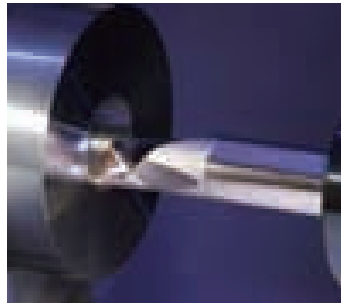


2007

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# Cutting Tools



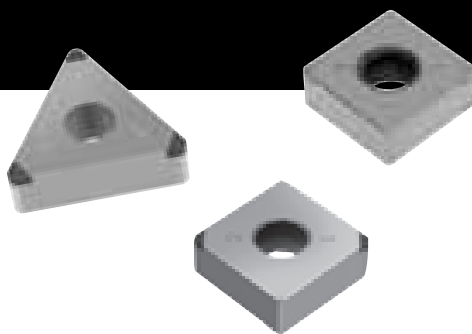
## ■ PCD Tools

- TAC Inserts for Turning ..... 430
- TAC Inserts for Milling ..... 433
- All-diamond Tipped TAC Mills ..... 434
- All-diamond Tipped TAC Endmills ..... 436
- PCD Tipped Endmills ..... 437
- Grinding of PCD Tools ..... 438

## ■ PCBN Tools

- TAC Insert for Turning ..... 439
- Grinding of PCBN Tools ..... 447
- All CBN Tipped TAC Mills ..... 448

# 11



## PCD inserts for Turning

## ■ Negative inserts

Shape	Cat. No.	Stocked grades			Dimensions(mm)				Applicable toolholder
		Sharpenability Better		Wear resistance Higher	ød	s	r <sub>c</sub>	a	
		DX120	DX140	DX160					
	TNGA160404-DIA TNGA160408-DIA		○	○	9.525	4.76	0.4 0.8	3.2 2.9	A, D, P, M, E, W
	SNGA120404-DIA SNGA120408-DIA		○	○	12.7	4.76	0.4 0.8	3.6 3.6	
	SNGN090308-DIA SNGN120408-DIA				9.525 12.7	3.18 4.76	0.8	3.6	C
	CNGA120404-DIA CNGA120408-DIA		○		12.7	4.76	0.4 0.8	3.5 3.4	A, D, P, M
	DNGA150404-DIA DNGA150408-DIA		○	○	12.7	4.76	0.4 0.8	3.1 2.8	A, D, P, M

## ■ Negative inserts (with chipbreaker)

Shape	Cat. No.	Stocked grades			Dimensions (mm)				Applicable toolholder
		Sharpenability Better		Wear resistance Higher	ød	s	r <sub>c</sub>	a	
		DX120	DX140	DX160					
	CNMM120402-DIA CNMM120404-DIA	○			12.7	4.76	0.2 0.4	3.5 3.5	A, D, P, M
	DNMM150402-DIA DNMM150404-DIA	○			12.7	4.76	0.2 0.4	3.3 3.1	
	TNMM160402-DIA TNMM160404-DIA	○			9.525	4.76	0.2 0.4	3.3 3.2	A, D, P, M
	VNMM160402-DIA VNMM160404-DIA VNMM160408-DIA	○ ○ ○			9.525	4.76	0.2 0.4 0.8	4.8 4.4 3.6	M

● : Standard stock in Europe  
○ : Standard stock in Japan

Positive inserts

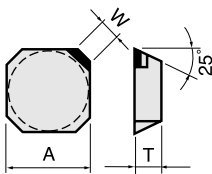
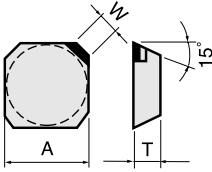
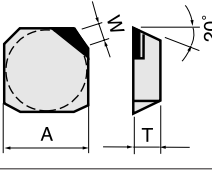
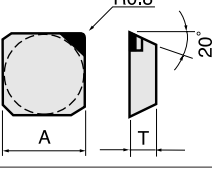
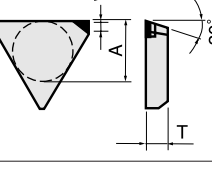
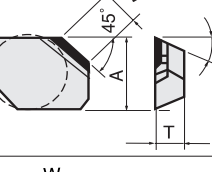
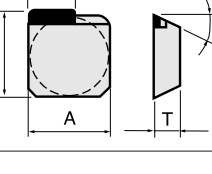
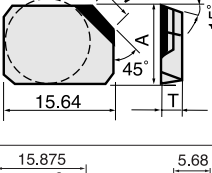
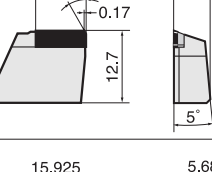
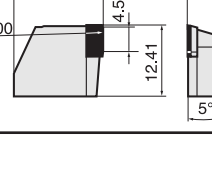
Shape	Cat. No.	Stocked grades			Dimensions (mm)				Applicable toolholder
		Sharpenability Better		Wear resistance Higher	ød	s	r <sub>c</sub>	a	
		DX120	DX140	DX160					
<p>(With Tungaloy standard hole)</p>	TPGA090202-DIA		○		5.556	2.38	0.2	2.4	
	TPGA090204-DIA		○				0.4	2.2	
	TPGA110202-DIA		○		6.35		0.2	2.4	
	TPGA110204-DIA		○				0.4	2.2	
	TPGA110302-DIA		○		6.35	3.18	0.2	2.4	
	TPGA110304-DIA		○				0.4	2.2	
	TPGA110308-DIA		○				0.8	2.0	
	TPGA160302-DIA		○		9.525		0.2	3.3	
	TPGA160304-DIA		○				0.4	3.2	
TPGA160308-DIA		○		0.8			2.9		
	TPGN090204-DIA		○		5.56	2.38	0.4	2.2	Boring toolholder C
	TPGN090208-DIA						0.8	2.0	
	TPGN110301-DIA				6.35	3.18	0.1	3.4	
	TPGN110302-DIA						0.2	3.3	
	TPGN110304-DIA		○		6.35	3.18	0.4	3.2	
	TPGN110308-DIA		○	○			0.8	2.9	
	TPGN160301-DIA						9.525	3.18	0.1
	TPGN160302-DIA		○		0.2	3.3			
	TPGN160304-DIA	○	○	○	0.4	3.2			
TPGN160308-DIA		○		0.8	2.9				
TPGN160312-DIA						1.2	2.6	Boring toolholder C	
	SPGN090302-DIA			○	9.525	3.18	0.2	3.6	Boring toolholder C
	SPGN090304-DIA						0.4	3.6	
	SPGN090308-DIA		○		0.8	3.6			
	SPGN120302-DIA		○		12.7	3.18	0.2	3.6	
	SPGN120304-DIA		○	○			0.4	3.6	
	SPGN120308-DIA		○	○			0.8	3.6	
SPGN120312-DIA				1.2			3.6		
	TPGW080202-DIA		○		4.76	2.38	0.2	2.4	Boring toolholder S
	TPGW080204-DIA		○				0.4	2.3	
	TPGW090202-DIA	○	○		5.56	2.38	0.2	2.4	
	TPGW090204-DIA		○				0.4	2.2	
	TPGW110202-DIA	○	○		6.35	2.38	0.2	2.4	
	TPGW110204-DIA		○				0.4	2.2	
	TPGW130302-DIA	○	○		7.94	3.18	0.2	3.3	
	TPGW130304-DIA		○	○			0.4	3.2	
	TPGW16T302-DIA		○		9.525	3.97	0.2	3.3	
TPGW16T304-DIA		○		0.4			3.2		
TPGW16T308-DIA		○		0.8			2.9		
	TCGW110202-DIA				6.35	2.38	0.2	2.4	Boring toolholder S
	TCGW110204-DIA						0.4	2.2	
	TCGW16T302-DIA				9.525	3.97	0.2	3.3	
	TCGW16T304-DIA						0.4	3.2	
	TCGW16T308-DIA				0.8	2.9			
	CCGW060200-DIA		○		6.35	2.38	0.05	2.4	
	CCGW060202-DIA		○				0.2	2.4	
	CCGW060204-DIA		○		0.4	2.4			
	CCGW09T302-DIA		○		9.525	3.97	0.2	3.5	
	CCGW09T304-DIA		○	○			0.4	3.5	
	CCGW09T308-DIA		○	○			0.8	3.4	
	DCGW070200-DIA		○		6.35	2.38	0.05	2.4	Boring toolholder S
	DCGW070202-DIA	○	○				0.2	2.3	
	DCGW070204-DIA		○		0.4	2.1			
	DCGW11T302-DIA		○		9.525	3.97	0.2	3.2	
	DCGW11T304-DIA		○				0.4	3.0	
	DCGW11T308-DIA		○				0.8	2.7	

Shape	Cat. No.	Stocked grades			Dimensions (mm)				Applicable toolholder
		Sharpenability Better		Wear resistance Higher	ød	s	r <sub>c</sub>	a	
		DX120	DX140	DX160					
	VCGW160402-DIA		○		9.525	4.76	0.2	4.8	Boring toolholder S
	VCGW160404-DIA		○				0.4	4.4	
	VCGW160408-DIA						0.8	3.6	
	VCGW160412-DIA						1.2	2.7	
	VCGW220530-DIA						12.7	5.56	
	EPGW040102-DIA		○		3.97	1.59	0.2	1.6	Boring toolholder S TAC Boring Bar Tools, Round shank, Top-Borer Tools
	EPGW040104-DIA		○				0.4	1.6	

## ■ Positive inserts (with chipbreaker)

Shape	Cat. No.	Stocked grades			Dimensions (mm)				Applicable toolholder
		Sharpenability Better		Wear resistance Higher	ød	s	r <sub>c</sub>	a	
		DX120	DX140	DX160					
	CCMT060202-DIA	○			6.35	2.38	0.2	2.4	Boring toolholder S
	CCMT060204-DIA	○					0.4	2.4	
	CCMT09T302-DIA	○			9.525	3.97	0.2	2.4	
	CCMT09T304-DIA	○					0.4	2.4	
	DCMT070202-DIA	○			6.35	2.38	0.2	2.3	Boring toolholder S
	DCMT070204-DIA	○					0.4	2.1	
	DCMT11T302-DIA	○			9.525	3.97	0.2	3.2	
	DCMT11T304-DIA	○					0.4	3.0	
	TCMT080202-DIA	○			4.76	2.38	0.2	2.2	Boring toolholder S
	TCMT080204-DIA	○					0.4	2.0	
	TCMT110202-DIA	○			6.35	2.38	0.2	2.4	
	TCMT110204-DIA	○					0.4	2.2	
	TCMT110302-DIA	○			6.35	3.18	0.2	2.4	
TCMT110304-DIA	○			0.4			2.2		
	VCMT160402-DIA	○			9.525	4.76	0.2	4.8	Boring toolholder S
	VCMT160404-DIA	○					0.4	4.4	

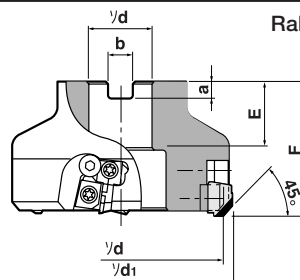
## PCD inserts for Milling

Shape	Cat. No. (Inch)	ISO Cat. No. (Metric)	Stocked grades		Dimensions (mm)			Applicable TAC mills
			DX140	DX160	A	T	W	
	SFCN42ZFN-DIA	SFCN1203AFFN-D	○		12.70	3.18	2.0	THF4400IA
	SFCN53ZFN-DIA	SFCN1504AFFN-D	○		15.875	4.76	2.0	THF5400IA
	SDCN42ZFN-DIA	SDCN1203AEFN-D	○		12.70	3.18	1.2	TGD4400-A TMD4400I EGD4400 EMD4403RI-S32
	SECN42ZFR-DIA	SECN1203ZEFN-D	○	○	12.70	3.18	2.5	THF4400IA QHE4000
	SECN422FN-DIA	SECN120308FN-D	○		12.70	3.18	-	ECE4000
	TECN32ZFR-DIA	TECN1603PEFR-D	○	○	9.525	3.18	1.4	TSE3000IA ESE3000
	TECN43ZFR-DIA	TECN2204PEFR-D	○	○	12.70	4.76	2.0	TSE4000IA ESE4000
	WFCN42ZFR-DIA	SFCX1203AFFR-WD	○		12.20	3.18	6.8	THF4400IA (Wiper)
	WFCN53ZFR-DIA	SFCX1504AFFR-WD	○		15.20	4.76	7.6	THF5400IA (Wiper)
	WECN42ZFR-DIA	SECX1203ZEFR-WD	○		12.40	3.18	6	THE4400IA (Wiper) QHE4000
	WDCN42ZFR-DIA	SDCX1203AFEFR-WD	○		12.20	3.18	4.9	TMD4400I (Wiper) EGD4400 EMD4403RI-S32
	<b>YDEN1505PDFR-D</b>		●		12.70	-	5	DPD15 (for roughing) EDPD15 (for roughing)
	<b>YDEN1505PDFR-WD</b>		●		12.70	-	4.5	DPD15 (Wiper) EDPD15 (Wiper)

## All-Diamond Tipped Mills

**DAD15**

For high-speed and high-precision face milling of aluminium alloys



Rake angle: A.R. + 8.5° R.R. + 5.0°

Max. cutting depth: 5 mm  
Right hand (R) shown

Cat. No.	Stock		No. of inserts	Dimensions (mm)						Weight (kg)	Mounting details	
	R	L		øD	øD1	ød	F	E	a			b
DAD15080R/L-E			4	80	90	27	40	26	7	12.4	1.4	P. 339 <sup>Ⓐ</sup>
DAD15100R/L-E			4	100	110	32	40	28.5	8	14.4	2.4	
DAD15125R/L-E			6	125	135	40	63	32	9	16.4	3.6	P. 339 <sup>Ⓑ</sup>
DAD15160R/L-E			6	160	170	40	63	29	9	16.4	5.5	
DAD15200R/L-E			8	200	210	60	63	38	14	25.7	8.9	P. 339 <sup>Ⓒ</sup>
DAD15250R/L-E			10	250	260	60	63	38	14	25.7	14.6	
DAD15315R/L-E			12	315	325	60	63	38	14	25.7	24.0	P. 339 <sup>Ⓓ</sup>

## ■ Inserts

Roughing		
Right hand (R) shown		
Cat. No.	Grades	Stock
YDEN1505ADFR-D	DX140	○
YDEN1505ADFL-D		

Wiper		
Right hand (R) shown		
Cat. No.	Grades	Stock
YDEN1505ADFR-WD	DX140	○
YDEN1505ADFL-WD		

## ■ Replacement parts

 Right hand (R) shown	No.	Description	Parts Cat. No.
	①	Insert locking wedge	FW304R/L-D
	②	Locator adjusting wedge	FW325R/L-D
	③	Screw for preventing wedge from flying out	BHM615-GT
	④	Wedge fixing screw (for øD = 80)	FDS-8ST-18
	④	Wedge fixing screw (for øD > 80)	FDS-8ST
	⑤	Adjusting wedge fixing screw	FDS-8ST-18
⑥	Wrench	T-27T	

## ■ Cautionary Points in Use

- To avoid danger of unbalanced revolution, the TAC mill should not be used in a state of reduced number of inserts.
- Use the cutter within the maximum revolutions written on the cutter body.
- When using the cutter at lower cutting speed than 1500 m/min, the balance quality of the arbor and toolholder should be prepared within class G16.
- When installing the inserts, recommended clamping torque for the wedge fixing screw is 980 N·cm.

## ■ Standard cutting conditions

Work materials	Grades	Cutter dia. øD (mm)	80	100	125	160	200	250	315	355	400	
Aluminium alloys Si < 12%	DX140 (T-DIA)	Max. cutting speed Vc (m/min)	4000									
		Max. number of revolutions n (rpm)	16000	12700	10200	8000	6400	5100	4000	3600	3200	
		Cutting depth ap (mm)	~ 5									
		Feed per tooth ft (mm/t)	0.05 ~ 0.28									
Aluminium alloys Si > 13%	DX140	Max. cutting speed Vc (m/min)	200 ~ 500									

• No. of revolutions n (rpm) = Cutting speed Vc (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)

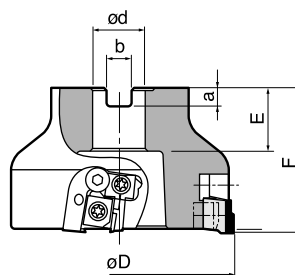
• Table feed Vf (mm/min) = n (rpm) × Feed per tooth ft (mm/t) × t (No. of inserts)

Features	Reference guide	Technical information
P. 298 ~ 302		P. 476 ~ 479

## All-Diamond Tipped Mills

**DPD15**

For high-speed and high-precision square shoulder milling of aluminium alloys



Rake angle: A.R. + 8.5° R.R. + 5.0°

Max. cutting depth: 7 mm  
Right hand (R) shown

Cat. No.	Stocked		No. of inserts	Dimensions (mm)						Weight (kg)	Mounting details
	R	L		øD	d	E	F	a	b		
DPD15080R/L-E			4	80	27	26	40	7	12.4	1.2	P. 339 <sup>④</sup>
DPD15100R/L-E			4	100	32	28.5	40	8	14.4	2.2	
DPD15125R/L-E			6	125	40	32	63	9	16.4	3.6	P. 339 <sup>⑥</sup>
DPD15160R/L-E			6	160	40	29	63	9	16.4	5.2	
DPD15200R/L-E			8	200	60	38	63	14	25.7	8.2	P. 339 <sup>⑥</sup>
DPD15250R/L-E			10	250	60	38	63	14	25.7	13.4	
DPD15315R/L-E			12	315	60	38	63	14	25.7	22.5	P. 339 <sup>⑥</sup>

## ■ Inserts

Roughing		
Right hand (R) shown		
Cat. No.	Grades	Stock
YDEN1505PDFR-D	DX140	●

Wiper		
Right hand (R) shown		
Cat. No.	Grades	Stock
YDEN1505PDFR-WD	DX140	●

## ■ Replacement parts

No.	Description	Parts Cat. No.
①	Insert locking wedge	FW304R/L-D
②	Locator adjusting wedge	FW325R/L-D
③	Screw for preventing wedge from flying out	BHM615-GT
④	Wedge fixing screw (for øD = 80)	FDS-8ST-18
	Wedge fixing screw (for øD > 80)	FDS-8ST
⑤	Adjusting wedge fixing screw	FDS-8ST-18
⑥	Wrench	T-27T

## ■ Standard cutting conditions

Work materials	Grades	Cutter dia. øD (mm)	80	100	125	160	200	250	315	355	400									
Aluminium alloys	Si < 12%	DX140 (T-DIA)	Max. cutting speed Vc (m/min)									4000								
			Max. No. of revolutions n (rpm)									16000	12700	10200	8000	6400	5100	4000	3600	3200
			Cutting depth ap (mm)									~ 7								
			Feed per tooth ft (mm/t)									0.05 ~ 0.20								
			Max. cutting speed Vc (m/min)									200 ~ 500								
Si > 13%																				

• No. of revolutions n (rpm) = Cutting speed Vc (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)

• Table feed Vf (mm/min) = n (rpm) × Feed per tooth ft (mm/t) × t (No. of inserts)

Features	Reference guide	Technical information
P. 298 ~ 302		P. 476 ~ 479

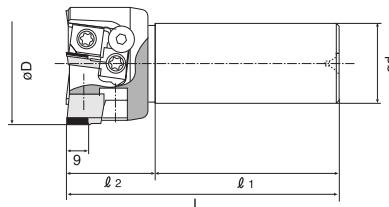


## All-diamond Tipped TAC Endmills

**EDPD15**

For high-speed and precision milling

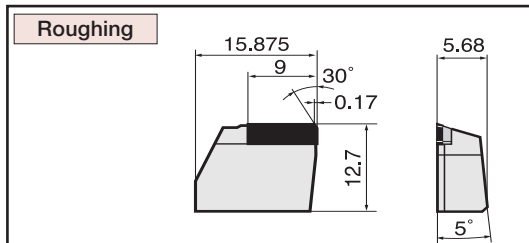
Rake angle: A.R. +7° R.R. 0°



## ■ Specifications

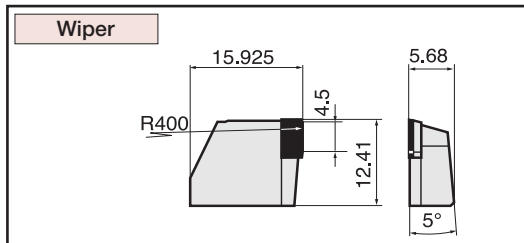
Cat. No.	Stock	No. of inserts	Dimensions (mm)					Insert locking wedge	Locator adjusting wedge	Screw for preventing wedge from flying out	Wedge fixing screw	Adjusting wedge fixing screw	Wrench
			øD	ød	l <sub>1</sub>	l <sub>2</sub>	L						
EDPD15050R/L		3	50	32.0	80	35	115	FW304R/L-D	FW325R/L-D	BHM611-GT	FDS-8SST	FDS-8SST	T-27
EDPD15063R/L		4	63										

## ■ Inserts



Right hand shown

Cat. No.	Standard grade	Stock
YDEN1505PDFR-D	DX140	●



Right hand shown

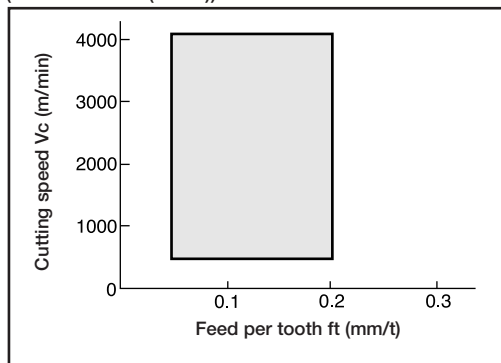
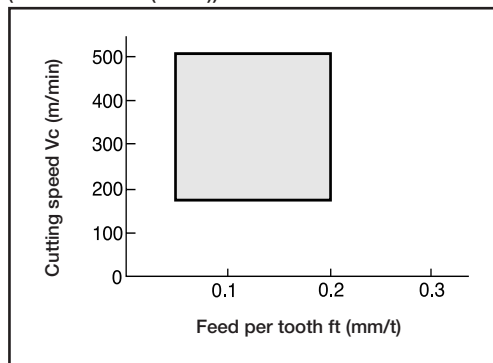
Cat. No.	Standard grade	Stock
YDEN1505PDFR-WD	DX140	●

## ■ Standard cutting conditions

Cutter diameter (mm)	50	63
Cutting speed V <sub>c</sub> (m/min)	500 ~ 3100	500 ~ 3900
Feed per tooth f <sub>t</sub> (mm/tooth)	0.05 ~ 0.2	
Cutting depth a <sub>p</sub> (mm)	~ 7	

- No. of revolutions n (rpm) = Cutting speed V<sub>c</sub> (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)
- Table feed V<sub>f</sub> (mm/min) = n (rpm) × Feed per tooth f<sub>t</sub> (mm/t) × t (No. of inserts)

## ■ Guidelines for selecting cutting speed and feed

Aluminium alloys (Si < 12%)  
(Grade: DX140 (T-DIA))Aluminium alloys (Si > 13%)  
(Grade: DX140 (T-DIA))

- Wet cutting is recommended.
- Dry cutting is also possible. But chip control and obtainable surface integrity are inferior to wet cutting.

## DEB1000 (T-DIA Endmills)



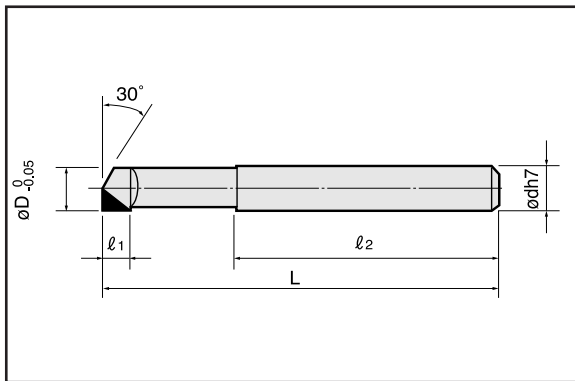
### ■ Features

- Provide superior wear resistance and longer tool life in machining non-ferrous metals and non-metals compared with carbide endmills.
- Less tendency to develop a built-up edge allows to produce excellent and accurate surface finish.
- The center cutting edge allows plunging.

### ■ Applications

- Aluminium alloys, copper alloys and other non-ferrous metals
- Non-metals such as glass-fiber plastics, epoxy resin, carbon, artificial marble and hard rubber.

### ■ Specifications



Cat. No.	Grade	Dimensions (mm)					
		DX140	øD	ød	l <sub>1</sub>	l <sub>2</sub>	L
DEB1040	○		4.0	6	3.5	32	45
DEB1050	○		5.0	6	3.5	35	50
DEB1060	○		6.0	6	3.5	35	55
DEB1070			7.0	8	5	37	55
DEB1080	○		8.0	8	5	37	55
DEB1090			9.0	10	5	40	60
DEB1100	○		10.0	10	5	40	60
DEB1110	○		11.0	12	5	45	65
DEB1120	○		12.0	12	5	45	65

### ■ Cutting conditions

For finishing  $a_p \leq 3D$ ,  $a_e = 0.1$  mm

Work materials	Aluminium- und Copper alloys	
Vc (m/min)	120 ~ 180	
Parameter Mill-ø (mm)	No. of revolutions n (min <sup>-1</sup> )	Table feed Vf (mm/min)
4	12000	120
5	9600	
6	8000	
8	6000	
10	4800	
12	4000	100

Set the protrusion length as short as possible. Reduce number of revolutions and table feed in order to prevent chattering when the protrusion length is long. Use the machine with high rigidity. Adjust the number of revolutions and the table feed according to the situation of use (cutting depth or machine rigidity etc.)

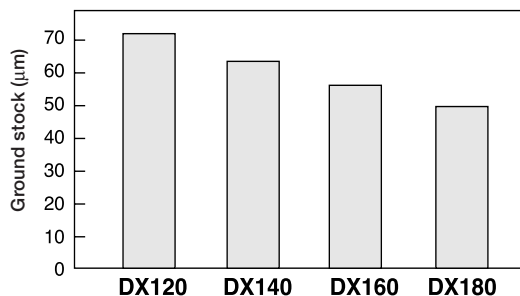
### ■ Practical examples

Work material	Aluminium alloy (AC4B-T6)	SiC-whisker reinforced aluminium alloy
Endmill	DEB1060 (ø6 mm)	DEB1100 (ø10 mm)
Cutting speed Vc (m/min)	68	113
Feed f (mm/t)	0.1 (360 mm/min)	0.05 (180 mm/min)
Cutting depth $a_p$ (mm)	2	1
Cutting width $a_e$ (mm)	3	6
Results	After machining for 20 min under above conditions, both the surface finish and accuracy of the work were good. Surface roughness of $R_{max} = 1.62$ $\mu$ m was attained.	After machining 12.6 m under above conditions, the flank wear was $VB = 0.05$ mm.

- No. of revolutions n (rpm) = Cutting speed Vc (m/min)  $\times$  1000  $\div$  3.14  $\div$  Cutter ø (mm)
- Table feed Vf (mm/min) = n (rpm)  $\times$  Feed per tooth ft (mm/t)  $\times$  t (No. of inserts)

## Grinding of T-DIA Tools

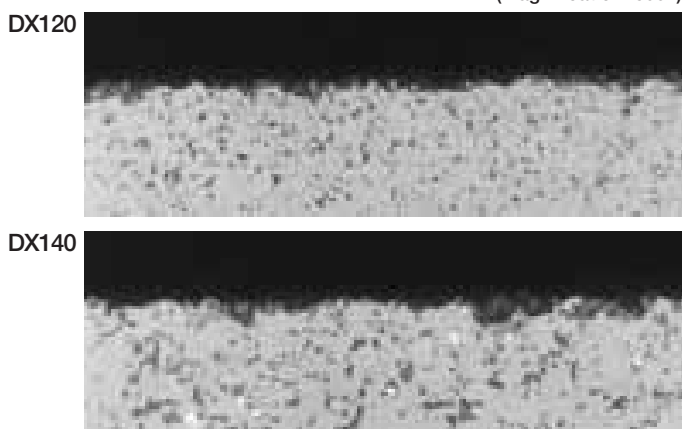
### 1. Comparison of grindability



Grinding machine	Diamond tool grinder
Grinding wheel	Vitrified bond Cup-type diamond wheel #800/1000, $\phi$ 150
Workpiece	Material: Four grades of T-DIA Ground surface area: 64 mm <sup>2</sup>
No. of revolutions	1600 rpm
Grinding time	6 min

### 2. Comparison of obtainable edge sharpness for fine and coarse grained grades

(Magnification: 600x)



As the grain size is finer, the grindability and ground-edge sharpness are improved and burr-free and better surface is attainable.

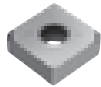
### ■ Standard regrinding method

T-DIA grades	DX160, DX140, DX120
Grinding machine	Highly rigid universal tool grinder
Grinding wheel	
Type	Diamond wheel
Bond	Vitrified bond
Grain size	Rough grinding: #400 ~ #600 Finish grinding: Finer than #1000
Concentration	100 ~ 125
Grinding conditions	
Grinding speed	900 ~ 1200 m/min
Oscillation cycle	30 ~ 60 cycle/min
Notes	<ul style="list-style-type: none"> <li>● Generally, prehoning is not necessary.</li> <li>● Cautious points               <ul style="list-style-type: none"> <li>• Use constant flood coolant.</li> <li>• A loaded or glazed wheel must not be used.</li> <li>• Always dress the wheel and keep fresh edges.</li> </ul> </li> </ul>

■ Excellent in hard machining up to 65 HRC

CBN in economic multi-cutting edge design

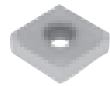
- Uncoated
- PVD coated
- Solid CBN



**BX310 / BX330 / BX360 / BX380**  
Uncoated CBN  
Extremely wear resistant up to robust, with economic multi-cutting edge design



**BX90S**  
The robust Solid CBN grade for extreme roughing operations



**BXC30 / BXC50**  
PVD coated CBN  
For increased tool life and improved surface qualities



**BXC90**  
Coated Solid CBN grade for extreme roughing operations

The specific features of the BX cutting grades provide for precision machining at extremely high cutting speeds ( $V_c > 300$  m/min) for continuous up to interrupted cut

■ TAC inserts PCBN

Best suitable for finishing to roughing of cast irons and difficult-to-cut materials

Work material	Operation	Cutting depth ap (mm)	Cutting speed Vc (m/min)	Feed f (mm/rev)	Grade selection								
					BX310	BX330	BX360	BX380	BXC30	BXC50	BX850	BX950	BX480
Hardened steel 55 - 65 HRC	continuous cut	0.03 ~ 0.25	150 ~ 250	0.05 ~ 0.20	●	○			●	○			
	interrupted cut	0.03 ~ 0.25	150 ~ 200	0.05 ~ 0.20		○	●		○				
	heavy interrupted cut	0.03 ~ 0.25	120 ~ 180	0.05 ~ 0.20			○	○		●			
Grey cast iron GG25	continuous to interrupted cut	0.03 ~ 0.50	600 ~ 1200	0.05 ~ 0.30							○	●	
Sintermetals Sint D30 Sint D39	continuous to interrupted cut	0.03 ~ 0.50	150 ~ 400	0.05 ~ 0.30								○	●

Note: ● First choice ○ Second choice

■ TAC inserts PCD

Best suitable for high-speed finishing of light alloys

Work materials	Operations	Cutting depth ap (mm)	Cutting speed Vc (m/min)	Feed f (mm/rev)	Grade selection			
					DX120	DX140	DX160	DX180
Aluminium alloys (Si < 12%)	Finishing	0.05 ~ 1.0	1000 ~ 2500	~ 0.2	○	●		
Aluminium alloys (Si 12 - 18%)		0.05 ~ 1.0	400 ~ 800	~ 0.2		○	●	○
Copper, brass		0.05 ~ 1.0	500 ~ 1500	~ 0.2	○	●		
Phosphor bronze		0.05 ~ 1.0	300 ~ 500	~ 0.2	○	●		
Carbon, graphite		0.05 ~ 1.0	300 ~ 500	~ 0.2		●	○	○
Fiber-reinforced plastics		0.05 ~ 1.0	500 ~ 1000	~ 0.1	●	○		
Plastics		0.05 ~ 0.5	500 ~ 1000	~ 0.05	●	○		
Cemented carbide (D40 ~ D50)		0.05 ~ 0.2	10 ~ 20	~ 0.05		○	○	●
Pre-sintered ceramics		0.05 ~ 0.2	100 ~ 150	~ 0.1			○	●

Note: ● First choice ○ Second choice

## ■ Negative inserts · Multi-corner type (Straight-lined one-wall recess for tip holding)

Shape	Cat. No.	Stocked grades								No. of cutting edges	Dimensions (mm)					Applicable TAC toolholder
		BXC30	BXC50	BX310	BX330	BX360	BX380	BX480	BX930		BX950	ød	s	ød <sub>1</sub>	r <sub>c</sub>	
	4QP-CNGA120404	●	●							4	12.7	4.76	5.16	0.4	2.3	A, D, P, M
	4QP-CNGA120408	●	●											0.8	2.2	
	4QP-CNGA120412	●	●											1.2	2.1	
	4QP-CNMA120404W		○											0.4	2.3	
	4QP-CNMA120408W		○											0.8	2.2	
	4QP-CNMA120412W		○											1.2	2.1	
	2QP-CNGA120404-L				○					2	12.7	4.76	5.16	0.4	2.3	A, D, P, M
	2QP-CNGA120404		●	●	●	●	○	○	●							
	T2QP-CNGA120404					○										
	2QP-CNGA120404-H					○	○									
	2QP-CNGA120408-L				○											
	2QP-CNGA120408		●	●	●	●	○	○	●							
	T2QP-CNGA120408					○										
	2QP-CNGA120408-H					○	○									
	2QP-CNGA120412-L				○											
	2QP-CNGA120412			●	●	●	●	○	○					●		
	2QP-CNGA120412-H					○	○									
	2QP-CNMA120404W					○										
	2QP-CNMA120408W					○										
	2QP-CNMA120412W					○										
	4QP-DNGA150404	●	●							4	12.7	4.76	5.16	0.4	2.5	A, D, P, M
	4QP-DNGA150408	●	●											0.8	2.1	
	4QP-DNGA150412	●	●											1.2	1.8	
	4QP-DNGA150604	●	●											0.4	2.5	
	4QP-DNGA150608	●	●											0.8	2.1	
	4QP-DNGA150612	●	●											1.2	1.8	
	2QP-DNGA150404-L				○					2	12.7	4.76	5.16	0.4	2.5	A, D, P, M
	2QP-DNGA150404		●	●	●	●	○	●	●							
	2QP-DNGA150404-H					○	○									
	2QP-DNGA150408-L				○											
	2QP-DNGA150408		●	●	●	●	○	●	●							
	2QP-DNGA150408-H					○	○									
	2QP-DNGA150412-L				○											
	2QP-DNGA150412			○	○	○	○	○	○							
	2QP-DNGA150412-H					○	○									
	2QP-DNGA150604			●	●	●	●	●	●							
2QP-DNGA150608			●	●	●	●	●	●								
2QP-DNGA150612			●	●	●	●	●	●								
	4QP-SNGA120404	●	●							4	12.7	4.76	5.16	0.4	2.4	A, D, P, M, E Boring toolholder P, M
	4QP-SNGA120408	●	●											0.8	2.4	
	4QP-SNGA120412	●	●											1.2	2.4	
	2QP-SNGA120404-L				○					2	12.7	4.76	5.16	0.4	2.4	A, D, P, M, E Boring toolholder P, M
	2QP-SNGA120404		●	●	●	●	○	●	●							
	2QP-SNGA120404-H					○	○									
	2QP-SNGA120408-L				○											
	2QP-SNGA120408		●	●	●	●	○	●	●							
	2QP-SNGA120408-H					○	○									
	2QP-SNGA120412-L				○											
	2QP-SNGA120412			●	●	●	●	○	●					●		
2QP-SNGA120412-H					○	○										

PCD and PCBN Tools

Cutting data P. 443	Reference guide	Grades P. 462
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● : Standard stock in Europe ○ : Standard stock in Japan

Shape	Cat. No.	Stocked grades									No. of cutting edges	Dimensions (mm)					Applicable TAC toolholder
		BXC30	BXC50	BX310	BX330	BX360	BX380	BX480	BX930	BX950		ød	s	ød <sub>1</sub>	r <sub>c</sub>	a	
	6QP-TNGA160404	●	●								6	9.525	4.76	3.81	0.4	2.2	A, D, P, M, E, W Boring toolholder M,P
	6QP-TNGA160408	●	●												0.8	1.9	
	6QP-TNGA160412	●	●												1.2	1.6	
	3QP-TNGA160404-L				○						3	9.525	4.76	3.81	0.4	2.2	A, D, P, M, E, W Boring toolholder M,P
	3QP-TNGA160404		●	●	●	●	○	●	●	0.8							
	T3QP-TNGA160404				○												
	3QP-TNGA160404-H				○	○											
	3QP-TNGA160408-L			○													
	3QP-TNGA160408		●	●	●	●	○	●	●	1.2					2.4		
	T3QP-TNGA160408				○												
	3QP-TNGA160408-H				○	○											
	3QP-TNGA160412-L			○													
	3QP-TNGA160412		●	●	●	●	○	●	●								
3QP-TNGA160412-H				○	○												
	4QP-VNGA160404	●	●							4	9.525	4.76	3.81	0.4	3.1	M	
	4QP-VNGA160408	●	●											0.8	2.2		
	2QP-VNGA160404-L				○					2	9.525	4.76	3.81	0.4	3.1	M	
	2QP-VNGA160404		●	●	●	●	○	●	●								0.8
	2QP-VNGA160404-H				○	○											
	2QP-VNGA160408-L			○													
	2QP-VNGA160408		●	●	●	●	○	●	●								
2QP-VNGA160408-H				○	○												
	6QP-WNGA080408	●	●							6	12.7	4.76	5.16	0.8	2.2	A, D, M Boring toolholder P	
	3QP-WNGA080408			○	○	○	○	○	○	3	12.7	4.76	5.16	0.8	2.2	A, D, M Boring toolholder P	

● : Standard stock in Europe  
○ : Standard stock in Japan

About catalog numbers of multi-corner type T-CBN inserts

- The sign (-L or -H) at the end of catalog number shows the size of honing angle.
  - 2QP-CNGA120408-L → Small honing angle  
**Wear resistance priority**
  - 2QP-CNGA120408 → Standard honing angle
  - 2QP-CNGA120408-H → Large honing angle  
**Impact resistance priority**
- T at the beginning of catalog number shows 10-inserts packing.  
Example: T3QP-TNGA160408

### ■ Positive inserts · Multi-corner type

Shape	Cat. No.	Stocked grades								No. of cutting edges	Dimensions (mm)					Applicable TAC toolholder		
		BXC30	BX310	BX330	BX360	BX380	BX480	BX930	BX950		ød	s	ød <sub>1</sub>	r <sub>c</sub>	a			
	2QP-CCMW060202	●	●	●						2	6.35	2.38	2.8	0.2	2.3	S		
	2QP-CCMW060204	●	●	●	●				○					○	0.4		2.3	
	2QP-CCMW09T304	●	●	●	●				○	○	9.525	3.97	4.4	0.4	2.3			
	2QP-CCMW09T308	●	●	●	●									0.8	2.2			
	2QP-DCMW070202	●	●	●						2	6.35	2.38	2.8	0.2	2.7	S		
	2QP-DCMW070204	●	●	●	●				○					○	0.4		2.5	
	2QP-DCMW11T302	●	●	●	●						9.525	3.97	4.4	0.2	2.7			
	2QP-DCMW11T304	●	●	●	●				○	○				0.4	2.5			
	2QP-DCMW11T308	●	●	●	●						0.8	2.1						
	2QP-SPMN090304			○	○				○	2	9.525	3.18	—	0.4	2.4	C Boring toolholder C		
	2QP-SPMN090308			○	○				○					0.8	2.4			
	3QP-TPMN110302			○	○				○	○	3	6.35	3.18	—	0.2	2.3	C Boring toolholder C	
	3QP-TPMN110304			○	○				○	○					0.4	2.2		
	3QP-TPMN110308			○	○				○	○					0.8	1.9		
	3QP-TPMN160304			○	○				○	○	3	9.525	3.18	—	0.4	2.2		
	3QP-TPMN160308			○	○				○	○					0.8	2.0		
	3QP-TPMW080204	●	●	●	●				●						0.4	2.2		
	3QP-TPMW090202			●	●				●	3	5.56	2.38	2.5	0.2	2.3	Boring toolholder S		
	3QP-TPMW090204	●	●	●	●				●						0.4		2.2	
	3QP-TPMW110202	●	●	●	●				●		3	6.35	2.38	2.8	0.2		2.3	
	3QP-TPMW110204	●	●	●	●				●						0.4		2.2	
	3QP-TPMW110302	●	○	○	○				○	○	3	6.35	3.18	3.4	0.2		2.4	
	3QP-TPMW110304	●	●	●	●				●	●					0.4		2.2	
	3QP-TPMW110308	●	●	●	●				●	●	3	7.94	3.18	3.4	0.8		2.0	
	3QP-TPMW130302	●	●	●	●				●	●					0.2		2.4	
	3QP-TPMW130304	●	●	●	●				●	●	3	9.525	3.97	4.4	0.4		2.2	
	3QP-TPMW16T304	●	●	●	●				●	●					0.8		1.9	
	3QP-TPMW160404	●	●	●	●				●		3	9.525	4.76	4.4	0.4		2.2	
	3QP-TPMW160408	●	●	●	●				●						0.8		2.0	
		2QP-VBMW110304	●	○	○	○				○	2	6.35	3.18	2.8	0.4		3.1	S Boring toolholder S
		2QP-VBMW110308	●	○	○	○				○							0.8	
2QP-VBMW160404		●	●	●	●						2	9.525	4.76	4.4	0.4	2.2		
2QP-VBMW160408		●	●	●	●										0.8			
	2QP-VCMW160404			○	○				○	2	9.525	4.76	4.4	0.4	2.2	S Boring toolholder S		

● : Standard stock in Europe  
○ : Standard stock in Japan

## ■ Standard cutting conditions

Grade	Work material and applications		Cutting speed V <sub>c</sub> (m/min)	Feed f (mm/rev)	Cutting depth a <sub>p</sub> (mm)	Use of coolant
BX310	Hardened steels	High-speed continuous to light interrupted cutting	100 ~ 300	~ 0.2	~ 0.5	Possible
BXC30		Medium to high-speed, continuous to light interrupted cutting	50 ~ 200			
BX330		Medium to high-speed, light to heavy interrupted cutting				
BX360		Medium to high-speed, heavy interrupted cutting				
BX380		High-speed continuous to interrupted cutting				
BXC50		Sintered metals	For gasoline engines (Plunging and traversing)			
BX450	For diesel engines (Plunging and traversing)		30 ~ 80			
BX480		Sintered metals for structure parts	100 ~ 280	~ 0.3		
BX850	Grey cast irons (Continuous to interrupted cutting)		300 ~ 1000	~ 0.3		
			300 ~ 1200	~ 0.3		
BX930	Ductile cast irons	100 ~ 500	~ 0.3			
	Roll steels	30 ~ 200	~ 0.5			
BX950	Difficult-to-cut materials (Nickel-based and titanium alloys)	70 ~ 300	~ 0.2			
	Grey cast irons (Light to heavy interrupted cutting)	300 ~ 1000	~ 0.3			
	VSR for diesel engines (Plunging and traversing)	30 ~ 80	~ 0.2			
	Sintered metals	70 ~ 200	~ 0.3			
	Thermal sprayed metals	30 ~ 230	~ 0.3			
	Roll steels	30 ~ 200	~ 0.5			

VSR : Valve seat ring

Notes in use:

1. For interrupted cutting, dry cutting is recommended.
2. QB-Mini inserts should be used for finishing at a cutting depth up to 0.5 mm.

- : Standard stock in Europe
- : Standard stock in Japan



### ■ Positive inserts · Single-corner type

Type	Shape	Cat. No.	Stocked grades						No. of cutting edges	Dimensions (mm)					Applicable toolholder	
			BX310	BX330	BX360	BX380	BX850	BX930		BX950	ød	s	ød <sub>1</sub>	r <sub>c</sub>		a
One-Corner type		Q-CCMW060202	●	●						1	6.35	2.38	2.8	0.2	2.6	S
		Q-CCMW060204	●	●	●									0.4	2.5	
		Q-CCMW09T302	●	●										0.2	2.6	
		Q-CCMW09T304	●	●	●					1	9.525	3.97	4.4	0.4	2.5	
		Q-CCMW09T308	●	●	●									0.8	2.4	
		Q-CPMW060202	●	●						1	6.35	2.38	2.8	0.2	2.5	
		Q-CPMW060204	●	●	●									0.4	2.5	
		Q-CPMW090302	●	●										0.2	2.5	
		Q-CPMW090304	●	●	●					1	9.525	3.18	4.4	0.4	2.5	
		Q-CPMW090308	●	●	●									0.8	2.4	
		Q-DCMW070202	●	●						1	6.35	2.38	2.8	0.2	2.3	S
		Q-DCMW070204	●	●	●									0.4	2.1	
		Q-DCMW11T302	●	●	●									0.2	2.3	
		Q-DCMW11T304	●	●	●					1	9.525	3.97	4.4	0.4	2.1	
		Q-DCMW11T308	●	●	●									0.8	2.3	
		Q-TPMW080204		●						1	4.76	2.38	2.7	0.4	2.2	Boring toolholder S
		Q-TPMW090202		○						1	5.56	2.38	2.5	0.2	2.4	
		Q-TPMW090204		○										0.4	2.3	
		Q-TPMW110202	●	●										0.2	2.4	
		Q-TPMW110204	●	●	●					1	6.35	2.38	3.4	0.4	2.2	
		Q-TPMW110208	●	●	●									0.8	2.0	
		Q-TPMW110304	●	●	●					1	6.35	3.18	2.8	0.4	2.2	
		Q-TPMW110308	●	●	●									0.8	2.0	
		Q-TPMW130302	●	●										0.2	2.4	
		Q-TPMW130304	●	●	●					1	7.94	3.18	3.4	0.4	2.3	
		Q-TPMW130308	●	●	●									0.8	2.0	
		Q-TPMW16T304		○						1	9.525	3.97	4.4	0.4	2.3	
		Q-TPMW160404	●	●	●					1	9.525	4.76	4.4	0.4	2.3	
		Q-TPMW160408	●	●	●									0.8	2.0	
			Q-SPGN090304		●	●					1	9.525	3.18	—	0.4	
	Q-SPGN090308			●	●									0.8	2.8	
	Q-SPGN120304			●	●									0.4	2.8	
	Q-SPGN120308			●	●					1	12.7	3.18	—	0.8	2.8	
		Q-TPGN110304		●	●					1	6.35	3.18	—	0.4	2.2	C Boring toolholder C
		Q-TPGN110308		●	●									0.8	2.2	
		Q-TPGN160304		●	●					1	9.525	3.18	—	0.4	2.3	
		Q-TPGN160308		●	●									0.8	2.0	
		Q-VBMW110204	●	●						1	11.2	2.38	2.8	0.4	3.1	
		Q-VBMW110208	●	●										0.8	2.2	
		Q-VBMW160404	●	●	●									0.4	2.6	
Q-VBMW160408		●	●	●					1	9.525	4.76	4.4	0.8	2.2		

● : Standard stock in Europe

○ : Standard stock in Japan

Cutting data  
P. 443Reference  
guideGrades  
P. 462

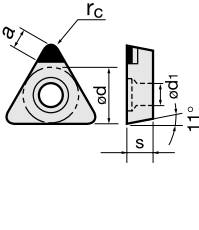
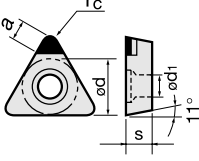
■ Big PCBN inlay

Type	Shape	Cat. No.	Stocked grades			Dimensions (mm)					Applicable toolholder
			BX330	BX360	BX850	ød	s	ød <sub>1</sub>	r <sub>c</sub>	a	
Negative Inserts		TNGA160402-QBN		○	○	9.525	4.76	3.81	0.2	4.4	Boring toolholder M, P
		TNGA160404-QBN	●	●	○			3.81	0.4	4.2	
		TNGA160408-QBN	●	●	○			3.81	0.8	4.0	
		TNGA160412-QBN	●	●	○			3.81	1.2	3.7	
		TNGN160402-QBN		○		9.525	4.76	—	0.2	4.4	M (Cutting edge style: F and G) C (Cutting edge style: F and G)
		TNGN160404-QBN	●	●	○			—	0.4	4.2	
		TNGN160408-QBN	●	●	○			—	0.8	4.0	
		TNGN160412-QBN	●	●	○			—	1.2	3.7	
		SNGA120402-QBN		○		12.7	4.76	5.16	0.2	4.1	Boring toolholder M, P
		SNGA120404-QBN	●	●	○			5.16	0.4	4.1	
		SNGA120408-QBN	●	●	○			5.16	0.8	4.1	
		SNGA120412-QBN	●	●	○			5.16	1.2	4.1	
		SNGN120402-QBN		○		12.7	4.76	—	0.2	4.1	C
		SNGN120404-QBN	●	●	○			—	0.4	4.1	
		SNGN120408-QBN	●	●	○			—	0.8	4.1	
		SNGN120412-QBN	●	●	○			—	1.2	4.1	
		CNGN090404-QBN		○		9.525	4.76	—	0.4	3.8	
		CNGN090408-QBN		○				—	0.8	3.8	
		CNGA120402-QBN		○		12.7	4.76	5.16	0.2	4.1	A, D, P, M
		CNGA120404-QBN	●	●	○			5.16	0.4	4.0	
		CNGA120408-QBN	●	●	○			5.16	0.8	3.9	
		CNGA120412-QBN	●	●	○			5.16	1.2	3.9	
		DNGA150402-QBN		●		12.7	4.76	5.16	0.2	4.3	A, D, P, M
		DNGA150404-QBN		○	○			5.16	0.4	4.1	
DNGA150408-QBN			○	○	5.16			0.8	3.8		
DNGA150412-QBN			○	○	5.16			1.2	3.4		
DNGA150602-QBN					12.7	6.35	5.16	0.2	4.3		
DNGA150604-QBN		●	●				5.16	0.4	4.1		
DNGA150608-QBN		●	●				5.16	0.8	3.8		
DNGA150612-QBN		●	●				5.16	1.2	3.4		
	TPGN110304-QBN		○		6.35	3.18	—	0.4	3.7	C	
	TPGN110308-QBN		○				—	0.8	3.5		
	TPGN160304-QBN		○		9.525		—	0.4	4.2		
	TPGN160308-QBN		○				—	0.8	4.0		
	TBGN060104-15-QBN		●	●	3.97	1.59	—	0.4	5.6		
	TBGN060108-15-QBN		●	●			—	0.8	5.2		
	SPGN090304-QBN		○		9.525	3.18	—	0.4	4.1	C Boring toolholder C	
	SPGN090308-QBN		○				—	0.8	4.1		
	SPGN090312-QBN		○		12.7		—	1.2	4.1		
	SPGN120308-QBN		○				—	0.8	4.1		
	SPGN120312-QBN		○				—	1.2	4.1		

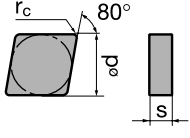
● : Standard stock in Europe  
○ : Standard stock in Japan

Cutting data P. 443	Reference guide	Grades P. 462
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### ■ Big PCBN inlay

Type	Shape	Cat. No.	Stocked grades			Dimensions (mm)					Applicable toolholder
			BX330	BX360	BX850	$\phi d$	s	$\phi d_1$	$r_c$	a	
Positive Inserts	 (With Tungaloy standard hole)	TPGA090202-QBN		○		5.56	2.38	3.2	0.2	3.1	Mainly used for former positive rake TAC toolholder
		TPGA090204-QBN		○				3.2	0.4	2.9	
		TPGA110202-QBN		○				3.0	0.2	3.9	
		TPGA110204-QBN		○		6.35	3.18	3.0	0.4	3.7	
		TPGA110302-QBN		○				3.0	0.2	3.9	
		TPGA110304-QBN		○				3.0	0.4	3.7	
		TPGA160302-QBN		○		9.525	3.18	4.0	0.2	4.4	
		TPGA160304-QBN		○				4.0	0.4	4.2	
		TPGA160308-QBN		○				4.0	0.8	4.0	
Positive Inserts Boring (ISO standard hole)		TPGW090202-QBN		○		5.56	2.38	2.5	0.2	3.3	S-type TAC boring toolholder
		TPGW090204-QBN		○				2.5	0.4	3.2	
		TPGW110202-QBN		○		6.35	3.18	2.8	0.2	3.9	
		TPGW110204-QBN		○				2.8	0.4	3.7	
		TPGW130302-QBN		○		7.94	3.18	3.4	0.2	3.9	
		TPGW130304-QBN		○				3.4	0.4	3.7	
		TPGW16T302-QBN		○		9.525	3.97	4.4	0.2	4.4	
		TPGW16T304-QBN		○				4.4	0.4	4.2	
		TPGW16T308-QBN		○				4.4	0.8	4.0	

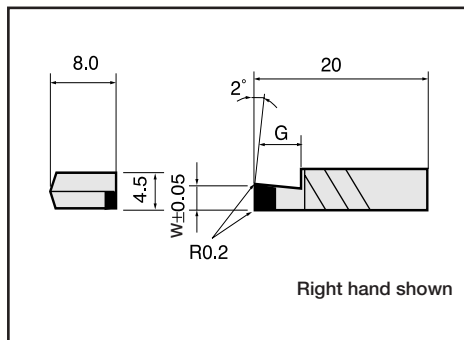
### ■ Solid PCBN

Type	Shape	Cat. No.	Accuracy	Stocked grades		Dimensions (mm)			Applicable toolholder
				BXC90	BX90S	$\phi d$	s	$r_c$	
Negative inserts, Solid CBN		S-CNGN090308	G	○		9.525	3.18	0.8	
		S-CNGN090312		○				1.2	
		CNMN090308	M		○	9.525	3.18	0.8	
		CNMN090312			○			1.2	
		S-CNGN120408	G	○		12.7	4.76	0.8	
		S-CNGN120412		○				1.2	
		CNMN120408	M		○	12.7	4.76	0.8	
		CNMN120412			○			1.2	
	S-RNGN090300	G	○		9.525	3.18	—		
	RNMN090300	M		○			—		
	S-RNGN120400	G	○		12.7	4.76	—		
	RNMN120400	M		○			—		
	S-SNGN090308	G	○		9.525	3.18	0.8		
	S-SNGN090312		○				1.2		
	SNMN090308	M		○	9.525	3.18	0.8		
	SNMN090312			○			1.2		
	S-SNGN120308	G	○		12.7	3.18	0.8		
	S-SNGN120312		○				1.2		
	SNMN120308	M		○	12.7	3.18	0.8		
	SNMN120312			○			1.2		
	S-SNGN120408	G	○		12.7	4.76	0.8		
	S-SNGN120412		○				1.2		
	SNMN120408	M		○	12.7	4.76	0.8		
	SNMN120412			○			1.2		
S-TNGN110308	G	○		6.35	3.18	0.8			
S-TNGN110312		○				1.2			
TNMN110308	M		○	6.35	3.18	0.8			
TNMN110312			○			1.2			
S-TNGN160408	G	○		9.525	4.76	0.8			
S-TNGN160412		○				1.2			
TNMN160408	M		○	9.525	4.76	0.8			
TNMN160412			○			1.2			

Note: BX90S available with specific micro geometry.

● : Standard stock in Europe ○ : Standard stock in Japan

● For grooving



Cat. No.	Stocked BX360		Max. grooving depth D	Dimensions (mm)		Applicable toolholder
	R	L		W	G	
XGR/L6310S-QBN			1.5	1.0	2.5	GX-2020R/L□ GX-2525R/L□
XGR/L6315S-QBN	○		2.3	1.5	2.5	
XGR/L6320S-QBN	○		3.0	2.0	3.2	
XGR/L6325S-QBN	○		3.8	2.5	3.9	
XGR/L6330S-QBN	○		4.5	3.0	4.6	
XGR/L6335S-QBN	○		5.3	3.5	5.4	
XGR/L6340S-QBN	○		6.0	4.0	6.1	
XGR/L6345S-QBN	○		7.0	4.5	6.1	

## Grinding of PCBN


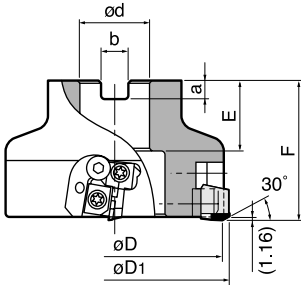
● Method of Regrinding

Grade PCBN	PCBN
Grinding machine	Universal tool grinder
Grinding wheel	
Type	Diamond wheel
Bond	Resinoid bond
Grain size	For roughing: #240 ~ #400 For finishing: #600 or finer
Concentration	100 ~ 125
Grinding conditions	
Grinding speed	900 ~ 1200 m/min
Oscillation cycle	30 ~ 60 cycle/min
Notes	Method of pre honing Use a #1000, resinoid bond hand stick. Honing specifications: 0.1 mm X (-15° ~ -25°)
	<ul style="list-style-type: none"> <li>● Cautionary points in grinding           <ul style="list-style-type: none"> <li>• Use flood coolant.</li> <li>• Use a sufficiently dressed wheel.</li> <li>• Do not use a glazed or loaded wheel.</li> </ul> </li> </ul>

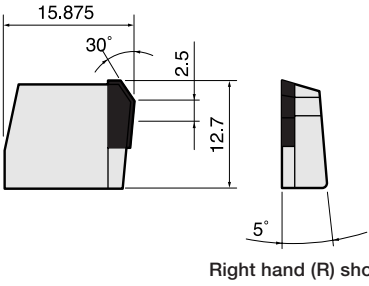
## All-CBN Tipped Mills

**QPP15**

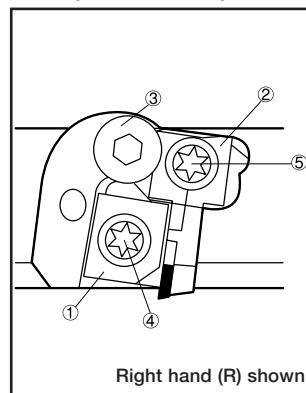
High-speed and high-precision finishing of grey cast irons

			Rake angle: A.R. + 5.5° R.R. -3°									
			Max. cutting depth: 1.0 mm Right hand (R) shown									
Cat. No.	Stock		No. of inserts	Dimensions (mm)						Weight (kg)	Mounting details	
	R	L		$\phi D$	$\phi D_1$	$\phi d$	E	F	a			b
QPP15080R/L-E			4	80	84	27	26	50	7	12.4	1.1	P. 339 <sup>Ⓐ</sup>
QPP15100R/L-E			6	100	104	32	28.5	63	8	14.4	2.1	
QPP15125R/L-E			6	125	129	40	32	63	9	16.4	3.7	
QPP15160R/L-E			8	160	164	40	29	63	9	16.4	5.3	P. 339 <sup>Ⓑ</sup>
QPP15200R/L-E			10	200	204	60	38	63	14	25.7	8.3	P. 339 <sup>Ⓒ</sup>
QPP15250R/L-E			12	250	254	60	38	63	14	25.7	13.5	
QPP15315R/L-E			14	315	319	60	38	63	14	25.7	22.6	P. 339 <sup>Ⓓ</sup>
QPP15355R/L-E			16	355	359	60	38	80	14	25.7	33.4	
QPP15400R/L-E			18	400	404	60	38	80	14	25.7	43.3	

## ■ Inserts

		
Cat. No.	Grades	Stock
YPEN1505PPTR-Q	BX950	●

## ■ Replacement parts



No.	Description	Parts Cat No.
①	Insert locking wedge	FW304R/L-D
②	Locator adjusting wedge	FW325R/L-D
③	Screw for preventing wedge from flying out	BHM615-GT
④	Wedge fixing screw (for $\phi D = 80$ )	FDS-8ST-18
	Wedge fixing screw (for $\phi D > 80$ )	FDS-8ST
⑤	Adjusting wedge fixing screw	FDS-8ST-18
-	Wrench	T-27T

## ■ Standard cutting conditions

Work materials	Insert grade	Cutting speed Vc (m/min)	Feed per tooth ft (mm/t)	Cutting depth ap (mm)
Grey cast irons (GG25 ~ GG35)	BX950	350 ~ 2000	0.1 ~ 0.25	0.1 ~ 1.0

● Note: Dry cutting is recommended.

• No. of revolutions n (rpm) = Cutting speed Vc (m/min) × 1000 ÷ 3.14 ÷ Cutter  $\phi$  (mm)

• Table feed Vf (mm/min) = n (rpm) × Feed per tooth ft (mm/t) × t (No. of inserts)

## Features

- 1** Highly efficient and accurate machining capability  
Rz ≤ 3.0  $\mu$ m, Rmax ≤ 6.0  $\mu$ m
- 2** Provided with adjusting mechanism for all the inserts
  - Attainable axial runout: Within 5  $\mu$ m
  - Inserts are grindable
- 3** Superior resistance to centrifugal force  
Even when using at speeds as high as 2000 m/min, inserts are firmly locked and free from any movement or looseness.