MITSUBISHI MATERIALS

C010A

CUTTING TOOLS 2024

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TOOLING & MACHINERY
COMPLETE METALWORKING SOLUTIONS
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DIA EDGE

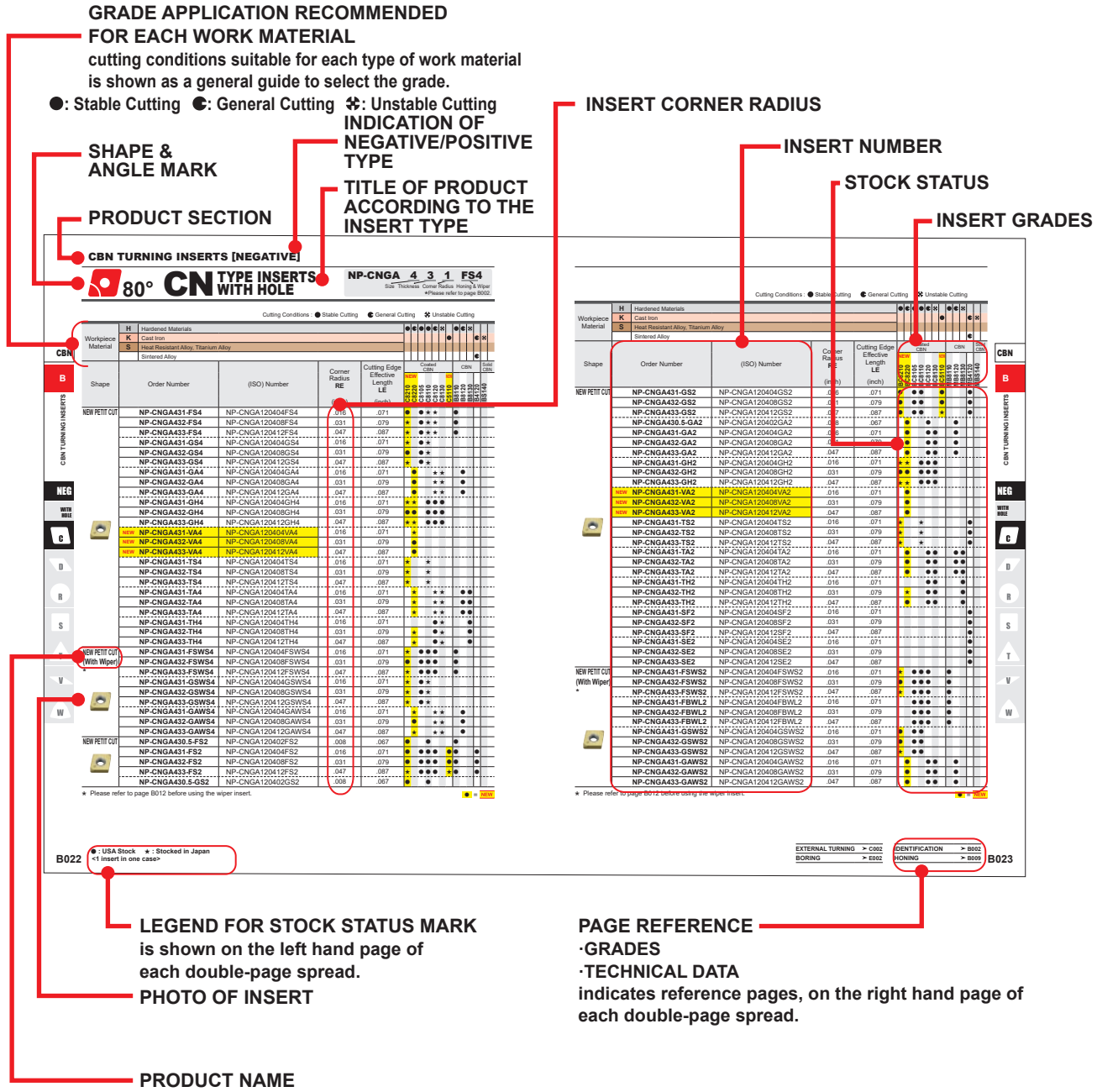
HOW TO READ THE STANDARD OF CBN & PCD TURNING INSERTS

●How this section page is organized

①Organized according to turning insert shape.
(Refer to the index on the next page.)

②Inserts are arranged in order of :

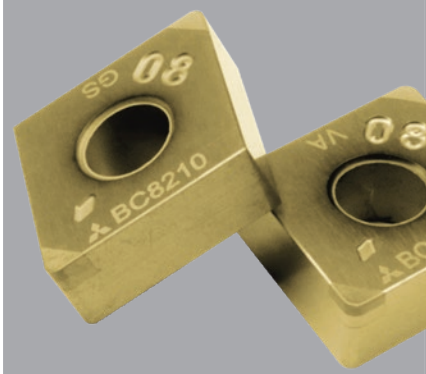
- Negative inserts (with hole→without hole)
- Positive inserts (with hole→without hole)



●To Order : Please specify insert number and grade.

TURNING TOOLS

CBN & PCD INSERT STANDARDS
CBN & PCD INSERT GRADES



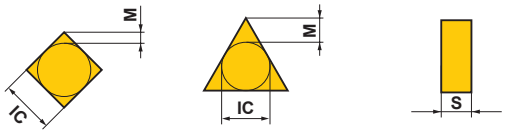
IDENTIFICATION

Symbol	Insert Shape
S	Square
T	Triangular
C	Rhombic 80°
D	Rhombic 55°
V	Rhombic 35°
W	Trigon
R	Round

② Symbol for Insert Shape

BM	With Breaker
BF	With Breaker
NP	Petit Tip
No mark	Standard Type

① Insert Geometry



Triangular insert with a facet (Secondary Cutting Edge)

④ Symbol for Tolerance Class

Symbol	Tolerance of Nose Height **M** (inch)	Tolerance of Inscribed Circle **IC** (inch)	Tolerance of Thickness **S** (inch)
G	±.001	±.001	±.005
M*	±.003 – ±.0063	±.002 – ±.003	±.005

*As a rule, the sides of these inserts are as sintered. Tolerance differs with insert size. For the accuracy of class M, refer to the table on the right.

Detail of M Class Insert Tolerance

●Tolerance of Nose Height **M** (inch)

I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
.250	±.003	±.003	±.003	±.004	±.0063	–
.375	±.003	±.003	±.003	±.004	±.0063	–
.500	±.005	±.005	±.005	±.006	–	–

●Tolerance of Inscribed Circle **IC** (inch)

I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
.250	±.002	±.002	±.002	±.002	±.002	–
.375	±.002	±.002	±.002	±.002	±.002	±.002
.500	±.003	±.003	±.003	±.003	–	±.003

④ Symbol for Tolerance Class

	①	②		④	
INCH	NP	- C	N	G	A
METRIC	NP	- C	N	G	A
			③		⑤

③ Symbol for Relief Angle

Symbol	Relief Angle
B	5°
C	7°
D	15°
E	20°
N	0°
P	11°

⑤ Symbol for Chipbreaker and Clamping System

Inch			Metric									
Figure	I.C. .250" and over	I.C. under .250"	Symbol	Hole	Hole Configuration	Chip Breaker	Figure	Symbol	Hole	Hole Configuration	Chip Breaker	Figure
	A	D	W	With Hole	Cylindrical Hole + One Countersink (40—60°)	No		A	With Hole	Cylindrical Hole	No	
	M	P	T	With Hole		One Sided		M	With Hole	Cylindrical Hole	One Sided	
	N	E	B	With Hole	Cylindrical Hole + One Countersink (70—90°)	No		N	Without Hole	–	No	
Special Design	X	X	H	With Hole		One Sided		X	–	–	–	Special Design

Inch		Diameter of Inscribed Circle (inch)	Metric						
I.C. .250" and over	I.C. under .250"		R	W	V	D	C	S	T
	1.2	.156		**02**		**04**	**03**	**03**	**06**
	1.5	.187		**L3**	**08**	**05**	**04**	**04**	**08**
	1.8	.219		**03**	**09**	**06**	**05**	**05**	**09**
2		.250		**04**	**11**	**07**	**06**	**06**	**11**
2.5		.313		**05**	**13**	**09**	**08**	**07**	**13**
3		.375	**09**	**06**	**16**	**11**	**09**	**09**	**16**
4		.500	**12**	**08**	**22**	**15**	**12**	**12**	**22**

⑥ Symbol for Insert Size

Thickness is from the bottom of the insert to the top of the cutting edge.

Inch		Thickness (inch)	Metric
I.C. .250" and over	I.C. under .250"		
–	**0.9**	.055	**S1**
–	**1**	.063	**01**
–	**1.1**	.070	**T0**
–	**1.5**	.094	**02**
–	**1.8**	.109	**T2**
2	–	.125	**03**
2.5	–	.156	**T3**
3	–	.187	**04**

⑦ Symbol for Insert Thickness

⑥	⑦				
4	**3**	**1**	**GA**	**WS**	**2**
12	**04**	**04**	**GA**	**WS**	**2**
		⑧	⑨	⑩	⑪

⑧ Symbol for Insert Corner Configuration		
Inch	Corner Radius (inch)	Metric
0.5	.008	**02**
1	.016	**04**
2	.031	**08**
3	.047	**12**
4	.063	**16**

⑨ Application (Honing)	
F FA FB FS	Continuous Cutting
G GA GB GH GS GN	General Cutting
T TA TH TS	Interrupted Cutting
SF SE	Edge Treatment for Sintered Alloy

Please refer to page B009 for further information.

⑩ Wiper	
WS	For High Rigidity Work Material
WL	For Deflection and Vibration Prevention
No mark	Without Wiper

⑪ Number of Tips	
2	2
3	3
⋮	⋮
No mark	1

CLASSIFICATION OF CBN & PCD GRADES

UNCOATED CBN MATERIALS

CBN sintered material based cutting tools are produced by binding CBN (cubic Boron Nitride) and ceramic. Its hardness is next to diamond and it is sintered under ultra-high pressure and high temperature.
CBN has a lower affinity to iron than diamond. The low affinity and high hardness properties mean that sintered CBN delivers a superior cutting performance especially during high-speed machining of materials such as hardened steel, cast iron and sintered alloys, etc.

COATED CBN MATERIALS

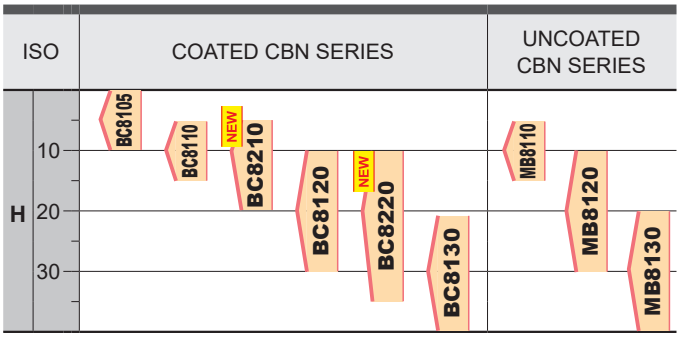
Mitsubishi Materials achieves longer tool life by using a unique "particle-activated sintering method" and combines it with an increased cutting edge strength. This specially developed PVD ceramic coating for CBN grades has a high crater wear resistance, longer tool life, and improved machine efficiency that exceed the conventional CBN grades.

PCD MATERIALS (Sintered Diamond)

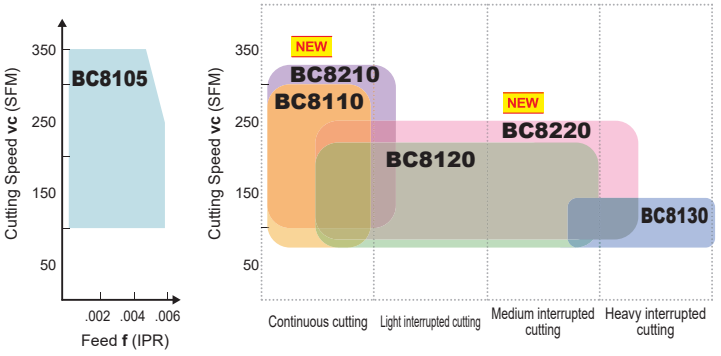
Suitable for cutting materials such as non ferrous metals and fiber reinforced plastics (FRP) including aluminum alloys.
It supports ultra-high-speed finish cutting.

Workpiece materials for turning grades/application area

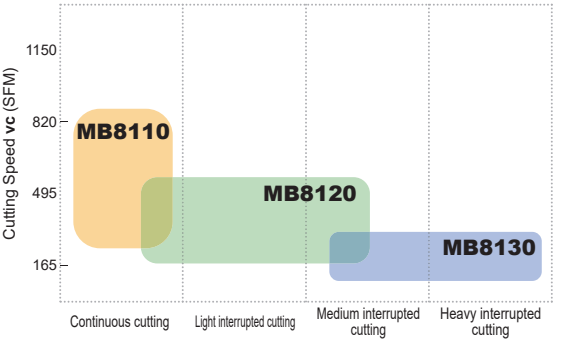
Hardened Steel



COATED CBN MATERIALS



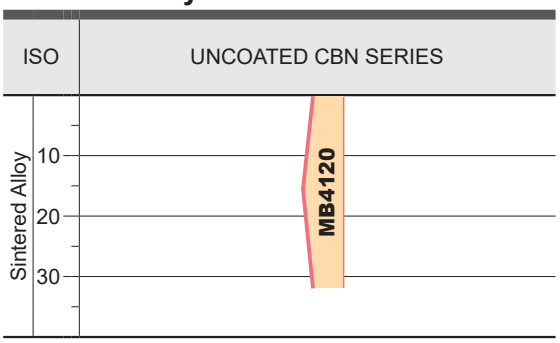
UNCOATED CBN MATERIALS

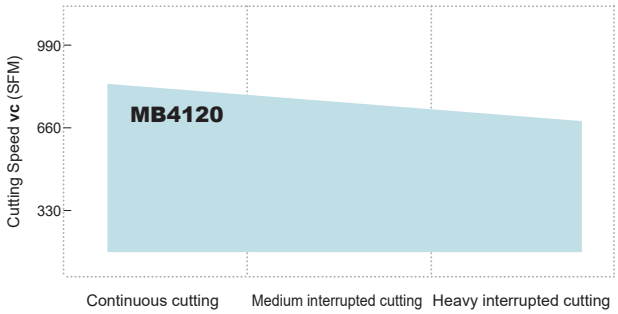


Suitable for finishing with surface roughness Ra .024 µinch or Rz .094 µinch or less.

Coated CBN Grades BC8200, BC8100 and Uncoated CBN Grade MB8100 for high hardness steel machining are available in a wide range of areas from finishing to continuous cutting of hardened steels and strongly interrupted machining.

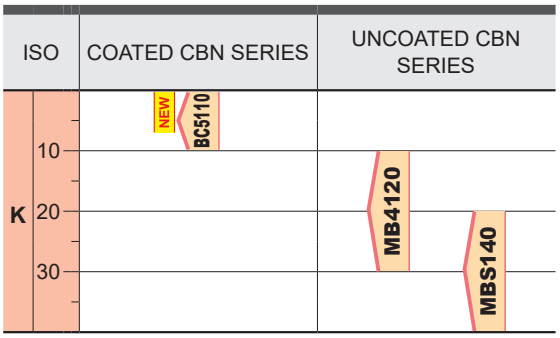
Sintered Alloys

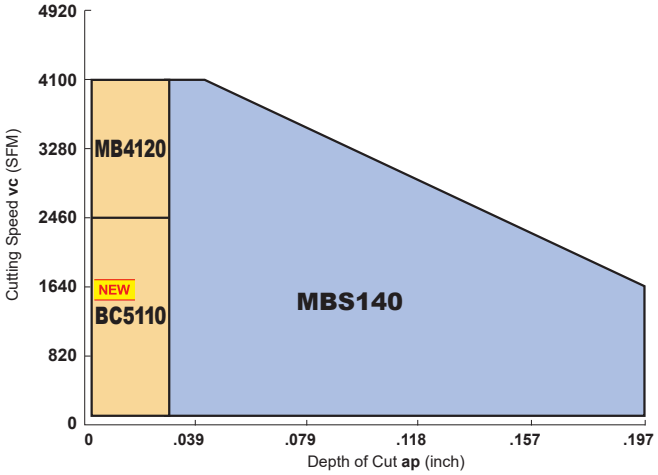




The CBN grade MB4120 for sintered alloys and cast iron cutting can be used widely from continuous cutting to interrupted cutting in the machining of cast iron and sintered alloys for valve mechanism parts and oil pump parts.

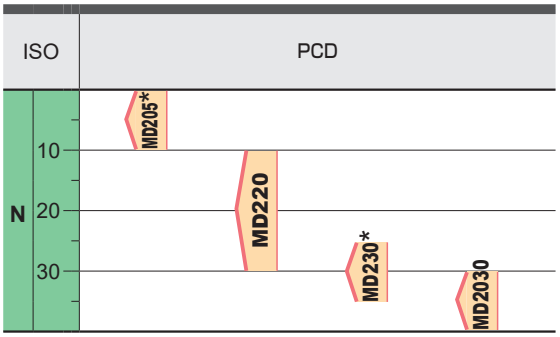
Cast Iron

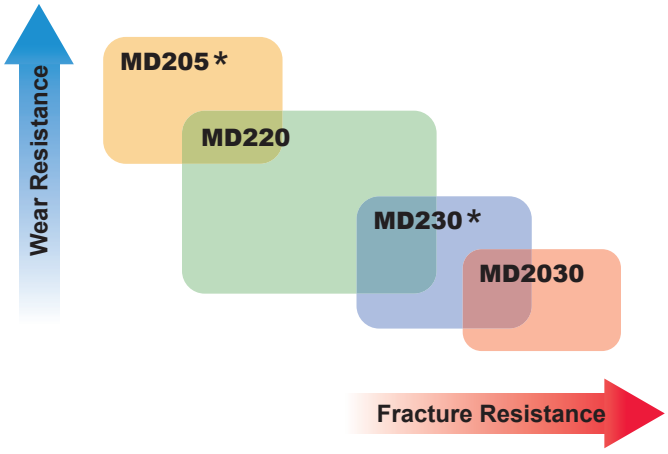




Lineup of grades available from general cutting to cutting of deep depths for high efficiency machining.

Aluminum Alloys





Suitable for cutting materials such as non ferrous metals and fiber reinforced plastics (FRP) including aluminum alloys.
It supports ultra-high-speed finish cutting.

*MD205 and MD230 are produced-to-order products.

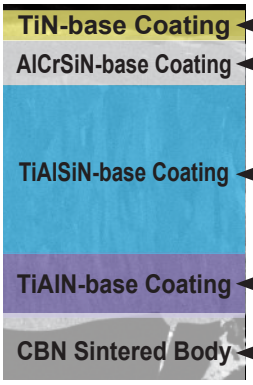
INTRODUCTION OF CBN GRADES

Coated CBN Grade for Machining of Hardened Steel

NEW BC8200 series

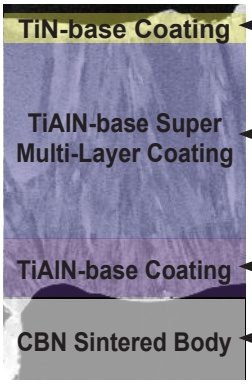
The new CBN substrate contains a new ultra micro-particle and heat resistant binder that suppress both chipping and crater wear which promotes longer tool life.

BC8210 NEW



- TiN-base Coating: Gold color assists easy identification of edge use.
- AlCrSiN-base Coating: Excellent chipping resistance. Absorbs impact forces.
- TiAlSiN-base Coating: Excellent wear resistance. Abrasion resistant layer.
- TiAlN-base Coating: Improved strength of adhesion to the CBN substrate prevents peeling. High adhesion layer for BC8210.
- CBN Sintered Body: Excellent crater wear and chipping resistance. Exclusive BC8210 sintered body.

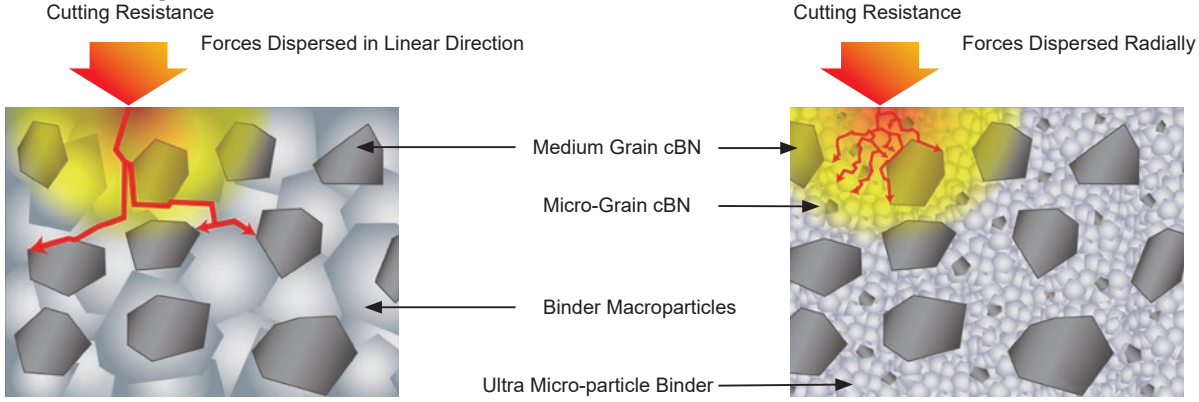
BC8220 NEW



- TiN-base Coating: Gold color assists easy identification of edge use.
- TiAlN-base Super Multi-Layer Coating: High wear and chipping resistance. Super Multi-Layer.
- TiAlN-base Coating: Improved strength of adhesion to the CBN substrate prevents peeling. High adhesion layer for BC8220.
- CBN Sintered Body: Excellent crater wear and fracture resistance. Exclusive BC8220 sintered body.

Ultra Micro-Particle Binder Prevents Sudden Defects

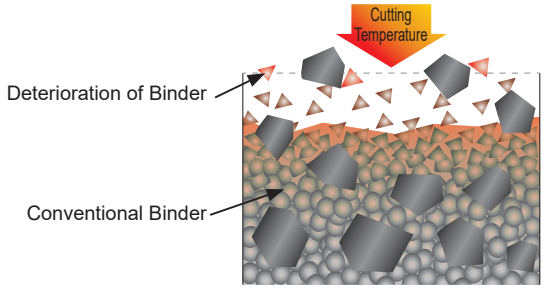
The ultra micro-particle binder cBN added to the CBN base material prevents linear crack development and avoids sudden fracturing.



Conventional **BC8200, BC8100 Series**

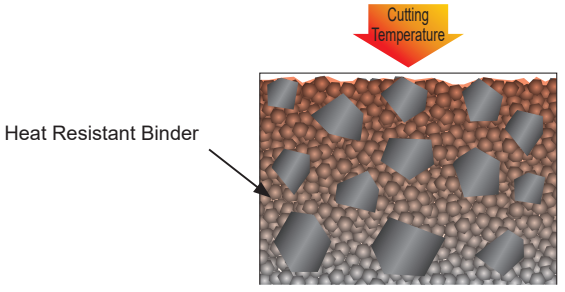
Heat Resistant Binder Suppresses Crater Wear

By increasing the heat reistance of the binder, wear resistance due to the deterioration of the binder component increases, thereby suppressing crater wear, chipping, and fracturing.



As binder wear progresses due to the heat produced during cutting, the cBN particles are exposed and lost.

Conventional



Suppresses the binder wear caused by cutting heat.

BC8200 Series

Coated CBN Grade for Machining Cast Iron

NEW BC5110

BC5110 uses a tough substrate with a remarkably hard coating to provide excellent chipping and wear resistance.

Excellent Chipping Resistance

Compared to conventional grades, the fine grain and high cBN content greatly improve chipping resistance and provide stability and long tool life.

Excellent Wear Resistance Coating

The hard ceramic coating layer provides excellent surface finishes as well as wear and notch resistance during continuous cutting.
Additionally, chipping and peeling of the coating layer is suppressed due to the improved bonding strength to the cBN substrate.

FOR CYLINDER LINER

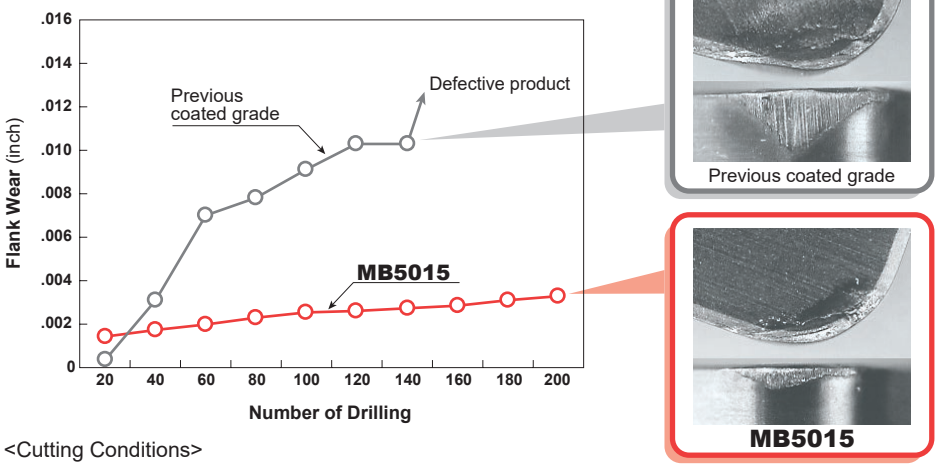
MB5015 *Produced to order only.

MB5015 is an exclusive grade for boring of centrifugal casting cylinder liners in semi finishing or finishing applications with high wear resistance.

■ Recommended Cutting Conditions

Work Material		Cutting Mode	Cutting Speed vc (SFM) 330 1640 3280 4920	Feed f (IPR)	Depth of Cut ap (inch)	Cutting Mode
Centrifugal casting	Cast Iron	Continuous cutting		–.012(Finishing) –.031(Semi-finishing)	–.002(Finishing) –.008(Semi-finishing)	Wet Cutting

■ Cutting Performance



<Cutting Conditions>
Work material : AISI No 30 B (Centrifugal casting) ϕ2.48"
Cutting Speed : vc=2625 SFM Feed : f=.014 IPR Depth of Cut : ap=.001 inch
Compornent : Centrifugal casting Cylinder liner Hole Depth : 3.94 inch

CBN

- Suitable for high speed finishing of heat treated steel, sintered ferrous alloy and cast iron.
- Low affinity to iron, thus good surface finishes are possible.
- Grinding can be replaced by machining.

Heat Treated Steel

Work Material		Type	Cutting Mode	Recommended Grade	Recommended Cutting Conditions			
					Cutting Speed vc (SFM)	Feed f (IPR)	Depth of Cut ap (inch)	Cutting Mode
Structural Steel Esp. Carburized Steel High Alloy Steel	35—65 HRC	Coated	High speed finishing cutting	**BC8105**	820 (330—1150)	≤.006	≤.008	Dry,Wet
			Continuous cutting for general purpose	NEW **BC8210** **BC8110**	655 (330—985)	≤.008	≤.014	Dry,Wet
				NEW **BC8220** **BC8120**	655 (330—755)	≤.012	≤.031	Dry,Wet
			Medium interrupted cutting	NEW **BC8220** **BC8120**	490 (195—655)	≤.008	≤.012	Dry,Wet
			Interrupted cutting	**BC8130**	390 (195—490)	≤.008	≤.012	Dry,Wet
		Non-coated	Continuous cutting for general purpose	**MB8110**	655 (330—820)	≤.008	≤.012	Dry,Wet
				MB8120	490 (260—720)	≤.008	≤.020	Dry,Wet
			Medium interrupted cutting	**MB8120**	425 (280—590)	≤.008	≤.012	Dry,Wet
			Interrupted cutting	**MB8130**	330 (195—490)	≤.008	≤.012	Dry,Wet

Cast Iron

Work Material		Work Structure	Cutting Speed vc (SFM) 820 1640 2460 3280 4100	Feed f (IPR)	Depth of Cut ap (inch)	Cutting Mode
Gray Cast Iron	AISI No 35 B	Ferritic + Pearlitic	**MBS140** **BC5110** **MB4120**	—.020	—.039 MBS140 —.200	Dry,Wet
	AISI No 45 B	Pearlitic				
Alloy Cast Iron		Pearlitic		—.016	—.020	Dry,Wet
Ductile Cast Iron	AISI 60-40-18	Ferritic	**MB4120**	—.016	—.020	Dry,Wet
	AISI 100-70-03	Ferritic + Pearlitic Pearlitic				

Sintered Alloy

Work Material	Recommended Grade	Recommended Cutting Conditions		
		Cutting Speed vc (SFM)	Feed f (IPR)	Depth of Cut ap (inch)
General Sintered Alloy	**MB4120**	590 (260—985)	—.008	—.012
High Density Sintered Alloy	**MB4120**	490 (260—755)	—.008	—.012
Sintered Alloy	**MB4120**	425 (260—590)	—.008	—.012

Valve Seat

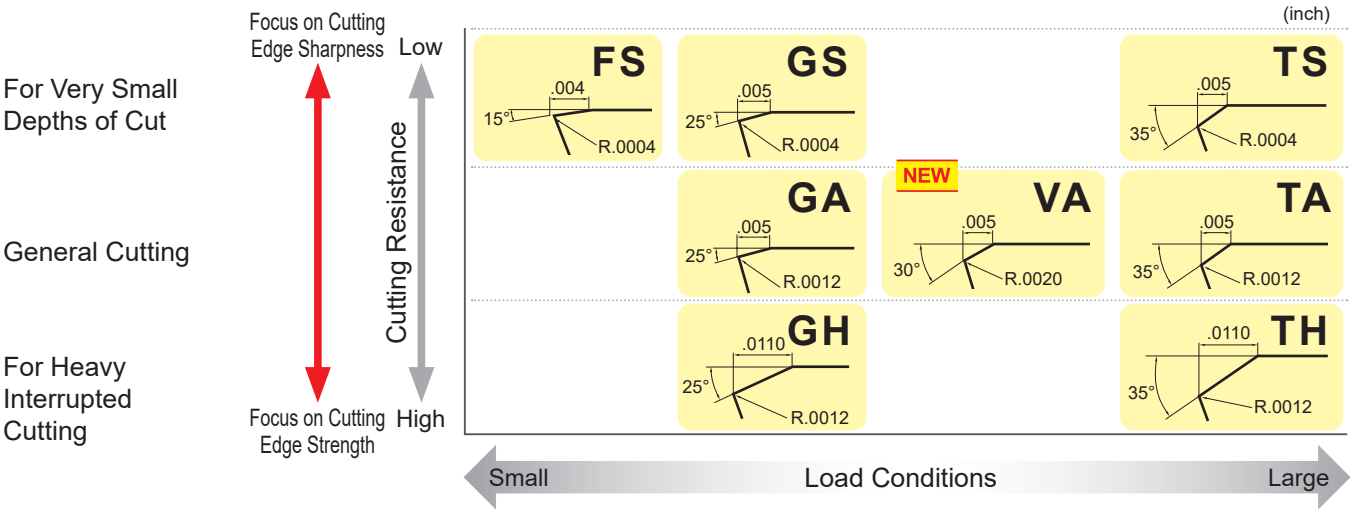
Amount of Hard Particles	**None or Small** ◄——————————► **Large**			
Hardness of Workpiece (HV)	150	250	300	350
Plunge Cut	**MB4120**			
Traverse Cut	**MB4120**			

Roll

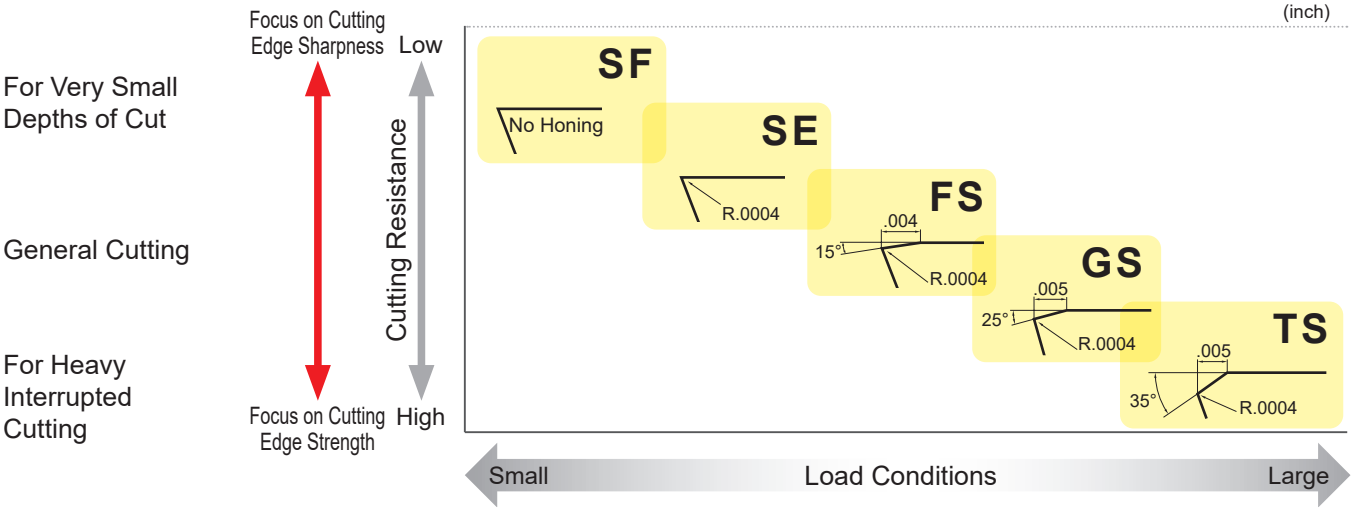
Work Material	Grade	Recommended Cutting Conditions		
		Cutting Speed vc (SFM)	Feed f (IPR)	Depth of Cut ap (inch)
Cemented Carbide	**MBS140**	65 (30—100)	—.008	—.008

HONING

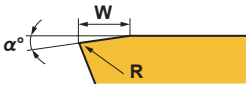
Honing for Machining Hardened Steel



Honing for Machining Sintered Alloys



NP-CNGA120408-GA2



Main Application — Edge Honing Type

(inch)

	A General			S Vibration and burr control			H High efficiency			F Focus on dimensional precision			E Chipping control		
	α	W	R	α	W	R	α	W	R	α	W	R	α	W	R
F Continuous cutting	15°	.004	0	15°	.004	.0004	—	—	—	—	—	—	—	—	—
G General cutting	25°	.005	.0012	25°	.005	.0004	25°	.0110	.0012	—	—	—	—	—	—
V For high-speed, High feed cutting	30°	.005	.0020	—	—	—	—	—	—	—	—	—	—	—	—
T Interrupted cutting	35°	.005	.0012	35°	.005	.0004	35°	.0110	.0012	—	—	—	—	—	—
S High precision cutting	—	—	—	—	—	—	—	—	—	0°	0	0	0°	0	.0004

Conventional honing shapes
F honing : .004 inch×15°+R0 **G** honing : .005 inch×25°+R.0012 **T** honing : .005 inch×35°+R.0012

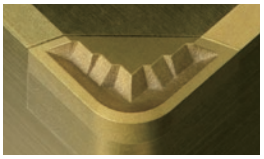
New Petit Cut Series

The surface area of the CBN sintered body has been optimized to allow for a lower price. Tool management is easier because repolishing is not required.

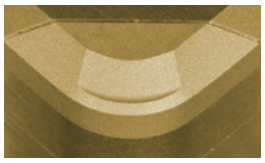
CBN BREAKER INSERT

■Application Area

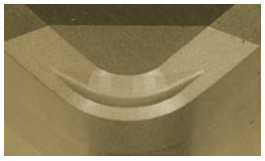
A BR breaker has been added to achieve better chip control at higher depths of cut.
A versatile range of chip breakers are available for a wide range of applications.



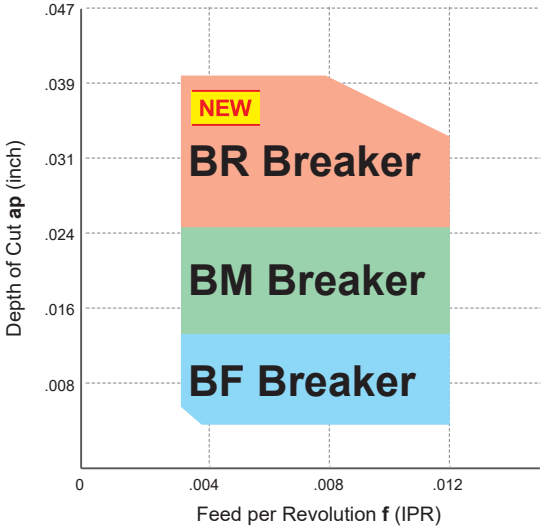
BR Breaker



BM Breaker



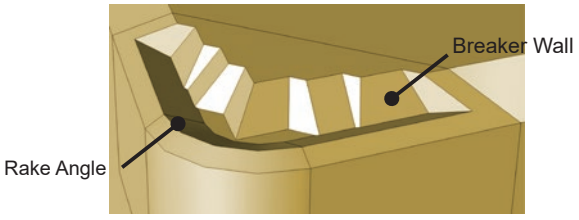
BF Breaker

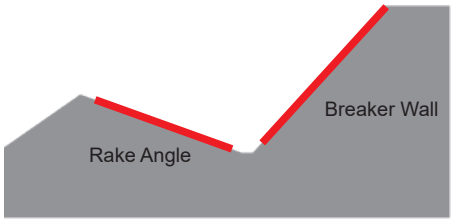


NEW BR Breaker (BC8220)

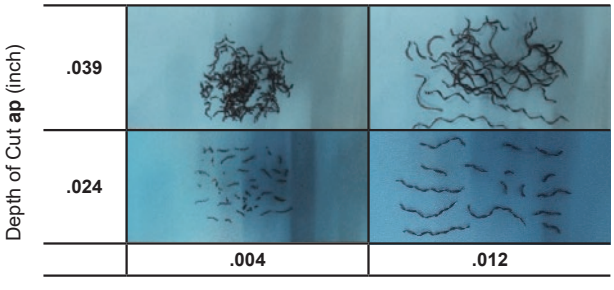
A reduced number of passes needed and improved chip control during high depth of cut.
Chips are formed with the effect from the rake angle, and the multi stage chip breaker wall supports a wide range of cuts.

Recommended Cutting Conditions : vc=260-655 SFM, f≤ .012 IPR, ap=.024-.039 inch





Achieves ideal chip control even at high depths of cut.

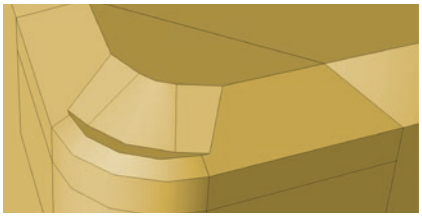


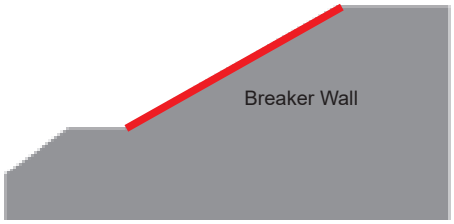
<Cutting Conditions>
Workpiece Material : AISI 5120H (60 HRC)
Insert : BR-CNGM432-TA2
Cutting Speed : vc= 655 SFM
Feed per Rev. : f= .004 IPR
.012 IPR
Depth of Cut : ap= .024 inch
.039 inch
Cutting Mode : Dry Cutting

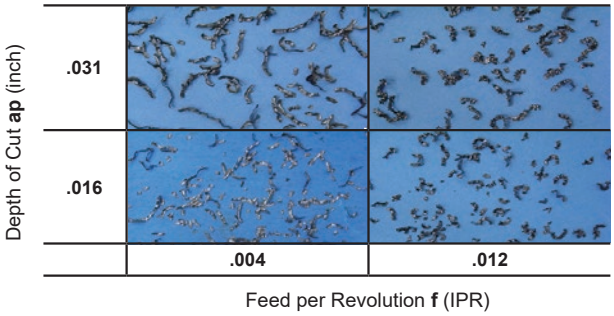
BM Breaker (BC8220)

Great chip control when machining at medium depths of cut. (.012-.031 inch)

Recommended Cutting Conditions : vc=260-655 SFM, f≤ .012 IPR, ap=.012-.031 inch





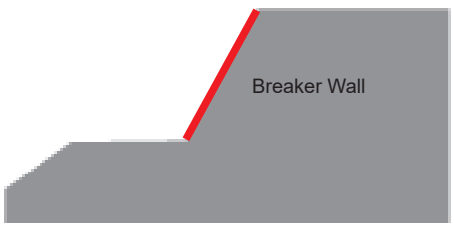


<Cutting Conditions>
Workpiece Material : JIS SCM415 (60 HRC)
Insert : BM-CNGM432-TA2
Cutting Speed : vc= 525 SFM
Feed per Rev. : f=.004 IPR
.012 IPR
Depth of Cut : ap=.016 inch
.031 inch
Cutting Mode : Dry Cutting

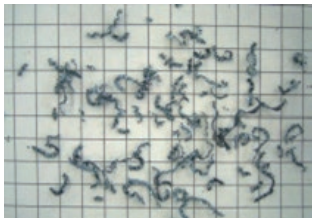
BF Breaker (BC8210, BC8220)

Achieves excellent chip control while finish cutting at depths of .012 inch or less.

Recommended Cutting Conditions : vc=260-655 SFM, f≤ .012 IPR, ap=.004-.012 inch

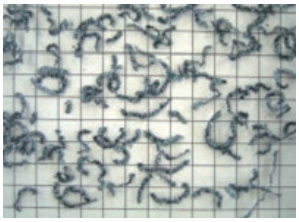


External Turning



Cutting Speed : vc = 330 SFM
Feed per Rev. : f=.008 IPR
Depth of Cut : ap = .012 inch

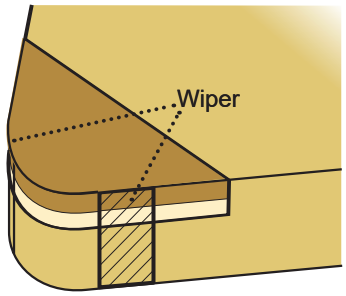
Boring



Cutting Speed : vc = 395 SFM
Feed per Rev. : f = .008 IPR
Depth of Cut : ap = .012 inch

<Cutting Conditions>
Workpiece Material : JIS SCM415 (60 HRC)
Insert : BF-CNGM432-TS2
Cutting Mode : Dry Cutting

WIPER INSERT



Improving Surface Finish

Under the same machining conditions as conventional breakers, but with the feed rate increased, the surface finish of the workpiece can be improved.

Improving Efficiency

High feed rates not only shorten machining times but also make it possible to combine roughing and finishing operations.

Increased Tool Life

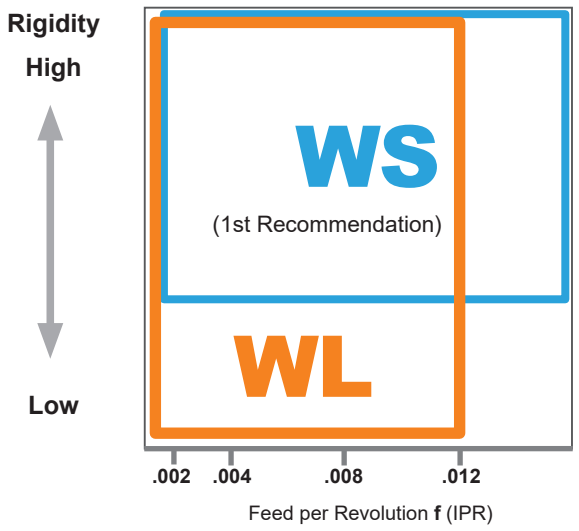
When changed to high feed conditions, the time required to cut one component is decreased, thus more parts can be machined with each insert. In addition, the high feed rate prevents rubbing, therefore, delaying the progression of wear and increasing the tool life of the insert.

Improving Chip Control

Under high feed conditions, the chips generated become thicker and are more easily broken, thus, chip control is improved.

■ Application of Wiper Inserts

The most recommended wiper shape is the WS Wiper. If deflection or chatter occur, use the WL Wiper.

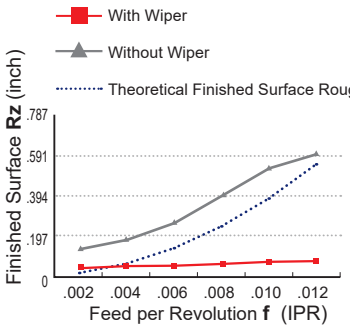


Examples of Low Rigidity:

- When overhang length is long due to boring
- When the workpiece material has a small diameter

■ Cutting Performance

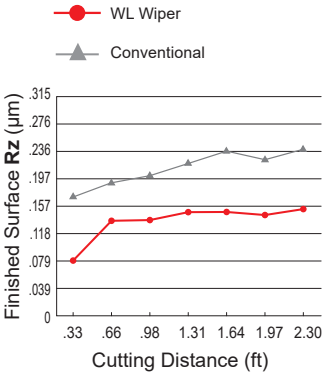
WL Wiper (External Turning)



<Cutting Conditions>

Workpiece Material	: Hardened Steel (60HRC)
Insert	: NP-CNGA432
Machining Methods	: Continuous
Cutting Speed	: vc=395 SFM
Depth of Cut	: ap=.004 inch
Cutting Mode	: Dry Cutting

WL Wiper (Boring)



<Cutting Conditions>

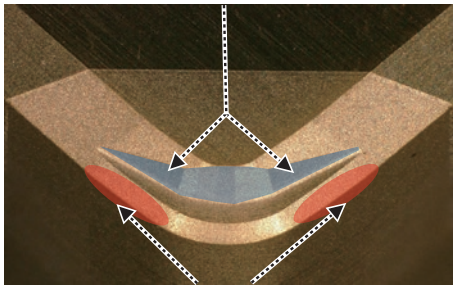
Workpiece Material	: AISI 5115 (60HRC)
Insert	: NP-CNGA432-FBWL2
Machining Methods	: Continuous
Cutting Speed	: vc=525 SFM
Feed	: f=.012 IPR
Depth of Cut	: ap=.004 inch
Cutting Mode	: Dry Cutting

Stable surface finish is maintained even in unstable cutting.

Combination of BF Breaker and WS Wiper Insert

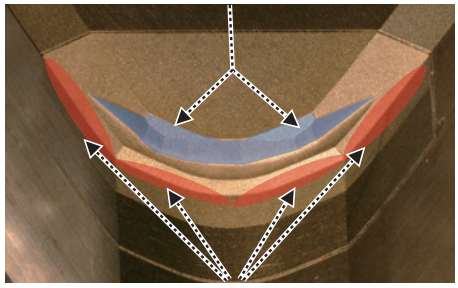
CNGM and DNGM types are now available with new inserts that combine a BF chip breaker with a WS wiper Insert.
(BC8210 : BF-○NGM○○○○○○TSWS2, BC8220 : BF-○NGM○○○○○○TAWS2)
It is effective for chip control and an improvement of finished surface roughness without worrying about the hand of the tool even when continuous external or internal turning and facing.

BF breaker



WL Wiper (No hand)
BF-CNGM120408TSWS2

BF breaker



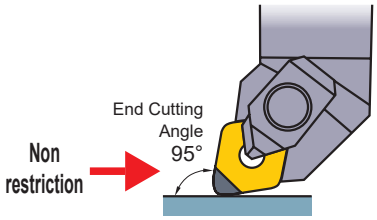
WL Wiper (No hand)
BF-DNGM150412TAWS2

■ Precautions when Using Wiper Inserts

When Using CNGM Type

No Restriction for Holders

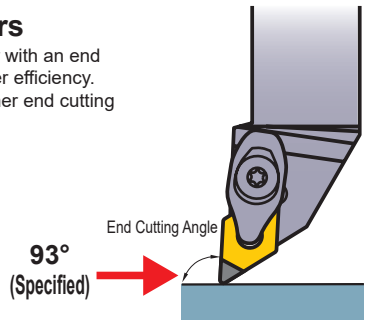
A standard holder can be used.
(*A double clamp, high rigidity tool is recommended.)



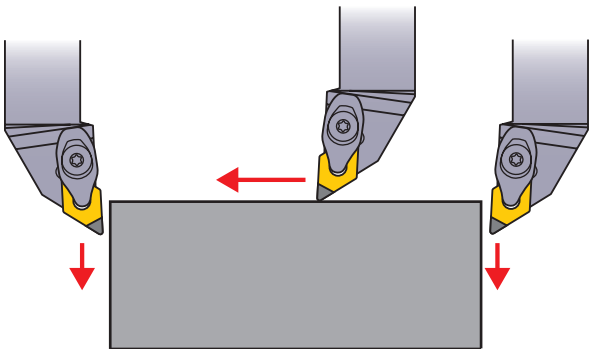
When Using DNGM Type

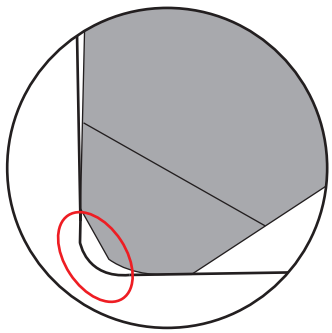
Restriction for Holders

Use a PDJN holder or DDJN holder with an end cutting angle of 93° to improve wiper efficiency.
There is no wiper efficiency with other end cutting angles (60°, 90°,107°, etc.).



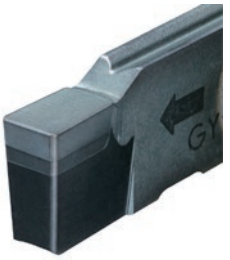
Displays great wiper efficiency when machining the end face and outer diameter in both right-hand and left-hand machining.





*The DNGM type is not suitable for machining the R that connects the end face and the outer diameter because it will leave uncut parts.

CBN GROOVING SERIES
(GY)

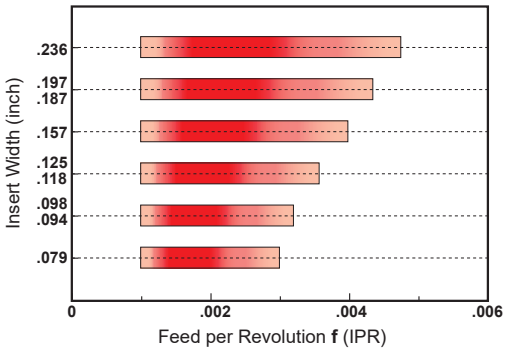


BC8110 coating for continuous machining of hardened steel has been added to GY inserts.

GY is a grooving tool series that achieves high rigidity with the "Tri-Lock System". (See page F004 for more details.)

BC8110 coating with excellent wear resistance has been added. Compared to conventional coating, it displays excellent wear resistance that achieves a longer tool life. A blade width of 6.0 has also been added to the BC8110 lineup.

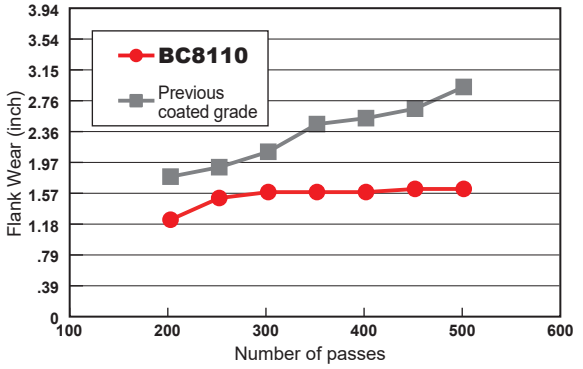
■ Recommended Cutting Conditions



Workpiece Material		Hardness	Grade	Cutting Speed vc (SFM)	Cutting Mode
H	Hardened Steel	35—65HRC	**BC8110**	330 (195—395)	Dry,Wet

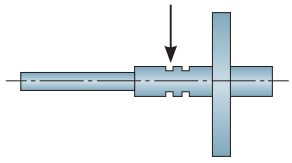
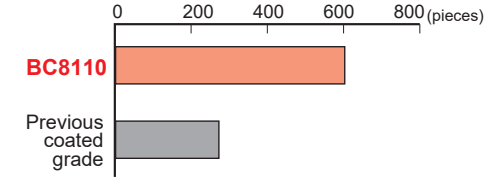
■ Cutting Performance

Tool life evaluation for the GY holder



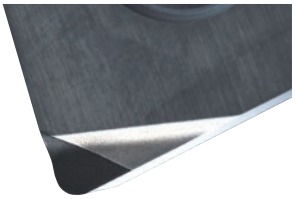
<Cutting Conditions>
Insert : GY1G0200D020N-GFGS
Workpiece Material : Hardened Steel (60HRC)
Cutting Speed : vc=395 SFM
Feed : f=.004 IPR
Depth of Cut : ap=.012 inch
Cutting Mode : Dry Cutting

■ Application Example

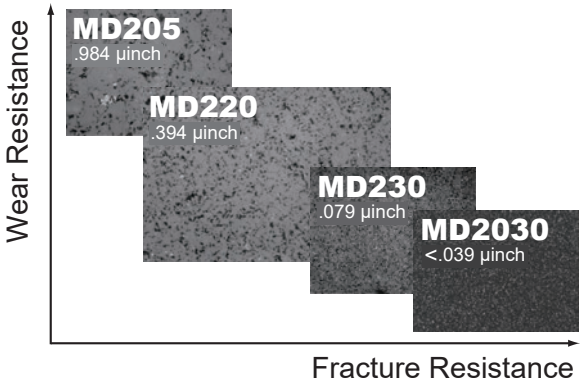
Insert	**GY1G0300F020N-GFGS** (Grade : **BC8110**)
Workpiece Material	 SNCM230H (58—62HRC)
Component	Input shaft
Cutting Conditions — Cutting Speed vc (SFM)	425
Cutting Conditions — Feed f (IPR)	.004
Result	 Tool life over twice as long as conventional products

INTRODUCTION OF PCD (SINTERED DIAMOND) GRADES

- Suitable for materials such as aluminum alloy, non ferrous metals, and fiber strengthened plastic.
- Suitable for extremely high speed finishing.



FEATURES



Grade	Features
MD205 *	**For Continuous Cutting** Coarse grain diamond particles are sintered and wear resistance is excellent. Use when wear resistance with MD220 is insufficient.
MD220	**Materials for General Machining** Sintered medium grain diamond particles. Wear resistance and fracture resistance are superbly balanced. Applicable to general finishing of non ferrous metals, non-metal cutting, and similar machining.
MD230 *	**For Interrupted Cutting** Fine grain diamond particles are used. Fracture resistance and cutting edge sharpness are excellent. Use when fracture and a high quality finished surface is demanded with MD220.
MD2030	**For Heavy Interrupted Cutting** Strong sintering of ultra micro-grain PCD particles provides exceptional fracture resistance. Chipping during high-speed finish turning can be controlled.

*MD205 and MD230 are produced-to-order products.

■ SELECTION STANDARD

TURNING

Work Material	Recommended Grade			Recommended Cutting Conditions		
	MD205	MD220	MD2030	Cutting Speed vc (SFM)	Feed f (IPR)	Depth of Cut ap (inch)
Aluminum Alloy (Si ≤ 12%)		◎	○	2625 (655—3935)	—.008	—.039
Aluminum Alloy (Si ≥13%)	◎	○		1970 (655—3280)	—.008	—.039
Copper Alloy		◎		2295 (655—3935)	—.008	—.039
Strengthened Plastic		◎		1970 (330—3280)	—.016	—.039
Glass Fiber Reinforced Plastic		◎		1640 (330—2625)	—.010	—.039
Carbon	○	◎		1310 (330—1970)	—.012	—.039
Ceramics		○		165 (100—260)	—.004	—.039
Hard Rubber		◎		1970 (985—2625)	—.006	—.039
Wood Inorganic Board		◎		4265 (985—13120)	—.016	—
Cemented Carbide	◎	○		50 (15—65)	—.008	—.020

Note1) ◎ : 1st recommendation. ○ : 2nd recommendation
Note2) Not suitable for steel.

■ NEW PETIT CUT INSERT SERIES

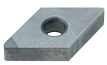
- **Economical** Low cost is achieved by reducing the area of the diamond sintered body. In addition, tool management is economical because regrinding is unnecessary.
- **With Breaker** Chip breaker formed directly on the PCD portion delivers superior chip control.
- Corner R.002" inserts are available, making it suitable for the machining of small work corner radii.

CLASSIFICATION

NEGATIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type Double-Sided	G	Flat Top	NP-CNGA_○4 → B022	NP-DNGA_○4 → B025		NP-TNGA_○6 → B030	NP-VNGA_○4 → B032	NP-WNGA_○6 → B034
	Multi-Corner Type Double-Sided With Wiper		Flat Top	NP-CNGA_○W○4 → B022					
	Multi-Corner Type Single Sided		Flat Top	NP-CNGA_○2 → B023	NP-DNGA_○2 → B026	NP-SNGA_○2 → B029	NP-TNGA_○3 → B030	NP-VNGA_○2 → B032	NP-WNGA_○3 → B034
	Multi-Corner Type Single Sided With Wiper		Flat Top	NP-CNGA_○W○2 → B023	NP-DNGA_○W○2J_R/L → B028				NP-WNGA_○W○3 → B034
	Multi-Corner Type Single Sided With Breaker		BF	BF-CNGM_○2 → B025	BF-DNGM_○2 → B028				
	Multi-Corner Type Single Sided With Breaker With Wiper		BF	BF-CNGM_○WS2 NEW → B025	BF-DNGM_○WS2 NEW → B028				
	Multi-Corner Type Single Sided With Breaker		BM	BM-CNGM_○2 → B025	BM-DNGM_○2 → B028		BM-TNGM_○3 → B031		
	Multi-Corner Type Single Sided With Breaker		BR	BR-CNGM_○2 NEW → B025	BR-DNGM_○2 NEW → B028				
	One-Corner Type Single Sided With Breaker	M	R/L-F	NP-CNMM_R-F → B049	NP-DNMM_R-F → B049	NP-SNMM_R-F → B050	NP-TNMM_R-F → B050	NP-VNMM_R-F → B051	

NEGATIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
STANDARD	Multi-Corner Type Double-Sided (Solid CBN)	G	Flat Top	CNGA  B024		SNGA  B029	TNGA  B031		
	One-Corner Type Single Sided	M	Flat Top	CNMA  B049					
	One-Corner Type Single Sided	G	Flat Top		DNGA  B049	SNGA  B050	TNGA  B050	VNGA  B051	

5° POSITIVE INSERTS WITH HOLE

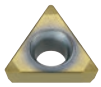
Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type	G	Flat Top					NP-VBGW_○2  B045	
	One-Corner Type With Breaker		R-F					NP-VBGT_R-F  B058	

CLASSIFICATION

7° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type	G	Flat Top	NP-CCGW_○2 → B038	NP-DCGW_○2 → B040		NP-TCGW_○3 → B042	NP-VCGW_○2 → B046	
	Multi-Corner Type With Wiper	G	Flat Top	NP-CCGW_○W○2 → B038					
	Multi-Corner Type With Breaker	G	BF	BF-CCGT_○2 → B038	BF-DCGT_○2 → B041				
	Multi-Corner Type With Breaker	G	BM	BM-CCGT_○2 → B038	BM-DCGT_○2 → B041				
	One-Corner Type With Breaker	M	Breaker	NP-CCMH → B053					
	One-Corner Type	G	Flat Top	NP-CCGW_○ → B038					
	One-Corner Type	M	Flat Top	NP-CCMW → B053					
	One-Corner Type With Breaker	M	R/L-F		NP-DCMT_R/L-F → B054				
	One-Corner Type With Breaker	G	R-F					NP-VCGT_R-F → B058	
STANDARD	One-Corner Type	M G	Flat Top	CCMW → B053	DCMW → B054		TCMW TCGW → B055	VCGW NEW → B058	WCMW → B059

11° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type	G	Flat Top	NP-CPGB_○2  B039			NP-TPGB_○3  B044		
NEW PETIT CUT	One-Corner Type With Breaker	M	Breaker	NP-CPMH  B053					
NEW PETIT CUT	One-Corner Type With Breaker	M	R/L-F				NP-TPMX_R/L-F  B056		
NEW PETIT CUT	One-Corner Type With Breaker	M	R/L-F				NP-TPMH_R/L-F  B056		
STANDARD	One-Corner Type With Breaker	G	Breaker	CPGT  B053					WPGT  B059
STANDARD	One-Corner Type	G	Flat Top			SPGX  B054	TPGX  B057		
STANDARD	One-Corner Type With Breaker	G	R/L-F				TPGT/V_R/L-F  B056, B057		

CLASSIFICATION

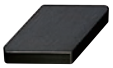
15° POSITIVE INSERTS WITH HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 35° 	
One-Corner Type (For Aluminum With Breaker)	G	R/L 	VDGX_R/L-F  ➔ B061	

20° POSITIVE INSERTS WITH HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 55° 	Triangular 60° 
One-Corner Type (For Aluminum With Breaker)	G	R/L 		TEGX_R/L  ➔ B060
One-Corner Type (For Aluminum With Breaker)		R/L-F 	DEGX_R/L-F  ➔ B060	
One-Corner Type (For Aluminum)		Flat Top 		TEGX  ➔ B060

NEGATIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Round
One-Corner Type Single Sided	G	Flat Top			SNGN  B052		
Multi-Corner Type Double-Sided (Solid CBN)	G	Flat Top	CNGN  B034	DNGN  B035	SNGN  B036	TNGN  B036	RNGN  B035

11° POSITIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Square 90°	Triangular 60°
Multi-Corner Type	G	Flat Top	NP-SPGN_◌2 NEW  B047	
One-Corner Type	G	Flat Top	SPGN  B062	TPGN  B062

SPECIAL PURPOSE INSERTS

Tool Holder Type	Tolerance	Inserts
GY Type	G	GY_GFGS  B048

80° CN TYPE INSERTS WITH HOLE

NP-CNGA 4 3 1 FS4
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN							CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	NP-CNGA431-FS4	NP-CNGA120404FS4	.016	.071	●		●	★	★			●				
	NP-CNGA432-FS4	NP-CNGA120408FS4	.031	.079	★		●	★	★			●				
	NP-CNGA433-FS4	NP-CNGA120412FS4	.047	.087	★		●	★	★			●				
	NP-CNGA431-GS4	NP-CNGA120404GS4	.016	.071	★		●	★								
	NP-CNGA432-GS4	NP-CNGA120408GS4	.031	.079	●		●	★								
	NP-CNGA433-GS4	NP-CNGA120412GS4	.047	.087	★		●	★								
	NP-CNGA431-GA4	NP-CNGA120404GA4	.016	.071		●			★	★			●			
	NP-CNGA432-GA4	NP-CNGA120408GA4	.031	.079		●			★	★			●			
	NP-CNGA433-GA4	NP-CNGA120412GA4	.047	.087		●			★	★			●			
	NP-CNGA431-GH4	NP-CNGA120404GH4	.016	.071	★	★		●	●	●						
	NP-CNGA432-GH4	NP-CNGA120408GH4	.031	.079	●	●		●	●	●						
	NP-CNGA433-GH4	NP-CNGA120412GH4	.047	.087	★	★		●	●	●						
	NEW NP-CNGA431-VA4	NP-CNGA120404VA4	.016	.071		★										
	NEW NP-CNGA432-VA4	NP-CNGA120408VA4	.031	.079		●										
	NEW NP-CNGA433-VA4	NP-CNGA120412VA4	.047	.087		●										
	NP-CNGA431-TS4	NP-CNGA120404TS4	.016	.071	★			★								
	NP-CNGA432-TS4	NP-CNGA120408TS4	.031	.079	★			★								
	NP-CNGA433-TS4	NP-CNGA120412TS4	.047	.087	★			★								
	NP-CNGA431-TA4	NP-CNGA120404TA4	.016	.071		★			★	★			●	●		
	NP-CNGA432-TA4	NP-CNGA120408TA4	.031	.079		★			★	★			●	●		
	NP-CNGA433-TA4	NP-CNGA120412TA4	.047	.087		★			★	★			●	●		
	NP-CNGA431-TH4	NP-CNGA120404TH4	.016	.071					●	★				●		
	NP-CNGA432-TH4	NP-CNGA120408TH4	.031	.079		★			●	★				●		
	NP-CNGA433-TH4	NP-CNGA120412TH4	.047	.087		★			●	★				●		
NEW PETIT CUT (With Wiper) *	NP-CNGA431-FSWS4	NP-CNGA120404FSWS4	.016	.071	★		●	●	●			●				
	NP-CNGA432-FSWS4	NP-CNGA120408FSWS4	.031	.079	●		●	●	●			●				
	NP-CNGA433-FSWS4	NP-CNGA120412FSWS4	.047	.087	★		●	●	●			●				
	NP-CNGA431-GSWS4	NP-CNGA120404GSWS4	.016	.071	★		●	★								
	NP-CNGA432-GSWS4	NP-CNGA120408GSWS4	.031	.079	★		●	★								
	NP-CNGA433-GSWS4	NP-CNGA120412GSWS4	.047	.087	★		●	★								
	NP-CNGA431-GAWS4	NP-CNGA120404GAWS4	.016	.071		★			★	★			●			
	NP-CNGA432-GAWS4	NP-CNGA120408GAWS4	.031	.079		●			★	★			●			
	NP-CNGA433-GAWS4	NP-CNGA120412GAWS4	.047	.087		★			★	★			●			
NEW PETIT CUT	NP-CNGA430.5-FS2	NP-CNGA120402FS2	.008	.067	●			●				●				
	NP-CNGA431-FS2	NP-CNGA120404FS2	.016	.071	●		●	●	●		●	●			●	
	NP-CNGA432-FS2	NP-CNGA120408FS2	.031	.079	●		●	●	●		●	●			●	
	NP-CNGA433-FS2	NP-CNGA120412FS2	.047	.087	★		●	●	●		★	●			●	
	NP-CNGA430.5-GS2	NP-CNGA120402GS2	.008	.067	●			●								

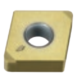
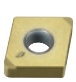
* Please refer to page B012 before using the wiper insert.

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✤ Unstable Cutting

Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✤		●	◐	✤		
	K	Cast Iron							●				◐	✤
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN BC8210 (NEW)	BC8220 (NEW)	BC8105	BC8110	BC8120	BC8130	BC5110 (NEW)	CBN MB8110	MB8120	MB8130	MB4120	Solid CBN MBS140
NEW PETIT CUT	**NP-CNGA431-GS2**	NP-CNGA120404GS2	.016	.071	●		●	●			●				●	
	NP-CNGA432-GS2	NP-CNGA120408GS2	.031	.079	●		●	●			●				●	
	NP-CNGA433-GS2	NP-CNGA120412GS2	.047	.087	●		●	●			★				●	
	NP-CNGA430.5-GA2	NP-CNGA120402GA2	.008	.067		●			●				●			
	NP-CNGA431-GA2	NP-CNGA120404GA2	.016	.071		●			●	●			●			
	NP-CNGA432-GA2	NP-CNGA120408GA2	.031	.079		●			●	●			●			
	NP-CNGA433-GA2	NP-CNGA120412GA2	.047	.087		●			●	●			●			
	NP-CNGA431-GH2	NP-CNGA120404GH2	.016	.071	★	★		●	●	●						
	NP-CNGA432-GH2	NP-CNGA120408GH2	.031	.079	●	●		●	●	●						
	NP-CNGA433-GH2	NP-CNGA120412GH2	.047	.087	★	★		●	●	●						
	NEW **NP-CNGA431-VA2**	NP-CNGA120404VA2	.016	.071		●										
	NEW **NP-CNGA432-VA2**	NP-CNGA120408VA2	.031	.079		●										
	NEW **NP-CNGA433-VA2**	NP-CNGA120412VA2	.047	.087		●										
	**NP-CNGA431-TS2**	NP-CNGA120404TS2	.016	.071	★			★							●	
	NP-CNGA432-TS2	NP-CNGA120408TS2	.031	.079	★			★							●	
	NP-CNGA433-TS2	NP-CNGA120412TS2	.047	.087	★			★							●	
	NP-CNGA431-TA2	NP-CNGA120404TA2	.016	.071		●			●	●			●	●		
	NP-CNGA432-TA2	NP-CNGA120408TA2	.031	.079		●			●	●			●	●		
	NP-CNGA433-TA2	NP-CNGA120412TA2	.047	.087		●			●	●			●	●		
	NP-CNGA431-TH2	NP-CNGA120404TH2	.016	.071					●	●				●		
	NP-CNGA432-TH2	NP-CNGA120408TH2	.031	.079		★			●	●				●		
	NP-CNGA433-TH2	NP-CNGA120412TH2	.047	.087		●			●	●				●		
	NP-CNGA431-SF2	NP-CNGA120404SF2	.016	.071											●	
	NP-CNGA432-SF2	NP-CNGA120408SF2	.031	.079											●	
	NP-CNGA433-SF2	NP-CNGA120412SF2	.047	.087											●	
	NP-CNGA431-SE2	NP-CNGA120404SE2	.016	.071											●	
	NP-CNGA432-SE2	NP-CNGA120408SE2	.031	.079											●	
	NP-CNGA433-SE2	NP-CNGA120412SE2	.047	.087											●	
NEW PETIT CUT (With Wiper) *	**NP-CNGA431-FSWS2**	NP-CNGA120404FSWS2	.016	.071	★		●	●	●			●				
	NP-CNGA432-FSWS2	NP-CNGA120408FSWS2	.031	.079	●		●	●	●			●				
	NP-CNGA433-FSWS2	NP-CNGA120412FSWS2	.047	.087	★		●	●	●			●				
	NP-CNGA431-FBWL2	NP-CNGA120404FBWL2	.016	.071			●	●	●			●				
	NP-CNGA432-FBWL2	NP-CNGA120408FBWL2	.031	.079			●	●	●			●				
	NP-CNGA433-FBWL2	NP-CNGA120412FBWL2	.047	.087			●	●	●			●				
	**NP-CNGA431-GSWS2**	NP-CNGA120404GSWS2	.016	.071	●		●	●								
	NP-CNGA432-GSWS2	NP-CNGA120408GSWS2	.031	.079	●		●	●								
	NP-CNGA433-GSWS2	NP-CNGA120412GSWS2	.047	.087	★		●	●								
	NP-CNGA431-GAWS2	NP-CNGA120404GAWS2	.016	.071		●			●	●			●			
	NP-CNGA432-GAWS2	NP-CNGA120408GAWS2	.031	.079		●			●	●			●			
	NP-CNGA433-GAWS2	NP-CNGA120412GAWS2	.047	.087		●			●	●			●			

* Please refer to page B012 before using the wiper insert.

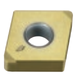
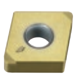
● (yellow) = NEW

80° CN TYPE INSERTS WITH HOLE

NP-CNGA 4 3 1 GBWL2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✤ Unstable Cutting

Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✤		●	◐	✤		
	K	Cast Iron							●				◐	✤
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN: BC8210 (NEW)	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 (NEW)	CBN: MB8110	MB8120	MB8130	MB4120	Solid CBN: MBS140
NEW PETIT CUT (With Wiper) * 	NP-CNGA431-GBWL2	NP-CNGA120404GBWL2	.016	.071			●	●	●				●			
	NP-CNGA432-GBWL2	NP-CNGA120408GBWL2	.031	.079			●	●	●				●			
	NP-CNGA433-GBWL2	NP-CNGA120412GBWL2	.047	.087			●	●	●				●			
NEW PETIT CUT  (With Breaker)	BF-CNGM431-TS2	BF-CNGM120404TS2	.016	.071	★			★								
	BF-CNGM432-TS2	BF-CNGM120408TS2	.031	.079	★			★								
	BF-CNGM433-TS2	BF-CNGM120412TS2	.047	.087	★			★								
NEW PETIT CUT (With Wiper) * NEW  (With Breaker)	BF-CNGM432-TSWS2	BF-CNGM120408TSWS2	.031	.079	★											
	BF-CNGA433-TSWS2	BF-CNGM120412TSWS2	.047	.087	★											
	BF-CNGM432-TAWS2	BF-CNGM120408TAWS2	.031	.079		●										
	BF-CNGM433-TAWS2	BF-CNGM120412TAWS2	.047	.087		●										
NEW PETIT CUT  (With Breaker)	BM-CNGM431-TA2	BM-CNGM120404TA2	.016	.071		★			●							
	BM-CNGM432-TA2	BM-CNGM120408TA2	.031	.079		●			●							
	BM-CNGM433-TA2	BM-CNGM120412TA2	.047	.087		●			●							
NEW PETIT CUT NEW  (With Breaker)	BR-CNGM431-TA2	BR-CNGM120404TA2	.016	.071		★										
	BR-CNGM432-TA2	BR-CNGM120408TA2	.031	.079		★										
	BR-CNGM433-TA2	BR-CNGM120412TA2	.047	.087		★										
	CNGA432	CNGA120408	.031	–												●
	CNGA433	CNGA120412	.047	–												●

* Please refer to page B012 before using the wiper insert.

● (yellow) = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

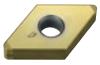
55° DN TYPE INSERTS WITH HOLE

NP-DNGA 4 3 1 FS4
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✲ Unstable Cutting

Workpiece Material		
H	Hardened Materials	● ◐ ● ● ◐ ✲ ● ● ◐ ✲ ◐ ✲
K	Cast Iron	● ◐ ✲
S	Heat Resistant Alloy, Titanium Alloy	◐ ✲
	Sintered Alloy	◐

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	NP-DNGA431-FS4	NP-DNGA150404FS4	.016	.083	★		●	★	★			●				
	NP-DNGA432-FS4	NP-DNGA150408FS4	.031	.079	★		●	★	★			●				
	NP-DNGA433-FS4	NP-DNGA150412FS4	.047	.071	★		●	★	★			●				
	NP-DNGA441-FS4	NP-DNGA150604FS4	.016	.083	★		★	★				●				
	NP-DNGA442-FS4	NP-DNGA150608FS4	.031	.079	★		★	★				●				
	NP-DNGA443-FS4	NP-DNGA150612FS4	.047	.071	★		★	★				●				
	NP-DNGA431-GS4	NP-DNGA150404GS4	.016	.083	★		●	★								
	NP-DNGA432-GS4	NP-DNGA150408GS4	.031	.079	●		●	★								
	NP-DNGA433-GS4	NP-DNGA150412GS4	.047	.071	★		●	★								
	NP-DNGA441-GS4	NP-DNGA150604GS4	.016	.083	★		★	★								
	NP-DNGA442-GS4	NP-DNGA150608GS4	.031	.079	★		★	★								
	NP-DNGA443-GS4	NP-DNGA150612GS4	.047	.071	★		★	★								
	NP-DNGA431-GA4	NP-DNGA150404GA4	.016	.083		●			★	★		●				
	NP-DNGA432-GA4	NP-DNGA150408GA4	.031	.079		●			★	★		●				
	NP-DNGA433-GA4	NP-DNGA150412GA4	.047	.071		★			★	★		●				
	NP-DNGA441-GA4	NP-DNGA150604GA4	.016	.083		★			★	★		●				
	NP-DNGA442-GA4	NP-DNGA150608GA4	.031	.079		★			★	★		●				
	NP-DNGA443-GA4	NP-DNGA150612GA4	.047	.071		★			★	★		●				
	NP-DNGA431-GH4	NP-DNGA150404GH4	.016	.083	★	●		●	●	●						
	NP-DNGA432-GH4	NP-DNGA150408GH4	.031	.079	★	★		●	●	●						
	NP-DNGA433-GH4	NP-DNGA150412GH4	.047	.071	★	★		●	●	●						
	NP-DNGA441-GH4	NP-DNGA150604GH4	.016	.083	★	★		★	★	★						
	NP-DNGA442-GH4	NP-DNGA150608GH4	.031	.079	★	★		★	★	★						
	NP-DNGA443-GH4	NP-DNGA150612GH4	.047	.071	★	★		★	★	★						
	NEW NP-DNGA431-VA4	NP-DNGA150404VA4	.016	.083		★										
	NEW NP-DNGA432-VA4	NP-DNGA150408VA4	.031	.079		●										
	NEW NP-DNGA433-VA4	NP-DNGA150412VA4	.047	.071		★										
	NEW NP-DNGA441-VA4	NP-DNGA150604VA4	.016	.083		★										
	NEW NP-DNGA442-VA4	NP-DNGA150608VA4	.031	.079		★										
	NEW NP-DNGA443-VA4	NP-DNGA150612VA4	.047	.071		★										
	NP-DNGA431-TS4	NP-DNGA150404TS4	.016	.083	★			★								
	NP-DNGA432-TS4	NP-DNGA150408TS4	.031	.079	★			★								
	NP-DNGA433-TS4	NP-DNGA150412TS4	.047	.071	★			★								
	NP-DNGA441-TS4	NP-DNGA150604TS4	.016	.083	★			★								
	NP-DNGA442-TS4	NP-DNGA150608TS4	.031	.079	★			★								
	NP-DNGA443-TS4	NP-DNGA150612TS4	.047	.071	★			★								
	NP-DNGA431-TA4	NP-DNGA150404TA4	.016	.083		★			★	★		●	●			
	NP-DNGA432-TA4	NP-DNGA150408TA4	.031	.079		★			★	★		●	●			
	NP-DNGA433-TA4	NP-DNGA150412TA4	.047	.071		●			★	★		●	●			



● = NEW

EXTERNAL TURNING ➤ C002
BORING ➤ E002
IDENTIFICATION ➤ B002
HONING ➤ B009

55° DN TYPE INSERTS WITH HOLE

NP-DNGA 4 4 1 TA4
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	**NP-DNGA441-TA4**	NP-DNGA150604TA4	.016	.083		★			★	★		●				
	NP-DNGA442-TA4	NP-DNGA150608TA4	.031	.079		★			★	★		●				
	NP-DNGA443-TA4	NP-DNGA150612TA4	.047	.071		★			★	★		●				
	NP-DNGA431-TH4	NP-DNGA150404TH4	.016	.083					●	★				●		
	NP-DNGA432-TH4	NP-DNGA150408TH4	.031	.079		★			●	★				●		
	NP-DNGA433-TH4	NP-DNGA150412TH4	.047	.071		★			●	★				●		
	NP-DNGA441-TH4	NP-DNGA150604TH4	.016	.083					★	★						
	NP-DNGA442-TH4	NP-DNGA150608TH4	.031	.079		★			★	★						
	NP-DNGA443-TH4	NP-DNGA150612TH4	.047	.071		★			★	★						
NEW PETIT CUT	**NP-DNGA430.5-FS2**	NP-DNGA150402FS2	.008	.087	●			●				●				
	NP-DNGA431-FS2	NP-DNGA150404FS2	.016	.083	●		●	●	●		★	●			●	
	NP-DNGA432-FS2	NP-DNGA150408FS2	.031	.079	●		●	●	●		●	●			●	
	NP-DNGA433-FS2	NP-DNGA150412FS2	.047	.071	●		●	●	●			●			●	
	NP-DNGA441-FS2	NP-DNGA150604FS2	.016	.083	★		★	★	★		★	●			●	
	NP-DNGA442-FS2	NP-DNGA150608FS2	.031	.079	★		★	★	★		★	●			●	
	NP-DNGA443-FS2	NP-DNGA150612FS2	.047	.071	★		★	★	★			●			●	
	NP-DNGA430.5-GS2	NP-DNGA150402GS2	.008	.087	●			●								
	NP-DNGA431-GS2	NP-DNGA150404GS2	.016	.083	●		●	●			★				●	
	NP-DNGA432-GS2	NP-DNGA150408GS2	.031	.079	●		●	●			●				●	
	NP-DNGA433-GS2	NP-DNGA150412GS2	.047	.071	★		●	●							●	
	NP-DNGA441-GS2	NP-DNGA150604GS2	.016	.083	★		★	★							●	
	NP-DNGA442-GS2	NP-DNGA150608GS2	.031	.079	★		★	★			★				●	
	NP-DNGA443-GS2	NP-DNGA150612GS2	.047	.071	★		★	★							●	
	NP-DNGA332-GA2	NP-DNGA110408GA2	.031	.079		●			●	●		●				
	NP-DNGA430.5-GA2	NP-DNGA150402GA2	.008	.087		●			●							
	NP-DNGA431-GA2	NP-DNGA150404GA2	.016	.083		●			●	●		●				
	NP-DNGA432-GA2	NP-DNGA150408GA2	.031	.079		●			●	●		●				
	NP-DNGA433-GA2	NP-DNGA150412GA2	.047	.071		●			●	●		●				
	NP-DNGA440.5-GA2	NP-DNGA150602GA2	.008	.087					★							
	NP-DNGA441-GA2	NP-DNGA150604GA2	.016	.083		★			★	★		●				
	NP-DNGA442-GA2	NP-DNGA150608GA2	.031	.079		★			★	★		●				
	NP-DNGA443-GA2	NP-DNGA150612GA2	.047	.071		★			★	★		●				
	NP-DNGA431-GH2	NP-DNGA150404GH2	.016	.083	★	★		●	●	●						
	NP-DNGA432-GH2	NP-DNGA150408GH2	.031	.079	★	★		●	●	●						
	NP-DNGA433-GH2	NP-DNGA150412GH2	.047	.071	★	★		●	●	●						
	NP-DNGA441-GH2	NP-DNGA150604GH2	.016	.083	★	★		★	★	★						
	NP-DNGA442-GH2	NP-DNGA150608GH2	.031	.079	★	★		★	★	★						
	NP-DNGA443-GH2	NP-DNGA150612GH2	.047	.071	★	★		★	★	★						

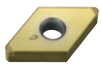
● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material																				
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠								
	K	Cast Iron							●					◐	✠					
	S	Heat Resistant Alloy, Titanium Alloy																		
		Sintered Alloy												◐						

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN							CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	NEW NP-DNGA431-VA2	NP-DNGA150404VA2	.016	.083		●										
	NEW NP-DNGA432-VA2	NP-DNGA150408VA2	.031	.079		●										
	NEW NP-DNGA433-VA2	NP-DNGA150412VA2	.047	.071		●										
	NEW NP-DNGA441-VA2	NP-DNGA150604VA2	.016	.083		★										
	NEW NP-DNGA442-VA2	NP-DNGA150608VA2	.031	.079		★										
	NEW NP-DNGA443-VA2	NP-DNGA150612VA2	.047	.071		★										
	NP-DNGA431-TS2	NP-DNGA150404TS2	.016	.083	★			★							●	
	NP-DNGA432-TS2	NP-DNGA150408TS2	.031	.079	★			★							●	
	NP-DNGA433-TS2	NP-DNGA150412TS2	.047	.071	★			★							●	
	NP-DNGA441-TS2	NP-DNGA150604TS2	.016	.083	★			★							●	
	NP-DNGA442-TS2	NP-DNGA150608TS2	.031	.079	★			★							●	
	NP-DNGA443-TS2	NP-DNGA150612TS2	.047	.071	★			★							●	
	NP-DNGA431-TA2	NP-DNGA150404TA2	.016	.083		●			●	●			●	●		
	NP-DNGA432-TA2	NP-DNGA150408TA2	.031	.079		●			●	●			●	●		
	NP-DNGA433-TA2	NP-DNGA150412TA2	.047	.071		●			●	●			●	●		
	NP-DNGA441-TA2	NP-DNGA150604TA2	.016	.083		★			★	★			●			
	NP-DNGA442-TA2	NP-DNGA150608TA2	.031	.079		★			★	★			●			
	NP-DNGA443-TA2	NP-DNGA150612TA2	.047	.071		★			★	★			●			
	NP-DNGA431-TH2	NP-DNGA150404TH2	.016	.083					●	●				●		
	NP-DNGA432-TH2	NP-DNGA150408TH2	.031	.079		★			●	●				●		
	NP-DNGA433-TH2	NP-DNGA150412TH2	.047	.071		★			●	●				●		
	NP-DNGA441-TH2	NP-DNGA150604TH2	.016	.083					★	★						
	NP-DNGA442-TH2	NP-DNGA150608TH2	.031	.079		★			★	★						
	NP-DNGA443-TH2	NP-DNGA150612TH2	.047	.071		★			★	★						
	NP-DNGA431-SF2	NP-DNGA150404SF2	.016	.083											●	
	NP-DNGA432-SF2	NP-DNGA150408SF2	.031	.079											●	
	NP-DNGA433-SF2	NP-DNGA150412SF2	.047	.071											●	
	NP-DNGA441-SF2	NP-DNGA150604SF2	.016	.083											●	
	NP-DNGA442-SF2	NP-DNGA150608SF2	.031	.079											●	
	NP-DNGA443-SF2	NP-DNGA150612SF2	.047	.071											●	
	NP-DNGA431-SE2	NP-DNGA150404SE2	.016	.083											●	
	NP-DNGA432-SE2	NP-DNGA150408SE2	.031	.079											●	
	NP-DNGA433-SE2	NP-DNGA150412SE2	.047	.071											●	
	NP-DNGA441-SE2	NP-DNGA150604SE2	.016	.083											●	
	NP-DNGA442-SE2	NP-DNGA150608SE2	.031	.079											●	
	NP-DNGA443-SE2	NP-DNGA150612SE2	.047	.071											●	



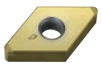
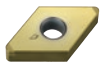
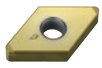
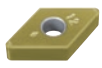
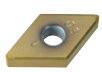
● = NEW

55° DN TYPE INSERTS WITH HOLE

NP-DNGA 4 3 1 GSWS2JR
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material																		
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠						
	K	Cast Iron							●				◐	✠				
	S	Heat Resistant Alloy, Titanium Alloy																
		Sintered Alloy											◐					

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT (With Wiper) *	NP-DNGA431-GSWS2JR	NP-DNGA150404GSWS2JR	.016	.071	★											
	NP-DNGA431-GSWS2JL	NP-DNGA150404GSWS2JL	.016	.071	★											
	NP-DNGA432-GSWS2JR	NP-DNGA150408GSWS2JR	.031	.067	★											
	NP-DNGA432-GSWS2JL	NP-DNGA150408GSWS2JL	.031	.067	★											
	NP-DNGA441-GSWS2JR	NP-DNGA150604GSWS2JR	.016	.071	★											
	NP-DNGA441-GSWS2JL	NP-DNGA150604GSWS2JL	.016	.071	★											
	NP-DNGA442-GSWS2JR	NP-DNGA150608GSWS2JR	.031	.067	★											
	NP-DNGA442-GSWS2JL	NP-DNGA150608GSWS2JL	.031	.067	★											
	NP-DNGA431-GAWS2JR	NP-DNGA150404GAWS2JR	.016	.071		★			●				●			
	NP-DNGA431-GAWS2JL	NP-DNGA150404GAWS2JL	.016	.071		★			●				●			
	NP-DNGA432-GAWS2JR	NP-DNGA150408GAWS2JR	.031	.067		●			●				●			
	NP-DNGA432-GAWS2JL	NP-DNGA150408GAWS2JL	.031	.067		●			●				●			
	NP-DNGA441-GAWS2JR	NP-DNGA150604GAWS2JR	.016	.071		★			★				●			
	NP-DNGA441-GAWS2JL	NP-DNGA150604GAWS2JL	.016	.071		★			★				●			
	NP-DNGA442-GAWS2JR	NP-DNGA150608GAWS2JR	.031	.067		★			★				●			
	NP-DNGA442-GAWS2JL	NP-DNGA150608GAWS2JL	.031	.067		●			●				●			
NEW PETIT CUT	BF-DNGM431-TS2	BF-DNGM150404TS2	.016	.083	★			★								
	BF-DNGM432-TS2	BF-DNGM150408TS2	.031	.079	★			★								
	BF-DNGM433-TS2	BF-DNGM150412TS2	.047	.071	●			★								
(With Breaker)																
NEW PETIT CUT (With Wiper) * NEW	BF-DNGM432-TSWS2	BF-DNGM150408TSWS2	.031	.094	★											
	BF-DNGM433-TSWS2	BF-DNGM150412TSWS2	.047	.102	★											
	BF-DNGM432-TAWS2	BF-DNGM150408TAWS2	.031	.094		●										
	BF-DNGM433-TAWS2	BF-DNGM150412TAWS2	.047	.102		●										
 (With Breaker)																
NEW PETIT CUT	BM-DNGM431-TA2	BM-DNGM150404TA2	.016	.083		●			●							
	BM-DNGM432-TA2	BM-DNGM150408TA2	.031	.079		★			●							
	BM-DNGM433-TA2	BM-DNGM150412TA2	.047	.071		●			●							
	BM-DNGM441-TA2	BM-DNGM150604TA2	.016	.083					★							
	BM-DNGM442-TA2	BM-DNGM150608TA2	.031	.079					★							
(With Breaker)	BM-DNGM443-TA2	BM-DNGM150612TA2	.047	.071					★							
NEW PETIT CUT NEW	BR-DNGM431-TA2	BR-DNGM150404TA2	.016	.083		★										
	BR-DNGM432-TA2	BR-DNGM150408TA2	.031	.079		★										
	BR-DNGM433-TA2	BR-DNGM150412TA2	.047	.071		★										
	BR-DNGM441-TA2	BR-DNGM150604TA2	.016	.083		★										
	BR-DNGM442-TA2	BR-DNGM150608TA2	.031	.079		★										
(With Breaker)	BR-DNGM443-TA2	BR-DNGM150612TA2	.047	.071		★										

* Please refer to page B012 before using the wiper insert.

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

90° SN TYPE INSERTS WITH HOLE

NP-SNGA 4 3 1 FS2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material		
H	Hardened Materials	● ◐ ● ● ◐ ✠ ● ◐ ✠
K	Cast Iron	● ◐
S	Heat Resistant Alloy, Titanium Alloy	◐ ✠
	Sintered Alloy	◐

Shapew	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	**NP-SNGA431-FS2**	NP-SNGA120404FS2	.016	.079											●	
	NP-SNGA432-FS2	NP-SNGA120408FS2	.031	.087											●	
	NP-SNGA433-FS2	NP-SNGA120412FS2	.047	.098											●	
	NP-SNGA431-GS2	NP-SNGA120404GS2	.016	.079											●	
	NP-SNGA432-GS2	NP-SNGA120408GS2	.031	.087							★				●	
	NP-SNGA433-GS2	NP-SNGA120412GS2	.047	.098											●	
	NP-SNGA432-GA2	NP-SNGA120408GA2	.031	.087		★			●	●			●			
	NP-SNGA433-GA2	NP-SNGA120412GA2	.047	.098		★			●	●			●			
	NP-SNGA431-TS2	NP-SNGA120404TS2	.016	.079											●	
	NP-SNGA432-TS2	NP-SNGA120408TS2	.031	.087											●	
	NP-SNGA433-TS2	NP-SNGA120412TS2	.047	.098											●	
	NP-SNGA431-SF2	NP-SNGA120404SF2	.016	.079											●	
	NP-SNGA432-SF2	NP-SNGA120408SF2	.031	.087											●	
	NP-SNGA433-SF2	NP-SNGA120412SF2	.047	.098											●	
	NP-SNGA431-SE2	NP-SNGA120404SE2	.016	.079											●	
	NP-SNGA432-SE2	NP-SNGA120408SE2	.031	.087											●	
	NP-SNGA433-SE2	NP-SNGA120412SE2	.047	.098											●	
	SNGA432	SNGA120408	.031	—												●
	SNGA433	SNGA120412	.047	—												●

● = NEW

CBN
B
CBN TURNING INSERTS
NEG
WITH HOLE
C
D
R
S
T
V
W

EXTERNAL TURNING ➤ C002
BORING ➤ E002
IDENTIFICATION ➤ B002
HONING ➤ B009

60° TN TYPE INSERTS WITH HOLE

NP-TNGA 3 3 1 FS6
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	NP-TNGA331-FS6	NP-TNGA160404FS6	.016	.063	★		●	★	★			●				
	NP-TNGA332-FS6	NP-TNGA160408FS6	.031	.067	★		●	★	★			●				
	NP-TNGA333-FS6	NP-TNGA160412FS6	.047	.075	★		●	★	★			●				
	NP-TNGA331-GS6	NP-TNGA160404GS6	.016	.063	●		●	★								
	NP-TNGA332-GS6	NP-TNGA160408GS6	.031	.067	★		●	★								
	NP-TNGA333-GS6	NP-TNGA160412GS6	.047	.075	★		●	★								
	NP-TNGA331-GA6	NP-TNGA160404GA6	.016	.063		★			★	★			●			
	NP-TNGA332-GA6	NP-TNGA160408GA6	.031	.067		★			★	★			●			
	NP-TNGA333-GA6	NP-TNGA160412GA6	.047	.075		★			★	★			●			
	NP-TNGA331-GH6	NP-TNGA160404GH6	.016	.063		★		●	●	●						
	NP-TNGA332-GH6	NP-TNGA160408GH6	.031	.067		★		●	●	●						
	NP-TNGA333-GH6	NP-TNGA160412GH6	.047	.075		★		●	●	●						
	NEW NP-TNGA331-VA6	NP-TNGA160404VA6	.016	.063		★										
	NEW NP-TNGA332-VA6	NP-TNGA160408VA6	.031	.067		★										
	NEW NP-TNGA333-VA6	NP-TNGA160412VA6	.047	.075		★										
	NP-TNGA331-TS6	NP-TNGA160404TS6	.016	.063	★			★								
	NP-TNGA332-TS6	NP-TNGA160408TS6	.031	.067	★			★								
	NP-TNGA333-TS6	NP-TNGA160412TS6	.047	.075	★			★								
	NP-TNGA331-TA6	NP-TNGA160404TA6	.016	.063		★			★	★			●	●		
	NP-TNGA332-TA6	NP-TNGA160408TA6	.031	.067		★			★	★			●	●		
	NP-TNGA333-TA6	NP-TNGA160412TA6	.047	.075		★			★	★			●	●		
	NP-TNGA331-TH6	NP-TNGA160404TH6	.016	.063					●	★				●		
	NP-TNGA332-TH6	NP-TNGA160408TH6	.031	.067		★			●	★				●		
	NP-TNGA333-TH6	NP-TNGA160412TH6	.047	.075		★			●	★				●		
NEW PETIT CUT	NP-TNGA330.5-FS3	NP-TNGA160402FS3	.008	.059	●			●				●				
	NP-TNGA331-FS3	NP-TNGA160404FS3	.016	.063	★		●	●	●		★	●			●	
	NP-TNGA332-FS3	NP-TNGA160408FS3	.031	.067	★		●	●	●		●	●			●	
	NP-TNGA333-FS3	NP-TNGA160412FS3	.047	.075	★		●	●	●		★	●			●	
	NP-TNGA330.5-GS3	NP-TNGA160402GS3	.008	.059	★			●								
	NP-TNGA331-GS3	NP-TNGA160404GS3	.016	.063	★		●	●			★				●	
	NP-TNGA332-GS3	NP-TNGA160408GS3	.031	.067	●		●	●			★				●	
	NP-TNGA333-GS3	NP-TNGA160412GS3	.047	.075	★		●	●			★				●	
	NP-TNGA330.5-GA3	NP-TNGA160402GA3	.008	.059		★			●				●			
	NP-TNGA331-GA3	NP-TNGA160404GA3	.016	.063		●			●	●			●			
	NP-TNGA332-GA3	NP-TNGA160408GA3	.031	.067		●			●	●			●			
	NP-TNGA333-GA3	NP-TNGA160412GA3	.047	.075		●			●	●			●			
	NP-TNGA331-GH3	NP-TNGA160404GH3	.016	.063		●		●	●	●						
	NP-TNGA332-GH3	NP-TNGA160408GH3	.031	.067		★		●	●	●						
	NP-TNGA333-GH3	NP-TNGA160412GH3	.047	.075		★		●	●	●						

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✣		●	◐	✣		
	K	Cast Iron							●				◐	✣
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN: BC8210	NEW BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	CBN: MB8110	MB8120	MB8130	MB4120	Solid CBN: MBS140
NEW PETIT CUT 	NEW NP-TNGA331-VA3	NP-TNGA160404VA3	.016	.063		●										
	NEW NP-TNGA332-VA3	NP-TNGA160408VA3	.031	.067		●										
	NEW NP-TNGA333-VA3	NP-TNGA160412VA3	.047	.075		●										
	NP-TNGA331-TS3	NP-TNGA160404TS3	.016	.063	★			★							●	
	NP-TNGA332-TS3	NP-TNGA160408TS3	.031	.067	★			★							●	
	NP-TNGA333-TS3	NP-TNGA160412TS3	.047	.075	★			★							●	
	NP-TNGA331-TA3	NP-TNGA160404TA3	.016	.063		★			●	●			●	●		
	NP-TNGA332-TA3	NP-TNGA160408TA3	.031	.067		★			●	●			●	●		
	NP-TNGA333-TA3	NP-TNGA160412TA3	.047	.075		★			●	●			●	●		
	NP-TNGA331-TH3	NP-TNGA160404TH3	.016	.063					●	●				●		
	NP-TNGA332-TH3	NP-TNGA160408TH3	.031	.067		★			●	●				●		
	NP-TNGA333-TH3	NP-TNGA160412TH3	.047	.075		★			●	●				●		
	NP-TNGA331-SF3	NP-TNGA160404SF3	.016	.063											●	
	NP-TNGA332-SF3	NP-TNGA160408SF3	.031	.067											●	
	NP-TNGA333-SF3	NP-TNGA160412SF3	.047	.075											●	
	NP-TNGA331-SE3	NP-TNGA160404SE3	.016	.063											●	
	NP-TNGA332-SE3	NP-TNGA160408SE3	.031	.067											●	
	NP-TNGA333-SE3	NP-TNGA160412SE3	.047	.075											●	
NEW PETIT CUT  (With Breaker)	BM-TNGM332-TA3	BM-TNGM160408TA3	.031	.067					●							
	BM-TNGM333-TA3	BM-TNGM160412TA3	.047	.075					●							
	TNGA332	TNGA160408	.031	–												●
	TNGA333	TNGA160412	.047	–												●

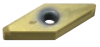
● (yellow) = NEW

35° VN TYPE INSERTS WITH HOLE

NP-VNGA 3 3 1 FS4
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	NP-VNGA331-FS4	NP-VNGA160404FS4	.016	.098	★		●	★	★			●				
	NP-VNGA332-FS4	NP-VNGA160408FS4	.031	.079	★		●	★	★			●				
	NP-VNGA333-FS4	NP-VNGA160412FS4	.047	.059					★							
	NP-VNGA331-GS4	NP-VNGA160404GS4	.016	.098	★		●	★								
	NP-VNGA332-GS4	NP-VNGA160408GS4	.031	.079	★		●	★								
	NP-VNGA333-GS4	NP-VNGA160412GS4	.047	.059	★			★								
	NP-VNGA331-GA4	NP-VNGA160404GA4	.016	.098		★			★	★		●				
	NP-VNGA332-GA4	NP-VNGA160408GA4	.031	.079		★			★	★		●				
	NP-VNGA333-GA4	NP-VNGA160412GA4	.047	.059		★			★	★		●				
	NP-VNGA331-GH4	NP-VNGA160404GH4	.016	.098		★		●	●	●						
	NP-VNGA332-GH4	NP-VNGA160408GH4	.031	.079		★		●	●	●						
	NP-VNGA333-GH4	NP-VNGA160412GH4	.047	.059				●	●	●						
	NEW NP-VNGA331-VA4	NP-VNGA160404VA4	.016	.098		★										
	NEW NP-VNGA332-VA4	NP-VNGA160408VA4	.031	.079		★										
	NEW NP-VNGA333-VA4	NP-VNGA160412VA4	.047	.059		★										
	NP-VNGA331-TS4	NP-VNGA160404TS4	.016	.098	★			★								
	NP-VNGA332-TS4	NP-VNGA160408TS4	.031	.079	★			★								
	NP-VNGA331-TA4	NP-VNGA160404TA4	.016	.098		★			★	★		●				
	NP-VNGA332-TA4	NP-VNGA160408TA4	.031	.079		★			★	★		●				
	NP-VNGA333-TA4	NP-VNGA160412TA4	.047	.059					★	★		●				
	NP-VNGA331-TH4	NP-VNGA160404TH4	.016	.098		★			●	★						
	NP-VNGA332-TH4	NP-VNGA160408TH4	.031	.079		★			●	★						
	NP-VNGA333-TH4	NP-VNGA160412TH4	.047	.059					●	★						
NEW PETIT CUT	NP-VNGA330.5-FS2	NP-VNGA160402FS2	.008	.098	●			●				●				
	NP-VNGA331-FS2	NP-VNGA160404FS2	.016	.098	●			●	●	●	★	●			●	
	NP-VNGA332-FS2	NP-VNGA160408FS2	.031	.079	●			●	●	●	★	●			●	
	NP-VNGA333-FS2	NP-VNGA160412FS2	.047	.059					●							
	NP-VNGA330.5-GS2	NP-VNGA160402GS2	.008	.098	●			●								
	NP-VNGA331-GS2	NP-VNGA160404GS2	.016	.098	●			●	●		●				●	
	NP-VNGA332-GS2	NP-VNGA160408GS2	.031	.079	●			●	●		●				●	
	NP-VNGA333-GS2	NP-VNGA160412GS2	.047	.059	★			●								
	NP-VNGA330.5-GA2	NP-VNGA160402GA2	.008	.098		●			●			●				
	NP-VNGA331-GA2	NP-VNGA160404GA2	.016	.098		●			●	●		●				
	NP-VNGA332-GA2	NP-VNGA160408GA2	.031	.079		●			●	●		●				
	NP-VNGA333-GA2	NP-VNGA160412GA2	.047	.059		●			●	●		●				
	NP-VNGA331-GH2	NP-VNGA160404GH2	.016	.098		★		●	●	●						
	NP-VNGA332-GH2	NP-VNGA160408GH2	.031	.079		★		●	●	●						

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			Coated CBN							CBN				Solid CBN
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron							●				◐	✠
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	Cutting Edge Effective Length **LE** (inch)	Coated CBN							CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	**NP-VNGA333-GH2**	NP-VNGA160412GH2	.047	.059				●	●	●						
	NEW **NP-VNGA331-VA2**	NP-VNGA160404VA2	.016	.098		●										
	NEW **NP-VNGA332-VA2**	NP-VNGA160408VA2	.031	.079		★										
	NEW **NP-VNGA333-VA2**	NP-VNGA160412VA2	.047	.059		★										
NEW PETIT CUT	**NP-VNGA331-TS2**	NP-VNGA160404TS2	.016	.098	★			★							●	
	NP-VNGA332-TS2	NP-VNGA160408TS2	.031	.079	★			★							●	
	NP-VNGA331-TA2	NP-VNGA160404TA2	.016	.098		★			●	●			●			
	NP-VNGA332-TA2	NP-VNGA160408TA2	.031	.079		★			●	●			●			
	NP-VNGA333-TA2	NP-VNGA160412TA2	.047	.059					●	●			●			
	NP-VNGA331-TH2	NP-VNGA160404TH2	.016	.098		★			●	●						
	NP-VNGA332-TH2	NP-VNGA160408TH2	.031	.079		★			●	●						
	NP-VNGA333-TH2	NP-VNGA160412TH2	.047	.059					●	●						
	NP-VNGA331-SF2	NP-VNGA160404SF2	.016	.098											●	
	NP-VNGA332-SF2	NP-VNGA160408SF2	.031	.079											●	
	NP-VNGA331-SE2	NP-VNGA160404SE2	.016	.098											●	
	NP-VNGA332-SE2	NP-VNGA160408SE2	.031	.079											●	

● = NEW

CBN TURNING INSERTS [NEGATIVE]

80° WN TYPE INSERTS WITH HOLE

NP-WNGA 4 3 2 FS6
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			Coated CBN							CBN				Solid CBN
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron						●					◐	✠
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN: NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	CBN: MB8110	MB8120	MB8130	MB4120	Solid CBN: MBS140
NEW PETIT CUT 	**NP-WNGA432-FS6**	NP-WNGA080408FS6	.031	.079	★		●	★								
	NP-WNGA432-GS6	NP-WNGA080408GS6	.031	.079	★		●	★								
	NP-WNGA432-TS6	NP-WNGA080408TS6	.031	.079	★			★								
NEW PETIT CUT 	**NP-WNGA432-FS3**	NP-WNGA080408FS3	.031	.079	●		●	★	●						●	
	NP-WNGA432-GS3	NP-WNGA080408GS3	.031	.079	●		●	★							●	
	NP-WNGA432-GA3	NP-WNGA080408GA3	.031	.079		●			●	●						
	NP-WNGA432-GH3	NP-WNGA080408GH3	.031	.079				●	●	●						
	NP-WNGA432-TS3	NP-WNGA080408TS3	.031	.079	★			★							●	
	NP-WNGA432-TA3	NP-WNGA080408TA3	.031	.079		★			●	●						
	NP-WNGA432-TH3	NP-WNGA080408TH3	.031	.079					●	●						
	NP-WNGA432-SF3	NP-WNGA080408SF3	.031	.079											●	
	NP-WNGA432-SE3	NP-WNGA080408SE3	.031	.079											●	
NEW PETIT CUT (With Wiper) * 	**NP-WNGA432-GSWS3**	NP-WNGA080408GSWS3	.031	.079	●			★								

* Please refer to page B012 before using the wiper insert.

● = NEW

80° CN TYPE INSERTS WITHOUT HOLE

CNG 4 3 1
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			Coated CBN							CBN				Solid CBN
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron						●					◐	✠
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN: NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	CBN: MB8110	MB8120	MB8130	MB4120	Solid CBN: MBS140
	**CNG431**	CNGN120404	.016	—												★
	CNG432	CNGN120408	.031	—												●
	CNG433	CNGN120412	.047	—												●

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

55° DN TYPE INSERTS WITHOUT HOLE

DNG 3 2 2
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			Coated CBN							CBN				Solid CBN
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron							●				◐	✠
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN NEW BC8210	Coated CBN BC8220	Coated CBN BC8105	Coated CBN BC8110	Coated CBN BC8120	Coated CBN BC8130	Coated CBN NEW BC5110	CBN MB8110	CBN MB8120	CBN MB8130	CBN MB4120	Solid CBN MBS140
	**DNG322**	DNGN110308	.031	—												★
	DNG323	DNGN110312	.047	—												★

● = NEW

RN TYPE INSERTS WITHOUT HOLE

RNG 3 2
Size Thickness
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			Coated CBN							CBN				Solid CBN
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron							●				◐	✠
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	Cutting Edge Effective Length **LE** (inch)	Coated CBN NEW BC8210	Coated CBN BC8220	Coated CBN BC8105	Coated CBN BC8110	Coated CBN BC8120	Coated CBN BC8130	Coated CBN NEW BC5110	CBN MB8110	CBN MB8120	CBN MB8130	CBN MB4120	Solid CBN MBS140
	**RNG32**	RNGN090300	—	—												●
	RNG42	RNGN120300	—	—												●
	RNG43	RNGN120400	—	—												●

● = NEW

90° SN TYPE INSERTS WITHOUT HOLE

SNG 3 2 2
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			Coated CBN							CBN				Solid CBN
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron							●				◐	✠
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN: NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	CBN: MB8110	MB8120	MB8130	MB4120	Solid CBN: MBS140
	**SNG322**	SNGN090308	.031	—												●
	SNG323	SNGN090312	.047	—												●
	SNG324	SNGN090316	.063	—												●
	SNG432	SNGN120408	.031	—												●
	SNG433	SNGN120412	.047	—												★
	SNG434	SNGN120416	.063	—												●

● = NEW

60° TN TYPE INSERTS WITHOUT HOLE

TNG 3 3 2
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			Coated CBN							CBN				Solid CBN
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron							●				◐	✠
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN: NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	CBN: MB8110	MB8120	MB8130	MB4120	Solid CBN: MBS140
	**TNG332**	TNGN160408	.031	—												●
	TNG333	TNGN160412	.047	—												●
	TNG334	TNGN160416	.063	—												●

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

80° CC TYPE INSERTS WITH HOLE

NP-CCGW 2 1.5 0.5 FS2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			Coated CBN						CBN				Solid CBN
	H	Hardened Materials	●	◐	●	●	◐	✠	●	◐	✠		
	K	Cast Iron						●				◐	✠
	S	Heat Resistant Alloy, Titanium Alloy											
		Sintered Alloy										◐	

Shape		Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT		NP-CCGW21.50.5-FS2	NP-CCGW060202FS2	.008	.067	●		●				★	●			●	
		NP-CCGW21.51-FS2	NP-CCGW060204FS2	.016	.071	●		●				★	●			●	
		NP-CCGW21.52-FS2	NP-CCGW060208FS2	.031	.079	●		●					●			●	
		NP-CCGW32.50.5-FS2	NP-CCGW09T302FS2	.008	.067	●		●	●				●			●	
		NP-CCGW32.51-FS2	NP-CCGW09T304FS2	.016	.071	●		●	●	●		●	●			●	
		NP-CCGW32.52-FS2	NP-CCGW09T308FS2	.031	.079	●		●	●	●		●	●			●	
		NP-CCGW21.50.5-GS2	NP-CCGW060202GS2	.008	.067	●		●	●			★				●	
		NP-CCGW21.51-GS2	NP-CCGW060204GS2	.016	.071	●		●	●							●	
		NP-CCGW21.52-GS2	NP-CCGW060208GS2	.031	.079	●		●	●							●	
		NP-CCGW32.50.5-GS2	NP-CCGW09T302GS2	.008	.067	●		●	●							●	
		NP-CCGW32.51-GS2	NP-CCGW09T304GS2	.016	.071	●		●	●			●				●	
		NP-CCGW32.52-GS2	NP-CCGW09T308GS2	.031	.079	●		●	●			●				●	
		NP-CCGW21.50.5-GA2	NP-CCGW060202GA2	.008	.067		●			●				●			
		NP-CCGW21.51-GA2	NP-CCGW060204GA2	.016	.071		●			●	●			●			
		NP-CCGW21.52-GA2	NP-CCGW060208GA2	.031	.079		●			●	●			●			
		NP-CCGW32.50.5-GA2	NP-CCGW09T302GA2	.008	.067		●			●				●			
		NP-CCGW32.51-GA2	NP-CCGW09T304GA2	.016	.071		●			●	●			●			
		NP-CCGW32.52-GA2	NP-CCGW09T308GA2	.031	.079		●			●	●			●			
		NP-CCGW32.51-GH2	NP-CCGW09T304GH2	.016	.071				●	●	●						
		NP-CCGW32.52-GH2	NP-CCGW09T308GH2	.031	.079				●	●	●						
	NEW	NP-CCGW32.51-VA2	NP-CCGW09T304VA2	.016	.071		●										
	NEW	NP-CCGW32.52-VA2	NP-CCGW09T308VA2	.031	.079		●										
		NP-CCGW21.52-TS2	NP-CCGW060208TS2	.031	.079											●	
		NP-CCGW32.52-TS2	NP-CCGW09T308TS2	.031	.079											●	
		NP-CCGW21.51-TA2	NP-CCGW060204TA2	.016	.071						●				●		
		NP-CCGW21.52-TA2	NP-CCGW060208TA2	.031	.079						●				●		
		NP-CCGW32.51-TA2	NP-CCGW09T304TA2	.016	.071		★			●	●			●	●		
		NP-CCGW32.52-TA2	NP-CCGW09T308TA2	.031	.079		★			●	●			●	●		
		NP-CCGW32.51-TH2	NP-CCGW09T304TH2	.016	.071					●	●				●		
		NP-CCGW32.52-TH2	NP-CCGW09T308TH2	.031	.079					●	●				●		
		NP-CCGW21.50.5-SF2	NP-CCGW060202SF2	.008	.067											●	
		NP-CCGW21.51-SF2	NP-CCGW060204SF2	.016	.071											●	
		NP-CCGW21.52-SF2	NP-CCGW060208SF2	.031	.079											●	
		NP-CCGW32.50.5-SF2	NP-CCGW09T302SF2	.008	.067											●	
		NP-CCGW32.51-SF2	NP-CCGW09T304SF2	.016	.071											●	
		NP-CCGW32.52-SF2	NP-CCGW09T308SF2	.031	.079											●	

● = NEW

EXTERNAL TURNING ➤ C002
BORING ➤ E002
IDENTIFICATION ➤ B002
HONING ➤ B009

80° CC TYPE INSERTS WITH HOLE

NP-CCGW 2 1.5 0.5 SE2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✲ Unstable Cutting

Workpiece Material		
H	Hardened Materials	
K	Cast Iron	
S	Heat Resistant Alloy, Titanium Alloy	
	Sintered Alloy	

Shape		Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN: NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	CBN: MB8110	MB8120	MB8130	MB4120	Solid CBN: MBS140
NEW PETIT CUT		**NP-CCGW21.50.5-SE2**	NP-CCGW060202SE2	.008	.067											●	
		NP-CCGW21.51-SE2	NP-CCGW060204SE2	.016	.071											●	
		NP-CCGW21.52-SE2	NP-CCGW060208SE2	.031	.079											●	
		NP-CCGW32.50.5-SE2	NP-CCGW09T302SE2	.008	.067											●	
		NP-CCGW32.51-SE2	NP-CCGW09T304SE2	.016	.071											●	
		NP-CCGW32.52-SE2	NP-CCGW09T308SE2	.031	.079											●	
NEW PETIT CUT (With Wiper) *1		**NP-CCGW32.51-FSWS2**	NP-CCGW09T304FSWS2	.016	.071	★		●	●	●			●				
		NP-CCGW32.52-FSWS2	NP-CCGW09T308FSWS2	.031	.079	●		●	●	●			●				
		NP-CCGW32.51-FBWL2	NP-CCGW09T304FBWL2	.016	.071			●	●	●			●				
		NP-CCGW32.52-FBWL2	NP-CCGW09T308FBWL2	.031	.079			●	●	●			●				
		NP-CCGW32.51-GSWS2	NP-CCGW09T304GSWS2	.016	.071	●		●	●								
		NP-CCGW32.52-GSWS2	NP-CCGW09T308GSWS2	.031	.079	★		●	●								
		NP-CCGW32.51-GAWS2	NP-CCGW09T304GAWS2	.016	.071		●			●	●			●			
		NP-CCGW32.52-GAWS2	NP-CCGW09T308GAWS2	.031	.079		●			●	●			●			
		NP-CCGW32.51-GBWL2	NP-CCGW09T304GBWL2	.016	.071			●	●	●				●			
		NP-CCGW32.52-GBWL2	NP-CCGW09T308GBWL2	.031	.079			●	●	●				●			
NEW PETIT CUT (With Breaker)		**BF-CCGT32.51-TS2**	BF-CCGT09T304TS2	.016	.071	●			★								
		BF-CCGT32.52-TS2	BF-CCGT09T308TS2	.031	.079	●			★								
NEW PETIT CUT (With Breaker)		**BM-CCGT32.51-TA2**	BM-CCGT09T304TA2	.016	.071		★			●							
		BM-CCGT32.52-TA2	BM-CCGT09T308TA2	.031	.079		★			●							
NEW PETIT CUT	*2	**NP-CCGW03S102FS**	NP-CCGW03S102FS	.008	.043	●			●				●				
	*2	**NP-CCGW03S104FS**	NP-CCGW03S104FS	.016	.039	●			●				●				
	*2	**NP-CCGW04T002FS**	NP-CCGW04T002FS	.008	.059	●			●				●				
	*2	**NP-CCGW04T004FS**	NP-CCGW04T004FS	.016	.055	●			●				●				
	*2	**NP-CCGW03S102GS**	NP-CCGW03S102GS	.008	.043			●									
	*2	**NP-CCGW03S104GS**	NP-CCGW03S104GS	.016	.039			●									
	*2	**NP-CCGW04T002GS**	NP-CCGW04T002GS	.008	.059			●									
	*2	**NP-CCGW04T004GS**	NP-CCGW04T004GS	.016	.055			●									

*1 Please refer to page B012 before using the wiper insert.
*2 Diameter of inscribed circle is special. (For SCLC type)

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

80° CP TYPE INSERTS WITH HOLE

NP-CPGB 2.5 1.5 0.5 FS2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✲ Unstable Cutting

Workpiece Material		
H	Hardened Materials	● ◐ ● ● ◐ ✲ ● ● ◐ ✲ ◐ ✲
K	Cast Iron	● ◐
S	Heat Resistant Alloy, Titanium Alloy	
	Sintered Alloy	◐

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130 NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	NP-CPGB2.51.50.5-FS2	NP-CPGB080202FS2	.008	.067										●	
	NP-CPGB2.51.51-FS2	NP-CPGB080204FS2	.016	.071				★						●	
	NP-CPGB2.51.52-FS2	NP-CPGB080208FS2	.031	.079				★							
	NP-CPGB320.5-FS2	NP-CPGB090302FS2	.008	.067			●	●						●	
	NP-CPGB321-FS2	NP-CPGB090304FS2	.016	.071			●		●					●	
	NP-CPGB322-FS2	NP-CPGB090308FS2	.031	.079			●		●					●	
	NP-CPGB323-FS2	NP-CPGB090312FS2	.047	.087					●						
	NP-CPGB2.51.51-GS2	NP-CPGB080204GS2	.016	.071	●		●	★							
	NP-CPGB2.51.52-GS2	NP-CPGB080208GS2	.031	.079	★		●	★							
	NP-CPGB320.5-GS2	NP-CPGB090302GS2	.008	.067	★		●	●							
	NP-CPGB321-GS2	NP-CPGB090304GS2	.016	.071	★		●	★							
	NP-CPGB322-GS2	NP-CPGB090308GS2	.031	.079	★		●	★							
	NP-CPGB2.51.51-GA2	NP-CPGB080204GA2	.016	.071		★			★	●					
	NP-CPGB2.51.52-GA2	NP-CPGB080208GA2	.031	.079		★			★	●					
	NP-CPGB2.51.53-GA2	NP-CPGB080212GA2	.047	.087		★			★	●					
	NP-CPGB320.5-GA2	NP-CPGB090302GA2	.008	.067		★			●						
	NP-CPGB321-GA2	NP-CPGB090304GA2	.016	.071		★			●	●					
	NP-CPGB322-GA2	NP-CPGB090308GA2	.031	.079		★			●	●					
	NP-CPGB323-GA2	NP-CPGB090312GA2	.047	.087		●			●	●					
	NEW NP-CPGB321-VA2	NP-CPGB090304VA2	.016	.071		★									
	NEW NP-CPGB322-VA2	NP-CPGB090308VA2	.031	.079		★									
	NEW NP-CPGB323-VA2	NP-CPGB090312VA2	.047	.087		★									
	NP-CPGB2.51.51-TA2	NP-CPGB080204TA2	.016	.071						●					
	NP-CPGB2.51.52-TA2	NP-CPGB080208TA2	.031	.079						●					
	NP-CPGB2.51.53-TA2	NP-CPGB080212TA2	.047	.087						●					
	NP-CPGB321-TA2	NP-CPGB090304TA2	.016	.071		★			●	●					
	NP-CPGB322-TA2	NP-CPGB090308TA2	.031	.079		★			●	●					
	NP-CPGB323-TA2	NP-CPGB090312TA2	.047	.087		★			●	●					
	NP-CPGB2.51.50.5-SE2	NP-CPGB080202SE2	.008	.067										●	
	NP-CPGB2.51.51-SE2	NP-CPGB080204SE2	.016	.071										●	
	NP-CPGB320.5-SE2	NP-CPGB090302SE2	.008	.067										●	
	NP-CPGB321-SE2	NP-CPGB090304SE2	.016	.071										●	
	NP-CPGB322-SE2	NP-CPGB090308SE2	.031	.079										●	

● = NEW

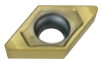
EXTERNAL TURNING ➤ C002
BORING ➤ E002
IDENTIFICATION ➤ B002
HONING ➤ B009

55° DC TYPE INSERTS WITH HOLE

NP-DCGW 2 1.5 0.5 FS2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

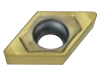
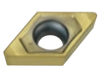
Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron							●				◐	✠
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
					NEW						NEW					
NEW PETIT CUT	**NP-DCGW21.50.5-FS2**	NP-DCGW070202FS2	.008	.087	★			●				●				
	NP-DCGW21.51-FS2	NP-DCGW070204FS2	.016	.083	●			●	●		★	●			●	
	NP-DCGW21.52-FS2	NP-DCGW070208FS2	.031	.079	●			●				●			●	
	NP-DCGW32.50.5-FS2	NP-DCGW11T302FS2	.008	.087	●		●	●				●			●	
	NP-DCGW32.51-FS2	NP-DCGW11T304FS2	.016	.083	●		●	●	●			●			●	
	NP-DCGW32.52-FS2	NP-DCGW11T308FS2	.031	.079	●		●	●	●		●	●			●	
	NP-DCGW21.50.5-GS2	NP-DCGW070202GS2	.008	.087	★		●	●								
	NP-DCGW21.51-GS2	NP-DCGW070204GS2	.016	.083	●		●	●			★				●	
	NP-DCGW21.52-GS2	NP-DCGW070208GS2	.031	.079	●		●	●							●	
	NP-DCGW32.50.5-GS2	NP-DCGW11T302GS2	.008	.087	●		●	●							●	
	NP-DCGW32.51-GS2	NP-DCGW11T304GS2	.016	.083	●		●	●			●				●	
	NP-DCGW32.52-GS2	NP-DCGW11T308GS2	.031	.079	●		●	●			★				●	
	NP-DCGW21.50.5-GA2	NP-DCGW070202GA2	.008	.087		★			●				●			
	NP-DCGW21.51-GA2	NP-DCGW070204GA2	.016	.083		★			●	●			●			
	NP-DCGW21.52-GA2	NP-DCGW070208GA2	.031	.079		★				●						
	NP-DCGW32.50.5-GA2	NP-DCGW11T302GA2	.008	.087		★			●				●			
	NP-DCGW32.51-GA2	NP-DCGW11T304GA2	.016	.083		●			●	●			●			
	NP-DCGW32.52-GA2	NP-DCGW11T308GA2	.031	.079		●			●	●			●			
	**NP-DCGW32.51-GH2**	NP-DCGW11T304GH2	.016	.083				●	●	●						
	NP-DCGW32.52-GH2	NP-DCGW11T308GH2	.031	.079				●	●	●						
NEW	**NP-DCGW32.51-VA2**	NP-DCGW11T304VA2	.016	.083		★										
NEW	**NP-DCGW32.52-VA2**	NP-DCGW11T308VA2	.031	.079		●										
	NP-DCGW21.51-TA2	NP-DCGW070204TA2	.016	.083					●	●			●	●		
	NP-DCGW21.52-TA2	NP-DCGW070208TA2	.031	.079						●				●		
	NP-DCGW32.51-TA2	NP-DCGW11T304TA2	.016	.083		★			●	●			●	●		
	NP-DCGW32.52-TA2	NP-DCGW11T308TA2	.031	.079		★			●	●			●	●		
	NP-DCGW32.51-TH2	NP-DCGW11T304TH2	.016	.083					●	●				●		
	NP-DCGW32.52-TH2	NP-DCGW11T308TH2	.031	.079					●	●				●		
	NP-DCGW21.51-SF2	NP-DCGW070204SF2	.016	.083											●	
	NP-DCGW21.52-SF2	NP-DCGW070208SF2	.031	.079											●	
	NP-DCGW32.50.5-SF2	NP-DCGW11T302SF2	.008	.087											●	
	NP-DCGW32.51-SF2	NP-DCGW11T304SF2	.016	.083											●	
	NP-DCGW32.52-SF2	NP-DCGW11T308SF2	.031	.079											●	
	NP-DCGW21.51-SE2	NP-DCGW070204SE2	.016	.083											●	
	NP-DCGW21.52-SE2	NP-DCGW070208SE2	.031	.079											●	
	NP-DCGW32.50.5-SE2	NP-DCGW11T302SE2	.008	.087											●	
	NP-DCGW32.51-SE2	NP-DCGW11T304SE2	.016	.083											●	
	NP-DCGW32.52-SE2	NP-DCGW11T308SE2	.031	.079											●	

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✤ Unstable Cutting

Workpiece Material					BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
H	Hardened Materials				●	◐	●	●	◐	✤		●	◐	✤		
K	Cast Iron										●				◐	✤
S	Heat Resistant Alloy, Titanium Alloy															
	Sintered Alloy														◐	
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN NEW						NEW	CBN				Solid CBN
NEW PETIT CUT  (With Breaker)	**BF-DCGT32.51-TS2**	BF-DCGT11T304TS2	.016	.083	★			★								
	BF-DCGT32.52-TS2	BF-DCGT11T308TS2	.031	.079	★			★								
NEW PETIT CUT  (With Breaker)	**BM-DCGT32.51-TA2**	BM-DCGT11T304TA2	.016	.083		●			●							
	BM-DCGT32.52-TA2	BM-DCGT11T308TA2	.031	.079		●			●							

● = NEW

CBN

B

CBN TURNING INSERTS

POSI 7°

WITH HOLE

C

D

R

S

T

V

W

60° TC TYPE INSERTS WITH HOLE

NP-TCGW 2 1.5 1 FS3
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN							CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	**NP-TCGW21.51-FS3**	NP-TCGW110204FS3	.016	.063							●				●	
	NP-TCGW21.52-FS3	NP-TCGW110208FS3	.031	.067							●				●	
	NP-TCGW1.81.51-GS3	NP-TCGW090204GS3	.016	.063				★			★					
	NP-TCGW1.81.52-GS3	NP-TCGW090208GS3	.031	.067				★								
	NP-TCGW21.50.5-GS3	NP-TCGW110202GS3	.008	.059				●								
	NP-TCGW21.51-GS3	NP-TCGW110204GS3	.016	.063				●							●	
	NP-TCGW21.52-GS3	NP-TCGW110208GS3	.031	.067				●			★				●	
	NP-TCGW2.521-GS3	NP-TCGW130304GS3	.016	.063				★								
	NP-TCGW2.522-GS3	NP-TCGW130308GS3	.031	.067				★								
	NP-TCGW32.51-GS3	NP-TCGW16T304GS3	.016	.063				●								
	NP-TCGW32.52-GS3	NP-TCGW16T308GS3	.031	.067				●								
	NP-TCGW21.51-SF3	NP-TCGW110204SF3	.016	.063											●	
	NP-TCGW21.52-SF3	NP-TCGW110208SF3	.031	.067											●	
	NP-TCGW21.51-SE3	NP-TCGW110204SE3	.016	.063											●	
	NP-TCGW21.52-SE3	NP-TCGW110208SE3	.031	.067											●	

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

60° TP TYPE INSERTS WITH HOLE

NP-TPGB 1.8 1.5 0.5 FS3
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✲ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	NP-TPGB1.81.50.5-FS3	NP-TPGB090202FS3	.008	.059											●	
	NP-TPGB1.81.51-FS3	NP-TPGB090204FS3	.016	.063							★				●	
	NP-TPGB220.5-FS3	NP-TPGB110302FS3	.008	.059	★		●	●				●			●	
	NP-TPGB221-FS3	NP-TPGB110304FS3	.016	.063	★		●	★	★		★	●			●	
	NP-TPGB222-FS3	NP-TPGB110308FS3	.031	.067	★		●	★	★		●	●			●	
	NP-TPGB321-FS3	NP-TPGB160304FS3	.016	.063					★							
	NP-TPGB322-FS3	NP-TPGB160308FS3	.031	.067					★							
	NP-TPGB1.51.51-GS3	NP-TPGB080204GS3	.016	.063	★		●	★			★					
	NP-TPGB1.51.52-GS3	NP-TPGB080208GS3	.031	.067	★		●	★								
	NP-TPGB1.81.50.5-GS3	NP-TPGB090202GS3	.008	.059											●	
	NP-TPGB1.81.51-GS3	NP-TPGB090204GS3	.016	.063	●		●	★							●	
	NP-TPGB1.81.52-GS3	NP-TPGB090208GS3	.031	.067	★		●	★								
	NP-TPGB220.5-GS3	NP-TPGB110302GS3	.008	.059	●		●	●							●	
	NP-TPGB221-GS3	NP-TPGB110304GS3	.016	.063	★		●	★			★				●	
	NP-TPGB222-GS3	NP-TPGB110308GS3	.031	.067	★		●	★			★				●	
	NP-TPGB321-GS3	NP-TPGB160304GS3	.016	.063	●		●	★								
	NP-TPGB322-GS3	NP-TPGB160308GS3	.031	.067	★		●	★								
	NP-TPGB1.51.51-GA3	NP-TPGB080204GA3	.016	.063						●						
	NP-TPGB1.51.52-GA3	NP-TPGB080208GA3	.031	.067						●						
	NP-TPGB1.81.51-GA3	NP-TPGB090204GA3	.016	.063		★			★	●			●			
	NP-TPGB1.81.52-GA3	NP-TPGB090208GA3	.031	.067		★			★	●			●			
	NP-TPGB220.5-GA3	NP-TPGB110302GA3	.008	.059		★			★				●			
	NP-TPGB221-GA3	NP-TPGB110304GA3	.016	.063		●			★	●			●			
	NP-TPGB222-GA3	NP-TPGB110308GA3	.031	.067		●			★	●			●			
	NP-TPGB321-GA3	NP-TPGB160304GA3	.016	.063		●			★	●			●			
	NP-TPGB322-GA3	NP-TPGB160308GA3	.031	.067		★			★	●			●			
	NP-TPGB321-GH3	NP-TPGB160304GH3	.016	.063				●	●	●						
	NP-TPGB322-GH3	NP-TPGB160308GH3	.031	.067				●	●	●						
NEW	NP-TPGB221-VA3	NP-TPGB110304VA3	.016	.063		★										
NEW	NP-TPGB222-VA3	NP-TPGB110308VA3	.031	.067		●										
	NP-TPGB1.51.51-TA3	NP-TPGB080204TA3	.016	.063						●				●		
	NP-TPGB1.51.52-TA3	NP-TPGB080208TA3	.031	.067						●				●		
	NP-TPGB1.81.51-TA3	NP-TPGB090204TA3	.016	.063						●				●		
	NP-TPGB1.81.52-TA3	NP-TPGB090208TA3	.031	.067						●				●		
	NP-TPGB221-TA3	NP-TPGB110304TA3	.016	.063		★			★	●			●	●		
	NP-TPGB222-TA3	NP-TPGB110308TA3	.031	.067		●			★	●			●	●		

● = NEW

EXTERNAL TURNING ➤ C002
BORING ➤ E002
IDENTIFICATION ➤ B002
HONING ➤ B009

60° TP TYPE INSERTS WITH HOLE

NP-TPGB 3 2 1 TA3
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN							CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	**NP-TPGB321-TA3**	NP-TPGB160304TA3	.016	.063					★	●			●	●		
	NP-TPGB322-TA3	NP-TPGB160308TA3	.031	.067					★	●			●	●		
	NP-TPGB321-TH3	NP-TPGB160304TH3	.016	.063					●	●				●		
	NP-TPGB322-TH3	NP-TPGB160308TH3	.031	.067					●	●				●		
NEW PETIT CUT	**NP-TPGB1.81.50.5-SF3**	NP-TPGB090202SF3	.008	.059											●	
	NP-TPGB1.81.51-SF3	NP-TPGB090204SF3	.016	.063											●	
	NP-TPGB220.5-SF3	NP-TPGB110302SF3	.008	.059											●	
	NP-TPGB221-SF3	NP-TPGB110304SF3	.016	.063											●	
	NP-TPGB222-SF3	NP-TPGB110308SF3	.031	.067											●	
	NP-TPGB1.81.50.5-SE3	NP-TPGB090202SE3	.008	.059											●	
	NP-TPGB1.81.51-SE3	NP-TPGB090204SE3	.016	.063											●	
	NP-TPGB220.5-SE3	NP-TPGB110302SE3	.008	.059											●	
	NP-TPGB221-SE3	NP-TPGB110304SE3	.016	.063											●	
	NP-TPGB222-SE3	NP-TPGB110308SE3	.031	.067											●	

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

35° VB TYPE INSERTS WITH HOLE

NP-VBGW 2 2 0.5 FS2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Workpiece Material																				
	H	Hardened Materials	●	◐	●	●	◐	✣		●	◐	✣								
	K	Cast Iron							●							◐	✣			
	S	Heat Resistant Alloy, Titanium Alloy																		
		Sintered Alloy														◐				

Shape		Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
						NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT		NP-VBGW220.5-FS2	NP-VBGW110302FS2	.008	.098	★			●				●				
		NP-VBGW221-FS2	NP-VBGW110304FS2	.016	.098	●			●				●			●	
		NP-VBGW222-FS2	NP-VBGW110308FS2	.031	.079	★			●				●			●	
		NP-VBGW330.5-FS2	NP-VBGW160402FS2	.008	.098	●			●				●				
		NP-VBGW331-FS2	NP-VBGW160404FS2	.016	.098					●						●	
		NP-VBGW332-FS2	NP-VBGW160408FS2	.031	.079					●						●	
		NP-VBGW220.5-GS2	NP-VBGW110302GS2	.008	.098	●		●	●								
		NP-VBGW221-GS2	NP-VBGW110304GS2	.016	.098	★		●	●							●	
		NP-VBGW222-GS2	NP-VBGW110308GS2	.031	.079	●		●	●							●	
		NP-VBGW330.5-GS2	NP-VBGW160402GS2	.008	.098	●		●	●								
		NP-VBGW331-GS2	NP-VBGW160404GS2	.016	.098	●		●	●			●				●	
		NP-VBGW332-GS2	NP-VBGW160408GS2	.031	.079	●		●	●			●				●	
		NP-VBGW220.5-GA2	NP-VBGW110302GA2	.008	.098		★			●			●				
		NP-VBGW221-GA2	NP-VBGW110304GA2	.016	.098		●			●	●		●				
		NP-VBGW222-GA2	NP-VBGW110308GA2	.031	.079		●			●	●		●				
		NP-VBGW330.5-GA2	NP-VBGW160402GA2	.008	.098		★			●			●				
		NP-VBGW331-GA2	NP-VBGW160404GA2	.016	.098		●			●	●		●				
		NP-VBGW332-GA2	NP-VBGW160408GA2	.031	.079		★			●	●		●				
		NP-VBGW331-GH2	NP-VBGW160404GH2	.016	.098				●	●	●						
		NP-VBGW332-GH2	NP-VBGW160408GH2	.031	.079				●	●	●						
	NEW	NP-VBGW331-VA2	NP-VBGW160404VA2	.016	.098		★										
	NEW	NP-VBGW332-VA2	NP-VBGW160408VA2	.031	.079		★										
		NP-VBGW221-TA2	NP-VBGW110304TA2	.016	.098						●						
		NP-VBGW222-TA2	NP-VBGW110308TA2	.031	.079						●						
		NP-VBGW331-TA2	NP-VBGW160404TA2	.016	.098		★			●	●		●				
		NP-VBGW332-TA2	NP-VBGW160408TA2	.031	.079		★			●	●		●				
		NP-VBGW331-TH2	NP-VBGW160404TH2	.016	.098					●	●						
		NP-VBGW332-TH2	NP-VBGW160408TH2	.031	.079					●	●						
		NP-VBGW221-SF2	NP-VBGW110304SF2	.016	.098											●	
		NP-VBGW222-SF2	NP-VBGW110308SF2	.031	.079											●	
		NP-VBGW331-SF2	NP-VBGW160404SF2	.016	.098											●	
		NP-VBGW332-SF2	NP-VBGW160408SF2	.031	.079											●	
		NP-VBGW221-SE2	NP-VBGW110304SE2	.016	.098											●	
		NP-VBGW222-SE2	NP-VBGW110308SE2	.031	.079											●	
		NP-VBGW331-SE2	NP-VBGW160404SE2	.016	.098											●	
		NP-VBGW332-SE2	NP-VBGW160408SE2	.031	.079											●	

● = NEW

EXTERNAL TURNING ➤ C002
BORING ➤ E002
IDENTIFICATION ➤ B002
HONING ➤ B009

35° VC TYPE INSERTS WITH HOLE

NP-VCGW 3 3 1 FS2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape		Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
						NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT		NP-VCGW331-FS2	NP-VCGW160404FS2	.016	.098				●	●			●				
		NP-VCGW332-FS2	NP-VCGW160408FS2	.031	.079				●	●			●				
		NP-VCGW331-GS2	NP-VCGW160404GS2	.016	.098	★		●	●								
		NP-VCGW332-GS2	NP-VCGW160408GS2	.031	.079	★		●	●								
		NP-VCGW331-GA2	NP-VCGW160404GA2	.016	.098		●			●	●						
		NP-VCGW332-GA2	NP-VCGW160408GA2	.031	.079		★			●	●						
		NP-VCGW331-GH2	NP-VCGW160404GH2	.016	.098				●	●	●						
		NP-VCGW332-GH2	NP-VCGW160408GH2	.031	.079				●	●	●						
	NEW	NP-VCGW331-VA2	NP-VCGW160404VA2	.016	.098		★										
	NEW	NP-VCGW332-VA2	NP-VCGW160408VA2	.031	.079		★										
		NP-VCGW331-TS2	NP-VCGW160404TS2	.016	.098				●								
		NP-VCGW332-TS2	NP-VCGW160408TS2	.031	.079				●								
		NP-VCGW331-TA2	NP-VCGW160404TA2	.016	.098		★			●	●						
		NP-VCGW332-TA2	NP-VCGW160408TA2	.031	.079		★			●	●						
		NP-VCGW331-TH2	NP-VCGW160404TH2	.016	.098					●	●						
		NP-VCGW332-TH2	NP-VCGW160408TH2	.031	.079					●	●						

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

90° SP TYPE INSERTS WITHOUT HOLE

NP-SPGN 4 3 3 GS2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			Coated CBN							CBN				Solid CBN
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron							●				◐	✠
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT NEW 	**NP-SPGN433-GS2**	NP-SPGN120412GS2	.047	.098							★					

● = NEW

EXTERNAL TURNING ➤ C002
BORING ➤ E002
IDENTIFICATION ➤ B002
HONING ➤ B009

GY TYPE INSERTS WITHOUT HOLE

GY1G 0200 D 020 N GFGS
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			Coated CBN							CBN				Solid CBN
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron							●				◐	✠
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN: NEW BC8210	Coated CBN: BC8220	Coated CBN: BC8105	Coated CBN: BC8110	Coated CBN: BC8120	Coated CBN: BC8130	Coated CBN: NEW BC5110	CBN: MB8110	CBN: MB8120	CBN: MB8130	CBN: MB4120	Solid CBN: MBS140
	**GY1G0200D020N-GFGS**	GY1G0200D020N-GFGS	.008	.106				●								
	GY1G0239E020N-GFGS	GY1G0239E020N-GFGS	.008	.106				●								
	GY1G0250E020N-GFGS	GY1G0250E020N-GFGS	.008	.106				●								
	GY1G0300F020N-GFGS	GY1G0300F020N-GFGS	.008	.106				●								
	GY1G0318F020N-GFGS	GY1G0318F020N-GFGS	.008	.106				●								
	GY1G0400G020N-GFGS	GY1G0400G020N-GFGS	.008	.106				●								
	GY1G0475H020N-GFGS	GY1G0475H020N-GFGS	.008	.106				●								
	GY1G0500H020N-GFGS	GY1G0500H020N-GFGS	.008	.106				●								
	GY1G0600J020N-GFGS	GY1G0600J020N-GFGS	.008	.106				●								

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

80° CN TYPE INSERTS WITH HOLE

NP-CNMM 4 3 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT  (With Breaker)	**NP-CNMM430.5RF**	NP-CNMM120402R-F	.008	.067	★
	NP-CNMM431RF	NP-CNMM120404R-F	.016	.071	★
	NP-CNMM432RF	NP-CNMM120408R-F	.031	.079	★
	**CNMA431**	CNMA120404	.016	.142	★
	CNMA432	CNMA120408	.031	.142	★

55° DN TYPE INSERTS WITH HOLE

NP-DNMM 4 3 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT  (With Breaker)	**NP-DNMM430.5RF**	NP-DNMM150402R-F	.008	.087	★
	NP-DNMM431RF	NP-DNMM150404R-F	.016	.083	★
	NP-DNMM432RF	NP-DNMM150408R-F	.031	.079	★
	**DNGA431**	DNGA150404	.016	.114	★
	DNGA432	DNGA150408	.031	.094	★

90° SN TYPE INSERTS WITH HOLE

NP-SNMM 4 3 1 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT  (With Breaker)	**NP-SNMM431RF**	NP-SNMM120404R-F	.016	.079	★
	NP-SNMM432RF	NP-SNMM120408R-F	.031	.087	★
	**SNGA432**	SNGA120408	.031	.150	★

60° TN TYPE INSERTS WITH HOLE

NP-TNMM 3 3 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT  (With Breaker)	**NP-TNMM330.5RF**	NP-TNMM160402R-F	.008	.059	★
	NP-TNMM331RF	NP-TNMM160404R-F	.016	.063	★
	NP-TNMM332RF	NP-TNMM160408R-F	.031	.067	★
	**TNGA330.5**	TNGA160402	.008	.122	★
	TNGA331	TNGA160404	.016	.114	★
	TNGA332	TNGA160408	.031	.110	★

★ : Stocked in Japan
<1 insert in one case>

35° VN TYPE INSERTS WITH HOLE

NP-VNMM 3 3 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◔ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT  (With Breaker)	**NP-VNMM330.5RF**	NP-VNMM160402R-F	.008	.098	★
	NP-VNMM331RF	NP-VNMM160404R-F	.016	.098	★
	NP-VNMM332RF	NP-VNMM160408R-F	.031	.079	★
	**VNGA331**	VNGA160404	.016	.102	★
	VNGA332	VNGA160408	.031	.071	★

90° SN TYPE INSERTS WITHOUT HOLE

SNG 4 3 2
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal				●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220	
	**SNG432**	SNGN120408	.031	.150	★	

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

80° CC TYPE INSERTS WITH HOLE

NP-CCMH 2 1.5 0.5
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT  (With Breaker)	**NP-CCMH21.50.5**	NP-CCMH060202	.008	.067	●
	NP-CCMH21.51	NP-CCMH060204	.016	.071	●
NEW PETIT CUT 	**NP-CCMW03S102**	NP-CCMW03S102	.008	.043	●
	NP-CCMW03S104	NP-CCMW03S104	.016	.039	●
	NP-CCMW04T002	NP-CCMW04T002	.008	.059	●
	NP-CCMW04T004	NP-CCMW04T004	.016	.055	●
	**CCMW21.50.5**	CCMW060202	.008	.114	●
	CCMW21.51	CCMW060204	.016	.114	●
	CCMW32.50.5	CCMW09T302	.008	.130	●
	CCMW32.51	CCMW09T304	.016	.130	●

80° CP TYPE INSERTS WITH HOLE

NP-CPMH 2.5 1.5 0.5
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●

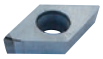
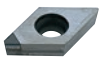
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT  (With Breaker)	**NP-CPMH2.51.50.5**	NP-CPMH080202	.008	.067	●
	NP-CPMH2.51.51	NP-CPMH080204	.016	.071	●
	NP-CPMH320.5	NP-CPMH090302	.008	.067	●
	NP-CPMH321	NP-CPMH090304	.016	.071	●
	**CPGT2.51.50.5**	CPGT080202	.008	.146	●
	CPGT2.51.51	CPGT080204	.016	.142	●
	CPGT320.5	CPGT090302	.008	.130	●
	CPGT321	CPGT090304	.016	.130	●

55° DC TYPE INSERTS WITH HOLE

NP-DCMT 2 1.5 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non ferrous Metal				●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT	**NP-DCMT21.50.5RF**	NP-DCMT070202R-F	.008	.055	●
	NP-DCMT21.50.5LF	NP-DCMT070202L-F	.008	.055	●
	NP-DCMT21.51RF	NP-DCMT070204R-F	.016	.059	●
	**NP-DCMT21.51LF**	NP-DCMT070204L-F	.016	.059	●
	NP-DCMT32.50.5RF	NP-DCMT11T302R-F	.008	.055	●
	NP-DCMT32.50.5LF	NP-DCMT11T302L-F	.008	.055	●
	NP-DCMT32.51RF	NP-DCMT11T304R-F	.016	.059	●
(With Breaker)	**NP-DCMT32.51LF**	NP-DCMT11T304L-F	.016	.059	●
	DCMW21.50.5	DCMW070202	.008	.106	★
	**DCMW21.51**	DCMW070204	.016	.098	●
	DCMW32.50.5	DCMW11T302	.008	.118	●
	DCMW32.51	DCMW11T304	.016	.114	●

90° SP TYPE INSERTS WITH HOLE

SPGX 3 2 1
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non ferrous Metal				●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
	**SPGX321**	SPGX090304	.016	.146	★
	SPGX322	SPGX090308	.031	.150	★

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

60° TC TYPE INSERTS WITH HOLE

TCMW 2 1.5 0.5
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal				●

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	Cutting Edge Effective Length **LE** (inch)	PCD MD220
	**TCMW21.50.5**	TCMW110202	.008	.106	●
	TCMW21.51	TCMW110204	.016	.102	★
	**TCGW1.210.5**	TCGW060102	.008	.059	★
	TCGW1.211	TCGW060104	.016	.063	★

60° TP TYPE INSERTS WITH HOLE

NP-TPMX 1.8 1.5 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◔ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT	**NP-TPMX1.81.50.5RF**	NP-TPMX090202R-F	.008	.059	★
	NP-TPMX1.81.50.5LF	NP-TPMX090202L-F	.008	.059	★
	NP-TPMX1.81.51LF	NP-TPMX090204L-F	.016	.063	★
	NP-TPMX1.81.52LF	NP-TPMX090208L-F	.031	.067	★
	**NP-TPMX220.5LF**	NP-TPMX110302L-F	.008	.059	★
	NP-TPMX221LF	NP-TPMX110304L-F	.016	.063	★
	NP-TPMX222LF	NP-TPMX110308L-F	.031	.067	★
	NP-TPMX320.5LF	NP-TPMX160302L-F	.008	.059	★
	NP-TPMX321LF	NP-TPMX160304L-F	.016	.063	★
(With Breaker)	**NP-TPMX322LF**	NP-TPMX160308L-F	.031	.067	★
NEW PETIT CUT	**NP-TPMH1.51.50.5RF**	NP-TPMH080202R-F	.008	.059	●
	NP-TPMH1.51.50.5LF	NP-TPMH080202L-F	.008	.059	●
	NP-TPMH1.51.51RF	NP-TPMH080204R-F	.016	.063	●
	NP-TPMH1.51.51LF	NP-TPMH080204L-F	.016	.063	●
	NP-TPMH1.81.50.5RF	NP-TPMH090202R-F	.008	.059	●
	NP-TPMH1.81.50.5LF	NP-TPMH090202L-F	.008	.059	●
	NP-TPMH1.81.51RF	NP-TPMH090204R-F	.016	.063	●
	**NP-TPMH1.81.51LF**	NP-TPMH090204L-F	.016	.063	●
	NP-TPMH220.5RF	NP-TPMH110302R-F	.008	.059	●
	NP-TPMH220.5LF	NP-TPMH110302L-F	.008	.059	●
	NP-TPMH221RF	NP-TPMH110304R-F	.016	.063	●
	NP-TPMH221LF	NP-TPMH110304L-F	.016	.063	●
	NP-TPMH320.5RF	NP-TPMH160302R-F	.008	.059	★
	NP-TPMH320.5LF	NP-TPMH160302L-F	.008	.059	★
	NP-TPMH321RF	NP-TPMH160304R-F	.016	.063	★
(With Breaker)	**NP-TPMH321LF**	NP-TPMH160304L-F	.016	.063	★
	TPGT320.5RF	TPGT160302R-F	.008	.122	★
	**TPGT320.5LF**	TPGT160302L-F	.008	.122	★
	TPGT321RF	TPGT160304R-F	.016	.114	★
	TPGT321LF	TPGT160304L-F	.016	.114	★
(With Breaker)					

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	Cutting Edge Effective Length **LE** (inch)	PCD MD220
 (With Breaker)	**TPGV1.81.50.5RF**	TPGV090202R-F	.008	.106	★
	TPGV1.81.50.5LF	TPGV090202L-F	.008	.106	★
	TPGV1.81.51RF	TPGV090204R-F	.016	.102	★
	TPGV1.81.51LF	TPGV090204L-F	.016	.102	★
	TPGV220.5RF	TPGV110302R-F	.008	.106	★
	TPGV220.5LF	TPGV110302L-F	.008	.106	★
	TPGV221RF	TPGV110304R-F	.016	.102	★
	TPGV221LF	TPGV110304L-F	.016	.102	★
	**TPGX1.51.50.5**	TPGX080202	.008	.071	★
	TPGX1.51.51	TPGX080204	.016	.067	★
	TPGX1.51.52	TPGX080208	.031	.055	★
	TPGX1.81.50.5	TPGX090202	.008	.106	★
	TPGX1.81.51	TPGX090204	.016	.102	★
	TPGX1.81.52	TPGX090208	.031	.091	★
	TPGX220.5	TPGX110302	.008	.106	★
	TPGX221	TPGX110304	.016	.102	★
	TPGX222	TPGX110308	.031	.091	★
	TPGX321	TPGX160304	.016	.114	★
	TPGX322	TPGX160308	.031	.102	★

35° VB TYPE INSERTS WITH HOLE

NP-VBGT 2 2 V5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non ferrous Metal			●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
 (With Breaker)	**NP-VBGT22V5RF**	NP-VBGT1103V5R-F	.002	.098	★
	NP-VBGT220.2RF	NP-VBGT110301R-F	.004	.098	★
	NP-VBGT220.5RF	NP-VBGT110302R-F	.008	.098	★
	NP-VBGT221RF	NP-VBGT110304R-F	.016	.098	★

35° VC TYPE INSERTS WITH HOLE

NP-VCGT 1.5 1.5 V5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non ferrous Metal			●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
 (With Breaker)	**NP-VCGT1.51.5V5RF**	NP-VCGT0802V5R-F	.002	.098	★
	NP-VCGT1.51.50.2RF	NP-VCGT080201R-F	.004	.098	★
	NP-VCGT1.51.50.5RF	NP-VCGT080202R-F	.008	.098	★
	NP-VCGT1.51.51RF	NP-VCGT080204R-F	.016	.098	★
	NP-VCGT22V5RF	NP-VCGT1103V5R-F	.002	.098	★
	NP-VCGT220.2RF	NP-VCGT110301R-F	.004	.098	★
	NP-VCGT220.5RF	NP-VCGT110302R-F	.008	.098	★
	NP-VCGT221RF	NP-VCGT110304R-F	.016	.098	★
NEW 	**VCGW220.2**	VCGW110301	.004	.122	●
	VCGW220.5	VCGW110302	.008	.118	●
	VCGW221	VCGW110304	.016	.102	●

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

80° WC TYPE INSERTS WITH HOLE

WCMW 1.5 1.5 0.5
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal				●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220	
	**WCMW1.51.50.5**	WCMWL30202	.008	.063	★	
	WCMW21.50.5	WCMW040202	.008	.114	★	
	WCMW32.51	WCMW06T304	.016	.118	★	

80° WP TYPE INSERTS WITH HOLE

WPGT 2 1.5 0.5
Size Thickness Corner Raduis
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal				●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220	
 (With Breaker)	**WPGT21.50.5**	WPGT040202	.008	.114	★	
	WPGT21.51	WPGT040204	.016	.114	★	
	WPGT320.5	WPGT060302	.008	.130	★	
	WPGT321	WPGT060304	.016	.130	★	

55° DE TYPE INSERTS WITH HOLE

DEGX 4 3 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
 (With Breaker)	**DEGX430.5RF**	DEGX150402R-F	.008	.118	★
	DEGX430.5LF	DEGX150402L-F	.008	.118	★
	DEGX431RF	DEGX150404R-F	.016	.114	★
	DEGX431LF	DEGX150404L-F	.016	.114	★

60° TE TYPE INSERTS WITH HOLE

TEGX 3 2 0.5 R
Size Thickness Corner Raduis
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
 (With Breaker)	**TEGX320.5R**	TEGX160302R	.008	.150	★
	TEGX320.5L	TEGX160302L	.008	.150	★
	TEGX321R	TEGX160304R	.016	.142	★
	TEGX321L	TEGX160304L	.016	.142	★
	**TEGX320.5**	TEGX160302	.008	.122	★
	TEGX321	TEGX160304	.016	.114	★

★ : Stocked in Japan
<1 insert in one case>

35° VD TYPE INSERTS WITH HOLE

VDGX 3 2 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
 (With Breaker)	**VDGX320.5RF**	VDGX160302R-F	.008	.122	★
	VDGX320.5LF	VDGX160302L-F	.008	.122	★
	VDGX321RF	VDGX160304R-F	.016	.106	★
	VDGX321LF	VDGX160304L-F	.016	.106	★

90° SP TYPE INSERTS WITHOUT HOLE

SPG 3 2 0.5
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
	**SPG320.5**	SPGN090302	.008	.146	★
	SPG321	SPGN090304	.016	.146	★
	SPG322	SPGN090308	.031	.150	★
	SPG421	SPGN120304	.016	.146	★
	SPG422	SPGN120308	.031	.150	★
	SPG423	SPGN120312	.047	.146	★

60° TP TYPE INSERTS WITHOUT HOLE

TPG 2 2 0.5
Size Thickness Corner Raduis
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
	**TPG220.5**	TPGN110302	.008	.106	★
	TPG221	TPGN110304	.016	.102	★
	TPG222	TPGN110308	.031	.091	★
	TPG320.5	TPGN160302	.008	.122	★
	TPG321	TPGN160304	.016	.114	★
	TPG322	TPGN160308	.031	.102	★

★ : Stocked in Japan
<1 insert in one case>

EXTERNAL TURNING ➤ –
BORING ➤ E002
IDENTIFICATION ➤ B002

Memo