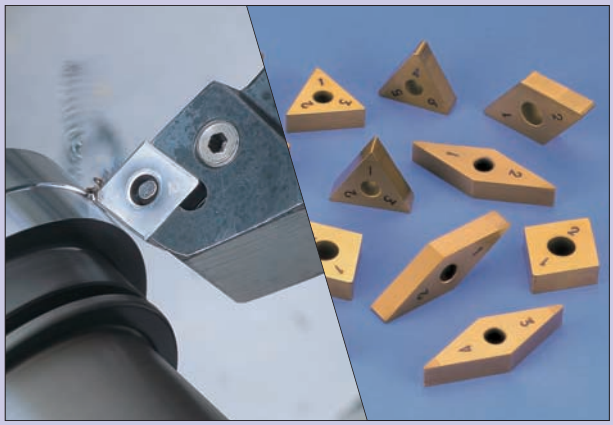
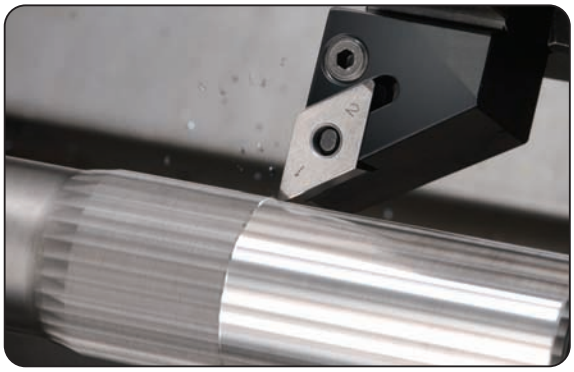
SUMIBORON

L1 ~ L65





■ General Features

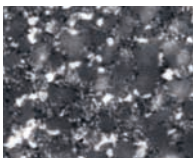
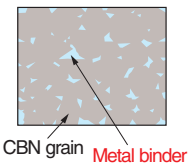
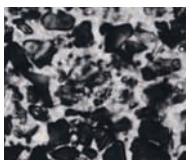
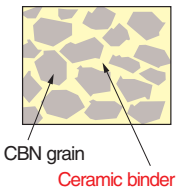
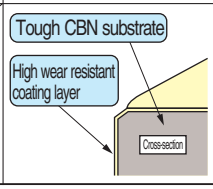
In 1977, Sumitomo Electric successfully developed a revolutionary CBN sintered tool - SumiBoron.
The main component in SumiBoron is Cubic Boron Nitride with a special ceramic binder sintered under super high pressure and temperature. As compared to other conventional tool materials, CBN has higher hardness and excellent heat resistance. With these distinct characteristics, SumiBoron can perform machining of hardened steel, high hardness cast iron and exotic metals where previously only done with grinding. Furthermore, excellent efficiency and longer tool life can also be achieved from high speed machining of cast irons.

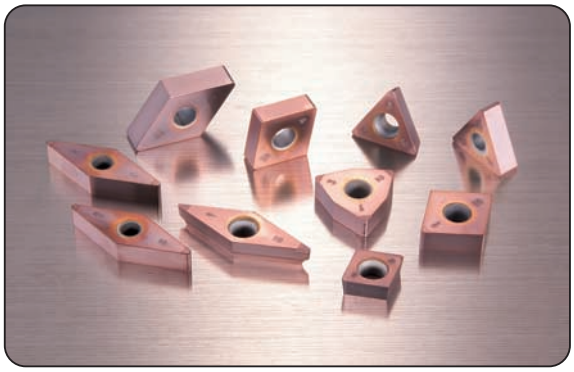
■ Characteristics

The sintered CBN tool - SumiBoron is mainly use for the machining of ferrous metals due to its low chemical reactions with iron. There are 3 different classifications of CBN as follows:

- A) in the table below shows high CBN content group, where each grain is fused together. Applicable for the machining of high hardness materials like cast iron, heat resistive alloys and carbides.
- B) below shows a group where CBN grains are held together with a special ceramic binder which has a strong binding force. These provide excellent wear resistance and toughness in the machining of hardened steel and cast iron.
- SumiBoron with a special ceramic coating (Coated SumiBoron). The CBN substrate along with the coating layer exhibit hardness, toughness, heat resistance and oxidation resistance, required by a tool material for excellent cutting performance.

■ Classifications/ Applications

Classifications	Structure	Diagram	Grade	Main Application
A) Mainly CBN grains fused together			**BN700**	High speed machining of cast iron（FC） Exotic alloys
			BNS800	High speed roughing of cast iron（FC） Exotic alloys
B) Mainly CBN grains held together with a binder			**BN500**	High precision machining of cast iron（FC/FCD）
			BN250	Continuous and interrupted machining of hardened steel
			BN350	Interrupted machining of hardened steel
			BNX10	High speed continuous machining of hardened steel
			BNX20	High efficiency machining of hardened steel
			BNX25	High precision machining of hardened steel
C) Sintered CBN body with special ceramic coating			**BNC80**	High precision machining of hardened steel
			BNC100 New	High speed continuous and Light interrupted machining of hardened steel
			BNC200	Continuous and interrrupted machining of hardened steel
			BNC300	Interrupted machining of hardened steel



New

■ General Features

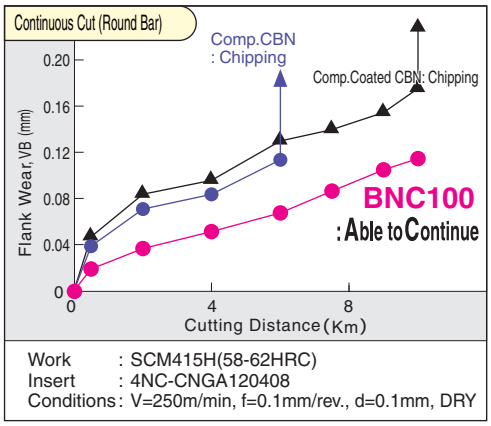
Utilizing an anti-crater wear CBN substrate coupled with a newly developed hybrid TiCN coating layer, BNC100 operates at high speed cutting conditions with excellent wear resistance.
Optimizing both toughness and wear resistance, stable and long tool life can be achieved during high speed finishing.

■ Characteristics

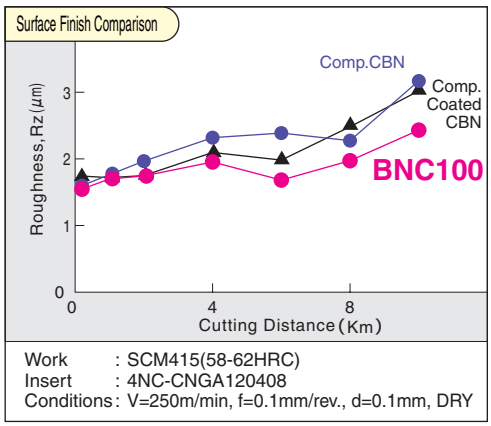
●Improved stability in surface finish and chipping control in high speed cutting.
- · Maintains good surface finish with smooth notch wear development.
- · Provides optimum balance of wear resistance and toughness.

●Achieving stable and long tool life in high speed continuous cutting
- · Hybrid TiCN coating provides excellent wear.
- · Newly developed anti-crater wear substrate.

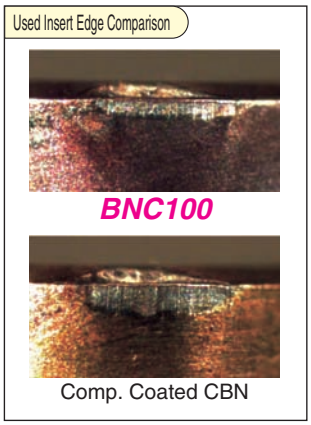
■ Cutting Performance



Work : SCM415H(58-62HRC)
Insert : 4NC-CNGA120408
Conditions: V=250m/min, f=0.1mm/rev., d=0.1mm, DRY



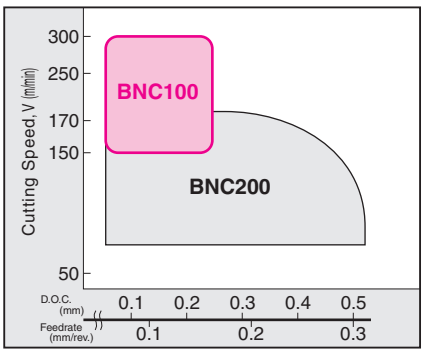
Work : SCM415(58-62HRC)
Insert : 4NC-CNGA120408
Conditions: V=250m/min, f=0.1mm/rev., d=0.1mm, DRY



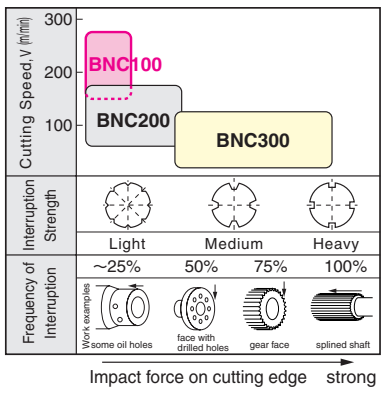
●BNC100 exhibits excellent wear resistance in high speed machining while maintaining good surface finish.

■ Application Range

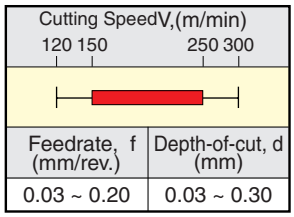
● Continuous Cutting of Hardened Steel



● Interrupted Cutting for Hardened Steel



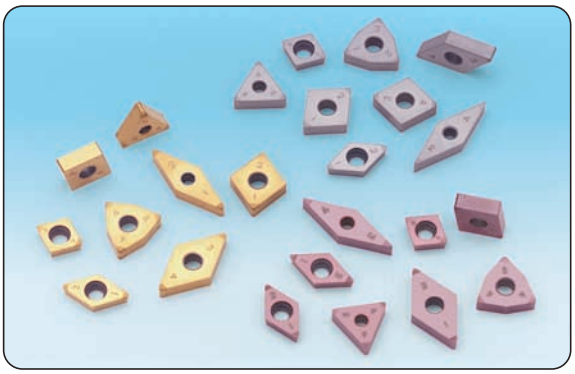
■ Recommended Conditions



Feedrate, f (mm/rev.)	Depth-of-cut, d (mm)
0.03 ~ 0.20	0.03 ~ 0.30

※ Coolant Continuous machining : Dry, Wet
Interrrupted machining : Dry

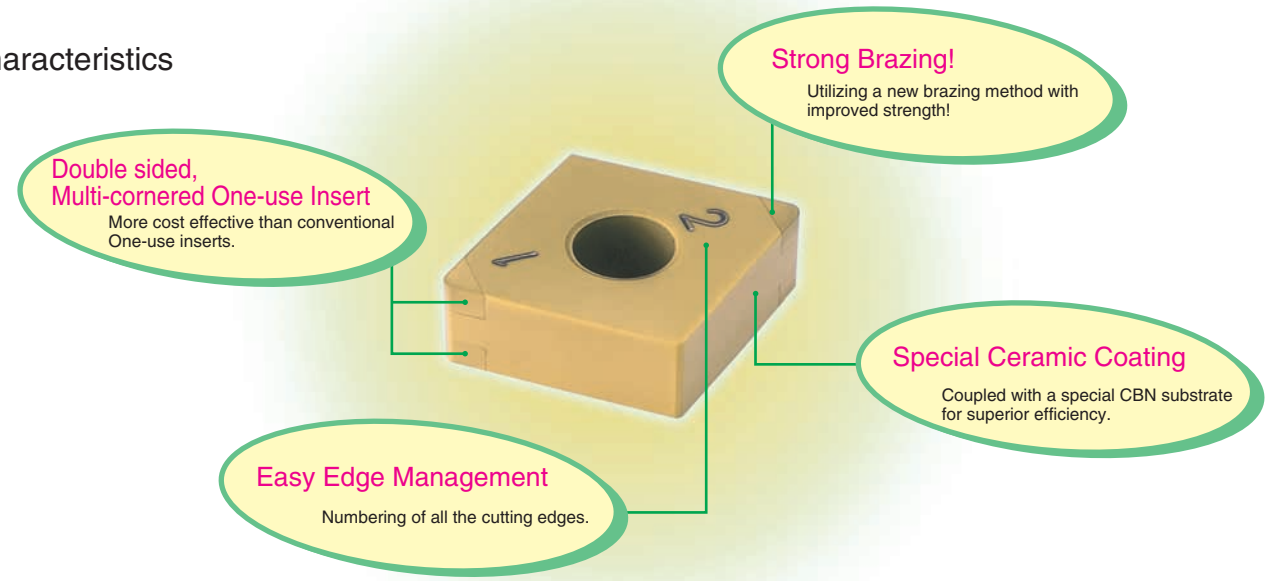
High Speed, High Efficiency, High Precision...
2nd Generation SUMIBORON!!



■ General Features

Coated SumiBoron 4 series expansion!!
Using a high heat resistant and tough CBN substrate coupled with a special ceramic coating, this series caters to a wide variety of applications, with improved precision and longer tool life as compared to conventional CBN. This expands the application range of CBN tools in hardened steel machining.
Available in economical, double-sided multi-cornered inserts, which are cost effective and easy to use on a wide range of hardened steel applications.

■ Characteristics



■ Cutting Performance

Application \ Condition	Cutting Speed (m/min) 100 200 300
Finishing — General Purpose (Continuous-Light interrupted)	BNC200 / BNC100 (New)
Finishing — Interrupted Cut (Middle Heavy interrupted)	BNC300
Finishing — High Precision (Rz =1.6~3.2)	BNC80
High Efficiency (Caburized layer removal)	BNC200

■ Cutting Edge Management


- The corner numbering are still visible after machining, making the management of the cutting edges easy.


Before use

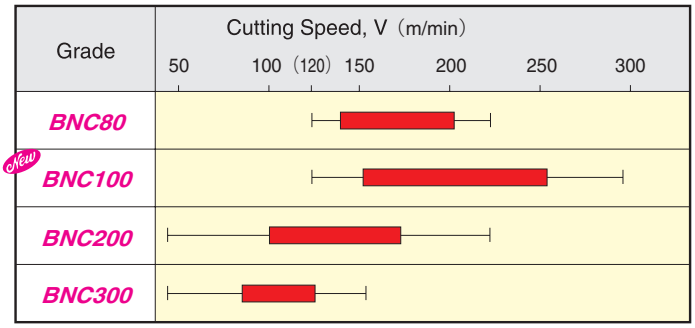
After use

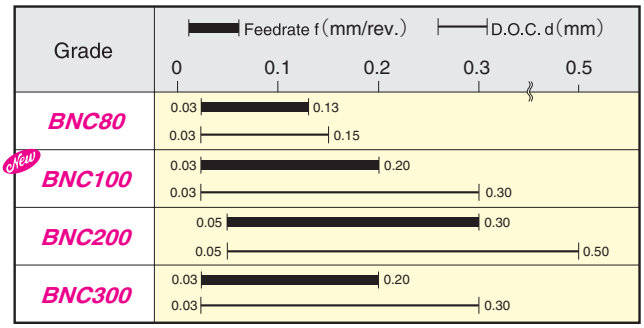
- The used corner can be easily identified.

Characteristics of Grades

Grades	Application	Characteristic	Hardness Hv (GPa)	TRS (GPa)
BNC80	 High Precision Machinning	● Superior substrate along with an extra smooth coating exhibit a good balance of wear and fracture resistance. ● Achieving 1.6S in high precision finishing of hardened steel.	31～33	1.00～1.10
BNC100 New	 High Speed Machinning	● Combination of an excellent anti-crater wear substrate, with a good wear resistant coating. ● Best choice for high speed finishing from continuous to light interrupted machining.	29～32	1.00～1.10
BNC200	 High Efficiency Machinning	● High toughness substrate with superior wear resistant coating combination. ● High efficiency machining with large depth-of-cut, removal of caburized layer.	33～35	1.10～1.20
BNC300	 Interrupted Machinning	● Fracture resistant, extra-high toughness substrate with a superior coating that exhibits both peel-off and wear resistance. ● Best choice for finishing when there is a combination of continuous and interrupted cutting.	33～35	1.15～1.25

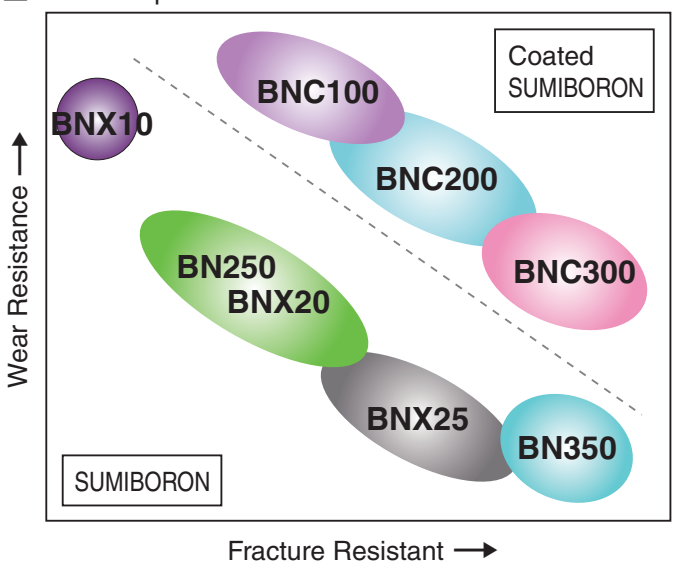
Recommended Conditions





● BNC200 can be use for the removal of caburized layer on hardened steels

Grade Map of Coated CBN



Tool Material Comparison

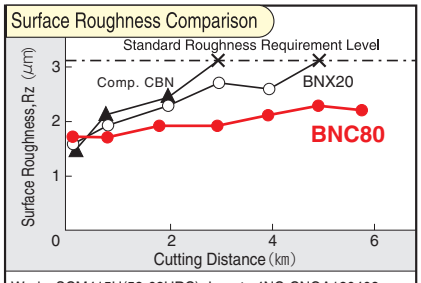
Materials	Thermal Resistance	Hardness Hv (GPa)
SUMIBORON	○	30～35
Ceramic Coating Layer	◎	17～30
Tungsten Carbide	△	15
Cermet	○	16

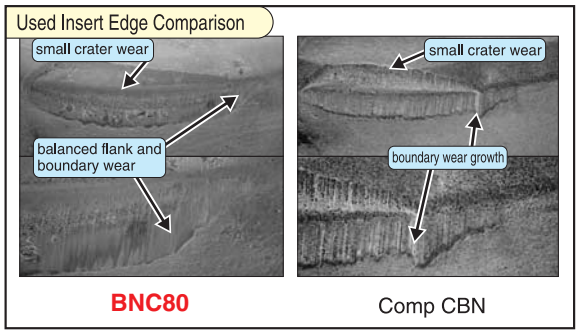
SUMIBORON, with its good thermal resistant ceramic content, can withstand high temperatures that occur at the cutting point during machining of hardened steels (around 1000℃). Coated SUMIBORON performs even better under the same circumstances.

Combining a hard CBN substrate with a ceramic coating to give a stronger thermal resistance and also a marked improvement in wear resistance. All these properties open up a whole new dimension in hardened steel machining!

■ Cutting Performance

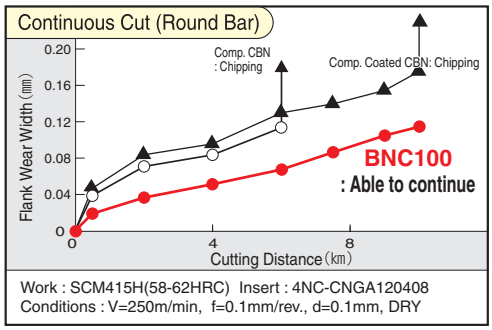
BNC80

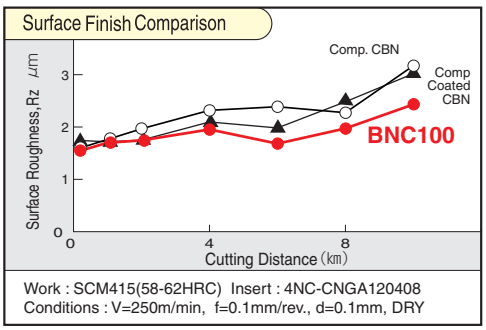




● BNC80 is able to maintain good surface finishing with only slight growth in front cutting edge boundary wear.

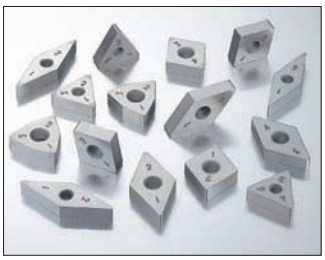
BNC100 New

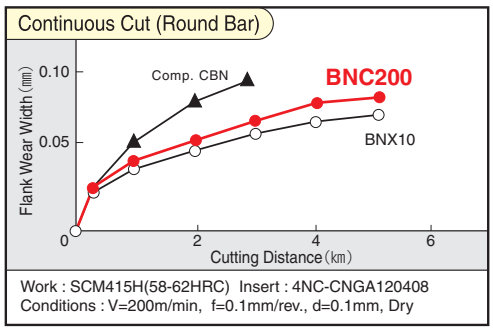


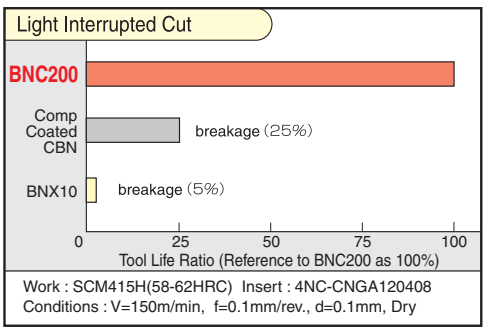


● BNC100 exhibits excellent wear resistance in high speed machining with good surface finish.

BNC200

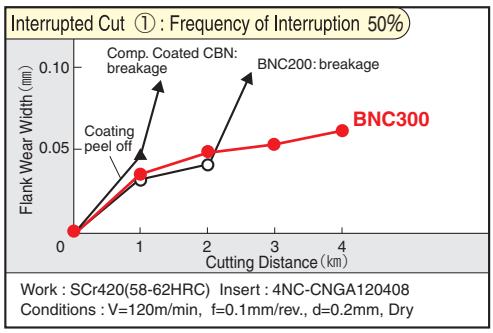


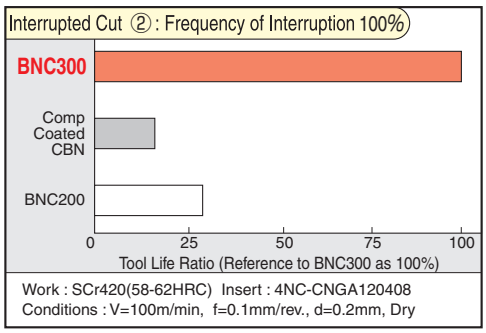




● BNC200 is a good balance of wear and fracture resistance suited for a wide application range.

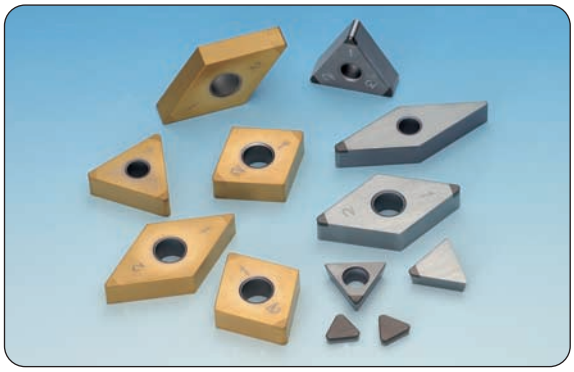
BNC300





● BNC300 exhibits good fracture resistance in interrupted cutting and can also perform on continuous cutting portion.

The Absolute In Interrupted Machining Of Hardened Steel!



■ General Features

BNC300

Newly developed CBN substrate that emphasizes on toughness coupled with a high wear resistant TiAlN based coating layer that has improved adhesion strength. With a good balance of fracture and wear resistance, stable and longer tool life can be achieve in interrupted cut or in a mixture of continuous and interrupted cutting.

BN350

SumiBoron series highest fracture resistant, tough CBN. Reliable grade for achieving stable tool life in heavy interrupted cutting conditions.

■ Characteristics

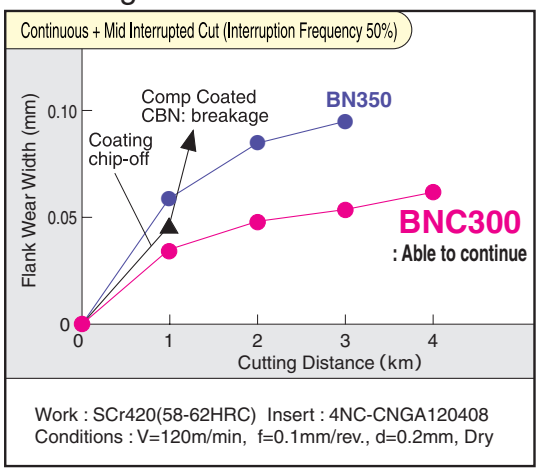
BNC300

- **Stable and long tool life in interrupted cutting**
  Achieving stable and long tool life in heavy interrupted cutting, with superior fracture resistance.
- **Superior dimensional precision**
  Good adhesion strength, TiAlN based, high wear resistance coating. Achieving superior dimensional precision even in interrupted cutting.
- **Stable and long tool life in interrupted cutting**
  Achieving stable and long tool life in heavy interrupted cutting, with superior fracture resistance.

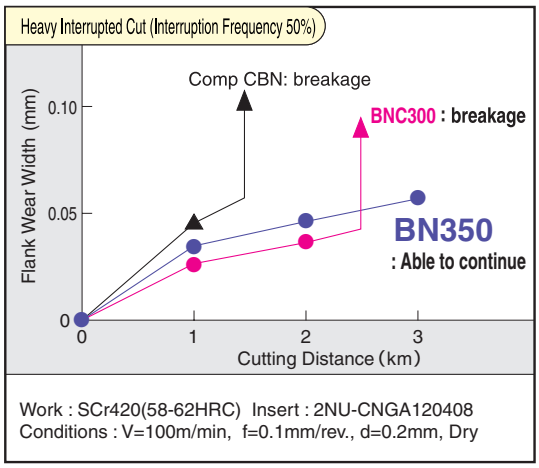
BN350

- **Stable and long tool life in interrupted cutting**
  Stable and long tool life with superior fracture resistance, that prevents fracture which commonly occurs during interrupted cutting.

■ Cutting Performance



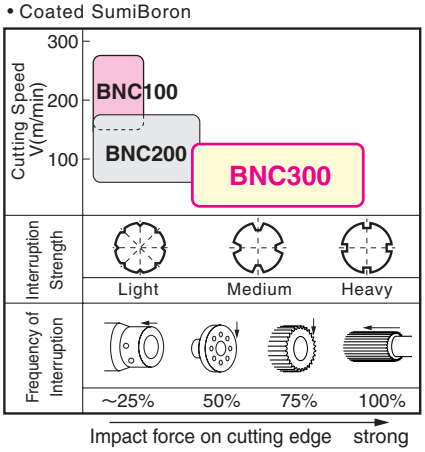
★ BNC300 has superior balance of fracture and wear resistance.



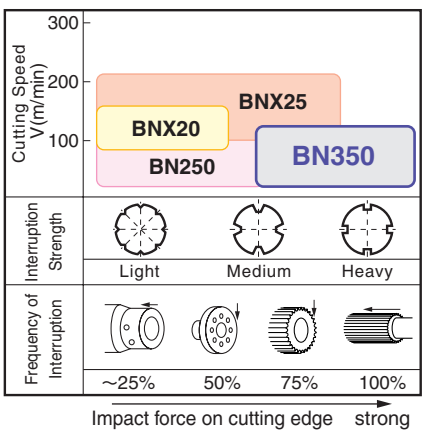
★ BN350 exhibits very good fracture resistance.

■ Application Range

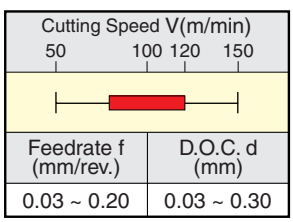
• Coated SumiBoron



• SumiBoron



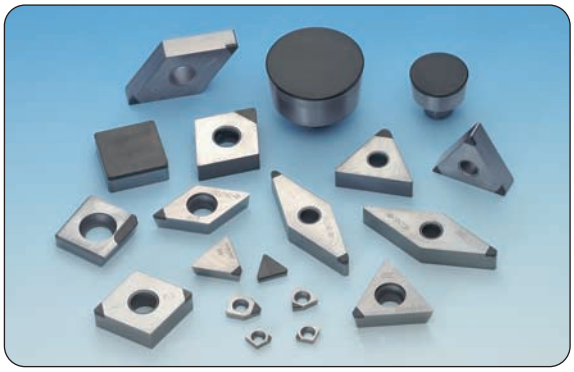
■ Recommended Conditions
(For Both BNC300/BN350)



Feedrate f (mm/rev.)	D.O.C. d (mm)
0.03 ~ 0.20	0.03 ~ 0.30

※ Coolant : Dry

High Speed Finishing Of Cast Iron And Sintered Alloy!



■ General Features

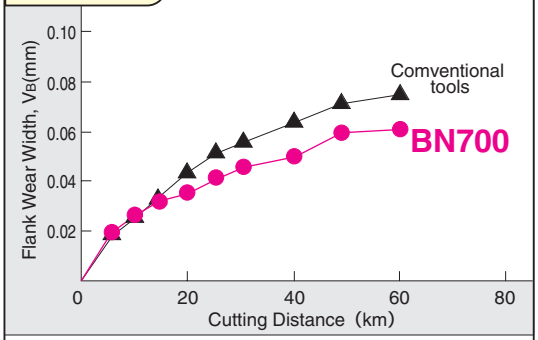
The optimum construction of this new CBN material, with a huge increase in CBN percentage, gives it improved material toughness and heat dissipation ratio. Achieving long and stable tool life by exhibiting a good balance of wear and fracture resistance, in the high speed maching of Cast Iron and Sintered Alloy.
Having a wide product range from turning inserts to milling inserts, coupled with various edge treatments such as: sharp edge type to prevent burrs in sintered alloy machining or strong edge type for interrupted cutting etc., to obtain effective performance in any machining situation.

■ Characteristics

- **Excellent for high speed finishing of Cast Iron!**
  Good wear and fracture resistance in high speed machining of Grey Cast Iron.
- **Excellent for Sintered Alloy machining!**
  With 4 different types of edge treatment, stable and long tool life can be achieved from machining of Sintered Alloys of any shape or hardness.
- **Able to machine any Exotic Metals.**
  Long tool life can also be achieved for the machining of exotic materials such as Roll, HSS and Heat-Resistive Alloy etc.

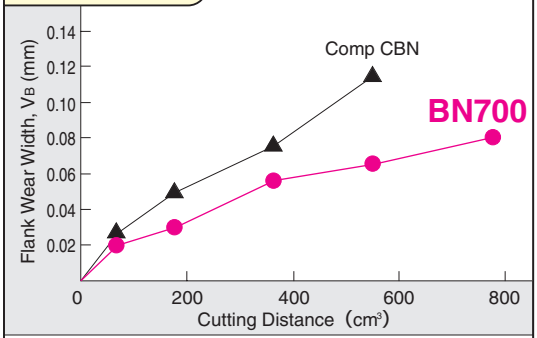
■ Cutting Performance

Cast Iron Turning



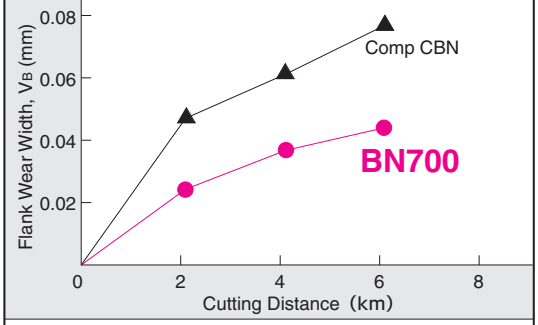
Work : FC300 (Pearlite) Insert : 2NU-CNGA120408
Conditions : V=800m/min、f=0.13mm/rev.、d=0.2mm、Wet

Cast Iron Milling



Work : FC300 (Pearlite) Tool : FMU4100R、SNEW1203ADTR
Conditions : V=1700m/min、f=0.15mm/rev.、d=0.5mm、Dry

Hardened Sintered Alloy



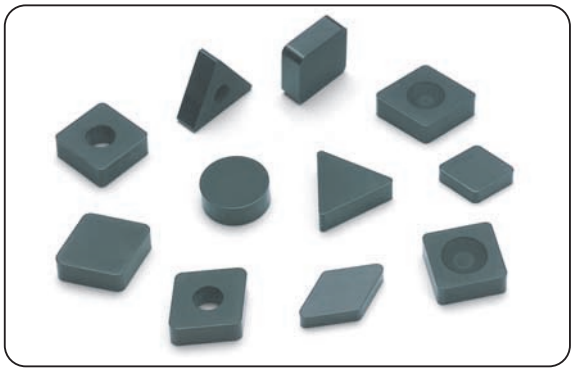
Work : SMF4040 Insert : 2NU-CNGA120408T
Conditions : V=120m/min、f=0.12mm/rev.、d=0.25mm、Dry

■ Recommended Cutting Edge Styles

General Sintered Alloy (SMF Standard)	Continuous cut ⟷ Interrupted cut	Standard type PM: For interrupted cutting of sintered alloy (S00525)
	Emphasis on precision	Standard type F: Sharp edge type (with no processing of blade edge)
High Density Sintered Alloy	Continuous cut ⟷ Interrupted cut	Standard type T : Reinforced blade edge type (S01225)
Hardened Sintered Alloy		T : Reinforced blade edge type (S01225)

Sharp edge type insert is identified by F after the catalogue no.
Strong edge type insert is identified by T after the catalogue no.
For interrupted cutting of sintered alloy is identified by PM after the catalogue no.

From Finishing to Roughing of Cast Iron and Exotic Metals!



■ General Features

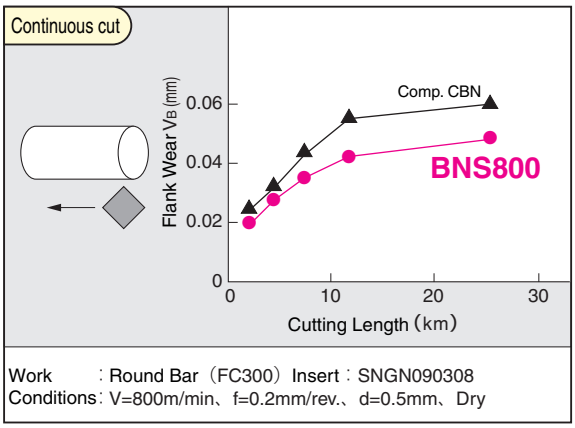
New solid structure CBN insert. As all the edges can be used, total machining cost will be lower, compared to conventional CBN inserts.
Biggest demand for this insert will be in Cast Iron machining. As conventional brazed CBN inserts are not suitable for high speed cutting and roughing, BNS800 can be used even for high speed finishing processes with many times the tool life of ceramic inserts. Precision machining of within 10μm can be achieved.

■ Characteristics

- **Larger Cutting Depths**
  100% solid CBN structure where the whole edge can be use.
- **High Precision Machining**
  Excellent balance of wear resistance and toughness.
- **Total Cost Effectiveness**
  All corners of the insert can be utilized.

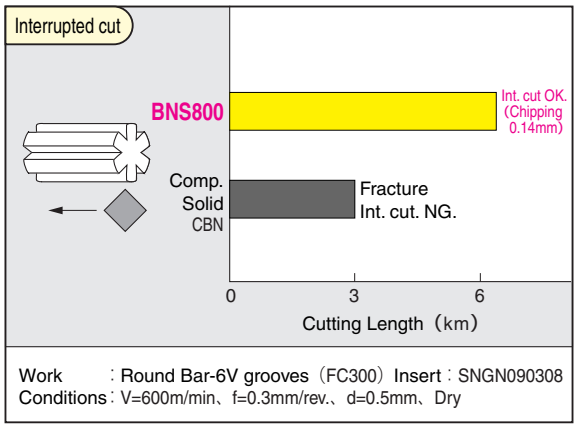
Refer to pages L46~L47 for BNS800 special holders and page L57 for RM Type milling cutter.

■ Performance



Work : Round Bar (FC300) Insert : SNGN090308
Conditions : V=800m/min、f=0.2mm/rev.、d=0.5mm、Dry

● Wear resistance is better than competitor's.

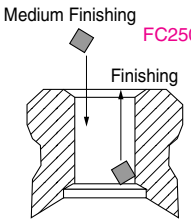


Work : Round Bar-6V grooves (FC300) Insert : SNGN090308
Conditions : V=600m/min、f=0.3mm/rev.、d=0.5mm、Dry

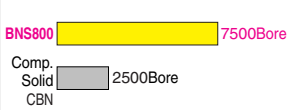
● Double the competitor's fracture resistance.

■ Application Example

● Cylinder Bore

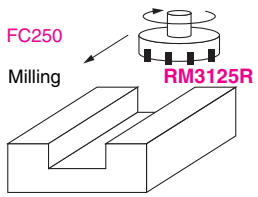


(Tool life criteria: Finishing)

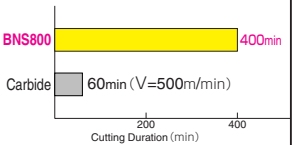


Process	Med. Finish	Finishing
Grade	BNS800	
Insert	SNGN090308	
V	1000m/min	
f	0.3mm/rev.	0.25mm/rev.
d	0.2mm	
Coolant	Wet	

● Machine Bed

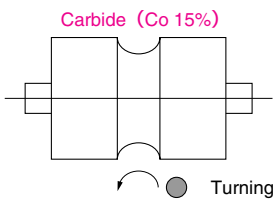


(Tool life criteria: Finishing)

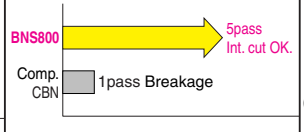


Process	Roughing
Grade	BNS800
Insert	SNEN090308W
V	1500m/min
f	0.2mm/rev
d	2.5mm (2 pass)
Coolant	Dry

● Carbide Roll

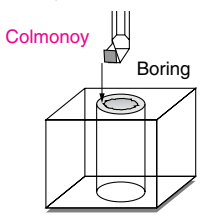


(Tool life criteria: breakage)

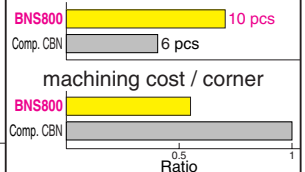


Process	Finishing
Grade	BNS800
Insert	RNGN090300
V	40m/min
f	0.15mm/rev.
d	0.2mm
Coolant	Wet

● Sprayed Face Bore



(Tool life criteria: breakage)

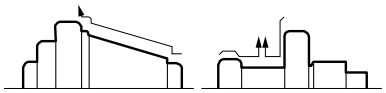
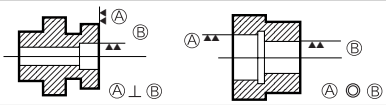


Process	Rough	Finishing
Grade	BNS800	
Insert	SNGN090312	SNGN090308
V	80m/min	
f	0.04mm/rev.	0.03mm/rev.
d	~3mm	0.5mm
Coolant	Wet	

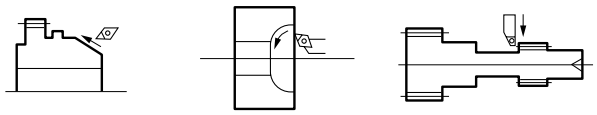
HARDENED STEEL MACHINING

■ Merits of using CBN

Below is an anaysis on the use of CBN as compared to grinding:
In terms of cost investments, it is much lower in machine cost and overhead cost due to the fact that a CNC lathe is cheaper than a grinding machine.
As for the quality of surface finish, inserts can machine different profiles with the workpiece finishing as commendable as with grinding.
Environmentally, sludge treatment for grinding is a hazard to the environment but for turning process, the chips can be collected and recycled.

	Advantages	Details
Cost	Facility Investment is low	• Cheaper machines. • Improved efficiency with less machine required.
	Profile finishing in a single set-up	
Quality	Improved precision	
Environment	Environmentally Friendly	Sludge management → Chips management (recyclable)

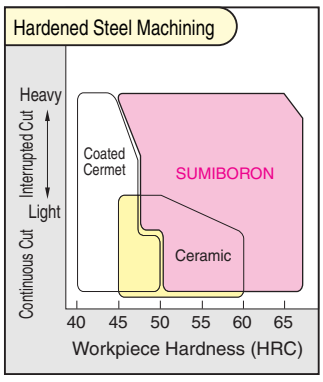
Machining Versatility In Using CBN

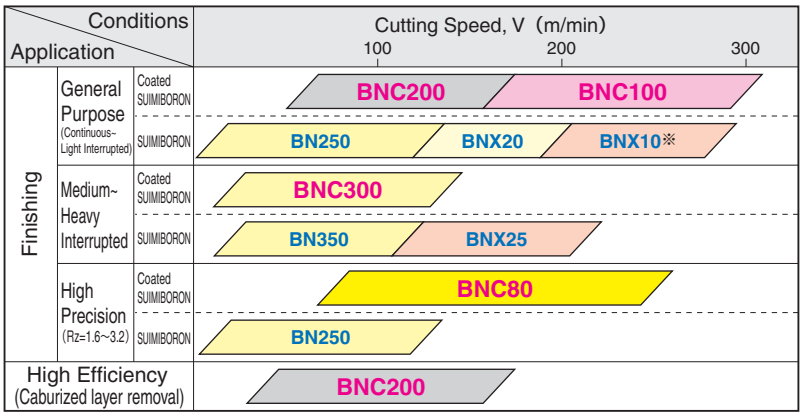


■ Recommended Grade

Series	Grade	Application	Characteristics	Hardness, Hv (GPa)	TRS (GPa)
Coated SUMIBORON	BNC80	High precision continuous cutting	High precision grade that produces excellent finishing due to the very smooth coating.	31 ~ 33	1.00 ~ 1.10
	BNC100 (New)	High speed continuous Light interrupted cutting	Best suited for high speed, continuous and light interrupted finishing due to the stable heat and fracture resistant substrate and wear resistant coating.	29 ~ 32	1.00 ~ 1.10
	BNC200	Continuous~Light interrupted cutting High efficiency cutting	Tough substrate with excellent wear resistant coating makes this a general purpose grade with long tool life in both low to high speed cutting conditions.	33 ~ 35	1.10 ~ 1.20
	BNC300	Interrupted cutting	Fracture resistant substrate with good peel-off and wear resistant coating, makes it the best grade for machining workpiece with a mixture of continuous and interrupted cutting.	33 ~ 35	1.15 ~ 1.25
SUMIBORON	BNX10	High speed continuous cutting	Best wear resistant grde, suitable for high speed continuous cutting.	27 ~ 31	0.80 ~ 0.90
	BNX20	High efficiency cutting	Best crater resistant grade, suitable for high efficiency cutting under high temperature conditions.	31 ~ 33	0.95 ~ 1.10
	BNX25	High precision continuous cutting	Superior fracture toughness in high speed cutting and suited for high speed interrupted cutting.	29 ~ 31	1.00 ~ 1.10
	BN250	Continuous cutting Light~Medium interrupted cutting	Foremost general purpose CBN grade with an excellent balance of wear and fracture resistance.	31 ~ 34	1.00 ~ 1.10
	BN350	Medium~Heavy interrupted cutting	Micro-grained CBN grade that achieves a high cutting edge strength besides having high toughness.	33 ~ 35	1.20 ~ 1.30

■ Application Range





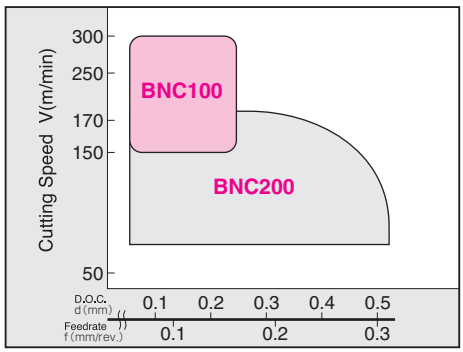
※ BNX10 is recommended for continuous cutting.

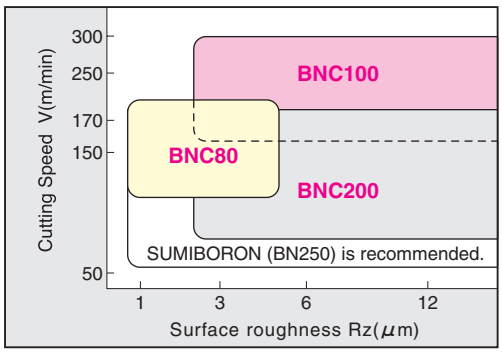
INTERRUPTED CUTTING OF HARDENED STEEL

RECOMMENDED GRADES : BNC80/BNC100/BNC200/BNX10/BNX20/BN250

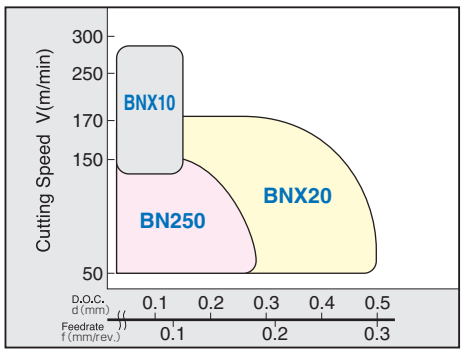
■ Application Range

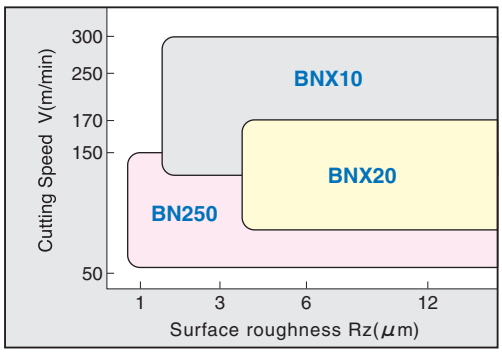
● Coated SUMIBORON (1st Recommendation)



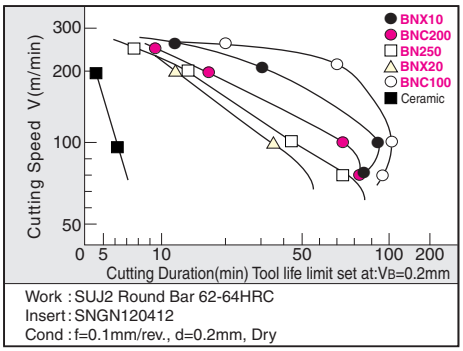


● SUMIBORON





■ Cutting Performance



Work : SUJ2 Round Bar 62-64HRC
Insert : SNGN120412
Cond : f=0.1mm/rev., d=0.2mm, Dry

■ Application Range

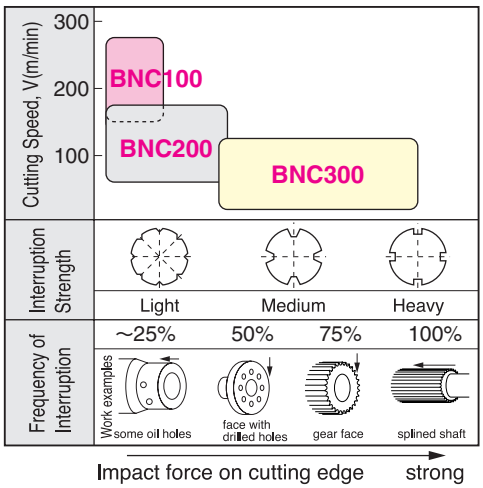
Series	Grade	Cutting Speed V(m/min) 50 100 (120) 150 200 250 300	f (mm/rev.)	d (mm)
Coated SUMIBORON	BNC80		0.03 ~ 0.13	0.03 ~ 0.15
	BNC100		0.03 ~ 0.20	0.03 ~ 0.30
	BNC200		0.05 ~ 0.30	0.05 ~ 0.50
SUMIBORON	BNX10		0.03 ~ 0.15	0.03 ~ 0.20
	BNX20		0.03 ~ 0.30	0.03 ~ 0.50
	BN250		0.03 ~ 0.20	0.03 ~ 0.30

CONTINUOUS CUTTING OF HARDENED STEEL

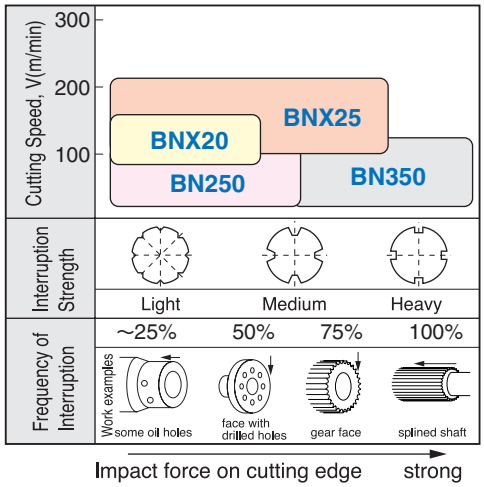
RECOMMENDED GRADES: BNC200/BNC300/BNX25/BN250/BN350

■ Application Range

● Coated SUMIBORON (1st Recommendation)



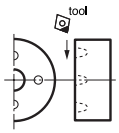
● SUMIBORON



■ Cutting Performance

Light Int. - face with 4 holes (Freq. of Int. 25%)

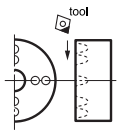
Work : SCr420H 58-62HRC
Conditions
Cutting speed : 100m/min
Feedrate : 0.1mm/rev.
Depth of cut : 0.2mm
Dry
Insert : CNMA120408



Grade	Tool life 50 100
BN250	
BNC300	
BN350	
BNX25	

Med. Int. - face with 8 holes (Freq. of Int. 50%)

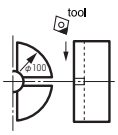
Work : SCr420H 58-62HRC
Conditions
Cutting speed : 100m/min
Feedrate : 0.1mm/rev.
Depth of cut : 0.2mm
Dry
Insert : CNMA120408



Grade	Tool life 50 100
BN250	
BNC300	
BN350	
BNX25	

Heavy Int. - U grooved face (Freq. of Int. 100%)

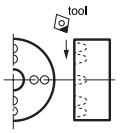
Work : SCr420H 58-62HRC
Conditions
Cutting speed : 100m/min
Feedrate : 0.1mm/rev.
Depth of cut : 0.2mm
Dry
Insert : CNMA120408



Grade	Tool life 50 100
BN250	
BNC300	
BN350	
BNX25	

Hi Speed nt. - Face with 8 holes (Freq. of Int. 50%)

Work : SCr420H 58-62HRC
Conditions
Cutting speed : 200m/min
Feedrate : 0.1mm/rev.
Depth of cut : 0.2mm
Dry
Insert : CNMA120408



Grade	Tool life 50 100
BN250	
BNC300	
BN350	
BNX25	

■ Application Range

Series	Grade	Cutting Speed, V(m/min) 50 100 (120) 150 200 250 300	f (mm/rev.)	d (mm)
Coated SUMIBORON	BNC200		0.05 ~ 0.30	0.05 ~ 0.50
	BNC300		0.03 ~ 0.20	0.03 ~ 0.30
SUMIBORON	BNX25		0.03 ~ 0.30	0.03 ~ 0.50
	BN250		0.03 ~ 0.20	0.03 ~ 0.30
	BN350		0.03 ~ 0.20	0.03 ~ 0.30

※ For interrupted cutting, please use dry cutting.

SINTERED COMPONENT MACHINING

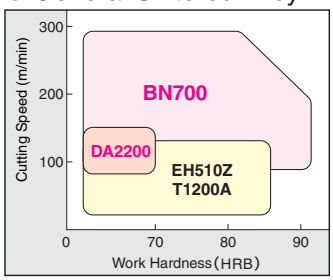
● Merits of Sintered Component machining with SUMIBORON

As compared to carbide or cermet, edge wear is very small for SUMIBORON, which also has better wear resistance and can be form to a sharp edge easily. Good machining precision and surface finish can be achieved because SUMIBORON is able to prevent burrs and chipping on the edges of the workpiece.

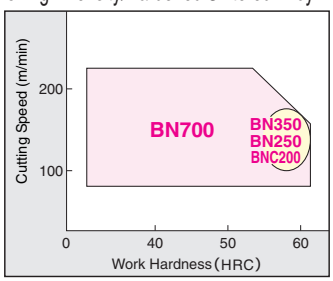
General Sintered Alloy

■ Recommended Grades

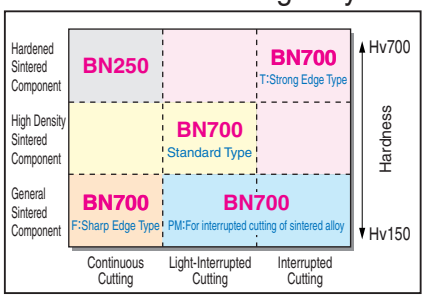
● General Sintered Alloy



● High Density/Hardened Sintered Alloy



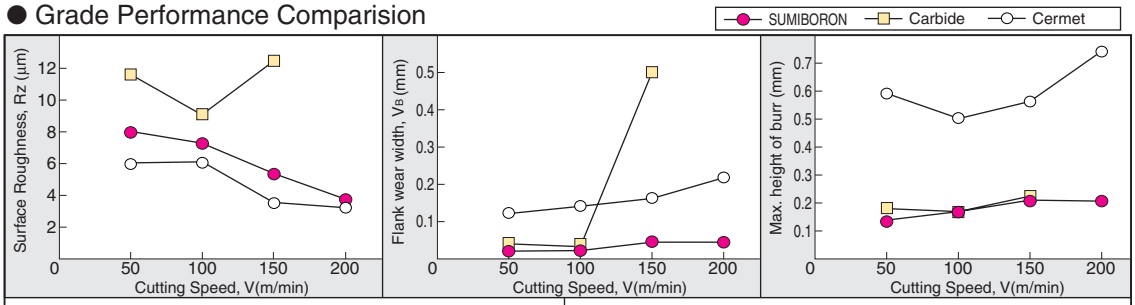
■ Recommended Edge Styles



※BN700 has 4 types of edge treatment to suit the various applications. (Standard, Sharp edge, Strong edge, For interrupted cutting of sintered alloy)

■ Cutting Performance

● Grade Performance Comparision



Work	: SMF4040 equivalent
Process details	: ∅100-∅80mm heavy interrupted facing with grooves and drilled holes. (after 40 passes)
Insert	: TNGA160404
Conditions	: f=0.1mm/rev,d=0.1mm, Wet

For general sintered alloy, carbide and cermet can perform up to V=100m/min. But around V=120m/min, wear growth becomes rapid and surface roughness deteriorates with increased burrs.
On the other hand, SUMIBORON exhibits stability and superior wear resistance, burr prevention and surface roughness especially at high speeds.

Valve Seat Ring (VSR)

※ VSR has both (Intake : IN) and (Exhaust : EX) with the exhaust being hardened.

■ Recommended Grades

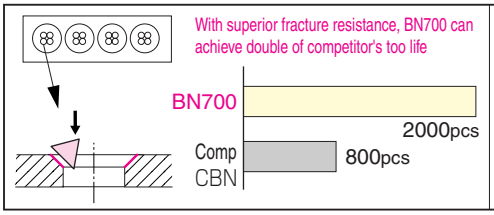
● Grade Performance Comparision

	Gasoline VSR material	Diesel VSR material
Plunge cut	BN700 BN350	BN700 BN350
Traverse cut	BN700 BN500	BN700 BN500
Hardness (HV)	low ← 300HV → high	low ← 300HV → high

■ Recommended Conditions

Cutting Speed, V(m/min)	50 ~ 125
Feedrate, f(mm/rev)	0.03 ~ 0.2
Depth of cut, d(mm)	0.05 ~ 0.5

■ Application Examples



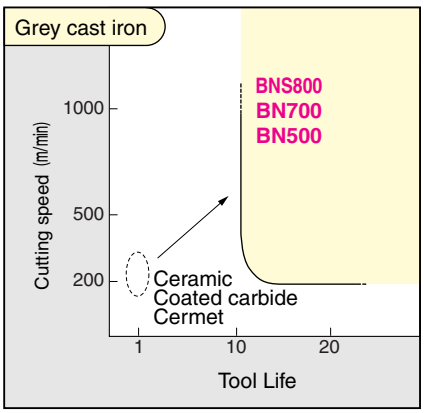
Work = Sintered alloy (150-250HV)
Process = VSR(IN) Plunge cut
Insert = TBGN060104B BN700
Cond. = V=75m/min f=0.1mm/rev Wet

CAST IRON MACHING

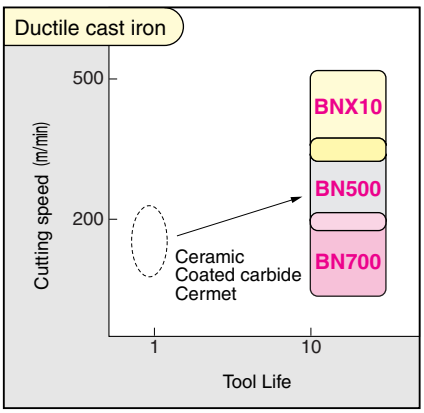
● Merits of using CBN

Following chart shows merits of using CBN in cast iron machining compared with conventional tool, such as carbide, cermet or ceramics.
SUMIBORON performs longer tool life than conventional tools in high speed machining and brings higher efficiency and superior precision.

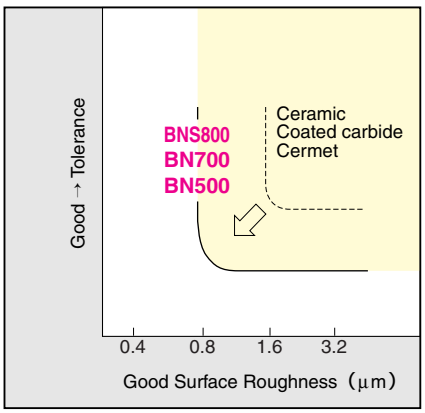
High Speed Machining



High Speed Machining



High Precision Machining

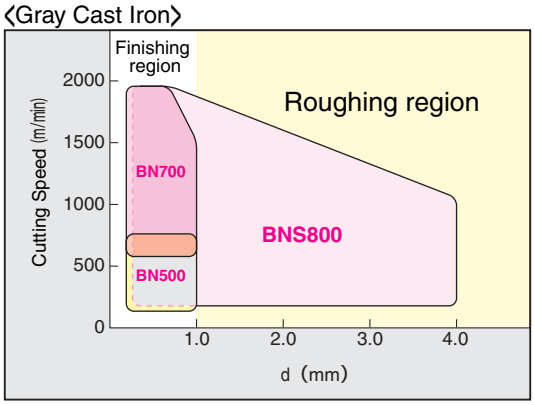


■ Grade and Application

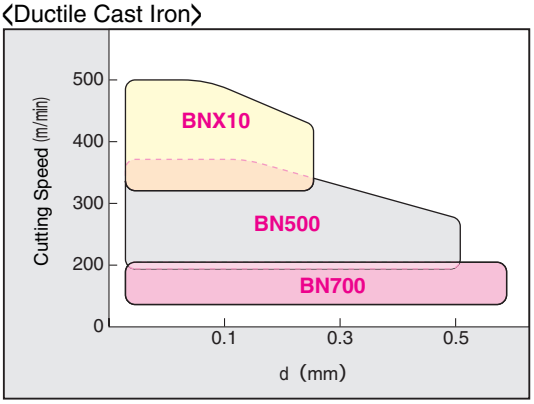
Grade	Application	Characteristics	Hardened Hv (GPa)	TRS (GPa)
BN500	FCD、FC machining Hardened VSR cutting (Traverse cut)→L13 Con't finishing of Hardened Roll→L16	Most suited for Cast Iron machining with a good balance of wear and fracture resistance	32 ~ 34	1.00 ~ 1.10
BN700	High speed machining of FC Cast Iron milling Iron based products→L13 Rolls of high hardness→L16 Heat resistive steels→L16	Lesser burrs when machining sintered parts due to excellent edge sharpness	40 ~ 43	1.20 ~ 1.30
BNS800	High speed machining of FC Iron based products→L13 Rolls of high hardness→L16 Hard Facing Alloys→L16 Special Cast Iron machining	High thermal impact resistance with high heat transfer ability and higher CBN content ratio	39 ~ 42	0.95 ~ 1.10

■ Application Range

〈Gray Cast Iron〉



〈Ductile Cast Iron〉



〈Special Cast Iron〉

Work	Hardness (HB)	Structure	Examples	Cutting Speed (m/min) 100 200 300 400
Ni-resist Cast Iron	150 ~ 200	Austenite	Piston ring	BN500
High-Cr Cast Iron	250 ~ 350	Austenite	Pump parts	BNS800
FCV	400 ~ 580	Pearlite	Engine block Cylinder head Disc brakes	BNX10

■ Recommended Conditions

● Turning Guidance

Work Material		Grade	Recommended Cutting Conditions		
Material Name	Hardness Code		V(m/min) 100 – 1000 – 2000	f (mm/rev)	d (mm)
Grey Cast Iron	FC200 ~ FC300 (HB≦230)	BN700	500 – 2000	0.1 ~ 0.5	≦1.0
		BNS800	200 – 2000	0.1 ~ 1.0	≦4.0
		BN500	200 – 700	0.1 ~ 0.5	≦1.0
Alloy Cast Iron	(HB≧200)	BN700	200 – 800	0.1 ~ 0.4	≦0.5
		BNS800	200 – 1000	0.1 ~ 0.8	≦2.0
Ductile Cast Iron	FCD450 ~ FCD550	BN700	80 – 200	0.1 ~ 0.4	≦0.6
		BN500	100 – 350	0.1 ~ 0.4	≦0.5
		BNX10	250 – 500	0.1 ~ 0.2	≦0.3
	FCD600 ~ FCD700	BN500	100 – 300	0.1 ~ 0.4	≦0.5

Dry cut is recommended for BNS800

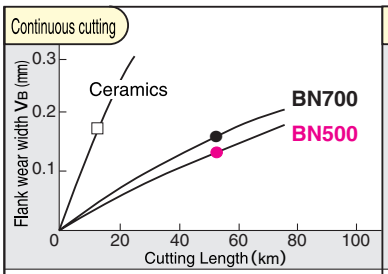
● Milling Guidance

Work Material		Grade	Recommended Cutting Conditions		
Material Name	Hardness Code		V(m/min) 100 – 1000 – 2000	f (mm/rev)	d (mm)
Grey Cast Iron	FC200 ~ FC300 (HB≦200)	BN700	800 – 2000	0.1 ~ 0.5	≦0.5
		BNS800	800 – 2000	0.1 ~ 1.0	≦4.0

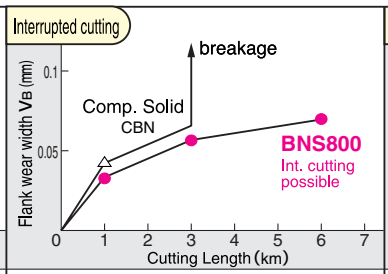
Please use dry cut.

■ Cutting Performance

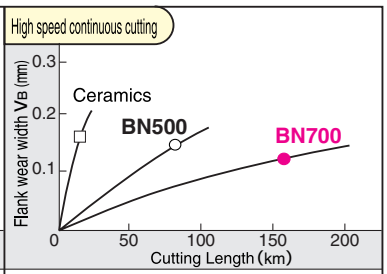
Grey cast iron turning → Recommended Grade: **BNS800/BN700/BN500**



Work Conditions: FC300 Insert: SNGN120412 V=500m/min, f=0.3mm/rev., d=0.15mm, Wet

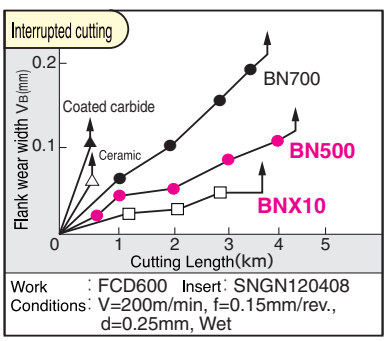


Work Conditions: FC300 Insert: SNGN090308 V=600m/min, f=0.3mm/rev., d=0.5mm, Dry



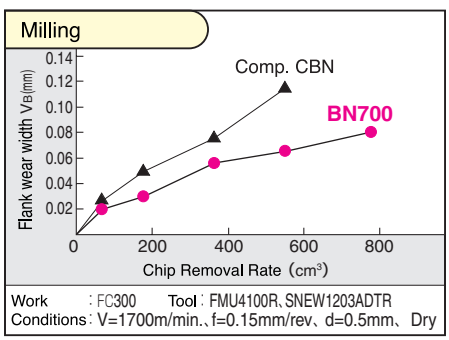
Work Conditions: FC250 Insert: SNGN120412 V=1,200m/min, f=0.25mm/rev., d=0.3mm, Wet

Ductile cast iron turning → Recommended Grade: **BN500/BNX10**



Work Conditions: FCD600 Insert: SNGN120408 V=200m/min, f=0.15mm/rev., d=0.25mm, Wet

Grey Cast Iron Milling → Recommended Grade: **BNS800/BN700**



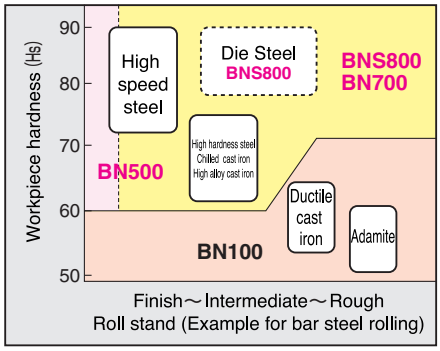
Work Conditions: FC300 Tool: FMU4100R, SNEW1203ADTR V=1700m/min., f=0.15mm/rev、d=0.5mm、Dry

ROLL MACHINING

● Merits of Roll machining with SUMIBORON

SUMIBORON enables the machining of high hardness rolls which were difficult to machine by conventional tools, thus drastically improves machining efficiency.

■ Recommended Grades



■ Recommended Conditions

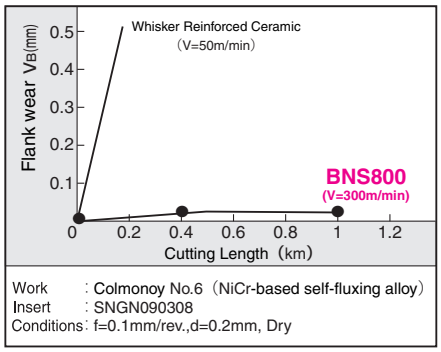
Work		Recommended Conditions		
Material type	Hardness (Hs)	V(m/min) 20 40 60 80 100 120 140	f (mm/rev)	d (mm)
Adamite	≧40		0.1 ~ 0.5	0.2 ~ 3.0
Chilled cast iron	≧60		0.1 ~ 0.5	0.2 ~ 3.0
High alloy cast iron	≧60		0.1 ~ 0.5	0.2 ~ 3.0
High speed steel	≧70		0.1 ~ 0.4	0.1 ~ 3.0

HARD FACING ALLOYS MACHINING

● Merits of machining Hard Facing Alloys with SUMIBORON

SUMIBORON enables the machining of Hard Facing Alloys, once considered difficult to machine.

■ Cutting Performance



● Small wear at V=300m/min

■ Recommended Conditions

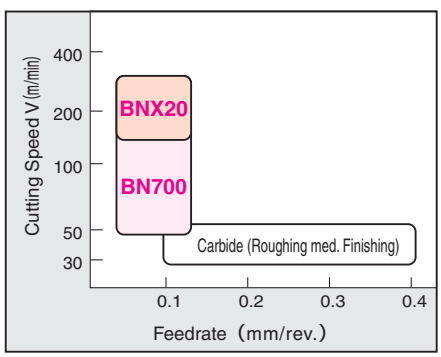
Work		Recommended Conditions		
Category	Name	V(m/min) 50 100 200 300	f (mm/rev)	d (mm)
Ni-based Self-fluxing alloy	Colmonoy No.6		0.05 ~ 0.2	0.1 ~ 3.0
Co-based Self-fluxing alloy	Stellite		0.05 ~ 0.2	0.1 ~ 1.0

HEAT RESISTIVE ALLOYS MACHINING

● Merits of cutting heat resistive alloys with SUMIBORON

SUMIBORON BN600 provides long tool life in the finishing of heat resistive alloys.

■ Recommended Grades



● SUMIBORON is best suited for finishing of heat resistive steel

■ Recommended Conditions

Work		Recommended Conditions		
Material type	Typical example	V(m/min) 50 100 150 200	f (mm/rev)	d (mm)
Ni base heat resistant alloy	Inconel 718		0.05 ~ 0.2	0.1 ~ 1.0
Co base heat resistant alloy	Stellite		0.05 ~ 0.2	0.1 ~ 1.0

Regrindable Type

CNMA120408(-) B

① Insert ISO Code (ISO Standard Classification)

② Additional Information Table 1

Table 1 ② Additional Information

Code	Code Description
(–)B	Full-top CBN insert
–BSN	Full-top CBN insert (Small edge treatment)

One-use Type

2NU - CNGA120408S

① No. of Cutting Edges Table 2

② Type Code Table 3

③ Insert ISO Code (ISO Standard Classification)

④ Additional Information Table 4

Table 2 ① No. of Cutting Edges

Code	No. of Cutting Edges	Type
(No Code)	1 cutting edges	Single Corner
2	2 cutting edges	Multi-Corner
3	3 cutting edges	
4	4 cutting edges	
6	6 cutting edges	

Table 3 ② Type Code

Code	Series	Grade
NC	Coated SUMIBORON	BNC80, 100, BNC200, 300
NU	SUMIBORON	BNX10, 20 BN250, 350 BN500, 700
NS		BNX25

※ NS type is the one-use type insert, using the latest brazing technique, for BNX25 grade. The shape is similar to NU type.

Table 4 ④ Additional Information

Code	Code Description
(No Code)	Standard Type
F	Sharp Edge Type
S	Small Edge Treatment Type
M	Continuous Cutting General Type
T	Strong Edge Type
PM	For interrupted cutting of sintered alloy
W	Wiper Insert
SV	Chipbreaker Type

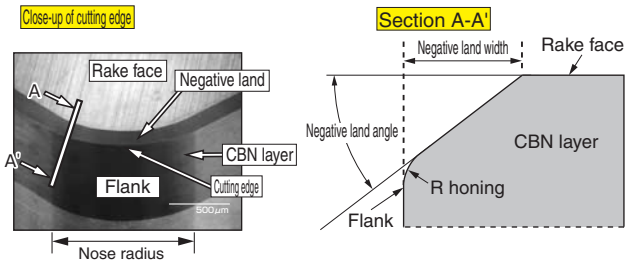
Grade Selection

Application	Colour Code	Series		
		Coated SUIMIBORON	SUMIBORON	Coated SUMIBORON
Hardened Steel	Grey	BNC80 BNC100 BNC200 BNC300	BN250 BN350 BNX10 BNX20 BNX25	—
Cast Iron	Pink	—	BN500 BN700	BNS800

Edge Treatment of SUMIBORON Inserts

■ SUMIBORON insert and edge treatment

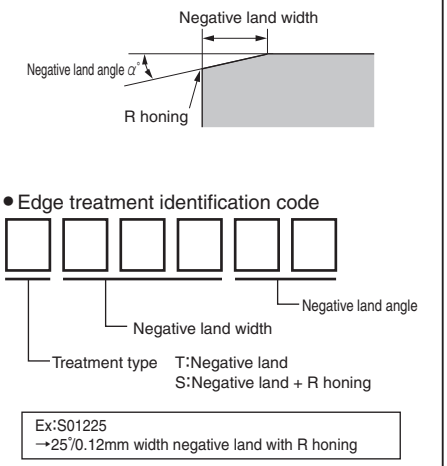
All SUMIBORON inserts are enhanced with the optimum cutting edge preparation catering for the various grades and geometries (shown on the right). This is to avoid cutting edge fracture caused by the heavy loads generated during the machining of high hardness materials such as Hardened Steel. As the pioneer of CBN tools "SUMIBORON", this vast selection of grades and edge treatment combinations is our trump card for Hardened Steel machining.



■ Standard cutting edge treatment of SUMIBORON inserts

The table below shows the standard edge treatments for normal inserts with no supplementary symbol (→ L12) after its cataloguenumber. The combination of insert geometry (negative/positive) and grade use will determine the "Negative land angle", "Negative land width" and "R honing" requirements.

Work Material	Series	Grade	Negative insert				Positive insert			
			Identification Code	α	W	Honing	Identification Code	α	W	Honing
Hardened Steel	Coated SUMIBORON	BNC80	S01020	20°	0.10	Yes	S01020	20°	0.10	Yes
		BNC100	S01225	25°	0.12	Yes	S01225	25°	0.12	Yes
		BNC150	S01225	25°	0.12	Yes	S01225	25°	0.12	Yes
		BNC200	S01225	25°	0.12	Yes	S01225	25°	0.12	Yes
		BNC300	S01225	25°	0.12	Yes	S01225	25°	0.12	Yes
	SUMIBORON	BNX10	T01225	25°	0.12	No	T01225	25°	0.12	No
		BNX20	S01225	25°	0.12	Yes	S01225	25°	0.12	Yes
		BNX25	S01725	25°	0.17	Yes	S01725	25°	0.17	Yes
		BN250	S01225	25°	0.12	Yes	S01235	35°	0.12	Yes
		BN350	T01225	25°	0.12	No	T01235	35°	0.12	No
Cast Iron Exotic Alloy	SUMIBORON	BN500	T01215	15°	0.12	No	T01215	15°	0.12	No
		BN700	T01215	15°	0.12	No	T01215	15°	0.12	No
		BNS800	T02020	20°	0.20	No				



■ Selection of cutting edge treatments

Other than the standard inserts, the SUMIBORON insert series also include items with special cutting edge treatment (denoted by a supplementary symbol after the catalogue number), for specific machining applications. It is recommended that standard inserts be tested first and depending on the results, move on test the items with specific edge treatments.

●Machining of Hardened Steel

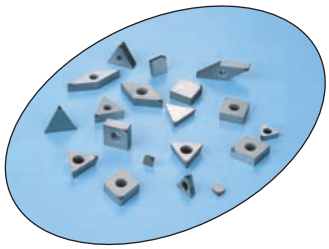
Continuous machining	Small Continuity degree Large Standard type S：Small edge treatment type (T01215) M:Continuous machining general type (S01225)
Interrupted machining	Small Interruption degree Large Standard type T:Strong edge type (T01235)
Emphasis on surface roughness	W:Wiper edge (S01215)
Chip Control (hardened carburized layer removal)	SV:With chipbreaker (S01235)

●Machining of Powder Metal

General powder metal (SMF standard part)	Continuous machining Interrupted machining Standard type PM:For interrupted cutting of P/M (S00525) Precision Standard type F:Sharp edge type
High density powder metal	Continuous machining Interrupted machining Standard type T：Strong edge type (S01225)
Hardened powder metal	T：Strong edge type (S01225)

Cutting performance and strength of blade edge also depend on the radius of nose and availability of honing.

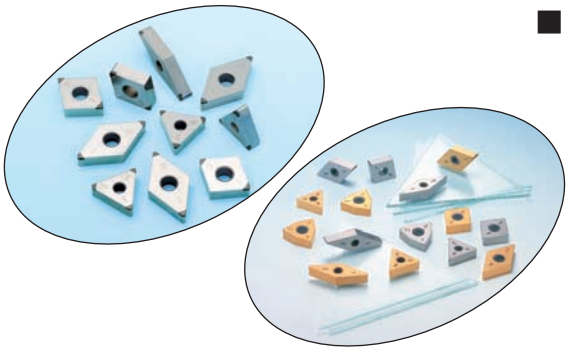
One-use Insert NU Type/NS Type



■ Characteristics

- ●Affordable version of the once expensive sintered CBN material, at its best size.
- ●One-use type eliminates regrinding thus making tool management easy.
- ●Reduce required storage space with 10pcs pack.

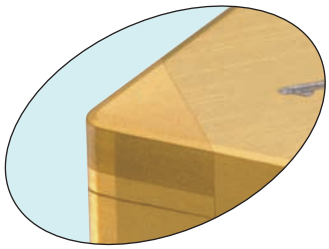
Multi-cornered, One-use Insert



■ Characteristics

- ● Insert with several brazed SUMIBORON one-use corners. Price per edge is more reasonable compared to normal single cornered, one-use type insert.
- ● Coated SUMIBORON is available as a double-faced insert. Diamond shaped inserts have 4 cutting edges and Triangle shaped inserts have 6 cutting edges etc.
- ● Multi-cornered, one-use type has G-class specification with side faces ground. In addition, all edges are numbered for easy cutting edge management.

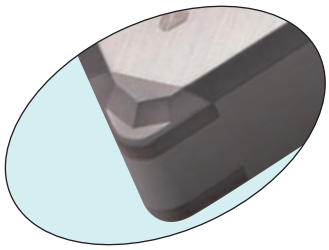
One-use Wiper Insert



■ Characteristics

- ● SUMIBORON one-use insert with wiper edge for Hardened Steel machining.
- ● Excellent surface roughness comparable to grinding.
- ● Multi-cornered, one-use type has G-class specification with side faces ground. In addition, all edges are numbered for easy cutting edge management.

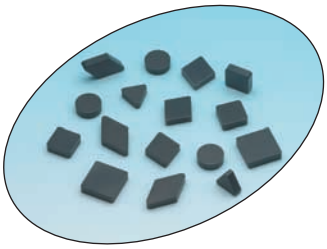
One-use insert with chipbreaker Break Master-SV Type



■ Characteristics

- ● SUMIBORON with chipbreaker! Especially for caburized layer removal.
- ● Breaker included on the CBN edge, chipbreaking effect can be maintained throughout.
- ● Unique breaker design can be applied to both hardened and non-hardened parts with effective chip control.

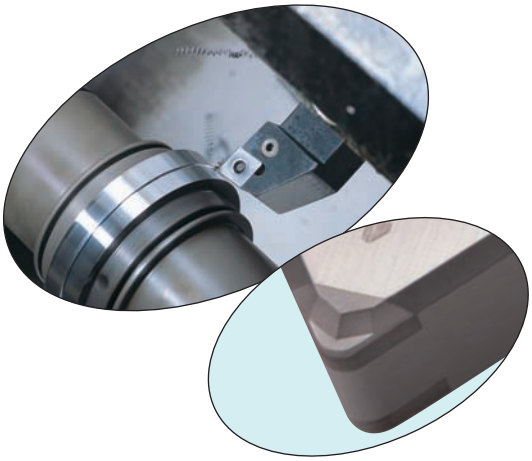
Solid SUMIBORON



■ Characteristics

- ● 100% solid CBN structure. With no brazed portion, this grade is excellent for the roughing of Cast Iron at large depth of cut.

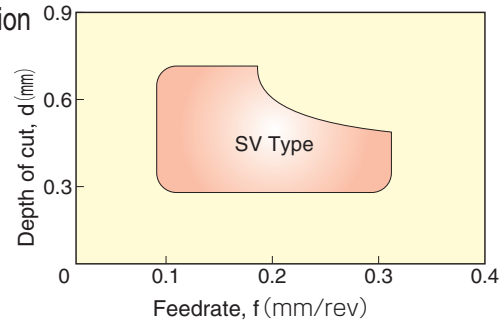
Break Master-SV Type

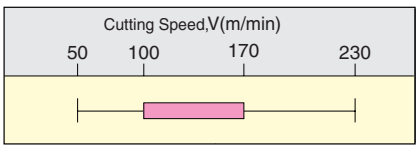


■ Characteristics

- SUMIBORON with chipbreaker! Especially for caburized layer removal.
- Breaker included on the CBN edge, chipbreaking effect can be maintained throughout.
- Unique breaker design can be applied to both hardened and non-hardened parts with effective chip control.
- Used with Coated SUMIBORON BNC200 for high efficiency machining.

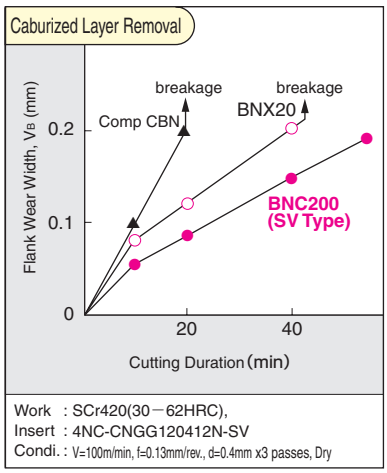
■ Application Range





※ For hardened parts (above HRC50), please use less than 0.5mm depth of cut.

■ Cutting Performance

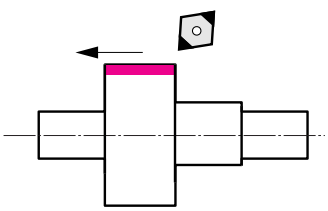


Work : SCr420(30－62HRC),
Insert : 4NC-CNGG120412N-SV
Condi. : V=100m/min, f=0.13mm/rev., d=0.4mm x3 passes, Dry

● Stable tool life with BNC200(SV Type)

■ Application Examples

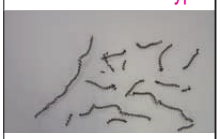
External Caburized Layer Removal



· No constant stoppages or incorrect part dimension problem and the chips are small.
· Double the tool life of competitor's CBN

Work : SCr420 Carburized Steel (shaft)
Tool : 4NC-CNGG120408N-SV(BNC200)
Condi. : V=150m/min, f=0.15mm/rev, d=0.5mm, 2 passes, Wet

Break Master-SV Type



Tool life=200pcs

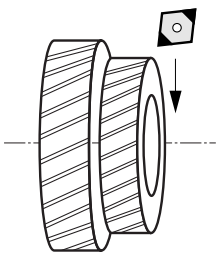
BNC200 (no breaker)

Tool life=200pcs

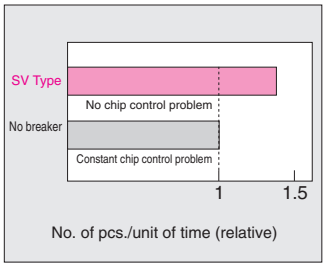
Comp CBN (no breaker)

Tool life=100pcs

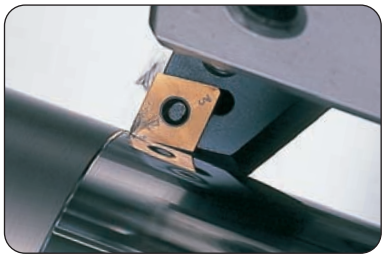
Caburized Face Layer Removal

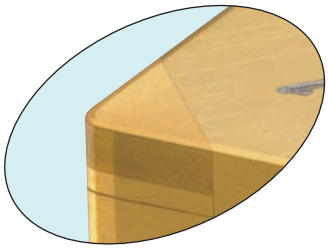


Break Master-SV type improves chip control with increased productivity until the pre-set tool life.



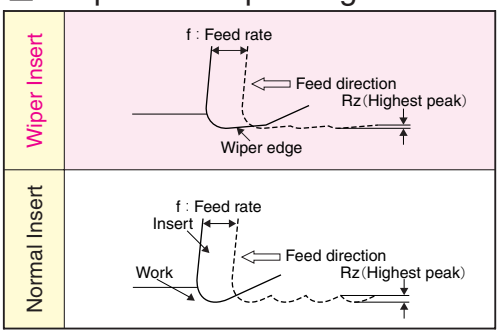
Work : SCM420(30-62HRC),Gear
Insert : 4NC-CNGG120408N-SV（BNC200）
Condi. : V=140m/min, f=0.15mm/rev, d=0.3mm, Wet



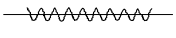
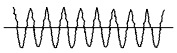


- SUMIBORON One-Use Insert with wiper flat
- Excellent surface finish similar to grinding
- Improved efficiency with higher speeds and feeds

■ Purpose of Wiper Edge



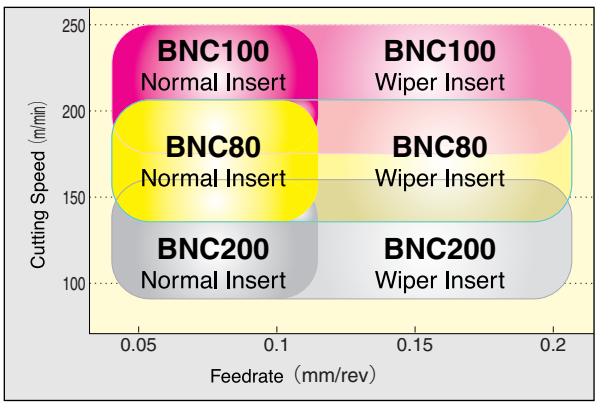
■ Surface Roughness of Wiper Insert

	Wiper Insert (R0.8)		Normal Insert (R0.8)	
	Finishing (f = 0.15mm/rev)	High feed cutting (f = 0.25mm/rev)	Finishing (f = 0.15mm/rev)	High feed cutting (f = 0.25mm/rev)
Surface Roughness Profile				
Surface Roughness Rz (Highest peak)	0.6μm	1.0μm	3.5μm	9.8μm

■ Recommended Conditions

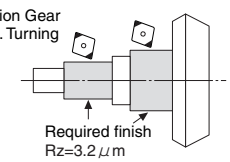
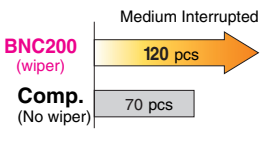
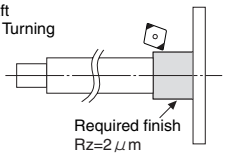
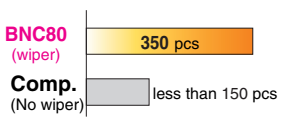
(Surface Roughness Standard: 1.6s～3.2s)

- Wiper insert is recommended for high feed conditions
- For optimum effectiveness, use wiper inserts for continuous cutting.
  For copy turning, inserts with nose-radius are recommended
- Chattering and undulation may occur, please use work and machines with high rigidity.

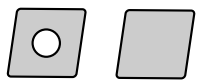


Max. feedrate under high feed conditions is 0.3mm/rev.

■ Application Examples

Process	Work ① Part Name ② Grade	Tool Insert	Cutting Conditions V = Cutting Speed (m/min) f = Feedrate (mm/rev.) d = Depth of cut (mm)	Results
Pinion Gear Ext. Turning  Required finish Rz=3.2μm	① Gear ② Hardened Steel 58～62HRC	4NC-CNGA120404W (BNC200)	V = 130m/min f = 0.18mm/rev. d = 0.15mm Wet	
Shaft Ext. Turning  Required finish Rz=2μm	① Shaft ② Carburized steel 58～62HRC	4NC-CNGA120408W (BNC80)	V = 200m/min f = 0.11～0.15mm/rev. d = 0.13mm Dry	

C 80° Diamond Type



Standard Cutting edge specification (Refer to L18 for details)

	BNX10	BNX20	BNX25	BN250	BN350	BNC80	BNC100 BNC150	BNC200 BNC300	BN500 BN700	BNS800
Negative	T01225	S01225	S01725	S01225	T01225	S01020	S01225	S01225	T01215	T02020
Positive	T01225	S01225	S01725	S01235	T01235	S01020	S01225	S01225	T01215	—

CN■A1204●●

I.C.: ϕ 12.70 Thickness: 4.76 Hole: 5.16

Applicable holder ref. page, (Example)
External Holders C9 C10
Boring Bars D42

◉=Stock for 1 & 10 pieces pack ●▲= Stock for 1 piece pack

● One-use Type/Negative (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-CNMA 120402 New 120404 120408 120412	T-NU-CNMA 120402 New 120404 120408 120412	— ◉ ◉ ◉	— ◉ ◉ ◉	— — — —	● ◉ ◉ ◉	— ◉ ◉ ◉	— ◉ ◉ ◉	— ● ● ●	— — — —	0.2 0.4 0.8 1.2	2.5 2.5 2.4 2.3	1 corner	Standard
	NS-CNMA 120404 120408 120412	T-NS-CNMA 120404 120408 120412	— — —	— — —	◉ ◉ ◉	— — —	— — —	— — —	— — —	— — —	0.4 0.8 1.2	2.5 2.4 2.3	1 corner	Standard

● Multi-cornered, One-use Type/Negative (With Hole)

※ Depth-of-cut for one-use type is 0.5mm or less

	2NU-CNGA 120404 120408 120412	T-2NU-CNGA 120404 120408 120412		◉ ◉ ◉	— — —	◉ ◉ ◉	● ◉ ●		● ◉ ●	— — —	0.4 0.8 1.2	2.5 2.4 2.3	2 corners	Standard
	2NS-CNGA 120404 120408 120412	T-2NS-CNGA 120404 120408 120412	— — —	— — —	◉ ◉ ◉	— — —	— — —	— — —	— — —	— — —	0.4 0.8 1.2	2.5 2.4 2.3	2 corners	Standard
 Sharp edge type	2NU-CNGA 120404F 120408F 120412F	T-2NU-CNGA 120404F 120408F 120412F	— — —	— — —	— — —	— — —	— — —	— ●	● ●	— — —	0.4 0.8 1.2	2.5 2.4 2.3	2 corners	No edge treatment
 Strong edge type	2NU-CNGA 120404T 120408T 120412T	T-2NU-CNGA 120404T 120408T 120412T	— — —	— — —	— — —	— — —	● ● ●	— —	● ●	— — —	0.4 0.8 1.2	2.5 2.4 2.3	2 corners	BN350→T01235 BN700→S01225 (Larger edge treatment)

● Negative Type (With Hole)

※ Depth-of-cut for one-use type is 0.5mm or less

	CNMA 120404 120408 120412			● ● ●		▲ ▲ ▲		● ●	 ● ●	— — —	0.4 0.8 1.2	4.6 4.5 4.4	1 corner	Standard

● Solid Type/Negative (With Hole)

	CNGA 120408 120412		— —	— —	— —	— —	— —	— —	— —	● ●	0.8 1.2	12.7 12.6	Solid	Standard

CNG■1204●● Coated SUMIBORON

I.C.: ϕ 12.70 Thickness: 4.76 Hole: 5.16

Applicable holder ref. page, (Example)
External Holders C9 C10
Boring Bars D42

● Multi-cornered, One-use Type/Negative (With Hole)

●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNC80	BNC100	BNC150	BNC200	BNC300	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	2NC-CNGA 120404 New 120408 New 120412 New					● ●		0.4 0.8 1.2	2.5 2.4 2.3	2 corners	Standard
	4NC-CNGA 120404 120408 120412		● ● ●	● ● ●	▲ ▲ ▲	● ● ●	● ● ●	0.4 0.8 1.2	2.5 2.4 2.3	4 corners	Standard
 Wiper insert	4NC-CNGA 120404W 120408W 120412W		● ●	● ●	▲ ▲	● ●		0.4 0.8 1.2	2.5 2.4 2.3	4 corners	S01225
 Break Master	4NC-CNGG 120404N-SV 120408N-SV 120412N-SV		— — —	— — —	— — —	 ● ●	— — —	0.4 0.8 1.2	2.5 2.4 2.3	4 corners	S01235

※ Depth-of-cut for one-use type is 0.5mm or less

CNGN0903●●

I.C.: ϕ 9.525 Thickness: 3.18 Hole: —

Applicable holder ref. page, (Example)
External Holders L46

● Solid Type/Negative (Without Hole)

●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	CNGN 090308 090312		— —	— —	— —	— —	— —	— —	— —	● ●	0.8 1.2	9.5 9.4	Solid	Standard
 Sharp edge type	CNGN 090308F 090312F		— —	— —	— —	— —	— —	— —	— —	● ●	0.8 1.2	9.7 9.7	Solid	No edge treatment

CNG■1204●●

I.C.: ϕ 12.70 Thickness: 4.76 Hole: —

Applicable holder ref. page, (Example)
External Holders L47 (CNGX Insert)
L46 (CNGX Insert)

● Solid Type/Negative (Dimple Lock)

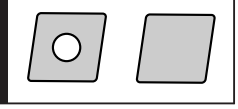
●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	CNGX 120408 120412 120416		— — —	— — —	— — —	— — —	— — —	— — —	— — —	 ● ●	0.8 1.2 1.6	12.7 12.6 12.5	Solid	Standard

● Solid Type/Negative (Without Hole)

	CNGN 120408 120412 120416		— — —	— — —	— — —	— — —	— — —	— — —	— — —	● ● ●	0.8 1.2 1.6	12.9 12.9 12.9	Solid	Standard

C 80° Diamond Type



Standard Cutting edge specification (Refer to L18 for details)

	BNX10	BNX20	BNX25	BN250	BN350	BNC80	BNC100 BNC150	BNC200 BNC300	BN500 BN700	BNS800
Negative	T01225	S01225	S01725	S01225	T01225	S01020	S01225	S01225	T01215	T02020
Positive	T01225	S01225	S01725	S01235	T01235	S01020	S01225	S01225	T01215	—

CCEW03X1●●

I.C.: φ 3.5 Thickness: 1.4 Hole: 1.8

Applicable holder ref. page, (Example)
Boring Bars D22

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/7° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
 Sharp edge type	NU-CCEW 03X102F 03X104F New	T-NU-CCEW 03X102F 03X104F New	— —	— —	— —	— —	— —	— —	● —	— —	0.2 0.4	1.2 1.1	1 corner	No edge treatment
 Fine Boring type	NU-CCEW 03X102S 03X104S New	T-NU-CCEW 03X102S 03X104S New	— —	● ●	— —	— —	— —	— —	— —	— —	0.2 0.4	1.2 1.1	1 corner	T01215 (Smaller edge treatment)

※ Depth-of-cut for one-use type is 0.5mm or less

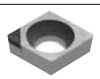
CCEW04X1●●

I.C.: φ 4.3 Thickness: 1.8 Hole: 2.2

Applicable holder ref. page, (Example)
Boring Bars D22

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/7° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
 Sharp edge type	NU-CCEW 04X102F 04X104F New	T-NU-CCEW 04X102F 04X104F New	— —	— —	— —	— —	— —	— —	● —	— —	0.2 0.4	2.0 1.9	1 corner	No edge treatment
 Fine Boring type	NU-CCEW 04X102S 04X104S New	T-NU-CCEW 04X102S 04X104S New	— —	● ●	— —	— —	— —	— —	— —	— —	0.2 0.4	2.0 1.9	1 corner	T01215 (Smaller edge treatment)

※ Depth-of-cut for one-use type is 0.5mm or less

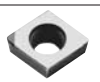
CCGW0602●●

I.C.: φ 6.35 Thickness: 2.38 Hole: 2.8

Applicable holder ref. page, (Example)
External Holders C47 C51 C56
Boring Bars D21 D22

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/7° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNX10	BNX20	BNX25※	BN250	BN350	BN500	BN700	BNS800	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-CCGW 060202 060204 060208	T-NU-CCGW 060202 060204 060208				◉ ◉			● —	— —	0.2 0.4 0.8	2.5 2.5 2.4	1 corner	Standard
 Continuous cutting general type	NU-CCGW 060202M New 060204M New 060208M New	T-NU-CCGW 060202M New 060204M New 060208M New	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	0.2 0.4 0.8	2.5 2.5 2.4	1 corner	S01225 (Smaller edge treatment)

※ Depth-of-cut for one-use type is 0.5mm or less

CCGW0602●● Coated SUMIBORON

I.C.: φ 6.35 Thickness: 2.38 Hole: 2.8

Applicable holder ref. page, (Example)
External Holders C47 C51 C56
Boring Bars D21 D22

●▲=Stock for 1 piece pack

● Multi-cornered, One-use Type/7° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNC80	BNC100	BNC150	BNC200	BNC300	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	2NC-CCGW 060202 060204					● ●		0.2 0.4	2.4 2.3	2 corners	Standard

※ Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON

CCGW09T3●●

I.C.: φ 9.525 Thickness: 3.97 Hole: 4.4

Applicable holder ref. page, (Example)
External Holders C47 C51 C56
Boring Bars D21 D22

◉=Stock for 1 & 10 pieces pack ●▲= Stock for 1 piece pack

● One-use Type/7° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25※	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-CCGW 09T302 09T304 09T308	T-NU-CCGW 09T302 09T304 09T308				◉ ◉			● 	— — —	0.2 0.4 0.8	2.5 2.5 2.4	1 corner	Standard
 Continuous cutting general type	NU-CCGW 09T302M New 09T304M New 09T308M New	T-NU-CCGW 09T302M New 09T304M New 09T308M New	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	0.2 0.4 0.8	2.5 2.5 2.4	1 corner	S01225 (Smaller edge treatment)

※ For BNX25, use NS type code (NS-CPGN) ※ Depth-of-cut for one-use type is 0.5mm or less

CCGW09T3●● Coated SUMIBORON

I.C.: φ 9.525 Thickness: 3.97 Hole: 4.4

Applicable holder ref. page, (Example)
External Holders C47 C51 C56
Boring Bars D21 D22

●▲=Stock for 1 piece pack

● Multi-cornered, One-use Type/7° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNC80	BNC100	BNC150	BNC200	BNC300	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	2NC-CCGW 09T302 09T304 09T308		● ● ●	 ● ●	 ▲ ▲	● ● ●	 ● ●	0.2 0.4 0.8	2.5 2.5 2.4	2 corners	Standard

※ Depth-of-cut for one-use type is 0.5mm or less

CCGN0401●●

I.C.: φ 4.76 Thickness: 1.59 Hole: —

Applicable holder ref. page, (Example)
(SUMIBORON Small Hole Boring Bar BNC Type)

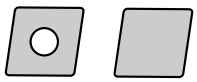
◉=Stock for 1 & 10 pieces pack ●▲= Stock for 1 piece pack

● One-use Type/7° Positive (Without Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25※	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-CCGN 040104 040108	T-NU-CCGN 040104 040108				◉ ◉				— —	0.4 0.8	2.5 2.4	1 corner	Standard

※ For BNX25, use NS type code (NS-CCGN) ※ Depth-of-cut for one-use type is 0.5mm or less

C 80° Diamond Type



Standard Cutting edge specification (Refer to L18 for details)

	BNX10	BNX20	BNX25	BN250	BN350	BNC80	BNC100 BNC150	BNC200 BNC300	BN500 BN700	BNS800
Negative	T01225	S01225	S01725	S01225	T01225	S01020	S01225	S01225	T01215	T02020
Positive	T01225	S01225	S01725	S01235	T01235	S01020	S01225	S01225	T01215	—

CPGW0802●●

I.C.: φ 7.94 Thickness: 2.38 Hole: 3.4

Applicable holder ref. page, (Example)
Boring Bars D26

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/11° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25※	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-CPGW 080202 080204 080208	T-NU-CPGW 080202 080204 080208				● ● ●				— — —	0.2 0.4 0.8	2.5 2.5 2.4	1 corner	Standard
 Continuous cutting general type	NU-CPGW 080202M New 080204M New 080208M New	T-NU-CPGW 080202M New 080204M New 080208M New	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	0.2 0.4 0.8	2.5 2.5 2.4	1 corner	S01225 (Smaller edge treatment)

※ For BNX25, use NS type code (NS-CPGW) ※ Depth-of-cut for one-use type is 0.5mm or less

CPGW0903●●

I.C.: φ 9.525 Thickness: 3.18 Hole: 4.4

Applicable holder ref. page, (Example)
Boring Bars D26

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/11° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25※	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-CPGW 090302 090304 090308	T-NU-CPGW 090302 090304 090308				● ● ●				— — —	0.2 0.4 0.8	2.5 2.5 2.4	1 corner	Standard
 Continuous cutting general type	NU-CPGW 090302M New 090304M New 090308M New	T-NU-CPGW 090302M New 090304M New 090308M New	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	0.2 0.4 0.8	2.5 2.5 2.4	1 corner	S01225 (Smaller edge treatment)

※ For BNX25, use NS type code (NS-CPGW) ※ Depth-of-cut for one-use type is 0.5mm or less

D 55° Diamond Type

Standard Cutting edge specification (Refer to L18 for details)

	BNX10	BNX20	BNX25	BN250	BN350	BNC80	BNC100 BNC150	BNC200 BNC300	BN500 BN700	BNS800
Negative	T01225	S01225	S01725	S01225	T01225	S01020	S01225	S01225	T01215	T02020
Positive	T01225	S01225	S01725	S01235	T01235	S01020	S01225	S01225	T01215	—

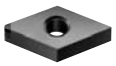
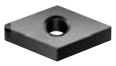
DN■A1504●●

I.C.: ϕ 12.70 Thickness: 4.76 Hole: 5.16

Applicable holder ref. page, (Example)
External Holders C11 C12
Boring Bars D43 D44

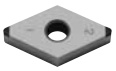
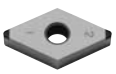
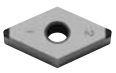
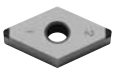
◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/Negative (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-DNMA 150401 New	T-NU-DNMA 150401 New			—	●				—	0.1	2.7	1 corner	Standard
	150402 New	150402 New			—	●				—	0.2	2.5		
	150404	150404	◉	◉	—	◉	◉	◉	●	—	0.4	2.5		
	150408	150408	◉	◉	—	◉	◉	◉	●	—	0.8	2.1		
	150412	150412			—	●		◉	●	—	1.2	2.0		
	NS-DNMA 150404	T-NS-DNMA 150404	—	—	◉	—	—	—	—	—	0.4	2.5	1 corner	Standard
	150408	150408	—	—	◉	—	—	—	—	—	0.8	2.1		
	150412	150412	—	—		—	—	—	—	—	1.2	2.0		

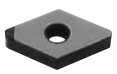
※ Depth-of-cut for one-use type is 0.5mm or less

● Multi-cornered, One-use Type/Negative (With Hole)

	2NU-DNGA 150404	T-2NU-DNGA 150404		◉	—	◉	●		●	—	0.4	2.5	2 corners	Standard
	150408	150408		◉	—	◉	◉		◉	—	0.8	2.1		
	150412	150412			—					—	1.2	2.0		
	2NS-DNGA 150404	T-2NS-DNGA 150404	—	—	◉	—	—	—	—	—	0.4	2.5	2 corners	
	150408	150408	—	—	◉	—	—	—	—	—	0.8	2.1		
	150412	150412	—	—		—	—	—	—	—	1.2	2.0		
 Sharp edge type	2NU-DNGA 150404F	T-2NU-DNGA 150404F	—	—	—	—	—	—	●	—	0.4	2.5	2 corners	No edge treatment
	150408F	150408F	—	—	—	—	—	—	●	—	0.8	2.1		
	150412F	150412F	—	—	—	—	—	—		—	1.2	2.0		
 Strong edge type	2NU-DNGA 150404T	T-2NU-DNGA 150404T	—	—	—	—	●	—	●	—	0.4	2.5	2 corners	BN350→T01235 BN700→S01225 (Larger edge treatment)
	150408T	150408T	—	—	—	—	●	—	●	—	0.8	2.1		
	150412T	150412T	—	—	—	—		—		—	1.2	2.0		

● Negative (With Hole)

※ Depth-of-cut for one-use type is 0.5mm or less

	DNMA 150404			●		▲				—	0.4	5.0	1 corner	Standard
	150408			●		▲		●	●	—	0.8	4.7		
	150412					▲			●	—	1.2	4.3		

D 55° Diamond Type

Standard Cutting edge specification (Refer to L18 for details)

	BNX10	BNX20	BNX25	BN250	BN350	BNC80	BNC100 BNC150	BNC200 BNC300	BN500 BN700	BNS800
Negative	T01225	S01225	S01725	S01225	T01225	S01020	S01225	S01225	T01215	T02020
Positive	T01225	S01225	S01725	S01235	T01235	S01020	S01225	S01225	T01215	—

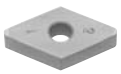
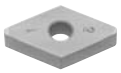
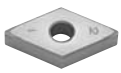
DNG■1504●● Coated SUMIBORON

I.C.: φ 12.70 Thickness: 4.76 Hole: 5.16

Applicable holder ref. page, (Example)
External Holders C11 C12
Boring Bars D43 D44

● Multi-cornered, One-use Type/Negative (With Hole)

●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNC80	BNC100	BNC150	BNC200	BNC300	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	2NC-DNGA 150404 New 150408 New 150412 New					● ●		0.4 0.8 1.2	2.5 2.1 2.0	2 corners	Standard
	4NC-DNGA 150404 150408 150412		● ● ●	● ●	▲ ▲	● ● ●	● ●	0.4 0.8 1.2	2.5 2.1 2.0	4 corners	Standard
 Break Master	4NC-DNGG 150404N-SV 150408N-SV 150412N-SV		— — —	— — —	— — —	● ●	— —	0.4 0.8 1.2	2.5 2.1 2.0	4 corners	S01235

※ Depth-of-cut for one-use type is 0.5mm or less

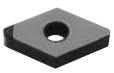
DNMA1506●●

I.C.: φ 12.70 Thickness: 6.35 Hole: 5.16

Applicable holder ref. page, (Example)
External Holders C11 C12

● One-use Type/Negative (With Hole)

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25※	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-DNMA 150604 New 150608 New 150612 New	T-NU-DNMA 150604 New 150608 New 150612 New				● ● ●				— — —	0.4 0.8 1.2	2.5 2.1 2.0	1 corner	Standard

※ For BNX25, use NS type code (NS-DNMA) ※ Depth-of-cut for one-use type is 0.5mm or less

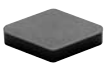
DNGN1103●●

I.C.: φ 9.525 Thickness: 3.18 Hole: —

Applicable holder ref. page, (Example)
External Holders L47

● Solid Type/Negative (Without Hole)

●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	DNGN 110308 110312		— —	— —	— —	— —	— —	— —	— —	● ●	0.8 1.2	10.8 10.5	Solid	Standard
 Sharp edge type	DNGN 110308F 110312F		— —	— —	— —	— —	— —	— —	— —	● ●	0.8 1.2	10.8 10.5	Solid	No edge treatment

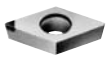
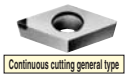
DCGW0702●●

I.C.: φ 6.35 Thickness: 2.38 Hole: 2.8

Applicable holder ref. page, (Example)
External Holders C48 C50 C52
Boring Bars D30 D31

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/7° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNX10	BNX20	BNX25※	BN250	BN350	BN500	BN700	BNS800	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-DCGW 070202 070204 070208	T-NU-DCGW 070202 070204 070208				◉ ◉			● —	— — —	0.2 0.4 0.8	2.7 2.5 2.1	1 corner	Standard
 Continuous cutting general type	NU-DCGW 070202M New 070204M New 070208M New	T-NU-DCGW 070202M New 070204M New 070208M New	—	—	—	● ● ●	—	—	—	—	0.2 0.4 0.8	2.7 2.5 2.5	1 corner	S01225 (Smaller edge treatment)

※ For BNX25, use NS type code (NS-DCGW) ※ Depth-of-cut for one-use type is 0.5mm or less

DCGW0702●● Coated SUMIBORON

I.C.: φ 6.35 Thickness: 2.38 Hole: 2.8

Applicable holder ref. page, (Example)
External Holders C48 C50 C52
Boring Bars D30 D31

●▲=Stock for 1 piece pack

● Multi-cornered, One-use Type/7° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNC80	BNC100	BNC150	BNC200	BNC300	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	2NC-DCGW 070202 070204					● ●		0.2 0.4	2.6 2.5	2 corners	Standard

※ Depth-of-cut for one-use type is 0.5mm or less

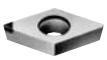
DCGW11T3●●

I.C.: φ 9.525 Thickness: 3.97 Hole: 4.4

Applicable holder ref. page, (Example)
External Holders C48 C50 C52
Boring Bars D30 D31

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/7° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNX10	BNX20	BNX25※	BN250	BN350	BN500	BN700	BNS800	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-DCGW 11T302 11T304 11T308 11T312	T-NU-DCGW 11T302 11T304 11T308 11T312				◉ ◉			● ●	— — — —	0.2 0.4 0.8 1.2	2.7 2.5 2.1 2.0	1 corner	Standard
 Sharp edge type	NU-DCGW 11T302F 11T304F 11T308F	T-NU-DCGW 11T302F 11T304F 11T308F	—	—	—	—	—	—	● ●	— — —	0.2 0.4 0.8	2.7 2.5 2.1	1 corner	No edge treatment
 Continuous cutting general type	NU-DCGW 11T302M New 11T304M New 11T308M New 11T312M New	T-NU-DCGW 11T302M New 11T304M New 11T308M New 11T312M New	—	—	—	● ● ● ●	—	—	—	—	0.2 0.4 0.8 1.2	2.7 2.5 2.5 2.0	1 corner	S01225 (Smaller edge treatment)

※ For BNX25, use NS type code (NS-DCGW) ※ Depth-of-cut for one-use type is 0.5mm or less

DCGW11T3●● Coated SUMIBORON

I.C.: φ 9.525 Thickness: 3.97 Hole: 4.4

Applicable holder ref. page, (Example)
External Holders C48 C50 C52
Boring Bars D30 D31

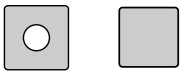
●▲=Stock for 1 piece pack

● Multi-cornered, One-use Type/7° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNC80	BNC100	BNC150	BNC200	BNC300	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	2NC-DCGW 11T302 11T304 11T308		● ● ●	 ● ●	 ▲ ▲	● ● ●	 ● ●	0.2 0.4 0.8	2.7 2.5 2.1	2 corners	Standard

※ Depth-of-cut for one-use type is 0.5mm or less

S Square



Standard Cutting edge specification (Refer to L18 for details)

	BNX10	BNX20	BNX25	BN250	BN350	BNC80	BNC100 BNC150	BNC200 BNC300	BN500 BN700	BNS800
Negative	T01225	S01225	S01725	S01225	T01225	S01020	S01225	S01225	T01215	T02020
Positive	T01225	S01225	S01725	S01235	T01235	S01020	S01225	S01225	T01215	—

SN■A1204●●

I.C.: ϕ 12.70 Thickness: 4.76 Hole: 5.16

Applicable holder ref. page, (Example)
External Holders C13 ~ C16
Boring Bars D45 D46

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/Negative (Without Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	**NU-SNMA 120404**	**T-NU-SNMA 120404**		—	◉		●	●	●	—	0.4	2.5	1 corner	Standard
	120408	**120408**		◉	◉	●	◉	●	●	—	0.8	2.3		
	120412	**120412**		◉	◉	●	●	●	●	—	1.2	2.1		
	**NS-SNMA 120404**	**T-NS-SNMA 120404**	—	—		—	—	—	—	—	0.4	2.5	1 corner	Standard
	120408	**120408**	—	—		—	—	—	—	—	0.8	2.3		
	120412	**120412**	—	—		—	—	—	—	—	1.2	2.1		

● Multi-cornered, One-use Type/Negative (With Hole)

※ Depth-of-cut for one-use type is 0.5mm or less

	**2NU-SNGA 120404**	**T-2NU-SNGA 120404**		◉	—	◉			●	—	0.4	2.5	2 corners	Standard
	120408	**120408**		◉	—	◉			●	—	0.8	2.3		
	120412	**120412**		◉	—	◉				—	1.2	2.1		
	**2NS-SNGA 120404**	**T-2NS-SNGA 120404**	—	—		—	—	—	—	—	0.4	2.5	2 corners	Standard
	120408	**120408**	—	—		—	—	—	—	—	0.8	2.3		
	120412	**120412**	—	—		—	—	—	—	—	1.2	2.1		

● Negative Type (Without Hole)

※ Depth-of-cut for one-use type is 0.5mm or less

	**SNMA 120404**			●		▲		▲	●	—	0.4	4.8	1 corner	Standard
	120408			●		▲		▲	●	—	0.8	4.8		
	120412			●		▲		▲	●	—	1.2	4.8		

● Solid Type/Negative (With Hole)

	**SNGA 120408**		—	—	—	—	—	—	—	●	0.8	12.7	Solid	Standard
	120412		—	—	—	—	—	—	—	●	1.2	12.7		

SN■N0903●●

I.C.: ϕ 9.525 Thickness: 3.18 Hole: –

Applicable holder ref. page, (Example)
External Holders L46

● Solid Type/Negative (Without Hole)

●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	**SNGN 090308** **090312**		— —	— —	— —	— —	— —	— —	— —	● ●	0.8 1.2	9.525 9.525	Solid	Standard
 Sharp edge type	**SNGN 090308F** **090312F**		— —	— —	— —	— —	— —	— —	— —	● ●	0.8 1.2	9.525 9.525	Solid	No edge treatment
 Wiper insert	**SNEN 090308W** **090308FW**		— —	— —	— —	— —	— —	— —	— —	● ●	0.8 0.8	9.525 9.525	Solid	W→T02020 FW→ Edge treatment is also possible

※ FW: Wiper type with sharp edge

● Negative Type (Without Hole)

	**SNGN 090308-B** **090312-B** **090316-B**								● — —	— — —	0.8 1.2 1.6	9.525 9.525 9.525	4 corners	Standard

SNGN1203●●

I.C.: ϕ 12.70 Thickness: 3.18 Hole: –

Applicable holder ref. page, (Example)
External Holders L46

● Solid Type/Negative (With Hole)

●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	**SNGN 120308** **120312**		— —	— —	— —	— —	— —	— —	— —	● ●	0.8 1.2	12.7 12.7	Solid	Standard
 Sharp edge type	**SNGN 120308F** **120312F**		— —	— —	— —	— —	— —	— —	— —	● ●	0.8 1.2	12.7 12.7	Solid	No edge treatment

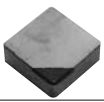
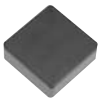
SNG■1204●●

I.C.: ϕ 12.70 Thickness: 4.76 Hole: –

Applicable holder ref. page, (Example)
External Holders L47 (SNGX Insert)
L46 (SNGN Insert)

● Negative Type (Without Hole)

●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	**SNGN 120408** **120412**			● ●		▲ ▲		●		— —	0.8 1.2	4.8 4.8	1 corner	Standard
	**SNGN 120408-B** **120412-B** **120416-B**									— — —	0.8 1.2 1.6	12.7 12.7 12.7	4 corners	Standard

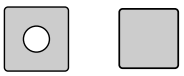
● Solid Type/Negative (Dimple Lock)

	**SNGX 120408** **120412** **120416**		— — —	— — —	— — —	— — —	— — —	— — —	— — —	 ● ●	0.8 1.2 1.6	12.7 12.7 12.7	Solid	Standard

● Solid Type/Negative (Without Hole)

	**SNGN 120408** **120412** **120416** **120420** New		— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	● ● ● ●	0.8 1.2 1.6 2.0	12.7 12.7 12.7 12.7	Solid	Standard

S Square



Standard Cutting edge specification (Refer to L18 for details)

	BNX10	BNX20	BNX25	BN250	BN350	BNC80	BNC100 BNC150	BNC200 BNC300	BN500 BN700	BNS800
Negative	T01225	S01225	S01725	S01225	T01225	S01020	S01225	S01225	T01215	T02020
Positive	T01225	S01225	S01725	S01235	T01235	S01020	S01225	S01225	T01215	—

SPGN0903●●

I.C.: ϕ 9.525 Thickness: 3.18 Hole: —

Applicable holder ref. page, (Example)
Boring Bars D40

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/11° Positive (Without Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25※	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	**NU-SPGN 090304**	**T-NU-SPGN 090304**		◉		◉			●	—	0.4	2.5	1 corner	Standard
	090308	**090308**		◉		◉		●	●	—	0.8	2.5		
 Continuous cutting general type	**NU-SPGN 090304M** New	**T-NU-SPGN 090304M** New	—	—	—	●	—	—	—	—	0.4	2.5	1 corner	S01225 (Smaller edge treatment)
	090308M New	**090308M** New	—	—	—	●	—	—	—	—	0.8	2.5		

※ For BNX25, use NS type code (NS-SPGN) ※ Depth-of-cut for one-use type is 0.5mm or less

● 11° Positive Type (Without Hole)

	**SPGN 090304**			▲		▲			●	—	0.4	4.8	1 corner	Standard
	090308			▲		▲			●	—	0.8	4.8		
	090312									—	1.2	4.8		

SPGN1203●●

I.C.: ϕ 12.70 Thickness: 3.18 Hole: —

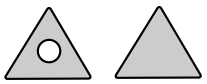
Applicable holder ref. page, (Example)
External Holders C29
Boring Bars D40

●▲=Stock for 1 piece pack

● 11° Positive Type (Without Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	**SPGN 120308**			▲				▲		—	0.8	4.8	1 corner	Standard
	120312									—	1.2	4.8		

T Triangular Type



Standard Cutting edge specification (Refer to L18 for details)

	BNX10	BNX20	BNX25	BN250	BN350	BNC80	BNC100 BNC150	BNC200 BNC300	BN500 BN700	BNS800
Negative	T01225	S01225	S01725	S01225	T01225	S01020	S01225	S01225	T01215	T02020
Positive	T01225	S01225	S01725	S01235	T01235	S01020	S01225	S01225	T01215	—

TN■A1604●●

I.C.: ϕ 9.525 Thickness: 4.76 Hole:3.81

Applicable holder ref. page, (Example)
External Holders C17 ~ C21 C49 C51
Boring Bars D47

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/Negative (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-TNMA 160401 New 160402 New 160404 160408 160412	T-NU-TNMA 160401 New 160402 New 160404 160408 160412	 ◉ ◉ 	 ◉ ◉ ◉	— — — — —	● ● ◉ ◉ 	 ◉ ◉ 	 ◉ ◉ ●	 ● ● ●	— — — — —	0.1 0.2 0.4 0.8 1.2	2.5 2.4 2.3 2.0 2.0	1 corner	Standard
	NS-TNMA 160404 160408 160412	T-NS-TNMA 160404 160408 160412	— — —	— — —	◉ ◉ 	— — —	— — —	— — —	— — —	— — —	0.4 0.8 1.2	2.3 2.0 2.0	1 corner	Standard

● Multi-cornered, One-use Type/Negative (With Hole)

※ Depth-of-cut for one-use type is 0.5mm or less

	3NU-TNGA 160404 160408 160412	T-3NU-TNGA 160404 160408 160412	 	◉ ◉ ◉	— — —	◉ ◉ ◉	● ◉ ●	 	◉ ◉ 	— — —	0.4 0.8 1.2	2.3 2.0 2.0	3 corners	Standard
	3NS-TNGA 160404 160408 160412	T-3NS-TNGA 160404 160408 160412	— — —	— — —	◉ ◉ 	— — —	— — —	— — —	— — —	— — —	0.4 0.8 1.2	2.3 2.0 2.0	3 corners	Standard
 Sharp edge type	3NU-TNGA 160404F 160408F 160412F	T-3NU-TNGA 160404F 160408F 160412F	— — —	— — —	— — —	— — —	— — —	— — 	● ● 	— — —	0.4 0.8 1.2	2.3 2.0 2.0	3 corners	No edge treatment
 Strong edge type	3NU-TNGA 160404T 160408T 160412T	T-3NU-TNGA 160404T 160408T 160412T	— — —	— — —	— — —	— — —	● ● ●	— —	● ● 	— — —	0.4 0.8 1.2	2.3 2.0 2.0	3 corners	BN350→T01235 BN700→S01225 (larger edge treatment)
 For interrupted cutting of sintered alloy	3NU-TNGA 160404PM New 160408PM New	T-3NU-TNGA 160404PM New 160408PM New	— —	— —	— —	— —	— —	— —	● ●	— —	0.4 0.8	2.3 2.0	3 corners	S00525 (Special application)

● Negative Type (With Hole)

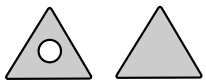
※ Depth-of-cut for one-use type is 0.5mm or less

	TNMA 160402 160404 160408 160412		 	● ● ● ●	 	▲ ▲ ▲ ▲	 	 ● ●	 ● ●	— — — —	0.2 0.4 0.8 1.2	3.6 3.5 3.2 2.9	1 corner	Standard

● Solid Type/Negative (With Hole)

	TNGA 160408 160412		— —	— —	— —	— —	— —	— —	— —	● ●	0.8 1.2	15.3 14.7	Solid	Standard

T Triangular Type



Standard Cutting edge specification (Refer to L18 for details)

	BNX10	BNX20	BNX25	BN250	BN350	BNC80	BNC100 BNC150	BNC200 BNC300	BN500 BN700	BNS800
Negative	T01225	S01225	S01725	S01225	T01225	S01020	S01225	S01225	T01215	T02020
Positive	T01225	S01225	S01725	S01235	T01235	S01020	S01225	S01225	T01215	—

TNG■1604●● Coated SUMIBORON

I.C.: ϕ 9.525 Thickness: 4.76 Hole: 3.81

Applicable holder ref. page, (Example)
External Holders C17 ~ C21 C49 C51
Boring Bars D47

● Multi-cornered, One-use Type/Negative (With Hole)

●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNC80	BNC100	BNC150	BNC200	BNC300	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	**3NC-TNGA 160404** New **160408** New **160412** New					● ●		0.4 0.8 1.2	2.3 2.0 2.0	3 corners	Standard
	**6NC-TNGA 160404** **160408** **160412**		● ● ●	● ● ●	▲ ▲	● ● ●	● ●	0.4 0.8 1.2	2.3 2.0 2.0	6 corners	Standard
 Break Master	**6NC-TNGG 160404N-SV** **160408N-SV** **160412N-SV**		— — —	— — —	— — —	● —	— — —	0.4 0.8 1.2	2.3 2.0 2.0	6 corners	S01235

※ Depth-of-cut for one-use type is 0.5mm or less

TNMA2204●●

I.C.: ϕ 12.70 Thickness: 4.76 Hole: 5.16

Applicable holder ref. page, (Example)
External Holders C17 ~ C21
Boring Bars D47

● Negative Type (With Hole)

●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	**TNMA 220408** **220412**			●		▲ ▲				— —	0.8 1.2	3.2 2.9	1 corner	Standard

TNGN1103●●

I.C.: ϕ 6.35 Thickness: 3.18 Hole: —

Applicable holder ref. page, (Example)
External Holders L46

●▲=Stock for 1 piece pack

● Solid Type/Negative (Without Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	TNGN 110308 110312		— —	— —	— —	— —	— —	— —	— —	● ●	0.8 1.2	9.8 9.2	Solid	Standard
 Sharp edge type	TNGN 110308F 110312F		— —	— —	— —	— —	— —	— —	— —	● ●	0.8 1.2	9.8 9.2	Solid	No edge treatment

TNGN1604●●

I.C.: ϕ 9.525 Thickness: 4.76 Hole: —

Applicable holder ref. page, (Example)
External Holders L46

●▲=Stock for 1 piece pack

● Negative Type (Without Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	TNGN 160404 160408 160412			● ●		▲ ▲ ▲				— —	0.4 0.8 1.2	3.5 3.2 2.9	1 corner	Standard

● Solid Type/Negative (Without Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	TNGN 160408 160412 160416 160420 New		— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	● ● ● ●	0.8 1.2 1.6 2.0	15.3 14.8 14.2 13.6	Solid	Standard

TBEW0601●●

I.C.: ϕ 3.97 Thickness: 1.59 Hole: 2.2

Applicable holder ref. page, (Example)
Boring Bars D16 D17

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/5° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-TBEW 060102F 060102S	T-NU-TBEW 060102F 060102S	— —	— ●	— —	— —	— —	— —	— —	— —	0.2 0.2	2.1 2.1	1 corner	F→No edge treatment S→T01215

∗ F : Sharp edge type S : Fine Boring type ※ Depth-of-cut for one-use type is 0.5mm or less

TBGN0601●●

I.C.: ϕ 3.97 Thickness: 1.59 Hole: —

Applicable holder ref. page, (Example)
Boring Bars L52

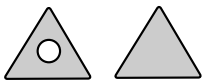
●▲=Stock for 1 piece pack

●5° Positive Type (Without Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	TBGN 060102B 060104B 060108B		● ●	● ● ●		● ● ●	● ● ●	● ● ●	● ● ●	— — —	0.2 0.4 0.8	6.5 6.3 5.7	3 corners	Standard
	TBGN 060102-BSN 060104-BSN 060108-BSN		— — —	● ● ●	— — —	— — —	— — —	— — —	— — —	— — —	0.2 0.4 0.8	6.5 6.3 5.7	3 corners	Standard

∗ BSN : Small edge treatment

T Triangular Type



Standard Cutting edge specification (Refer to L18 for details)

	BNX10	BNX20	BNX25	BN250	BN350	BNC80	BNC100 BNC150	BNC200 BNC300	BN500 BN700	BNS800
Negative	T01225	S01225	S01725	S01225	T01225	S01020	S01225	S01225	T01215	T02020
Positive	T01225	S01225	S01725	S01235	T01235	S01020	S01225	S01225	T01215	—

TPGW0802●●

I.C.: φ 4.76 Thickness: 2.38 Hole: 2.3

Applicable holder ref. page, (Example)
Boring Bars D16 D17

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/11° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25 ※	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-TPGW 080202 080204 080208	T-NU-TPGW 080202 080204 080208	◉ ◉			◉ ◉			● ● ●	— — — — — —	0.2 0.4 0.8	2.6 2.5 2.2	1 corner	Standard
Sharp edge type	NU-TPGW 080202F 080204F 080208F	T-NU-TPGW 080202F 080204F 080208F	— — — — — —	— — — — — —	— — — — — —	— — — — — —	— — — — — —	— — — — — —	● ●	— — — — — —	0.2 0.4 0.8	2.6 2.5 2.2	1 corner	No edge treatment
Fine Boring type	NU-TPGW 080202S 080204S 080208S	T-NU-TPGW 080202S 080204S 080208S	— — — — — —		— — — — — —	● ●	— — — — — —	— — — — — —	— — — — — —	— — — — — —	0.2 0.4 0.8	2.6 2.5 2.2	1 corner	T01215 (Smaller edge treatment)
Continuous cutting general type	NU-TPGW 080202M New 080204M New 080208M New	T-NU-TPGW 080202M New 080204M New 080208M New	— — — — — —	— — — — — —	— — — — — —	● ●	— — — — — —	— — — — — —	— — — — — —	— — — — — —	0.2 0.4 0.8	2.6 2.5 2.2	1 corner	S01225 (Smaller edge treatment)

※ For BNX25, use NS type code (NS-TPGW) ※ Depth-of-cut for one-use type is 0.5mm or less

TPGW0902●●

I.C.: φ 5.56 Thickness: 2.38 Hole: 2.8

Applicable holder ref. page, (Special holder)

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/11° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25 ※	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-TPGW 090202 090204 090208	T-NU-TPGW 090202 090204 090208				● ●			● ●	— — — —	0.2 0.4 0.8	2.6 2.5 2.2	1 corner	Standard
Continuous cutting general type	NU-TPGW 090202M New 090204M New 090208M New	T-NU-TPGW 090202M New 090204M New 090208M New	— — — — — —	— — — — — —	— — — — — —	● ●	— — — — — —	— — — — — —	— — — — — —	— — — — — —	0.2 0.4 0.8	2.6 2.5 2.2	1 corner	S01225 (Smaller edge treatment)

※ For BNX25, use NS type code (NS-TPGW) ※ Depth-of-cut for one-use type is 0.5mm or less

TPGW1102●●

I.C.: φ 6.35 Thickness: 2.38 Hole: 2.8

Applicable holder ref. page, (Example)
(SEC-Boring Bar STUP Type)

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/11° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25 ※	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-TPGW 110202 110204 110208	T-NU-TPGW 110202 110204 110208	◉ ◉			◉ ◉			● ●	— — — —	0.2 0.4 0.8	2.5 2.3 2.0	1 corner	Standard
Fine Boring type	NU-TPGW 110202S 110204S 110208S	T-NU-TPGW 110202S 110204S 110208S	— — — — — —		— — — — — —	● ●	— — — — — —	— — — — — —	— — — — — —	— — — — — —	0.2 0.4 0.8	2.5 2.3 2.0	1 corner	T01215 (Smaller edge treatment)
Continuous cutting general type	NU-TPGW 110202M New 110204M New 110208M New	T-NU-TPGW 110202M New 110204M New 110208M New	— — — — — —	— — — — — —	— — — — — —	● ●	— — — — — —	— — — — — —	— — — — — —	— — — — — —	0.2 0.4 0.8	2.3 2.3 2.0	1 corner	S01225 (Smaller edge treatment)

※ For BNX25, use NS type code (NS-TPGW) ※ Depth-of-cut for one-use type is 0.5mm or less

TPGW1103●●

I.C.: φ 6.35 Thickness: 3.18 Hole: 3.4

Applicable holder ref. page, (Example)

Boring Bars D16 D17

● One-use Type/11° Positive (With Hole)

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-TPGW 110302 110304 110308	T-NU-TPGW 110302 110304 110308	◉ ◉ ◉	◉ ◉ ◉	— — —	◉ ◉ ◉	 ◉ ◉	● ● ●	● ● ●	— — —	0.2 0.4 0.8	2.6 2.5 2.2	1 corner	Standard
	NS-TPGW 110302 110304 110308	T-NS-TPGW 110302 110304 110308	— — —	— — —	 ◉ ◉	— — —	— — —	— — —	— — —	— — —	0.2 0.4 0.8	2.6 2.5 2.2	1 corner	Standard
 Sharp edge type	NU-TPGW 110302F 110304F 110308F	T-NU-TPGW 110302F 110304F 110308F	— — —	— — —	— — —	— — —	— — —	— — —	● ● ●	— — —	0.2 0.4 0.8	2.6 2.5 2.2	1 corner	No edge treatment
 Fine Boring type	NU-TPGW 110302S 110304S 110308S	T-NU-TPGW 110302S 110304S 110308S	— — —	● ● ●	— — —	● ● ●	— — —	— — —	— — —	— — —	0.2 0.4 0.8	2.6 2.5 2.2	1 corner	T01215 (Smaller edge treatment)
 Continuous cutting general type	NU-TPGW 110302M New 110304M New 110308M New	T-NU-TPGW 110302M New 110304M New 110308M New	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	0.2 0.4 0.8	2.6 2.5 2.2	1 corner	S01225 (Smaller edge treatment)

● 11° Positive Type (With Hole)

※ Depth-of-cut for one-use type is 0.5mm or less

	TPGW 110304 110308			● ●		▲ ▲		▲	● —	—	0.4 0.8	3.5 3.2	1 corner	Standard

TPGW1103●● Coated SUMIBORON

I.C.: φ 6.35 Thickness: 3.18 Hole: 3.4

Applicable holder ref. page, (Example)

Boring Bars D16 D17

● Multi-cornered, One-use Type/11° Positive (With Hole)

●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNC80	BNC100	BNC150	BNC200	BNC300	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	3NC-TPGW 110302 110304 110308		● ●	● ●	▲ ▲	● ●	● ●	0.2 0.4 0.8	2.4 2.3 2.0	3 corners	Standard

※ Depth-of-cut for one-use type is 0.5mm or less

TPGW1603●●

I.C.: φ 9.525 Thickness: 3.18 Hole: 4.4

Applicable holder ref. page, (Example)

(Special holder)

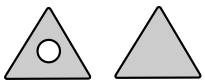
● One-use Type/11° Positive (With Hole)

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
 Continuous cutting general type	NU-TPGW 160302M New 160304M New 160308M New	T-NU-TPGW 160302M New 160304M New 160308M New	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	0.2 0.4 0.8	2.4 2.3 2.0	1 corner	S01225 (Smaller edge treatment)

※ Inserts with standard edge treatment can be made to order ※ Depth-of-cut for one-use type is 0.5mm or less

T Triangular Type



Standard Cutting edge specification (Refer to L18 for details)

	BNX10	BNX20	BNX25	BN250	BN350	BNC80	BNC100 BNC150	BNC200 BNC300	BN500 BN700	BNS800
Negative	T01225	S01225	S01725	S01225	T01225	S01020	S01225	S01225	T01215	T02020
Positive	T01225	S01225	S01725	S01235	T01235	S01020	S01225	S01225	T01215	—

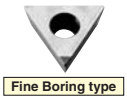
TPGW1604●●

I.C.: ϕ 9.525 Thickness: 4.76 Hole: 4.4

Applicable holder ref. page, (Example)
Boring Bars D16 D17

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/11° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-TPGW 160402 160404 160408	T-NU-TPGW 160402 160404 160408	— ◉ ◉	— ◉ ◉	— — —	— ◉ ◉	— ◉ ◉	— ● ●	— ● ●	— — —	0.2 0.4 0.8	2.6 2.5 2.2	1 corner	Standard
	NS-TPGW 160402 160404 160408	T-NS-TPGW 160402 160404 160408	— — —	— — —	— ◉ ◉	— — —	— — —	— — —	— — —	— — —	0.2 0.4 0.8	2.6 2.5 2.2	1 corner	Standard
 Sharp edge type	NU-TPGW 160402F 160404F 160408F	T-NU-TPGW 160402F 160404F 160408F	— — —	— — —	— — —	— — —	— — —	— — —	— ● —	— — —	0.2 0.4 0.8	2.6 2.5 2.2	1 corner	No edge treatment
 Fine Boring type	NU-TPGW 160402S 160404S 160408S	T-NU-TPGW 160402S 160404S 160408S	— — —	— ● ●	— — —	— ● ●	— — —	— — —	— — —	— — —	0.2 0.4 0.8	2.6 2.5 2.2	1 corner	T01215 (Smaller edge treatment)
 Continuous cutting general type	NU-TPGW 160404M New 160408M New 160412M New	T-NU-TPGW 160404M New 160408M New 160412M New	— — —	— — —	— — —	● ●	— — —	— — —	— — —	— — —	0.4 0.8 1.2	2.5 2.2 2.2	1 corner	S01225 (Smaller edge treatment)

● 11° Positive Type (With Hole)

※ Depth-of-cut for one-use type is 0.5mm or less

	TPGW 160404 160408 160412			● ●		▲ ▲		▲		— —	0.4 0.8 1.2	3.5 3.2 2.9	1 corner	Standard

TPGW1604●● Coated SUMIBORON

I.C.: ϕ 9.525 Thickness: 4.76 Hole: 4.4

Applicable holder ref. page, (Example)
Boring Bars D16 D17

●▲=Stock for 1 piece pack

● Multi-cornered, One-use Type/11° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNC80	BNC100	BNC150	BNC200	BNC300	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	3NC-TPGW 160402 160404 160408			● ●	▲ ▲	● ●		0.2 0.4 0.8	2.4 2.3 2.0	3 corners	Standard

※ Depth-of-cut for one-use type is 0.5mm or less

TPGN0902●●

I.C.: φ 5.56 Thickness: 2.38 Hole: –

Applicable holder ref. page, (Example)
(Cartridge CP Type)

●▲=Stock for 1 piece pack

● 11° Positive Type (Without Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	TPGN 090204 090208			●		▲		●		—	0.4 0.8	3.5 3.2	1 corner	Standard

TPGN1103●●

I.C.: φ 6.35 Thickness: 3.18 Hole: –

Applicable holder ref. page, (Example)
Boring Bars D38

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/11° Positive (Without Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNX10	BNX20	BNX25 ※	BN250	BN350	BN500	BN700	BNS800	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-TPGN 110304 110308 110312	T-NU-TPGN 110304 110308 110312		◉ ◉		◉ ◉	● ●	● ●	● ●	— —	0.4 0.8 1.2	2.3 2.0 2.0	1 corner	Standard
 Continuous cutting general type	NU-TPGN 110302M New 110304M New 110308M New	T-NU-TPGN 110302M New 110304M New 110308M New	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	0.2 0.4 0.8	2.4 2.3 2.0	1 corner	S01225 (Smaller edge treatment)

※ For BNX25, use NS type code (NS-TPGN) ※ Depth-of-cut for one-use type is 0.5mm or less

● 11° Positive Type (Without Hole)

	TPGN 110304 110308			●		▲ ▲			●	— —	0.4 0.8	3.5 3.2	1 corner	Standard

TPGN1603●●

I.C.: φ 9.525 Thickness: 3.18 Hole: –

Applicable holder ref. page, (Example)
External Holders C30
Boring Bars D38

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/11° Positive (Without Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNX10	BNX20	BNX25 ※	BN250	BN350	BN500	BN700	BNS800	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-TPGN 160302 160304 160308	T-NU-TPGN 160302 160304 160308		◉ ◉		◉ ◉	● ●	 ●	● ●	— —	0.2 0.4 0.8	2.4 2.3 2.0	1 corner	Standard
 Continuous cutting general type	NU-TPGN 160302M New 160304M New 160308M New	T-NU-TPGN 160302M New 160304M New 160308M New	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	0.2 0.4 0.8	2.4 2.3 2.0	1 corner	S01225 (Smaller edge treatment)

※ For BNX25, use NS type code (NS-TPGN) ※ Depth-of-cut for one-use type is 0.5mm or less

● 11° Positive Type (Without Hole)

	TPGN 160304 160308 160312			● ●		▲ ▲		●	●	— — —	0.4 0.8 1.2	3.5 3.2 2.9	1 corner	Standard

TPGN2204●●

I.C.: φ 12.70 Thickness: 4.76 Hole: –

Applicable holder ref. page, (Example)
External Holders C30

●▲=Stock for 1 piece pack

● 11° Positive Type (Without Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	TPGN 220408			●		▲				—	0.8	3.2	1 corner	Standard

SUMIBORON Indexable Inserts

V — 35° Diamond Type

Standard Cutting edge specification (Refer to L18 for details)

	BNX10	BNX20	BNX25	BN250	BN350	BNC80	BNC100 BNC150	BNC200 BNC300	BN500 BN700	BNS800
Negative	T01225	S01225	S01725	S01225	T01225	S01020	S01225	S01225	T01215	T02020
Positive	T01225	S01225	S01725	S01235	T01235	S01020	S01225	S01225	T01215	—

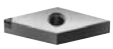
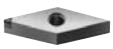
VN■A1604●●

I.C.: ϕ 9.525 Thickness: 4.76 Hole: 3.81

Applicable holder ref. page, (Example)
External Holders C23 C24

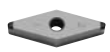
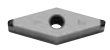
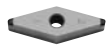
◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/Negative (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-VNMA 160401 New 160402 New 160404 160408 160412 New	T-NU-VNMA 160401 New 160402 New 160404 160408 160412 New	— — ◉ ◉ —	— — ◉ ◉ —	— — — — —	● ● ◉ ◉ ●	 ◉ ◉ 	 ● ● 	 ● ● 	— — — — —	0.1 0.2 0.4 0.8 1.2	3.5 3.3 2.8 2.0 1.7	1 corner	Standard
	NS-VNMA 160404 160408	T-NS-VNMA 160404 160408	— —	— —	◉ ◉	— —	— —	— —	— —	— —	0.4 0.8	2.8 2.0	1 corner	Standard

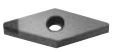
※ Depth-of-cut for one-use type is 0.5mm or less

● Multi-cornered, One-use Type/Negative (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	2NU-VNGA 160404 160408	T-2NU-VNGA 160404 160408		◉ ◉	— —	◉ ◉	● ●		● ●	— —	0.4 0.8	2.8 2.0	2 corners	Standard
	2NS-VNGA 160404 160408	T-2NS-VNGA 160404 160408	— —	— —	◉ ◉	— —	— —	— —	— —	— —	0.4 0.8	2.8 2.0	2 corners	Standard
 Strong edge type	2NU-VNGA 160404T 160408T	T-2NU-VNGA 160404T 160408T	— —	— —	— —	— —	● ●	— —	 ●	— —	0.4 0.8	2.8 2.0	2 corners	BN350→T01235 BN700→S01225 (Larger edge treatment)

※ Depth-of-cut for one-use type is 0.5mm or less

● Negative Type (With Hole)

	VNMA 160404 160408			● ●		▲ ▲		▲	● 	— —	0.4 0.8	5.0 4.1	1 corner	Standard

※ Depth-of-cut for one-use type is 0.5mm or less

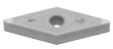
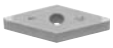
VNGA1604●● Coated SUMIBORON

I.C.: ϕ 9.525 Thickness: 4.76 Hole: 3.81

Applicable holder ref. page, (Example)
External Holders C23 C24

●▲=Stock for 1 piece pack

● Multi-cornered, One-use Type/Negative (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	BNC80	BNC100	BNC150	BNC200	BNC300	Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	2NC-VNGA 160404 New 160408 New					● ●		0.4 0.8	2.8 2.0	2 corners	Standard
	4NC-VNGA 160404 160408 160412		● ●	● ●	▲ ▲	● ● ●	● ●	0.4 0.8 1.2	2.8 2.0 1.7	4 corners	Standard

※ Depth-of-cut for one-use type is 0.5mm or less

VBGW1103●●

I.C.: φ 6.35 Thickness: 3.18 Hole: 2.8

Applicable holder ref. page, (Example)

Boring Bars D34

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/5° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25※	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	NU-VBGW 110302 New 110304 New 110308 New	T-NU-VBGW 110302 New 110304 New 110308 New							● ●	— —	0.2 0.4 0.8	3.2 2.8 2.0	1 corner	Standard
 Continuous cutting general type	NU-VBGW 110302M New 110304M New 110308M New	T-NU-VBGW 110302M New 110304M New 110308M New	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	0.2 0.4 0.8	3.2 2.8 2.0	1 corner	S01225 (Smaller edge treatment)

※ For BNX25, use NS type code (NS-VBGW) ※ Depth-of-cut for one-use type is 0.5mm or less

VBGW1604●●

I.C.: φ 6.35 Thickness: 3.18 Hole: 2.8

Applicable holder ref. page, (Example)

(Special holder)

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/5° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
 Continuous cutting general type	NU-VBGW 160402M New 160404M New 160408M New	T-NU-VBGW 160402M New 160404M New 160408M New	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	0.2 0.4 0.8	3.8 3.3 2.5	1 corner	S01225 (Smaller edge treatment)

※ Inserts with standard edge treatment can be made to order ※ Depth-of-cut for one-use type is 0.5mm or less

V 35° Diamond Type

Standard Cutting edge specification (Refer to L18 for details)

	BNX10	BNX20	BNX25	BN250	BN350	BNC80	BNC100 BNC150	BNC200 BNC300	BN500 BN700	BNS800
Negative	T01225	S01225	S01725	S01225	T01225	S01020	S01225	S01225	T01215	T02020
Positive	T01225	S01225	S01725	S01235	T01235	S01020	S01225	S01225	T01215	—

VCGW0802●●

I.C.: φ 4.76 Thickness: 2.38 Hole: 2.3

Applicable holder ref. page, (Example)

(Special holder)

●=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/7° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
 Continuous cutting general type	**NU-VCGW 080202M** New **080204M** New **080208M** New	**T-NU-VCGW 080202M** New **080204M** New **080208M** New	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	0.2 0.4 0.8	3.3 2.8 2.0	1 corner	S01225 (Smaller edge treatment)

※ Inserts with standard edge treatment can be made to order ※ Depth-of-cut for one-use type is 0.5mm or less

VCGW1103●●

I.C.: φ 6.35 Thickness: 3.18 Hole: 2.8

Applicable holder ref. page, (Example)

External Holders C49 C51 C62

●=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

● One-use Type/7° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25※	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	**NU-VCGW 110302** **110304**	**T-NU-VCGW 110302** **110304**				● ●				—	0.2 0.4	3.3 2.8	1 corner	Standard
 Continuous cutting general type	**NU-VCGW 110302M** New **110304M** New	**T-NU-VCGW 110302M** New **110304M** New	— —	— —	— —	● ●	— —	— —	— —	— —	0.2 0.4	3.3 2.8	1 corner	S01225 (Smaller edge treatment)

※ For BNX25, use NS type code (NS-VCGW) ※ Depth-of-cut for one-use type is 0.5mm or less

VCMW1604●●

I.C.: φ 9.525 Thickness: 4.76 Hole: 4.4

Applicable holder ref. page, (Example)

External Holders C28

Boring Bars D36

●▲=Stock for 1 piece pack

●7° Positive Type (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	**VCMW 160404** **160408**			● ●				●		—	0.4 0.8	5.2 4.3	1 corner	Standard

VCGW1604●● Coated SUMIBORON

I.C.: φ 9.525 Thickness: 4.76 Hole: 4.4

Applicable holder ref. page, (Example)

External Holders C28

Boring Bars D36

●▲=Stock for 1 piece pack

● Multi-cornered, One-use Type/7° Positive (With Hole)

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNC80	BNC100	BNC150	BNC200	BNC300	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	**2NC-VCGW 160404** **160408**		● ●	● ●	▲ ▲	● ●		0.4 0.8	3.3 2.5	2 corners	Standard

※ Depth-of-cut for one-use type is 0.5mm or less

W Trigon Type

Standard Cutting edge specification (Refer to L18 for details)

	BNX10	BNX20	BNX25	BN250	BN350	BNC80	BNC100 BNC150	BNC200 BNC300	BN500 BN700	BNS800
Negative	T01225	S01225	S01725	S01225	T01225	S01020	S01225	S01225	T01215	T02020
Positive	T01225	S01225	S01725	S01235	T01235	S01020	S01225	S01225	T01215	—

WNGA0804●● Coated SUMIBORON

I.C.: φ 12.70 Thickness: 4.76 Hole: 5.16

Applicable holder ref. page, (Example)
External Holders C25

● Multi-cornered, One-use Type/Negative (With Hole)

●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNC80	BNC100	BNC150	BNC200	BNC300	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	**6NC-WNGA 080404**		●	●	▲	●		0.4	2.4	6 corners	Standard
	080408							0.8	2.3		
	080412							1.2	2.2		

※ Depth-of-cut for one-use type is 0.5mm or less

WNMA0804●●

I.C.: φ 12.70 Thickness: 4.76 Hole: 5.16

Applicable holder ref. page, (Example)
External Holders C25

● One-use Type/ Negative (With Hole)

●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25 ※	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
	**NU-WNMA 080404** New	**T-NU-WNMA 080404** New				●				—	0.2	3.3	1 corner	Standard
	080408 New	**080408** New				●				—	0.4	2.8		

● Negative Type (With Hole)

※ For BNX25, use NS type code (NS-WNMA) ※ Depth-of-cut for one-use type is 0.5mm or less

	**WNMA 080404**			●						—	0.4	4.5	1 corner	Standard
	080408			●						—	0.8	4.4		
	080412									—	1.2	4.3		

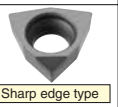
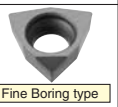
WBEW0601●●

I.C.: φ 3.97 Thickness: 1.59 Hole: 2.2

Applicable holder ref. page, (Example)
Boring Bars D14

● One-use Type/5° Positive (With Hole)

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
 Sharp edge type	**NU-WBEW 060102L-F**	**T-NU-WBEW 060102L-F**	—	—	—	—	—	—	●	—	0.2	1.3	1 corner	No edge treatment
	060104L-F New	**060104L-F** New	—	—	—	—	—	—		—	0.4	1.2		
 Fine Boring type	**NU-WBEW 060102L-S**	**T-NU-WBEW 060102L-S**	—	●	—	—	—	—	—	—	0.2	1.3	1 corner	T01215
	060104L-S New	**060104L-S** New	—	●	—	—	—	—	—	—	0.4	1.2		

∗ F : Sharp edge type S : Fine Boring type ※ Depth-of-cut for one-use type is 0.5mm or less

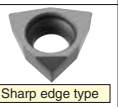
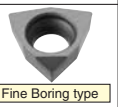
WBEW0802●●

I.C.: φ 4.76 Thickness: 2.38 Hole: 2.4

Applicable holder ref. page, (Example)
Boring Bars D14

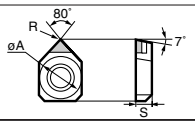
● One-use Type/5° Positive (With Hole)

◉=Stock for 1 & 10 pieces pack ●▲=Stock for 1 piece pack

Appearance	1 piece pack ISO Cat. No.	10 pieces pack ISO Cat. No.	Stock BNX10	BNX20	BNX25	BN250	BN350	BN500	BN700	BNS800	Dimensions (mm) Nose Radius	Cutting Edge Length	No. of cutting edges	Cutting edge specification
 Sharp edge type	**NU-WBEW 080202L-F** New	**T-NU-WBEW 080202L-F** New	—	—	—	—	—	—		—	0.2	1.7	1 corner	No edge treatment
	080204L-F New	**080204L-F** New	—	—	—	—	—	—		—	0.4	1.6		
 Fine Boring type	**NU-WBEW 080202L-S** New	**T-NU-WBEW 080202L-S** New	—	●	—	—	—	—	—	—	0.2	1.7	1 corner	T01215
	080204L-S New	**080204L-S** New	—	●	—	—	—	—	—	—	0.4	1.6		

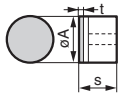
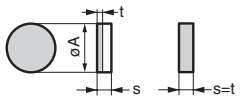
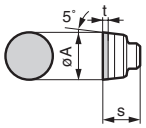
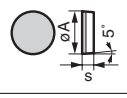
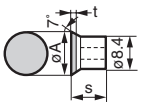
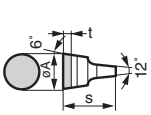
※ Depth-of-cut for one-use type is 0.5mm or less

■ Turning Insert

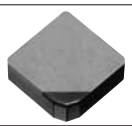
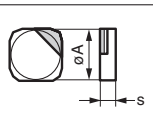
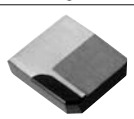
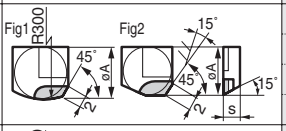
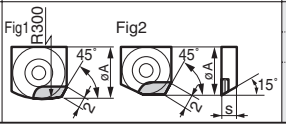
Appearance	Shape	ISO Cat. No.	Stock BN250	BNX20	BN350	BNX25※	BNX10	BN500	BN700		Dimension (mm) Inscribed Circle (A)	Thickness (s)	Nose Radius (R)	Hole Size	Applicable Holder
		NU-ZNEX 040102	●						●		4.76	1.59	0.2	2.3	SUMIBORON Small Hole Boring Bar BNZ Type →L51
		NU-ZNEX 040104	●						●				0.4		
		T-NU-ZNEX 040102	●										0.2		
		T-NU-ZNEX 040104	●										0.4		

※ BNX25, use NS type code (NS-ZNEX).
※ T-NU-ZNEX is a 10 pieces pack.

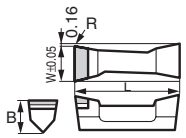
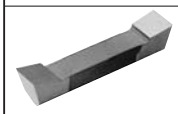
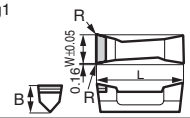
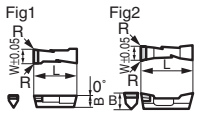
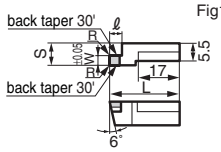
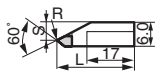
■ Round Insert

Appearance	Shape	ISO Cat. No.	Stock BN250	BNX20	BN350	BNX25	BNX10	BN500	BN700	BNS800	Dimension (mm) Inscribed Circle (A)	Thickness (s)	Thickness of CBN (t)	Fig	Applicable Holder
	Fig1 	RNGA 0906M0	●	●						—	9.00	6.35	0.8	1	SUMIBORON Tool Holder for Round Insert (PRGN Type) →L54
	Fig1 Fig2 	RNGN 120400-B							●	—	12.70	4.76	0.8	1	Special Holder
		RNGN 150400-B								—	15.88				
		RNGN 090300	—	—	—	—	—	—	—	●	9.525	3.18	3.18	2	Tool Holder for Solid SUMIBORON (CRDN, CRSN Types) →L47
		RNGN 090300 F	—	—	—	—	—	—	—	●					
		RNGN 120300	—	—	—	—	—	—	—	●	12.70				
		RNGN 120300 F	—	—	—	—	—	—	—	●					
		RNGN 120400	—	—	—	—	—	—	—	●	12.70	4.76	4.76		
	Fig1 	RBG 08-B							●	—	8.00	6.50	0.8	1	SUMIBORON Tool Holder for Roll Turning (BNRN Type) →L55
		RBG 10-B							●	—	10.00	9.00			
		RBG 12-B							●	—	12.00	6.35			
		RBG 16-B							●	—	16.00	11.00			
		RBG 20-B							●	—	20.00	13.00			
		RBG 26-B							●	—	26.00	15.00			
	Fig1 	RBGN 12S3M0-B		▲						—	12.00	3.60	0.8	1	SUMIBORON Tool Holder for Roll Turning (BNR Type)
		RBGN 16S3M0-B								—	16.00				
		RBGN 20S3M0-B								—	20.00				
		RBGN 29S3M0-B								—	29.00				
	Fig1 	RCGA 0906M0	●							—	9.00	6.35	0.8	1	SUMIBORON Tool Holder for Small Round Insert (PRGC, PRDC Types) →L54
	Fig1 	RTGN 0508M0		●						—	5.00	7.50	0.8	1	SUMIBORON Tool Holder for Small Round Insert (TRGT Type) →L53
		RTGN 0608M0		●						—	6.00				
		RTGN 0711M0		●						—	7.00	11.00			
		RTGN 0811M0		●						—	8.00				
		RTGN 0914M0		●						—	9.00				
		RTGN 1014M0		●						—	10.00	14.00			
		RTGN 1214M0		●						—	12.00				

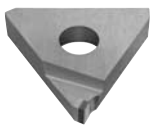
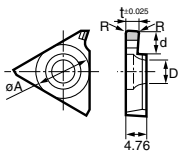
■ Milling Insert

Appearance	Shape	ISO Cat. No.	Stock BN250	BN700		Dimension (mm) Inscribed Circle (A)	Thickness (s)		Fig	Applicable Holder
	Fig1 	CSN 43MT	●			12.70	4.76		1	SEC-ACE Mill DNF Type →G30
	Fig1 R300 Fig2 	SNEN 1504ADTR		●		15.875	4.76		1	BN Finish Mill FM, FMF Types →L60
		SNEN 1504ADTL								
		SNEN 1504ADTR-S		●		15.875	4.76		2	
		SNEN 1504ADTL-S								
	Fig1 R300 Fig2 	SNEW 1203ADTR		●		12.70	3.18		1	BN Finish Mill EASY FMU Types →L58
		SNEW 1203ADTR-S		●		12.70	3.18		2	

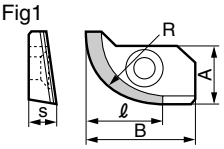
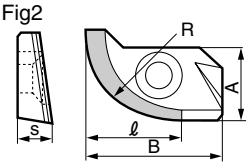
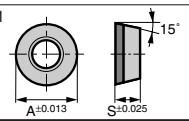
■ Grooving and Threading Insert

Appearance	Shape (Right-hand tool)	Catalogue No.	Stock BN250 R	Stock BN250 L	Stock BNX20 R	Stock BNX20 L	Stock BN350 R	Stock BN350 L	Dimensions (mm) W	ℓ	R	L	S	B	Fig	Applicable Holder
	Fig1 	**MGE R/L740**	●						4.0	—	0.4	22.2	—	6.12	1	SEC-Grooving Holder (GME, GMES, GMD, GMDS, GMDN Types) →E12～E14 (GMFW, GMFWS Types) →E25～E26
		MGE R/L850	●						5.0	—	0.4	25.4	—	6.12		
		MGE R/L860	●						6.0	—	0.4	25.4	—	6.12		
		MGE R/L970							7.0	—	0.4	28.6	—	8.28		
		MGE R/L980							8.0	—	0.4	28.6	—	8.28		
		MGE R/L990							9.0	—	0.4	28.6	—	8.28		
	Fig1 	**MGI R/L740**	●						4.0	—	0.4	22.2	—	6.12		SEC-Grooving Holder (GMI, GMIX Types) →E19
		MGI R/L850							5.0	—	0.4	25.4	—	6.12		
		MGI R/L860							6.0	—	0.4	25.4	—	6.12		
	Fig1 Fig2 	**MGF R/L835-50**							3.5	—	0.4	24.9	—	4.50	1	SEC-Grooving Holder (GMF Types) →E27
		MGF R/L855-50							5.5	—	0.4	24.9	—	4.50		
		MGF R/L835-75							3.5	—	0.4	24.9	—	6.12	2	
		MGF R/L855-75							5.5	—	0.4	24.9	—	6.12		
	Fig1 	**BNGNT 0200R/L**	●				●		2.0	4.0	0.2	25	6.0	—	1	SUMIBORON Grooving Holder BNGG Type →L56
		BNGNT 0250R/L	●				●		2.5	4.0	0.2	25	6.0	—		
		BNGNT 0300R/L	●				●		3.0	5.0	0.4	25	6.0	—		
		BNGNT 0400R/L	●				●		4.0	6.0	0.4	26	6.0	—		
		BNGNT 0500R/L	●				●		5.0	6.0	0.4	26	6.0	—		
		BNGNT 0600R/L	●				●		6.0	7.0	0.4	27	6.0	—		
	Fig1 	**BNTT 1020R/L**	●						Pitch = 1.0-2.0		0.14	25	4.0	—	1	SUMIBORON Grooving Holder BNGG Type →L56
		BNTT 1530R/L	●						Pitch = 1.5-3.0		0.20	25	4.0	—		

■ Turning Insert

Appearance	Shape	Catalogue No.	Stock BN250 R	Stock BN250 L	Dimensions (mm) Inscribed Circle (A)	Edge Width (t)	Nose Radius (R)	Max. Groove Depth (d)	Hole Size (D)	Applicable Holder
		**TGA R/L4125**	●		12.70	1.25	0.2	2.0	5.5	SEC-Grooving Holder (GWC, GWCS, GWCI Types) →E4～E5
		TGA R/L4150	●			1.50		3.5		
		TGA R/L4200	●			2.00		3.5		
		TGA R/L4250	●			2.50		4.0		
		TGA R/L4300	●			3.00		4.0		
		TGA R/L4350	●			3.50		5.0		
		TGA R/L4400	●			4.00		5.0		

■ Endmill Insert

Appearance	Shape	Catalogue No.	Stock BN350	Stock BN500	Stock BN700	Dimensions (mm) R	A	B	ℓ	s	Fig	Applicable Endmill
	Fig1  Fig2 	**BEST 160S**	—			8	6.8	13	10	3.5	1	SUMIBORON Ball Endmill BES Type →L61
		BEST 160L	—			8	6.8	13	13	3.5		
		BEST 200S	—			10	8.5	20	13	4.5		
		BEST 200L	—			10	8.5	20	20	4.5		
		BEST 250S	—	●		12.5	10.5	22.5	15.5	5.0		
		BEST 250L	—	●		12.5	10.5	22.5	22.5	5.0		
		BEST 300S	—	●		15	12.0	25	18	6.0		
		BEST 300L	—	●		15	12.0	25	25	6.0		
		BEST 400S	—			20	16.0	30	23	7.5	2	
		BEST 400L	—			20	16.0	30	30	7.5		
		BEST 500S	—			25	20.0	35	28	8.0		
		BEST 500L	—			25	20.0	35	35	8.0		
	Fig1 	**RDHX 0701M0T**	●		●	—	7.0	—	—	1.99	1	SUMIBORON Radius Endmill BRC Type →L62
		RDHX 0702M0T	●		●	—	7.0	—	—	2.38		
		RDHX 1003M0T	●		●	—	10.0	—	—	3.18		
		RDHX 12T3M0T	●		●	—	12.0	—	—	3.97		

SEC-Tool Holders for Solid SUMIBORON

Top Clamp Type

Refer to page B152 for Solid SUMIBORON stock items

CSBN/FN11
General Turning

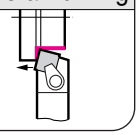


Fig 1

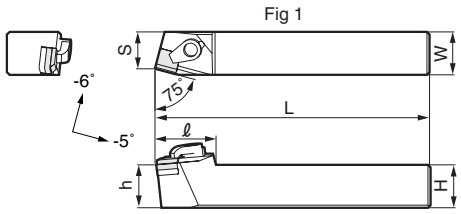
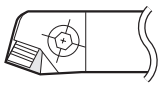


Fig 2



■ Insert

①SNGN0903○○
②SNGN1203○○
③SNGN1204○○

■ Holder

Cat. No.	Stock R	Stock L	H	W	L	S	h	ℓ		Fig
CSBN R/L2525-32	●		25	25	160	21.5	25	30		1
CSBN R/L2525-42	●		25	25	160	21.5	25	35		1
FN11 R/L-44A	●	●	25	25	160	21.5	25	33		2

■ Parts

Cat. No.	Applicable Insert	Clamp	Chip Breaker	Clamp Bolt	Shim	Shim Pin	Spring	Wrench
CSBN R/L2525-32	SNGN0903○○	CCM8UL	CBS13	WB8-22T	SSN0903	SPP3	—	LT27
CSBN R/L2525-42	SNGN1203○○	CCM8UL	CBS14	WB8-22T	SSND423	SPP3	—	LT27
FN11 R/L-44A	SNGN1204○○	DCR/L1	CBD4R/L	BH0830R/L	SSND423	SPP3	DSP5	LH040

CSKN
Facing

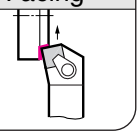
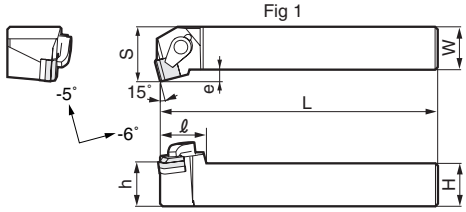


Fig 1



■ Insert

①SNGN0903○○
②SNGN1203○○

■ Holder

Cat. No.	Stock R	Stock L	H	W	L	S	h	ℓ	e	Fig
CSKN R/L2525-32	●		25	25	160	32	25	25	7	1
CSKN R/L2525-42	●		25	25	160	32	25	25	7	1

■ Parts

Cat. No.	Applicable Insert	Clamp	Chip Breaker	Double Screw	Shim	Shim Pin	Wrench
CSKN R/L2525-32	SNGN0903○○	CCM8UL	CBS13	WB8-22T	SSN0903	SPP3	LT27
CSKN R/L2525-42	SNGN1203○○	CCM8UL	CBS14	WB8-22T	SSND423	SPP3	LT27

CTGN/FN21
General Turning

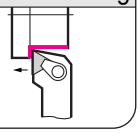


Fig 1

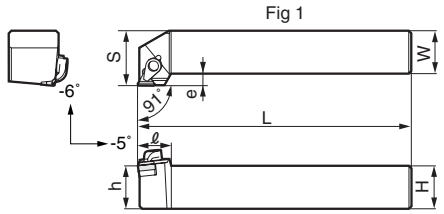
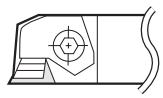


Fig 2



■ Insert

①TNGN1103○○
②TNGN1604○○

■ Holder

Cat. No.	Stock R	Stock L	H	W	L	S	h	ℓ	e	Fig
CTGN R/L2525-22	●		25	25	160	32	25	20	7	1
FN21 R/L-44A	●	●	25	25	160	25	25	32	0	2

■ Parts

Cat. No.	Applicable Insert	Clamp	Chip Breaker	Clamp Bolt	Shim	Shim Pin	Spring	Wrench
CTGN R/L2525-22	TNGN1103○○	CCM6UL	CBT12	WB6-16T	STN1103	SPP3	—	LT20
FN21 R/L-44A	TNGN1604○○	DCR/L2	CBD4R/L	BH0830R/L	STND323	SPP3	DSP5	LH040

CCLN/FCLN
General Turning & Facing

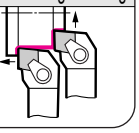


Fig 1

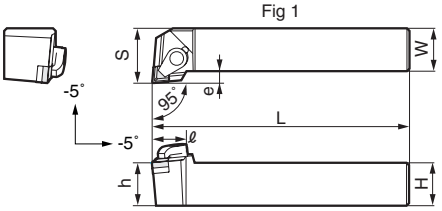
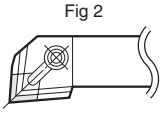


Fig 2



■ Insert

①CNGN0903○○
②CNGN1204○○

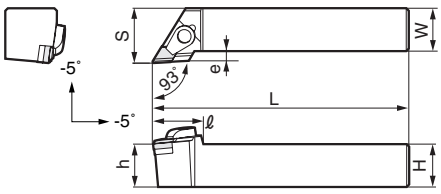
■ Holder

Cat. No.	Stock R	Stock L	H	W	L	S	h	ℓ	e	Fig
CCLN R/L2525-32	●		25	25	150	32	25	25	7	1
FCLN R/L2525-43	●	●	25	25	150	32	25	30	7	2

■ Parts

Cat. No.	Applicable Insert	Clamp	Chip Breaker	Double Screw	Shim	Shim Pin	Wrench
CCLN R/L2525-32	CNGN0903○○	CCM8UL	CBC0903	WB8-22T	SCN0903	SPP3	LT27
FCLN R/L2525-43	CNGN1204○○	CCM8-LONG	CBC4	WB8-30	SCND433	SPP3	LH040

CDJN
General Turning & Facing



■ Insert

①DNGN1103○○

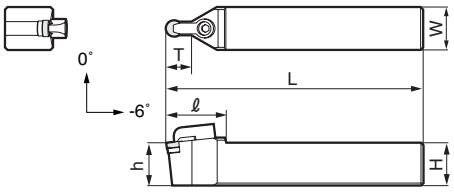
■ Holder

Cat. No.	Stock R	Stock L	Dimensions (mm) H	W	L	S	h	ℓ	e	Applicable Insert
CDJN R/L2525-32	●		25	25	150	32	25	30	7	DNGN1103○○

■ Parts

Clamp	Chip Breaker	Double Screw	Shim	Shim Pin	Wrench
CCM8UL	CBD1103	WB8-22T	SDN1103	SPP3	LT27

CRDN
General Turning & Copying



■ Insert

①RNGN090300
②RNGN120300
③RNGN120400

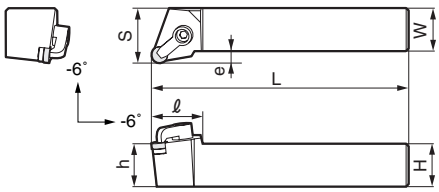
■ Holder

Cat. No.	Stock	Dimensions (mm) H	W	L	h	ℓ	T	Applicable Insert
CRDNN2525-32	●	25	25	150	25	35	15	RNGN090300
CRDNN2525-42	●	25	25	150	25	35	20	RNGN120300
CRDNN2525-43	●	25	25	150	25	35	20	RNGN120400

■ Parts

Clamp	Double Screw	Shim	Shim Pin	Wrench
CCM8-LONG	WB8-22T	SRND32	SPP3	LT27
CCM8-LONG	WB8-22T	SRND42	SPP3	LT27
CCM8-LONG	WB8-22T	SRND42	SPP3	LT27

CRSN
General Turning & Facing



■ Insert

①RNGN090300
②RNGN120300
③RNGN120400

■ Holder

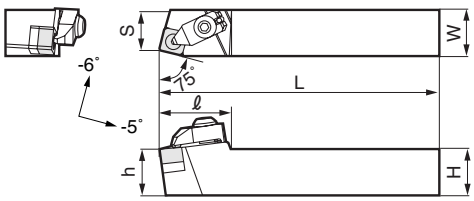
Cat. No.	Stock R	Stock L	Dimensions (mm) H	W	L	S	h	ℓ	e	Applicable Insert
CRSN R/L2525-32	●		25	25	150	32	25	30	7	RNGN090300
CRSN R/L2525-42	●		25	25	150	32	25	30	7	RNGN120300
CRSN R/L2525-43	●		25	25	150	32	25	30	7	RNGN120400

■ Parts

Clamp	Double Screw	Shim	Shim Pin	Wrench
CCM8-LONG	WB8-22T	SRND32	SPP3	LT27
CCM8-LONG	WB8-22T	SRND42	SPP3	LT27
CCM8-LONG	WB8-22T	SRND42	SPP3	LT27

Dimple Lock Type

XSBN
General Turning



■ Insert

①SNGX1204○○

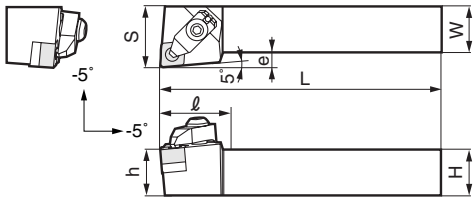
■ Holder

Cat. No.	Stock R	Stock L	Dimensions (mm) H	W	L	S	h	ℓ	Applicable Insert
XSBN R/L2525-43			25	25	150	21.5	25	38	SNGX1204○○

■ Parts

Clamp	Clamp Bolt	Shim	Shim Pin	Spring	Wrench
DSLX8	BH0825	SSND433	SPP3	GSP10	LH040

XCLN
General Turning & Facing



■ Insert

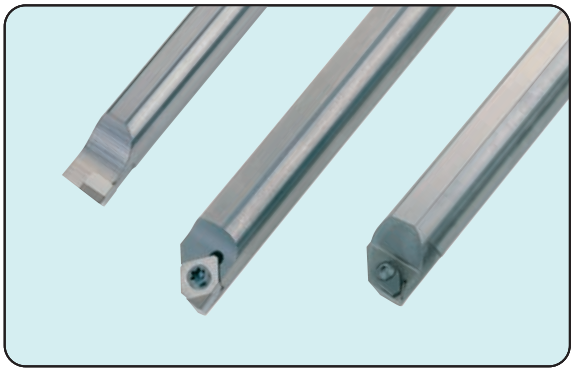
①CNGX1204○○

■ Holder

Cat. No.	Stock R	Stock L	Dimensions (mm) H	W	L	S	h	ℓ	e	Applicable Insert
XCLN R/L2525-43			25	25	150	32	25	33	7	CNGX1204○○

■ Parts

Clamp	Clamp Bolt	Shim	Shim Pin	Spring	Wrench
DSLX8	BH0825	SCND433	SPP3	GSP10	LH040



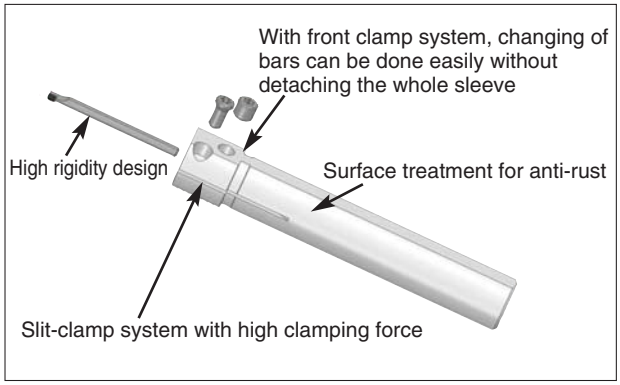
High Rigidity With Full Carbide Bars!

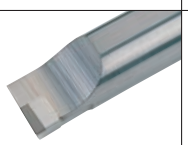
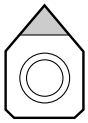
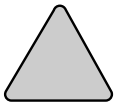
SUMIBORON small hole boring bar series with brazed CBN (SUMIBORON) tip, is a revolutionary tool that achieves a one-pass boring process of Hardened Steel.
Utilizing the proven SUMIBORON grades for high speed and high precision machining of Hardened Steel, coupled with a whole series of high rigidity, full shank-to-tip carbide bars to achieve trouble-free small hole boring of Hardened Steel.

New

BNBX Type

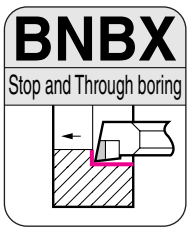
Newly developed slit-clamp system greatly improves clamp rigidity and stably performs small hole boring of Hardened Steel.

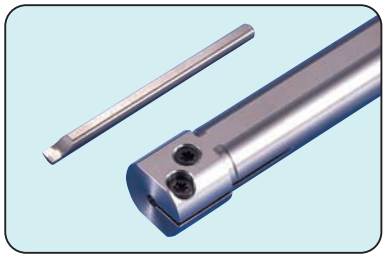


Type	Appearance	Type	Insert	Smallest Boring Diameter	Page
New BNBX Type		Brazed (High rigidity)	———	ϕ2.5～ϕ8.5	L49
BNBB Type		Brazed	———	ϕ3.5～ϕ8.5	L50
BNZ Type		Indexable		ϕ7～ϕ21	L51
BNB Type		Indexable		ϕ10～ϕ22	L52

BNBX Type

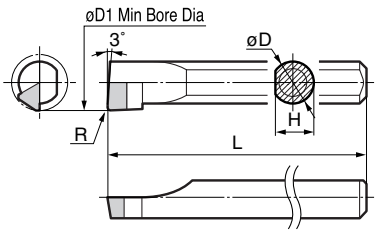
New





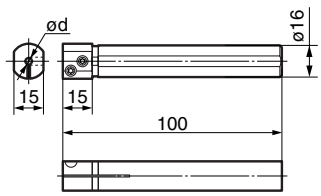
- **Newly developed high rigidity slit-clamping system, excellent for small hole boring**
  - Maximum overhang of L/D=5 possible.
  - Minimal bar deformation produces excellent boring accuracy.
  - Minimal vibration produces superior surface finish.
  - Easy bar indexing without sleeve removal.
- **BN250 for hardened steel and BN700 for powder metal are available**

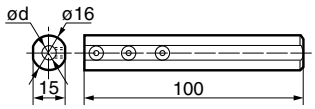
■ Brazed Boring Bar



Catalogue No.	Stock		Min. Bore Dia. øD1	Dimensions (mm)				Applicable Sleeve
	BN250	BN700		øD	H	L	R	
BNBX020R	●	●	2.5	2.0	1.7	40	0.2	HBX2016
BNBX025R	●	●	3.0	2.5	2.2	40	0.2	HBX2516
BNBX030R	●	●	3.5	3.0	2.7	40	0.2	HBX3016
BNBX035R	●	●	4.0	3.5	3.2	40	0.2	HBX3516
BNBX040R	●	●	4.5	4.0	3.7	40	0.2	HBX4016
BNBX045R	●	●	5.0	4.5	4.2	40	0.2	HBX4516
BNBX050R	●	●	5.5	5.0	4.7	60	0.2	HBX5016
BNBX055R	●	●	6.0	5.5	5.2	60	0.2	HBX5516
BNBX060R	●	●	6.5	6.0	5.7	60	0.2	HBX6016
BNBX065R	●		7.0	6.5	6.2	60	0.2	HBB6516
BNBX070R	●		7.5	7.0	6.7	80	0.2	HBB716
BNBX075R	●		8.0	7.5	7.2	80	0.2	HBB7516
BNBX080R	●		8.5	8.0	7.7	80	0.2	HBB816

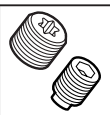
■ Adaptor Sleeve





Catalogue No.	Stock	Diameter (ød)	Applicable Bar
HBX2016	●	2.0	BNBX020R
HBX2516	●	2.5	BNBX025R
HBX3016	●	3.0	BNBX030R
HBX3516	●	3.5	BNBX035R
HBX4016	●	4.0	BNBX040R
HBX4516	●	4.5	BNBX045R
HBX5016	●	5.0	BNBX050R
HBX5516	●	5.5	BNBX055R
HBX6016	●	6.0	BNBX060R
HBB6516	●	6.5	BNBX065R
HBB716	●	7.0	BNBX07R
HBB7516	●	7.5	BNBX075R
HBB816	●	8.0	BNBX08R

■ Parts (For Sleeve)


Screw	Set Screw	Wrench	Applicable Sleeve
BFTX0409N	BT06035T	TRD15	HBX○○○○
—	BT0404	TH020	HBB○○○○

※BNBX bars can be use with HBB type sleeves, however, HBX type sleeves are recommended for bars below ϕ6mm.

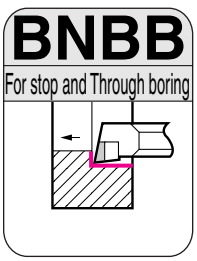
■ Recommended Conditions

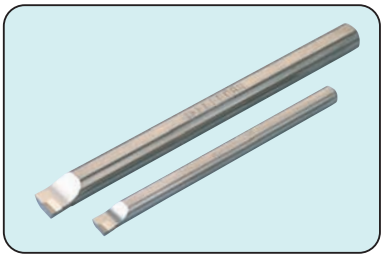
Spindle speed	More than 2,000min^{-1}	Low speed may cause chattering and chipping on the cutting edge.
Depth of cut	0.01～0.2mm	Excessive depth of cut may cause larger tool deformation resulting in deterioration of bore accuracy.
Feed	0.01～0.1mm/rev	–

■ Important notes

(1) Shorten overhang as much as possible (Max. L/D=5).
(2) Even minor workpiece run-out may affect tool life.
(3) Select a boring bar with a diameter closest to the bore diameter.
(4) Although it is difficult to increase the rotational speed in small diameter boring applications, higher speeds are recommended whenever possible.

BNBB Type

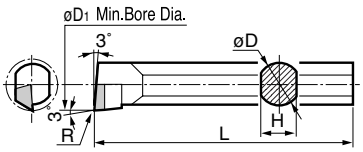




● **High rigidity solid carbide shank for small hole boring**
- Maximum overhang of L/D = 5 possible.
- Minimal bar deformation produces excellent boring accuracy.
- Minimal vibration produces superior surface finish.

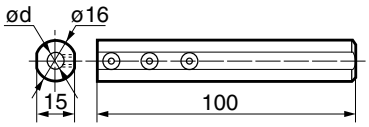
● **High rigidity solid carbide shank for small hole boring**
- Excellent performancee in boring of Hardened Steel

■ Holder



Catalogue No.	Stock	Min. Bore Dia. (φD1)	Dimensions (mm)			
	BN250		øD	H	L	R
BNBB 03R	▲	3.5	3.0	2.4	60	0.2
BNBB 035R	▲	4.0	3.5	2.9	60	0.2
BNBB 04R	▲	4.5	4.0	3.4	60	0.2
BNBB 045R	▲	5.0	4.5	3.9	60	0.2
BNBB 05R	▲	5.5	5.0	4.4	80	0.2
BNBB 055R	▲	6.0	5.5	4.9	80	0.2
BNBB 06R	▲	6.5	6.0	5.4	80	0.2
BNBB 065R	▲	7.0	6.5	5.9	80	0.2
BNBB 07R	▲	7.5	7.0	6.4	100	0.2
BNBB 075R	▲	8.0	7.5	6.9	100	0.2
BNBB 08R	▲	8.5	8.0	7.4	100	0.2

■ Adaptor Sleeve



※ Indicates sleeves that can also be use with BNZ type bars.

Catalogue No.	Stock	Dimension (ød)	Applicable Holder
HBB316	●	3.0	BNBB03R
HBB3516	●	3.5	BNBB035R
HBB416	●	4.0	BNBB04R
HBB4516	●	4.5	BNBB045R
HBB516	●	5.0	BNBB05R
HBB5516	●	5.5	BNBB055R
HBB616※	●	6.0	BNBB06R
HBB6516	●	6.5	BNBB065R
HBB716	●	7.0	BNBB07R
HBB7516	●	7.5	BNBB075R
HBB816※	●	8.0	BNBB08R

■ Parts (for Adapter Sleeve)

	
Set Screw	Wrench
BT0404	TH020

■ Recommended Conditions

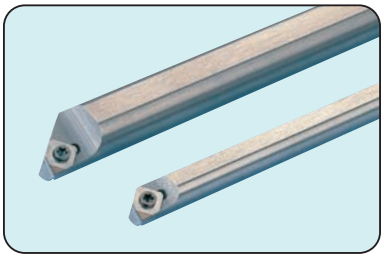
Spindle speed (N)	More than 2,000min^{-1}	Low speed may cause chattering and chipping on the cutting edge.
Depth of cut (d)	0.03～0.2mm	Excessive depth of cut may cause larger tool deformation resulting in deterioration of bore accuracy.
Feed (f)	0.03～0.1mm/rev	–

■ Important notes

(1) Shorten overhang as much as possible (Max. L/D = 5).
(2) Even minor workpiece run-out may affect tool life.
(3) Select a boring bar with a diameter closest to the bore diameter.
(4) Although it is difficult to increase the rotational speed in small diameter boring applications, higher speeds are recommended whenever possible.

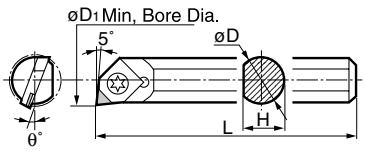
BNZ Type

BNZ
General / Facing



- ø7mm minimum bore diameter with special insert.
- High rigidity indexable type boring bar with full carbide holder.
- Economical and easy tool management with one-use type inserts.

■ Holder



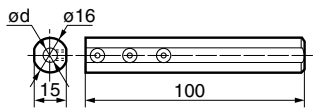
Catalogue No.	Stock	Min. Bore Dia. (φD1)	Dimensions (mm)			
			øD	H	L	θ°
BNZ606R	●	7.0	6.0	5.5	80	-14
BNZ608R	●	9.0	8.0	7.5	100	-12
BNZ610R	●	11.0	10.0	9.5	125	-10
BNZ612R	●	13.0	12.0	11.0	130	-8
BNZ616R	●	17.0	16.0	15.0	145	-6
BNZ620R	●	21.0	20.0	19.0	160	-5

Inserts are not included

■ Parts (for Holder)

	
Screw	Wrench
BFTX0204N	TRX06

■ Sleeve



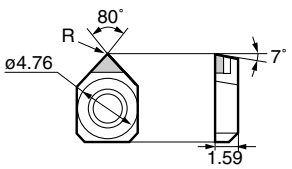
Catalogue No.	Stock	Dimension (mm) (φd)	Applicable Holder
HBB616	●	6.0	BNZ606R
HBB816	●	8.0	BNZ608R

■ Parts (for Adapter Sleeve)

	
Set Screw	Wrench
BT0404	TH020

■ Insert (1 piece pack)

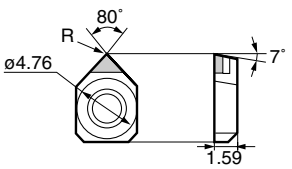
NU-ZNEX
—



Catalogue No.	Stock BN250	Stock BN700	Dimension (mm) Nose Radius (R)
NU-ZNEX040102	●	●	0.2
NU-ZNEX040104	●	●	0.4

■ Insert (10 pieces pack)

T-NU-ZNEX
—



Catalogue No.	Stock BN250	Stock BN700	Dimension (mm) Nose Radius (R)
T-NU-ZNEX040102	●		0.2
T-NU-ZNEX040104	●		0.4

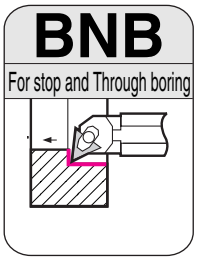
■ Recommended Conditions

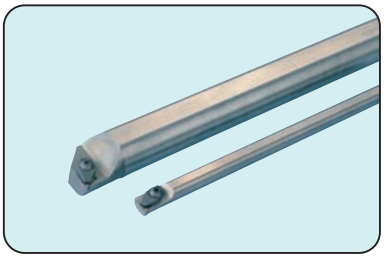
Spindle speed (N)	More than 2,000min^{-1}	Low speed may cause chattering and chipping on the cutting edge.
Depth of cut (d)	0.03～0.2mm	Excessive depth of cut may cause larger tool deformation resulting in deterioration of bore accuracy.
Feed (f)	0.03～0.1mm/rev	–

■ Important notes

(1) Shorten overhang as much as possible (Max. L/D = 5).
(2) Even minor workpiece run-out may affect tool life.
(3) Select a boring bar with a diameter closest to the bore diameter.
(4) Although it is difficult to increase the rotational speed in small diameter boring applications, higher speeds are recommended whenever possible.

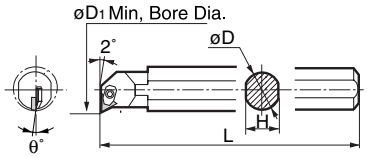
BNB Type





- **High rigidity full carbide boring bar**
  - Minimal bar deformation produces excellent boring accuracy.
  - Minimal vibration produces superior surface finish.
- **Full-Top SUMIBORON insert enables 3 cutting edges**
- **Can be used with SUMIDIA inserts for non-ferrous metal machining**
- **Now with economical one-corner NF Type SUMIDIA insert**

■ Holder

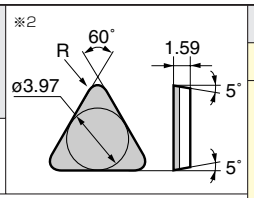


Catalogue No.	Stock	Min. Bore Dia. (φD1)	Dimensions (mm)			
			øD	H	L	θ°
BNB508R	●	10.0	8.0	7.0	140	-9
BNB510R	●	12.0	10.0	9.0	140	-8
BNB512R	●	14.0	12.0	11.0	160	-6
BNB516R	●	18.0	16.0	14.0	180	-5
BNB520R	●	22.0	20.0	18.0	180	-4

Inserts are not included

■ Insert

TBGN —



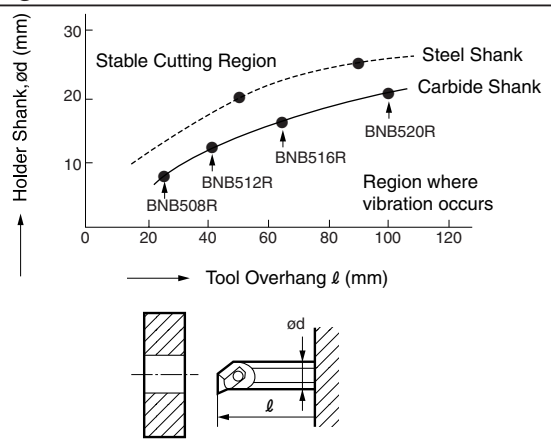
Catalogue No.	Stock: SUMIBORON BN250	BNX20	BN350	BNX10	BN500	BN700	SUMIDIA DA150	DA200	DA2200	Nose Radius (R) (mm)
TBGN060102B	●	●					●	●		0.2
TBGN060104B	●	●	●	●	●	●	●	●		0.4
TBGN060108B	●	●	●		●	●				0.8
TBGN060102-BSN ※1	–	●	–	–	–	–	–	–	–	0.2
TBGN060104-BSN ※1	–	●	–	–	–	–	–	–	–	0.4
TBGN060108-BSN ※1	–	●	–	–	–	–	–	–	–	0.8
NF-TBGN060102 ※2	–	–	–	–	–	–	–	–	●	0.2
NF-TBGN060104 ※2	–	–	–	–	–	–	–	–	●	0.4

■ Parts

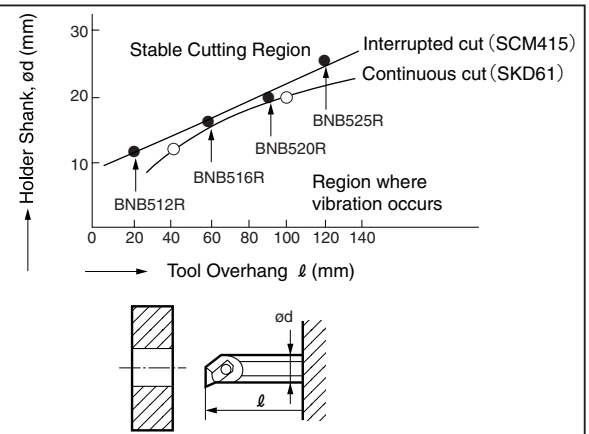
 Clamp	 Clamp Bolt	 Nut	 Wrench	Applicable Holder
BNBC	BH0306	BNBW-2	TH020	BNB 508R
	FBUP3-A0-9	BNBW-4		BNB 510R
				BNB 512R
	BH0310			BNB 516R
		BNBW-7		BNB 520R

※1 TBGN○○○○○○-BSN is only available in BNX20 grade and it has a smaller negative land angle (-15°) as compared to the B type (-25°).
※2 NF-TBGN is a single corner insert. (This is not a Full-Top insert)

■ Cutting Performance

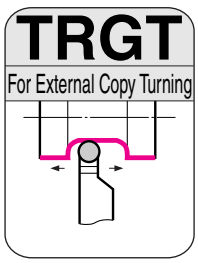


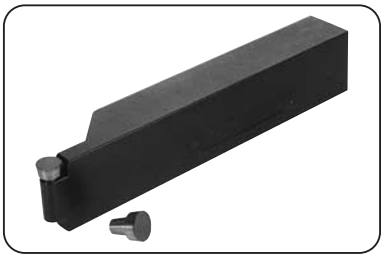
Cutting Conditions		
	Work	: SKD61 (60HRC)
	Insert	: TBGN060104B
	Conditions	: V=100m/min
		f =0.1mm/rev d=0.2mm



Cutting Conditions		
	Work	: SCM415 (61HRC) ø45 (6U-grooves)
	Insert	: TBGN060104B
	Conditions	: V=100m/min
		f =0.1mm/rev d=0.2mm

TRGT Type



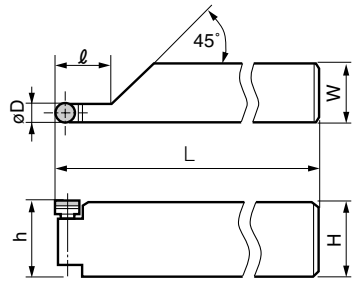


● **Clamping by cutting force alone**
Secure clamping is achieved by inserting the tapered portion of the insert into the holder.
The lack of protruding clamp mechanisms allow for smooth chip flow.

● **Various machining operations possible**
Small round insert with stable clamping can be applied to various machining operations.

■ Holder

Right hand tool show

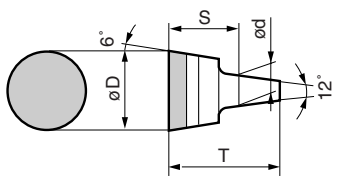


Above figures show right hand tools.

Catalogue No.	Stock		Dimensions (mm)						Applicable Insert
	R	L	øD	H	W	L	h	ℓ	
TRGT R/L2020K05	●		5	20	20	125	20	16	RTGN 0508M0
TRGT R/L2020K06	●		6	20	20	125	20	16	RTGN 0608M0
TRGT R/L2525M07			7	25	25	150	25	20	RTGN 0711M0
TRGT R/L2525M08	●		8	25	25	150	25	20	RTGN 0811M0
TRGT R/L3225P09	●		9	32	25	170	32	25	RTGN 0914M0
			10	32	25	170	32	25	RTGN 1014M0
TRGT R/L3225P12			12	32	25	170	32	25	RTGN 1214M0

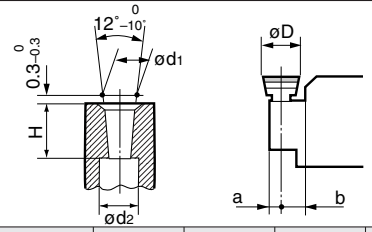
Inserts are not included

■ Insert



Catalogue No.	Stock			Dimensions (mm)			
	BN250	BNX20	BN700	øD	ød	T	S
RTGN 0508M0		●		5	2.5	7.5	3.5
RTGN 0608M0		●		6	3.5	7.5	3.5
RTGN 0711M0		●		7	3.5	11.0	5.0
RTGN 0811M0		●		8	4.5	11.0	5.0
RTGN 0914M0		●		9	5.5	14.0	6.0
RTGN 1014M0		●		10	5.5	14.0	6.0
RTGN 1214M0		●		12	7.5	14.0	6.0

■ Insert Clamping



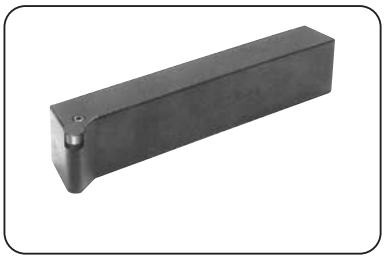
φ D	H	ød1	ød2	a	b
5	4	2.5	1.9	1.85	3.2
6	4	3.5	2.9	2.35	3.7
7	6	3.5	2.5	2.75	4.3
8	6	4.5	3.5	3.25	4.8
9,10	7.5	5.5	4.2	4.15	5.9
12	7.5	7.5	6.2	5.15	6.9

PR Type

● Lever Lock clamping system

- Easy to use, the lack of protruding clamp mechanism allow for smooth chip flow.

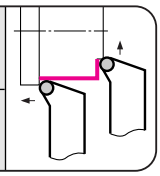
● Versatile round insert can be applied to various operations.

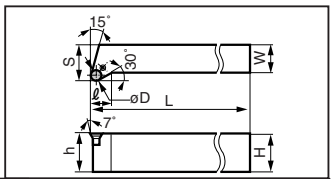


■ Holder

PRGC Type

For External General Turning

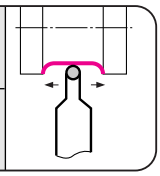


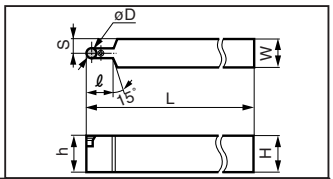


Catalogue No.	Stock		Dimensions (mm)							Applicable Insert
	R	L	øD	H	W	L	S	h	ℓ	
PRGC R/L3225P9	●	●	9	32	25	170	32	32	18	RCGA 0906M0

PRDC Type

For External General Turning

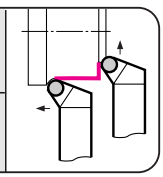


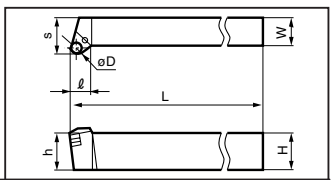


Catalogue No.	Stock	Dimensions (mm)							Applicable Insert
		øD	H	W	L	S	h	ℓ	
PRDCN 3225P9	●	9	32	25	170	12.5	32	25	RCGA 0906M0

PRGN Type

For External General Turning

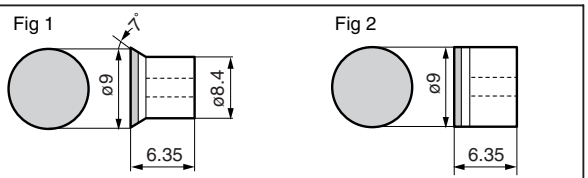




Catalogue No.	Stock		Dimensions (mm)							Applicable Insert
	R	L	øD	H	W	L	S	h	ℓ	
PRGN R/L3225P9	●	●	9	32	25	170	32	32	10	RNGA 0906M0

Inserts are not included

■ Insert

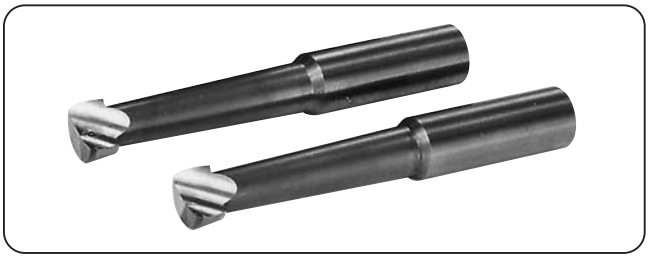


Catalogue No.	Stock				Figure
	BN250	BNX20	BN350	BN700	
RCGA 0906M0	●				Fig1
RNGA 0906M0	●	●			Fig2

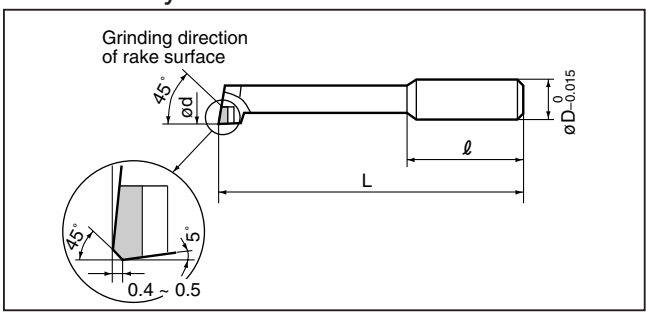
■ Parts

					Applicable Holder
Shim	Lever Pin	Clamp Bolt	Shim Pin	Wrench	
LSR817	LCL3S	LCS3	LSP3	LH025	PRGC R/L3225P9 PRDCN 3225P9
LSR917					PRGN R/L3225P9

SJB Type



■ Tool Body

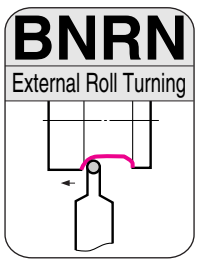


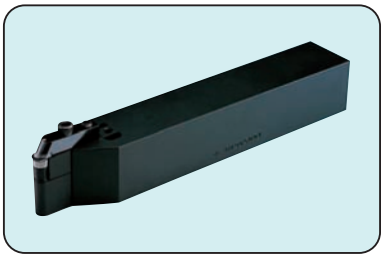
Catalogue No.	Stock	Dimensions (mm)			
	BN250	øD	ød	L	ℓ
SJB 0804	●	8	4	45	32
SJB 0805	●	8	5	45	32
SJB 0806	●	8	6	50	30
SJB 0808	●	8	8	60	30
SJB 1006	●	10	6	50	30
SJB 1008	●	10	8	60	30
SJB 1010	●	10	10	70	30
SJB 1012	●	10	12	70	30
SJB 1015	●	10	15	70	30

■ Recommended Conditions

Spindle Speed (N)	800min^{-1} or higher	Low speeds may cause chattering and chipping on the cutting edge.
Depth-of-cut (d)	0.03～0.3 mm/radius	Excessive depth-of-cut may cause larger tool deformation resulting in deterioration of bore accuracy.
Feedrate (f)	0.03～0.1mm/rev	—

BNRN Type



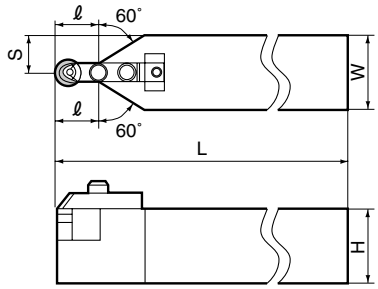


● **Regrind insert can be used.**
- Same holder can be used for regrind insert by adjusting slide locator.

● **Reliable holder design.**
- The tip of the clamp is a carbide chipbreaker, which can withstand wear from chips.
- Slide locator uses HSS for durability.

■ Holder

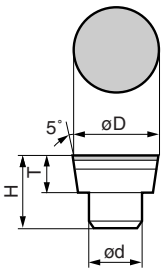
Inserts are not included



Catalogue No.	Stock	Dimensions (mm)					Applicable Insert	
		H	W	L	S	ℓ	New Insert	Regrindable range
BNRN3232-08-07		32	32	200	16	13	RBG08-B	8.0~7.0
BNRN4038-10-09		40	38	250	19	17	RBG10-B	10.0~9.0
BNRN4038-12-11		40	38	250	19	20	RBG12-B	12.0~11.0
BNRN5050-14-12		50	50	350	25	25	*	14.0~12.0
BNRN5050-16-14		50	50	350	25	25	RBG16-B	16.0~14.0
BNRN5050-18-16		50	50	350	25	30	*	18.0~16.0
BNRN5050-20-18		50	50	350	25	30	RBG20-B	20.0~18.0
BNRN5050-22-20		50	50	350	25	35	*	22.0~20.0
BNRN5050-24-22		50	50	350	25	35	*	24.0~22.0
BNRN5050-26-24		50	50	350	25	35	RBG26-B	26.0~24.0

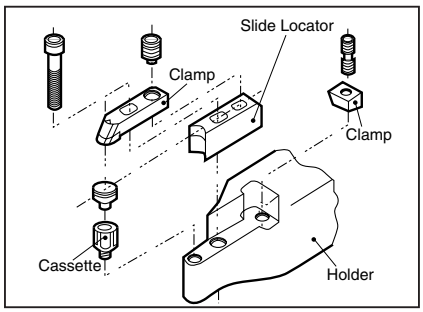
Blank space indicates holders for regrind inserts

■ Insert



Catalogue No.	Stock				Dimensions (mm)			
	BN700	BN500			øD	ød	T	H
RBG08-B	●				8.0	4.0	4.0	6.5
RBG10-B	●				10.0	5.0	5.0	9.0
RBG12-B	●				12.0	6.0	6.0	11.0
RBG16-B	●				16.0	8.0	8.0	13.0
RBG20-B	●				20.0	10.0	10.0	15.0
RBG26-B	●				26.0	14.0	10.0	15.0

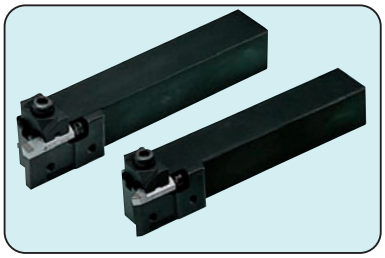
■ Structure



■ Parts

Applicable Holder	Slide Locator	Clamp	Cassette	Clamp	Cap Screw	Set Screw	Double Screw	Wrench
BNRN3232-08-07	BNRSR-08	BNRC-08	BNRE-08	BNRW-08	BX0425	BTD0609	WB5-18	LH025 LH030
BNRN4038-10-09	BNRSR-10		BNRE-10					
BNRN4038-12-11	BNRSR-12	BNRC-12	BNRE-12	BNRW-12	BX0635	BTD0812	WB6-20	LH030 LH040 LH050
BNRN5050-14-12	BNRSR-14		BNRE-14		BX0640		WB6-30	
BNRN5050-16-14	BNRSR-16	BNRC-16	BNRE-16	BNRW-16			WB8-30	LH040 LH050
BNRN5050-18-16	BNRSR-18		BNRE-18					
BNRN5050-20-18	BNRSR-20	BNRC-20	BNRE-20	BNRW-20				
BNRN5050-22-20	BNRSR-22		BNRE-22					
BNRN5050-24-22	BNRSR-24	BNRC-26	BNRE-24	BNRW-26	BX0840	BTD0818		LH040 LH060
BNRN5050-26-24	BNRSR-26		BNRE-26					

BNGG Type

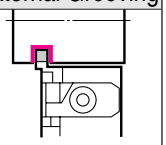


● High rigidity improves tool life
- Strong clamping reduces vibration and enhance chipping resistance.

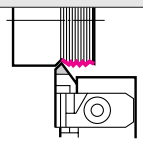
● Grooving and Threading operations
- Grooving and Threading can be adopted by changing the support.

SEC-Grooving Holder + SUMIBORON Insert can be use for Hardened steel grooving. (Refer to pages E2~E27)

BNGG
External Grooving



BNGG-TT
External Threading



■ Holder

Inserts are not included

Fig 1 Grooving

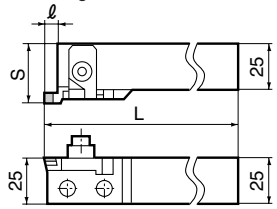
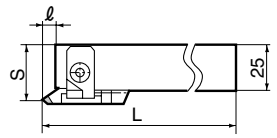


Fig 2 Threading



	Catalogue No.	Stock R	Stock L	Dimensions (mm) S	Dimensions (mm) ℓ	Dimensions (mm) L	Shape	Applicable Holder
Grooving	**BNGG R/L2525-200**	●		30.5	4	150	Fig1	BNGNT0200R/L
	BNGG R/L2525-250	●		30.5	4	150		BNGNT0250R/L
	BNGG R/L2525-300	●		30.5	5	150		BNGNT0300R/L
	BNGG R/L2525-400	●		30.5	6	151		BNGNT0400R/L
	BNGG R/L2525-500	●		30.5	6	151		BNGNT0500R/L
	BNGG R/L2525-600	●		30.5	7	152		BNGNT0600R/L
Threading	**BNGG R/L2525-TT**	●		28.5	5	150	Fig2	BNTT1020R/L BNTT1530R/L

※ Holder can be configured for grooving or threading by changing the support.

■ Insert

Fig 1 Grooving

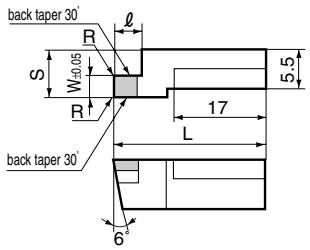
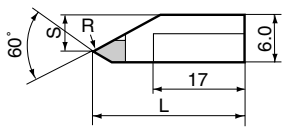
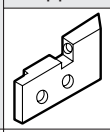
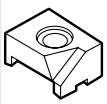
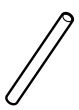


Fig 2 Threading



	Catalogue No.	Stock BN250 R	BN250 L	BNX20 R	BNX20 L	BN350 R	BN350 L	BNX25 R	BNX25 L	Dimensions (mm) W	Dimensions (mm) ℓ	Dimensions (mm) R	Dimensions (mm) L	Dimensions (mm) S	Shape	Applicable Holder
Grooving	**BNGNT0200R/L**	●				●				2.0	4.0	0.2	25	6.0	Fig1	BNGG R/L2525-200
	BNGNT0250R/L	●				●				2.5	4.0	0.2	25	6.0		BNGG R/L2525-250
	BNGNT0300R/L	●				●				3.0	5.0	0.4	25	6.0		BNGG R/L2525-300
	BNGNT0400R/L	●				●				4.0	6.0	0.4	26	6.0		BNGG R/L2525-400
	BNGNT0500R/L	●				●				5.0	6.0	0.4	26	6.0		BNGG R/L2525-500
	BNGNT0600R/L	●				●				6.0	7.0	0.4	27	6.0		BNGG R/L2525-600
Threading	**BNTT1020R/L**	●								Pitch 1.0~2.0		0.14	25	4.0	Fig2	BNGG R/L2525-TT
	BNTT1530R/L	●								Pitch 1.5~3.0		0.20	25	4.0		

■ Parts

Applicable Holder	Support	Clamp	Axial Screw	Spring	Cap Screw	Wrench	
							
BNGG R/L2525-200	BNGSR/L200	BNGCR/L	FMJ	GSP06	BX0615 (Clamp)	LH050 (Clamp)	1.8 x 45
BNGG R/L2525-250	BNGSR/L250						
BNGG R/L2525-300	BNGSR/L300						
BNGG R/L2525-400	BNGSR/L400						
BNGG R/L2525-500	BNGSR/L500				BX0414 (Support)	LH030 (Support)	
BNGG R/L2525-600	BNGSR/L600						
BNGG R/L2525-TT	BNGSR/LTT						

■ Recommended Conditions

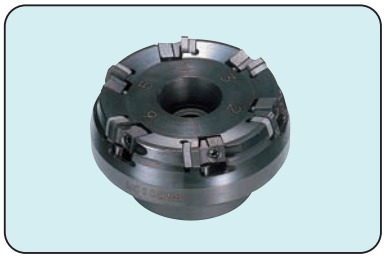
- For Grooving

Cutting Speed (V)	80~120 m/min
Feed Rate (f)	0.03~0.07 mm/rev

- For Threading

Cutting Speed (V)	80~120 m/min
Feed Rate (f)	Largest Pitch 3.0 mm

RM Type



● **High speed, high efficiency milling of Grey Cast Iron**
- Utilising solid SumiBoron BSN800 for high speed milling of V=1,500m/min.
- High speed roughing of up to d=3.0mm.
- Wiper insert for high speed finishing.

● **Low cost**
- Cost effective 8 cornered inserts.
- Insert regrinding possible.

● **Simple construction for insert run-out**
- Simple design for direct insert mounting.
- Insert run-out can be easily adjusted.

■ Cutter Body

Fig 1

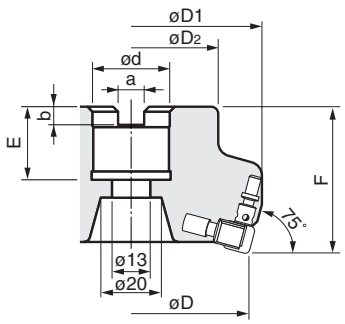
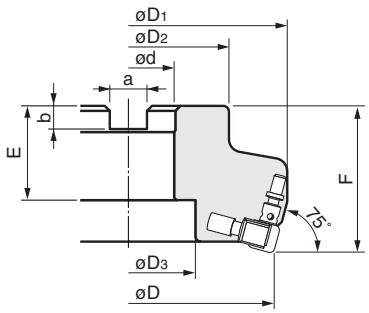


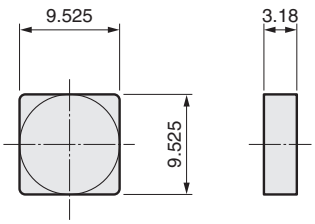
Fig 2



Catalogue No.	Stock	øD	øD1	øD2	øD3	F	ød	a	b	E	No. of teeth	Max. Rotation	Weight (kg)	Fig.
RM3080R		80	90	60	–	50	25.40	9.5	6	25	6	9,000	1.6	Fig 1
RM3100R		100	110	70	46	50	31.75	12.7	8	32	8	8,000	2.1	Fig 2
RM3125R		125	135	80	59	63	38.10	15.9	10	38	10	7,000	3.9	Fig 2
RM3160R		160	170	100	80	63	50.80	19	11	38	12	6,000	5.9	Fig 2

Inserts are not included

■ Insert



Catalogue No.	Stock	Grade	Cutting Edge
SNGN090308	●	BNS800	Standard
SNGN090312	●	BNS800	Standard
SNEN090308W	●	BNS800	Wiper

■ Important Notes

(1) Do not use a mix of standard and wiper inserts on a single cutter setting.

(2) Do not mix new and regrind inserts on a single cutter setting.

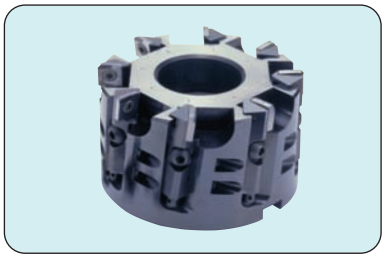
(3) Inserts can only be regrind once (inscribed circle dimension must be at least 9.125mm)

FMU/FMU-E Type

High-speed Finishing for Cast Iron

Rake Angle		
	Radial	+2°
	Axial	+8°

0.5mm 0°



- High speed finishing cutter for Cast Iron milling, that uses removable cartridges for easy insert run-out management.
- Utilising BN700 grade with both good wear and fracture resistance.
- Available in shell and small diameter endmill types.

■ Features

- High speed machining V=1500m/min
- Surface Roughness Rz=3.2 (1.0Ra)
- Safety structure for the centrifugal force under high speed cutting conditions
- Run-out is less than 10μm
- Easy assembling method using the setting gauge
- Running cost is reduced because of economical insert

■ Application

FC250～FC300 (200～250HB) Grey Cast Iron with Pearlite matrix, and Ferrite matrix (HB130~160)
Application Examples: engine block, cylinder block, etc.

■ Specifications

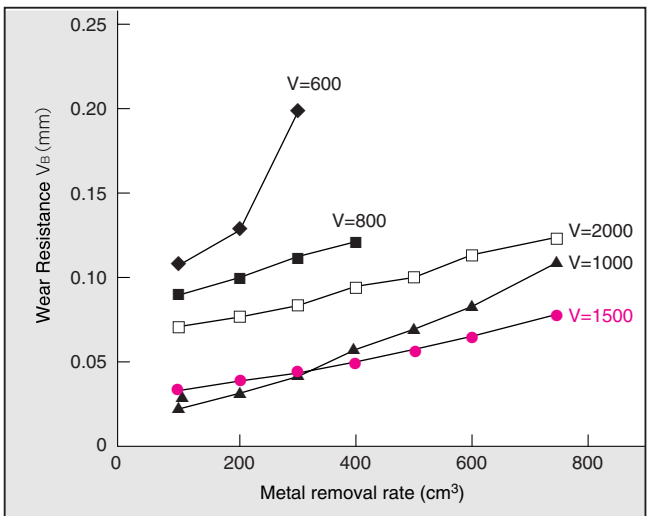
● FMU Type	φ80～φ315mm (FMU Type)
	φ40～φ63mm (FMU-E Type)
● Insert	SNEW1203ADTR/L
● Low cutting force type	SNEW1203ADTR/L-S

■ Recommended Conditions

- Speed V = 800～2,000m/min
- Feed f = 0.1～0.3mm/tooth
- Depth d = 0.5mm or less
- Dry

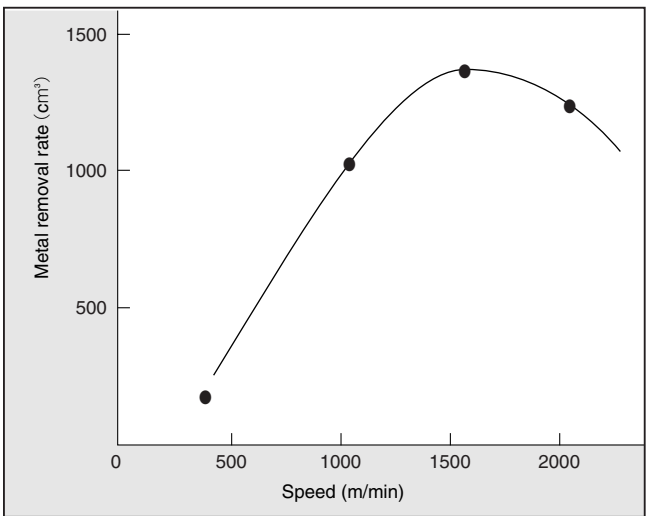
■ Performance

Tool life diagram



Work : FC250 240HB (Pearlite)
Speed : V=600～2000m/min Feed: f =0.15mm/tooth
Depth : d=0.5mm Dry Grade: BN700

Estimated tool life

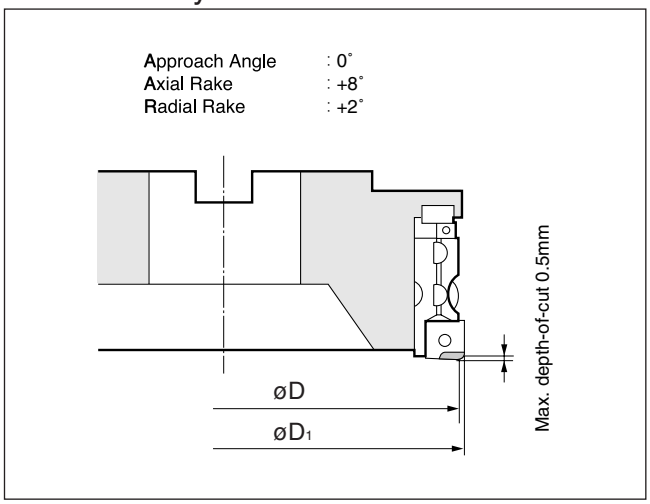


Work : FC250 240HB (Pearlite)
Speed : V=400～2000m/min Feed: f =0.15mm/tooth
Depth : d=0.5mm Dry Grade : BN700

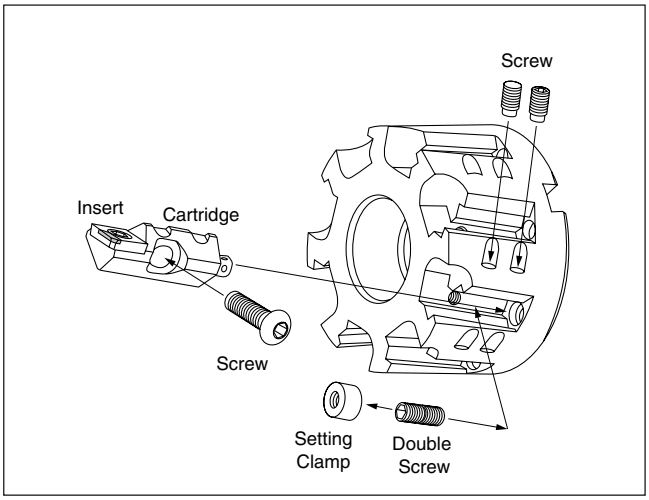
Milling of ductile cast iron and alloy steel casting do not produce the best results.
Dry cutting is recommended. Wet cutting will result in chipping of cutting edges in the early stages due to thermal cracking.

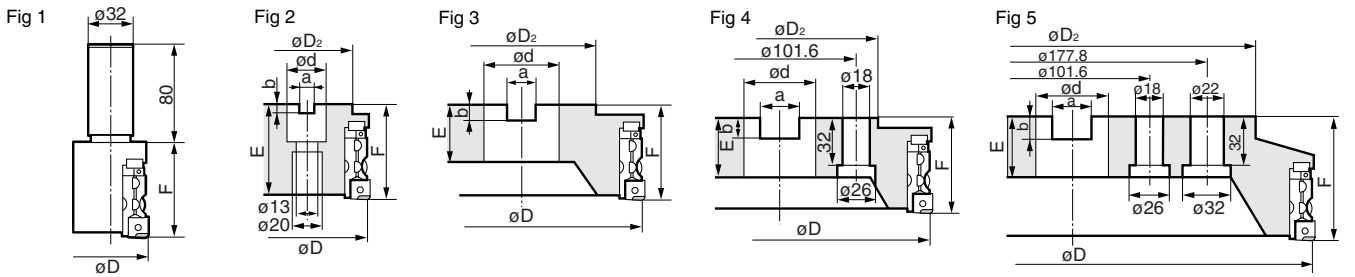
FMU/FMU-E Type

■ Cutter Body



■ Structure

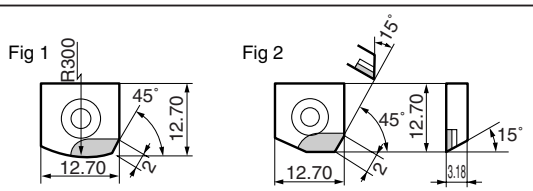




Catalogue No.	Stock R		Dimensions (mm) øD	øD1	øD2	F	ød	a	b	E	No. of teeth	Weight (Kg)	Figure
FMU 4040ER	●		37	40	—	63	—	—	—	—	2	1.0	Fig 1
FMU 4050ER	●		47	50	—	63	—	—	—	—	3	1.2	Fig 1
FMU 4063ER	●		60	63	60	63	25.4	9.5	6	25	4	1.0	Fig 2
FMU 4080R	●		80	82.8	60	63	25.4	9.5	6	25	6	1.7	Fig 2
FMU 4100R	●		100	102.8	75	63	31.75	12.7	8	38	8	2.5	Fig 3
FMU 4125R	●		125	127.8	75	63	38.1	15.9	10	38	10	3.9	Fig 3
FMU 4160R	●		160	162.8	100	63	50.8	19.0	11	38	12	6.3	Fig 3
FMU 4200R	●		200	202.8	130	63	47.625	25.4	14	40	16	9.3	Fig 4
FMU 4250R			250	252.8	130	63	47.625	25.4	14	40	20	14.5	Fig 4
FMU 4315R			315	317.8	240	80	47.625	25.4	14	40	24	25.0	Fig 5

Inserts are not included

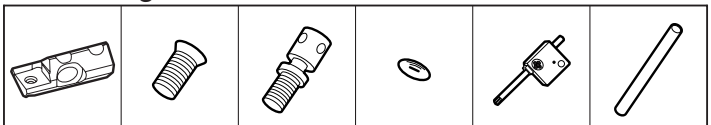
■ Insert



Catalogue No.	Stock R		Grade	Figure
SNEW1203ADTR	●		BN700	Fig 1
SNEW1203ADTR-S	●		BN700	Fig 2

※ S denotes low cutting force insert

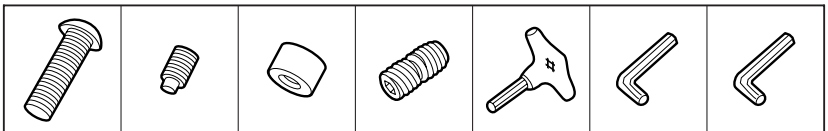
■ Cartridge



Cartridge	Screw	Adjustment screw	O-ring	Wrench	Wrench
FMUU ※	BFTX0509N	FMUJ	P3	TRX20	1.8 x 45

※ FMU4040ER/4050ER/4063ERS uses FMUUE type cartridge
※ FMUU/FMUUES uses similar screw (BFTX0509N), adjustment screw (FMUJ) and O-ring (P3)

■ Parts



Screw	Screw	Setting clamp	Double screw	Wrench	Wrench	Wrench
BH0620 ※	BTD0609	FMUE	WB5-10	TH040	LH030	LH025

※ Screw for FMU4040ER/4050ER/4063ER is BH0615

■ Setting Gauge

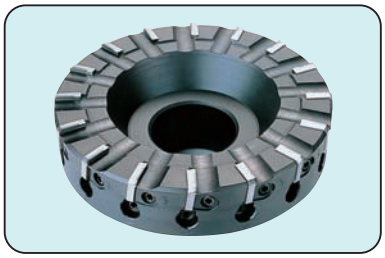
FMU-SET

Dial-gauge is not included

High-speed Finishing for Cast Iron

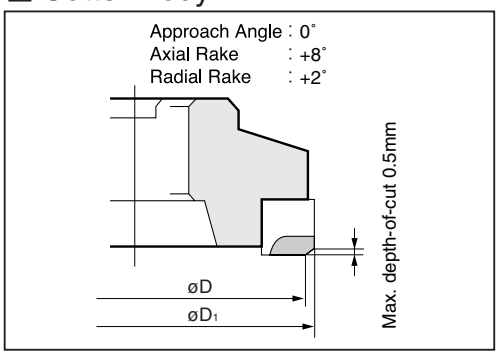
Rake Angle		
	Radial	+2°
	Axial	+8°

0.5mm 0°



●Specially designed for use with SUMIBORON BN600 in the high speed milling of Cast Iron

■ Cutter Body



■ Structure

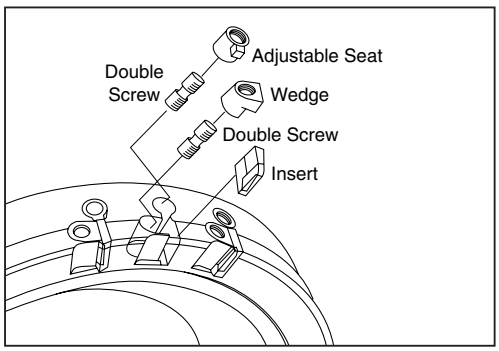


Fig 1

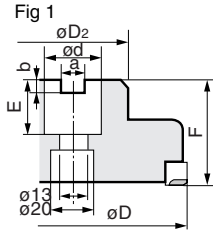


Fig 2

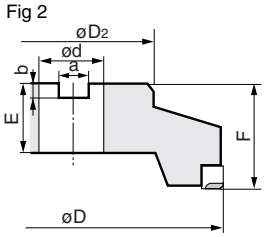


Fig 3

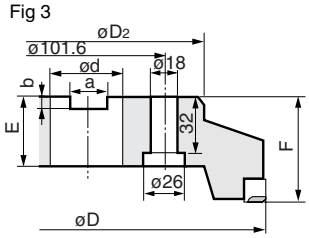
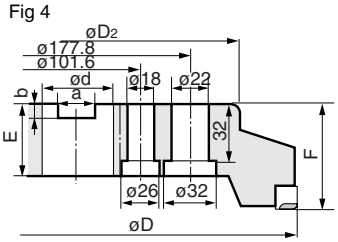


Fig 4



Catalogue No.	Stock		Dimensions (mm)								No. of teeth	Weight (Kg)	Figure
	R	L	øD	øD1	øD2	F	ød	a	b	E			
FM 5080R/L	●		80	82.8	60	50	24.5	9.5	6	25	6	1.6	Fig 1
FM 5100R/L	●		100	102.8	75	50	31.75	12.7	8	32	8	2.4	Fig 2
FM 5125R/L	●		125	127.8	75	63	38.1	15.9	10	38	10	3.4	Fig 2
FM 5160R/L	●		160	162.8	100	63	50.8	19.0	11	38	12	5.6	Fig 2
FM 5200R/L			200	202.8	130	63	47.625	25.4	14	40	16	8.3	Fig 3
FM 5250R/L			250	252.8	130	63	47.625	25.4	14	40	20	14.3	Fig 3
FM 5315R/L			315	317.8	240	80	47.625	25.4	14	40	24	27.8	Fig 4
FMF 5125R/L			125	127.8	75	63	38.1	15.9	10	38	12	3.4	Fig 2
FMF 5160R/L			160	162.8	100	63	50.8	19.0	11	38	16	5.6	Fig 2
FMF 5200R/L			200	202.8	130	63	47.625	25.4	14	40	20	8.3	Fig 3
FMF 5250R/L			250	252.8	130	63	47.625	25.4	14	40	24	14.3	Fig 3
FMF 5315R/L			315	317.8	240	80	47.625	25.4	14	40	28	27.8	Fig 4

Inserts are not included

■ Insert

Fig 1

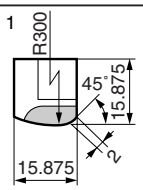
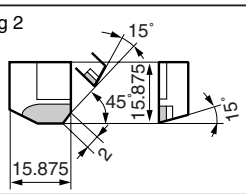


Fig 2

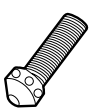
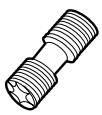


Catalogue No.	Stock		Grade	Figure
	R	L		
SNEN 1504ADTR/L	●		BN700	Fig1
SNEN 1504ADTR/L-S	●		BN700	Fig2

※-S denotes low cutting force insert

■ Parts



Wedge	Adjustable Seat	Adjustment Screw	Double Screw	Wrench	Wrench	Applicable Cutter
FMW	—	FMJ	WB7F-20TL	TT25	1.8 x 45	FM5080R/L
	FME	—			—	FM5100R/L ~ FM5315R/L

● High Speed Finish Endmilling of Cast Iron Die Molds

- Balanced cutting with 2 effective teeth for high efficiency finishing process
- Unique insert design to prevent chipping at the tip of the ball for high precision machining
- Good chipping and wear resistance with SUMIBORON BN500 grade for longer tool life.

■ Cutter Body

Fig 1

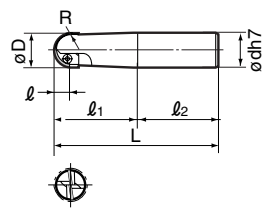
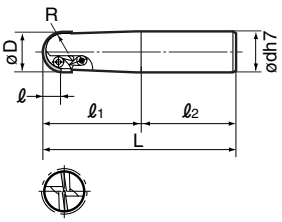


Fig 2



Catalogue No.	Stock	Dimensions (mm)							Figure
		R	øD	ℓ	ℓ1	ℓ2	L	ød	
BES 160S		8	16	10	50	60	110	20	Fig 1
BES 200S		10	20	13	60	80	140	25	Fig 1
BES 250S		12.5	25	15.5	70	80	150	32	Fig 1
BES 300S		15	30	18	80	80	160	32	Fig 1
BES 400S		20	40	23	100	100	200	42	Fig 2
BES 500S		25	50	28	120	100	220	50	Fig 2

Inserts are not included

■ Insert

Fig 1

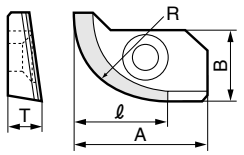
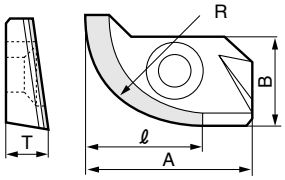


Fig 2



Catalogue No.	Stock	Dimensions (mm)					Figure	Applicable Endmill
	BN500	R	ℓ	A	B	T		
BEST 160S		8	10	13	6.8	3.5	Fig 1	BES 160S
BEST 160L		8	13	13	6.8	3.5	Fig 1	BES 160S
BEST 200S		10	13	20	8.5	4.5	Fig 1	BES 200S
BEST 200L		10	20	20	8.5	4.5	Fig 1	BES 200S
BEST 250S	●	12.5	15.5	22.5	10.5	5.0	Fig 1	BES 250S
BEST 250L	●	12.5	22.5	22.5	10.5	5.0	Fig 1	BES 250S
BEST 300S	●	15	18	25	12.0	6.0	Fig 1	BES 300S
BEST 300L	●	15	25	25	12.0	6.0	Fig 1	BES 300S
BEST 400S		20	23	30	16.0	7.5	Fig 2	BES 400S
BEST 400L		20	30	30	16.0	7.5	Fig 2	BES 400S
BEST 500S		25	28	35	20.0	8.0	Fig 2	BES 500S
BEST 500L		25	35	35	20.0	8.0	Fig 2	BES 500S

■ Parts

					Applicable Endmill
Clamp	Double Screw	Screw	Wrench	Wrench	
—	—	BFTX 0306N	TRX 10	—	BES 160S
—	—	BFTX 0407N	TRX 15	—	BES 200S
—	—	BFTX 0509N	TRX 20	—	BES 250S
—	—	BFTX 0511N	TRX 20	—	BES 300S
CCM 6BL	WB 6-13	BXF 0616	—	LH 030 LH 040	BES 400S
CCM 6BL	WB 6-16	BXF 0616	—	LH 030 LH 040	BES 500S

■ Important Notes

(1) Use a rigid machine and select a high cutting speed with low feedrate.
(2) Use dry cutting conditions

■ Recommended Conditions

Endmill Cat. No.	Cast Iron (FC)				Ductile Cast Iron (FCD)			
	C/Speed (m/min)	Feed f (mm/rev)	Cutting Depth d (mm)	Pitch feed P·f (mm)	C/Speed (m/min)	Feed f (mm/rev)	Cutting Depth d (mm)	Pitch feed P·f (mm)
BES 160S	250-**500**-1000	0.1-**0.2**-0.4	0.1-**0.3**-0.4	0.2-**0.3**-0.5	250-**500**-1000	0.1-**0.2**-0.3	0.1-**0.2**-0.3	0.2-**0.3**-0.5
BES 200S	250-**600**-1250	0.2-**0.4**-0.6	0.1-**0.3**-0.4	0.3-**0.5**-0.7	250-**600**-1250	0.1-**0.3**-0.5	0.1-**0.2**-0.4	0.3-**0.5**-0.7
BES 250S	300-**750**-1500	0.3-**0.5**-0.7	0.2-**0.4**-0.5	0.4-**0.6**-0.9	300-**750**-1500	0.2-**0.4**-0.6	0.2-**0.3**-0.5	0.4-**0.6**-0.9
BES 300S	350-**800**-1500	0.3-**0.5**-0.7	0.2-**0.4**-0.5	0.5-**0.8**-1.1	350-**800**-1500	0.2-**0.4**-0.6	0.2-**0.3**-0.5	0.5-**0.8**-1.1
BES 400S	500-**1000**-1500	0.3-**0.6**-1.0	0.3-**0.5**-0.7	0.6-**1.0**-1.4	500-**1000**-1500	0.2-**0.5**-0.8	0.3-**0.4**-0.7	0.6-**1.0**-1.4
BES 500S	600-**1200**-1500	0.3-**0.6**-1.0	0.3-**0.5**-0.7	0.8-**1.3**-1.8	600-**1200**-1500	0.2-**0.5**-0.8	0.3-**0.4**-0.7	0.8-**1.3**-1.8

BRC Type

■ General Features

- High speed, high efficiency milling of hardened mold material.
- Cost effective with full-top CBN inserts, multiple corner usage.
- Strong clamping with conical insert screw hole design.

■ Body (Endmill Type)

Fig 1

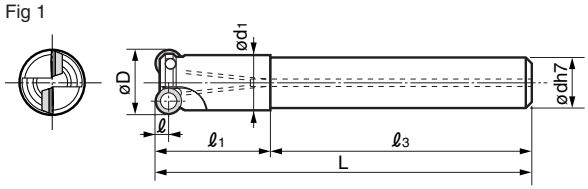


Fig 2

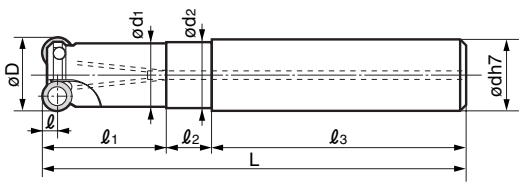
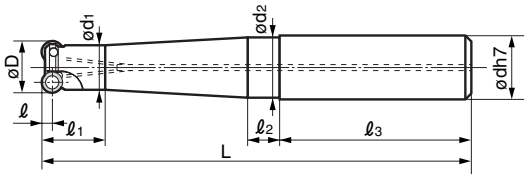


Fig 3



Catalogue No.	Stock	Dimensions (mm)									No. of teeth	Figure	Group No.
		øD	ød	ød1	ød2	ℓ	ℓ1	ℓ2	ℓ3	L			
BRC 071207ES10	●	12	10	11	—	3.5	23	—	52	75	2	Fig 1	
BRC 071207ES12	●	12	12	11	11.5	3.5	22	8	45	75	2	Fig 2	
BRC 071208ES16	●	12	16	11	15.5	3.5	16	8	48	88	2	Fig 3	
BRC 071210ES16	●	12	16	11	15.5	3.5	16	8	48	108	2	Fig 3	❶
BRC 071212ES16	●	12	16	11	15.5	3.5	16	8	48	128	2	Fig 3	
BRC 071507ES12	●	15	12	12.5	—	3.5	16	—	59	75	3	Fig 1	
BRC 071507ES16	●	15	16	12.5	13	3.5	19	11	48	78	3	Fig 2	
BRC 071508ES16	●	15	16	13.5	15.5	3.5	20	8	48	88	2		
BRC 071510ES16	●	15	16	13.5	15.5	3.5	20	8	48	108	2		
BRC 071513ES20	●	15	20	13.5	19.5	3.5	22	8	50	130	2	Fig 3	❷
BRC 071515ES20	●	15	20	13.5	19.5	3.5	22	8	50	150	2		
BRC 071517ES25	●	15	25	13.5	24.5	3.5	22	8	56	176	2		
BRC 102009ES20	●	20	20	17	19.5	5	20	8	50	90	2		
BRC 102011ES20	●	20	20	17	19.5	5	22	8	50	110	2		
BRC 102012ES25	●	20	25	17	24.5	5	24	8	56	136	2	Fig 3	❸
BRC 102015ES25	●	20	25	17	24.5	5	24	8	56	156	2		
BRC 102017ES25	●	20	25	17	24.5	5	24	8	56	176	2		

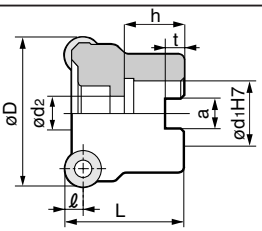
Inserts are not included

■ Recommended Conditions

Work / Grade / Conditions	Steel			Cast Iron
	40 ~ 45HRC	47 ~ 55HRC	58 ~ 62HRC	—
	BN700		BN350	BN700
V (m/min)	200 ~ 800	150 ~ 400	80 ~ 200	300 ~ 1500
f (mm/t)	0.1 ~ 0.4	0.1 ~ 0.3	0.1 ~ 0.2	0.1 ~ 0.4
d (mm)	~ 0.5	~ 0.5	~ 0.5	~ 0.5

● Dry cut (Air Blow) and Down cut are recommended.

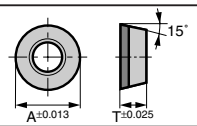
■ Body (Shell Type)



Catalogue No.	Stock	Dimensions (mm)								No. of teeth	Group No.
		øD	ød1	ød2	ℓ	L	h	a	t		
BRC 10042R	●	42	16	9	5	44	20	8	6	6	❸
BRC 10052R	●	52	22	11	5	50	30	10	7	7	
BRC 12042R	●	42	16	9	6	42	20	8	6	5	
BRC 12052R	●	52	22	11	6	52	30	10	7	5	❹
BRC 12066R	●	66	27	13	6	52	30	12	7	6	

Inserts are not included

■ Insert

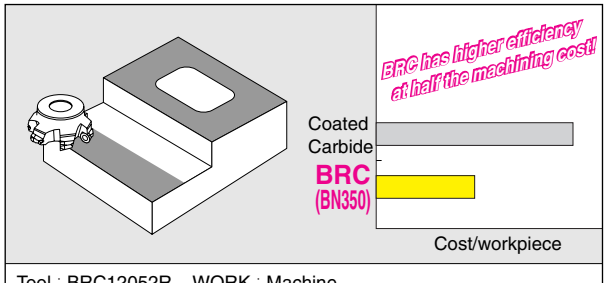


Catalogue No.	Stock		Dimensions (mm)		Applicable Holder (Using Group No.)
	BN350	BN700	A	T	
RDHX0701M0T	●	●	7	1.99	❶
RDHX0702M0T	●	●	7	2.38	❷
RDHX1003M0T	●	●	10	3.18	❸
RDHX12T3M0T	●	●	12	3.97	❹

■ Parts

Screw	Wrench	Applicable Holder (Using Group No.)
		
BFTB025048	TRD07	❶
BFTB02505	TRD07	❷
BFTB035074	TRD15	❸❹

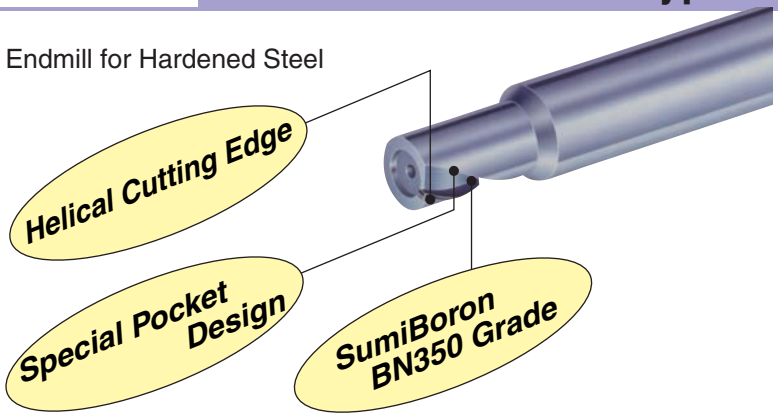
■ Application Example



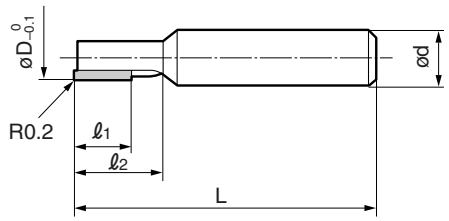
Tool : BRC12052R WORK : Machine
Work : SNCM435 (55~60HRC) Grade : BN350
V=250m/min f=0.1mm/t Ad=0.5mm pf=50mm

Helical Master BNES Type

● Special Endmill for Hardened Steel



■ Spiral Flute-BNES Type (1 Flute)

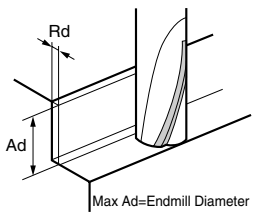


No. of teeth : 1
Helix angle : 15°

Catalogue No.	Stock		Dimensions (mm)				
	BN350		øD	ℓ1	ℓ2	L	ød
BNES1060	●		6.0	7.0	11	60	10
BNES1080	●		8.0	10.0	14	70	10
BNES1100	●		10.0	12.0	17	75	12
BNES1120	●		12.0	14.0	20	80	12
BNES1140	●		14.0	16.0	21.5	80	16
BNES1160	●		16.0	18.0	24	80	16

● For 3-dimensional profile milling, use SumiBoron Ball Endmill BNBS type.

■ Recommended Cutting Conditions



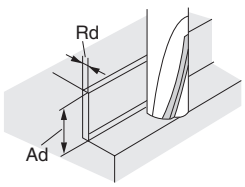
Hardness of work / Conditions / Endmill (mm)	50～57HRC V : 100～170m/min			58～65HRC V : 80～150m/min		
	N (min-1)	F (mm/min)	Depth (Rd) (mm)	N (min-1)	F (mm/min)	Depth (Rd) (mm)
ø6~8	4,000~9,000	240~540	~0.1	3,200~8,000	150~370	~0.08
ø10~12	2,700~5,400	180~360	~0.15	2,100~4,800	120~370	~0.12
ø14~16	2,000~3,800	140~260	~0.2	1,600~3,400	110~230	~0.15

• Use a rigid machine and select a high cutting speed with low feedrate • Use dry cutting conditions.
• Make overhang as short as possible and down-cut.

■ Performance

● Long tool life and high efficiency

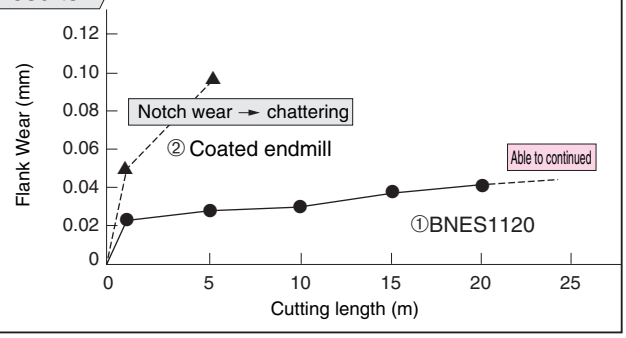
Tooling • Side cut



Condition

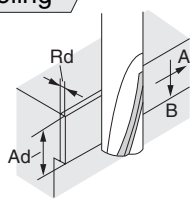
• Work : SKD11 (Hardened) 60HRC
• Conditions : ①V=100m/min
F=186mm/min
②V=40m/min
F=186mm/min
Down cut, Dry
Ad=8mm Rd=0.05mm

Results



● Excellent Surface Roughness

Tooling • Side cut

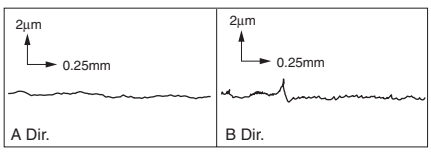


Condition

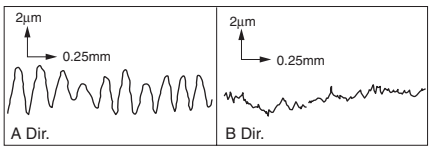
• Work : SCr15
(Hardened) 55～58HRC
• Conditions : V=130m/min
F=310mm/min
Down cut, Dry
Ad=4mm Rd=0.05mm

Results

①BNES1080

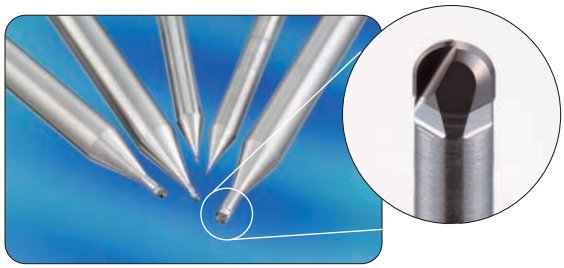


②Straight flute type (ø8)



SUMIBORON
MOLD FINISH MASTER BNBP Type

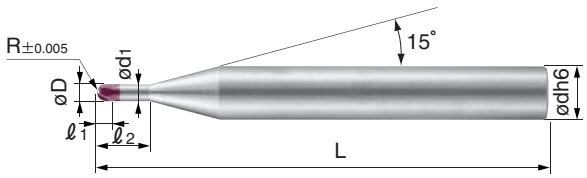
MOLD FINISH MASTER
SUMIBORON MOLD FINISH MASTER



■ Characteristics

- ●Achieving longer tool life in high speed, high precision machining of Pre-hardened and Hardened Steel (~HRC70)!
- ●Utilizing SUMIBORON BN350 for excellent chipping resistance!
- ●High precision, radial cutting edge profile accuracy of ± 0.005 mm!
- ●Excellent surface finish! Polishing process greatly reduced, compared with carbide endmills.

■ Endmills



※Endmill identification

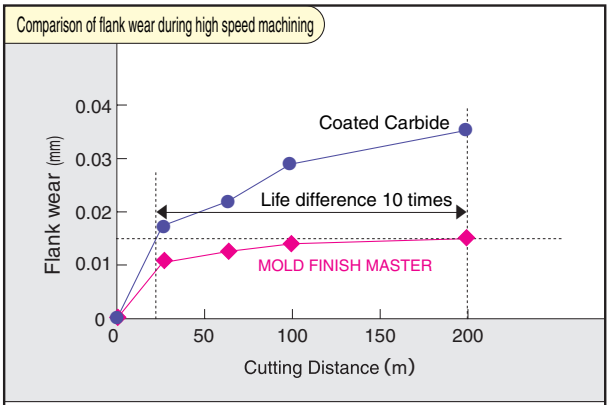
BNBP 2 R030-015 4

- BNBP: MOLD FINISH MASTER
- 2: No. of flutes
- R030-015: Radius of ballnose (R)
- 4: Diameter of shank (φd)
- 015: Length from neck to tip (ℓ2)

	Catalogue No.	Stock	Dimensions (mm)						
		BN350	R	øD	L	ød1	ød	ℓ1	ℓ2
φ4 Shank	**BNBP2R020-0124**	●	0.2	0.4	50	0.37	4	0.3	1.2
	BNBP2R030-0154	●	0.3	0.6	50	0.57	4	0.4	1.5
	BNBP2R050-0254	●	0.5	1.0	50	0.97	4	0.6	2.5
	BNBP2R075-0404	●	0.75	1.5	50	1.47	4	0.9	4.0
	BNBP2R100-0554	●	1.0	2.0	50	1.97	4	1.4	5.5
φ6 Shank	**BNBP2R020-0126**	●	0.2	0.4	50	0.37	6	0.3	1.2
	BNBP2R030-0156	●	0.3	0.6	50	0.57	6	0.4	1.5
	BNBP2R050-0256	●	0.5	1.0	50	0.97	6	0.6	2.5
	BNBP2R075-0406	●	0.75	1.5	50	1.47	6	0.9	4.0
	BNBP2R100-0556	●	1.0	2.0	50	1.97	6	1.4	5.5

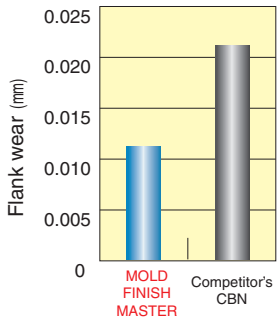
■ Performance

Comparison of flank wear during high speed machining

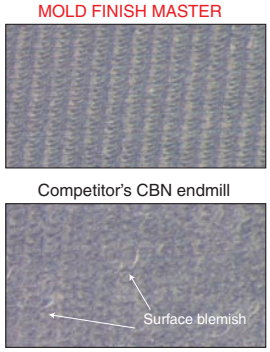


R1.0 Endmill, Work : SKD11 (60HRC), N=40,000min⁻¹, f=0.05mm/tooth (F=4,000mm/min), Ad=0.05mm, Rd=0.05mm, Oil mist

Wear amount at the ballnose tip



Competitor's CBN



R1.0 Endmill, Work: SKD11(60HRC), Milling length: 100m, N=20,000min⁻¹, f=0.05mm/tooth (F=2,000mm/min), Ad=0.05mm, Rd=0.05mm, Air blow

■ Recommended Conditions

Work / Cutting Conditions / Radius of ballnose (mm)	STAVAX, NAK80, SKD61 (~52HRC)				SKD11 (~62HRC)				SKH (~70HRC)			
	Spindle Speed (min⁻¹)	Feedrate (mm/tooth)	Depth-of-cut Ad (mm)	Depth-of-cut Rd (mm)	Spindle Speed (min⁻¹)	Feedrate (mm/tooth)	Depth-of-cut Ad (mm)	Depth-of-cut Rd (mm)	Spindle Speed (min⁻¹)	Feedrate (mm/tooth)	Depth-of-cut Ad (mm)	Depth-of-cut Rd (mm)
R0.2	20,000~50,000	0.02	0.03	0.03	20,000~50,000	0.02	0.01	0.02	20,000~50,000	0.015	0.01	0.02
R0.3	20,000~50,000	0.02	0.03	0.03	20,000~50,000	0.02	0.01	0.02	20,000~50,000	0.015	0.01	0.02
R0.5	20,000~50,000	0.03	0.05	0.05	20,000~50,000	0.03	0.03	0.04	20,000~50,000	0.02	0.02	0.03
R0.75	20,000~50,000	0.04	0.08	0.1	20,000~50,000	0.04	0.05	0.05	20,000~50,000	0.03	0.02	0.05
R1.0	20,000~50,000	0.05	0.1	0.1	17,000~50,000	0.05	0.05	0.05	17,000~50,000	0.03	0.03	0.05

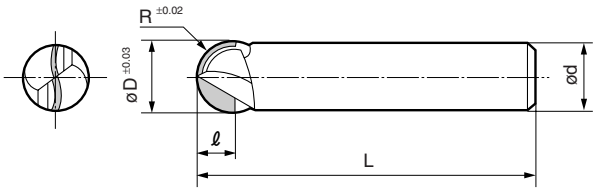
■ Important notes

(1) For stable machining, a more rigid machine is recommended.
(2) Air blow or oil mist coolant is recommended.
(3) Shorten overhang as much as possible.

● **Combination of Special Grade and Spiral Cutting Edge Design**

•The combination of special SUMIBORON grade with unique tool design is a break-through for high efficiency and smooth end-milling of hardened steels.

■ Spiral Ballnose-BNBS Type (2 Flutes)

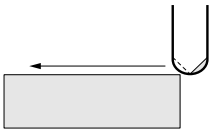


Catalogue No.	Stock	Dimensions (mm)				
	BN350	R	øD	ℓ	L	ød
BNBS 2020S	●	1.0	2.0	1.5	50	4
BNBS 2030S	●	1.5	3.0	2.0	60	6
BNBS 2040S	●	2.0	4.0	3.0	70	6
BNBS 2060S	●	3.0	6.0	4.5	80	6
BNBS 2080S	●	4.0	8.0	5.5	90	8
BNBS 2100S	●	5.0	10.0	6.5	100	10
BNBS 2120S	●	6.0	12.0	7.5	110	12
BNBS 2140S		7.0	14.0	8.5	120	16
BNBS 2160S		8.0	16.0	9.5	120	16
BNBS 2180S		9.0	18.0	10.5	130	20
BNBS 2200S		10.0	20.0	11.5	130	20

■ BNX3 Grade Cutting Performance

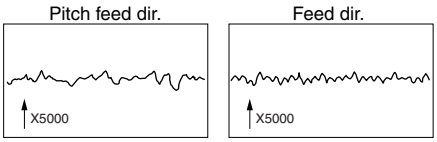
Work : SKD11 (60HRC)

	BN350
Cutting Speed	250m/min
Feedrate	0.04mm/tooth
Pitch feed	0.3mm
Depth-of-cut	0.3mm
Tool	BNBS2100S



Results

Cutting length : 110m, VB=0.128mm → able to continue
Surface roughness : Pitch feed dir. Ry1.8µm,
Feed dir. Ry2.2µm



■ Recommended Conditions

Work Material / Conditions / Endmill ø (mm)	Hardened Steel			
	50~57HRC		58~65HRC	
	C/Speed (m/min)	Feed f (mm/rev)	C/Speed (m/min)	Feed f (mm/rev)
2~6	80~250	0.01~0.03	80~200	0.01~0.02
6~10		0.02~0.05		0.02~0.04
10~20		0.04~0.08		0.03~0.06

■ Important Notes

- Use a rigid machine and select a high cutting speed with low feedrate.
- Use dry cutting conditions.
- Make overhang as short as possible.
- If work hardness is lower than HRC50, try a coated or uncoated carbide ballnose endmill instead. (→J31)