				Applicable TAC toolholders		
			BXM20	BXM25	BXM30	BXM40	BXM50	BXM60	Insert width	Thickness	Hole diameter	Corner radius			
General purpose	Sharp edge	SOP-CNGA120402F							2	2.7	4.76	5.16	0.2	2.3	TAC External Toolholders (2-14 -)
		SOP-CNGA120404F							2	2.7	4.76	5.16	0.4	2.3	
		SOP-CNGA120408F							2	2.7	4.76	5.16	0.8	2.2	
		SOP-CNGA120412F							2	2.7	4.76	5.16	1.2	2.4	
		SOP-CNGA120402							2	2.7	4.76	5.16	0.2	2.3	
		SOP-CNGA120404							2	2.7	4.76	5.16	0.4	2.3	
		SOP-CNGA120408							2	2.7	4.76	5.16	0.8	2.2	
		SOP-CNGA120412							2	2.7	4.76	5.16	1.2	2.4	
		SOP-CNGA120404-L							2	2.7	4.76	5.16	0.4	2.3	
		SOP-CNGA120408-L							2	2.7	4.76	5.16	0.8	2.2	
Light honing	Sharp edge	SOP-CNGA120412-L							2	2.7	4.76	5.16	1.2	2.4	TAC Internal Toolholders (5-53 -)
		SOP-CNGA120404-H							2	2.7	4.76	5.16	0.4	2.3	
		SOP-CNGA120408-H							2	2.7	4.76	5.16	0.8	2.2	
		SOP-CNGA120412-H							2	2.7	4.76	5.16	1.2	2.4	
		SOP-CNMA120404W							2	2.7	4.76	5.16	0.4	2.3	
		SOP-CNMA120408W							2	2.7	4.76	5.16	0.8	2.2	
		SOP-CNMA120412W							2	2.7	4.76	5.16	1.2	2.4	
		SOP-CNMA120404W							2	2.7	4.76	5.16	0.4	2.3	
		SOP-CNMA120408W							2	2.7	4.76	5.16	0.8	2.2	
		SOP-CNMA120412W							2	2.7	4.76	5.16	1.2	2.4	
Heavy honing	Sharp edge	T2OP-CNGA120404							2	2.7	4.76	5.16	0.4	2.3	TAC External Toolholders (2-21 -)
		T2OP-CNGA120408							2	2.7	4.76	5.16	0.8	2.2	
		T2OP-CNGA120412							2	2.7	4.76	5.16	1.2	2.4	
		T2OP-CNGA120404-H							4	2.7	4.76	5.16	0.4	2.3	
		T2OP-CNGA120408-H							4	2.7	4.76	5.16	0.8	2.2	
		T2OP-CNGA120412-H							4	2.7	4.76	5.16	1.2	2.4	
		T2OP-CNMA120404W							4	2.7	4.76	5.16	0.4	2.3	
		T2OP-CNMA120408W							4	2.7	4.76	5.16	0.8	2.2	
		T2OP-CNMA120412W							4	2.7	4.76	5.16	1.2	2.4	
		T2OP-DNGA150402F							2	2.7	4.76	5.16	0.2	2.7	
General purpose	Sharp edge	SOP-DNGA150404F							2	2.7	4.76	5.16	0.4	2.5	TAC Internal Toolholders (5-34 -)
		SOP-DNGA150408F							2	2.7	4.76	5.16	0.8	2.1	
		SOP-DNGA150412F							2	2.7	4.76	5.16	1.2	2	
		SOP-DNGA150404							2	2.7	4.76	5.16	0.4	2.5	
		SOP-DNGA150408							2	2.7	4.76	5.16	0.8	2.1	
		SOP-DNGA150412							2	2.7	4.76	5.16	1.2	2	
		SOP-DNGA150404-L							2	2.7	4.76	5.16	0.4	2.5	
		SOP-DNGA150408-L							2	2.7	4.76	5.16	0.8	2.1	
		SOP-DNGA150412-L							2	2.7	4.76	5.16	1.2	2	
		SOP-DNGA150404-H							2	2.7	4.76	5.16	0.4	2.5	
Light honing	Sharp edge	SOP-DNGA150408-H							2	2.7	4.76	5.16	0.8	2.1	TAC External Toolholders (2-21 -)
		SOP-DNGA150412-H							2	2.7	4.76	5.16	1.2	2	
		SOP-DNGA150404W							2	2.7	4.76	5.16	0.4	2.3	
		SOP-DNGA150408W							2	2.7	4.76	5.16	0.8	2.1	
		SOP-DNGA150412W							2	2.7	4.76	5.16	1.2	2	
		SOP-DNGA150404WJ							2	2.7	4.76	5.16	0.4	2.3	
		SOP-DNGA150408WJ							2	2.7	4.76	5.16	0.8	2.1	
		SOP-DNGA150604							2	2.7	6.35	5.16	0.4	2.5	
		SOP-DNGA150608							2	2.7	6.35	5.16	0.8	2.1	
		SOP-DNGA150612							2	2.7	6.35	5.16	1.2	2	

Note: Letter "T" in the first position of Cat. No. shows that the standard packing quantity is 10 pieces.
(2-21) Please refer to wiper type inserts, W, WL, WJ.

Standard honing specifications

Grades (1-1) Relating pages TAC External Toolholders (2-21) TAC Internal Toolholders (5-34)

3-7

Ordering information

- When ordering, please specify Cat. No., grade, and quantity.
Example: **2QP-DNGA150408 BXM20** 1 piece.
- Standard packing quantity is 1 piece.
- Letter "T" in the 1st position of Cat. No. shows 10 pieces packing.
- Other packing quantity is written separately.

Guidance

- Designation system for TAC T-CBN inserts 3-2
- Designation system for TAC T-DIA inserts 3-3
- Selection system for TAC T-CBN inserts by work material 3-4
- Honing specifications for TAC T-CBN inserts 3-6
- Specifications of TAC T-CBN inserts with wiper edge 3-6
- Outline of T-DIA series 3-20

3 T-CBN (PCBN) and
T-DIA (PCD) tools

Products

■ T-CBN tools

- TAC inserts Negative type multi-corner type inserts 3-7
- TAC inserts Negative type one corner type 3-11
- TAC inserts Positive type multi-corner type inserts 3-12
- TAC inserts Positive type one corner type 3-15
- TAC inserts Solid T-CBN inserts 3-17
- TAC inserts T-CBN grooving inserts 3-17

■ T-DIA tools

- TAC inserts Negative type with rake angle 3-21
- TAC inserts Negative type 3-21
- TAC inserts Positive type with rake angle 3-22
- TAC inserts Positive type 3-22

Designation System for TAC T-CBN (PCBN) Inserts

3

PCD and PCBN Tools

Multi-Corner type

2 QP-CNGA120404 -L

1 No. of corners	
2	One side Multi-Corner type
3	
4	Both side Multi-Corner type
6	

2 Type	
QP	T-CBN Inserts

3 ISO symbol

4 Special feature & chipbreaker	
Without	Standard honing
-L	Light honing angle Wear resistance priority
-H	Heavy honing angle Impact resistance priority
W	Wiper type insert
W□	Round wiper type insert
F	Sharp edges
-HF	With chipbreaker
-HM	With chipbreaker

Multi-Corner type (10 inserts packing)

T 2 QP-CNGA120408

1 "T" shows 10 inserts packing.

For general turning

TNGA160402 - QBN

1 ISO symbol

2 TAC T-CBN inserts

T-CBN (PCBN tipped) grooving Inserts

XG R 63 10 S - QBN

1 For grooving tool GX-type

2 Hand of Insert	
L	Left
R	Right

3 Groove width	
10	→ 1.0 mm
15	→ 1.5 mm etc.

4 S : Corner radius (r_ϵ) is 0.2 mm.

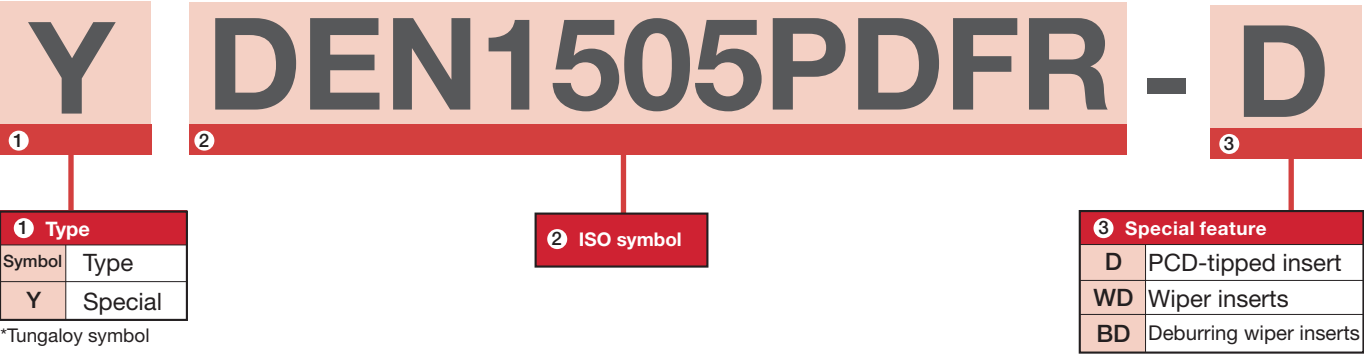
5 TAC T-CBN inserts

Designation System for TAC T-DIA Inserts

Inserts for turning

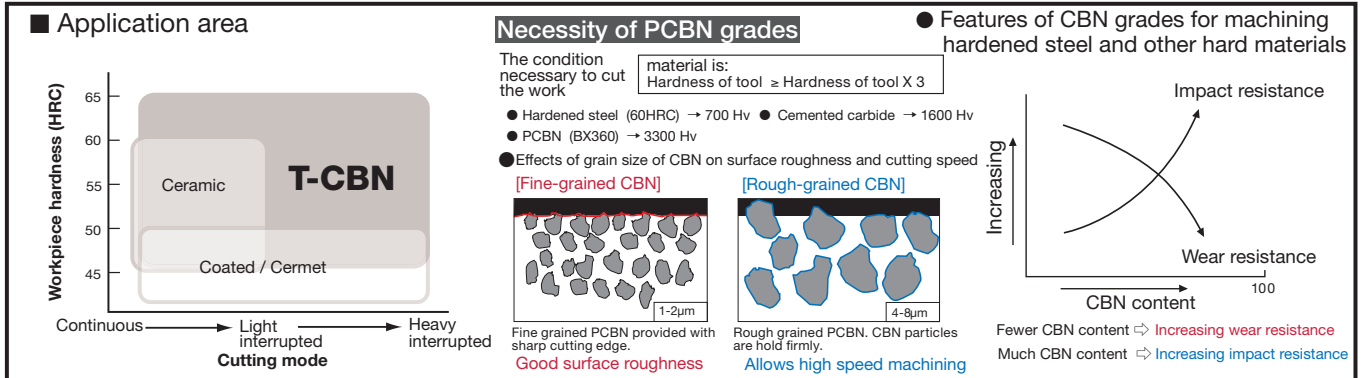


Inserts for milling



T-CBN (PCBN) Series

H T-CBN series for machining hardened steels and hard materials



Basic selection of T-CBN grades in machining of hardened steel and hard material

Coated T-CBN grades

BXM10 For high speeds cutting

BXM20 For general purpose
First recommendation

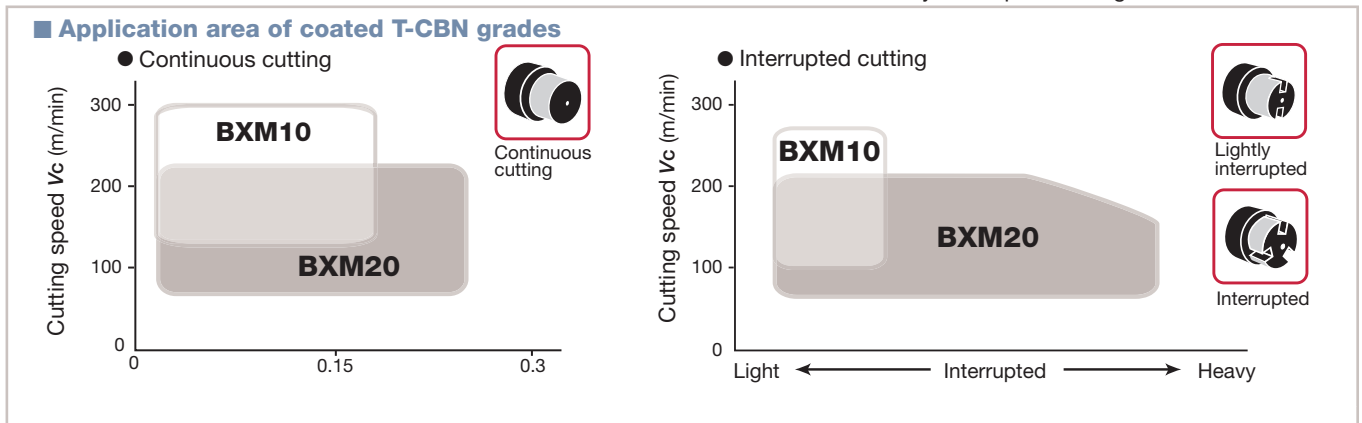
Uncoated T-CBN grades

BX310 For high speeds / Priority on wear resistance in continuous cutting

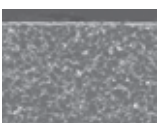
BX330 For medium speeds / Priority on surface quality

BX360 For low to medium speeds / General purpose grade, excels in impact resistance

BX380 For low to medium speeds / Priority on impact resistance in heavily interrupted cutting



Effects of Coated T-CBN grades



Coated on hard CBN
Hardness:
CBN > Coating layer

Protect CBN from oxidation wear

Since the coating layer intercepts air, oxidation wear of CBN can be prevented.

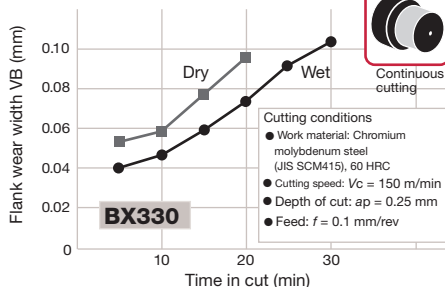
Peeling of coating layer can be protected

Hard and deformation resistant CBN is excellent substrate material.

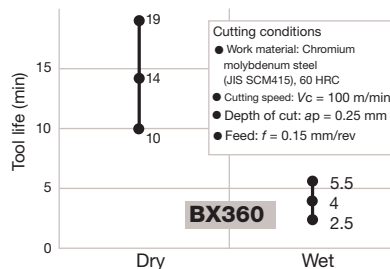
Improved resistance to flank wear

Effects of coolant in machining of hardened steel

Continuous cutting



Interrupted cutting

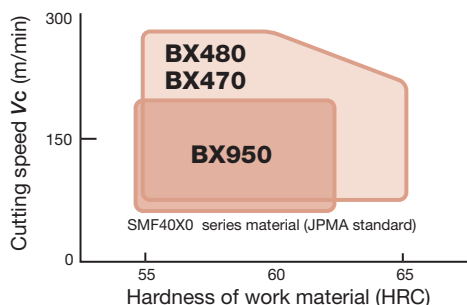


- In continuous cutting, wet cutting is superior to dry cutting in tool life for wear.
- In interrupted cutting, dry cutting is superior to wet cutting in tool life for fracture.

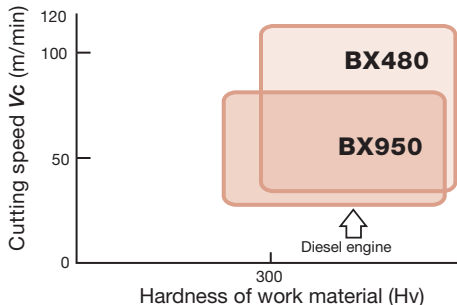
S T-CBN series for machining sintered metals

Application area

● Ferrous sintered metal



● Valve seat



BX470

Priority on burr prevention and surface finish

BX480

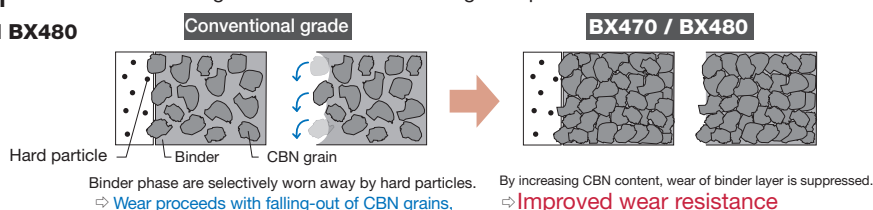
Priority on wear resistance and versatility

BX950

For general sintered metal parts

Features of BX470 and BX480

● Machining of sintered metal including hard particles



● Features of BX470 and BX480

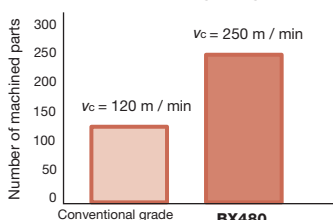
CBN content: 95 vol%

Hv = 4100 ~ 4300

The world highest CBN content as a commercially available material.

*as of July 2010

BX480 (Facing of gears)



Cutting conditions

- Work material: Sintered metal (> HRA60)
- Insert: DCMW11T308
- Depth of cut: $a_p = 0.2 \sim 0.5$ mm
- Feed: $f = 0.07$ mm/rev
- Coolant: Water soluble type
- Interrupted cutting

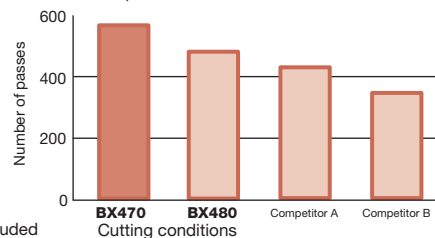
BX470/BX480 Tool failure after machining sintered metal



Cutting conditions

- Work material: Sintered metal (> HRA60), Nitriding, Hard particles included
- Cutting speed: $V_c = 110$ m/min
- Depth of cut: $a_p = 0.15$ mm
- Feed: $f = 0.1$ mm/rev
- Coolant: Water soluble type
- Interrupted cutting

BX470 (Tool life criterion: Burr occurrence)



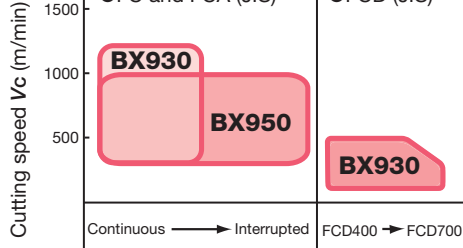
Cutting conditions

- Work material: Ferrous sintered metal
- Cutting speed: $V_c = 100$ m/min
- Depth of cut: $a_p = 0.15 \sim 0.3$ mm
- Feed: $f = 0.07 \sim 0.25$ mm/rev
- Dry and interrupted cutting

K T-CBN series for machining grey and ductile cast irons

Application area

● FC and FCA (JIS)



● FCD (JIS)

BX930

- General purpose, first choice grade.
- Dedicated grade for machining ductile cast iron

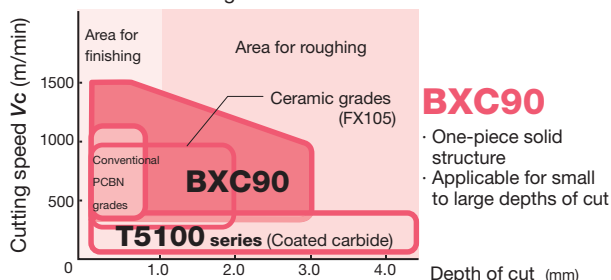
BX950

- Suitable for interrupted machining
- Excels in impact resistance

BX910

- For machining cylinder liners

● Solid coated T-CBN grades

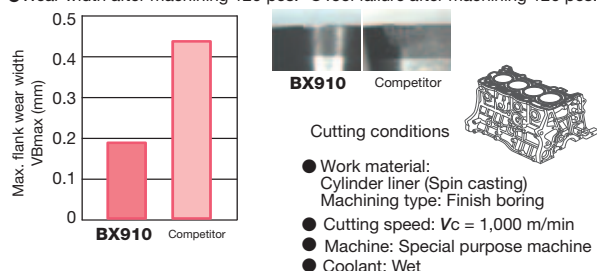


BXC90

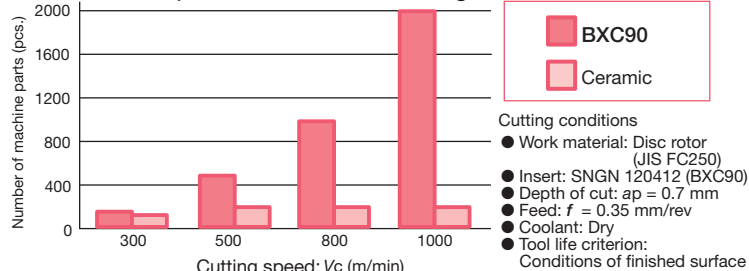
- One-piece solid structure
- Applicable for small to large depths of cut

Machining of cylinder liners (Machining example of BX910)

● Wear width after machining 120 pcs. ● Tool failure after machining 120 pcs.



Tool life comparison in finish machining of disc brakes



Honing specifications

● T-CBN inserts with special honing specifications are made to order. Refer to the following description.

Designation system for honing

Example:
Honing width 0.15 mm
Honing angle - 30°
With R-honing



T ... Chamfered honing

S ... Chamfered + R-honing

E ... R-honing alone

F ... Sharp edges

Symbol

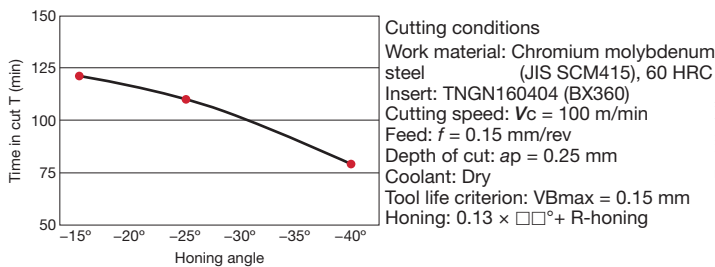
W	Amount of honing
005	0.05 mm
010	0.10 mm
013	0.13 mm
015	0.15 mm
020	0.20 mm

α	Honing angle
10°	- 10°
15°	- 15°
20°	- 20°
25°	- 25°
30°	- 30°
35°	- 35°
40°	- 40°

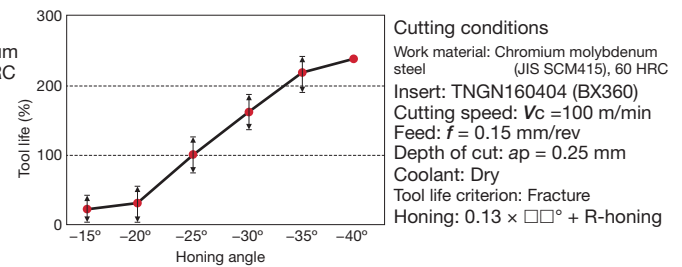
- Honing specification can be selected in combination of items described here.
 - Inserts with "R" honing alone are available.
- Note: There are unavailable combinations.
For details, ask your nearest Tungaloy sales office.

Honing specifications for machining hardened steels and other hard materials
Standard honing: 0.13 × 25° + R-honing
"L" honing : 0.13 × 15° + R-honing
"H" honing : 0.13 × 35° + R-honing

Relationship between honing angle and tool life in continuous turning



Relationship between honing angle and tool life in interrupted turning



General rule

- For continuous cutting, small honing angle is favorable to minimize wear in general.
- For interrupted cutting, large honing angle is favorable to minimize fracture in general.

T-CBN Series

Wiper insert

- A finishing edge (wiper edge) is formed at the point of intersection between corner radius and straight cutting edge.

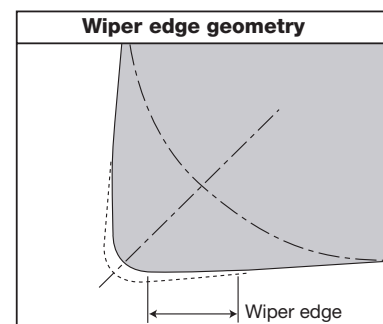
Effect of wiper edge

- Doubles the productivity → Reduced machining time

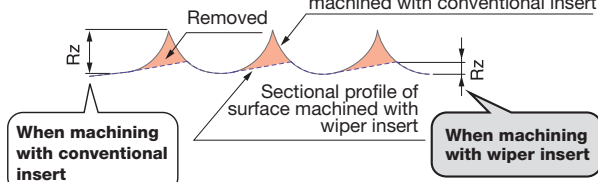
The wiper edge can double the feed rate and moreover does not deteriorate the surface roughness. (Note: Feed rate: $*f < 0.3$ mm/rev)

- Superior surface roughness → By integrating roughing and finishing into one process, productivity can be increased.

Compared with conventional inserts only with corner radius, surface roughness can be improved with the wiper edge.



Profiles of surface roughness



Recommended toolholders for wiper-edged inserts

	2QP-CNGA1204**WL	3QP-WNGA080408WL	2QP-DNGA1504**WJ	3QP-TNGA1604**WG
End cutting angle	95°		93°	91°
External toolholder	ACLNR/L****12-A	AWLNR/L****08-A	ADJNR/L****15-A	ATGNR/L****16-A
	DCLNR/L****12	DWLNR/L****08	DDJNR/L****15	DTGNR/L****16
Internal toolholder	A***-ACLNR/L12-D***	A***-AWLNR/L08-D***	A***-ADUNR/L15-D***	A***-ATFNR/L16-D***

Negative inserts · Multi-corner type

Specifi- cation	Shape	Cat. No.	Stocked grades										No. of corner	Dimensions (mm)					Applicable TAC Toolholders
			BXM10	BXM20	BXC50	BX310	BX330	BX360	BX380	BX470	BX480	BX930		BX950	Inner circle ød	Thick- ness s	Hole dia. ød1	Corner radius rε	
Sharp edge		2QP-CNGA120402F											2	12.7	4.76	5.16	0.2	2.3	TAC External Toolholders (4-14 ~)
		2QP-CNGA120404F								●			2	12.7	4.76	5.16	0.4	2.3	
		2QP-CNGA120408F								●			2	12.7	4.76	5.16	0.8	2.2	
		2QP-CNGA120412F											2	12.7	4.76	5.16	1.2	2.4	
General purpose		2QP-CNGA120402											2	12.7	4.76	5.16	0.2	2.3	TAC Internal Toolholders (5-33 ~)
		2QP-CNGA120404	●	●		●	●	●	●	●	●	●	2	12.7	4.76	5.16	0.4	2.3	
		2QP-CNGA120408	●	●		●	●	●	●	●	●	●	2	12.7	4.76	5.16	0.8	2.2	
		2QP-CNGA120412		●		●	●	●	●	●	●	●	2	12.7	4.76	5.16	1.2	2.4	
Light honing		2QP-CNGA120404-L	●	●			●						2	12.7	4.76	5.16	0.4	2.3	
		2QP-CNGA120408-L	●	●			●						2	12.7	4.76	5.16	0.8	2.2	
		2QP-CNGA120412-L	●	●			●						2	12.7	4.76	5.16	1.2	2.4	
Heavy honing		2QP-CNGA120404-H		●				●	●				2	12.7	4.76	5.16	0.4	2.3	
		2QP-CNGA120408-H		●				●	●				2	12.7	4.76	5.16	0.8	2.2	
		2QP-CNGA120412-H		●				●	●				2	12.7	4.76	5.16	1.2	2.4	
Wiper edge		2QP-CNGA120404WL	●	●									2	12.7	4.76	5.16	0.4	2.3	
		2QP-CNGA120408WL	●	●									2	12.7	4.76	5.16	0.8	2.2	
		2QP-CNGA120412WL	●	●									2	12.7	4.76	5.16	1.2	2.4	
Wiper edge		2QP-CNMA120404W					●						2	12.7	4.76	5.16	0.4	2.3	
		2QP-CNMA120408W					●						2	12.7	4.76	5.16	0.8	2.2	
		2QP-CNMA120412W					●						2	12.7	4.76	5.16	1.2	2.4	
General purpose		T2QP-CNGA120404						●					2	12.7	4.76	5.16	0.4	2.3	
		T2QP-CNGA120408						●					2	12.7	4.76	5.16	0.8	2.2	
General purpose		4QP-CNGA120404			●							4	12.7	4.76	5.16	0.4	2.3		
		4QP-CNGA120408			●							4	12.7	4.76	5.16	0.8	2.2		
		4QP-CNGA120412			●							4	12.7	4.76	5.16	1.2	2.4		
Heavy honing		4QP-CNGA120404-H										4	12.7	4.76	5.16	0.4	2.3		
		4QP-CNGA120408-H										4	12.7	4.76	5.16	0.8	2.2		
		4QP-CNGA120412-H										4	12.7	4.76	5.16	1.2	2.4		
Wiper edge		4QP-CNMA120404W			●							4	12.7	4.76	5.16	0.4	2.3		
		4QP-CNMA120408W			●							4	12.7	4.76	5.16	0.8	2.2		
		4QP-CNMA120412W			●							4	12.7	4.76	5.16	1.2	2.4		
Sharp edge		2QP-DNGA150402F										2	12.7	4.76	5.16	0.2	2.7	TAC External Toolholders (4-21 ~)	
		2QP-DNGA150404F										2	12.7	4.76	5.16	0.4	2.5		
		2QP-DNGA150408F										2	12.7	4.76	5.16	0.8	2.1		
		2QP-DNGA150412F										2	12.7	4.76	5.16	1.2	2		
General purpose		2QP-DNGA150404	●	●		●	●	●	●	●	●	●	2	12.7	4.76	5.16	0.4	2.5	TAC Internal Toolholders (5-34 ~)
		2QP-DNGA150408	●	●		●	●	●	●	●	●	●	2	12.7	4.76	5.16	0.8	2.1	
		2QP-DNGA150412	●	●		●	●	●		●	●	●	2	12.7	4.76	5.16	1.2	2	
Light honing		2QP-DNGA150404-L	●	●			●						2	12.7	4.76	5.16	0.4	2.5	
		2QP-DNGA150408-L	●	●			●						2	12.7	4.76	5.16	0.8	2.1	
		2QP-DNGA150412-L		●			●						2	12.7	4.76	5.16	1.2	2	
Heavy honing		2QP-DNGA150404-H		●				●	●				2	12.7	4.76	5.16	0.4	2.5	
		2QP-DNGA150408-H		●				●	●				2	12.7	4.76	5.16	0.8	2.1	
		2QP-DNGA150412-H		●				●	●				2	12.7	4.76	5.16	1.2	2	
Wiper edge		2QP-DNGA150404WJ	●	●									2	12.7	4.76	5.16	0.4	2.3	
		2QP-DNGA150408WJ	●	●									2	12.7	4.76	5.16	0.8	2.1	
General purpose		2QP-DNGA150604	●	●									2	12.7	6.35	5.16	0.4	2.5	
		2QP-DNGA150608	●	●									2	12.7	6.35	5.16	0.8	2.1	
		2QP-DNGA150612	●	●									2	12.7	6.35	5.16	1.2	2	

Note:

Letter "T" in the first position of Cat. No. shows that the standard packing quantity is 10 pieces.

● : Stocked item

▶ 3-6 Please refer to wiper type inserts, W, WL, WJ.

Standard honing specifications

▶ 3-6

Grades	BXM10	BXM20	BXC50	BX310	BX330	BX360	BX380	BX470	BX480	BX910	BX930	BX950
Negative inserts	S01325	S01325	S01325	S01325	S01325	S01325	S01325	T01315	S01325	S01315	S01315	S01325
Positive inserts	S01325	S01325	—	S00515	S00515	S00515	—	T01315	—	S01315	S00515	S00515

Negative inserts · Multi-corner type

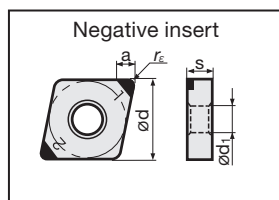
Specifi- cation	Shape	Cat. No.	Stocked grades											No. of corner	Dimensions (mm)					Applicable TAC toolholders
			BXM10	BXM20	BXC50	BX310	BX330	BX360	BX380	BX470	BX480	BX910	BX930		BX950	Inner circle ød	Thick- ness s	Hole dia. ød1	Corner radius rε	
General purpose		4QP-DNGA150404			●									4	12.7	4.76	5.16	0.4	2.5	TAC External Toolholders (4-21 ~) TAC Internal Toolholders (5-34 ~)
		4QP-DNGA150408			●									4	12.7	4.76	5.16	0.8	2.1	
		4QP-DNGA150412			●									4	12.7	4.76	5.16	1.2	2	
Heavy honing		4QP-DNGA150404-H											4	12.7	4.76	5.16	0.4	2.5		
		4QP-DNGA150408-H											4	12.7	4.76	5.16	0.8	2.1		
		4QP-DNGA150412-H											4	12.7	4.76	5.16	1.2	2		
General purpose		2QP-SNGA120404		●		●	●	●	●		●	●	●	2	12.7	4.76	5.16	0.4	2.4	TAC External Toolholders (4-25 ~) TAC Internal Toolholders (5-35 ~)
		2QP-SNGA120408		●		●	●	●	●		●	●	●	2	12.7	4.76	5.16	0.8	2.4	
		2QP-SNGA120412		●		●	●	●	●		●	●	●	2	12.7	4.76	5.16	1.2	2.4	
Light honing		2QP-SNGA120404-L					●						2	12.7	4.76	5.16	0.4	2.4		
		2QP-SNGA120408-L		●			●						2	12.7	4.76	5.16	0.8	2.4		
		2QP-SNGA120412-L		●			●						2	12.7	4.76	5.16	1.2	2.4		
Heavy honing		2QP-SNGA120404-H						●	●				2	12.7	4.76	5.16	0.4	2.4		
		2QP-SNGA120408-H		●				●	●				2	12.7	4.76	5.16	0.8	2.4		
		2QP-SNGA120412-H		●				●	●				2	12.7	4.76	5.16	1.2	2.4		
General purpose		4QP-SNGA120404			●								4	12.7	4.76	5.16	0.4	2.4	TAC External Toolholders (4-25 ~) TAC Internal Toolholders (5-35 ~)	
		4QP-SNGA120408			●								4	12.7	4.76	5.16	0.8	2.4		
		4QP-SNGA120412			●								4	12.7	4.76	5.16	1.2	2.4		
Heavy honing		4QP-SNGA120408-H										4	12.7	4.76	5.16	0.8	2.4			
		4QP-SNGA120412-H										4	12.7	4.76	5.16	1.2	2.4			
General purpose		2QP-SNGN090308									●		2	9.525	3.18	-	0.8	2.4	TAC External Toolholders (4-24 ~)	
		2QP-SNGN090312									●		2	9.525	3.18	-	1.2	2.4		
Sharp edge		3QP-TNGA160402F											3	9.525	4.76	3.81	0.2	2.3	TAC External Toolholders (4-24 ~)	
		3QP-TNGA160404F								●			3	9.525	4.76	3.81	0.4	2.2		
		3QP-TNGA160408F								●			3	9.525	4.76	3.81	0.8	1.9		
General purpose		3QP-TNGA160412F										3	9.525	4.76	3.81	1.2	2.4	TAC Internal Toolholders (5-36 ~)		
		3QP-TNGA160404	●	●		●	●	●	●	●	●	●	3	9.525	4.76	3.81	0.4		2.2	
		3QP-TNGA160408	●	●		●	●	●	●	●	●	●	3	9.525	4.76	3.81	0.8		1.9	
Light honing		3QP-TNGA160412	●	●		●	●	●	●	●	●	3	9.525	4.76	3.81	1.2	2.4			
		3QP-TNGA160404-L	●	●			●						3	9.525	4.76	3.81	0.4		2.2	
		3QP-TNGA160408-L	●	●			●						3	9.525	4.76	3.81	0.8		1.9	
Heavy honing		3QP-TNGA160412-L	●	●			●					3	9.525	4.76	3.81	1.2	2.4			
		3QP-TNGA160404-H		●				●	●				3	9.525	4.76	3.81	0.4		2.2	
		3QP-TNGA160408-H		●				●	●				3	9.525	4.76	3.81	0.8		1.9	
Wiper edge		3QP-TNGA160412-H		●			●	●				3	9.525	4.76	3.81	1.2	2.4			
		3QP-TNGA160404WG		●								3	9.525	4.76	3.81	0.4	2.4			
		3QP-TNGA160408WG	●	●								3	9.525	4.76	3.81	0.8	2.2			
General purpose		T3QP-TNGA160404						●				3	9.525	4.76	3.81	0.4	2.2			
		T3QP-TNGA160408						●				3	9.525	4.76	3.81	0.8	1.9			
General purpose		6QP-TNGA160404			●							6	9.525	4.76	3.81	0.4	2.2	TAC External Toolholders (4-24 ~) TAC Internal Toolholders (5-36 ~)		
		6QP-TNGA160408			●							6	9.525	4.76	3.81	0.8	1.9			
		6QP-TNGA160412			●							6	9.525	4.76	3.81	1.2	2.4			
Heavy honing		6QP-TNGA160404-H									6	9.525	4.76	3.81	0.4	2.2				
		6QP-TNGA160408-H									6	9.525	4.76	3.81	0.8	1.9				
		6QP-TNGA160412-H									6	9.525	4.76	3.81	1.2	2.4				

Note:

Letter "T" in the first position of Cat. No. shows that the standard packing quantity is 10 pieces.

● : Stocked item

3-6 Please refer to wiper type inserts, WG.



Standard honing specifications

3-6

Grades	BXM10	BXM20	BXC50	BX310	BX330	BX360	BX380	BX470	BX480	BX910	BX930	BX950
Negative inserts	S01325	S01325	S01325	S01325	S01325	S01325	S01325	T01315	S01325	S01315	S01315	S01325
Positive inserts	S01325	S01325	-	S00515	S00515	S00515	-	T01315	-	S01315	S00515	S00515

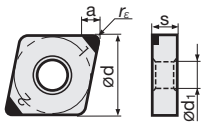
Negative inserts · Multi-corner type

Specifi- cation	Shape	Cat. No.	Stocked grades										No. of corner	Dimensions (mm)					Applicable TAC toolholders
			BXM10	BXM20	BXC50	BX310	BX330	BX360	BX380	BX470	BX480	BX930		BX950	Inner circle ød	Thick- ness s	Hole dia. ød1	Corner radius rε	
General purpose		2QP-VNGA160402											2	9.525	4.76	3.81	0.2	3.5	TAC External Toolholders (4-30 ~)
		2QP-VNGA160404	●	●		●	●	●	●	●	●	●	2	9.525	4.76	3.81	0.4	3.1	
Light honing		2QP-VNGA160408	●	●		●	●	●	●	●	●	●	2	9.525	4.76	3.81	0.8	2.2	TAC Internal Toolholders (5-37 ~)
		2QP-VNGA160412		●									2	9.525	4.76	3.81	1.2	3	
		2QP-VNGA160404-L	●	●			●						2	9.525	4.76	3.81	0.4	3.1	
		2QP-VNGA160408-L	●	●			●						2	9.525	4.76	3.81	0.8	2.2	
Heavy honing		2QP-VNGA160404-H		●				●	●				2	9.525	4.76	3.81	0.4	3.1	TAC Internal Toolholders (5-37 ~)
		2QP-VNGA160408-H		●				●	●				2	9.525	4.76	3.81	0.8	2.2	
General purpose		4QP-VNGA160404			●							4	9.525	4.76	3.81	0.4	3.1	TAC External Toolholders (4-17 ~)	
		4QP-VNGA160408			●								4	9.525	4.76	3.81	0.8		2.2
4QP-VNGA160412												4	9.525	4.76	3.81	1.2	3		
Reinforced cutting edge		4QP-VNGA160404-H										4	9.525	4.76	3.81	0.4	3.1		TAC Internal Toolholders (5-38 ~)
		4QP-VNGA160408-H										4	9.525	4.76	3.81	0.8	2.2		
Wiper edge		3QP-WNGA080408	●	●		●	●	●		●	●	●	3	12.7	4.76	5.16	0.8	2.2	TAC External Toolholders (4-17 ~)
General purpose		3QP-WNGA080408WL	●	●									3	12.7	4.76	5.16	0.8	2.2	
	General purpose	6QP-WNGA080408			●								6	12.7	4.76	5.16	0.8	2.2	

3-6 Please refer to wiper type inserts, WL.

● : Stocked item

Negative insert



Standard honing specifications

3-6

Grades	BXM10	BXM20	BXC50	BX310	BX330	BX360	BX380	BX470	BX480	BX910	BX930	BX950
Negative inserts	S01325	S01325	S01325	S01325	S01325	S01325	S01325	T01315	S01325	S01315	S01315	S01325
Positive inserts	S01325	S01325	—	S00515	S00515	S00515	—	T01315	—	S01315	S00515	S00515

Negative inserts · Multi-corner type Hard Breaker (T-CBN inserts with chipbreaker)

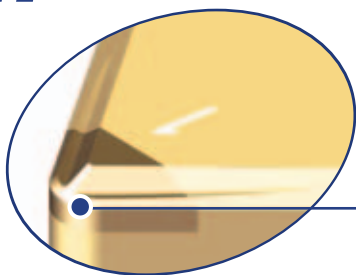
Specification	Shape	Cat. No.	Stocked grades		No. of corner	Dimensions (mm)					Applicable TAC toolholders
			BX	XM20		Inner circle ød	Thickness s	Hole dia. ød1	Corner radius rε	CBN Length a	
With chip-breaker		2QP-CNGM120408-HF	●		2	12.7	4.76	5.16	0.8	2.2	TAC External Toolholders (4-14 ~) TAC Internal Toolholders (5-33 ~)
		2QP-CNGM120412-HF	●		2	12.7	4.76	5.16	1.2	2.4	
		2QP-DNGM150408-HF	●		2	12.7	4.76	5.16	0.8	2.1	
		2QP-DNGM150412-HF	●		2	12.7	4.76	5.16	1.2	2	
		3QP-TNGM160408-HF	●		3	9.525	4.76	3.81	0.8	1.9	
		3QP-TNGM160412-HF	●		3	9.525	4.76	3.81	1.2	2.4	
		2QP-VNGM160408-HF	●		2	9.525	4.76	3.81	0.8	2.2	
With chip-breaker		2QP-CNGM120408-HM	●		2	12.7	4.76	5.16	0.8	2.2	
		2QP-CNGM120412-HM	●		2	12.7	4.76	5.16	1.2	2.4	
		2QP-DNGM150408-HM	●		2	12.7	4.76	5.16	0.8	2.1	
		2QP-DNGM150412-HM	●		2	12.7	4.76	5.16	1.2	2	
		3QP-TNGM160408-HM	●		3	9.525	4.76	3.81	0.8	1.9	
		3QP-TNGM160412-HM	●		3	9.525	4.76	3.81	1.2	2.2	
		2QP-VNGM160408-HM	●		2	9.525	4.76	3.81	0.8	2.4	

● : Stocked item

“Hard Breakers” for removing the carburized layer

Two types of chipbreaker provide excellent chip control in a wide application range !

HF type For finishing

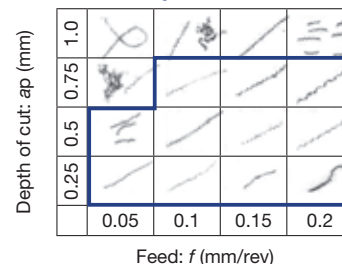


Single sided CBN insert provides higher stability in heavy machining.

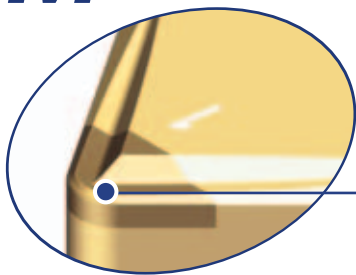
Excellent chip control in small DoC due to the high functional nose. Delivers exceptional surface finishes.

Example of chips

HF Chipbreaker



HM type For medium cutting

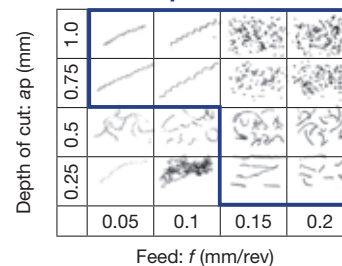


Single sided CBN insert provides higher stability in heavy machining.

Providing ideal chip control in large DoC by the well designed chipbreaker. Suitable for medium cutting or roughing.

Example of chips

HM Chipbreaker



Negative inserts · One-corner type

Application & features	Shape	Cat. No.	Stocked grades		No. of corner	Dimensions (mm)					Applicable TAC toolholders
			T-CBN	BX360		Inner circle ød	Thick ness s	Hole dia. ød1	Corner radius r _E	CBN length a	
Finishing to medium cutting		CNGA120402-QBN	●		1	12.7	4.76	5.16	0.2	4.1	TAC External Toolholders (4-14 ~) TAC Internal Toolholders (5-53 ~)
		CNGA120404-QBN	●		1	12.7	4.76	5.16	0.4	4.0	
		CNGA120408-QBN	●		1	12.7	4.76	5.16	0.8	3.9	
		CNGA120412-QBN	●		1	12.7	4.76	5.16	1.2	3.9	
		CNGN090404-QBN			1	9.525	4.76	—	0.4	3.8	
		CNGN090408-QBN			1	9.525	4.76	—	0.8	3.8	
		DNGA150402-QBN	●		1	12.7	4.76	5.16	0.2	4.3	TAC External Toolholders (4-21 ~) TAC Internal Toolholders (5-34 ~)
		DNGA150404-QBN	●		1	12.7	4.76	5.16	0.4	4.1	
		DNGA150408-QBN	●		1	12.7	4.76	5.16	0.8	3.8	
		DNGA150412-QBN	●		1	12.7	4.76	5.16	1.2	3.4	
Finishing to medium cutting		SNGA120402-QBN	●		1	12.7	4.76	5.16	0.2	4.1	TAC External Toolholders (4-25 ~) TAC Internal Toolholders (5-35 ~)
		SNGA120404-QBN	●		1	12.7	4.76	5.16	0.4	4.1	
		SNGA120408-QBN	●		1	12.7	4.76	5.16	0.8	4.1	
		SNGA120412-QBN	●		1	12.7	4.76	5.16	1.2	4.1	
Finishing to medium cutting		SNGN120402-QBN			1	12.7	4.76	—	0.2	4.1	TAC External Toolholders (4-50 ~)
		SNGN120404-QBN			1	12.7	4.76	—	0.4	4.1	
		SNGN120408-QBN			1	12.7	4.76	—	0.8	4.1	
		SNGN120412-QBN			1	12.7	4.76	—	1.2	4.1	
Finishing to medium cutting		TNGA160402-QBN	●		1	9.525	4.76	3.81	0.2	4.4	TAC External Toolholders (4-24 ~) TAC Internal Toolholders (5-36 ~)
		TNGA160404-QBN	●		1	9.525	4.76	3.81	0.4	4.2	
		TNGA160408-QBN	●		1	9.525	4.76	3.81	0.8	4.0	
		TNGA160412-QBN	●		1	9.525	4.76	3.81	1.2	3.7	
Finishing to medium cutting		TNGN160402-QBN			1	9.525	4.76	—	0.2	4.4	TAC External Toolholders (4-47 ~)
		TNGN160404-QBN			1	9.525	4.76	—	0.4	4.2	
		TNGN160408-QBN			1	9.525	4.76	—	0.8	4.0	
		TNGN160412-QBN			1	9.525	4.76	—	1.2	3.7	

● : Stocked item

Standard honing specifications

3-6

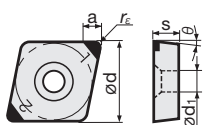
Grades	BXM10	BXM20	BXC50	BX310	BX330	BX360	BX380	BX470	BX480	BX910	BX930	BX950
Negative inserts	S01325	S01325	S01325	S01325	S01325	S01325	S01325	T01315	S01325	S01315	S01315	S01325
Positive inserts	S01325	S01325	—	S00515	S00515	S00515	—	T01315	—	S01315	S00515	S00515

Positive inserts · Multi-corner type (G class)

Specifi- cation	Shape	Cat. No.	Stocked grades				No. of corner	Dimensions (mm)						Applicable TAC toolholders
			BXM10	BXM20	BX470	BX910		Clear- ance angle θ	Inner circle ϕd	Thick- ness s	Hole dia. ϕd_1	Corner radius r ϵ	CBN Length a	
General purpose		2QP-CCGW060202	●	●			2	7°	6.35	2.38	2.8	0.2	2.3	TAC External Toolholders (4-63 ~)
		2QP-CCGW060204	●	●	●		2	7°	6.35	2.38	2.8	0.4	2.3	
General purpose		2QP-CCGW09T302					2	7°	9.525	3.97	4.4	0.2	2.3	TAC Internal Toolholders (5-12 ~)
		2QP-CCGW09T304	●	●	●		2	7°	9.525	3.97	4.4	0.4	2.3	
		2QP-CCGW09T308	●	●	●		2	7°	9.525	3.97	4.4	0.8	2.2	
General purpose		2QP-DCGW070202	●	●			2	7°	6.35	2.38	2.8	0.2	2.7	TAC External Toolholders (4-63 ~)
		2QP-DCGW070204	●	●	●		2	7°	6.35	2.38	2.8	0.4	2.5	
		2QP-DCGW070208			●		2	7°	6.35	2.38	2.8	0.8	2.5	
Sharp edge		2QP-DCGW11T302F			●		2	7°	9.525	3.97	4.4	0.2	2.7	TAC Internal Toolholders (5-16 ~)
		2QP-DCGW11T304F			●		2	7°	9.525	3.97	4.4	0.4	2.5	
General purpose		2QP-DCGW11T302	●	●			2	7°	9.525	3.97	4.4	0.2	2.7	
		2QP-DCGW11T304	●	●	●		2	7°	9.525	3.97	4.4	0.4	2.5	
		2QP-DCGW11T308	●	●	●		2	7°	9.525	3.97	4.4	0.8	2.1	
General purpose		2QP-SPGW09T308				●	2	11°	9.525	3.97	4.4	0.8	2.4	
		2QP-SPGW09T312				●	2	11°	9.525	3.97	4.4	1.2	2.4	
General purpose		2QP-SPGW120408				●	2	11°	12.7	4.76	5.5	0.8	2.4	
		2QP-SPGW120412				●	2	11°	12.7	4.76	5.5	1.2	2.4	
		2QP-SPGW120416				●	2	11°	12.7	4.76	5.5	1.6	2.4	
General purpose		2QP-SPGN090308				●	2	11°	9.525	3.18	-	0.8	2.4	
		2QP-SPGN090312				●	2	11°	9.525	3.18	-	1.2	2.4	
General purpose		3QP-TPGW080202					3	11°	4.76	2.38	2.3	0.2	2.4	TAC Internal Toolholders (5-20 ~)
		3QP-TPGW080204	●	●			3	11°	4.76	2.38	2.3	0.4	2.2	
General purpose		3QP-TPGW090202		●			3	11°	5.56	2.38	2.5	0.2	2.3	
		3QP-TPGW090204	●	●			3	11°	5.56	2.38	2.5	0.4	2.2	
General purpose		3QP-TPGW110202		●			3	11°	6.35	2.38	2.8	0.2	2.3	
		3QP-TPGW110204	●	●	●		3	11°	6.35	2.38	2.8	0.4	2.2	
		3QP-TPGW110208			●		3	11°	6.35	2.38	2.8	0.8	2.2	
Sharp edge		3QP-TPGW110302F					3	11°	6.35	3.18	3.4	0.2	2.3	
		3QP-TPGW110304F			●		3	11°	6.35	3.18	3.4	0.4	2.2	
		3QP-TPGW110308F			●		3	11°	6.35	3.18	3.4	0.8	2	
General purpose		3QP-TPGW110302		●			3	11°	6.35	3.18	3.4	0.2	2.3	
		3QP-TPGW110304	●	●	●		3	11°	6.35	3.18	3.4	0.4	2.2	
		3QP-TPGW110308	●	●	●	●	3	11°	6.35	3.18	3.4	0.8	1.9	
General purpose		3QP-TPGW130302		●			3	11°	7.94	3.18	3.4	0.2	2.3	
		3QP-TPGW130304	●	●			3	11°	7.94	3.18	3.4	0.4	2.2	
		3QP-TPGW130308					3	11°	7.94	3.18	3.4	0.8	2	
General purpose		3QP-TPGW16T302					3	11°	9.525	3.97	4.4	0.2	2.3	
		3QP-TPGW16T304	●	●			3	11°	9.525	3.97	4.4	0.4	2.2	
		3QP-TPGW16T308	●	●			3	11°	9.525	3.97	4.4	0.8	1.9	
Sharp edge		3QP-TPGW160402F					3	11°	9.525	4.76	4.4	0.2	2.3	
		3QP-TPGW160404F					3	11°	9.525	4.76	4.4	0.4	2.2	
		3QP-TPGW160408F					3	11°	9.525	4.76	4.4	0.8	2	
General purpose		3QP-TPGW160404	●	●			3	11°	9.525	4.76	4.4	0.4	2.2	
		3QP-TPGW160408		●			3	11°	9.525	4.76	4.4	0.8	2	
General purpose		3QP-TPGN110308				●	3	11°	6.35	3.18	-	0.8	1.9	
		3QP-TPGN110312				●	3	11°	6.35	3.18	-	1.2	2.4	

● : Stocked item

Positive insert



Standard honing specifications

▶ 3-6

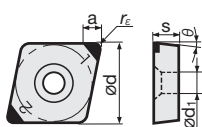
Grades	BXM10	BXM20	BXC50	BX310	BX330	BX360	BX380	BX470	BX480	BX910	BX930	BX950
Negative inserts	S01325	S01325	S01325	S01325	S01325	S01325	S01325	T01315	S01325	S01315	S01315	S01325
Positive inserts	S01325	S01325	-	S00515	S00515	S00515	-	T01315	-	S01315	S00515	S00515

Positive inserts · Multi-corner type (G class)

Specifi- cation	Shape	Cat. No.	Stocked grades			Dimensions (mm)							Applicable TAC toolholders
			BXM10	BXM20		No. of corner	Clear- ance angle θ	Inner circle ϕd	Thick- ness s	Hole dia. ϕd_1	Corner radius r_ϵ	CBN Length a	
General purpose		2QP-VBGW110302				2	5°	6.35	3.18	2.8	0.2	3.5	TAC External Toolholders (4-83 ~)
		2QP-VBGW110304	●	●		2	5°	6.35	3.18	2.8	0.4	3.1	
		2QP-VBGW110308	●	●		2	5°	6.35	3.18	2.8	0.8	2.2	
		2QP-VBGW160402				2	5°	9.525	4.76	4.4	0.2	3.5	TAC Internal Toolholders (5-22 ~)
		2QP-VBGW160404	●	●		2	5°	9.525	4.76	4.4	0.4	3.1	
		2QP-VBGW160408	●	●		2	5°	9.525	4.76	4.4	0.8	2.2	
General purpose		2QP-VCGW160402				2	7°	9.525	4.76	4.4	0.2	3.5	TAC External Toolholders (4-65 ~)
		2QP-VCGW160404	●	●		2	7°	9.525	4.76	4.4	0.4	3.1	TAC Internal Toolholders (5-24 ~)
		2QP-VCGW160408				2	7°	9.525	4.76	4.4	0.8	2.2	

● : Stocked item

Positive insert



Standard honing specifications

▶ 3-6

Grades	BXM10	BXM20	BXC50	BX310	BX330	BX360	BX380	BX470	BX480	BX910	BX930	BX950
Negative inserts	S01325	S01325	S01325	S01325	S01325	S01325	S01325	T01315	S01325	S01315	S01315	S01325
Positive inserts	S01325	S01325	—	S00515	S00515	S00515	—	T01315	—	S01315	S00515	S00515

Positive inserts · Multi-corner type

3

PCD and PCBN Tools

Specification	Shape	Cat. No.	Stocked grades				No. of corner	Dimensions (mm)						Applicable TAC toolholders
			BX310	BX330	BX360	BX930		Clearance angle θ	Inner circle ϕd	Thickness s	Hole dia. ϕd_1	Corner radius r_ϵ	CBN Length a	
Finishing General purpose		2QP-CCMW060202	●	●	●	●	2	7°	6.35	2.38	2.8	0.2	2.3	TAC External Toolholders (4-63 ~) TAC Internal Toolholders (5-12 ~)
		2QP-CCMW060204	●	●	●	●	2	7°	6.35	2.38	2.8	0.4	2.3	
		2QP-CCMW09T304	●	●	●	●	2	7°	9.525	3.97	4.4	0.4	2.3	
		2QP-CCMW09T308	●	●	●	●	2	7°	9.525	3.97	4.4	0.8	2.2	
Finishing General purpose		2QP-DCMW070202	●	●	●	●	2	7°	6.35	2.38	2.8	0.2	2.7	TAC External Toolholders (4-63 ~) TAC Internal Toolholders (5-16 ~)
		2QP-DCMW070204	●	●	●	●	2	7°	6.35	2.38	2.8	0.4	2.5	
		2QP-DCMW11T302	●	●	●	●	2	7°	9.525	3.97	4.4	0.2	2.7	
		2QP-DCMW11T304	●	●	●	●	2	7°	9.525	3.97	4.4	0.4	2.5	
		2QP-DCMW11T308	●	●	●	●	2	7°	9.525	3.97	4.4	0.8	2.1	
		2QP-SPMN090304		●	●	●	2	11°	9.525	3.18	—	0.4	2.4	TAC External Toolholders (4-73) TAC Internal Toolholders (5-61)
		2QP-SPMN090308		●	●	●	2	11°	9.525	3.18	—	0.8	2.4	
Finishing General purpose		3QP-TPMW080204	●	●	●	●	3	11°	4.76	2.38	2.3	0.4	2.2	TAC Internal Toolholders (5-20 ~)
		3QP-TPMW090202		●	●	●	3	11°	5.56	2.38	2.5	0.2	2.3	
		3QP-TPMW090204	●	●	●	●	3	11°	5.56	2.38	2.5	0.4	2.2	
		3QP-TPMW110202	●	●	●	●	3	11°	6.35	2.38	2.8	0.2	2.3	
		3QP-TPMW110204	●	●	●	●	3	11°	6.35	2.38	2.8	0.4	2.2	
		3QP-TPMW110302	●	●	●	●	3	11°	6.35	3.18	3.4	0.2	2.4	
		3QP-TPMW110304	●	●	●	●	3	11°	6.35	3.18	3.4	0.4	2.2	
		3QP-TPMW110308	●	●	●	●	3	11°	6.35	3.18	3.4	0.8	1.9	
		3QP-TPMW130302	●	●	●	●	3	11°	7.94	3.18	3.4	0.2	2.4	
		3QP-TPMW130304	●	●	●	●	3	11°	7.94	3.18	3.4	0.4	2.2	
		3QP-TPMW16T304	●	●	●	●	3	11°	9.525	3.97	4.4	0.4	2.2	
		3QP-TPMW16T308	●				3	11°	9.525	3.97	4.4	0.8	1.9	
		3QP-TPMW160404	●	●	●	●	3	11°	9.525	4.76	4.4	0.4	2.2	
		3QP-TPMW160408	●	●	●	●	3	11°	9.525	4.76	4.4	0.8	1.9	
Finishing to medium cutting General purpose		3QP-TPMN110302		●	●	●	3	11°	6.35	3.18	—	0.2	2.3	TAC External Toolholders (4-73) TAC Internal Toolholders (5-50)
		3QP-TPMN110304		●	●	●	3	11°	6.35	3.18	—	0.4	2.2	
		3QP-TPMN110308		●	●	●	3	11°	6.35	3.18	—	0.8	1.9	
		3QP-TPMN160304		●	●	●	3	11°	9.525	3.18	—	0.4	2.2	
		3QP-TPMN160308		●	●	●	3	11°	9.525	3.18	—	0.8	1.9	
Finishing General purpose		2QP-VBMW110304	●	●	●	●	2	5°	6.35	3.18	2.8	0.4	3.1	TAC External Toolholders (4-83 ~) TAC Internal Toolholders (5-22 ~)
		2QP-VBMW110308	●	●	●	●	2	5°	6.35	3.18	2.8	0.8	2.2	
		2QP-VBMW160404	●	●	●	●	2	5°	9.525	4.76	4.4	0.4	2.2	
		2QP-VBMW160408	●	●	●	●	2	5°	9.525	4.76	4.4	0.8	2.2	
Finishing General purpose		2QP-VCMW160404		●	●	●	2	5°	9.525	4.76	4.4	0.4	2.2	TAC External Toolholders (4-65 ~) TAC Internal Toolholders (5-24 ~)

● : Stocked item

Standard honing specifications

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Grades	BXM10	BXM20	BXC50	BX310	BX330	BX360	BX380	BX470	BX480	BX910	BX930	BX950
Negative inserts	S01325	S01325	S01325	S01325	S01325	S01325	S01325	T01315	S01325	S01315	S01315	S01325
Positive inserts	S01325	S01325	—	S00515	S00515	S00515	—	T01315	—	S01315	S00515	S00515

Positive inserts · One-corner type

Application & features	Shape	Cat. No.	Stocked grades		No. of corner	Dimensions (mm)						Applicable TAC toolholders
			T-CBN	No. of corner		Clear- ance angle	Inner circle	Thick- ness	Hole dia.	Corner radius	CBN length	
			BX330									
Finishing General purpose Packing Qty: 2 pcs.		Q-CCMW060204	●		1	7°	6.35	2.38	2.8	0.4	2.5	TAC External Toolholders (4-63 ~) TAC Internal Toolholders (5-12 ~)
		Q-CCMW09T304	●		1	7°	9.525	3.97	4.4	0.4	2.5	
		Q-DCMW070204	●		1	7°	6.35	2.38	2.8	0.4	2.1	TAC External Toolholders (4-63 ~) TAC Internal Toolholders (5-16~)
		Q-DCMW11T304	●		1	7°	9.525	3.97	4.4	0.4	2.1	
		Q-SPGN090304	●		1	11°	9.525	3.18	–	0.4	2.8	TAC External Toolholders (4-73) TAC Internal Toolholders (5-61)
		Q-SPGN090308	●		1	11°	9.525	3.18	–	0.8	2.8	
		Q-TPMW080204	●		1	11°	4.76	2.38	2.3	0.4	2.2	TAC Internal Toolholders (5-20 ~)
		Q-TPMW090202	●		1	11°	5.56	2.38	2.5	0.2	2.4	
		Q-TPMW090204	●		1	11°	5.56	2.38	2.5	0.4	2.3	
		Q-TPMW110202	●		1	11°	6.35	2.38	2.8	0.2	2.4	
		Q-TPMW110204	●		1	11°	6.35	2.38	2.8	0.4	2.2	
		Q-TPMW110304	●		1	11°	6.35	3.18	3.4	0.4	2.2	
		Q-TPMW110308	●		1	11°	6.35	3.18	3.4	0.8	1.9	
		Q-TPMW130302	●		1	11°	7.94	3.18	3.4	0.2	2.4	
		Q-TPMW130304	●		1	11°	7.94	3.18	3.4	0.4	2.3	
		Q-TPMW16T304	●		1	11°	9.525	3.97	4.4	0.4	2.3	
		Q-TPMW160404	●		1	11°	9.525	4.76	4.4	0.4	2.3	
		Q-TPMW160408	●		1	11°	9.525	4.76	4.4	0.8	1.9	
		Q-TPGN110304	●		1	11°	6.35	3.18	–	0.4	2.2	TAC External Toolholders (4-73) TAC Internal Toolholders (5-50)
Q-TPGN110308		●		1	11°	6.35	3.18	–	0.8	2.2		
Q-TPGN160304		●		1	11°	9.525	3.18	–	0.4	2.3		
Q-TPGN160308		●		1	11°	9.525	3.18	–	0.8	1.9		

3

PCD and PCDN Tools

MINI T-CBN

● : Stocked item

Positive inserts · Mini

Application & features	Shape	Cat. No.	Stocked grades		No. of corner	Dimensions (mm)						Applicable TAC toolholders
			T-CBN			Clearance angle	Inner circle	Thick ness	Hole dia.	Corner radius	CBN length	
			BX310									
Finishing to medium cutting		1QP-CCGW03X102	●		1	7°	3.57	1.39	1.9	0.2	1.4	TAC Internal Toolholders (5-12)
		1QP-CCGW03X104	●		1	7°	3.57	1.39	1.9	0.4	1.3	
		1QP-CCGW04T102	●		1	7°	4.37	1.79	2.3	0.2	1.9	
		1QP-CCGW04T104	●		1	7°	4.37	1.79	2.3	0.4	1.8	
		1QP-EPGW03X102	●		1	11°	3.57	1.39	1.9	0.2	1.4	TAC Internal Toolholders (5-28) Tooling Systems (12-41)
		1QP-EPGW03X104	●		1	11°	3.57	1.39	1.9	0.4	1.3	
		1QP-EPGW040102	●		1	11°	3.97	1.59	2.3	0.2	1.7	
		1QP-EPGW040104	●		1	11°	3.97	1.59	2.3	0.4	1.6	

● : Stocked item

Standard honing specifications

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Grades	BXM10	BXM20	BXC50	BX310	BX330	BX360	BX380	BX470	BX480	BX910	BX930	BX950
Negative inserts	S01325	S01325	S01325	S01325	S01325	S01325	S01325	T01315	S01325	S01315	S01315	S01325
Positive inserts	S01325	S01325	—	S00515	S00515	S00515	—	T01315	—	S01315	S00515	S00515

Grades
(1-1)Relating
pagesTAC External
toolholders
(4-1)TAC Internal
toolholders
(5-1)

Positive inserts · One-corner type

Application & features	Shape	Cat. No.	Stocked grades	No. of corner	Dimensions (mm)						Applicable TAC toolholders
			T-CBN BX360		Clearance angle θ	Inner circle ϕd	Thickness s	Hole dia. ϕd_1	Corner radius r_E	CBN length a	
Finishing to medium cutting		SPGN090304-QBN	●	1	11°	9.525	3.18	—	0.4	4.1	TAC External Toolholders (4-73) TAC Internal Toolholders (5-61)
		SPGN090308-QBN	●	1	11°	9.525	3.18	—	0.8	4.1	
		SPGN090312-QBN	●	1	11°	9.525	3.18	—	1.2	4.1	
		SPGN120308-QBN	●	1	11°	12.7	3.18	—	0.8	4.1	
		SPGN120312-QBN	●	1	11°	12.7	3.18	—	1.2	4.1	
Finishing to medium cutting		TPGW090202-QBN	●	1	11°	5.56	2.38	2.5	0.2	3.3	TAC Internal Toolholders (5-20 ~)
		TPGW090204-QBN	●	1	11°	5.56	2.38	2.5	0.4	3.2	
		TPGW110202-QBN	●	1	11°	6.35	2.38	2.8	0.2	3.9	
		TPGW110204-QBN	●	1	11°	6.35	2.38	2.8	0.4	3.7	
		TPGW130302-QBN	●	1	11°	7.94	3.18	3.4	0.2	3.9	
		TPGW130304-QBN	●	1	11°	7.94	3.18	3.4	0.4	3.7	
		TPGW16T302-QBN	●	1	11°	9.525	3.97	4.4	0.2	4.4	
		TPGW16T304-QBN	●	1	11°	9.525	3.97	4.4	0.4	4.2	
		TPGW16T308-QBN	●	1	11°	9.525	3.97	4.4	0.8	4	
		TPGN110304-QBN	●	1	11°	6.35	3.18	—	0.4	3.7	TAC External Toolholders (4-73) TAC Internal Toolholders (5-50)
		TPGN110308-QBN	●	1	11°	6.35	3.18	—	0.8	3.5	
		TPGN160304-QBN	●	1	11°	9.525	3.18	—	0.4	4.2	
		TPGN160308-QBN	●	1	11°	9.525	3.18	—	0.8	4	
Finishing		TBGN060104-15-QBN	●	3	5°	3.97	1.59	—	0.4	6.4	
		TBGN060108-15-QBN	●	3	5°	3.97	1.59	—	0.8	6	
Finishing to medium cutting		CPGA090204-QBN	●	1	11°	9.525	2.38	4	0.4	4	Tungaloy's former toolholders (Not ISO)
		CPGA090208-QBN	●	1	11°	9.525	2.38	4	0.8	3.8	
Finishing to medium cutting		TPGA090202-QBN	●	1	11°	5.56	2.38	3.2	0.2	3.1	Tungaloy's former toolholders (Not ISO)
		TPGA090204-QBN	●	1	11°	5.56	2.38	3.2	0.4	2.9	
		TPGA110202-QBN	●	1	11°	6.35	2.38	3	0.2	3.9	
		TPGA110204-QBN	●	1	11°	6.35	2.38	3	0.4	3.7	
		TPGA110302-QBN	●	1	11°	6.35	3.18	3	0.2	3.9	
		TPGA110304-QBN	●	1	11°	6.35	3.18	3	0.4	3.7	
		TPGA160302-QBN	●	1	11°	9.525	3.18	4	0.2	4.4	
		TPGA160304-QBN	●	1	11°	9.525	3.18	4	0.4	4.2	
		TPGA160308-QBN	●	1	11°	9.525	3.18	4	0.8	4	

● : Stocked item

Standard honing specifications

▶ 3-6

Grades	BXM10	BXM20	BXC50	BX310	BX330	BX360	BX380	BX470	BX480	BX910	BX930	BX950
Negative inserts	S01325	S01325	S01325	S01325	S01325	S01325	S01325	T01315	S01325	S01315	S01315	S01325
Positive inserts	S01325	S01325	—	S00515	S00515	S00515	—	T01315	—	S01315	S00515	S00515

Coated Solid T-CBN (BXC90)

Application & features	Shape	Cat. No.	Stocked grades	Dimensions (mm)		
			Coated Solid T-CBN BXC90	Inner circle: ϕd	Thickness: s	Corner radius: r_E
Finishing to heavy cutting		S-CNGN090308	●	9.525	3.18	0.8
		S-CNGN090312	●	9.525	3.18	1.2
		S-CNGN120408	●	12.7	4.76	0.8
		S-CNGN120412	●	12.7	4.76	1.2
		S-RNGN090300	●	9.525	3.18	—
		S-RNGN120400	●	12.7	4.76	—
		S-SNGN090308	●	9.525	3.18	0.8
		S-SNGN090312	●	9.525	3.18	1.2
		S-SNGN120308	●	12.7	3.18	0.8
		S-SNGN120312	●	12.7	3.18	1.2
		S-SNGN120408	●	12.7	4.76	0.8
		S-SNGN120412	●	12.7	4.76	1.2
		S-TNGN110308	●	6.35	3.18	0.8
		S-TNGN110312	●	6.35	3.18	1.2
		S-TNGN160408	●	9.525	4.76	0.8
		S-TNGN160412	●	9.525	4.76	1.2

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PCD and PCBN Tools

T-CBN Series

● : Stocked item

Solid T-CBN (BX90S)

Application & features	Shape	Cat. No.	Stocked grades	Dimensions (mm)		
			Solid T-CBN BX90S	Inner circle: ϕd	Thickness: s	Corner radius: r_E
Finishing to heavy cutting		S-CNMN090308		9.25	3.18	0.8
		S-CNMN090312		9.525	3.18	1.2
		S-CNMN120408		12.7	4.76	0.8
		S-CNMN120412		12.7	4.76	1.2
		S-RNMN090300		9.525	3.18	—
		S-RNMN120400		12.7	4.76	—
		S-SNMN090308		9.525	3.18	0.8
		S-SNMN090312		9.525	3.18	1.2
		S-SNMN120308		12.7	3.18	0.8
		S-SNMN120312		12.7	3.18	1.2
		S-SNMN120408		12.7	4.76	0.8
		S-SNMN120412		12.7	4.76	1.2
		S-TNMN110308		6.35	3.18	0.8
		S-TNMN110312		6.35	3.18	1.2
		S-TNMN160408		9.525	4.76	0.8
		S-TNMN160412		9.525	4.76	1.2

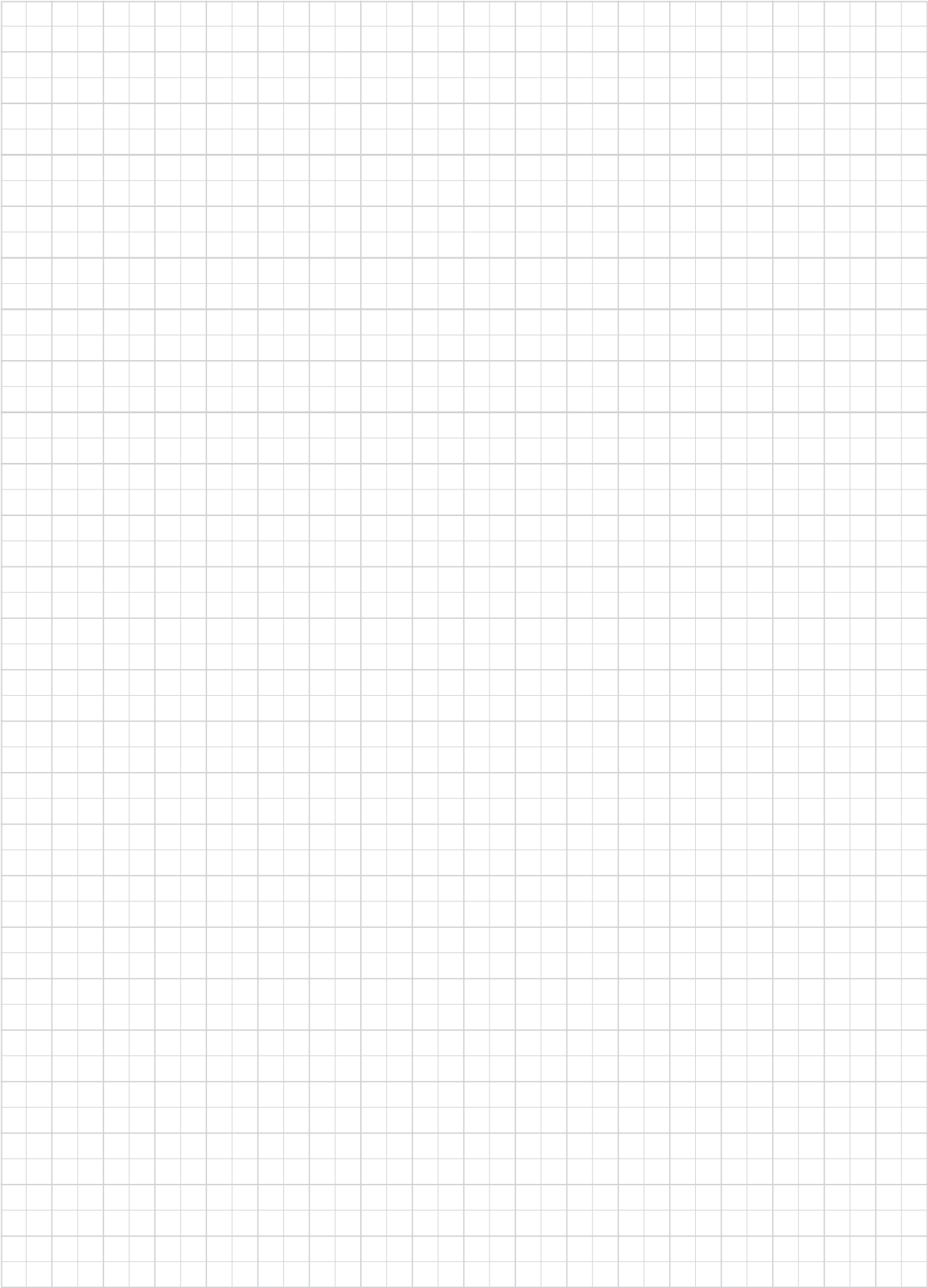
T-CBN Series

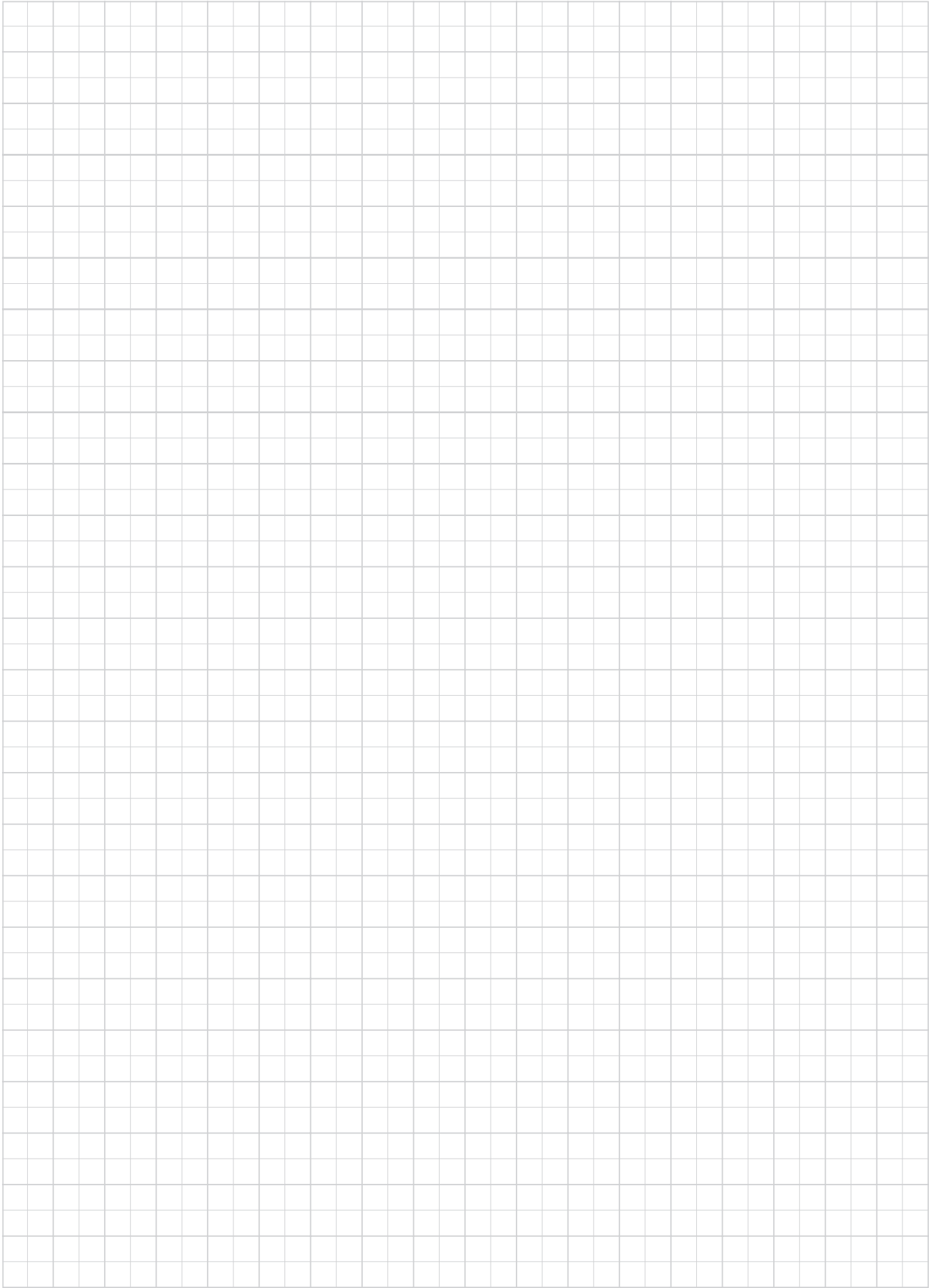
T-CBN (PCBN tipped) grooving Inserts

Application & features	Shape	Cat. No.	Stocked grades		No. of corner	Dimensions (mm)			Applicable TAC toolholders
			T-CBN			Groove width ±0.05	Max. groove depth	Corner radius r _E	
			BX360						
			R	L					
Grooving		XGR/L6310S-QBN			1	1.0	1.5	0.2	TAC toolholders: GX-□□□□R/LE (6-49) TAC boring toolholders: GX-□□□□L/RI (Min. bore dia. ø55) (6-92)
		XGR/L6315S-QBN	●		1	1.5	2.3	0.2	
		XGR/L6320S-QBN	●		1	2.0	3	0.2	
		XGR/L6325S-QBN	●		1	2.5	3.8	0.2	
		XGR/L6330S-QBN	●		1	3.0	4.5	0.2	
		XGR/L6335S-QBN	●		1	3.5	5.3	0.2	
		XGR/L6340S-QBN	●		1	4.0	6	0.2	
		XGR/L6345S-QBN	●		1	4.5	6	0.2	

● : Stocked item

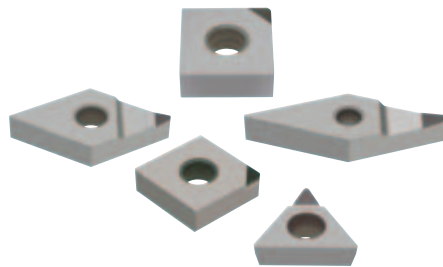
Grades
(1-1)Relating
pagesTAC External
toolholders
(4-1)TAC Internal
toolholders
(5-1)





PCD grades

T-DIA series



Expanded product line allows T-DIA tools to be applied to wider work materials and cutting conditions.

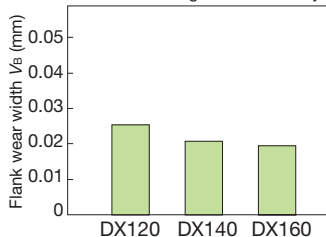
■ Features and applications (Physical and mechanical properties)

	DX110	DX120	DX140	DX160	DX180
Grade					
Property	Super fine grained grade. Excels in surface finish.	Fine grained grade. Excels in surface finish.	General purpose grade	High purity grade for hard materials	Highly wear resistant grade for special applications
Approx. grain size of diamond (μm)	< 1	4.5	12.5	28	45
Hardness (Hv)	6000				12000 (Harder)
Wear resistance					Higher
Grindability (Cutting edge sharpness)	Better				

Note: T-DIA grades are not suitable for ferrous materials (such as hardened steel, chilled cast iron), and Ni- or Co-base superalloys.

■ Cutting performance (Wear resistance)

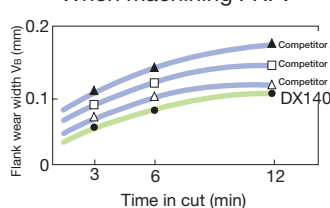
When machining aluminium alloy:



Continuous external turning

- Work material: 10 % Si, aluminium alloy
- Insert: SPGN120308-DIA
- Toolholder: CSBPR2525M4
- Cutting speed: $v_c = 500$ m/min
- Feed: $f = 0.1$ mm/rev
- Depth of cut: $a_p = 0.5$ mm
- Coolant: Dry cutting
- Time in cut: 30 min

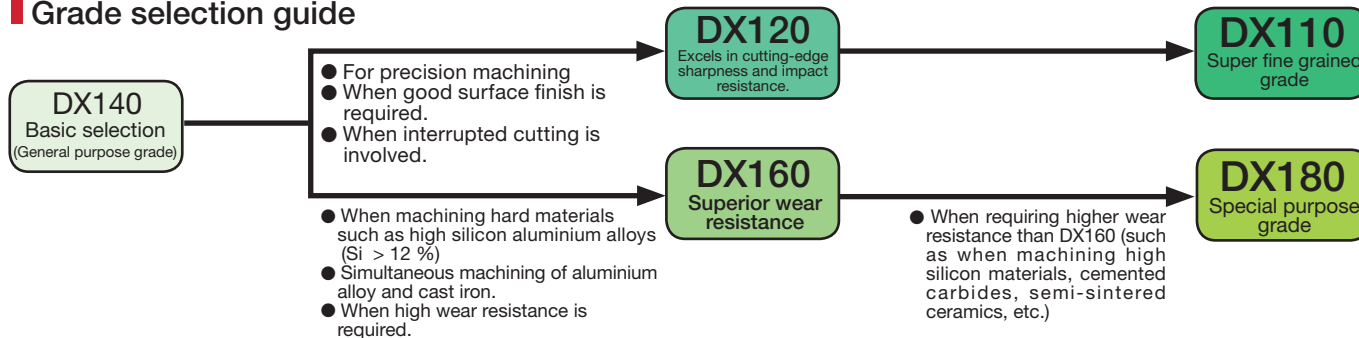
When machining FRP:



Face milling

- Work material: Fiber reinforced plastics (FRP)
- Insert: SPCN42ZFR-DIA
- Milling cutter: TPG4208R-A
- Cutting speed: $v_c = 942$ m/min
- Feed: $f = 0.1$ mm/rev
- Depth of cut: $a_p = 1.5$ mm
- Coolant: Dry cutting

■ Grade selection guide



● Standard cutting conditions for turning

Work material	Cutting speed v_c (m/min)	Depth of cut a_p (mm)	Feed f (mm/rev)	Grade applicability				
				DX110	DX120	DX140	DX160	DX180
Aluminium alloys (Si < 12 %)	1500 (1000-2500)	0.5 (0.05-2.0)	0.1 (0.05-0.2)	○	○	◎		
Aluminium alloys (Si > 12 %)	600 (400-800)	0.5 (0.05-2.0)	0.1 (0.05-0.2)			○	◎	
Copper, brass	800 (500-1500)	0.5 (0.05-2.0)	0.1 (0.05-0.2)	○	○	◎		
Phosphor bronze	400 (300-500)	0.5 (0.05-2.0)	0.1 (0.05-0.2)	○	○	◎		
Carbon, graphite	400 (300-500)	0.5 (0.05-2.0)	0.1 (0.05-0.2)			◎		
FRP	700 (500-1000)	0.2 (0.05-0.5)	0.05 (0.03-0.1)	○	◎	○		
Plastics	700 (500-1000)	0.2 (0.05-0.5)	0.03 (0.01-0.05)	○	◎	○		
Cemented carbides (D40 ~ D60)	15 (10-20)	0.1 (0.05-0.2)	0.03 (0.01-0.05)				○	◎
Semi-sintered ceramics	130 (100-150)	0.5 (0.05-2.0)	0.05 (0.03-0.1)				○	◎

(Note) ◎ : First choice ○ : Second choice

TAC T-DIA (PCD) Inserts

■ Negative inserts (with rake angle)

Application & features	Shape	Cat. No.	Stocked grades			Dimensions (mm)					Applicable toolholders
			Sharpenability Better Wear resistance Higher			Inner circle ød	Thick- ness s	Hole dia. ød ₁	Corner radius r _ε	DIA length a	
			DX120	DX140	DX180						
Finishing low resistance		CNMM120402-DIA	●			12.7	4.76	5.16	0.2	3.5	TAC External Toolholders (4-14 ~)
		CNMM120404-DIA	●			12.7	4.76	5.16	0.4	3.5	TAC Internal Toolholders (5-33 ~)
		DNMM150402-DIA	●			12.7	4.76	5.16	0.2	3.3	TAC External Toolholders (4-21 ~)
		DNMM150404-DIA	●			12.7	4.76	5.16	0.4	3.1	TAC Internal Toolholders (5-34 ~)
		TNMM160402-DIA	●			9.525	4.76	3.81	0.2	3.3	TAC External Toolholders (4-24 ~)
		TNMM160404-DIA	●			9.525	4.76	3.81	0.4	3.2	TAC Internal Toolholders (5-36 ~)
		VNMM160402-DIA	●			9.525	4.76	3.81	0.2	4.8	TAC External Toolholders (4-30 ~)
		VNMM160404-DIA	●			9.525	4.76	3.81	0.4	4.4	TAC Internal Toolholders (5-37 ~)
		VNMM160408-DIA	●			9.525	4.76	3.81	0.8	3.6	

3

PCD and PCBN Tools

■ Negative inserts

Application & features	Shape	Cat. No.	Stocked grades			Dimensions (mm)					Applicable toolholders
			Sharpenability Better Wear resistance Higher			Inner circle ød	Thick- ness s	Hole dia. ød1	Corner radius rε	DIA length a	
			DX120	DX140	DX160						
Finishing to medium cutting		CNGA120404-DIA		●		12.7	4.76	5.16	0.4	3.5	TAC External Toolholders (4-14 ~)
		CNGA120408-DIA				12.7	4.76	5.16	0.8	3.4	TAC Internal Toolholders (5-33 ~)
		DNGA150404-DIA		●	●	12.7	4.76	5.16	0.4	3.1	TAC External Toolholders (4-21 ~)
		DNGA150408-DIA		●		12.7	4.76	5.16	0.8	2.8	TAC Internal Toolholders (5-34 ~)
		TNGA160304-DIA				9.525	3.18	3.81	0.4	3.2	TAC External Toolholders (4-24 ~)
		TNGA160308-DIA				9.525	3.18	3.81	0.8	2.9	TAC Internal Toolholders (5-36 ~)
		TNGA160404-DIA		●	●	9.525	4.76	3.81	0.4	3.2	
		TNGA160408-DIA		●	●	9.525	4.76	3.81	0.8	2.9	
		SNGA120404-DIA		●	▲	12.7	4.76	5.16	0.4	3.6	TAC External Toolholders (4-25 ~)
		SNGA120408-DIA		●	▲	12.7	4.76	5.16	0.8	3.6	TAC Internal Toolholders (5-35 ~)
		SNGN090308-DIA				9.525	3.18	–	0.8	3.6	TAC External Toolholders (4-50~)
		SNGN120408-DIA		●		12.7	4.76	–	0.8	3.6	

● : Stocked items.
▲ : Shortly unavailable

TAC T-DIA (PCD) Inserts

Positive inserts (with rake angle)

Application & features	Shape	Cat. No.	Stocked grades			Dimensions (mm)						Applicable toolholders
			Sharpenability Better		Wear resistance Higher	Clearance angle θ	Inner circle ϕd	Thick- ness s	Hole dia. ϕd_1	Corner radius r_E	DIA length a	
			DX120	DX140	DX160							
Finishing low resistance		CCMT060202-DIA	●			7°	6.35	2.38	2.8	0.2	2.4	TAC External Toolholders (4-63 ~)
		CCMT060204-DIA	●			7°	6.35	2.38	2.8	0.4	2.4	TAC Internal Toolholders (5-12 ~)
		CCMT09T302-DIA	●			7°	9.525	3.97	4.4	0.2	2.4	
		CCMT09T304-DIA	●			7°	9.525	3.97	4.4	0.4	2.4	
		DCMT070202-DIA	●			7°	6.35	2.38	2.8	0.2	2.3	TAC External Toolholders (4-63 ~)
		DCMT070204-DIA	●			7°	6.35	2.38	2.8	0.4	2.1	TAC Internal Toolholders (5-16 ~)
		DCMT11T302-DIA	●			7°	9.525	3.97	4.4	0.2	3.2	
		DCMT11T304-DIA	●			7°	9.525	3.97	4.4	0.4	3.0	
		TCMT080202-DIA	●			7°	4.76	2.38	2.3	0.2	2.2	TAC External Toolholders (4-65)
		TCMT080204-DIA	●			7°	4.76	2.38	2.3	0.4	2.0	TAC Internal Toolholders (5-19)
		TCMT110202-DIA	●			7°	6.35	2.38	2.8	0.2	2.4	
		TCMT110204-DIA	●			7°	6.35	2.38	2.8	0.4	2.2	
		TCMT110302-DIA	●			7°	6.35	3.18	2.8	0.2	2.4	
		TCMT110304-DIA	●			7°	6.35	3.18	2.8	0.4	2.2	
		VCMT160402-DIA	●			7°	9.525	4.76	4.4	0.2	4.8	TAC External Toolholders (4-65 ~)
		VCMT160404-DIA	●			7°	9.525	4.76	4.4	0.4	4.4	TAC Internal Toolholders (5-24 ~)

Positive inserts

Application & features	Shape	Cat. No.	Stocked grades			Dimensions (mm)						Applicable toolholders
			Sharpenability Better Wear resistance Higher			Clear- ance angle θ	Inner circle ød	Thick- ness s	Hole dia. ød1	Corner radius r _ε	DIA length a	
			DX120	DX140	DX160							
Finishing to medium cutting		CCGW060200-DIA		●		7°	6.35	2.38	2.8	0.05	2.4	TAC External Toolholders (4-63 ~)
		CCGW060202-DIA		●		7°	6.35	2.38	2.8	0.2	2.4	TAC Internal Toolholders (5-12 ~)
		CCGW060204-DIA		●		7°	6.35	2.38	2.8	0.4	2.4	
		CCGW09T302-DIA		●		7°	9.525	3.97	4.4	0.2	3.5	
		CCGW09T304-DIA		●	●	7°	9.525	3.97	4.4	0.4	3.5	
		CCGW09T308-DIA		●	▲	7°	9.525	3.97	4.4	0.8	3.4	
		DCGW070200-DIA		●		7°	6.35	2.38	2.8	0.05	2.4	TAC External Toolholders (4-63 ~)
		DCGW070202-DIA	●	●		7°	6.35	2.38	2.8	0.2	2.3	TAC Internal Toolholders (5-16 ~)
		DCGW070204-DIA		●		7°	6.35	2.38	2.8	0.4	2.1	
		DCGW11T302-DIA		●		7°	9.525	3.97	4.4	0.2	3.2	
		DCGW11T304-DIA		●		7°	9.525	3.97	4.4	0.4	3.0	
		DCGW11T308-DIA		●		7°	9.525	3.97	4.4	0.8	2.7	
		SPGN090302-DIA				11°	9.525	3.18	–	0.2	3.6	TAC External Toolholders (4-73)
		SPGN090304-DIA			▲	11°	9.525	3.18	–	0.4	3.6	TAC Internal Toolholders (5-61)
		SPGN090308-DIA		●		11°	9.525	3.18	–	0.8	3.6	
		SPGN120302-DIA		●		11°	12.7	3.18	–	0.2	3.6	
		SPGN120304-DIA		●	▲	11°	12.7	3.18	–	0.4	3.6	
		SPGN120308-DIA		●	●	11°	12.7	3.18	–	0.8	3.6	
		SPGN120312-DIA				11°	12.7	3.18	–	1.2	3.6	
		TCGW110202-DIA				7°	6.35	2.38	2.8	0.2	2.4	TAC External Toolholders (4-65)
		TCGW110204-DIA				7°	6.35	2.38	2.8	0.4	2.2	TAC Internal Toolholders (5-19)
		TCGW16T302-DIA				7°	9.525	3.97	4.4	0.2	3.3	
		TCGW16T304-DIA				7°	9.525	3.97	4.4	0.4	3.2	
		TCGW16T308-DIA				7°	9.525	3.97	4.4	0.8	2.9	
		TPGW080202-DIA		●		11°	4.76	2.38	2.3	0.2	2.4	TAC Internal Toolholders (5-20 ~)
		TPGW080204-DIA		●		11°	4.76	2.38	2.3	0.4	2.3	
		TPGW090202-DIA	●	●		11°	5.56	2.38	2.5	0.2	2.4	
		TPGW090204-DIA		●		11°	5.56	2.38	2.5	0.4	2.2	
		TPGW110202-DIA	●	●		11°	6.35	2.38	2.8	0.2	2.4	
		TPGW110204-DIA		●		11°	6.35	2.38	2.8	0.4	2.2	
		TPGW130302-DIA	●	●		11°	7.94	3.18	3.4	0.2	3.3	
		TPGW130304-DIA		●		11°	7.94	3.18	3.4	0.4	3.2	
		TPGW16T302-DIA		●		11°	9.525	3.97	4.4	0.2	3.3	
		TPGW16T304-DIA		●		11°	9.525	3.97	4.4	0.4	3.2	
		TPGW16T308-DIA		●		11°	9.525	3.97	4.4	0.8	2.9	

● : Stocked items.
▲ : Shortly unavailable

TAC T-DIA (PCD) Inserts

Positive inserts

Application & features	Shape	Cat. No.	Stocked grades			Dimensions (mm)						Applicable toolholders
			Sharpenability Better Wear resistance Higher			Clear- ance angle θ	Inner circle ϕd	Thick- ness s	Hole dia. ϕd_1	Corner radius r_E	DIA length a	
			DX120	DX140	DX160							
Finishing to medium cutting		TPGN090204-DIA		●		11°	5.56	2.38	—	0.4	2.2	TAC Internal Toolholders (5-20 ~)
		TPGN090208-DIA				11°	5.56	2.38	—	0.8	2.0	
		TPGN110301-DIA				11°	6.35	3.18	—	0.1	3.4	
		TPGN110302-DIA				11°	6.35	3.18	—	0.2	3.3	
		TPGN110304-DIA	●	●		11°	6.35	3.18	—	0.4	3.2	
		TPGN110308-DIA		●		11°	6.35	3.18	—	0.8	2.9	
		TPGN160301-DIA				11°	9.525	3.18	—	0.1	3.4	
		TPGN160302-DIA		●		11°	9.525	3.18	—	0.2	3.3	
		TPGN160304-DIA	●	●	▲	11°	9.525	3.18	—	0.4	3.2	
		TPGN160308-DIA		●		11°	9.525	3.18	—	0.8	2.9	
		TPGN160312-DIA				11°	9.525	3.18	—	1.2	2.6	
		VCGW160402-DIA		●		7°	9.525	4.76	4.4	0.2	4.8	TAC External Toolholders (4-65 ~)
		VCGW160404-DIA		●		7°	9.525	4.76	4.4	0.4	4.4	TAC Internal Toolholders (5-24 ~)
		VCGW160408-DIA				7°	9.525	4.76	4.4	0.8	3.6	
		VCGW160412-DIA				7°	9.525	4.76	4.4	1.2	2.7	
		VCGW220530-DIA				7°	12.7	5.56	5.5	3.0	5.0	
	Finishing		EPGW040102-DIA		●		11°	3.97	1.59	2.3	0.2	2.0
EPGW040104-DIA				●		11°	3.97	1.59	2.3	0.4	1.9	
Finishing to medium cutting		CPGA090202-DIA		●		11°	9.525	2.38	4.0	0.2	2.4	Tungaloy's former toolholders (Not ISO)
		CPGA090204-DIA		●		11°	9.525	2.38	4.0	0.4	2.4	
		TPGA090202-DIA		●		11°	5.556	2.38	3.2	0.2	2.4	Tungaloy's former toolholders (Not ISO)
		TPGA090204-DIA		●		11°	5.556	2.38	3.2	0.4	2.2	
		TPGA110202-DIA		●		11°	6.35	3.18	3.0	0.2	2.4	
		TPGA110204-DIA		●		11°	6.35	3.18	3.0	0.4	2.2	
		TPGA110302-DIA		●		11°	6.35	3.18	3.0	0.2	2.4	
		TPGA110304-DIA		●		11°	6.35	3.18	3.0	0.4	2.2	
		TPGA110308-DIA		●		11°	6.35	3.18	3.0	0.8	2.0	
		TPGA160302-DIA		●		11°	9.525	3.18	4.0	0.2	3.3	
		TPGA160304-DIA		●		11°	9.525	3.18	4.0	0.4	3.2	
		TPGA160308-DIA		●		11°	9.525	3.18	4.0	0.8	2.9	

● : Stocked items.
▲ : Shortly unavailable