

Guidance

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■ Designation system for TAC T-DIA inserts ·	3-3
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3 T-CBN (PCBN) and T-DIA (PCD) tools

Products

■ T-CBN tools

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■ T-DIA tools

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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.

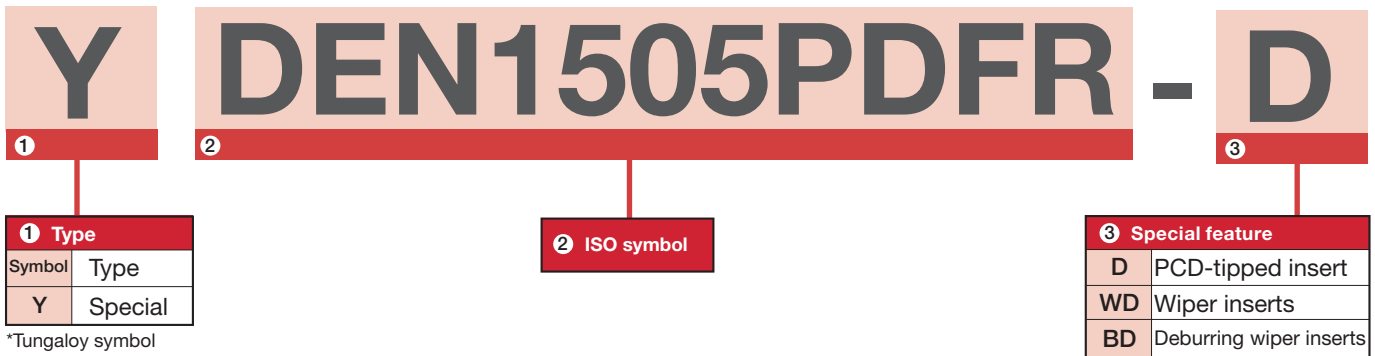
5 TAC T-CBN inserts

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

Application area

Workpiece hardness (HRC)

Cutting mode: Continuous → Light interrupted → Heavy interrupted

Necessity of PCBN grades

The condition necessary to cut the work material is: $\text{Hardness of tool} \geq \text{Hardness of work}$

- Hardened steel (60HRC) → 700 Hv
- PCBN (BX360) → 3300 Hv
- Cemented carbide → 1600 Hv

Effects of grain size of CBN on surface roughness and cutting speed

[Fine-grained CBN]

1-2µm

Fine grained PCBN provided with sharp cutting edge.
Good surface roughness

[Rough-grained CBN]

4-8µm

Rough grained PCBN. CBN particles are hold firmly.
Allows high speed machining

Features of CBN grades for machining hardened steel and other hard materials

Impact resistance

Wear resistance

CBN content

Fewer CBN content ⇨ Increasing wear resistance
Much CBN content ⇨ Increasing impact resistance

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

Application area of coated T-CBN grades

Continuous cutting

Cutting speed V_c (m/min)

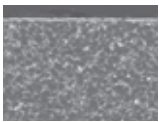
Time (min)

Interrupted cutting

Cutting speed V_c (m/min)

Cutting mode: Light → Interrupted → Heavy

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.

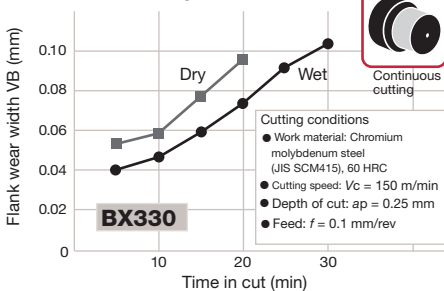
Peeling of coating layer can be protected

Hard and deformation resistant CBN is excellent substrate material.

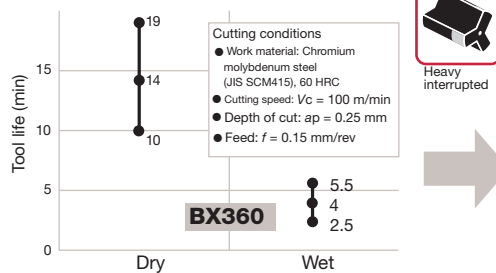
Improved resistance to flank wear

Effects of coolant in machining of hardened steel

Continuous cutting



Interrupted cutting

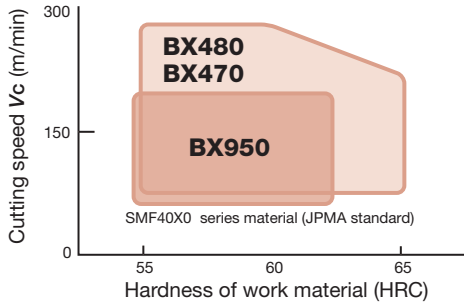


● In continuous cutting, wet cutting is superior to dry cutting in tool life for wear.
 ● In interrupted cutting, dry cutting is superior to wet cutting in tool life for fracture.

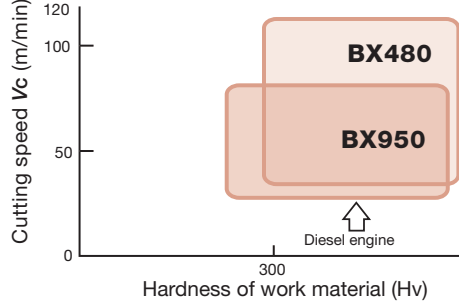
S T-CBN series for machining sintered metals

Application area

● Ferrous sintered metal



● Valve seat



BX470

Priority on burr prevention and surface finish

BX480

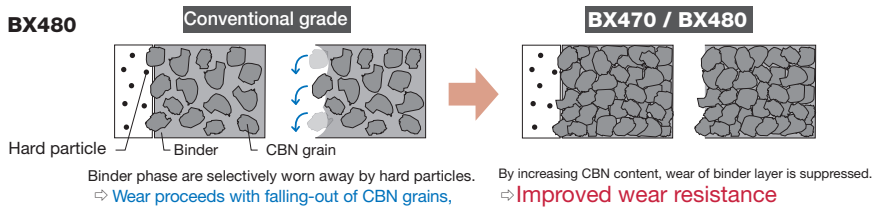
Priority on wear resistance and versatility

BX950

For general sintered metal parts

Features of BX470 and BX480

● Machining of sintered metal including hard particles



● Features of BX470 and BX480

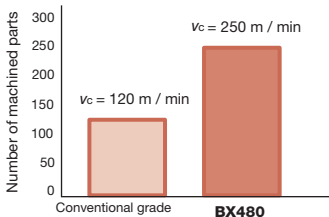
CBN content: 95 vol%

Hv = 4100 ~ 4300

The world highest CBN content as a commercially available material.

*as of July 2010

BX480 (Facing of gears)



Conventional grade

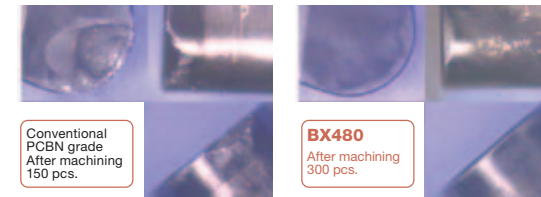
BX480

Number of machined parts

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



Conventional PCBN grade

After machining 150 pcs.

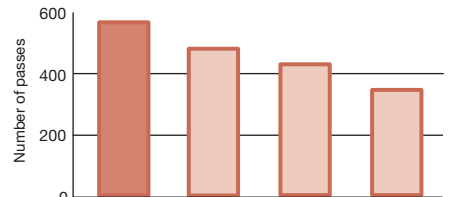
BX480

After machining 300 pcs.

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)



BX470

BX480

Competitor A

Competitor B

Number of passes

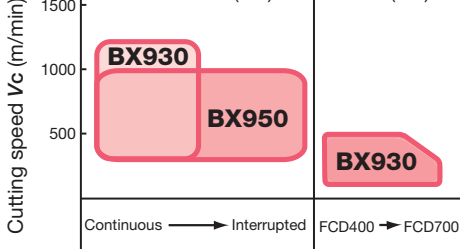
Cutting conditions

- 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

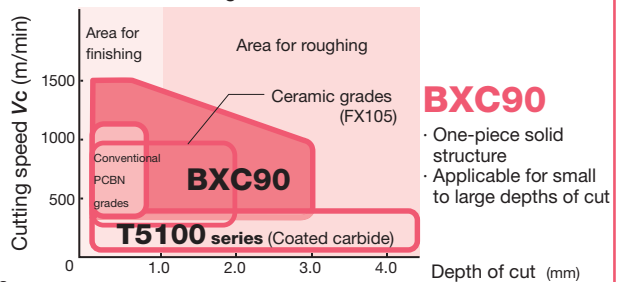
BX950

- Suitable for interrupted machining
- Excels in impact resistance

BX910

- For machining cylinder liners

● Solid coated T-CBN grades

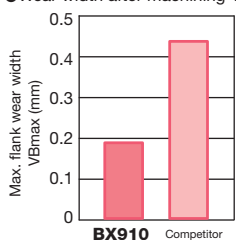


BXC90

- 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.



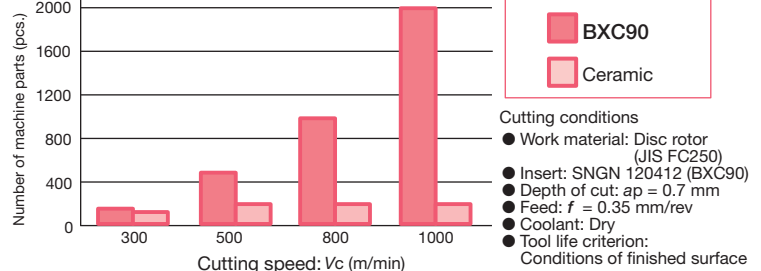
BX910

Competitor

Cutting conditions

- Work material: Cylinder liner (Spin casting)
- Machining type: Finish boring
- Cutting speed: $V_c = 1,000$ m/min
- Machine: Special purpose machine
- Coolant: Wet

Tool life comparison in finish machining of disc brakes



BXC90

Ceramic

Cutting conditions

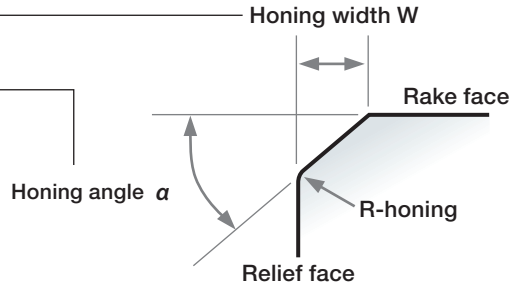
- Work material: Disc rotor (JIS FC250)
- Insert: SNGN 120412 (BXC90)
- Depth of cut: $a_p = 0.7$ mm
- Feed: $f = 0.35$ mm/rev
- Coolant: Dry
- Tool life criterion: Conditions of finished surface

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



- Shape
- T ... Chamfered honing
 - S ... Chamfered + R-honing
 - E ... R-honing alone
 - F ... Sharp edges

Symbol

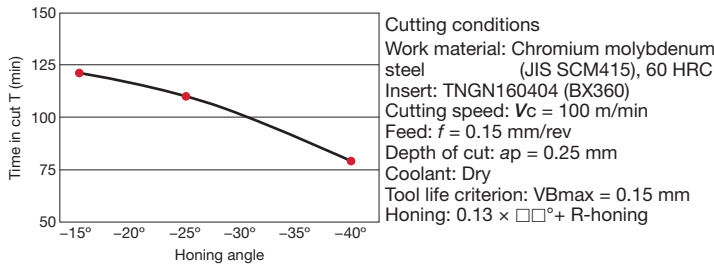
W	Amount of honing
005	0.05 mm
010	0.10 mm
013	0.13 mm
015	0.15 mm
020	0.20 mm

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

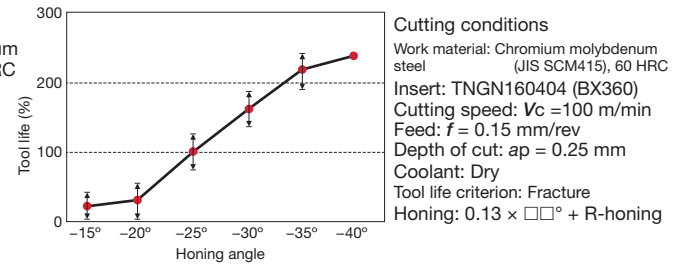
- Honing specification can be selected in combination of items described here.
 - Inserts with "R" honing alone are available.
- Note: There are unavailable combinations.
 For details, ask your nearest Tungaloy sales office.

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

Wiper insert

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

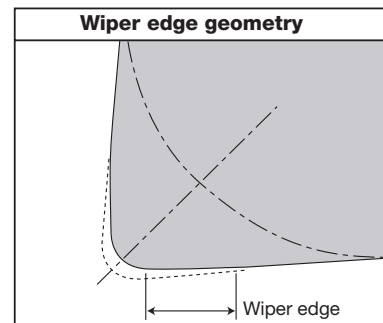
Effect of wiper edge

Doubles the productivity → Reduced machining time

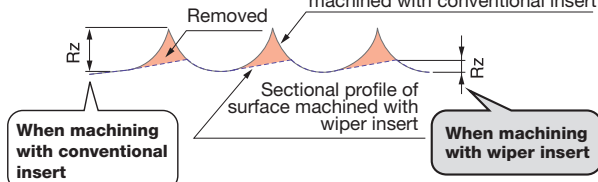
The wiper edge can double the feed rate and moreover does not deteriorate the surface roughness. (Note: Feed rate: *f < 0.3 mm/rev)

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°			
External toolholder	ACLNR/L****12-A	AWLNR/L****08-A	ADJNR/L****15-A	ATGNR/L****16-A
	ATFNR/L****16-A			
	DCLNR/L****12	DWLNR/L****08	DDJNR/L****15	DTFNR/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

Specification	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	Thickness 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

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















Grades (1-1)

Relating pages

TAC External toolholders (4-1)

TAC Internal toolholders (5-1)

Negative inserts · Multi-corner type

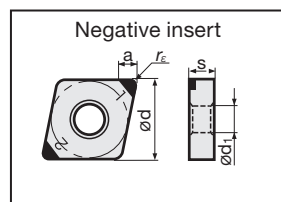
Specification	Shape	Cat. No.	Stocked grades													No. of corner	Dimensions (mm)					Applicable TAC toolholders
			BXM10	BXM20	BXC50	BX310	BX330	BX360	BX380	BX470	BX480	BX910	BX930	BX950	Inner circle ød		Thickness s	Hole dia. ød1	Corner radius rε	CBN length a		
General purpose		4QP-DNGA150404			●										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				
		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				
		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				
		3QP-TNGA160412F											3	9.525	4.76	3.81	1.2	2.4				
General purpose		3QP-TNGA160404		●	●		●	●	●	●	●	●	●	3	9.525	4.76	3.81	0.4	2.2	TAC Internal Toolholders (5-36 ~)		
		3QP-TNGA160408		●	●		●	●	●	●	●	●	●	3	9.525	4.76	3.81	0.8	1.9			
		3QP-TNGA160412		●	●		●	●	●	●	●	●	●	3	9.525	4.76	3.81	1.2	2.4			
Light honing		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				
		3QP-TNGA160412-L		●	●		●						3	9.525	4.76	3.81	1.2	2.4				
Heavy honing		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				
		3QP-TNGA160412-H		●						●	●		3	9.525	4.76	3.81	1.2	2.4				
Wiper edge		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				
		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

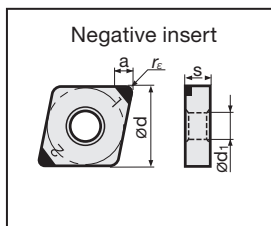
Negative inserts · Multi-corner type

Specification	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	Thickness s	Hole dia. ød1		Corner radius rε	CBN Length a
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	
Heavy honing		2QP-VNGA160404-L	●	●			●							2	9.525	4.76	3.81	0.4	3.1	TAC Internal Toolholders (5-37 ~)
		2QP-VNGA160408-L	●	●			●							2	9.525	4.76	3.81	0.8	2.2	
General purpose		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 Internal Toolholders (5-37 ~)
		4QP-VNGA160408			●									4	9.525	4.76	3.81	0.8	2.2	
Reinforced cutting edge	4QP-VNGA160412												4	9.525	4.76	3.81	1.2	3	TAC Internal Toolholders (5-37 ~)	
	4QP-VNGA160404-H												4	9.525	4.76	3.81	0.4	3.1		
Wiper edge	3QP-WNGA080408		●	●		●	●	●		●	●	●	3	12.7	4.76	5.16	0.8	2.2	TAC External Toolholders (4-17 ~)	
	3QP-WNGA080408WL		●	●									3	12.7	4.76	5.16	0.8	2.2	TAC Internal Toolholders (5-38 ~)	
General purpose	6QP-WNGA080408			●									6	12.7	4.76	5.16	0.8	2.2	TAC Internal Toolholders (5-38 ~)	

3 PCD and PCBN Tools

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

● : 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

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

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

3

PCD and PCBN Tools

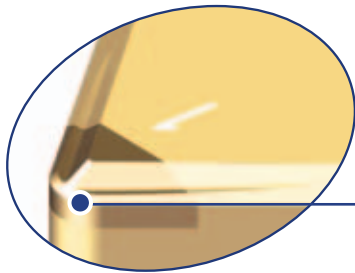
Specification	Shape	Cat. No.	Stocked grades		No. of corner	Dimensions (mm)					Applicable TAC toolholders	
			BX	M20		Inner circle ød	Thickness s	Hole dia. ød1	Corner radius rε	CBN Length a		
With chip-breaker		2QP-CNGM120408-HF	●		2	12.7	4.76	5.16	0.8	2.2	TAC External Toolholders (4-14 ~)	
		2QP-CNGM120412-HF	●		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		TAC Internal Toolholders (5-33 ~)
		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

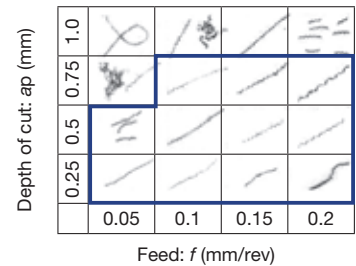


Single sided CBN insert provides higher stability in heavy machining.

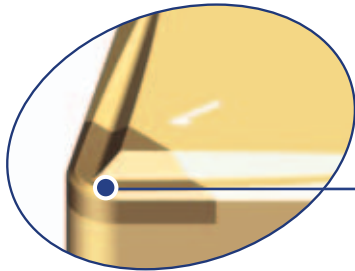
Excellent chip control in small DoC due to the high functional nose. Delivers exceptional surface finishes.

■ Example of chips

● HF Chipbreaker



HM type For medium cutting

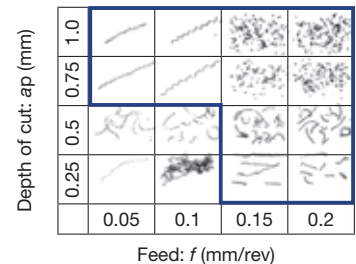


Single sided CBN insert provides higher stability in heavy machining.

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

■ Example of chips

● HM Chipbreaker



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Negative inserts · One-corner type

Application & features	Shape	Cat. No.	Stocked grades		No. of corner	Dimensions (mm)					Applicable TAC toolholders
			T-CBN			Inner circle	Thick ness	Hole dia.	Corner radius	CBN length	
			BX360			ød	s	ød1	r _E	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 ~)
		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	TAC Internal Toolholders (5-34 ~)
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

3

PCD and PCBN Tools

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

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Grades (1-1)

Relating pages

TAC External toolholders (4-1)

TAC Internal toolholders (5-1)

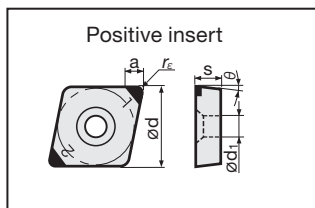
Positive inserts · Multi-corner type (G class)

3

PCD and PCBN Tools

Specification	Shape	Cat. No.	Stocked grades				No. of corner	Dimensions (mm)					Applicable TAC toolholders		
			BXM10	BXM20	BX470	BX910		Clearance angle θ	Inner circle ϕd	Thickness 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		
		2QP-DCGW070202	●	●			2	7°	6.35	2.38	2.8	0.2	2.7		
General purpose		2QP-DCGW070204	●	●			2	7°	6.35	2.38	2.8	0.4	2.5	TAC External Toolholders (4-63 ~)	
		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		
General purpose		3QP-TPGW110208			●		3	11°	6.35	2.38	2.8	0.8	2.2		
		3QP-TPGW110302F					3	11°	6.35	3.18	3.4	0.2	2.3		
Sharp edge		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



Standard honing specifications

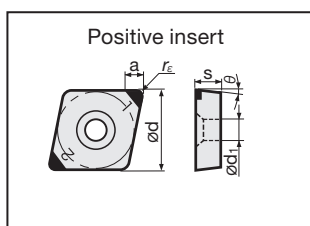
▶ 3-6

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)

Specification	Shape	Cat. No.	Stocked grades		No. of corner	Dimensions (mm)						Applicable TAC toolholders
			BXM10	BXM20		Clearance angle θ	Inner circle ϕd	Thickness s	Hole dia. ϕd_1	Corner radius r_E	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	
		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



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PCD and PCBN Tools

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

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

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Positive inserts · Multi-corner type

Specification	Shape	Cat. No.	Stocked grades					No. of corner	Dimensions (mm)					Applicable TAC toolholders		
			BX310	BX330	BX360	BX930	BX950		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

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

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Positive inserts · One-corner type

Application & features	Shape	Cat. No.	Stocked grades		No. of corner	Dimensions (mm)					Applicable TAC toolholders	
			T-CBN	BX330		Clearance angle θ	Inner circle ϕd	Thick ness s	Hole dia. ϕd_1	Corner radius r_E		CBN length a
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 PCBN 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	BX310		Clearance angle θ	Inner circle ϕd	Thick ness s	Hole dia. ϕd_1	Corner radius r_E		CBN length a
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

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Grades
(1-1)

Relating
pages

TAC External
toolholders
(4-1)

TAC Internal
toolholders
(5-1)

Positive inserts · One-corner type

PCD and PCBN Tools

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Application & features	Shape	Cat. No.	Stocked grades		No. of corner	Dimensions (mm)					Applicable TAC toolholders	
			T-CBN	BX360		Clearance angle	Inner circle	Thickness	Hole dia.	Corner radius		CBN length
						θ	ϕd	s	ϕd_1	r_E		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

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Coated Solid T-CBN (BXC90)

Application & features	Shape	Cat. No.	Stocked grades		Dimensions (mm)		
			Coated Solid T-CBN	No. of corner	Inner circle: ϕd	Thickness: s	Corner radius: r_E
			BXC90				
Finishing to heavy cutting		S-CNGN090308	●	1	9.525	3.18	0.8
		S-CNGN090312	●	1	9.525	3.18	1.2
		S-CNGN120408	●	1	12.7	4.76	0.8
		S-CNGN120412	●	1	12.7	4.76	1.2
		S-RNGN090300	●	1	9.525	3.18	–
		S-RNGN120400	●	1	12.7	4.76	–
		S-SNGN090308	●	1	9.525	3.18	0.8
		S-SNGN090312	●	1	9.525	3.18	1.2
		S-SNGN120308	●	1	12.7	3.18	0.8
		S-SNGN120312	●	1	12.7	3.18	1.2
		S-SNGN120408	●	1	12.7	4.76	0.8
		S-SNGN120412	●	1	12.7	4.76	1.2
		S-TNGN110308	●	1	6.35	3.18	0.8
		S-TNGN110312	●	1	6.35	3.18	1.2
		S-TNGN160408	●	1	9.525	4.76	0.8
		S-TNGN160412	●	1	9.525	4.76	1.2

T-CBN Series

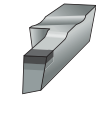
● : Stocked item

Solid T-CBN (BX90S)

Application & features	Shape	Cat. No.	Stocked grades		Dimensions (mm)		
			Solid T-CBN	No. of corner	Inner circle: ϕd	Thickness: s	Corner radius: r_E
			BX90S				
Finishing to heavy cutting		S-CNMN090308		1	9.25	3.18	0.8
		S-CNMN090312		1	9.525	3.18	1.2
		S-CNMN120408		1	12.7	4.76	0.8
		S-CNMN120412		1	12.7	4.76	1.2
		S-RNMN090300		1	9.525	3.18	–
		S-RNMN120400		1	12.7	4.76	–
		S-SNMN090308		1	9.525	3.18	0.8
		S-SNMN090312		1	9.525	3.18	1.2
		S-SNMN120308		1	12.7	3.18	0.8
		S-SNMN120312		1	12.7	3.18	1.2
		S-SNMN120408		1	12.7	4.76	0.8
		S-SNMN120412		1	12.7	4.76	1.2
		S-TNMN110308		1	6.35	3.18	0.8
		S-TNMN110312		1	6.35	3.18	1.2
		S-TNMN160408		1	9.525	4.76	0.8
		S-TNMN160412		1	9.525	4.76	1.2

T-CBN Series

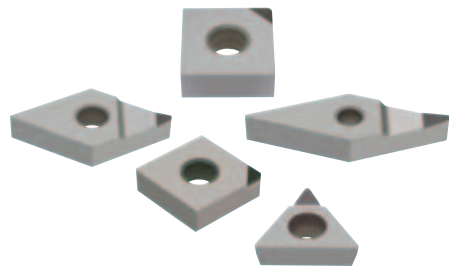
T-CBN (PCBN tipped) grooving Inserts

Application & features	Shape	Cat. No.	Stocked grades		No. of corner	Dimensions (mm)			Applicable TAC toolholders	
			T-CBN	R		L	Groove width ± 0.05	Max. groove depth		Corner radius r_E
			BX360							
			R							
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. $\phi 55$) (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

PCD grades

T-DIA series



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

3

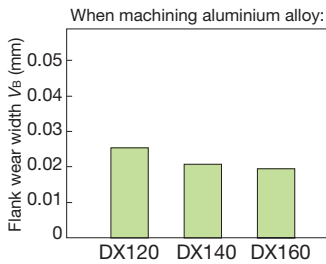
PCD and PCBN Tools

Features and applications (Physical and mechanical properties)

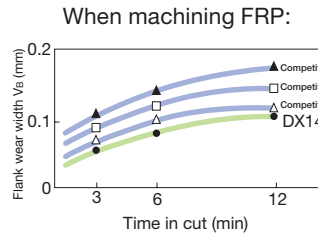
	DX110	DX120	DX140	DX160	DX180
Grade					
Property	Super fine grained grade. Excels in surface finish.	Fine grained grade. Excels in surface finish.	General purpose grade	High purity grade for hard materials	Highly wear resistant grade for special applications
Approx. grain size of diamond (µm)	< 1	4.5	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)

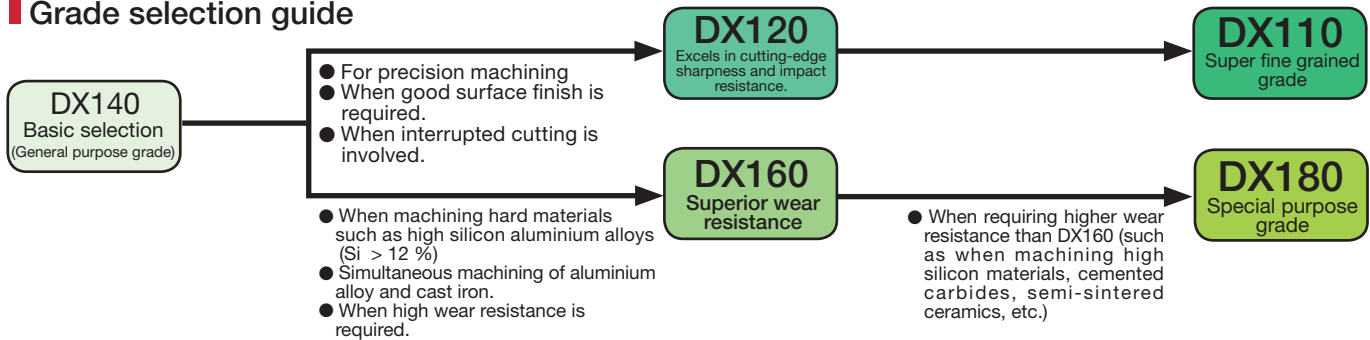


- Continuous external turning**
- Work material: 10 % Si, aluminium alloy
 - Insert: SPGN120308-DIA
 - Toolholder: CSBPR2525M4
 - Cutting speed: $v_c = 500$ m/min
 - Feed: $f = 0.1$ mm/rev
 - Depth of cut: $a_p = 0.5$ mm
 - Coolant: Dry cutting
 - Time in cut: 30 min



- 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 ϕd	Thick-ness s	Hole dia. ϕd_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	
		VNMM160408-DIA	●			9.525	4.76	3.81	0.8	3.6	TAC Internal Toolholders (5-37 ~)

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 ϕd	Thick-ness s	Hole dia. ϕd_1	Corner radius r_ϵ	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

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Grades (1-1)

Cutting Conditions (3-22)

Relating pages

TAC External toolholders (4-1)

TAC Internal toolholders (5-1)

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	Thickness s	Hole dia. ϕd_1	Corner radius r_ϵ		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	Clearance angle θ	Inner circle ϕd	Thickness s	Hole dia. ϕd_1	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	Clearance angle θ	Inner circle ϕd	Thickness s	Hole dia. ϕd_i	Corner radius r_ϵ	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	TAC Internal Toolholders (5-28 -)
		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	

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