

SUMIBORON

L1 to L123

L



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Stock Indications and Symbols

- mark: Standard stocked item
- mark: To be replaced by a new item featured on the same page
- ▲ mark: To be replaced by new item
(Please confirm stock availability)

- * mark: Semi-standard stock (Please confirm stock availability)
- mark: Stock or planned stock (Please confirm stock availability)
- No mark: Made-to-order item
- mark: We cannot produce

L
SUMIBORON



General Features

In 1977, Sumitomo Electric Hardmetal 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 grinding was done. Furthermore, excellent efficiency and longer tool life can also be achieved from high speed machining of cast irons.

Characteristics

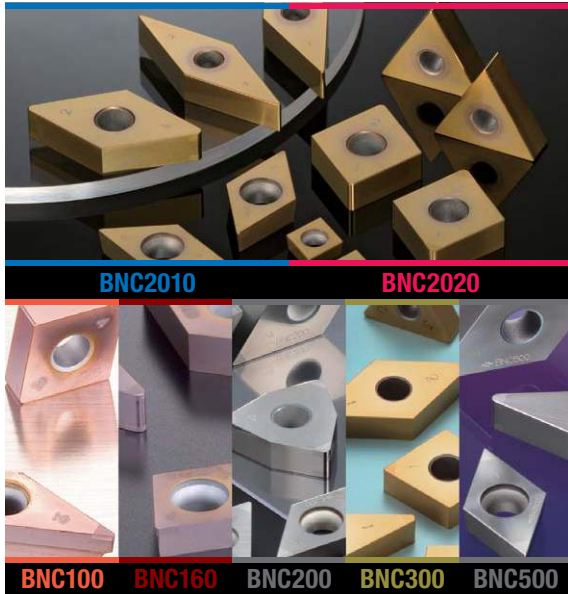
The sintered CBN tool - SUMIBORON is mainly used for the machining of ferrous metals due to its low chemical reactivity with iron. There are 3 different classifications of CBN as follows:

- A) in the chart 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.
- C) below shows 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	Work Material
A)	Mainly CBN grains fused together			BN700	K Cast Iron (FC) S Sintered Alloy
				BN7000	S Exotic Alloys
				BN7500	S Sintered Alloy
				BNS800	K Cast Iron (FC) S Exotic Alloys
B)	Mainly CBN grains held together with a binder			BN1000	H Hardened Steel
				BN2000	
				BN350	
				BNX10	
				BNX20	
				BNX25	
				BN500	K Cast Iron (FC/FCD)
C)	Sintered CBN body with special ceramic coating			New BNC2010	H Hardened Steel
				New BNC2020	
				BNC300	
				BNC100	
				BNC160	
				BNC200	
				BNC500	K Cast Iron (FCD)

Coated SUMIBORON Series



Achieves higher speed, higher efficiency, and higher precision New Coated SUMIBORON Series

General Features

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. Our rich lineup including more cost-effective, double-sided, multi-cornered one-use inserts offers a selection of economical and easy-to-use tools. Also, BNC2010 and BNC2020, new grades for hardened steel cutting, have been added to the Coated SUMIBORON Series. These grades provide further stability and longer tool life in hardened steel cutting.

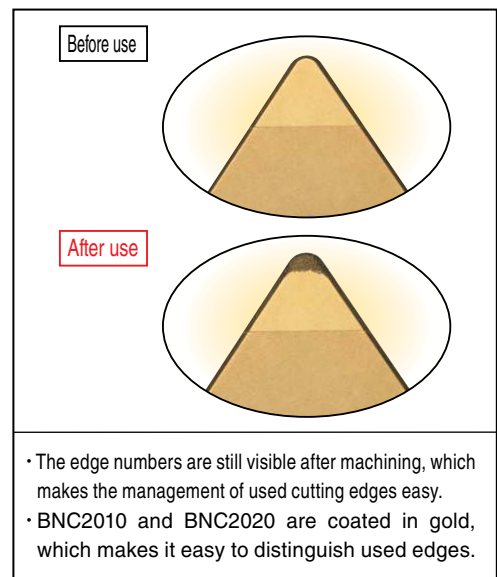
Characteristics



Cutting Performance

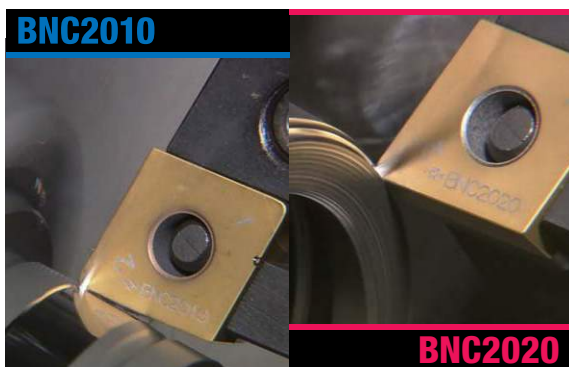
Condition		Cutting Speed (m/min)				
Application		100	200	300	400	500
Hardened Steel	General Purpose (Continuous to Light interrupted) Rz = Above 3.2	BNC2020 / BNC2010		BNC200	BNC100	
	Heavy interrupted	BNC300				
	High Precision (Rz = 1.6 to 3.2)	BNC2010		BNC160		
	High Efficiency (Cabrized layer removal)	BNC2020		BNC200		
Cast Iron	Ductile Cast Iron	BNC500				

Cutting Edge Management



Coated SUMIBORON for Hardened Steel Machining

BNC2010/BNC2020



Trump Card for Longer Tool Life and Cost Reduction

General Features

Provides improved machining accuracy and longer tool life as compared to conventional Coated SUMIBORON by combining newly developed CBN substrate and ceramic coating.

Exhibits excellent performance in high-precision and general cutting of hardened steel and enables reductions in machining costs.

Characteristics

BNC2010

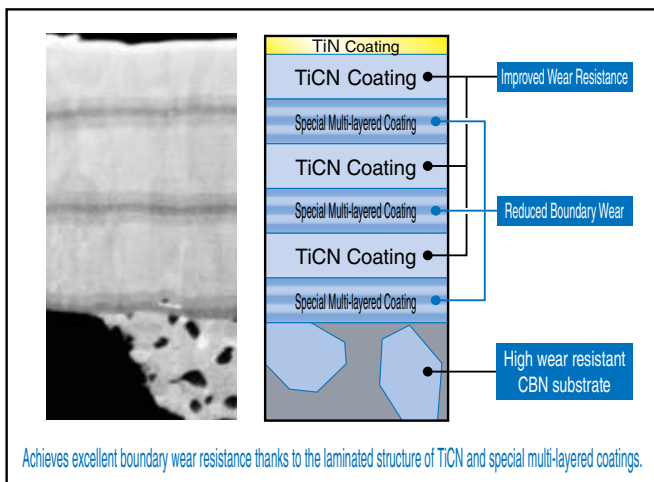
- For high-precision finishing requiring good surface roughness and dimensional accuracy. Ideal for high-precision machining thanks to excellent wear resistance.
- Further maintains excellent surface roughness. Stably provides excellent surface roughness thanks to coating with high boundary wear resistance and CBN substrate.

BNC2020

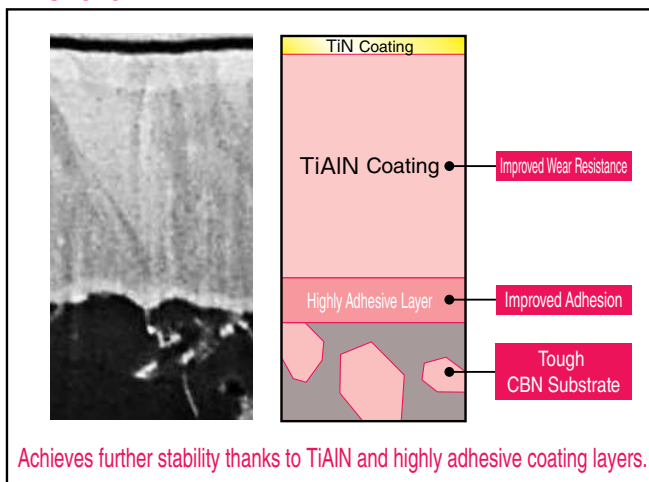
- General-purpose grade suitable for typical hardened steel machining applications. Achieves further stability in machining of a wide range of hardened steel components.
- Achieves long tool life thanks to highly wear-resistant, highly adhesive coating and tough CBN substrate. Achieves stable and long tool life even in high-efficiency and interrupted machining.

CBN Substrate and Coating Structure of BNC2010 and BNC2020

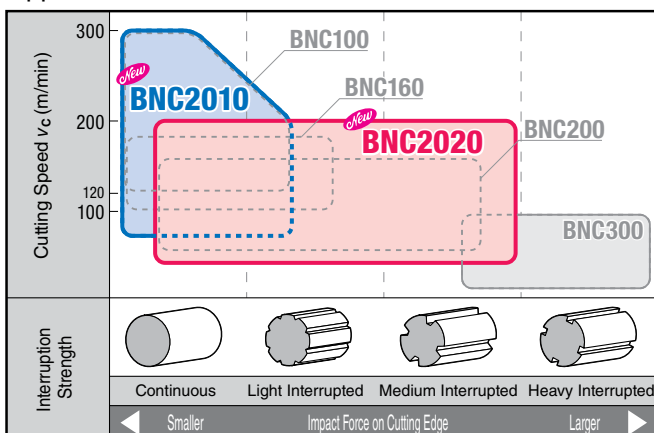
BNC2010



BNC2020



Application



Recommended Cutting Conditions

BNC2010

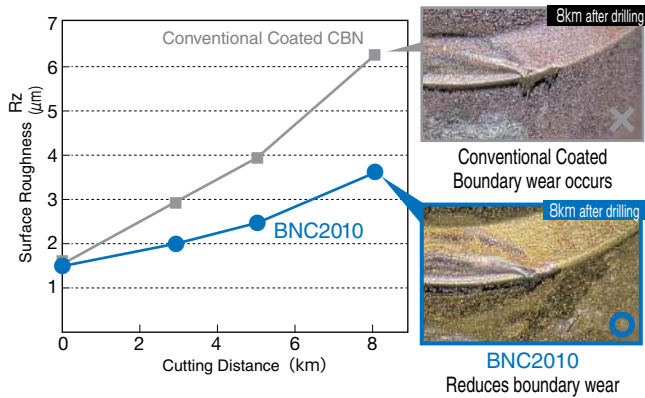
Cutting Speed V_c (m/min)	
120 150 200 250 300	
Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
0.03 to 0.25	0.03 to 0.35

BNC2020

Cutting Speed V_c (m/min)	
50 100 150 200 220	
Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
0.03 to 0.40	0.03 to 0.50

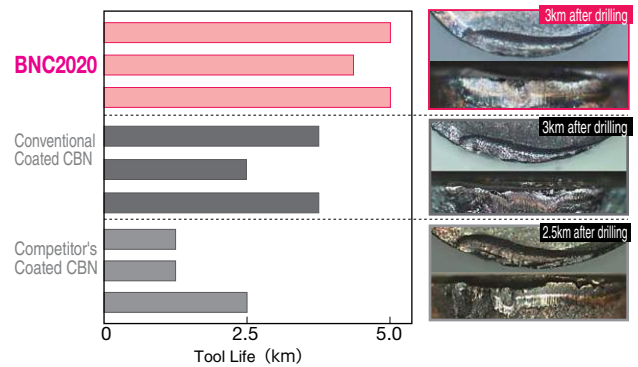
Performance

BNC2010



Work Material : SCM415 58-62HRC (Continuous)
 Insert : 4NC-DNGA150408 Edge Treatment : S01225
 Cutting Conditions : $v_c=160\text{m/min}$ $f=0.08\text{mm/rev}$ $a_p=0.1\text{mm}$ Wet

BNC2020

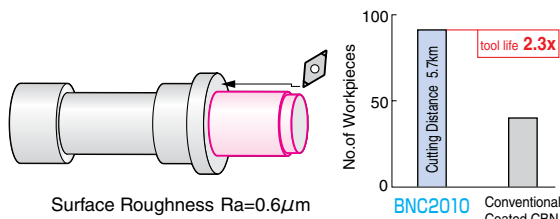


Work Material : SCM415-5V 58-62HRC (Interrupted Cut)
 Insert : 4NC-CNGA120412 Edge Treatment : S01225
 Cutting Conditions : $v_c=130\text{m/min}$ $f=0.1\text{mm/rev}$ $a_p=0.6\text{mm}$ Dry

Application Examples

BNC2010

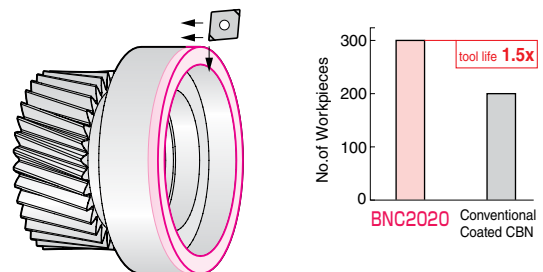
[Continuous External Turning of Main Shaft] (58 to 60HRC)
 BNC2010 provides excellent wear resistance and achieves excellent surface roughness.



Insert : 4NC-DNGA150408 (BNC2010)
 Cutting Conditions : $v_c=200\text{m/min}$ $f=0.10\text{mm/rev}$ $a_p=0.35\text{mm}$ Dry

BNC2020

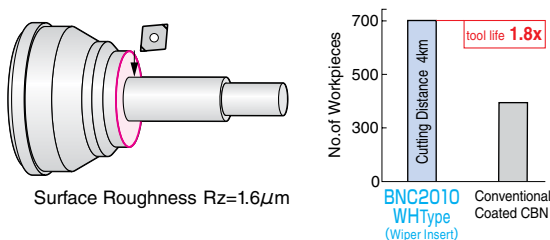
[Carburized Layer Removal for Sun Gear] (58 to 60HRC)
 BNC2020 achieves long tool life in high load cutting.



Insert : 4NC-CNGA120408 (BNC2020)
 Cutting Conditions : $v_c=100\text{m/min}$ $f=0.15\text{mm/rev}$ $a_p=0.5\text{mm}$ Wet

[CVJ Outer Race Facing] (58 to 60HRC)

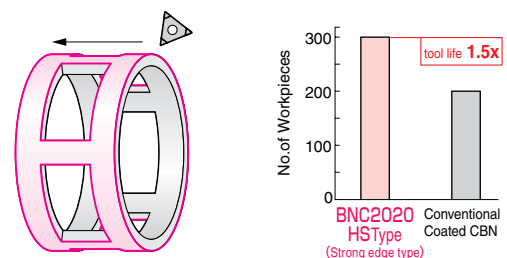
BNC2010 with a WH type wiper insert maintains excellent surface roughness for a long time.



Insert : 2NC-CNGA120412WH (BNC2010)
 Cutting Conditions : $v_c=150\text{m/min}$ $f=0.2\text{mm/rev}$ $a_p=0.2\text{mm}$ Dry

[Interrupted Machining of CVJ Cage Window] (58 to 60HRC)

BNC2020 strong edge HS type provides stable performance in continuous cutting.



Insert : 3NC-TNGA160420HS (BNC2020)
 Cutting Conditions : $v_c=120\text{m/min}$ $f=0.10\text{mm/rev}$ $a_p=0.15\text{mm}$ Dry



The Ultimate In Interrupted Machining Of Hardened Steel!

General Features

BNC300

Newly developed CBN substrate that emphasizes on toughness coupled with a highly 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 achieved in interrupted cut or in a mixture of continuous and interrupted cutting.

BN350

SUMIBORON series highest fracture resistance and toughest 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.

● Suitable for different types of workpieces

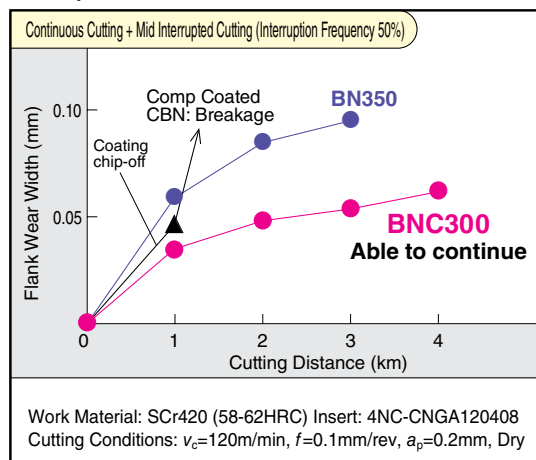
Achieving significantly longer tool life even on workpieces that have a mixture of continuous and interrupted cutting.

BN350

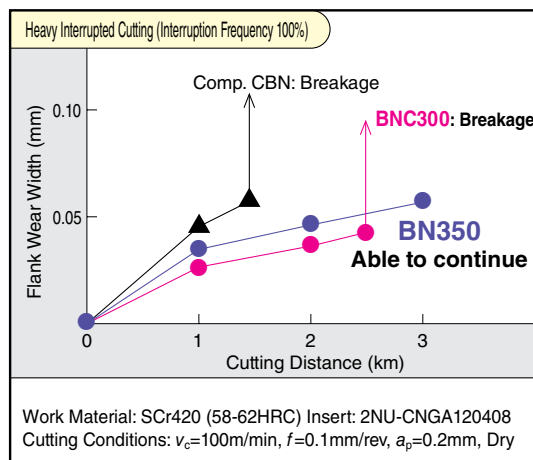
● Stable and long tool life in interrupted cutting

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

Cutting Performance



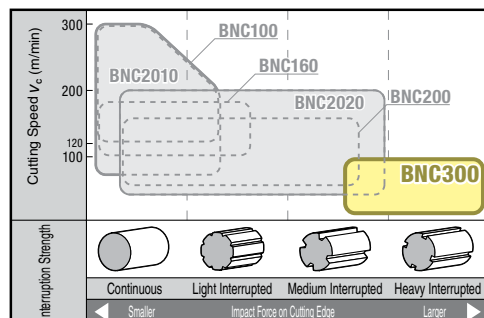
● BNC300 has superior balance of fracture and wear resistance.



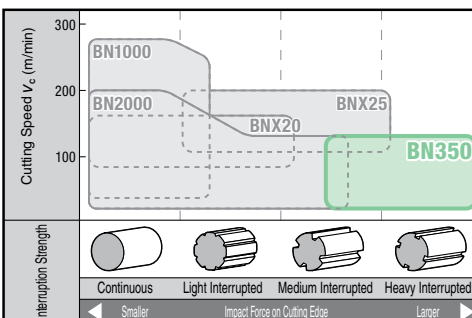
● BN350 exhibits very good fracture resistance.

Application Range

● Coated SUMIBORON



● SUMIBORON



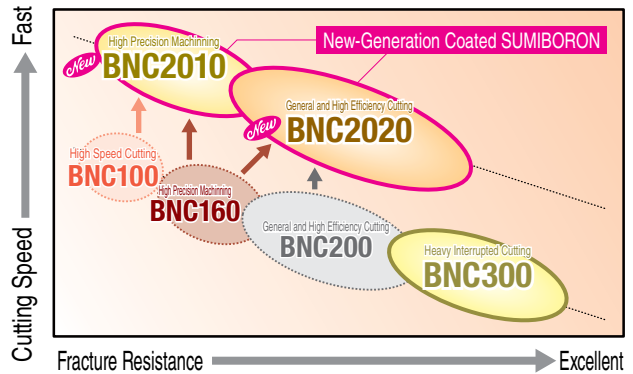
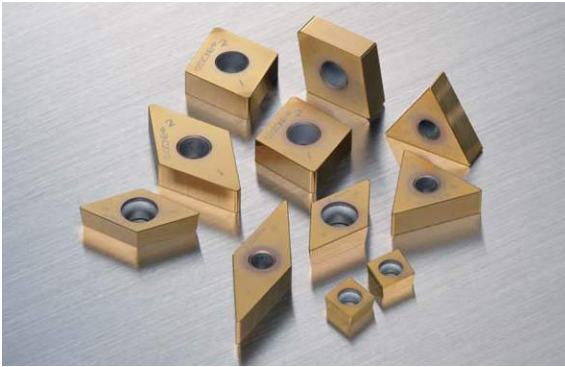
Recommended Cutting Conditions (For BNC300/BN350)

Cutting Speed v_c (m/min)	
50	80 100 120 150
Feed Rate f (mm/rev)	D.O.C. a_p (mm)
0.03 to 0.20	0.03 to 0.30

* Cutting Conditions: Dry

Characteristics of Coating Grades

New-Generation Coated SUMIBORON Released



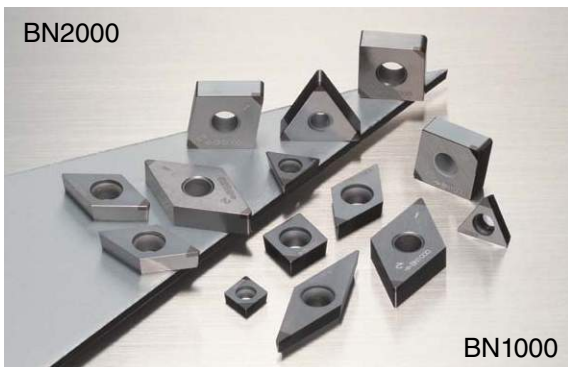
Characteristics of Grades

BNC2010 <i>New</i> Carbon Content : 50 to 55% Grain Size : 2 μ m Hardness HV : 30 to 32GPa TRS : 1.10 to 1.20GPa Main Coating Components : Multi-layered TiCN Coating Thickness : 1.5 μ m		High Precision Machining	Newly developed CBN substrate with high crater wear resistance coated with special multi-layered TiCN, which exhibits excellent boundary wear resistance. Ideal for finishing of hardened steel requiring excellent accuracy or surface roughness. Able to stably maintain 1.6S machining.
BNC2020 <i>New</i> Carbon Content : 70 to 75% Grain Size : 5 μ m Hardness HV : 34 to 36GPa TRS : 1.20 to 1.30GPa Main Coating Components : Multi-layered TiAlN Coating Thickness : 1.5 μ m		General and High Efficiency Cutting	Newly developed tough CBN substrate with highly wear-resistant TiAlN coating. Provides improved stability by inserting a highly adhesive layer between the substrate and the TiAlN layer. Ideal for general machining including finishing and interrupted cutting as well as high-efficiency machining such as carburized layer removal.
BNC100 Carbon Content : 40 to 45% Grain Size : 1 μ m Hardness HV : 29 to 32GPa TRS : 1.05 to 1.15GPa Main Coating Components : TiAlN/TiCN Coating Thickness : 2.0 μ m		High Speed Cutting	
BNC160 Carbon Content : 60 to 65% Grain Size : 3 μ m Hardness HV : 31 to 33GPa TRS : 1.10 to 1.20GPa Main Coating Components : TiAlN/TiCN Coating Thickness : 2.0 μ m		High Precision Machining	
BNC200 Carbon Content : 65 to 70% Grain Size : 4 μ m Hardness HV : 33 to 35GPa TRS : 1.15 to 1.25GPa Main Coating Components : TiAlN Coating Thickness : 2.0 μ m		General and High Efficiency Cutting	
BNC300 Carbon Content : 60 to 65% Grain Size : 1 μ m Hardness HV : 33 to 35GPa TRS : 1.15 to 1.25GPa Main Coating Components : TiAlN Coating Thickness : 1.0 μ m		Heavy Interrupted Cutting	

Recommended Cutting Conditions

Grade	Cutting Speed v_c (m/min)						
	50	100	(120)	150	(180)	200	(220) 250 300
<i>New</i> BNC2010							
<i>New</i> BNC2020							
BNC300							
BNC100							
BNC160							
BNC200							

Grade	Feed Rate (mm/rev)					
	0	0.1	0.2	0.3	0.4	0.5
<i>New</i> BNC2010						
<i>New</i> BNC2020						
BNC300						
BNC100						
BNC160						
BNC200						



General Features

An uncoated type of SUMIBORON that has a newly developed high-purity ceramic binder.

Both fracture and wear resistance are combined to achieve a stable tool life in a wide variety of hardened steel machining.

We offer a wide selection of tools starting with single-cornered types.

Characteristics

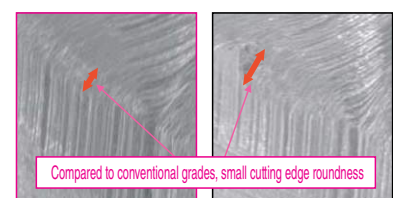
BN1000

- Superior high-speed machining grade with the highest wear resistance of any uncoated SUMIBORON. Delivers excellent tool life in continuous cutting to light-interrupted cutting.
- Improved fracture resistance while also emphasizing wear resistance. Improved hardness and heat resistance from the high-purity TiCN ceramic binder.

BN2000

- General purpose grade suitable for typical hardened steel machining applications. Provides stable tool life in everything from continuous cutting to light-to-medium interrupted cutting.
- High degrees of both fracture resistance and wear resistance. Significant improvements in the performance of both by employing a high-purity ceramic binder.
- Stable surface roughness by increasing sharpness (Figure on right).

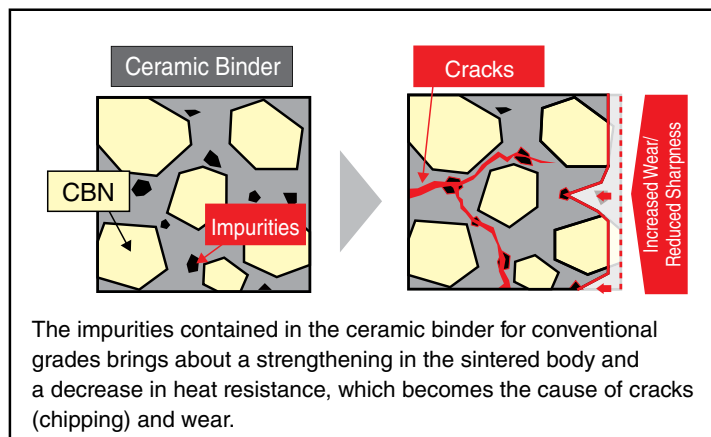
Sharpness Comparison



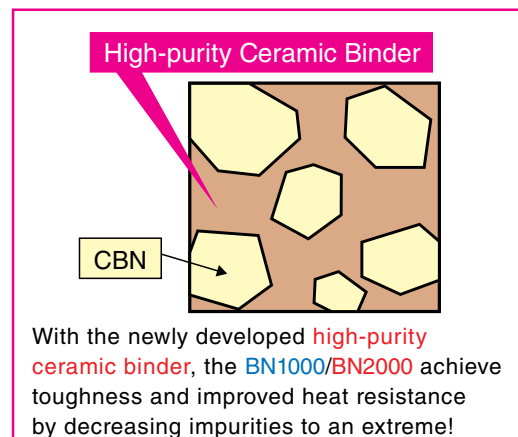
BN2000

Conventional Grade

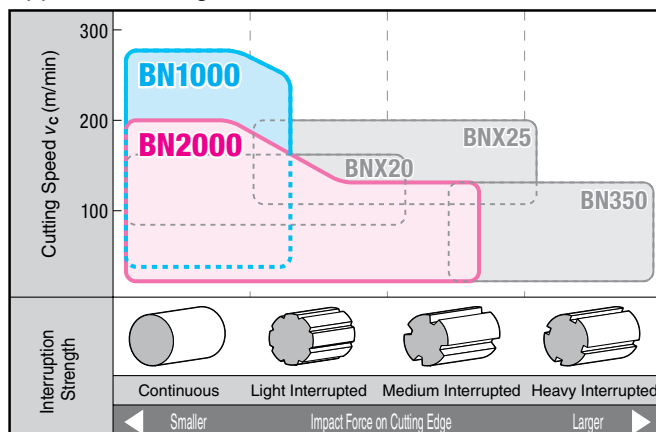
Newly Developed High-Purity Ceramic Binder Conventional Grade



BN1000/BN2000



Application Range



Recommended Cutting Conditions

BN1000

Cutting Speed v_c (m/min)	
50	100 120 150 200 250 300
Feed Rate f (mm/rev)	D.O.C. a_p (mm)
0.03 to 0.15	0.03 to 0.2

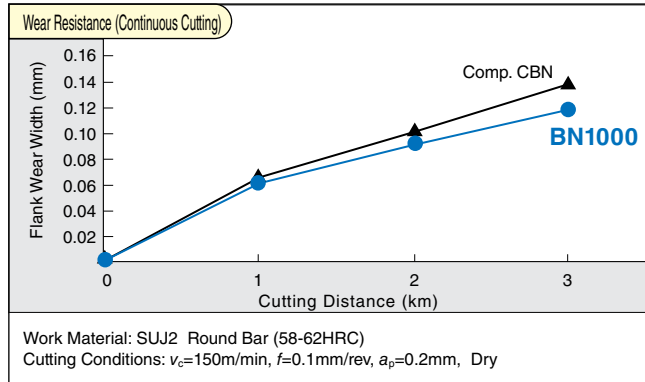
BN2000

Cutting Speed v_c (m/min)	
50	80 100 120 150 200 250 300
Feed Rate f (mm/rev)	D.O.C. a_p (mm)
0.03 to 0.2	0.03 to 0.3

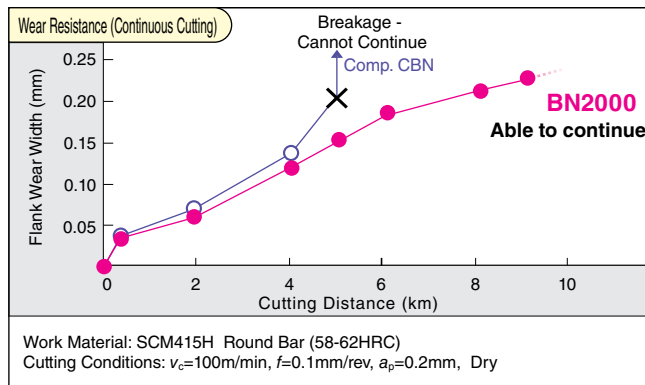
* Coolant: Continuous Cutting Dry, Wet
Interrupted Cutting Dry

Cutting Performance

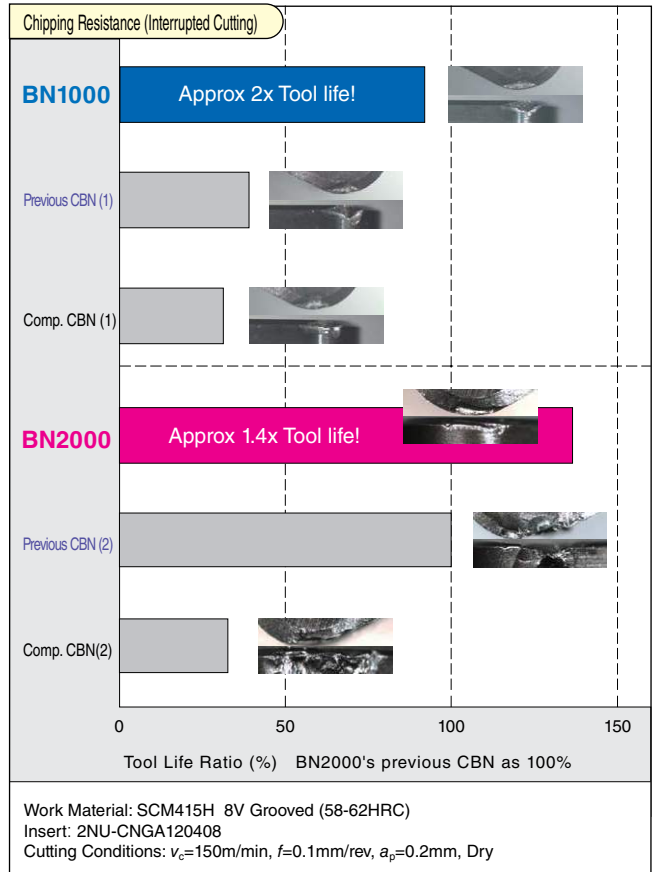
BN1000



BN2000

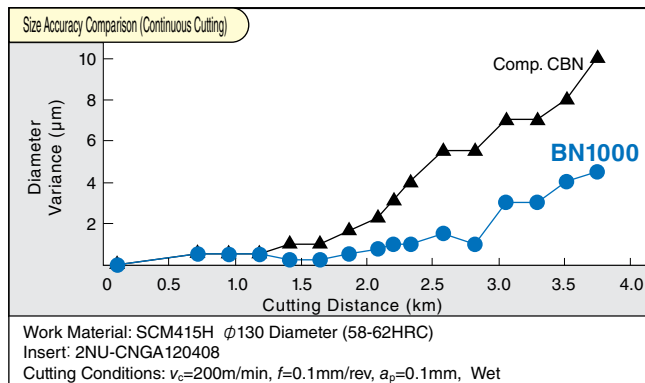


BN1000/BN2000

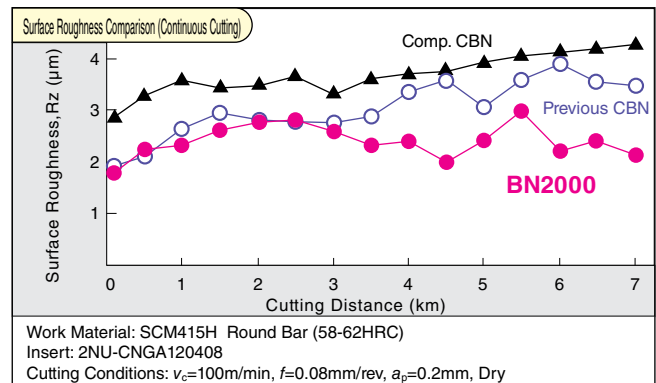


Machining Precision

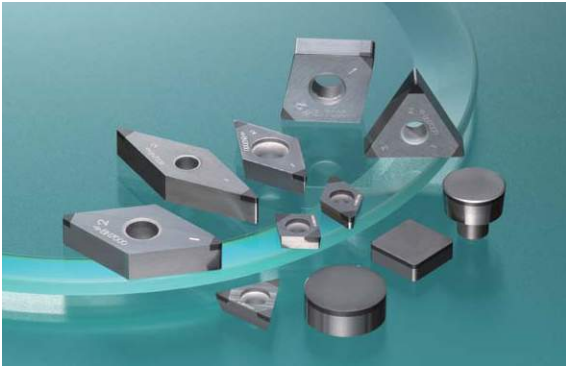
BN1000



BN2000



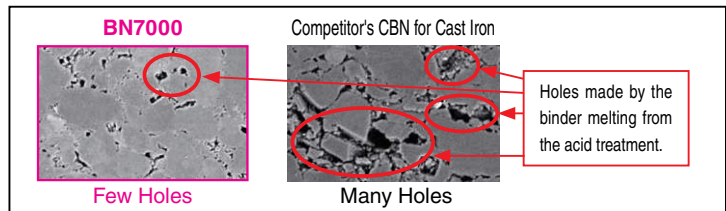
For high-speed finishing of cast iron, powdered metals, and difficult-to-machine materials!



General Features

Medium-grain CBN sintered to a high density to achieve the maximum content percentage. Also delivers superior fracture resistance by increasing the binding strength between CBN particles. Provides stable, long tool life for high-speed finishing work with cast iron, powdered metals, and difficult-to-machine materials.

Acid-treated CBN Sintered Body Structure



Characteristics

● Excellent for high speed finishing of Cast Iron!

Good wear and fracture resistance in high speed machining of Grey Cast Iron.

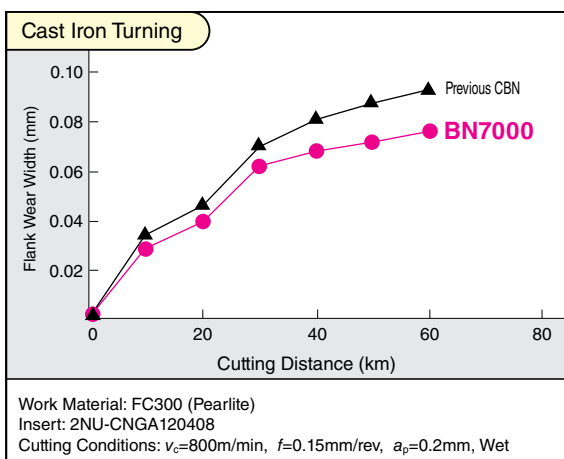
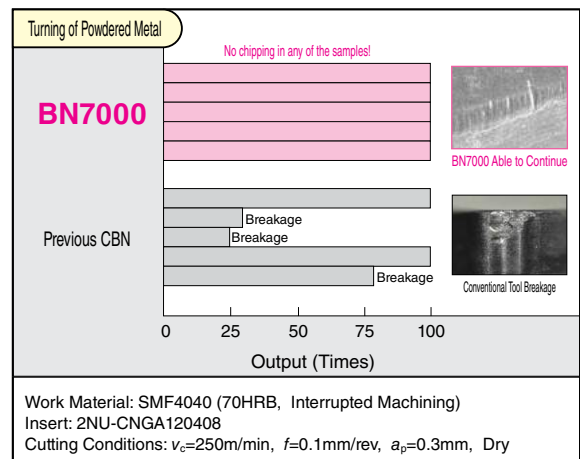
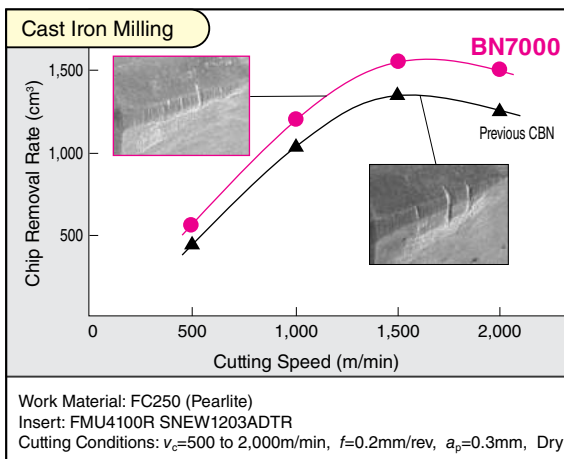
● High efficiency machining of powdered metal

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.

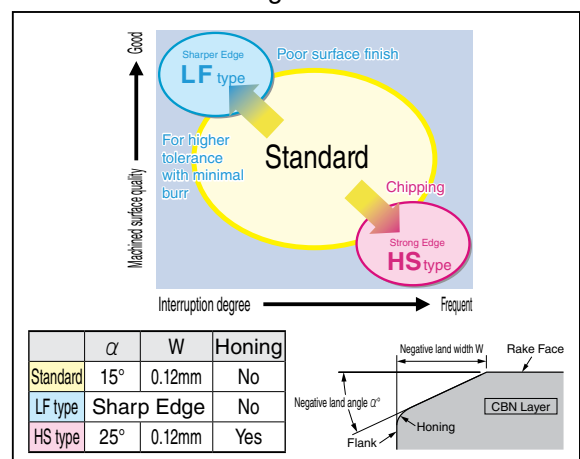
● Able to machine any Exotic Metals.

Long tool life can also be achieved for the machining of exotic materials such as Roll, HSS and Heat-Resistive Alloy etc.

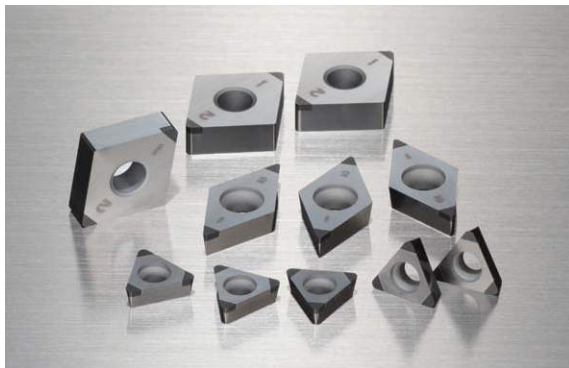
Cutting Performance



Recommended Edge Treatment

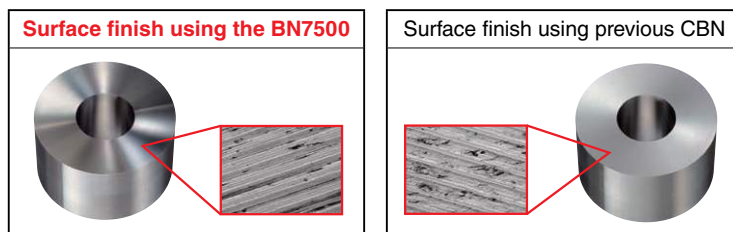


Achieves High Precision, High Efficiency Machining of Powdered Metal



General Features

High density sintered material made of micro-grained CBN grains provide excellent sharpness and wear resistance for high quality surfaces in sintered alloy finishing.



★ The previous CBN left white blemishes on the finished surface whereas the BN7500 leaves a better, glossy surface finish.

Characteristics ● Excellent for finishing of powdered metal

Excellent machined surface finish and surface appearance.

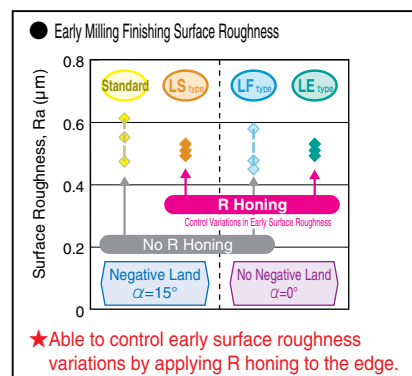
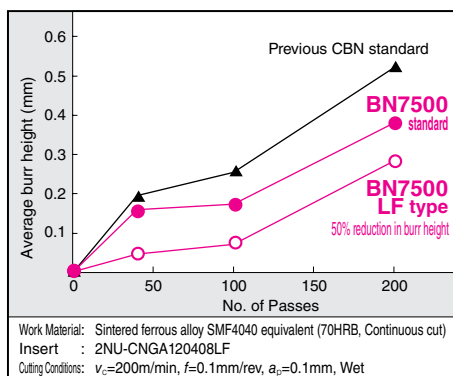
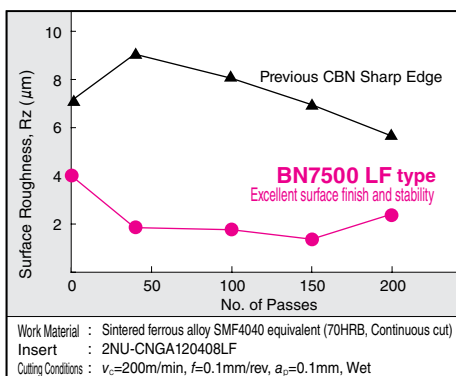
● Available with 5 different types of edge treatment for machining sintered alloys of any shape or hardness

The LF type has a sharper edge designed specifically for machining sintered alloys with minimal burr and improved machining precision. The HS Type has a strengthened cutting edge for stable chipping resistance during interrupted cutting and finishing.

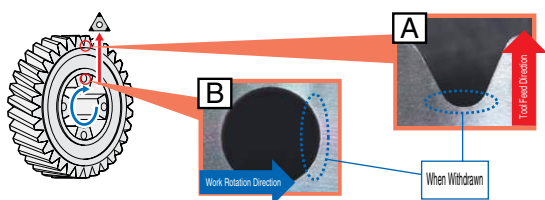
Provides machining stability by reducing the variation in early milling surface roughness with the LE edge treatment, which emphasizes superior surface finish.

The LS Type, excelling in fracture resistance and cutting edge balance, also supports finishing that includes light interrupted cutting.

Cutting Performance



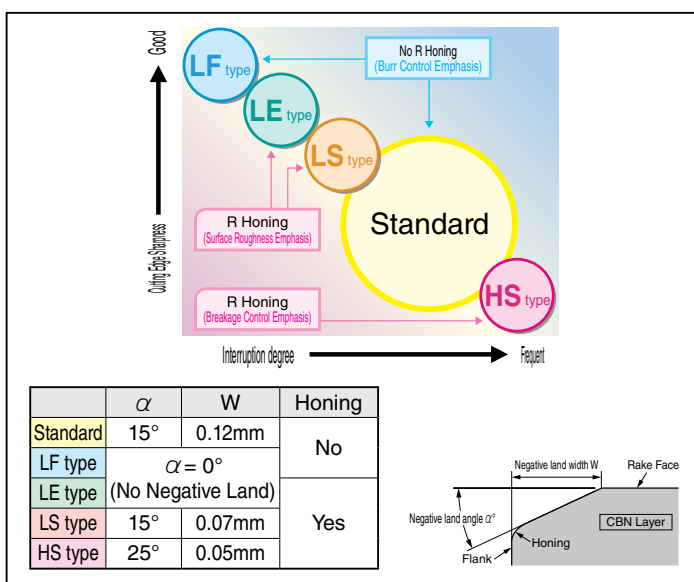
Feed and Burr Relationship



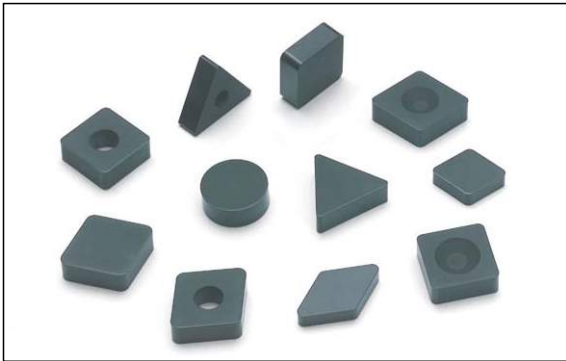
★ The LF Type without R honing has a cutting edge sharpness superior to the LE type with R honing and can control burrs better.
★ For a feed rate 0.1 mm/rev or higher, LS Type has a cutting edge sharpness superior to the standard type and can control burrs better.

	LF type	LE type	LS type	Standard
Diagram A				
Diagram B				
Work Material: VVT Facing Insert: 3NU-TNGA160404 Cutting Conditions: $v_c=200\text{m/min}$, $f=0.1\text{mm/rev}$, $a_p=0.1\text{mm}$, Wet				

Recommended Edge Treatment



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. Additionally, RM type cutter is developed exclusively for Solid SUMIBORON and is suitable for high-speed rough milling.

■ Characteristics

● Larger Cutting Depths

100% solid CBN structure where the whole edge can be use.

● High Precision Machining

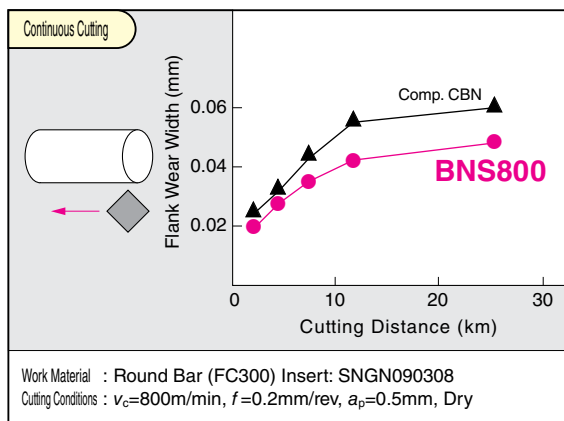
Excellent balance of wear resistance and toughness.

● Total Cost Effectiveness

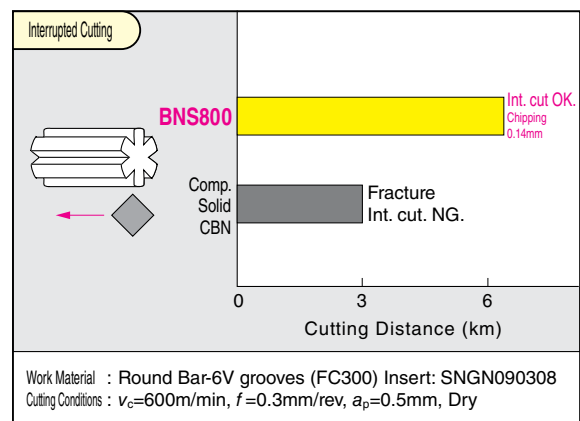
All corners of the insert can be utilized.

Refer to pages L98 to L99 for BNS800 special holders and page L113 for RM Type milling cutter.

■ Cutting Performance



● Wear resistance is better than competitor's.

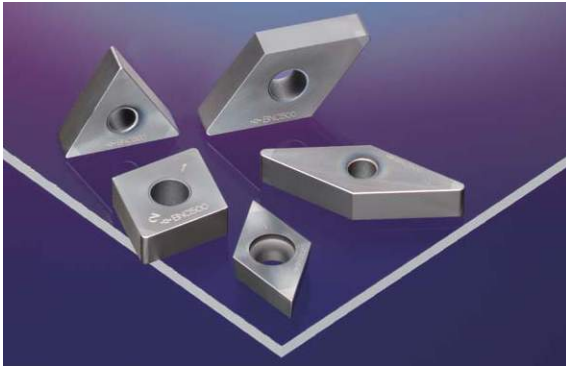


● Double the competitor's fracture resistance.

■ Application Example

● Cylinder Bore			● Machine Bed			● Carbide Roll			● Sprayed Face Bore		
Medium Finishing FC250 			Milling FC250 RM3125R 			Turning Carbide (Co 15%) 			Boring Colmonoy 		
<Tool life criteria: Finishing> 			<Tool life criteria: Finishing> 			<Tool life criteria: breakage> 			<Tool life criteria: breakage> 		
<machining cost / corner> 											
Cutting Conditions	Med. Finish	Finishing	Cutting Conditions	Roughing		Cutting Conditions	Finishing		Cutting Conditions	Roughing	Finishing
Grade	BNS800		Grade	BNS800		Grade	BNS800		Grade	BNS800	
Cat.No.	SNGN090308		Cat.No.	SNEN090308W		Cat.No.	RNGN090300		Cat.No.	SNGN090312	SNGN090308
v_c	1,000m/min		v_c	1,500m/min		v_c	40m/min		v_c	80m/min	
f	0.3mm/rev	0.25mm/rev	f_z	0.2mm/t		f	0.15mm/rev		f	0.04mm/rev	0.03mm/rev
a_p	0.2mm		a_p	2.5mm (2 pass)		a_p	0.2mm		a_p	to 3mm	0.5mm
Coolant	Wet		Coolant	Dry		Coolant	Wet		Coolant	Wet	

Coated CBN Grades for Ductile Cast Iron Machining

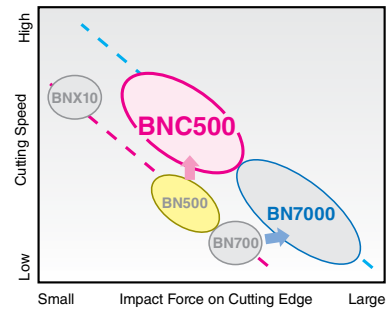


■ Characteristics ● Achieves a Long, Stable Tool Life at $v_c=400$ m/min or Higher

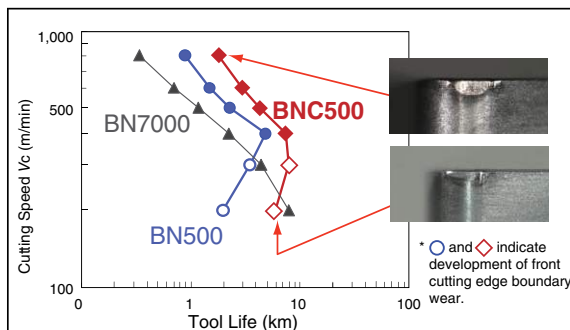
Superior wear resistance, makes stable machining possible under high-speed conditions.

● Supports High-precision Machining

Can maintain excellent dimensional tolerance and surface roughness over many hours.

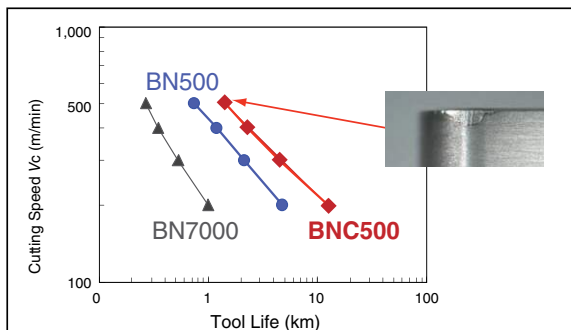


● FCD450 Continuous Cut (V-T Chart)



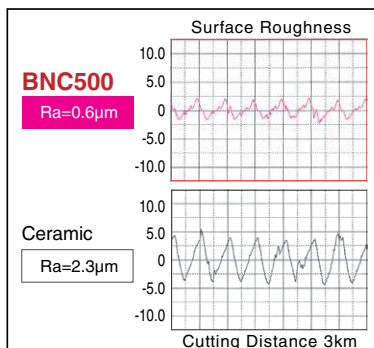
Work Material: FCD450(160HB) Insert: 4NC-CNGA120408
Cutting Conditions: $f=0.2$ mm/rev, $a_p=0.2$ mm, Wet
Tool life limit set at: $VB_{max}=0.2$ mm

● FCD700 Continuous Cut (V-T Chart)



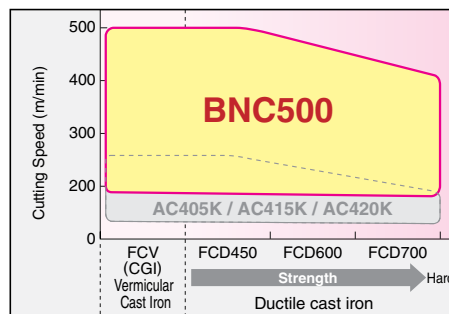
Work Material: FCD700(260HB) Insert: 4NC-CNGA120408
Cutting Conditions: $f=0.2$ mm/rev, $a_p=0.2$ mm, Wet
Tool life limit set at: $VB_{max}=0.2$ mm

■ Machined Surface Quality

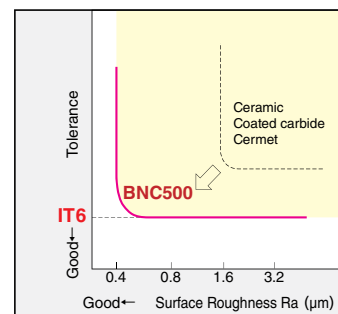


Work Material: FCD700 (260HB)
Cutting Conditions: $v_c=400$ m/min,
 $f=0.2$ mm/rev, $a_p=0.2$ mm, Wet

■ Application Range



■ High Precision Machining



■ Recommended Cutting Conditions

Cutting Speed v_c (m/min)	
200	500
Feed Rate f (mm/rev)	D.O.C. a_p (mm)
0.10 to 0.40	≤ 0.50

* Coolant: Wet

Grade Comparison Chart

■ CBN Grades

Classification	Grade	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	Hitachi	Sandvik	Kennametal	Dijet	SECO Tools
	K01	BNC500* BN7000 BN500	MB710	BX930 BX870 BX910	KBN60M		CB7525 CB7925	KB1340	JBN795	
	K10	BN7000 BN500	MB710 MB730	BX950	KBN900	BH200	CB7525 CB7925		JBN330	CBN200,CBN300 CBN300P,CBN400C
	K20	BN7000 BNS800	MBS140	BXC90 BX90S	KBN900	BH250				CBN200,CBN300 CBN300P,CBN400C
	K30	BNS800		BXC90 BX90S				KB5630		CBN500
	N01	BN700 BN7000								
	S01	BN7000	MB730	BX470 BX480 BX950	KBN65M KBN70M			KB5630 KB1340		
	H01	BNC2010 BNC2020 BNC100 BN1000 BN2000 BNX10	MBC010 MB810	BXM10 BX310	KBN05M PT600M	BH100		KB5610		CBN10 CBN100 CBN060K
	H10	BNC2010 BNC2020 BNC160 BNC200 BN2000	MBC020 BC8020 MB820	BXM20 BX330	KBN25M	BH150	CB7015	KB5610 KB5625	JBN300	CBN10,CBN100 CBN150,CBN060K CBN160C
	H20	BNC2020 BNC200 BNX20	MBC020 BC8020 MB825	BXC50 BX360	KBN35M KBN900	BH250	CB7025 CB20	KB5625 KB5630	JBN245	CBN150 CBN160C
	H30	BNC300 BN350 BNX25	MB835 BC8020	BX380			CB7525	KB5630		

*: For ductile cast iron cutting

HARDENED STEEL MACHINING (1)

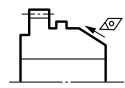
● Merits of using CBN

Below is an analysis on the use of CBN as compared to grinding:

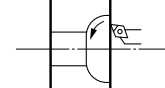
In terms of cost investments, it is much lower in machine cost and overhead cost due to the fact that a CNC lathe is cheaper than a grinding machine. As for the quality of surface finish, inserts can machine different profiles with excellent surface finish, in a single set-up. Environmentally, sludge treatment for grinding is a hazard to the environment but the chips from the turning process can be collected and recycled.

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

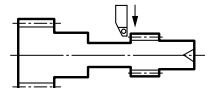
Machining Versatility In Using CBN



Taper turning



Internal (Profile) Boring

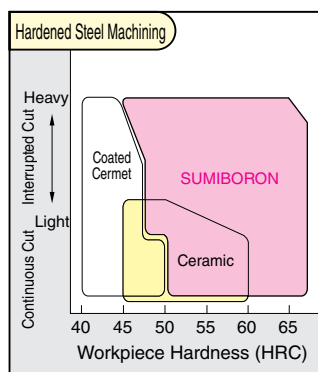


Grooving/Profiling

■ Recommended Grade

	Grade	Binder	Carbon Content(%)	Grain Size(μm)	Hardness(GPa)	TRS(GPa)	Main Coating Components	Coating Thickness(μm)	Characteristics
Coated	BNC2010	TiCN	50 to 55	2	30 to 32	1.10 to 1.20	TiCN multi-layered	1.5	Improves the wear resistance of coating and substrate and stably achieves excellent surface roughness.
	BNC2020	TiN	70 to 75	5	34 to 36	1.20 to 1.30	TiAlN multi-layered	1.5	Provides long tool life in general and high-efficiency cutting thanks to tough substrate coated with a highly wear-resistant, highly adhesive layer.
	BNC300	TiN	60 to 65	1	33 to 35	1.15 to 1.25	TiAlN	1	Suitable for finishing work materials with both continuous and interrupted cutting.
	BNC100	TiN	40 to 45	1	29 to 32	1.05 to 1.15	TiAlN/TiCN	2	Suitable for high-speed finishing thanks to highly wear-resistant coating.
	BNC160	TiN	60 to 65	3	31 to 33	1.10 to 1.20	TiAlN/TiCN	2	Achieves stable, high-precision finishing of hardened steel.
	BNC200	TiN	65 to 70	4	33 to 35	1.15 to 1.25	TiAlN	2	Provides long tool life thanks to tough substrate and highly wear-resistant coating.
Uncoated	BN1000	TiCN	40 to 45	1	27 to 31	0.90 to 1.00	—	—	Achieves ultimate wear and fracture resistance. Suitable for high-speed cutting.
	BN2000	TiN	50 to 55	2	31 to 34	1.05 to 1.15	—	—	General-purpose grade for hardened steel machining with high degree of fracture and wear resistance.
	BNX20	TiN	55 to 60	3	31 to 33	0.95 to 1.10	—	—	Achieves excellent crater wear resistance. Suitable for high-efficiency cutting under high temperature conditions.
	BN350	TiN	60 to 65	1	33 to 35	1.20 to 1.30	—	—	Achieves ultimate cutting edge strength. Suitable for heavy interrupted cutting.
	BNX10	TiCN	40 to 45	3	27 to 31	0.80 to 0.90	—	—	Excellent wear resistance. Suitable for continuous high-speed cutting.
	BNX25	TiN	65 to 70	4	29 to 31	1.00 to 1.10	—	—	Exhibits superior fracture resistance in high speed cutting. Suitable for high-speed interrupted cutting of hardened steel.

■ Application Range

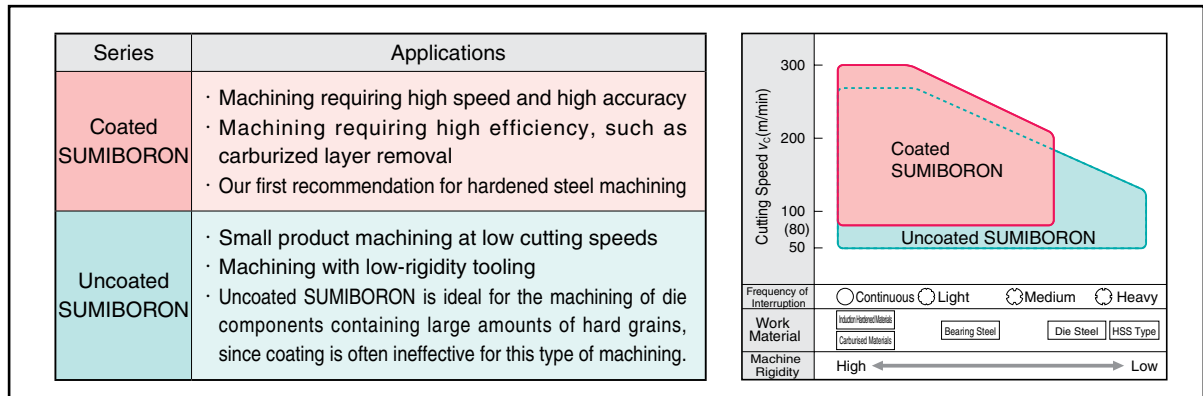


Application			Conditions			Cutting Speed (m/min)		
						100	200	300
Finishing	General Purpose (Continuous to Light Interrupted Rz=Above 3.2)	Coated SUMIBORON						
		Uncoated SUMIBORON						
	Medium to Heavy Interrupted	Coated SUMIBORON						
		Uncoated SUMIBORON						
	High Precision (Rz=1.6 to 3.2)	Coated SUMIBORON						
		Uncoated SUMIBORON						
High Efficiency (Cabrurized layer removal)		Coated SUMIBORON						

HARDENED STEEL MACHINING (2)

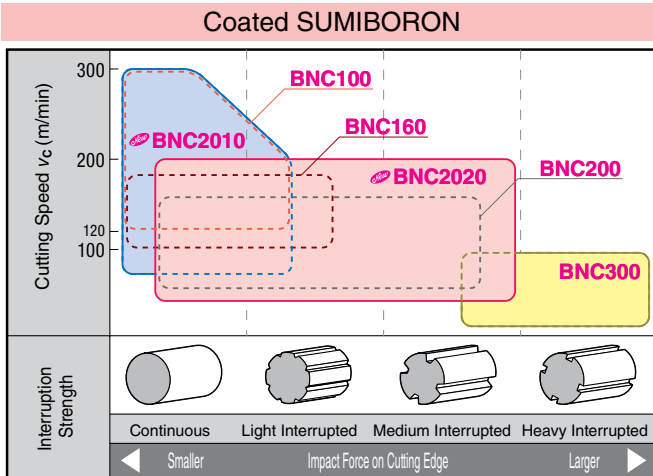
Recommended Grade **BNC2010/BNC2020/BNC300/BNC100/BNC160/BNC200**
BN1000/BN2000/BN250/BN350/BNX10/BNX20/BNX25

- Applications Coated SUMIBORON: 1st recommendation for hardened steel machining, best performance in high-speed, high-efficiency machining.
 Uncoated SUMIBORON: Optimal for machining small items with a limited cutting speed and hardened steel.

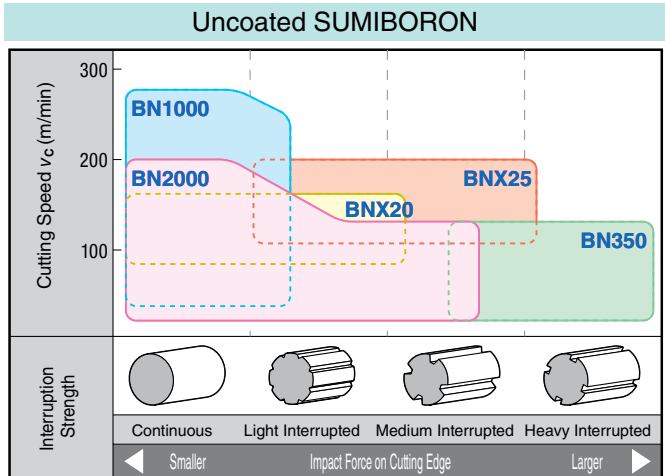


Application Range

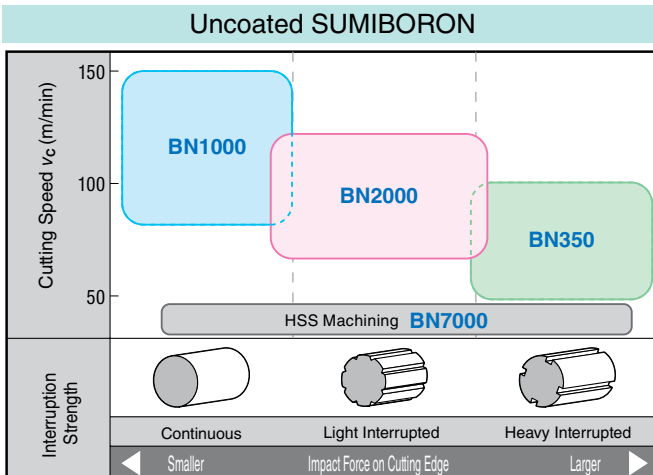
- Induction Hardened Materials (S45C / S55C etc.) , Carburized steel



- Induction Hardened Materials (S45C / S55C etc.) , Carburized steel



- Die Steel (SKD11 / SKD61 etc.) , HSS

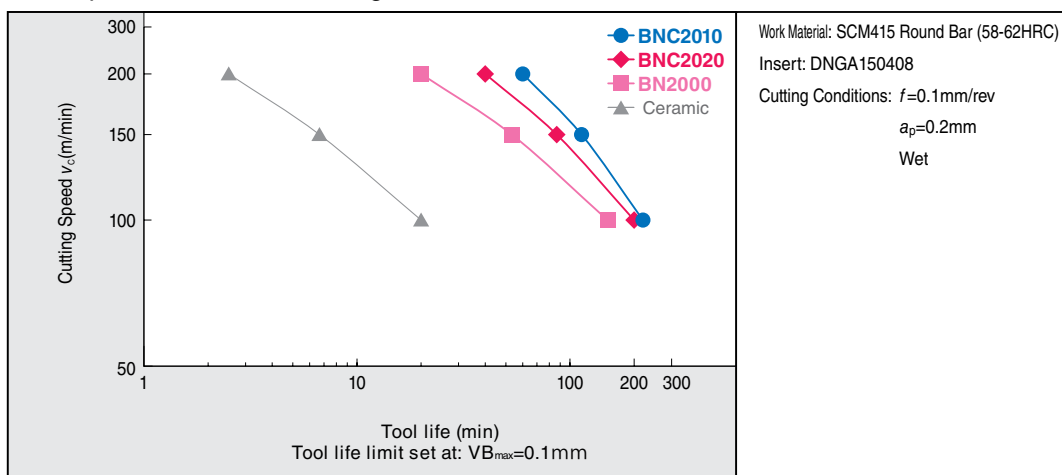


Recommended Cutting Conditions

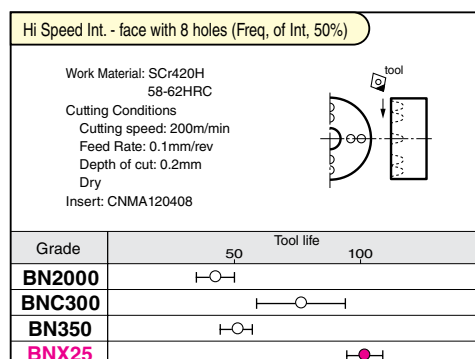
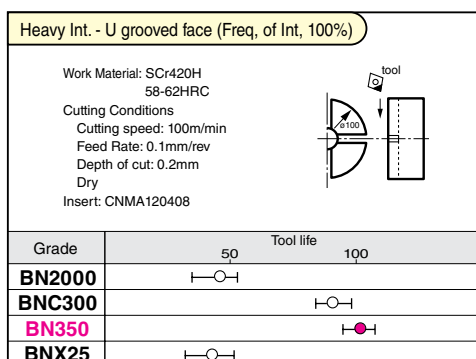
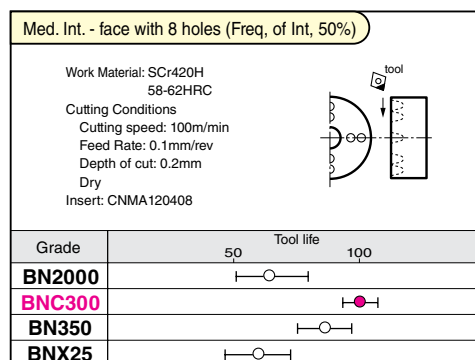
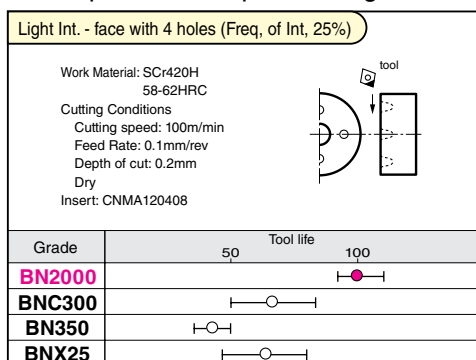
	Grade	Cutting Speed v_c (m/min)						f (mm/rev)	a_p (mm)
		50	100 (120)	150 (170)	200 (220)	250	300		
Coated	BNC2010							0.03 to 0.25	0.03 to 0.35
	BNC2020							0.03 to 0.40	0.03 to 0.50
	BNC300							0.03 to 0.20	0.03 to 0.30
	BNC100							0.03 to 0.20	0.03 to 0.30
	BNC160							0.03 to 0.20	0.03 to 0.35
	BNC200							0.05 to 0.35	0.05 to 0.50
Uncoated	BN1000							0.03 to 0.15	0.03 to 0.20
	BN2000							0.03 to 0.20	0.03 to 0.30
	BN350							0.03 to 0.20	0.03 to 0.30
	BNX10							0.03 to 0.15	0.03 to 0.20
	BNX20							0.03 to 0.30	0.03 to 0.50
	BNX25							0.03 to 0.30	0.03 to 0.50

HARDENED STEEL MACHINING (3)

Application Examples (Continuous cutting)



Application Examples (Interrupted cutting)

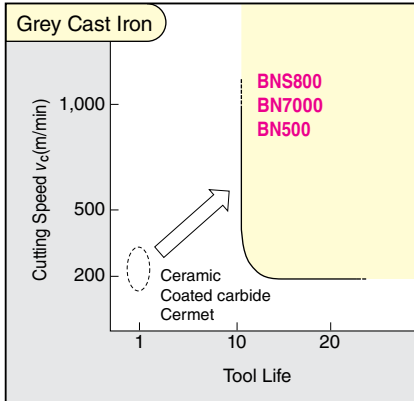


CAST IRON MACHINING

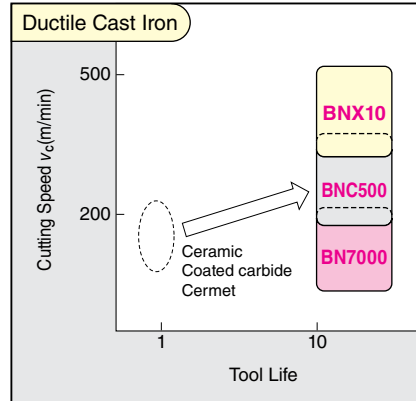
● Merits of using CBN

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

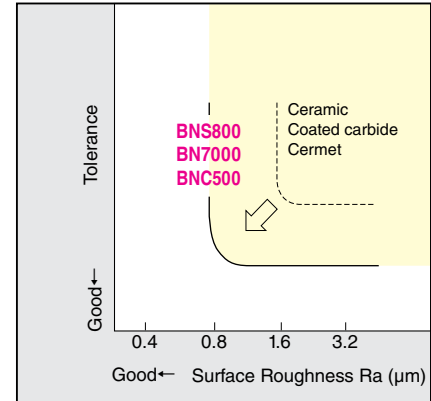
High Speed Machining



High Speed Machining



High Precision Machining



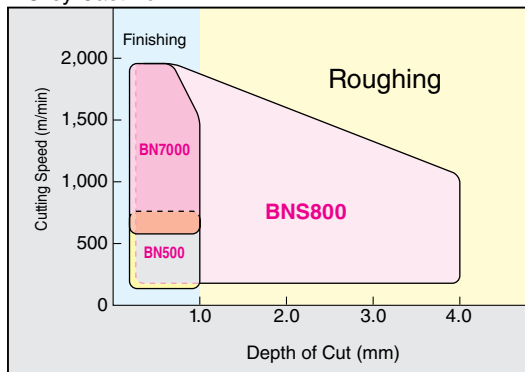
■ Recommended Grade

	Grade	Binder	Carbon Content (%)	Grain Size (μm)	Hardness (GPa)	TRS (GPa)	Main Coating Components	Coating Thickness (μm)	Characteristics
Uncoated	BNS800	Al Compound	85 to 90	8	39 to 42	0.95 to 1.10	—	—	Grade with 100% solid CBN structure and excellent thermal shock resistance.
	BN7000	Co Compound	90 to 95	2	41 to 44	1.30 to 1.40	—	—	Exhibits improved wear and fracture resistance in cutting of cast iron and exotic alloys.
	BN500	TiC	65 to 70	6	32 to 34	1.00 to 1.10	—	—	Optimized for cast iron cutting. Provides superior wear and fracture resistance.
Coated	BNC500 (Ductile Cast Iron)	TiC	60 to 65	4	32 to 34	1.00 to 1.10	TiAlN	2	Suitable for machining of hard-to-cut cast iron thanks to the highly wear-resistant substrate and coating.

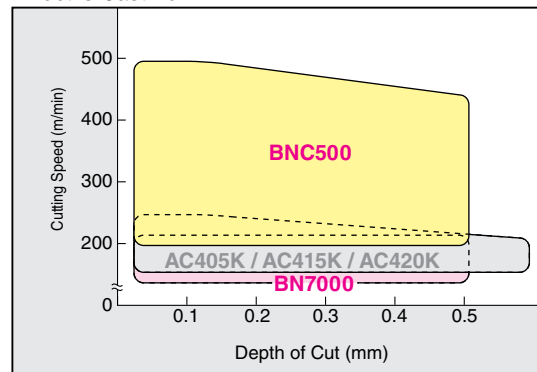
* Refer to pages L20 and L21 for machining of sintered components, rolls, hard facing alloys and heat resistive alloys.

■ Application Range

<Grey Cast Iron>



<Ductile Cast Iron>



<Special Cast Iron>

Work	Hardness (HB)	Structure	Examples	Cutting Speed (m/min)					
				100	200	300	350	400	500
Ni-resist Cast Iron	150 to 200	Austenite	Piston ring	BNC500					
High-Cr Cast Iron	250 to 350	Austenite	Pump parts	BNS800					
FCV (CGI)	400 to 580	Pearlite	Engine block Cylinder head Disc brakes	BNC500					

Recommended Cutting Conditions ● Turning

Work Material		Grade	Recommended Cutting Conditions		
Material Name	Hardness Code		v_c (m/min)	f (mm/rev)	a_p (mm)
Grey Cast Iron	FC200 to FC300 (HB≤230)	BN7000	100 ————— 2,000	0.1 to 0.5	≤1.0
		BNS800	200 ————— 2,000	0.1 to 1.0	≤4.0
		BN500	200 ————— 700	0.1 to 0.5	≤1.0
Alloy Cast Iron	(HB≥200)	BN7000	200 ————— 800	0.1 to 0.4	≤0.5
		BNS800	200 ————— 1,000	0.1 to 0.8	≤2.0
Ductile Cast Iron	FCD450 to FCD550	BN7000	80 ————— 200	0.1 to 0.4	≤0.6
		BNC500	150 ————— 500	0.1 to 0.4	≤0.5
	FCD600 to FCD700	BNC500	200 ————— 400	0.1 to 0.4	≤0.5
Vermicular Cast Iron FCV (CGI)	—	BNC500	200 ————— 500	0.1 to 0.4	≤0.4

Coolant recommendation: Wet (BNS800: Wet or Dry)

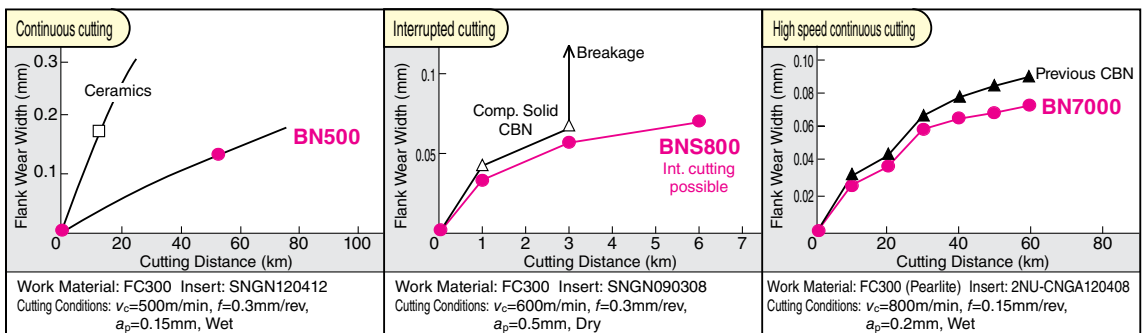
● Milling

Work Material		Grade	Recommended Cutting Conditions		
Material Name	Hardness Code		v_c (m/min)	f (mm/rev)	a_p (mm)
Grey Cast Iron	FC200 to FC300 (HB≤200)	BN7000	800 ————— 2,000	0.1 to 0.5	≤0.5
		BNS800	800 ————— 2,000	0.1 to 1.0	≤4.0

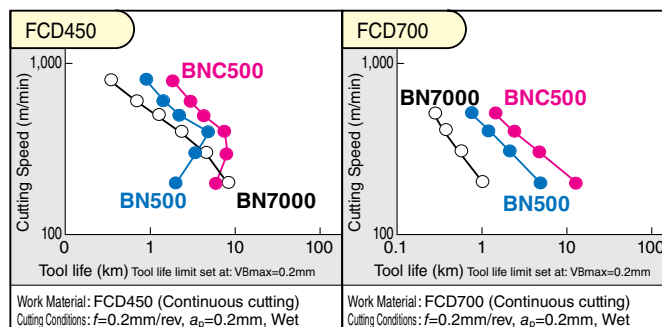
Coolant recommendation: Dry

■ Cutting Performance

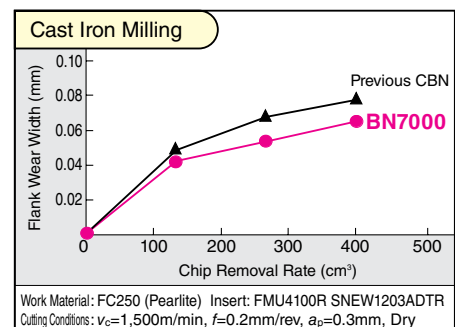
Grey Cast Iron turning → Recommended Grade **BNS800/BN7000/BN500**



Ductile Cast Iron turning → Recommended Grade **BNC500**



Grey Cast Iron milling → Recommended Grade **BNS800/BN7000**



SINTERED COMPONENT MACHINING

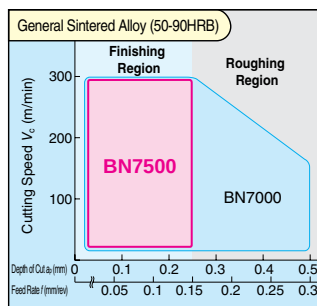
● Merits of Sintered Component machining with SUMIBORON

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.

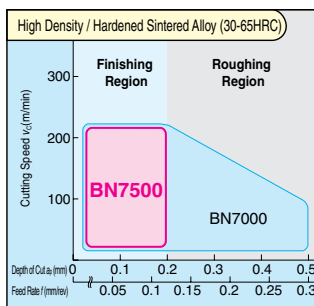
Sintered Alloy

■ Recommended Grade

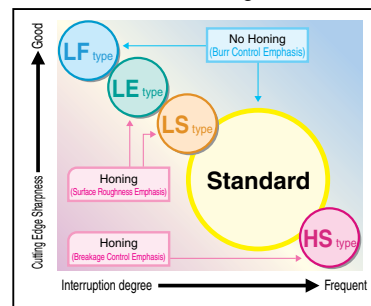
● General Sintered Alloy



● High Density/Hardened Sintered Alloy



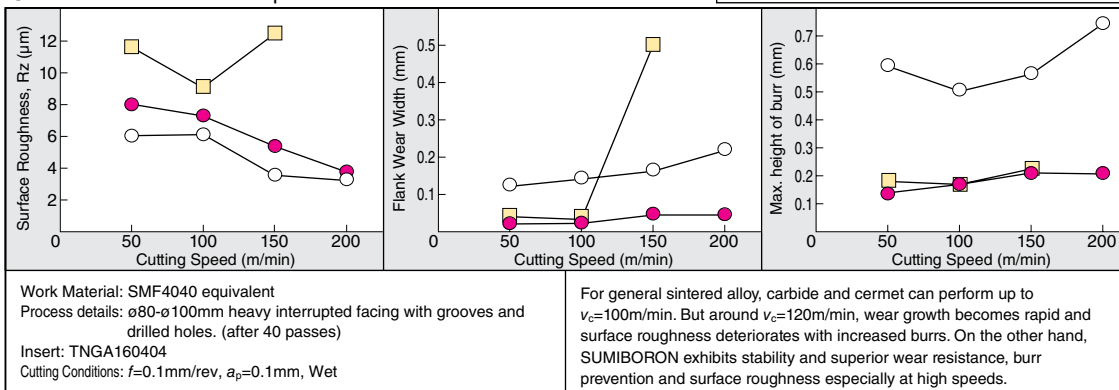
■ Recommended Edge Treatment



Grade	Binder	Carbon Content (%)	Grain Size (μm)	Hardness(GPa)	TRS(GPa)	Main Coating Components	Coating Thickness(μm)	Characteristics
BN7500	Co Compound	90 to 95	1	41 to 44	1.40 to 1.50	—	—	Maintains ultimate cutting edge sharpness. Suitable for finishing of sintered alloys.
BN7000	Co Compound	90 to 95	2	41 to 44	1.30 to 1.40	—	—	Exhibits improved wear and fracture resistance in roughing of sintered materials.

■ Cutting Performance

● Grade Performance Comparison



Valve Seat Ring (VSR)

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

■ Recommended Grade

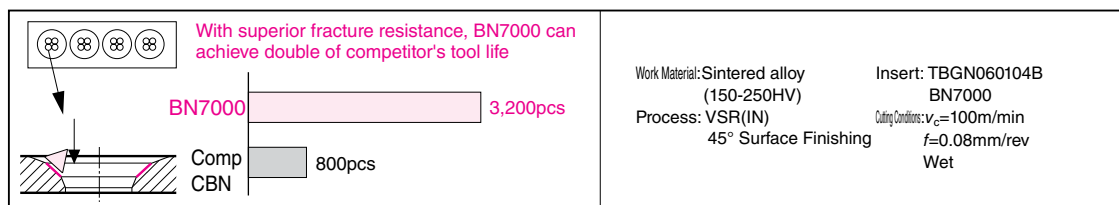
● Grade Performance Comparison

	Gasoline VSR material	Diesel VSR material
Plunge cut	BN7000 BN7500 BN350	BN7000 BN7500 BN350
Traverse cut	BN7000 BN7500 BN500	BN7000 BN7500 BN500
Hardness (HV)	low ← 300HV → high	low ← 300HV → high

■ Recommended Cutting Conditions

Cutting Speed v_c (m/min)	Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
50 to 125	0.03 to 0.2	0.05 to 0.5

■ Application Examples

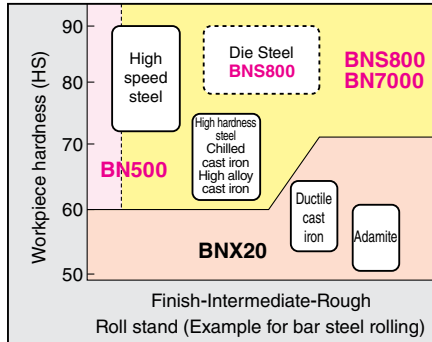


ROLL MACHINING

● Merits of Roll Machining with SUMIBORON

Enables the machining of high hardness rolls which were difficult to machine by conventional tools, thus drastically improving machining efficiency.

■ Recommended Grade



■ Recommended Cutting Conditions

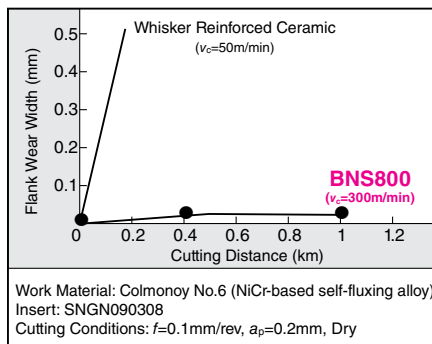
Work		Recommended Cutting Conditions				
Material type	Hardness (HS)	v_c (m/min)				
		20	40	60	80	100 120 140
Adamite	≥40	[Bar from 60 to 120]				
Chilled cast iron	≥60	[Bar from 40 to 100]				
High alloy cast iron	≥60	[Bar from 40 to 100]				
High speed steel	≥70	[Bar from 20 to 60]				
				f (mm/rev)		a_p (mm)
Adamite	≥40			0.1 to 0.5		0.2 to 3.0
Chilled cast iron	≥60			0.1 to 0.5		0.2 to 3.0
High alloy cast iron	≥60			0.1 to 0.5		0.2 to 3.0
High speed steel	≥70			0.1 to 0.4		0.1 to 3.0

HARD FACING ALLOYS MACHINING

● Merits of machining Hard Facing Alloys with SUMIBORON

Enables the machining of Hard Facing Alloys, once considered difficult to machine. Recommended grade is BNS800.

■ Cutting Performance



● BNS800 has low wear even at cutting speeds of $v_c=300$ m/min

■ Recommended Cutting Conditions

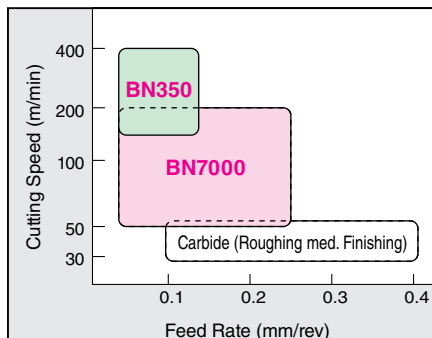
Work		Recommended Cutting Conditions				
Material type	Material	v_c (m/min)				
		50	100	200	300	
Ni-based Self-fluxing alloy	Colmonoy No.6	[Bar from 100 to 200]				
Co-based Self-fluxing alloy	Stellite	[Bar from 50 to 100]				
				f (mm/rev)		a_p (mm)
Ni-based Self-fluxing alloy	Colmonoy No.6			0.05 to 0.2		0.1 to 3.0
Co-based Self-fluxing alloy	Stellite			0.05 to 0.2		0.1 to 1.0

HEAT RESISTIVE ALLOYS MACHINING

● Merits of cutting heat resistive alloys with SUMIBORON

Provides long tool life in the finishing of heat resistive alloys.

■ Recommended Grade



● SUMIBORON is best suited for finishing of heat resistive steel

■ Recommended Cutting Conditions

Work		Recommended Cutting Conditions				
Material type	Material	v_c (m/min)				
		50	100	150	200	
Ni-based heat resistant alloy	Inconel 718	[Bar from 100 to 150]				
Co-based heat resistant alloy	Stellite	[Bar from 50 to 100]				
				f (mm/rev)		a_p (mm)
Ni-based heat resistant alloy	Inconel 718			0.05 to 0.2		0.1 to 1.0
Co-based heat resistant alloy	Stellite			0.05 to 0.2		0.1 to 1.0

Insert Identification

Regrindable Type

CNMA120408(-)B

(1)

(2)

(1) Insert ISO Code
(ISO Standard Classification)
B2/B3

(2) Additional Information
Chart 1

Chart 1 (2) Additional Information

New symbol	Old symbol	Code Description
(-)B	(-)B	Full-top CBN insert
-BSTN	-BSN	Full-top CBN insert (Small edge treatment)

One-use Type

2NU - CNGA120408LT

(1)

(2)

(3)

(4)

(1) No. of Cutting Edges
Chart 2

(2) Type Code
Chart 3

(3) Insert ISO Code
(ISO Standard Classification) B2/B3

(4) Additional Information
Chart 4

Chart 2 (1) No. of Cutting Edges

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

Chart 3 (2) Type Code

Code	Series	Grade
NC	Coated SUMIBORON	BNC2010, 2020, BNC100, 160, BNC200, 300, 500
NU	SUMIBORON	BNX10, 20 BN1000, 2000, 350 BN500, 700, 7000, 7500
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.

Chart 4 (4) Additional Information L26

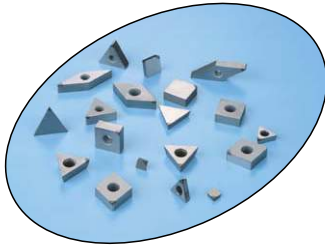
New symbol	Old symbol	Code Description	
		SUMIBORON	Coated SUMIBORON
(No Code)	(No Code)	Standard Type	
LF LE	F	Sharp Edge Type	—
LT	S	Small Edge Treatment Type	—
LS	M	General Type for Continuous Cutting	Fine Boring Type
HT HS	T	Strong Edge Type	Strong Edge Type
PM*	PM*	For interrupted cutting of hardened steel	—
WG WH W	W	Wiper Insert	
N-FV N-LV N-SV	N-SV	Chipbreaker Type	

* In the future, the edge treatment code PM Type will be unified with the HS Type.

Grade Selection

Work	Colour Code	Series		
		Coated SUMIBORON	SUMIBORON	Solid SUMIBORON
Hardened Steel	Grey	BNC2010 BNC2020 BNC100 BNC160 BNC200 BNC300	BN1000 BN2000 BN350 BNX10 BNX20 BNX25	—
Cast Iron	Pink	BNC500	BN500 BN7000 BN700	BNS800
Sintered component	Purple	—	BN7500 BN7000 BN700	—

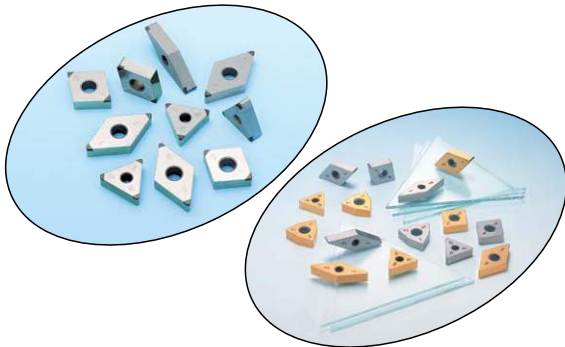
One-use Insert NU Type/NS Type



■ 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

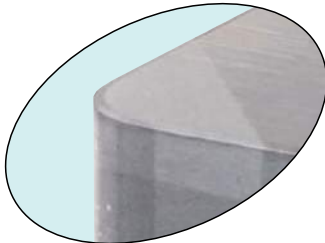


■ Characteristics

- 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

WG Type/WH Type/W Type

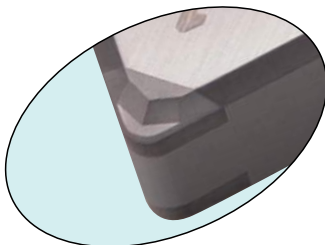


■ Characteristics

- SUMIBORON one-use insert with wiper edge for Hardened Steel machining.
- Excellent surface roughness comparable to grinding.
- Improved efficiency with higher speeds and feeds.
- New lineup includes WG Type for low-feed cutting and WH Type for high-feed cutting.

One-use insert with chipbreaker

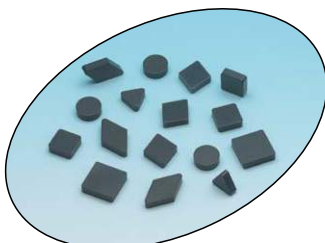
Break Master FV Type/LV Type/SV Type



■ Characteristics

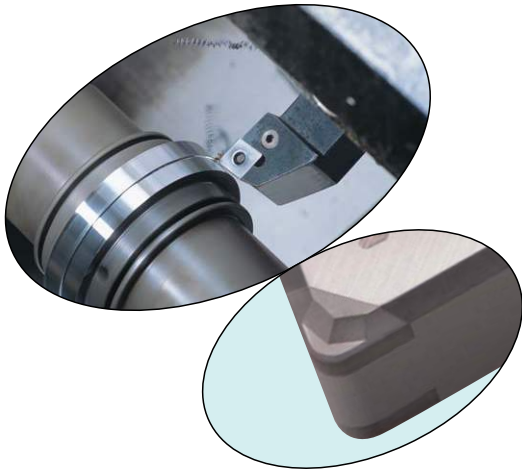
- SUMIBORON one-use insert with chipbreaker. SV type is perfect for carburised layer removal while LV/FV types are best suited to finishing of hardened steel.
- Breaker included on the CBN edge, chipbreaking effect can be maintained throughout.
- Unique breaker design can be applied to both hardened and non-hardened parts with effective chip control.

Solid SUMIBORON



■ Characteristics

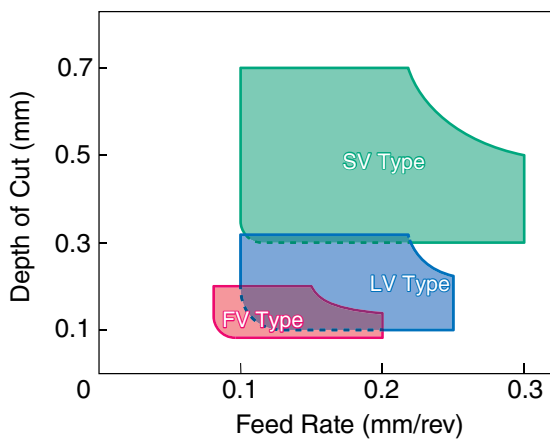
- 100% solid CBN structure. With no brazed portion, this grade is excellent for the roughing of Cast Iron at large depth of cut.



Characteristics

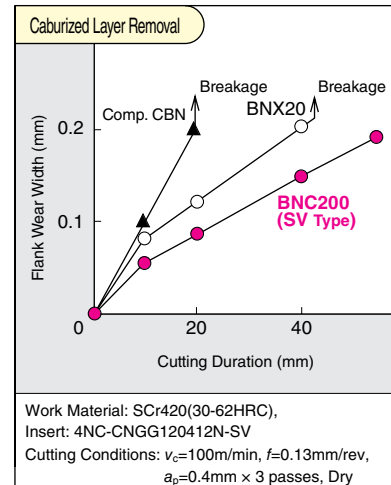
- SUMIBORON one-use insert with chipbreaker. SV type is perfect for carburised layer removal while FV/LV types are best suited to finishing of hardened steel.
- Breaker included on the CBN edge, chipbreaking effect can be maintained throughout machining process.
- Unique breaker design can be applied to both hardened and non-hardened parts with effective chip control.
- SV type lineup now includes new BNC160 for good wear resistance, while Coated SUMIBORON BNC2010 / BNC2020 / BNC200 allows high efficiency machining.
- In addition to general-purpose Coated SUMIBORON BNC200, the FV/LV type lineup includes BNC160 for excellent wear resistance and general-purpose uncoated SUMIBORON BN2000.

Application Range



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

Cutting Performance

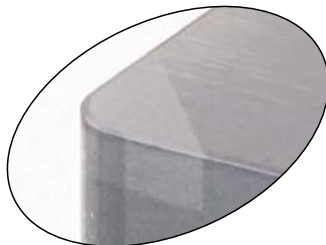


● Stable tool life with BNC200 (SV Type)

Application Example

External Caburized Layer Removal	Break Master-SV Type
· No constant stoppages or incorrect part dimension problems and the chips are small. · Double the tool life of competitor's CBN Work Material: SCr420 Carburized Steel (shaft) Insert: 4NC-CNGG120408N-SV(BNC200) Cutting Conditions: $v_c=150\text{m/min}$, $f=0.15\text{mm/rev}$, $a_p=0.5\text{mm} \times 2 \text{ passes}$, Wet	Tool life=200pcs BNC200 (no breaker)
	Tool life=200pcs Comp CBN (with breaker)
	Tool life=100pcs

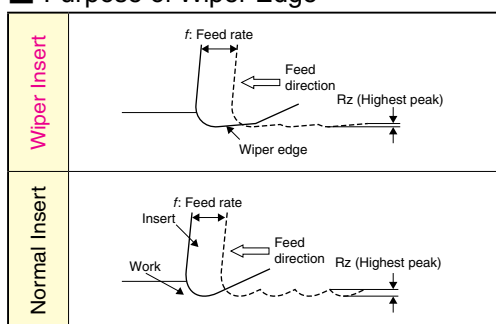
Finishing of Hardened Steel	Break Master-FV Type
· Improved chip control during boring. Work Material: Carburized Steel HRC60 (Automotive Component) Insert: 2NC-CCGT060204N-FV(BNC200) Cutting Conditions: $v_c=80\text{m/min}$, $f=0.08\text{mm/rev}$, $a_p=0.15\text{mm}$, Wet	Tool life=300pcs BNC200 (no breaker)
	Tool life=300pcs
	Tool life=300pcs



■ Characteristics

- SUMIBORON one-use insert with wiper flat for Hardened Steel machining.
- Excellent surface finish similar to grinding
- Improved efficiency with higher speeds and feeds
- Lineup includes WG type for low-feed cutting and WH type for high-feed cutting.

■ Purpose of Wiper Edge



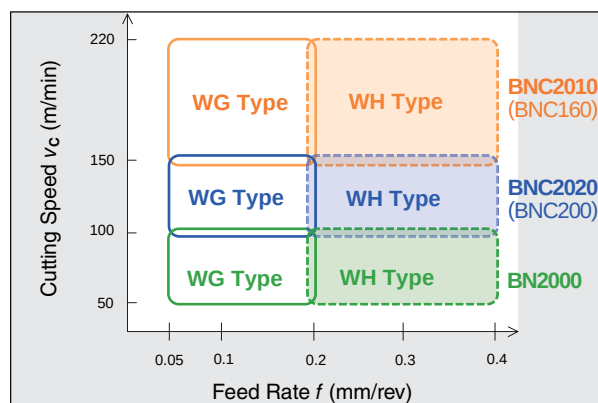
■ Surface Roughness of Wiper Insert

	Wiper Insert (WG Type/WH Type)		Standard Insert (No Wiper)	
	Low feed cutting ($f = 0.10$)	High feed cutting ($f = 0.30$)	Low feed cutting ($f = 0.10$)	High feed cutting ($f = 0.30$)
Surface Roughness Profile				
Surface Roughness Rz (Highest peak)	0.63 μm	1.39 μm	1.98 μm	9.20 μm

The wiper flat offers good surface finish and improved efficiency.

■ Recommended Cutting Conditions (Surface Roughness Standard: 1.6s to 3.2s)

- 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 material and machines with high rigidity.



WG Type: Recommended feed rate of $f = 0.20$ or lower (Surface Finish $R_z = 1.6$ to $3.2 \mu\text{m}$)
 WH Type: Recommended feed rate of $f = 0.20$ or higher (Surface Finish $R_z = 1.6$ to $3.2 \mu\text{m}$)
 Lineup includes five grades (BN2000, BNC2010, BNC2020, BNC200, BNC160) to suit different cutting speeds.

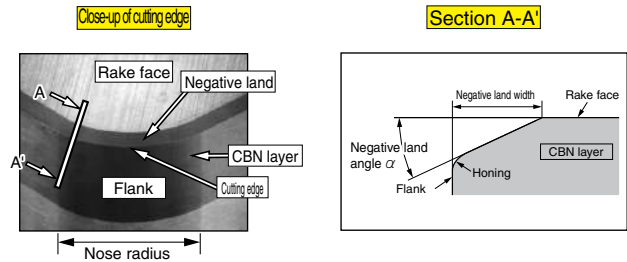
■ Application Example

Condition	Work	Tool	Cutting Conditions	Results
	① Part Name ② Grade	Insert	v_c = Cutting Speed (m/min) f = Feed Rate (mm/rev) a_p = Depth of cut (mm)	
CVJ Outer Race Facing 	① CVJ Outer Race ② Carburized steel 58 to 62HRC	4NC-CNGA120412 WH (BNC2010)	$v_c = 150\text{m/min}$ $f = 0.20\text{mm/rev}$ $a_p = 0.2\text{mm}$ Dry	BNC2010 (WH Type) 700 pcs Comp. (No wiper) 400 pcs
Shaft Ext. Turning 	① Shaft ② Carburized steel 58 to 62HRC	4NC-DNGA150408 WG (BNC2010)	$v_c = 140\text{m/min}$ $f = 0.20\text{mm/rev}$ $a_p = 0.15\text{mm}$ Dry	BNC2010 (WG Type) 500 pcs Comp. (No wiper) 350 pcs

Edge Specification of SUMIBORON Inserts

SUMIBORON Insert and Edge Treatment

All SUMIBORON inserts are enhanced with the optimum cutting edge preparation 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.



SUMIBORON Insert Cutting Edge Specification List

Series	Work Material	Grade	Negative/ Positive	Standard				Low Resistance Type L					Strong Edge Type H				
				Identification Code	R	W	Honing	Notation	Identification Code	R	W	Honing	Notation	Identification Code	R	W	Honing
Uncoated SUMIBORON	Hardened Steel	BNX10	Negative/Positive	T01225	25°	0.12	No	—	—	—	—	—	—	—	—	—	—
		BNX20	Negative/Positive	S01225	25°	0.12	Yes	LT	T01215*	15°	0.12	No	—	—	—	—	—
		BNX25	Negative/Positive	S01725	25°	0.17	Yes	—	—	—	—	—	—	—	—	—	
		BN1000	Negative/Positive	S01225	25°	0.12	Yes	—	—	—	—	—	—	—	—	—	
		BN250	Negative	S01225	25°	0.12	Yes	LT	T01215	15°	0.12	No	—	—	—	—	—
			Positive	S01235	35°	0.12	Yes	LS	S01225	25°	0.12	Yes	—	—	—	—	—
		BN2000	Negative/Positive	S01225	25°	0.12	Yes	LT	T01215	15°	0.12	No	HS	S01235	35°	0.12	Yes
		BN350	Negative	T01225	25°	0.12	No	—	—	—	—	—	HT	T01235	35°	0.12	No
		Positive	T01235	35°	0.12	No	—	—	—	—	—	—	—	—	—	—	
	Cast Iron Exotic Alloy	BN500	Negative/Positive	T01215	15°	0.12	No	—	—	—	—	—	—	—	—	—	—
		BN700	Negative/Positive	T01215	15°	0.12	No	LF	Sharp edge	0°	0	No	HS	S01225	25°	0.12	Yes
		BN7000	Negative/Positive	T01215	15°	0.12	No	LF	Sharp edge	0°	0	No	HS	S01225	25°	0.12	Yes
BN7500		Negative/ Positive	T01215	15°	0.12	No	LF	Sharp edge	0°	0	No	HS	S00525	25°	0.05	Yes	
							LE	Sharp edge	0°	0	Yes	HS	S00525	25°	0.05	Yes	
	BNS800	Negative	T02020	20°	0.20	No	LF	S00715	15°	0.07	Yes	—	—	—	—	—	
Coated SUMIBORON	Hardened Steel	BNC2010	Negative/Positive	S01225	25°	0.12	Yes	—	—	—	—	—	HS	S01730	30°	0.17	Yes
		BNC2020	Negative/Positive	S01225	25°	0.12	Yes	—	—	—	—	—	HS	S02735	35°	0.27	Yes
		BNC100	Negative/Positive	S01225	25°	0.12	Yes	LS	S01715	15°	0.17	Yes	—	—	—	—	
		BNC160	Negative/Positive	S01225	25°	0.12	Yes	LS	S01020	20°	0.10	Yes	HS	S01730	30°	0.17	Yes
		BNC200	Negative/Positive	S01225	25°	0.12	Yes	LS	S01015	15°	0.10	Yes	HS	S01735	35°	0.17	Yes
		BNC300	Negative/Positive	S01225	25°	0.12	Yes	—	—	—	—	—	HS	S01735	35°	0.17	Yes
	Cast Iron	BNC500	Negative/Positive	S01215	15°	0.12	Yes	—	—	—	—	—	HS	S01225	25°	0.12	Yes

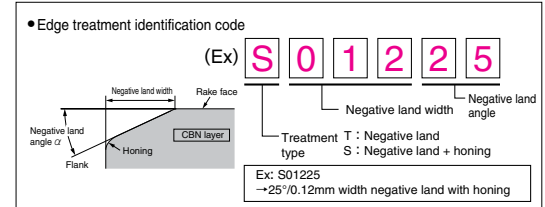
* BNX20 Identification code will be T00715 for inserts with inscribed circle of less than $\phi 4.76$.

Cutting edge treatment of inserts with wipers / chipbreakers

Series	Work Material	Grade	Other Types							
			Notation	Identification Code	R	W	Honing	Type		
Uncoated SUMIBORON	Hardened Steel	BN2000	WG	S01215	15°	0.12	Yes	Wiper		
			WH	S01215	15°	0.12	Yes	Wiper		
			N-FV	—	0°	0	Yes	With breaker		
			N-LV	S00535	35°	0.05	Yes	With breaker		
	Cast Iron Exotic Alloy	BNS800	W	T02020	20°	0.20	No	Wiper		
			LFW	Sharp edge	0°	0	No	Wiper Sharp edge		
Coated SUMIBORON	Hardened Steel	BNC2010 BNC2020	WG	S01215	15°	0.12	Yes	Wiper		
			WH	S01215	15°	0.12	Yes	Wiper		
			N-FV	—	0°	0	Yes	With breaker		
			N-LV	S00535	35°	0.05	Yes	With breaker		
			N-SV	S01235	35°	0.12	Yes	With breaker		
			W	S01715	15°	0.17	Yes	Wiper		
		BNC160 BNC200	WG	S01215	15°	0.12	Yes	Wiper		
			WH	S01215	15°	0.12	Yes	Wiper		
			W	S01215	15°	0.12	Yes	Wiper		
			N-FV	—	0°	0	Yes	With breaker		
			N-LV	S00535	35°	0.05	Yes	With breaker		
			N-SV	S01235	35°	0.12	Yes	With breaker		
			Cast Iron	BNC500	W	S01215	15°	0.12	Yes	Wiper

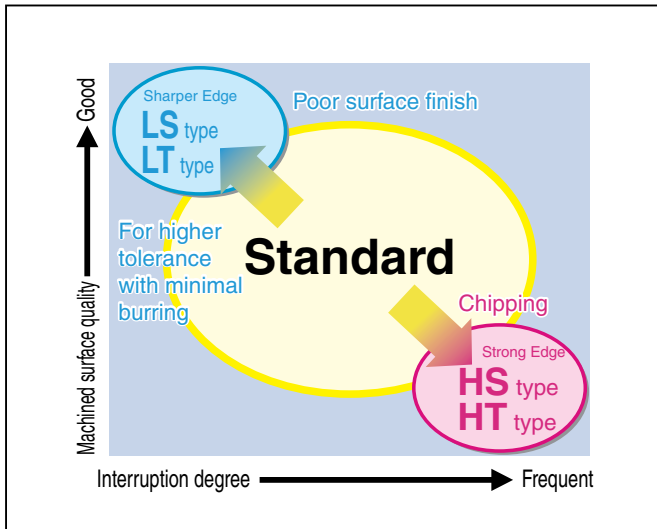
Edge treatment identification code

Edge Treatment Notation			
No	Standard type		
L	Low cutting forces	F	Sharp edge
		E	Honing
H	Strong edge type	T	Negative land
		S	Negative land + Honing
WG/WH/W	Wiper		
N-FV/N-LV/N-SV	With Chipbreaker		

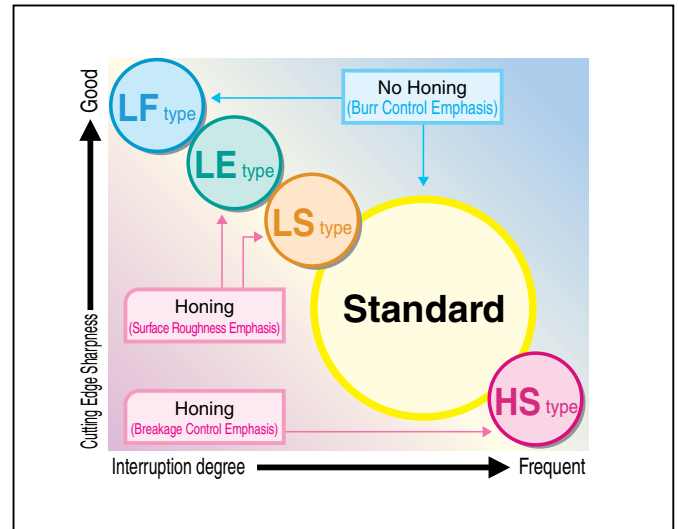


Edge Treatment Performance

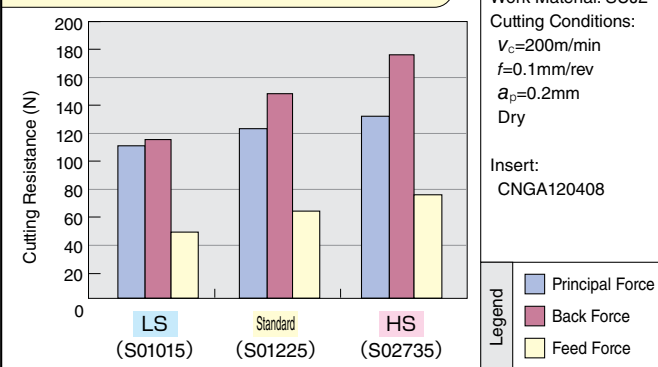
Machining of Hardened Steel



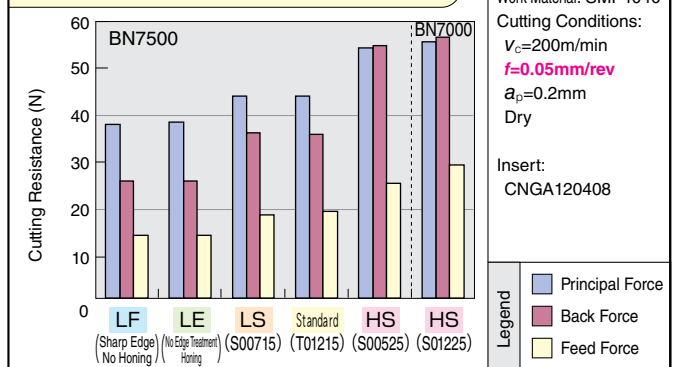
Powdered Alloy Machining



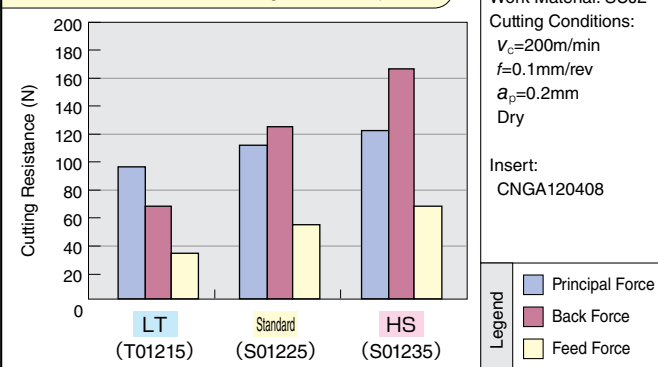
Coated SUMIBORON Cutting Force Comparison



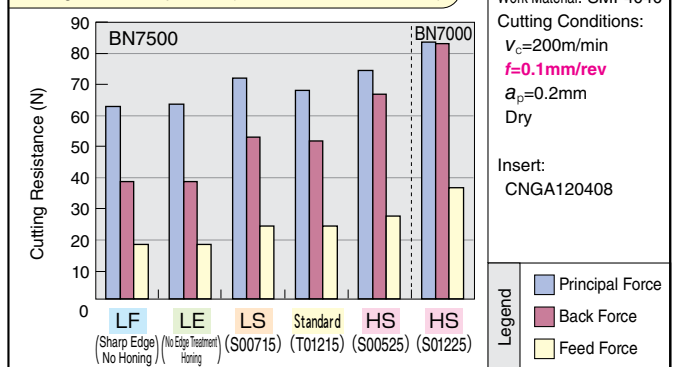
Cutting Force Comparison (Feed Rate: $f = 0.05\text{mm/rev}$)



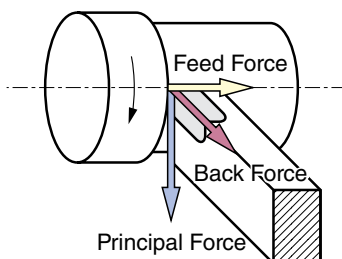
Uncoated SUMIBORON Cutting Force Comparison



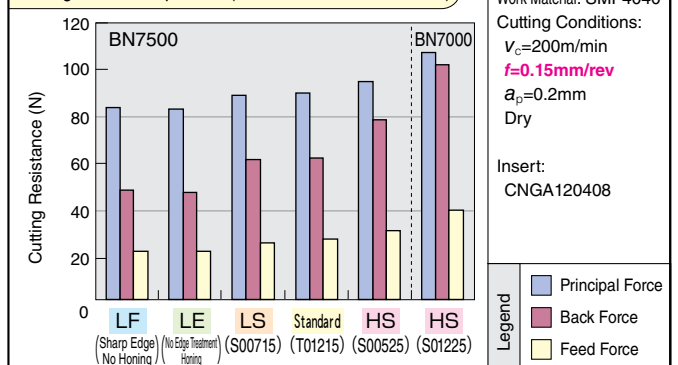
Cutting Force Comparison (Feed Rate: $f = 0.1\text{mm/rev}$)



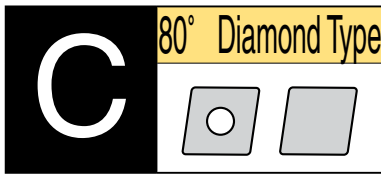
Three Force Components of Cutting Force



Cutting Force Comparison (Feed Rate: $f = 0.15\text{mm/rev}$)



SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

CN 1204

Applicable holder ref. page, (Example)
 Applicable External Holders **C7, 8**
 Applicable Internal Holders **E45 to E47**

I.C.: ø12.7 Thickness: 4.76 Hole: ø5.16

Recommended Application	K cast iron	S exotic alloy	H hardened steel	simulated component	CBN
	●	●	●	●	●
	○	○	○	○	○
	★	★	★	★	★
	☆	☆	☆	☆	☆

● One-use Type/Negative (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-CNMA 120402	—	1	1	0.2 2.5	●	●	—	●	●	▲	●	●	●	●	●	—
		120404				0.4 2.5	●	●	—	●	●	▲	●	●	●	●	●	—
		120408				0.8 2.4	●	●	—	●	●	▲	●	●	●	●	●	—
		120412				1.2 2.3	●	●	—	●	●	▲	●	●	●	●	●	—
	Standard	T-NU-CNMA 120402	—	10	1	0.2 2.5	●	●	—	●	●	▲	●	●	●	●	●	—
		120404				0.4 2.5	●	●	—	●	●	▲	●	●	●	●	●	—
		120408				0.8 2.4	●	●	—	●	●	▲	●	●	●	●	●	—
		120412				1.2 2.3	●	●	—	●	●	▲	●	●	●	●	●	—
	Standard	NS-CNMA 120404	—	1	1	0.4 2.5	—	●	—	—	—	—	—	—	—	—	—	—
		120408				0.8 2.4	—	●	—	—	—	—	—	—	—	—	—	—
		120412				1.2 2.3	—	●	—	—	—	—	—	—	—	—	—	—
		T-NS-CNMA 120404	—	10	1	0.4 2.5	—	●	—	—	—	—	—	—	—	—	—	—
		120408				0.8 2.4	—	●	—	—	—	—	—	—	—	—	—	—
		120412				1.2 2.3	—	●	—	—	—	—	—	—	—	—	—	—

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

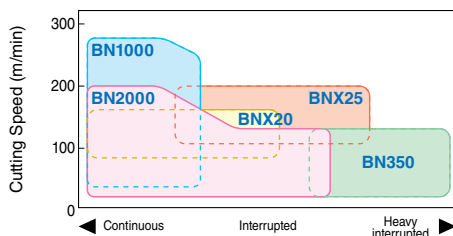
● Multi-cornered, One-use Type/Negative (With Hole)

	Standard	2NU-CNGA 120404	—	1	2	0.4 2.5	●	—	●	●	▲	●	●	●	●	●	●	—
		120408				0.8 2.4	●	—	●	●	▲	●	●	●	●	●	●	—
		120412				1.2 2.3	●	—	●	●	▲	●	●	●	●	●	●	—
		T-2NU-CNGA 120404	—	10	2	0.4 2.5	●	—	—	●	▲	●	—	—	—	—	—	—
		120408				0.8 2.4	●	—	—	●	▲	●	—	—	—	—	—	—
		120412				1.2 2.3	●	—	—	●	▲	●	—	—	—	—	—	—
	Standard	2NS-CNGA 120404	—	1	2	0.4 2.5	—	●	—	—	—	—	—	—	—	—	—	—
		120408				0.8 2.4	—	●	—	—	—	—	—	—	—	—	—	—
		120412				1.2 2.3	—	●	—	—	—	—	—	—	—	—	—	—
		T-2NS-CNGA 120404	—	10	2	0.4 2.5	—	●	—	—	—	—	—	—	—	—	—	—
		120408				0.8 2.4	—	●	—	—	—	—	—	—	—	—	—	—
		120412				1.2 2.3	—	●	—	—	—	—	—	—	—	—	—	—

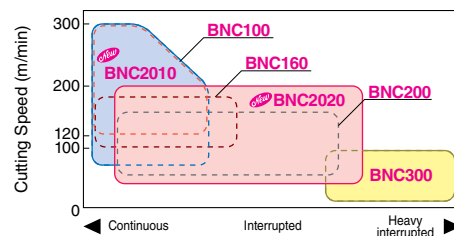
*For BNX25, use 2NS type code (2NS-CNGA) *Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



▲▲mark: To be replaced by new item (Please confirm stock availability)

SUMIBORON Indexable Inserts

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

CN 1204

I.C.: $\phi 12.7$ Thickness: 4.76 Hole: $\phi 5.16$

Applicable holder ref. page, (Example)

Applicable External Holders C7, 8

Applicable Internal Holders E45 to E47

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component	CBN
●▲=1 piece pack and 10 pieces pack both Stocked ▲=1 piece pack Stocked	●	●	●	●	●
	○	○	○	○	○
	★	★	★	★	★
	☆	☆	☆	☆	☆

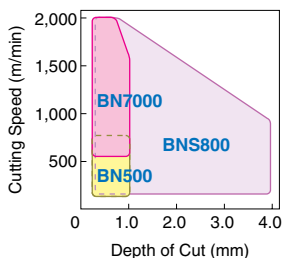
● Multi-cornered, One-use Type/Negative (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	S01215	2NU-CNGA 120404WG 120408WG 120412WG	—	1	2	Nose Radius Cutting Edge Length	0.4 2.4 0.8 2.4 1.2 2.3	—	—	—	●	—	—	—	—	—	—	—
	S01215	2NU-CNGA 120404WH 120408WH 120412WH	—	1	2	0.4 2.4 0.8 2.3 1.2 2.2	—	—	—	●	—	—	—	—	—	—	—	—
	S00535	2NU-CNGM 120404N-LV 120408N-LV 120412N-LV	—	1	2	0.4 2.5 0.8 2.4 1.2 2.3	—	—	—	●	—	—	—	—	—	—	—	—
	Sharp Edge	2NU-CNGA 120404LF 120408LF 120412LF T-2NU-CNGA 120404LF 120408LF 120412LF	2NU-CNGA 120404F 120408F 120412F T-2NU-CNGA 120404F 120408F 120412F	1	2	0.4 2.5 0.8 2.4 1.2 2.3	—	—	—	—	—	—	—	—	●	●	●	—
	Sharp Edge	T-2NU-CNGA 120404LF 120408LF 120412LF	T-2NU-CNGA 120404F 120408F 120412F	10	2	0.4 2.5 0.8 2.4 1.2 2.3	—	—	—	—	—	—	—	—	—	—	—	—
	Honing	2NU-CNGA 120404LE 120408LE	—	1	2	0.4 2.5 0.8 2.4	—	—	—	—	—	—	—	—	—	—	●	—
	T01215	2NU-CNGA 120404LT 120408LT 120412LT	—	1	2	0.4 2.5 0.8 2.4 1.2 2.3	—	—	—	●	—	—	—	—	—	—	—	—
	S00715	2NU-CNGA 120404LS 120408LS	—	1	2	0.4 2.5 0.8 2.4	—	—	—	—	—	—	—	—	—	—	●	—
	T01235	2NU-CNGA 120404HT 120408HT 120412HT T-2NU-CNGA 120404HT 120408HT 120412HT	2NU-CNGA 120404T 120408T 120412T T-2NU-CNGA 120404T 120408T 120412T	1	2	0.4 2.5 0.8 2.4 1.2 2.3	—	—	—	—	—	—	●	—	—	—	—	—
	T01235	T-2NU-CNGA 120404HT 120408HT 120412HT	T-2NU-CNGA 120404T 120408T 120412T	10	2	0.4 2.5 0.8 2.4 1.2 2.3	—	—	—	—	—	—	—	—	—	—	—	—

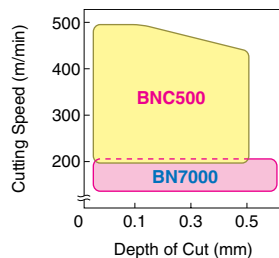
*Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

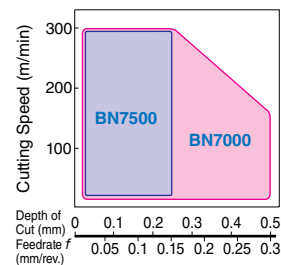
© Grey Cast Iron



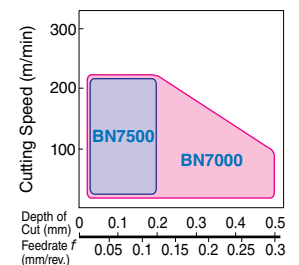
① Ductile Cast Iron



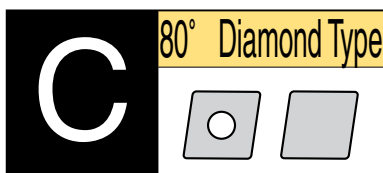
② General Sintered Alloy



③ High Density Sintered Alloy



SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive				S01235	S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

CN 1204
I.C.: ø12.7 Thickness: 4.76 Hole: ø5.16

Applicable holder ref. page, (Example)

Applicable External Holders **C7, 8**

Applicable Internal Holders **E45 to E47**

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	stirred component										

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
 Strong edge type	BN2000 → S01235	2NU-CNGA 120404HS 120408HS 120412HS	2NU-CNGA 120404T 120408T 120412T	1	2	0.4	2.5	—	—	—	—	●	—	—	—	—	—	—	—
	BN7000 → S01225					0.8	2.4	—	—	—	—	●	—	—	—	—	—	—	—
	BN700 → S01225					1.2	2.3	—	—	—	—	●	—	—	—	—	—	—	—
	BN7500 → S00525					1.2	2.3	—	—	—	—	●	—	—	—	—	—	—	—
 Strong edge type	BN2000 → S01235	T-2NU-CNGA 120404HS 120408HS 120412HS	T-2NU-CNGA 120404T 120408T 120412T	10	2	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—
	BN7000 → S01225					0.8	2.4	—	—	—	—	—	—	—	—	—	—	—	—
	BN700 → S01225					1.2	2.3	—	—	—	—	—	—	—	—	—	—	—	—
	BN7500 → S00525					1.2	2.3	—	—	—	—	—	—	—	—	—	—	—	—

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

● Negative Type (With Hole)

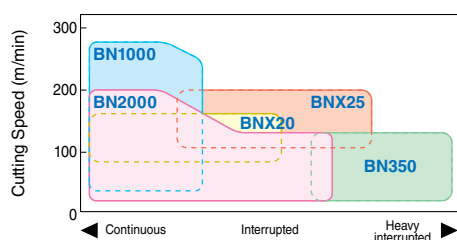
Appearance	Standard	CNMA 120404	120408	120412	—	1	1	0.4	4.6	●	—	●	▲	—	●	—	—	—	—
	Standard	CNMA 120404	120408	120412	—	1	1	0.8	4.5	●	—	●	▲	—	●	—	—	—	—
								1.2	4.4	●	—	●	▲	—	●	—	—	—	—

● Solid Type/Negative (With Hole)

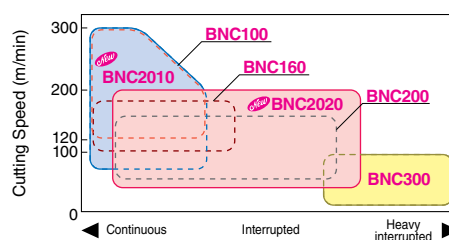
Appearance	Standard	CNGA 120408	120412	—	1	Solid	0.8	12.9	—	—	—	—	—	—	—	—	—	—	—
	Standard	CNGA 120408	120412	—	1	Solid	1.2	12.9	—	—	—	—	—	—	—	—	—	—	—

SUMIBORON Application Range Map

A Uncoated SUMIBORON



B Coated SUMIBORON



SUMIBORON Indexable Inserts

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☺ : 1st Choice ☹ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱✱ : 2nd Choice

CNG1204 ●●

Coated
SUMIBORON

Applicable holder ref. page, (Example)

Applicable External Holders 1C7, 8

Applicable Internal Holders 1E45 to E47

I.C.: $\phi 12.7$ Thickness: 4.76 Hole: $\phi 5.16$

●=1 piece pack and 10 pieces pack both Stocked ▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component
	●	○	○	○

Coated CBN

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500
	Standard	2NC-CNGA 120404 120408 120412 120416 120420 120424	—	1	2	Nose Radius Cutting Edge Length	0.4 2.5 ●●	0.8 2.4 ●●	1.2 2.3 ●●	1.6 3.3 ●●	2.0 3.2 ●●	2.4 3.1 ●●	
	Standard	4NC-CNGA 120404 120408 120412 120416 120420 120424	—	1	4		0.4 2.5 ●●	0.8 2.4 ●●	1.2 2.3 ●●	1.6 3.3 ●●	2.0 3.2 ●●	2.4 3.1 ●●	
	S01215	4NC-CNGA 120404WG 120408WG 120412WG	—	1	4		0.4 2.4 ●●	0.8 2.4 ●●	1.2 2.3 ●●	1.6 3.3 ●●	2.0 3.2 ●●	2.4 3.1 ●●	
	S01215	4NC-CNGA 120404WH 120408WH 120412WH	—	1	4		0.4 2.4 ●●	0.8 2.3 ●●	1.2 2.2 ●●	1.6 3.3 ●●	2.0 3.2 ●●	2.4 3.1 ●●	
	BNC100 → S01715 BNC160 → S01215 BNC200 → S01215 BNC500 → S01215	4NC-CNGA 120404W 120408W 120412W	—	1	4		0.4 2.5 ●●	0.8 2.4 ●●	1.2 2.3 ●●	1.6 3.3 ●●	2.0 3.2 ●●	2.4 3.1 ●●	
	No edge treatment	4NC-CNGG 120404N-FV 120408N-FV 120412N-FV	—	1	4		0.4 2.5 ●●	0.8 2.4 ●●	1.2 2.3 ●●	1.6 3.3 ●●	2.0 3.2 ●●	2.4 3.1 ●●	
	S00535	4NC-CNGG 120404N-LV 120408N-LV 120412N-LV	—	1	4		0.4 2.5 ●●	0.8 2.4 ●●	1.2 2.3 ●●	1.6 3.3 ●●	2.0 3.2 ●●	2.4 3.1 ●●	
	S01235	4NC-CNGG 120404N-SV 120408N-SV 120412N-SV	—	1	4		0.4 2.5 ●●	0.8 2.4 ●●	1.2 2.3 ●●	1.6 3.3 ●●	2.0 3.2 ●●	2.4 3.1 ●●	

Negative Inserts

C

D

R

S

T

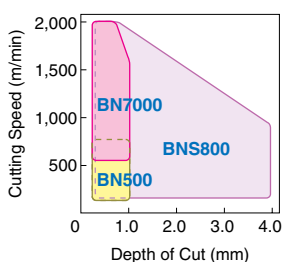
V

W

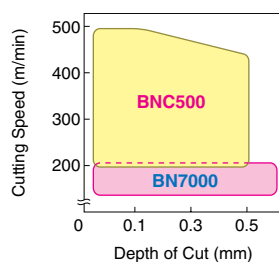
SUMIBORON

SUMIBORON Application Range Map

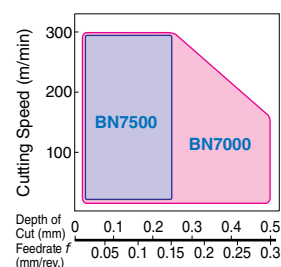
© Grey Cast Iron



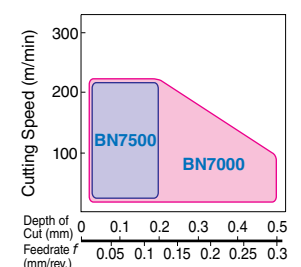
Ⓓ Ductile Cast Iron



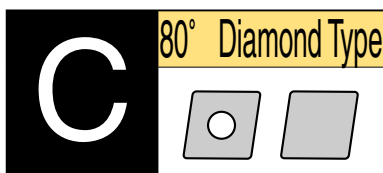
Ⓔ General Sintered Alloy



Ⓕ High Density Sintered Alloy



SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☉ : 1st Choice ☺ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱✱ : 2nd Choice

CNG 1204 Coated SUMIBORON

I.C.: ø12.7 Thickness: 4.76 Hole: ø5.16

Applicable holder ref. page, (Example)

Applicable External Holders **C7, 8**

Applicable Internal Holders **E45 to E47**

●=1 piece pack and 10 pieces pack both Stocked ▲=1 piece pack Stocked

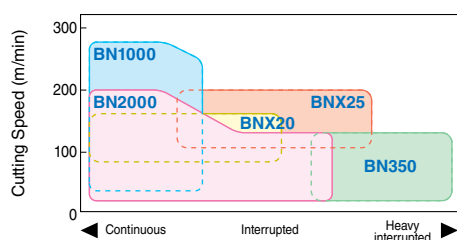
Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component
	●	●	●	●

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

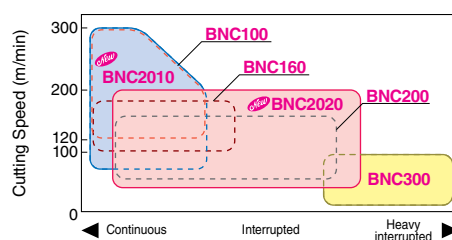
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	Coated CBN
 Fine Boring type	BNC100 → S01715 BNC160 → S01020 BNC200 → S01015	4NC-CNGA 120404LS 120408LS 120412LS	—	1	4	0.4 0.8 1.2	2.5 2.4 2.3	BNC2010 BNC2020 BNC300 BNC100 BNC160 BNC200 BNC500
 Strong edge type	BNC2010 → S01730 BNC2020 → S02735 BNC300 → S01735 BNC160 → S01730 BNC200 → S01735 BNC500 → S01225	4NC-CNGA 120404HS 120408HS 120412HS	—	1	4	0.4 0.8 1.2	2.5 2.4 2.3	BNC2010 BNC2020 BNC300 BNC100 BNC160 BNC200 BNC500

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



SUMIBORON Indexable Inserts

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☺ : 1st Choice ☹ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

CNGN0903●●

Applicable holder ref. page, (Example)

I.C.: ø9.525 Thickness: 3.18 Hole: —

Applicable External Holders L98

● Solid Type/Negative (Without Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	CNGN 090308 090312	—	1	Solid	Nose Radius Cutting Edge Length	0.8 9.5 1.2 9.4	—	—	—	—	—	—	—	—	—	—	●
 Low Resistance Type	Sharp Edge	CNGN 090308LF 090312LF	CNGN 090308F 090312F	1	Solid	Nose Radius Cutting Edge Length	0.8 9.5 1.2 9.4	—	—	—	—	—	—	—	—	—	—	●

CNG■1204●●

Applicable holder ref. page, (Example)

I.C.: ø12.7 Thickness: 4.76 Hole: —

Applicable External Holders L98

● Solid Type/Negative (Dimple Lock)

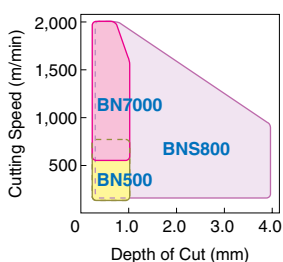
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	CNGX 120408 120412 120416	—	1	Solid	Nose Radius Cutting Edge Length	0.8 12.7 1.2 12.6 1.6 12.5	—	—	—	—	—	—	—	—	—	—	●

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

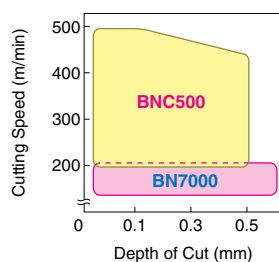
● Solid Type/Negative (Without Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	CNGN 120408 120412 120416	—	1	Solid	Nose Radius Cutting Edge Length	0.8 12.7 1.2 12.6 1.6 12.5	—	—	—	—	—	—	—	—	—	—	●

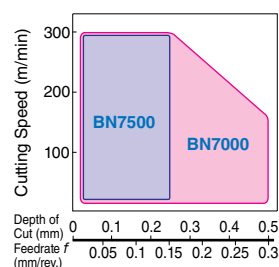
© Grey Cast Iron



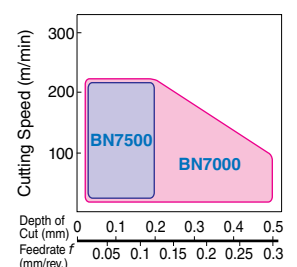
Ⓓ Ductile Cast Iron



Ⓔ General Sintered Alloy



Ⓕ High Density Sintered Alloy



Negative Inserts

C

D

R

S

T

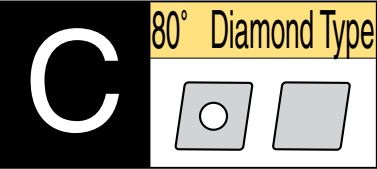
V

W

SUMIBORON

SUMIBORON Application Range Map

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

CCEW03X1 ●●
I.C.: ø3.5 Thickness: 1.4 Hole: ø1.8

Applicable holder ref. page, (Example)

Applicable Internal Holders **E36, 37**

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱ : 2nd Choice

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	simulated component										

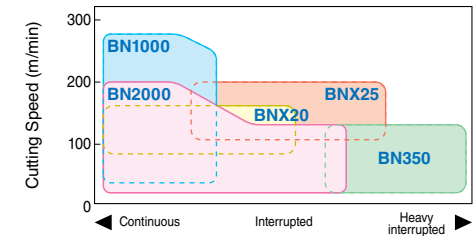
● One-use Type/7 ° Positive (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN7500	BN7500	BNS800
 Low Resistance Type	Sharp Edge	NU-CCEW 03X102LF 03X104LF	NU-CCEW 03X102F 03X104F	1	1	0.2	1.2	—	—	—	—	—	—	—	—	●	▲	●	—
		T-NU-CCEW 03X102LF 03X104LF	T-NU-CCEW 03X102F 03X104F	10	1	0.2	1.2	—	—	—	—	—	—	—	—	—	—	—	—
 Fine Boring type	T00715	NU-CCEW 03X102LT 03X104LT	NU-CCEW 03X102S 03X104S	1	1	0.2	1.2	—	●	—	—	—	—	—	—	—	—	—	—
		T-NU-CCEW 03X102LT 03X104LT	T-NU-CCEW 03X102S 03X104S	10	1	0.2	1.2	—	—	—	—	—	—	—	—	—	—	—	—

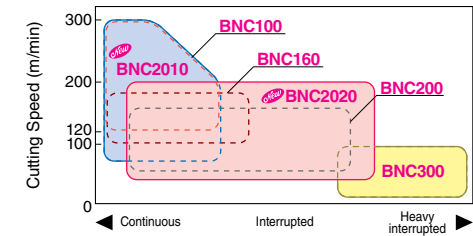
*Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON

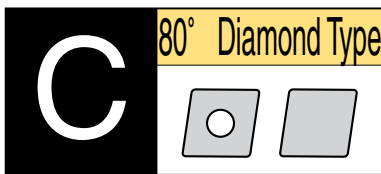


Positive Inserts

- **C**
- **D**
- **R**
- **S**
- **T**
- **V**
- **W**

L35

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

CCG 0602 ●●

I.C.: ø6.35 Thickness: 2.38 Hole: ø2.8

Applicable holder ref. page, (Example)

Applicable External Holders **C29, D13, 17, 24**

Applicable Internal Holders **E36, 37**

Recommended Application	K cast iron	S exotic alloy	H hardened steel	simulated component	CBN
●▲=1 piece pack and 10 pieces pack both Stocked					
●▲=1 piece pack Stocked					

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Radius	Edge Length	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-CCGW 060202 060204 060208	—	1	1	0.2	2.5	—				●	●	▲						
		T-NU-CCGW 060202 060204 060208	—	10	1	0.2	2.5	—				●	●	▲						
		NU-CCGW 060202LT 060204LT 060208LT	—	1	1	0.2	2.5	—				●	●	▲						
	T01215	NU-CCGW 060202LS 060204LS 060208LS	NU-CCGW 060202M 060204M 060208M	1	1	0.2	2.5	—				▲	▲	▲						
		T-NU-CCGW 060202LS 060204LS 060208LS	T-NU-CCGW 060202M 060204M 060208M	10	1	0.2	2.5	—												
	S01225	NU-CCGW 060202HS 060204HS	—	1	1	0.2	2.5	—				●	●							
		NU-CCGW 060202HS 060204HS	—	1	1	0.2	2.5	—				●	●							

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

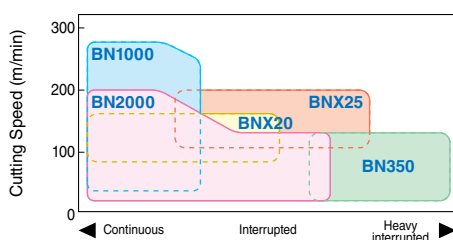
● Multi-cornered, One-use Type/7 ° Positive (With Hole)

	Standard	2NU-CCGW 060204	—	1	2	0.4	2.5													
	No edge treatment	2NU-CCGT 060204N-FV	—	1	2	0.4	2.3					●								

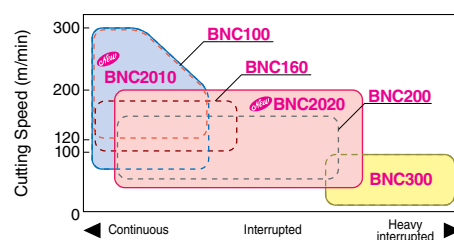
*For BNX25, use 2NS type code (2NS-CCGW) *Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

A Uncoated SUMIBORON



B Coated SUMIBORON



▲▲mark: To be replaced by new item (Please confirm stock availability)

Positive Inserts

- **C**
- **D**
- **R**
- **S**
- **T**
- **V**
- **W**

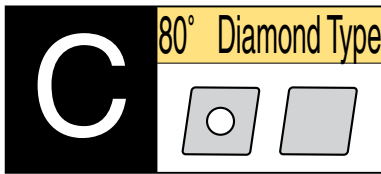
Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☹ : 1st Choice ☺ : 2nd Choice Interrupted Cut ✖ : 1st Choice ✎ : 2nd Choice

●=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

					Coated CBN								
Pcs./Pack		No. of Cutting Edges		Dimensions (mm)									
		Nose Radius	Cutting Edge Length			BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	
1	2	0.2	2.4	●	●						●	●	
		0.4	2.3	●	●					●	●	●	
		0.8	2.4										●
1	2	0.4	2.3	●	●	—	—			●	●	—	
1	2	0.2	2.4								●		
		0.4	2.3								●		

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs	No. of C	Nose Radius	Cutting Length	BNC	BNC	BNC	BNC	BNC	BNC	BNC
	Standard	2NC-CCGW 060202 060204 060208	—	1	2	0.2 0.4 0.8	2.4 2.3	●	●				●	●
 Break Master	No edge treatment	2NC-CCGT 060204N-FV	—	1	2	0.4	2.3	●	●	—	—	●	●	—
 Fine Boring type	BNC100 → S01715 BNC160 → S01020 BNC200 → S01015	2NC-CCGW 060202LS 060204LS	—	1	2	0.2 0.4	2.4 2.3						●	●

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

CCG 09T3

Applicable holder ref. page, (Example)

Applicable External Holders **C29, D13, 17, 24**

Applicable Internal Holders **E36, 37**

I.C.: ø9.525 Thickness: 3.97 Hole: ø4.4

Recommended Application	▲=1 piece pack and 10 pieces pack both Stocked	●=1 piece pack Stocked
K cast iron		
S exotic alloy		
H hardened steel		
silenced component		

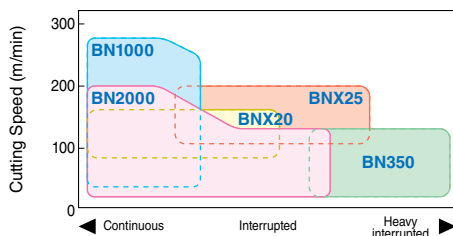
● One-use Type/7 ° Positive (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-CCGW 09T302 09T304 09T308	—	1	1	0.2 2.5 0.4 2.5 0.8 2.4				●	●	▲						
		T-NU-CCGW 09T302 09T304 09T308	—	10	1	0.2 2.5 0.4 2.5 0.8 2.4				●	●	▲						
	T01215	NU-CCGW 09T302LT 09T304LT 09T308LT	—	1	1	0.2 2.5 0.4 2.5 0.8 2.4				●	●	▲						
	S01225	NU-CCGW 09T302LS 09T304LS 09T308LS	NU-CCGW 09T302M 09T304M 09T308M	1	1	0.2 2.5 0.4 2.5 0.8 2.4						▲						
	S01235	T-NU-CCGW 09T302LS 09T304LS 09T308LS	T-NU-CCGW 09T302M 09T304M 09T308M	10	1	0.2 2.5 0.4 2.5 0.8 2.4												
	S01235	NU-CCGW 09T302HS 09T304HS 09T308HS	—	1	1	0.2 2.5 0.4 2.5 0.8 2.4				●	●	●						

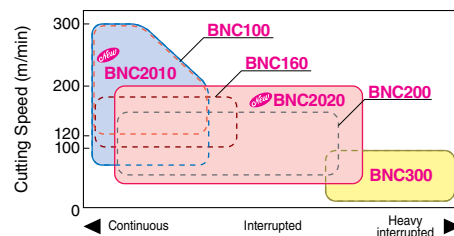
*For BNX25, use NS type code (NS-CCGW) *Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

A Uncoated SUMIBORON



B Coated SUMIBORON

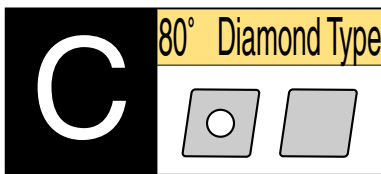


▲▲mark: To be replaced by new item (Please confirm stock availability)

SUMIBOROI

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

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

CCG 09T3 Coated SUMIBORON

I.C.: ø9.525 Thickness: 3.97 Hole: ø4.4

Applicable holder ref. page, (Example)

Applicable External Holders **C29, D13, 17, 24**

Applicable Internal Holders **E36, 37**

●=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

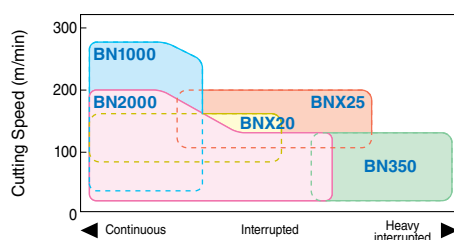
Recommended Application	K cast iron	S exotic alloy	H hardened steel	silenced component
	●	●	●	●

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

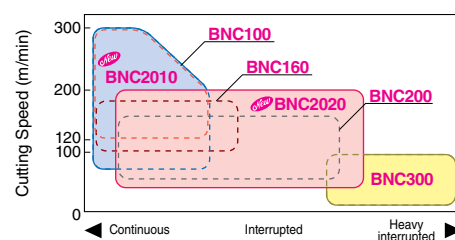
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BN2010	BN2020	BN300	BN100	BN160	BN200	BN500
	Standard	2NC-CCGW 09T302 09T304 09T308	—	1	2	Nose Radius Cutting Edge Length	0.2 2.5	●	●	●	●	●	●
	S01215	2NC-CCGW 09T304WG 09T308WG	—	1	2	0.4 2.4	●	●	●	●	●	●	—
	S01215	2NC-CCGW 09T304WH 09T308WH	—	1	2	0.4 2.4	●	●	—	—	●	●	—
	No edge treatment	2NC-CCGT 09T304N-FV 09T308N-FV	—	1	2	0.4 2.4	●	●	—	—	●	●	—
	S00535	2NC-CCGT 09T304N-LV 09T308N-LV	—	1	2	0.4 2.4	●	●	—	—	●	●	—
	BN100 → S01715 BNC160 → S01020 BNC200 → S01015	2NC-CCGW 09T302LS 09T304LS 09T308LS	—	1	2	0.2 2.5				●	●	●	—
	BN2010 → S01730 BNC2020 → S02735 BNC300 → S01735 BNC160 → S01730 BNC200 → S01735 BNC500 → S01225	2NC-CCGW 09T304HS 09T308HS	—	1	2	0.4 2.5		●					—

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



SUMIBORON

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BN5800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								—

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

I.C.: $\varnothing 7.94$ Thickness: 2.38 Hole: $\varnothing 3.4$

Applicable Internal Holders  E42, 43

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	PCs.	No. of Cuts	Nose Radius	Cutting Length	BNX	BNX	BNX	BN1	BN2	BN2	BN3	BN5	BN7	BN7	BN7	BN5	
	Standard	NU-CPGW 080202 080204 080208	—	1	1	0.2 2.5 0.4 2.5 0.8 2.4					●	●	▲							
		T-NU-CPGW 080202 080204 080208	—	10	1	0.2 2.5 0.4 2.5 0.8 2.4														
 [Fine Boring type]	T01215	NU-CPGW 080204LT	—	1	1	0.4 2.5	—	—	—	—	●	—	—	—	—	—	—	—	—	
 [Continuous cutting general type]	S01225	NU-CPGW 080202LS 080204LS 080208LS	NU-CPGW 080202M 080204M 080208M	1	1	0.2 2.5 0.4 2.5 0.8 2.4	—	—	—	—	—	▲	—	—	—	—	—	—	—	
		T-NU-CPGW 080202LS 080204LS 080208LS	T-NU-CPGW 080202M 080204M 080208M	10	1	0.2 2.5 0.4 2.5 0.8 2.4	—	—	—	—	—	—	▲	—	—	—	—	—	—	
 [Strong edge type]	S01235	NU-CPGW 080202HS 080204HS 080208HS	—	1	1	0.2 2.5 0.4 2.5 0.8 2.4	—	—	—	—	●	—	—	—	—	—	—	—	—	

*For BN25, use NS type code (NS-CPGW) *Depth-of-cut for one-use type is 0.5mm or less

④ Uncoated SUMIBORON

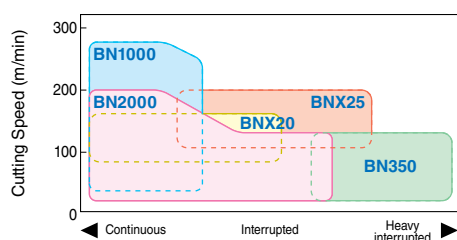


Figure 1 is a graph showing the cutting speed range (m/min) for the BNC series across different cutting conditions: Continuous, Interrupted, and Heavy interrupted. The y-axis represents Cutting Speed (m/min) from 0 to 300. The x-axis represents the cutting conditions. The graph is divided into five regions corresponding to different BNC models: BNC100, BNC160, BNC200, BNC2010, and BNC300. Dashed lines within the regions indicate the cutting speed range for different chip thicknesses (0.1mm, 0.2mm, 0.3mm, 0.4mm, 0.5mm).

SUMIBORON Indexable Inserts

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☘ : 1st Choice ☙ : 2nd Choice Interrupted Cut ⚙ : 1st Choice ⚙ : 2nd Choice

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

CPGW0903●●

Applicable holder ref. page, (Example)

Applicable Internal Holders E42, 43

I.C.: $\varnothing 9.525$ Thickness: 3.18 Hole: $\varnothing 4.4$

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs	No. of Cuts	Nose Radius	Cutting Length	BNX	BNX	BNX	BN11	BN21	BN22	BN3	BN5	BN7	BN7	BN7	BN5
	Standard	NU-CPGW 090302 090304 090308	—	1	1	0.2 0.4 0.8	2.5 2.5 2.4				● ● ●	● ● ●	▲ ▲ ▲						
		T-NU-CPGW 090302 090304 090308	—	10	1	0.2 0.4 0.8	2.5 2.5 2.4												
 Fine Boring type	T01215	NU-CPGW 090302LT 090304LT 090308LT	—	1	1	0.2 0.4 0.8	2.5 2.5 2.4	—	—	—	—	● ● ●	— — —						
 Continuous cutting general type	S01225	NU-CPGW 090302LS 090304LS 090308LS	NU-CPGW 090302M 090304M 090308M	1	1	0.2 0.4 0.8	2.5 2.5 2.4	—	—	—	—	—	▲ ▲ ▲						
		T-NU-CPGW 090302LS 090304LS 090308LS	T-NU-CPGW 090302M 090304M 090308M	10	1	0.2 0.4 0.8	2.5 2.5 2.4	—	—	—	—	—	—	—					
 Strong edge type	S01235	NU-CPGW 090302HS 090304HS 090308HS	—	1	1	0.2 0.4 0.8	2.5 2.5 2.4	—	—	—	—	● ● ●	— — —						

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

Positive Inserts

C

D

®

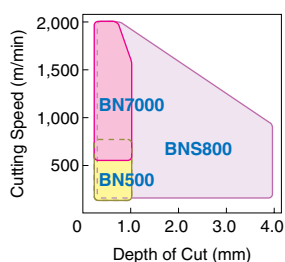
S

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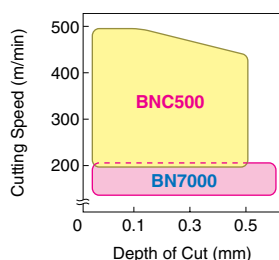
SUMIBORON

SUMIBORON Application Range Map

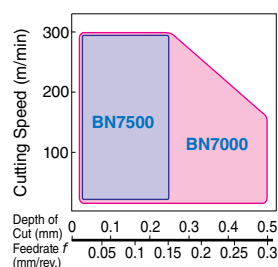
© Grey Cast Iron



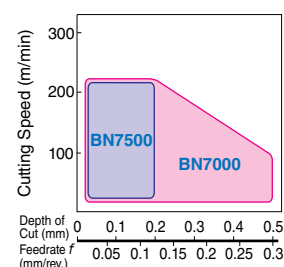
☒ Ductile Cast Iron



⑤ General Sintered Alloy



Ⓕ High Density Sintered Alloy



▲mark: To be replaced by new item (Please confirm stock availability)

L43

D 55° Diamond Type

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BN5800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								—

DN■■1504●●

Applicable External Holders  C9, 10

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

[illegible][illegible][illegible]

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

Main structure, standard type (standard)																
	Standard	2NU-DNGA 150404 150408 150412	—	1	2	0.4	2.5		—							
							0.8	2.1		—						
							1.2	2.0		—						
	Standard	T-2NU-DNGA 150404 150408 150412	—	10	2	0.4	2.5		—							
							0.8	2.1		—						
							1.2	2.0		—						
	Standard	2NS-DNGA 150404 150408 150412	—	1	2	0.4	2.5	—		—	—	—	—	—	—	
							0.8	2.1	—		—	—	—	—	—	
							1.2	2.0	—	—	—	—	—	—	—	
	Standard	T-2NS-DNGA 150404 150408 150412	—	10	2	0.4	2.5	—		—	—	—	—	—	—	
							0.8	2.1	—		—	—	—	—	—	
							1.2	2.0	—	—	—	—	—	—	—	

*For BNX25, use 2NS type code (2NS-DNGA) *Depth-of-cut for one-use type is 0.5mm or less

④ Uncoated SUMIBORON

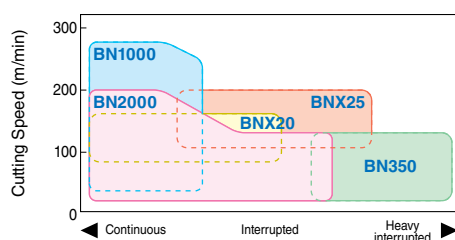


Figure 1 is a graph showing the cutting speed range (m/min) for the BNC series across different cutting conditions: Continuous, Interrupted, and Heavy interrupted. The y-axis represents Cutting Speed (m/min) from 0 to 300. The x-axis represents the cutting conditions. The graph is divided into five regions corresponding to different BNC models: BNC100, BNC160, BNC200, BNC2010, and BNC300. Each region is color-coded and contains dashed lines indicating the cutting speed range for different chip thicknesses (0.1mm, 0.2mm, 0.3mm, 0.4mm, 0.5mm).

Model	Color	Approx. Speed Range (m/min)
BNC100	Blue	100 - 300
BNC160	Pink	100 - 200
BNC200	Pink	100 - 200
BNC2010	Pink	100 - 200
BNC300	Yellow	100 - 200

SUMIBORON Indexable Inserts

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☺ : 1st Choice ☹ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

DN**1504**

Applicable holder ref. page, (Example)
 Applicable External Holders **C9, 10**
 Applicable Internal Holders **E65 to E67**

I.C.: $\phi 12.7$ Thickness: 4.76 Hole: $\phi 5.16$

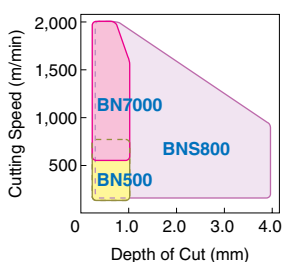
● Multi-cornered, One-use Type/Negative (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs	No. of C	Nose Radius	Cutting Length	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BN5800
 Wiper Insert	S01215	2NU-DNGA 150404WG 150408WG	—	1	2	0.4 0.8	2.3 2.0	— —	— —	— —	— —	● ●	— —	— —	— —	— —	— —	— —	— —
 Wiper Insert	S01215	2NU-DNGA 150404WH 150408WH	—	1	2	0.4 0.8	2.1 1.8	— —	— —	— —	— —	● ●	— —	— —	— —	— —	— —	— —	
 Break Master	S00535	2NU-DNGM 150404N-LV 150408N-LV 150412N-LV	—	1	2	0.4 0.8 1.2	2.5 2.1 2.0	— — —	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	— — —	— — —	
 Low Resistance Type	Sharp Edge	2NU-DNGA 150404LF 150408LF 150412LF	2NU-DNGA 150404F 150408F 150412F	1	2	0.4 0.8 1.2	2.5 2.1 2.0	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— ● ●	— ● ●	— — —	
		T-2NU-DNGA 150404LF 150408LF 150412LF	T-2NU-DNGA 150404F 150408F 150412F	10	2	0.4 0.8 1.2	2.5 2.1 2.0	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	
 Fine Boring type	T01215	2NU-DNGA 150404LT 150408LT 150412LT	—	1	2	0.4 0.8 1.2	2.5 2.1 2.0	— — —	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	— — —	— — —	
 Strong edge type	T01235	2NU-DNGA 150404HT 150408HT 150412HT	2NU-DNGA 150404T 150408T 150412T	1	2	0.4 0.8 1.2	2.5 2.1 2.0	— — —	— — —	— — —	— — —	— — —	● ●	— —	— —	— —	— —	— —	
		T-2NU-DNGA 150404HT 150408HT 150412HT	T-2NU-DNGA 150404T 150408T 150412T	10	2	0.4 0.8 1.2	2.5 2.1 2.0	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	
 Strong edge type	BN2000 → S01235 BN7000 → S01225 BN700 → S01225 BN7500 → S00525	2NU-DNGA 150404HS 150408HS 150412HS	2NU-DNGA 150404T 150408T 150412T	1	2	0.4 0.8 1.2	2.5 2.1 2.0	— — —	— — —	— — —	— — ●	● ● ●	— — —	— — —	— — —	— ● ●	— ● ●	— — —	
		T-2NU-DNGA 150404HS 150408HS 150412HS	T-2NU-DNGA 150404T 150408T 150412T	10	2	0.4 0.8 1.2	2.5 2.1 2.0	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	

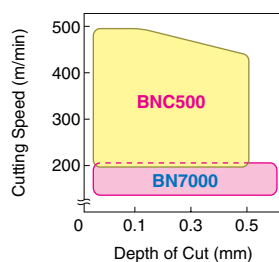
*Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

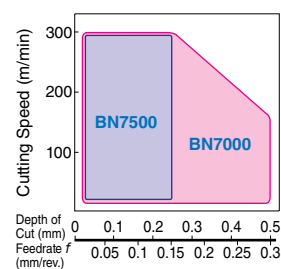
© Grey Cast Iron



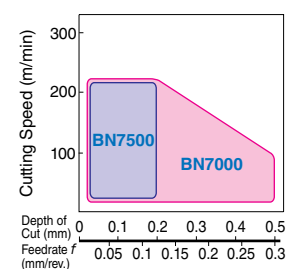
① Ductile Cast Iron



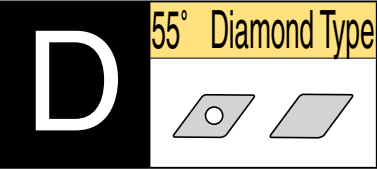
② General Sintered Alloy



③ High Density Sintered Alloy



SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

DN **1504**

I.C.: ø12.7 Thickness: 4.76 Hole: ø5.16

Applicable holder ref. page, (Example)

Applicable External Holders **C9, 10**

Applicable Internal Holders **E65 to E67**

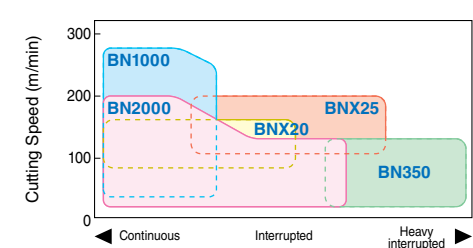
● Negative Type (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	DNMA 150404 150408 150412	—	1	1	0.4	5.0	●				●	▲			●	●	●	—
						0.8	4.7	●				●	▲			●	●	●	—
						1.2	4.3					●	▲			●	●	●	—

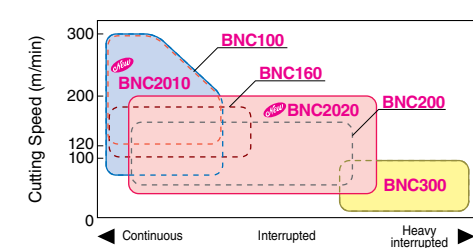
*Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



▲mark: To be replaced by new item (Please confirm stock availability)

SUMIBORON Indexable Inserts

DNG 1504

Coated
SUMIBORON

Applicable holder ref. page, (Example)

Applicable External Holders **C9, 10**

Applicable Internal Holders **E65 to E67**

I.C.: $\phi 12.7$ Thickness: 4.76 Hole: $\phi 5.16$

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☺ : 1st Choice ☹ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱ : 2nd Choice

●=1 piece pack and 10 pieces pack both Stocked ▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component
	●	○	○	○

Coated CBN

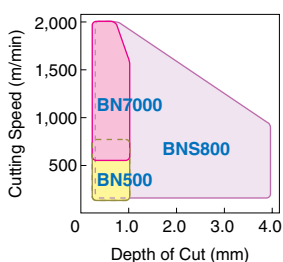
Pcs./Pack		No. of Cutting Edges		Dimensions (mm)								
		Nose Radius	Cutting Edge Length	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500		
1	2	0.4	2.5	●	●				●			
		0.8	2.1	●	●				●			
		1.2	2.0	●	●							
		1.6	3.4	●	●	●		●	●			
		2.0	3.0	●	●	●		●	●			
		2.4	2.7	●	●	●		●	●			
1	4	0.4	2.5	●	●	●	●	●	●	●		
		0.8	2.1	●	●	●	●	●	●	●		
		1.2	2.0	●	●			●	●	●		
		1.6	3.4	●	●	●		●	●	●		
		2.0	3.0	●	●	●		●	●	●		
		2.4	2.7	●	●	●		●	●			
1	4	0.4	2.3	●	●	—	—	●	●	—		
		0.8	2.0	●	●	—	—	●	●	—		
1	4	0.4	2.1	●	●	—	—	●	●	—		
		0.8	1.8	●	●	—	—	●	●	—		
1	4	0.4	2.5	●	●	—	—	●	●	—		
		0.8	2.1	●	●	—	—	●	●	—		
		1.2	2.0	●	●	—	—			—		
1	4	0.4	2.5	●	●	—	—	●	●	—		
		0.8	2.1	●	●	—	—	●	●	—		
		1.2	2.0	●	●	—	—	●	●	—		
1	4	0.4	2.5	●	●	—	—	●	●	—		
		0.8	2.1	●	●	—	—	●	●	—		
		1.2	2.0	●	●	—	—	●	●	—		
1	4	0.4	2.5				●	●	●			
		0.8	2.1				●	●	●			
		1.2	2.0					●	●			
1	4	0.4	2.5	●	●	●		●	●	●		
		0.8	2.1	●	●	●		●	●	●		
		1.2	2.0	●	●			●	●	●		

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

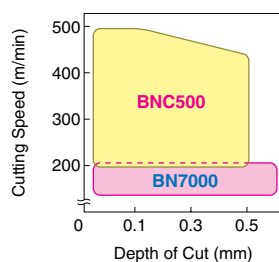
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Cutting Edge Length	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500
	Standard	2NC-DNGA 150404 150408 150412 150416 150420 150424	—	1	2	0.4	2.5	●	●	○	○	○	○	○
	Standard	4NC-DNGA 150404 150408 150412 150416 150420 150424	—	1	4	0.4	2.5	●	●	○	○	○	○	○
 Wiper Insert	S01215	4NC-DNGA 150404WG 150408WG	—	1	4	0.4	2.3	●	○	○	○	○	○	○
 Wiper Insert	S01215	4NC-DNGA 150404WH 150408WH	—	1	4	0.4	2.1	●	○	○	○	○	○	○
 Break Master	No edge treatment	4NC-DNGG 150404N-FV 150408N-FV 150412N-FV	—	1	4	0.4	2.5	●	○	○	○	○	○	○
 Break Master	S00535	4NC-DNGG 150404N-LV 150408N-LV 150412N-LV	—	1	4	0.4	2.5	●	○	○	○	○	○	○
 Break Master	S01235	4NC-DNGG 150404N-SV 150408N-SV 150412N-SV	—	1	4	0.4	2.5	●	○	○	○	○	○	○
 Fine Boring type	BNC100 → S01715 BNC160 → S01020 BNC200 → S01015	4NC-DNGA 150404LS 150408LS 150412LS	—	1	4	0.4	2.5	○	○	○	○	○	○	○
 Strong edge type	BNC2010 → S01730 BNC2020 → S02735 BNC300 → S01735 BNC160 → S01730 BNC200 → S01735 BNC500 → S01225	4NC-DNGA 150404HS 150408HS 150412HS	—	1	4	0.4	2.5	●	●	○	○	○	○	○

SUMIBORON Application Range Map

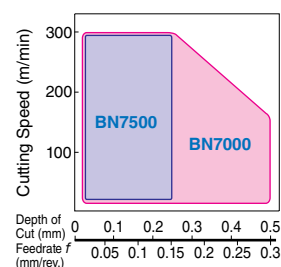
© Grey Cast Iron



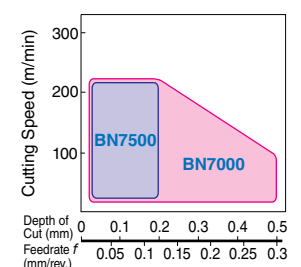
① Ductile Cast Iron



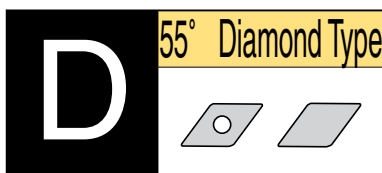
② General Sintered Alloy



③ High Density Sintered Alloy



SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☉ : 1st Choice ☼ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱✱ : 2nd Choice

DNMA1506

Applicable holder ref. page, (Example)
 Applicable External Holders **C9, 10**

I.C.: ø12.7 Thickness: 6.35 Hole: ø5.16

● One-use Type/Negative (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-DNMA 150604	—	1	1	Nose Radius												
		150608				0.4					●	▲						
		150612				0.8					●	▲						
	Standard	T-NU-DNMA 150604	—	10	1	Cutting Edge Length												
		150608				1.2					●	▲						
		150612				2.0					●	▲						

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

DNGN1103

Applicable holder ref. page, (Example)
 Applicable External Holders **L99**

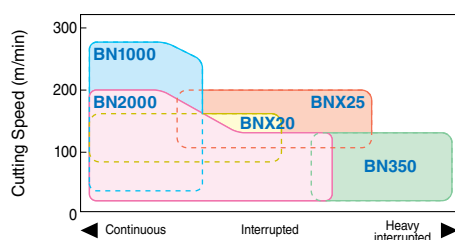
I.C.: ø9.525 Thickness: 3.18 Hole: —

● Solid Type/Negative (Without Hole)

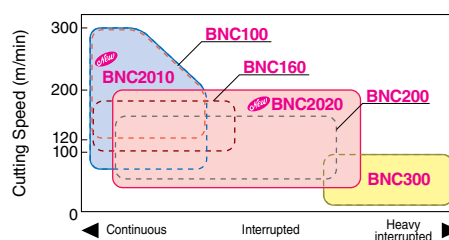
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	DNGN 110308	—	1	Solid	Nose Radius												
		110312				0.8												
	Sharp Edge	DNGN 110308LF	DNGN 110308F	1	Solid	1.2												
		110312LF				10.5												

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



SUMIBORON Indexable Inserts

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☘ : 1st Choice ☙ : 2nd Choice Interrupted Cut ⚙ : 1st Choice ⚙ : 2nd Choice

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

DCG 0702

I.C.: $\varnothing 6.35$ Thickness: 2.38 Hole: $\varnothing 2.8$

Applicable holder ref. page, (Example)

Applicable External Holders C29, D14, 16, 19Applicable Internal Holders  E49 to E51

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs	No. of Cuts	Nose Radius	Cutting Length	BNX	BNX	BNX	BN11	BN21	BN22	BN3	BN5	BN7	BN7	BN7	BN7
	Standard	NU-DCGW 070202 070204 070208	—	1	1	0.2 0.4 0.8	2.7 2.5 2.1				● ● ●	● ● ●	▲ ▲ ●				● ●		
		T-NU-DCGW 070202 070204 070208	—	10	1	0.2 0.4 0.8	2.7 2.5 2.1					● ● ●	▲ ▲ ●						
 Fine Boring type	T01215	NU-DCGW 070202LT 070204LT 070208LT	—	1	1	0.2 0.4 0.8	2.7 2.5 2.1	—	—	—	—	● ● ●	— — —	—	—	—	—	—	—
 Continuous cutting general type	S01225	NU-DCGW 070202LS 070204LS 070208LS	NU-DCGW 070202M 070204M 070208M	1	1	0.2 0.4 0.8	2.7 2.5 2.1	—	—	—	—	—	▲ ▲ ▲	—	—	—	—	—	—
		T-NU-DCGW 070202LS 070204LS 070208LS	T-NU-DCGW 070202M 070204M 070208M	10	1	0.2 0.4 0.8	2.7 2.5 2.1	—	—	—	—	—	—	—	—	—	—	—	—
 Strong edge type	S01235	NU-DCGW 070202HS 070204HS	—	1	1	0.2 0.4	2.7 2.5	—	—	—	—	● ●	— —	—	—	—	—	—	—

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

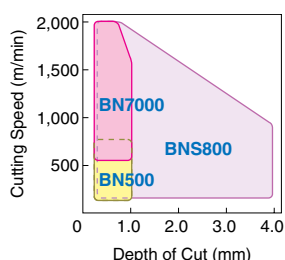
● Multi-cornered, One-use Type/7 ° Positive (With Hole)

[illegible]

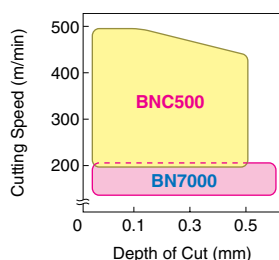
*For BNX25, use 2NS type code (2NS-DCGW) *Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

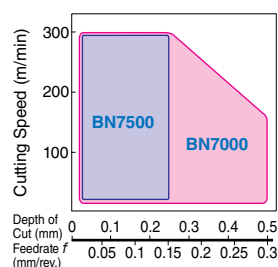
© Grey Cast Iron



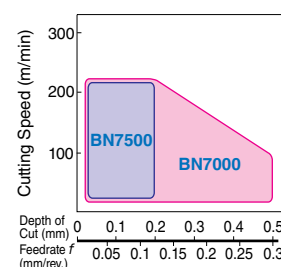
☒ Ductile Cast Iron



⑤ General Sintered Alloy

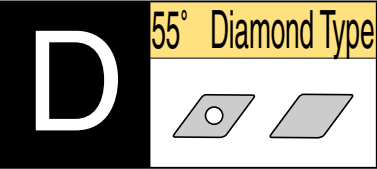


Ⓕ High Density Sintered Alloy



▲▲mark: To be replaced by new item (Please confirm stock availability)

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

DCG 0702

Coated SUMIBORON

I.C.: ø6.35 Thickness: 2.38 Hole: ø2.8

Applicable holder ref. page, (Example)

Applicable External Holders **C29, D14, 16, 19**

Applicable Internal Holders **E49 to E51**

Legend: Continuous Cut 1st Choice 2nd Choice Medium Cut 1st Choice 2nd Choice Interrupted Cut 1st Choice 2nd Choice

	●=1 piece pack and 10 pieces pack both Stocked	▲=1 piece pack Stocked
Recommended Application	K cast iron	
	S exotic alloy	
	H hardened steel	
	sintered component	

Coated CBN

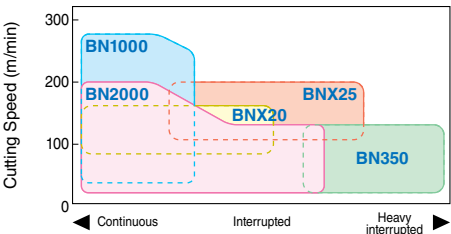
Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	Cutting Edge Length	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500
1	2	0.2	2.6		●	●				●	
1	2	0.4	2.5		●	●				●	●
1	2	0.4	2.4		●	●			●	●	
1	2	0.2	2.6							●	
1	2	0.4	2.5							●	

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

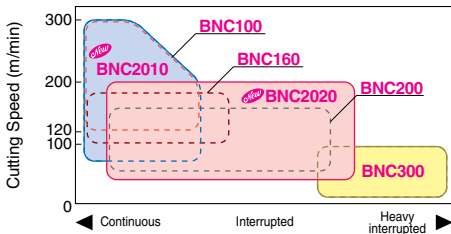
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	Cutting Edge Length	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500
	Standard	2NC-DCGW 070202 070204	—	1	2	0.2	2.6		●	●				●	
	No edge treatment	2NC-DCGT 070204N-FV	—	1	2	0.4	2.4		●	●			●	●	
	BNC100 → S01715 BNC160 → S01020 BNC200 → S01015	2NC-DCGW 070202LS 070204LS	—	1	2	0.2	2.6							●	
						0.4	2.5							●	

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



SUMIBORON Indexable Inserts

DCG■11T3●●

I.C.: $\varnothing 9.525$ Thickness: 3.97 Hole: $\varnothing 4.4$

Applicable holder ref. page, (Example)

Applicable External Holders C29, D14, 16, 19Applicable Internal Holders E49 to E51

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☹ : 1st Choice ☺ : 2nd Choice Interrupted Cut ⚙ : 1st Choice ⚙ : 2nd Choice

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel
sintered component			

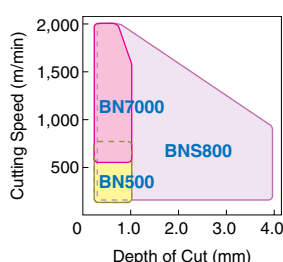
CBN

	Pcs./Pack		Dimensions (mm)				BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800												
	No. of Cutting Edges		Nose Radius	Cutting Edge Length																										
	1	1	0.2	2.7						●	●	▲			●	●														
			0.4	2.5						●	●	▲																		
			0.8	2.1						●	●																			
			1.2	2.0						●	●																			
	10	1	0.2	2.7						●	●	▲																		
			0.4	2.5						●	●	▲																		
			0.8	2.1																										
			1.2	2.0																										
	1	1	0.2	2.7	—	—	—	—	—	—	—	—	—	—	●	●														
			0.4	2.5	—	—	—	—	—	—	—	—	—	—	●	●														
			0.8	2.1	—	—	—	—	—	—	—	—	—	—																
	10	1	0.2	2.7	—	—	—	—	—	—	—	—	—	—																
			0.4	2.5	—	—	—	—	—	—	—	—	—	—																
			0.8	2.1	—	—	—	—	—	—	—	—	—	—																
	1	1	0.2	2.7	—	—	—	—	—	●	●	—	—	—	—	—	—	—												
			0.4	2.5	—	—	—	—	—	●	●	—	—	—	—	—	—	—												
			0.8	2.1	—	—	—	—	—	●	●	—	—	—	—	—	—	—												
			1.2	2.0	—	—	—	—	—	●	●	—	—	—	—	—	—	—												
	1	1	0.2	2.7	—	—	—	—	—	—	—	▲	—	—	—	—	—	—												
			0.4	2.5	—	—	—	—	—	—	—	▲	—	—	—	—	—	—												
			0.8	2.1	—	—	—	—	—	—	—	▲	—	—	—	—	—	—												
			1.2	2.0	—	—	—	—	—	—	—	▲	—	—	—	—	—	—												
	1	1	0.2	2.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—												
			0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—												
			0.8	2.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—												
			1.2	2.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—												
	1	1	0.2	2.7	—	—	—	—	—	●	●	—	—	—	—	—	—	—												
			0.4	2.5	—	—	—	—	—	●	●	—	—	—	—	—	—	—												
			0.8	2.1	—	—	—	—	—	●	●	—	—	—	—	—	—	—												

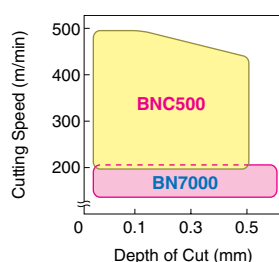
*For BNX25, use NS type code (NS-DCGW) *Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

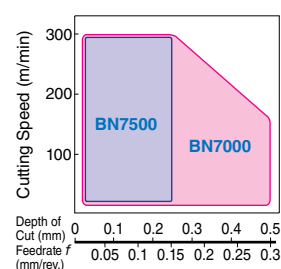
© Grey Cast Iron



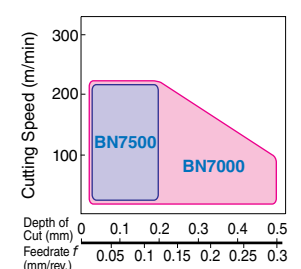
Ⓓ Ductile Cast Iron



⑤ General Sintered Alloy

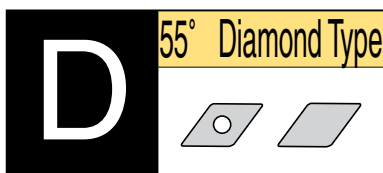


Ⓣ High Density Sintered Alloy



▲▲mark: To be replaced by new item (Please confirm stock availability)

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive				S01235	S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

DCG 11T3

Applicable holder ref. page, (Example)

Applicable External Holders C29, D14, 16, 19

Applicable Internal Holders E49 to E51

I.C.: ø9.525 Thickness: 3.97 Hole: ø4.4

Recommended Application	K cast iron	S exotic alloy	H hardened steel	Intermittent component	CBN
●▲=1 piece pack and 10 pieces pack both Stocked					
●▲=1 piece pack Stocked					

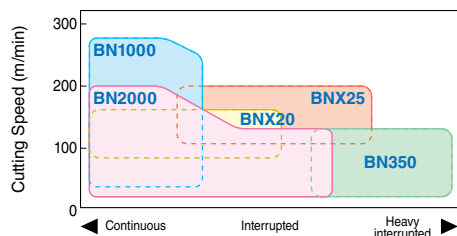
● Multi-cornered, One-use Type / 7° Positive (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	2NU-DCGW 11T302	—	1	2	0.2 2.7												
		11T304				0.4 2.5												
		11T308				0.8 2.1												
	S01215	T-2NU-DCGW 11T302	—	10	2	0.2 2.7												
		11T304				0.4 2.5												
		11T308				0.8 2.1												
	S01215	2NU-DCGW 11T304WG	—	1	2	0.4 2.3												
		11T308WG				0.8 2.1												
	No edge treatment	2NU-DCGW 11T304WH	—	1	2	0.4 2.1												
		11T308WH				0.8 1.8												
	S00535	2NU-DCGT 11T304N-FV	—	1	2	0.4 2.4												
		11T308N-FV				0.8 2.0												
	Sharp Edge	2NU-DCGW 11T302LF	—	1	2	0.2 2.7												
		11T304LF				0.4 2.5												
		11T308LF				0.8 2.1												
	Honing	2NU-DCGW 11T302LE	—	1	2	0.2 2.7												
		11T304LE				0.4 2.5												
		11T308LE				0.8 2.1												
	S00715	2NU-DCGW 11T302LS	—	1	2	0.2 2.7												
		11T304LS				0.4 2.5												
		11T308LS				0.8 2.1												

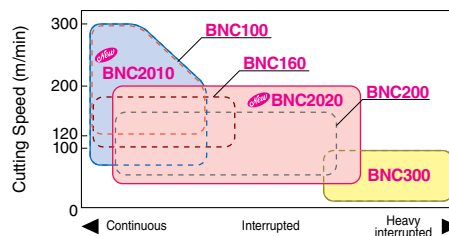
*For BNX25, use 2NS type code (2NS-DCGW) *Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

A Uncoated SUMIBORON



B Coated SUMIBORON



SUMIBORON Indexable Inserts

DCG 11T3

Coated
SUMIBORON

Applicable holder ref. page, (Example)

Applicable External Holders C29, D14, 16, 19

Applicable Internal Holders E49 to E51

I.C.: ø9.525 Thickness: 3.97 Hole: ø4.4

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☺ : 1st Choice ☹ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱✱ : 2nd Choice

●=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component
	●	○	○	○

Coated CBN

Pcs./Pack	No. of Cutting Edges	Dimensions (mm)		Coated CBN						
		Nose Radius	Cutting Edge Length	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500
1	2	0.2	2.7	●	●	○	○	○	○	○
		0.4	2.5	●	●	○	○	○	○	○
		0.8	2.1	●	●	○	○	○	○	○
1	2	0.4	2.3	●	●	○	○	○	○	○
		0.8	2.1	●	●	○	○	○	○	○
				○	○	○	○	○	○	○
1	2	0.4	2.1	●	●	○	○	○	○	○
		0.8	1.8	●	●	○	○	○	○	○
				○	○	○	○	○	○	○
1	2	0.4	2.4	●	●	○	○	○	○	○
		0.8	2.0	●	●	○	○	○	○	○
				○	○	○	○	○	○	○
1	2	0.4	2.4	●	●	○	○	○	○	○
		0.8	2.0	●	●	○	○	○	○	○
				○	○	○	○	○	○	○
1	2	0.2	2.7	○	○	○	○	○	○	○
		0.4	2.5	○	○	○	○	○	○	○
		0.8	2.1	○	○	○	○	○	○	○
1	2	0.4	2.5	○	○	○	○	○	○	○
		0.8	2.1	○	○	○	○	○	○	○
				○	○	○	○	○	○	○

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Cutting Edge Length	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500
	Standard	2NC-DCGW 11T302 11T304 11T308	—	1	2	0.2	2.7	●	●	○	○	○	○	○
	S01215	2NC-DCGW 11T304WG 11T308WG	—	1	2	0.4	2.3	●	●	○	○	○	○	○
	Wiper Insert					0.8	2.1	●	●	○	○	○	○	○
	S01215	2NC-DCGW 11T304WH 11T308WH	—	1	2	0.4	2.1	●	●	○	○	○	○	○
	Wiper Insert					0.8	1.8	●	●	○	○	○	○	○
	No edge treatment	2NC-DCGT 11T304N-FV 11T308N-FV	—	1	2	0.4	2.4	●	●	○	○	○	○	○
	Break Master					0.8	2.0	●	●	○	○	○	○	○
	S00535	2NC-DCGT 11T304N-LV 11T308N-LV	—	1	2	0.4	2.4	●	●	○	○	○	○	○
	Break Master					0.8	2.0	●	●	○	○	○	○	○
	Fine Boring type	BNC100 → S01715 BNC160 → S01020 BNC200 → S01015	—	1	2	0.2	2.7	○	○	○	○	○	○	○
						0.4	2.5	○	○	○	○	○	○	○
						0.8	2.1	○	○	○	○	○	○	○
	Strong edge type	BNC2010 → S01730 BNC2020 → S02735 BNC300 → S01735 BNC160 → S01730 BNC200 → S01735 BNC500 → S01225	—	1	2	0.4	2.5	○	○	○	○	○	○	○
						0.8	2.1	○	○	○	○	○	○	○

Positive Inserts

C

D

R

S

T

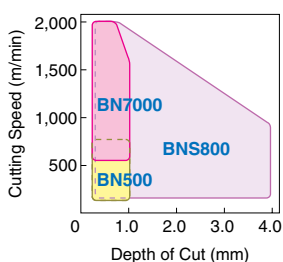
V

W

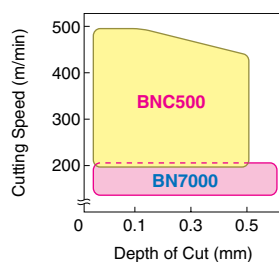
SUMIBORON

SUMIBORON Application Range Map

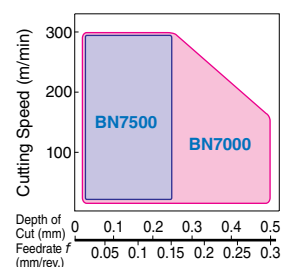
© Grey Cast Iron



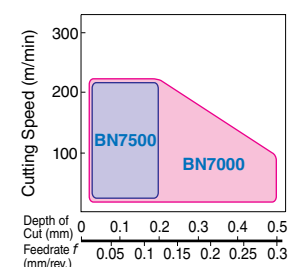
① Ductile Cast Iron



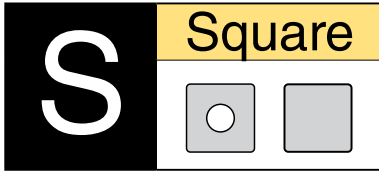
② General Sintered Alloy



③ High Density Sintered Alloy



SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

SN A1204

Applicable holder ref. page, (Example)

I.C.: ø12.7 Thickness: 4.76 Hole: ø5.16

Applicable External Holders **E75, C13 to C18**

Applicable Internal Holders **E75, 76**

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component	CBN
	●	●	●	●	●
	○	○	○	○	○
	★	★	★	★	★
	☆	☆	☆	☆	☆

● One-use Type/Negative (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-SNMA 120404	—	1	1	0.4	2.5	●	—	—	●	▲	●	●	●	●	●	●	—
		120408				0.8	2.3	●	—	—	●	▲	●	●	●	●	●	●	—
		120412				1.2	2.1	●	—	—	●	▲	●	●	●	●	●	●	—
		T-NU-SNMA 120404		10	1	0.4	2.5	●	—	—	●	▲	●	●	●	●	●	●	—
	Standard	120408				0.8	2.3	●	—	—	●	▲	●	●	●	●	●	●	—
		120412				1.2	2.1	●	—	—	●	▲	●	●	●	●	●	●	—
		NS-SNMA 120404		1	1	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—
		120408				0.8	2.3	—	—	—	—	—	—	—	—	—	—	—	—
		120412				1.2	2.1	—	—	—	—	—	—	—	—	—	—	—	—
		T-NS-SNMA 120404		10	1	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—
	Standard	120408				0.8	2.3	—	—	—	—	—	—	—	—	—	—	—	—
		120412				1.2	2.1	—	—	—	—	—	—	—	—	—	—	—	—
		2NU-SNGA 120404		1	2	0.4	2.5	●	—	—	●	▲	●	—	—	—	—	—	—
	Standard	120408				0.8	2.3	●	—	—	●	▲	●	—	—	—	—	—	—
		120412				1.2	2.1	●	—	—	●	▲	●	—	—	—	—	—	—
		T-2NU-SNGA 120404		10	2	0.4	2.5	●	—	—	●	▲	●	—	—	—	—	—	—
	Standard	120408				0.8	2.3	●	—	—	●	▲	●	—	—	—	—	—	—
		120412				1.2	2.1	●	—	—	●	▲	●	—	—	—	—	—	—
		2NS-SNGA 120404		1	2	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—
	Standard	120408				0.8	2.3	—	—	—	—	—	—	—	—	—	—	—	—
		120412				1.2	2.1	—	—	—	—	—	—	—	—	—	—	—	—
		T-2NS-SNGA 120404		10	2	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—
	Standard	120408				0.8	2.3	—	—	—	—	—	—	—	—	—	—	—	—
		120412				1.2	2.1	—	—	—	—	—	—	—	—	—	—	—	—
		2NU-SNGA 120404LT		1	2	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—
	T01215	120408LT				0.8	2.3	—	—	—	—	—	—	—	—	—	—	—	—
		120412LT				1.2	2.1	—	—	—	—	—	—	—	—	—	—	—	—
		2NU-SNGA 120404LT				0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—

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

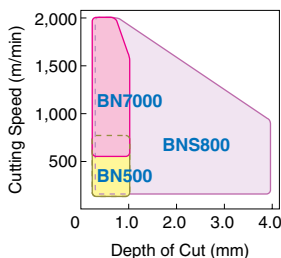
● Multi-cornered, One-use Type/Negative (With Hole)

	Standard	2NU-SNGA 120404	—	1	2	0.4	2.5	●	—	—	●	▲	●	—	—	—	—	—	—
		120408				0.8	2.3	●	—	—	●	▲	●	—	—	—	—	—	—
		120412				1.2	2.1	●	—	—	●	▲	●	—	—	—	—	—	—
		T-2NU-SNGA 120404		10	2	0.4	2.5	●	—	—	●	▲	●	—	—	—	—	—	—
	Standard	120408				0.8	2.3	●	—	—	●	▲	●	—	—	—	—	—	—
		120412				1.2	2.1	●	—	—	●	▲	●	—	—	—	—	—	—
		2NS-SNGA 120404		1	2	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—
	Standard	120408				0.8	2.3	—	—	—	—	—	—	—	—	—	—	—	—
		120412				1.2	2.1	—	—	—	—	—	—	—	—	—	—	—	—
		T-2NS-SNGA 120404		10	2	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—
	Standard	120408				0.8	2.3	—	—	—	—	—	—	—	—	—	—	—	—
		120412				1.2	2.1	—	—	—	—	—	—	—	—	—	—	—	—
		2NU-SNGA 120404LT		1	2	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—
	T01215	120408LT				0.8	2.3	—	—	—	—	—	—	—	—	—	—	—	—
		120412LT				1.2	2.1	—	—	—	—	—	—	—	—	—	—	—	—
		2NU-SNGA 120404LT				0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—

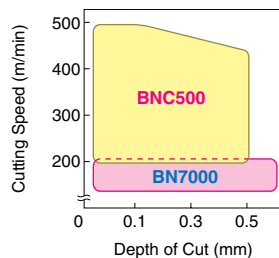
*For BNX25, use 2NS type code (2NS-SNGA) *Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

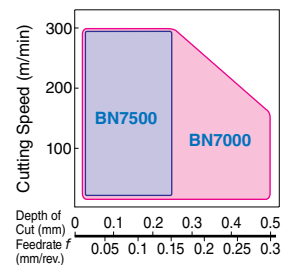
© Grey Cast Iron



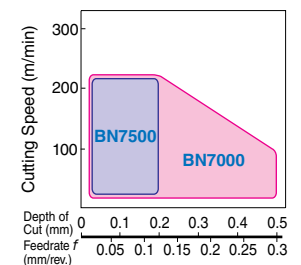
① Ductile Cast Iron



② General Sintered Alloy



③ High Density Sintered Alloy



▲mark: To be replaced by new item (Please confirm stock availability)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BN5800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								—

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Applicable holder ref. page, (Example)

Applicable External Holders C13 to C18Applicable Internal Holders  E75.76

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs.	No. of Co.	Nose Radius	Cutting Length	BNX	BNX	BNX	BN10	BN22	BN33	BN55	BN77	BN77	BN77	BN77
	S01235	2NU-SNGA 120404HS 120408HS 120412HS	—	1	2	0.4 2.5	—	—	—	—	●	—	—	—	—	—	—	—
						0.8 2.3	—	—	—	—	●	—	—	—	—	—	—	—
						1.2 2.1	—	—	—	—	●	—	—	—	—	—	—	—

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

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

[illegible]

Applicable holder ref. page, (Example)

Applicable External Holders L98

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs	No of Cts	Nose Radius	Cutting Length	BNX	BNX	BNX	BN1	BN2	BN2	BN3	BN5	BN7	BN7	BN7	BN5
	Standard	SNGN 090308-B 090312-B 090316-B	—	1	4	0.8 9.5 1.2 9.5 1.6 9.5										●	●		

④ Uncoated SUMIBORON

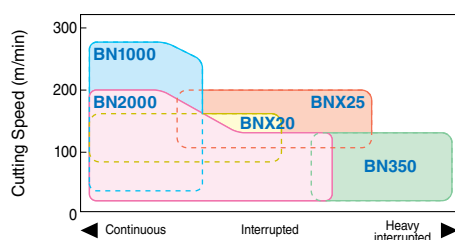


Figure 1 is a graph showing the recommended cutting speed range for the BNC series. The y-axis represents Cutting Speed (m/min) from 0 to 300. The x-axis represents the cutting condition, divided into Continuous, Interrupted, and Heavy interrupted. The graph shows five regions corresponding to different BNC series models, each with a recommended speed range indicated by a dashed line and a specific speed value (e.g., 250, 200, 150, 100, 50 m/min).

Model	Recommended Speed (m/min)	Condition Range
BNC100	250	Continuous to Interrupted
BNC200	200	Interrupted to Heavy interrupted
BNC160	150	Continuous to Interrupted
BNC200	100	Interrupted to Heavy interrupted
BNC300	50	Heavy interrupted

SUMIBORON Indexable Inserts

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☺ : 1st Choice ☹ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

SN N0903

I.C.: ø9.525 Thickness: 3.18 Hole: —

Applicable holder ref. page, (Example)

Applicable External Holders L98

● Solid Type/Negative (Without Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs	No. of Cutting Edges	Nose Radius	Cutting Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BN5800	
	Standard	SNGN 090308 090312	—	1	Solid	0.8 1.2	9.5 9.5	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	● ●
 Low Resistance Type	Sharp Edge	SNGN 090308LF 090312LF	SNGN 090308F 090312F	1	Solid	0.8 1.2	9.5 9.5	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	● ●
 Wiper Insert	T02020	SNEN 090308W	—	1	Solid	0.8	9.5	—	—	—	—	—	—	—	—	—	—	—	—	●
 Wiper Sharp Edge Type	No edge treatment	SNEN 090308LFW	SNEN 090308FW	1	Solid	0.8	9.5	—	—	—	—	—	—	—	—	—	—	—	—	●

SNGN1203

I.C.: ø12.7 Thickness: 3.18 Hole: —

Applicable holder ref. page, (Example)

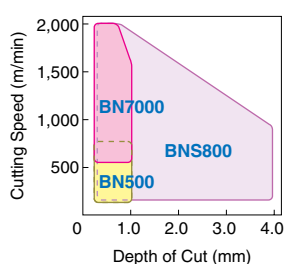
Applicable External Holders L98

● Solid Type/Negative (Without Hole)

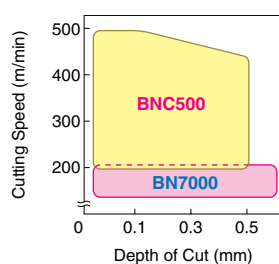
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BN5800
	Standard	SNGN 120308 120312	—	1	Solid	0.8 1.2	12.7 12.7	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —
 Low Resistance Type	Sharp Edge	SNGN 120308LF 120312LF	SNGN 120308F 120312F	1	Solid	0.8 1.2	12.7 12.7	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —

SUMIBORON Application Range Map

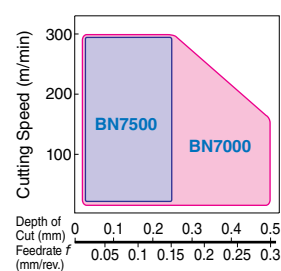
© Grey Cast Iron



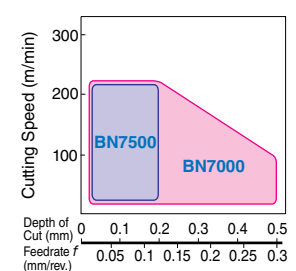
① Ductile Cast Iron



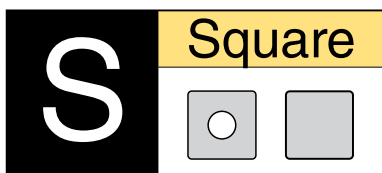
② General Sintered Alloy



③ High Density Sintered Alloy



SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱ : 2nd Choice

SNG 1204 ●●

Applicable holder ref. page, (Example)

Applicable External Holders **L98**

I.C.: ø12.7 Thickness: 4.76 Hole: —

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	silinter component	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN7500	BN7500	BNS800

● Negative (Without Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN7500	BN7500	BNS800
	Standard	SNGN 120408 120412	—	1	1	0.8	4.8	●				●	▲		●				
						1.2	4.8	●				●	▲						
	Standard	SNGN 120408-B 120412-B 120416-B	—	1	4	0.8	12.7												
						1.2	12.7												
						1.6	12.7												

● Solid Type/Negative (Dimple Lock)

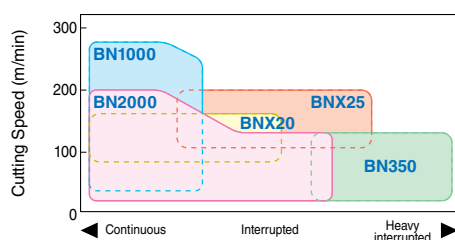
	Standard	SNGX 120408 120412 120416	—	1	Solid	0.8	12.7	—	—	—	—	—	—	—	—	—	—	—	—
						1.2	12.7	—	—	—	—	—	—	—	—	—	—	—	—
						1.6	12.7	—	—	—	—	—	—	—	—	—	—	—	—

● Solid Type/Negative (Without Hole)

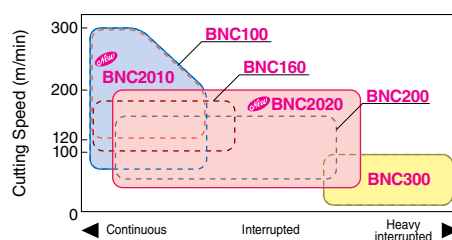
	Standard	SNGN 120408 120412 120416 120420	—	1	Solid	0.8	12.7	—	—	—	—	—	—	—	—	—	—	—	—
						1.2	12.7	—	—	—	—	—	—	—	—	—	—	—	—
						1.6	12.7	—	—	—	—	—	—	—	—	—	—	—	—
						2.0	12.7	—	—	—	—	—	—	—	—	—	—	—	—

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



SUMIBORON Indexable Inserts

SNGA1204

Coated
SUMIBORON

Applicable holder ref. page, (Example)

I.C.: $\phi 12.7$ Thickness: 4.76 Hole: $\phi 5.16$

Applicable External Holders 

Applicable Internal Holders 

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

●=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component
	●	●	●	●

Coated CBN

Pcs./Pack	No. of Cutting Edges	Dimensions (mm)		BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500
		Nose Radius	Cutting Edge Length							
1	2	0.8	2.3	●	●					●
		1.2	2.1							●
1	2	0.4	2.5	●	●					
		0.8	2.3	●	●					
		1.2	2.1	●	●					

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.
	Standard	2NC-SNGA 120408 120412	—
	Standard	2NC-SNGA 120404 <i>New</i> 120408 <i>New</i> 120412 <i>New</i>	—

L

Negative Inserts

C

D

R

S

T

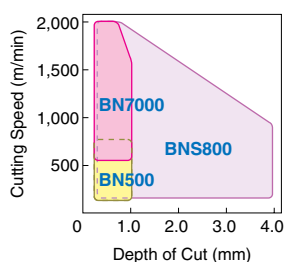
V

W

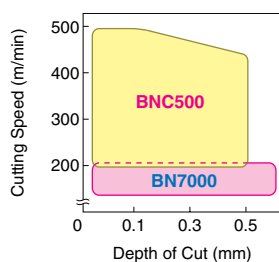
SUMIBORON

SUMIBORON Application Range Map

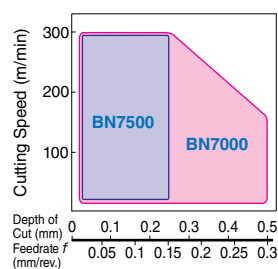
© Grey Cast Iron



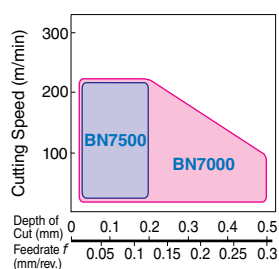
① Ductile Cast Iron



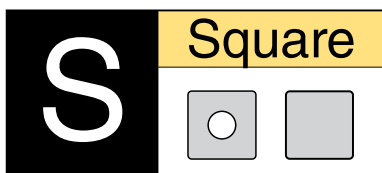
③ General Sintered Alloy



④ High Density Sintered Alloy



SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

SPGN0903

Applicable holder ref. page, (Example)

I.C.: ø9.525 Thickness: 3.18 Hole: —

Applicable Internal Holders **E73**

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-SPGN 090304 090308	—	1	1	0.4	2.5	●	○			●	▲		●	●	●	—	—
		T-NU-SPGN 090304 090308	—	10	1	0.4	2.5	●	○			●	▲		●	●	●	—	—
	T01215	NU-SPGN 090304LT 090308LT	—	1	1	0.4	2.5	—	—	—	—	●	—	—	—	—	—	—	—
						0.8	2.5	—	—	—	—	●	—	—	—	—	—	—	—
	S01225	NU-SPGN 090304LS 090308LS	NU-SPGN 090304M 090308M	1	1	0.4	2.5	—	—	—	—	—	▲	—	—	—	—	—	—
		T-NU-SPGN 090304LS 090308LS	T-NU-SPGN 090304M 090308M	10	1	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—
	S01235	NU-SPGN 090304HS 090308HS	—	1	1	0.4	2.5	—	—	—	—	●	—	—	—	—	—	—	—
						0.8	2.5	—	—	—	—	●	—	—	—	—	—	—	—

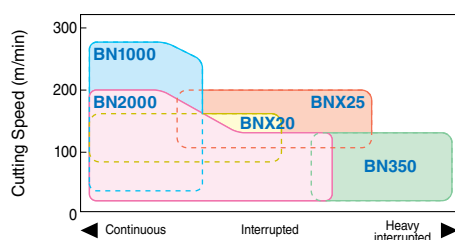
*For BNX25, use NS type code (NS-SPGN) *Depth-of-cut for one-use type is 0.5mm or less

● 11° Positive Type (Without Hole)

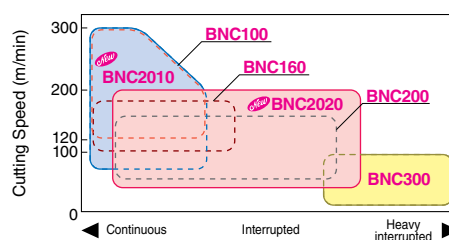
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	SPGN 090304 090308 090312	—	1	1	0.4	4.8	▲	—	—	—	▲	—	—	—	●	●	—	—
						0.8	4.8	▲	—	—	—	▲	—	—	—	●	●	—	—
						1.2	4.8	—	—	—	—	—	—	—	—	—	—	—	—

SUMIBORON Application Range Map

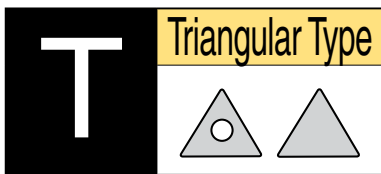
① Uncoated SUMIBORON



② Coated SUMIBORON



SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

TN 1604

Applicable holder ref. page, (Example)

Applicable External Holders **C19 to C25, D15, 18**

Applicable Internal Holders **E33 to E35**

I.C.: ø9.525 Thickness: 4.76 Hole: ø3.81

Recommended Application	K cast iron	S exotic alloy	H hardened steel	stirred component	CBN
	●	●	●	●	●
	○	○	○	○	○
	★	★	★	★	★
	☆	☆	☆	☆	☆

● One-use Type/Negative (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-TNMA 160401	—	1	1	0.1 2.5	●	●	●	●	●	●	●	●	●	●	●	●
		160402				0.2 2.4	●	●	●	●	●	●	●	●	●	●	●	●
		160404				0.4 2.3	●	●	●	●	●	●	●	●	●	●	●	●
		160408				0.8 2.0	●	●	●	●	●	●	●	●	●	●	●	●
		160412				1.2 2.0	●	●	●	●	●	●	●	●	●	●	●	●
	Standard	T-NU-TNMA 160401	—	10	1	0.1 2.5	●	●	●	●	●	●	●	●	●	●	●	●
		160402				0.2 2.4	●	●	●	●	●	●	●	●	●	●	●	●
		160404				0.4 2.3	●	●	●	●	●	●	●	●	●	●	●	●
		160408				0.8 2.0	●	●	●	●	●	●	●	●	●	●	●	●
		160412				1.2 2.0	●	●	●	●	●	●	●	●	●	●	●	●
	Standard	NS-TNMA 160404	—	1	1	0.4 2.3	—	—	●	—	—	—	—	—	—	—	—	—
		160408				0.8 2.0	—	—	●	—	—	—	—	—	—	—	—	—
		160412				1.2 2.0	—	—	●	—	—	—	—	—	—	—	—	—
	Standard	T-NS-TNMA 160404	—	10	1	0.4 2.3	—	—	●	—	—	—	—	—	—	—	—	—
		160408				0.8 2.0	—	—	●	—	—	—	—	—	—	—	—	—
	Standard	160412	—	10	1	1.2 2.0	—	—	●	—	—	—	—	—	—	—	—	—

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

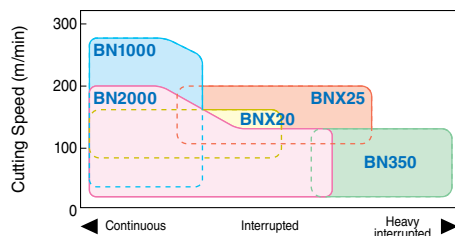
● Multi-cornered, One-use Type/Negative (With Hole)

	Standard	3NU-TNGA 160404	—	1	3	0.4 2.3	●	—	●	●	●	●	●	●	●	●	●	●
		160408				0.8 2.0	●	—	●	●	●	●	●	●	●	●	●	●
		160412				1.2 2.0	●	—	●	●	●	●	●	●	●	●	●	●
	Standard	T-3NU-TNGA 160404	—	10	3	0.4 2.3	●	—	●	●	●	●	●	●	●	●	●	●
		160408				0.8 2.0	●	—	●	●	●	●	●	●	●	●	●	●
	Standard	3NS-TNGA 160404	—	1	3	0.4 2.3	—	—	●	—	—	—	—	—	—	—	—	—
		160408				0.8 2.0	—	—	●	—	—	—	—	—	—	—	—	—
		160412				1.2 2.0	—	—	●	—	—	—	—	—	—	—	—	—
	Standard	T-3NS-TNGA 160404	—	10	3	0.4 2.3	—	—	●	—	—	—	—	—	—	—	—	—
		160408				0.8 2.0	—	—	●	—	—	—	—	—	—	—	—	—
	Standard	160412	—	10	3	1.2 2.0	—	—	●	—	—	—	—	—	—	—	—	—

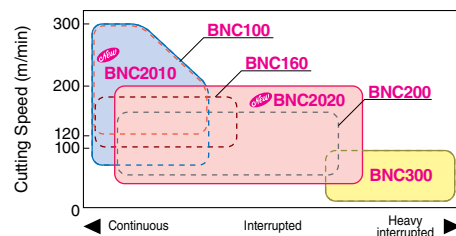
*For BNX25, use 3NS type code (3NS-TNGA) *Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

A Uncoated SUMIBORON



B Coated SUMIBORON



SUMIBORON Indexable Inserts

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☹ : 1st Choice ☺ : 2nd Choice Interrupted Cut ⚙ : 1st Choice ⚙ : 2nd Choice

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

TN■■1604●●

I.C.: $\varnothing 9.525$ Thickness: 4.76 Hole: $\varnothing 3.81$

Applicable holder ref. page, (Example)

Applicable External Holders C19 to C25, D15, 18Applicable Internal Holders E33 to E35

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs	No. of Cl	Nose Radius	Cutting Length	BNX	BNX	BNX	BN11	BN21	BN3	BN5	BN7	BN7	BN7	BN7
 Break Master	S00535	3NU-TNGM 160404N-LV 160408N-LV 160412N-LV	—	1	3	0.4 0.8 1.2	2.3 2.0 2.0	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	— — —	— — —	— — —
 Low Resistance Type	Sharp Edge	3NU-TNGA 160404LF 160408LF 160412LF T-3NU-TNGA 160404LF 160408LF 160412LF	3NU-TNGA 160404F 160408F 160412F T-3NU-TNGA 160404F 160408F 160412F	1 10	3 3	0.4 0.8 1.2	2.3 2.0 2.0	— — —	— — —	— — —	— — —	— — —	— — —	— — —	● ● ●	● ● ●	● ● ●	— — —
 Low Resistance Type	Honing	3NU-TNGA 160404LE 160408LE	—	1	3	0.4 0.8	2.3 2.0	— —	— —	— —	— —	— —	— —	— —	— —	— —	● ●	— —
 Fine Boring type	T01215	3NU-TNGA 160404LT 160408LT 160412LT	—	1	3	0.4 0.8 1.2	2.3 2.0 2.0	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	— — —	— — —	— — —
 Continuous cutting general type	S00715	3NU-TNGA 160404LS 160408LS	—	1	3	0.4 0.8	2.3 2.0	— —	— —	— —	— —	— —	— —	— —	— —	— —	● ●	— —
 Strong edge type	T01235	3NU-TNGA 160404HT 160408HT 160412HT T-3NU-TNGA 160404HT 160408HT 160412HT	3NU-TNGA 160404T 160408T 160412T T-3NU-TNGA 160404T 160408T 160412T	1 10	3 3	0.4 0.8 1.2	2.3 2.0 2.0	— — —	— — —	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	— — —	— — —
 Strong edge type	BN2000 → S01235 BN7000 → S01225 BN700 → S01225 BN7500 → S00525	3NU-TNGA 160404HS 160408HS 160412HS T-3NU-TNGA 160404HS 160408HS 160412HS	3NU-TNGA 160404T 160408T 160412T T-3NU-TNGA 160404T 160408T 160412T	1 10	3 3	0.4 0.8 1.2	2.3 2.0 2.0	— — —	— — —	— — —	● ● ●	— — —	— — —	— — —	● ● ●	● ● ●	● ● ●	— — —

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

Negative Inserts

C



D

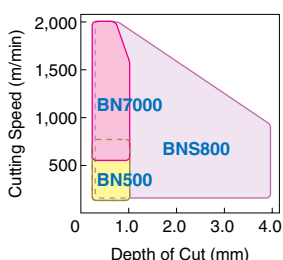
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S

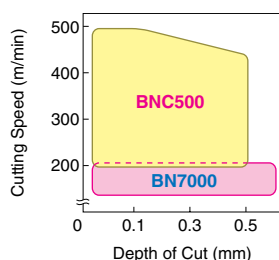
SUMIBORON

SUMIBORON Application Range Map

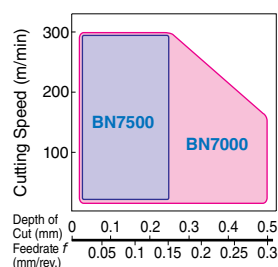
© Grey Cast Iron



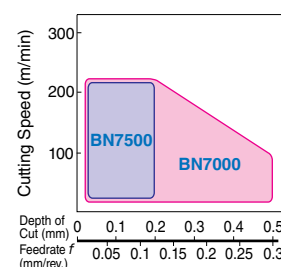
Ⓓ Ductile Cast Iron



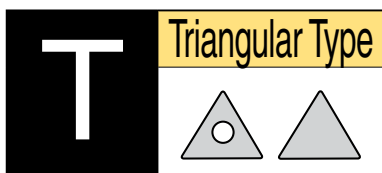
⑤ General Sintered Alloy



Ⓕ High Density Sintered Alloy



SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive				S01235	S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	interfered component	CBN
	●	●	●	●	●
	○	○	○	○	○
	★	★	★	★	★
	☆	☆	☆	☆	☆

Pcs./Pack	No. of Cutting Edges	Dimensions (mm)		CBN											
		Nose Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
1	3	0.4	2.3	—	—	—	—	—	—	—	—	—	—	—	—
10	3	0.8	2.0	—	—	—	—	—	—	—	—	—	—	—	—

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	S00525 (Special application)	3NU-TNGA 160404PM* 160408PM*	—	1	3	0.4	2.3	—	—	—	—	—	—	—	—	—	—	—	—
		T-3NU-TNGA 160404PM* 160408PM*	—	10	3	0.8	2.0	—	—	—	—	—	—	—	—	—	—	—	—

*Depth-of-cut for one-use type is 0.5mm or less *Edge treatment code for PM type to be consolidated into HS type

● Negative Type (With Hole)

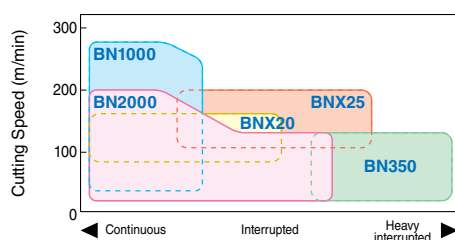
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	TNMA 160402 160404 160408 160412	—	1	1	0.2	3.6	●	—	—	—	—	—	—	—	—	—	—	—
						0.4	3.5	●	—	—	—	—	—	—	—	—	—	—	—
						0.8	3.2	●	—	—	—	—	—	—	—	—	—	—	—
						1.2	2.9	●	—	—	—	—	—	—	—	—	—	—	—

● Solid Type/Negative (With Hole)

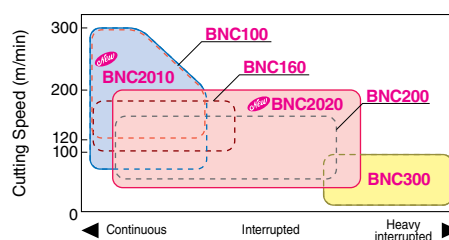
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	TNGA 160408 160412	—	1	Solid	0.8	15.3	—	—	—	—	—	—	—	—	—	—	—	—
						1.2	15.7	—	—	—	—	—	—	—	—	—	—	—	—

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



SUMIBORON Indexable Inserts

TNG1604 Coated SUMIBORON	Applicable holder ref. page, (Example) Applicable External Holders E39 to C25, D15, 18 Applicable Internal Holders E33 to E35
---------------------------------------	---

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☘ : 1st Choice ☙ : 2nd Choice Interrupted Cut ☒ : 1st Choice ☓ : 2nd Choice

●=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Coated CBN

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs	No. of Co	Nose Radius	Cutting Length	BNC	BNC	BNC	BNC	BNC	BNC	BNC
	Standard	3NC-TNGA 160404 160408 160412 160416 160420 160424	—	1	3	0.4 0.8 1.2 1.6 2.0 2.4	2.3 2.0 2.0 3.3 3.0 2.7	●	●				●	
	Standard	6NC-TNGA 160404 160408 160412 160416 160420 160424	—	1	6	0.4 0.8 1.2 1.6 2.0 2.4	2.3 2.0 2.0 3.3 3.0 2.7	●	●	●	●	●	●	●
 Break Master	No edge treatment	6NC-TNGG 160404N-FV 160408N-FV 160412N-FV	—	1	6	0.4 0.8 1.2	2.3 2.0 2.0	●	●	—	—	●	●	—
 Break Master	S00535	6NC-TNGG 160404N-LV 160408N-LV 160412N-LV	—	1	6	0.4 0.8 1.2	2.3 2.0 2.0	●	●	—	—	●	●	—
 Break Master	S01235	6NC-TNGG 160404N-SV 160408N-SV 160412N-SV	—	1	6	0.4 0.8 1.2	2.3 2.0 2.0	●	●	—	—	●	●	—
 Fine Boring type	BNC100 → S01715 BNC160 → S01020 BNC200 → S01015	6NC-TNGA 160404LS 160408LS 160412LS	—	1	6	0.4 0.8 1.2	2.3 2.0 2.0				●	●	●	
 Strong edge type	BNC2010 → S01730 BNC2020 → S02735 BNC300 → S01735 BNC160 → S01730 BNC200 → S01735 BNC500 → S01225	6NC-TNGA 160404HS 160408HS 160412HS	—	1	6	0.4 0.8 1.2	2.3 2.0 2.0	●	●	●		●	●	●

Negative Insert

C

D

R

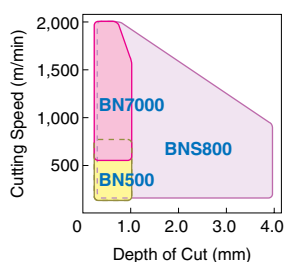
S



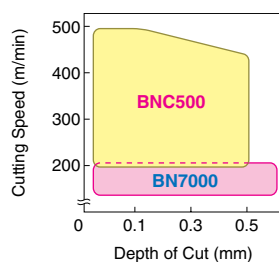
SUMIBORON

SUMIBORON Application Range Map

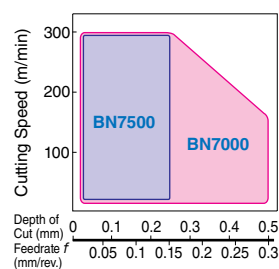
© Grey Cast Iron



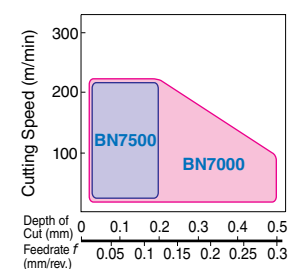
☒ Ductile Cast Iron



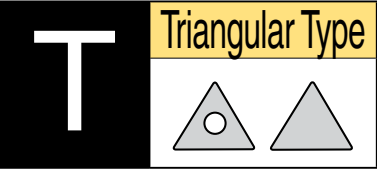
⑤ General Sintered Alloy



Ⓣ High Density Sintered Alloy



SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

TNMA2204 ●●
I.C.: ø12.7 Thickness: 4.76 Hole: ø5.16

Applicable holder ref. page, (Example)

Applicable External Holders **W** C20 to C25

Applicable Internal Holders **W** E33, 35

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ✖ : 1st Choice ✖ : 2nd Choice

▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component										

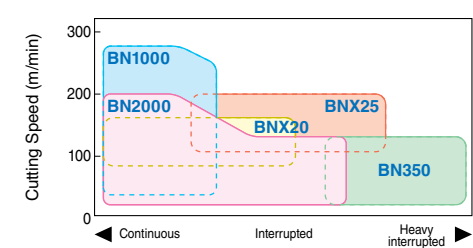
CBN													
Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN7500
1	1	0.8	3.2	●				●	▲				
		1.2	2.9					●	▲				

● Negative Type (With Hole)

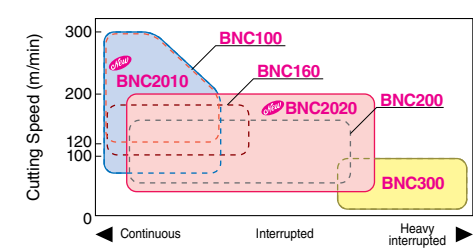
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.
	Standard	TNMA 220408 220412	—

SUMIBORON Application Range Map

Ⓐ Uncoated SUMIBORON



Ⓑ Coated SUMIBORON



SUMIBORON Indexable Inserts

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☺ : 1st Choice ☹ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱ : 2nd Choice

TNGN1103

I.C.: ø6.35 Thickness: 3.18 Hole: —

Applicable holder ref. page, (Example)

Applicable External Holders L98

● Solid Type/Negative (Without Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	TNGN 110308 110312	—	1	Solid	Nose Radius Cutting Edge Length	0.8 9.8 1.2 9.2	—	—	—	—	—	—	—	—	—	—	●
	Sharp Edge	TNGN 110308LF 110312LF	TNGN 110308F 110312F	1	Solid	Nose Radius Cutting Edge Length	0.8 9.8 1.2 9.2	—	—	—	—	—	—	—	—	—	—	●

TNGN1604

I.C.: ø9.525 Thickness: 4.76 Hole: —

Applicable holder ref. page, (Example)

Applicable External Holders L98

● Negative Type (Without Hole)

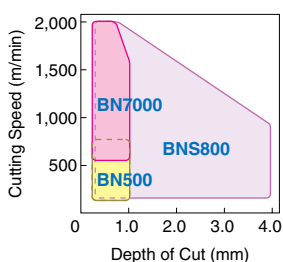
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	TNGN 160404 160408 160412	—	1	1	Nose Radius Cutting Edge Length	0.4 3.5 0.8 3.2 1.2 2.9	●	—	—	—	●	—	—	—	—	—	—

● Solid Type/Negative (Without Hole)

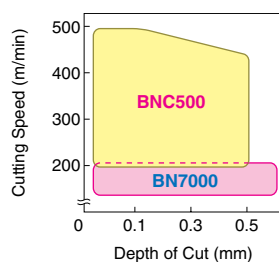
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	TNGN 160408 160412 160416 160420	—	1	Solid	Nose Radius Cutting Edge Length	0.8 15.3 1.2 14.8 1.6 14.2 2.0 13.6	—	—	—	—	—	—	—	—	—	—	●

SUMIBORON Application Range Map

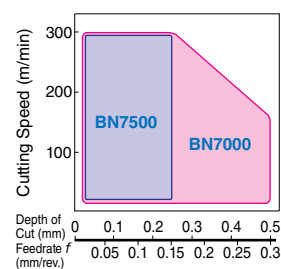
© Grey Cast Iron



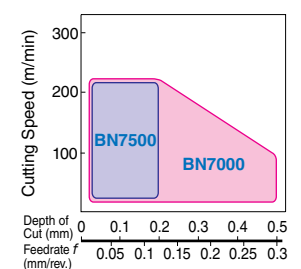
① Ductile Cast Iron



⑤ General Sintered Alloy



⑥ High Density Sintered Alloy



▲mark: To be replaced by new item (Please confirm stock availability)

L67

Negative Inserts

C

D

R

S

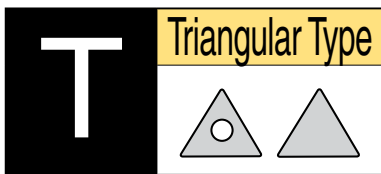
T

V

W

SUMIBORON

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☉ : 1st Choice ☼ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱✱ : 2nd Choice

TBEW0601

Applicable holder ref. page, (Example)
 Applicable Internal Holders **E24, 25**

I.C.: ø3.97 Thickness: 1.59 Hole: ø2.2

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
 Low Resistance Type	Sharp Edge	NU-TBEW 060102LF	NU-TBEW 060102F	1	1	Nose Radius 0.2 Cutting Edge Length 2.1	—	—	—	—	—	—	—	—	—	—	—	—
		T-NU-TBEW 060102LF	T-NU-TBEW 060102F	10	1	Nose Radius 0.2 Cutting Edge Length 2.1	—	—	—	—	—	—	—	—	—	—	—	—
 Fine Boring type	T01215	NU-TBEW 060102LT	NU-TBEW 060102S	1	1	Nose Radius 0.2 Cutting Edge Length 2.1	●	—	—	—	—	—	—	—	—	—	—	—
		T-NU-TBEW 060102LT	T-NU-TBEW 060102S	10	1	Nose Radius 0.2 Cutting Edge Length 2.1	—	—	—	—	—	—	—	—	—	—	—	—

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

TBGN0601

Applicable holder ref. page, (Example)
 Applicable Internal Holders **E20**

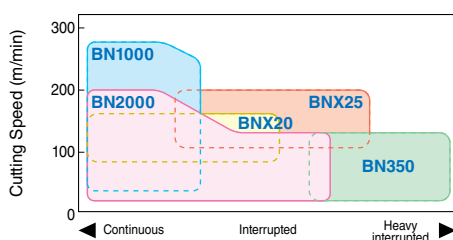
I.C.: ø3.97 Thickness: 1.59 Hole: —

● 5 ° Positive (Without Hole)

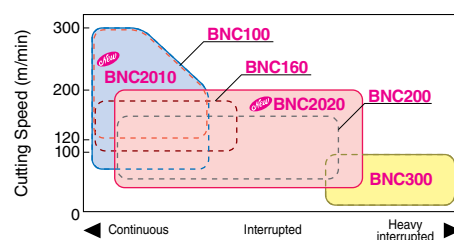
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	TBGN 060102B 060104B 060108B	—	1	3	Nose Radius 0.2 Cutting Edge Length 6.5	●	●	—	—	●	▲	—	—	—	—	—	—
						Nose Radius 0.4 Cutting Edge Length 6.3	●	●	—	—	●	▲	—	—	—	—	—	—
						Nose Radius 0.8 Cutting Edge Length 5.7	●	●	—	—	●	▲	—	—	—	—	—	—
 Fine Boring type	Standard	TBGN 060102-BSTN 060104-BSTN 060108-BSTN	TBGN 060102-BSN 060104-BSN 060108-BSN	1	3	Nose Radius 0.2 Cutting Edge Length 6.5	—	●	—	—	—	—	—	—	—	—	—	—
						Nose Radius 0.4 Cutting Edge Length 6.3	—	●	—	—	—	—	—	—	—	—	—	—
						Nose Radius 0.8 Cutting Edge Length 5.7	—	●	—	—	—	—	—	—	—	—	—	—

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



SUMIBORON Indexable Inserts

TPGW0802●●

Applicable holder ref. page, (Example)

I.C.: $\varnothing 4.76$ Thickness: 2.38 Hole: $\varnothing 2.4$

Applicable Internal Holders  E24 to E26

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☹ : 1st Choice ☺ : 2nd Choice Interrupted Cut ✖ : 1st Choice ✚ : 2nd Choice

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

[illegible]

CBN

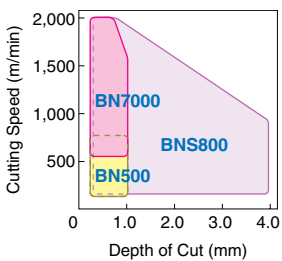
● One-use Type/11 ° Positive (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs	No. of	Nose Radii	Cutting Length	BNX	BNX	BNX	BN1	BN2	BN2	BN3	BN5	BN7	BN7	BN7	BN9
	Standard	NU-TPGW 080202 080204 080208	—	1	1	0.2 2.6 0.4 2.5 0.8 2.2	●				●	●	▲			●	●		
		T-NU-TPGW 080202 080204 080208	—	10	1	0.2 2.6 0.4 2.5 0.8 2.2	●				●	●	▲						
 Low Resistance Type	Sharp Edge	NU-TPGW 080202LF 080204LF 080208LF	NU-TPGW 080202F 080204F 080208F	1	1	0.2 2.6 0.4 2.5 0.8 2.2	—	—	—							●	●		
		T-NU-TPGW 080202LF 080204LF 080208LF	T-NU-TPGW 080202F 080204F 080208F	10	1	0.2 2.6 0.4 2.5 0.8 2.2	—	—	—										
 Fine Boring type	T01215	NU-TPGW 080202LT 080204LT 080208LT	NU-TPGW 080202S 080204S 080208S	1	1	0.2 2.6 0.4 2.5 0.8 2.2	—		—		●	▲							
		T-NU-TPGW 080202LT 080204LT 080208LT	T-NU-TPGW 080202S 080204S 080208S	10	1	0.2 2.6 0.4 2.5 0.8 2.2	—		—										
 Continuous cutting general type	S01225	NU-TPGW 080202LS 080204LS 080208LS	NU-TPGW 080202M 080204M 080208M	1	1	0.2 2.6 0.4 2.5 0.8 2.2	—	—	—			▲							
		T-NU-TPGW 080202LS 080204LS 080208LS	T-NU-TPGW 080202M 080204M 080208M	10	1	0.2 2.6 0.4 2.5 0.8 2.2	—	—	—				▲						
 Strong edge type	S01235	NU-TPGW 080202HS 080204HS 080208HS	—	1	1	0.2 2.6 0.4 2.5 0.8 2.2	—	—	—		●	●	●						

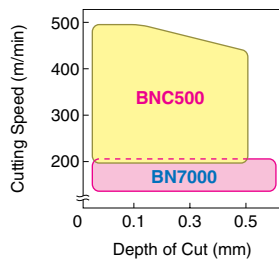
*For BNX25, use NS type code (NS-TPGW) *Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

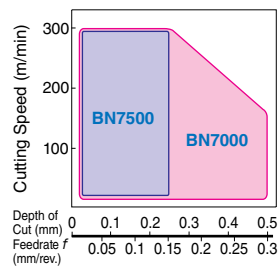
© Grey Cast Iron



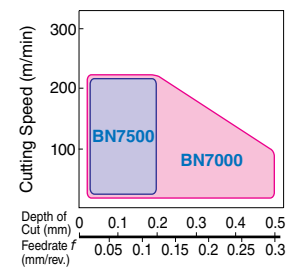
☒ Ductile Cast Iron



⑤ General Sintered Alloy

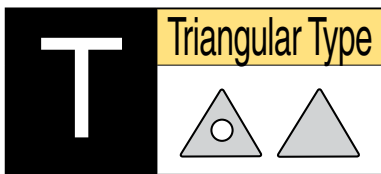


⑦ High Density Sintered Alloy



▲▲mark: To be replaced by new item (Please confirm stock availability)

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

TPGW0902 ●●
I.C.: ø5.56 Thickness: 2.38 Hole: ø2.8

Applicable holder ref. page, (Example)

Applicable Internal Holders **E24**

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked																

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-TPGW 090202 090204 090208	—	1	1	Nose Radius Cutting Edge Length	0.2 2.6 0.4 2.5 0.8 2.2				●	▲			●	●		
	T01215	NU-TPGW 090202LT 090204LT	—	1	1	0.2 2.6 0.4 2.5	—	—	—		●							
	S01225	NU-TPGW 090202LS 090204LS 090208LS	NU-TPGW 090202M 090204M 090208M	1	1	0.2 2.6 0.4 2.5 0.8 2.2	—	—	—			▲						
		T-NU-TPGW 090202LS 090204LS 090208LS	T-NU-TPGW 090202M 090204M 090208M	10	1	0.2 2.6 0.4 2.5 0.8 2.2	—	—	—			▲						
	S01235	NU-TPGW 090202HS 090204HS	—	1	1	0.2 2.6 0.4 2.5	—	—	—		●							

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

TPGW0902 ●● Coated SUMIBORON
I.C.: ø5.56 Thickness: 2.38 Hole: ø2.8

Applicable holder ref. page, (Example)

Applicable Internal Holders **E24**

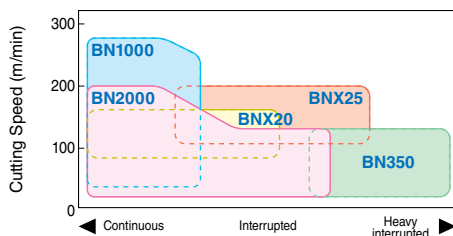
Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
●=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked																

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

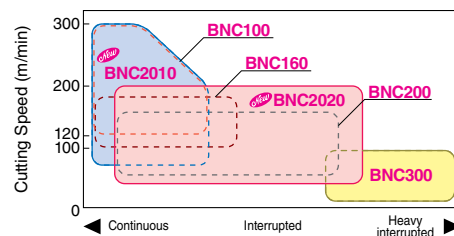
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500
	Standard	3NC-TPGW 090202 090204	—	1	3	Nose Radius Cutting Edge Length	0.2 2.6 0.4 2.5						●

SUMIBORON Application Range Map

A Uncoated SUMIBORON



B Coated SUMIBORON



SUMIBORON Indexable Inserts

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☐ : 1st Choice ☐ : 2nd Choice Interrupted Cut ⚙ : 1st Choice ⚙ : 2nd Choice

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

TPGW1102●●

Applicable holder ref. page, (Example)

I.C.: $\varnothing 6.35$ Thickness: 2.38 Hole: $\varnothing 2.8$

(Special holder)

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs	No. of Cuts	Nose Radius	Cutting Length	BNX	BNX	BNX	BN1	BN2	BN2	BN3	BN5	BN7	BN7	BN7	BN7
	Standard	NU-TPGW 110202 110204 110208	—	1	1	0.2 0.4 0.8	2.5 2.3 2.0	●				●	▲			●	●		
		T-NU-TPGW 110202 110204 110208	—	10	1	0.2 0.4 0.8	2.5 2.3 2.0	●				●	▲						
 Fine Boring type	T01215	NU-TPGW 110202LT 110204LT 110208LT	NU-TPGW 110202S 110204S 110208S	1	1	0.2 0.4 0.8	2.5 2.3 2.0	—			—	●	▲						
		T-NU-TPGW 110202LT 110204LT 110208LT	T-NU-TPGW 110202S 110204S 110208S	10	1	0.2 0.4 0.8	2.5 2.3 2.0	—				—							
 Continuous cutting general type	S01225	NU-TPGW 110202LS 110204LS 110208LS	NU-TPGW 110202M 110204M 110208M	1	1	0.2 0.4 0.8	2.5 2.3 2.0	—			—		▲						
		T-NU-TPGW 110202LS 110204LS 110208LS	T-NU-TPGW 110202M 110204M 110208M	10	1	0.2 0.4 0.8	2.5 2.3 2.0	—				—							
 Strong edge type	S01235	NU-TPGW 110204HS	—	1	1	0.4	2.3	—			—	●	—						

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

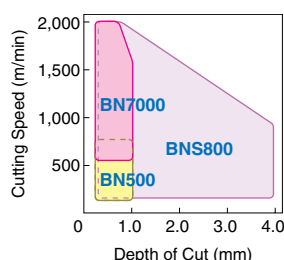
● Multi-cornered, One-use Type/11 ° Positive (With Hole)

① Main Connector, One Side Type (Main Positive (Main Hole))																	
	Standard	3NU-TPGW 110204 110208	—	1	3	0.4 0.8	2.3 2.0										
 Low Resistance Type	Sharp Edge	3NU-TPGW 110204LF	—	1	3	0.4	2.3	—	—	—	—	—	—	—	—		

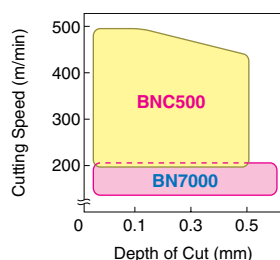
*For BNX25, use 3NS type code (3NS-TPGW) *Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

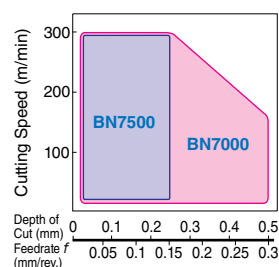
© Grey Cast Iron



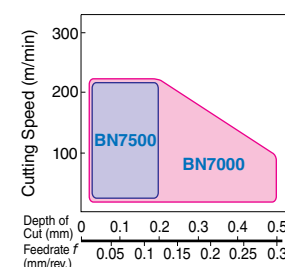
☒ Ductile Cast Iron



⑤ General Sintered Alloy



Ⓕ High Density Sintered Alloy



▲▲mark: To be replaced by new item (Please confirm stock availability)

L71

Positive Inserts

C

D

R

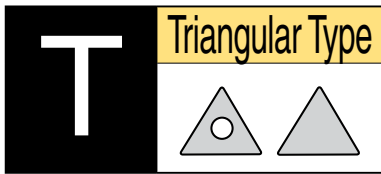
S



v

SUMIBORON

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☉ : 1st Choice ☺ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱✱ : 2nd Choice

TPGW1102●●

Applicable holder ref. page, (Example)

I.C.: ø6.35 Thickness: 2.38 Hole: ø2.8

(Special holder)

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Honing	3NU-TPGW 110204LE	—	1	3	Nose Radius 0.4 Cutting Edge Length 2.3	—	—	—	—	—	—	—	—	—	—	—	—
	S00515	3NU-TPGW 110204LS	—	1	3	Nose Radius 0.4 Cutting Edge Length 2.3	—	—	—	—	—	—	—	—	—	—	—	—

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

TPG1103●●

Applicable holder ref. page, (Example)

I.C.: ø6.35 Thickness: 3.18 Hole: ø3.4

Applicable Internal Holders E24 to E26

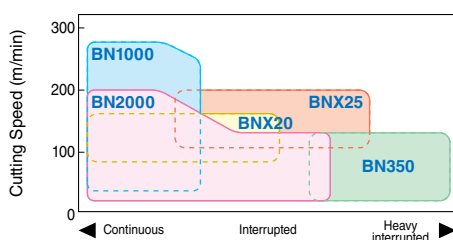
● One-use Type/11° Positive (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-TPGW 110302 110304 110308	—	1	1	Nose Radius 0.2 Cutting Edge Length 2.6 0.4 2.5 0.8 2.2	●	●	—	●	●	▲	●	●	●	●	●	—
	Standard	T-NU-TPGW 110302 110304 110308	—	10	1	Nose Radius 0.2 Cutting Edge Length 2.6 0.4 2.5 0.8 2.2	●	●	—	●	●	▲	●	●	●	●	●	—
	Standard	NS-TPGW 110302 110304 110308	—	1	1	Nose Radius 0.2 Cutting Edge Length 2.6 0.4 2.5 0.8 2.2	—	—	●	—	—	—	—	—	—	—	—	—
	Standard	T-NS-TPGW 110302 110304 110308	—	10	1	Nose Radius 0.2 Cutting Edge Length 2.6 0.4 2.5 0.8 2.2	—	—	●	—	—	—	—	—	—	—	—	—

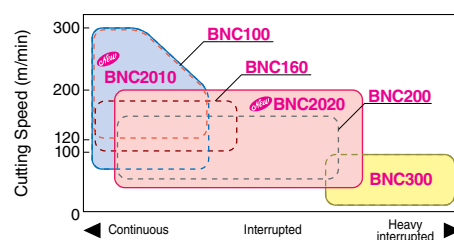
*For BNX25, use NS type code (NS-TPGW) *Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

A Uncoated SUMIBORON



B Coated SUMIBORON



SUMIBORON Indexable Inserts

TPG 1103

I.C.: $\varnothing 6.35$ Thickness: 3.18 Hole: $\varnothing 3.4$

Applicable holder ref. page, (Example)

Applicable Internal Holders  E24 to E26

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ✖ : 1st Choice ✖ : 2nd Choice

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron								○	●			●
	S exotic alloy									●			●
	H hardened steel	○	☺	☹	☹	●	☺	☹					
	sintered component									●			●

CBN

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs	No. of C	Nose Radius	Cutting Length	BNX	BNX	BNX	BN1	BN2	BN2	BN3	BN5	BN7	BN7	BN7	BN5
 Low Resistance Type	Sharp Edge	NU-TPGW 110302LF 110304LF 110308LF	NU-TPGW 110302F 110304F 110308F	1	1	0.2 0.4 0.8	2.6 2.5 2.2	—	—	—	—	—	—	—	—	●	●	—	—
		T-NU-TPGW 110302LF 110304LF 110308LF	T-NU-TPGW 110302F 110304F 110308F	10	1	0.2 0.4 0.8	2.6 2.5 2.2	—	—	—	—	—	—	—	—	—	—	—	—
 Fine Boring type	T01215	NU-TPGW 110302LT 110304LT 110308LT	NU-TPGW 110302S 110304S 110308S	1	1	0.2 0.4 0.8	2.6 2.5 2.2	●	—	—	—	●	▲	—	—	—	—	—	—
		T-NU-TPGW 110302LT 110304LT 110308LT	T-NU-TPGW 110302S 110304S 110308S	10	1	0.2 0.4 0.8	2.6 2.5 2.2	—	—	—	—	—	—	—	—	—	—	—	—
 Continuous cutting general type	S01225	NU-TPGW 110302LS 110304LS 110308LS	NU-TPGW 110302M 110304M 110308M	1	1	0.2 0.4 0.8	2.6 2.5 2.2	—	—	—	—	—	▲	—	—	—	—	—	—
		T-NU-TPGW 110302LS 110304LS 110308LS	T-NU-TPGW 110302M 110304M 110308M	10	1	0.2 0.4 0.8	2.6 2.5 2.2	—	—	—	—	—	—	—	—	—	—	—	—
 Strong edge type	S01235	NU-TPGW 110302HS 110304HS 110308HS	—	1	1	0.2 0.4 0.8	2.6 2.5 2.2	—	—	—	—	●	—	—	—	—	—	—	—

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

Positive Inserts

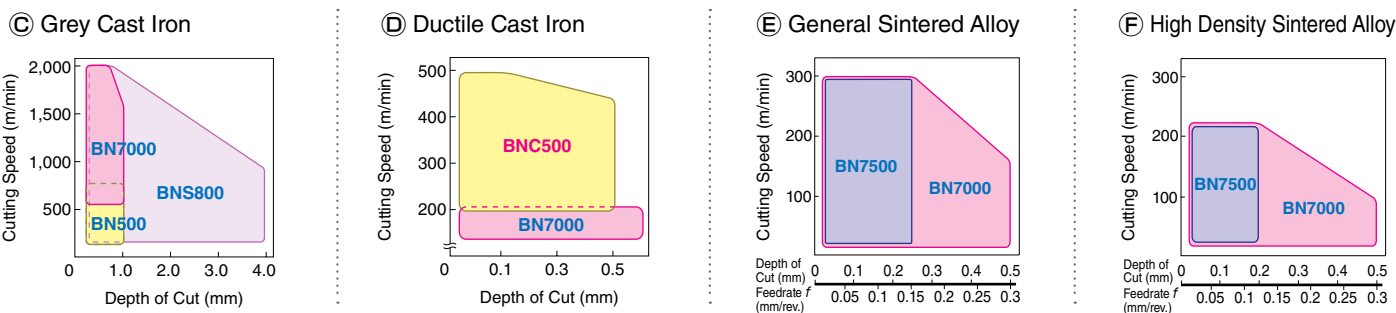
C

D

R

S

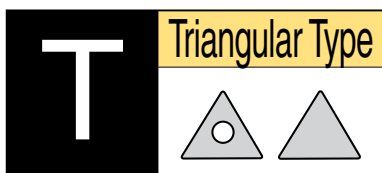
SUMIBORON Application Range Map



▲mark: To be replaced by new item (Please confirm stock availability)

L73

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

TPG 1103

Applicable holder ref. page, (Example)

I.C.: ø6.35 Thickness: 3.18 Hole: ø3.4

Applicable Internal Holders E24 to E26

Recommended Application	K cast iron	S exotic alloy	H hardened steel	simulated component	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
Continuous Cut	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Interrupted Cut	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	3NU-TPGW 110304 110308	—	1	3	0.4	2.5	●	●	●	●	●	●	●	●	●	●	●	●
	No edge treatment	3NU-TPGT 110304N-FV 110308N-FV	—	1	3	0.4	2.2	—	—	—	●	—	—	—	—	—	—	—	—
	Sharp Edge	3NU-TPGW 110302LF 110304LF 110308LF	—	1	3	0.2	2.6	—	—	—	—	—	—	—	—	—	—	—	—
	Honing	3NU-TPGW 110304LE	—	1	3	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—
	S00715	3NU-TPGW 110304LS	—	1	3	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—

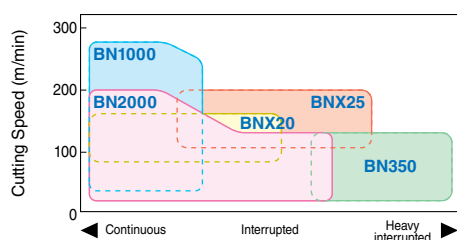
*For BNX25, use 3NS type code (3NS-TPGW) *Depth-of-cut for one-use type is 0.5mm or less

● 11° Positive Type (With Hole)

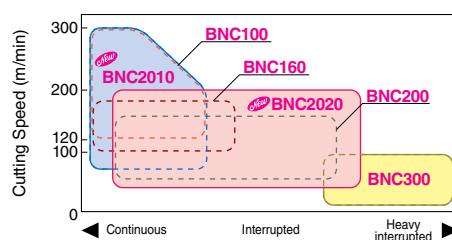
	Standard	TPGW 110304 110308	—	1	1	0.4	3.5	●	●	●	●	●	●	●	●	●	●	●	●
	S01235	TPGW 110304HS 110308HS	—	1	1	0.4	3.5	—	—	—	●	—	—	—	—	—	—	—	—

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



SUMIBORON Indexable Inserts

TPG 1103

Coated
SUMIBORON

Applicable holder ref. page, (Example)

Applicable Internal Holders **E24 to E26**

I.C.: $\phi 6.35$ Thickness: 3.18 Hole: $\phi 3.4$

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☺ : 1st Choice ☹ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱✱ : 2nd Choice

●=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component
	●	●	●	●

Coated CBN

Pcs./Pack	No. of Cutting Edges	Dimensions (mm)		BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500
		Nose Radius	Cutting Edge Length							
1	3	0.2	2.4	●	●					
		0.4	2.3	●	●	●	●	●	●	●
		0.8	2.0	●	●	●	●	●	●	●
1	3	0.4	2.2	●	●					
		0.8	1.9	●	●			●	●	
1	3	0.4	2.3			●	●	●		
		0.8	2.0			●	●	●		
1	3	0.4	2.3		●					
		0.8	2.0		●					

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.
	Standard	3NC-TPGW 110302 110304 110308	—
 Break Master	No edge treatment	3NC-TPGT 110304N-FV 110308N-FV	—
 Fine Boring type	BNC100 → S01715 BNC160 → S01020 BNC200 → S01015	3NC-TPGW 110304LS 110308LS	—
 Strong edge type	BNC2010 → S01730 BNC2020 → S02735 BNC300 → S01735 BNC160 → S01730 BNC200 → S01735 BNC500 → S01225	3NC-TPGW 110304HS 110308HS	—

Positive Inserts

C

D

R

S

T

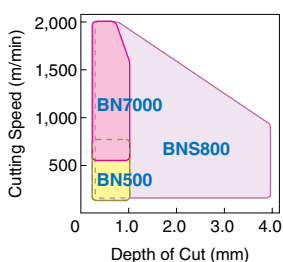
V

W

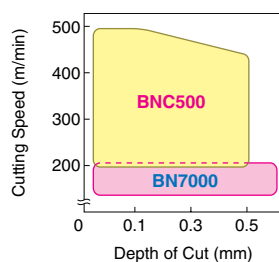
SUMIBORON

SUMIBORON Application Range Map

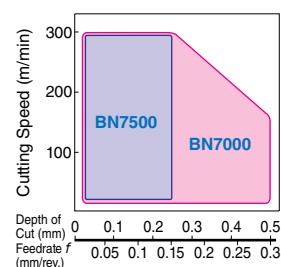
© Grey Cast Iron



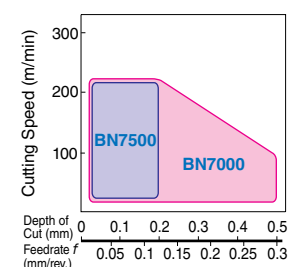
Ⓓ Ductile Cast Iron



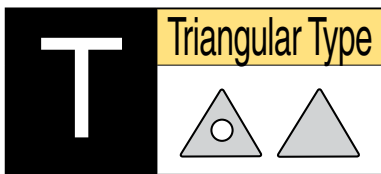
Ⓔ General Sintered Alloy



Ⓕ High Density Sintered Alloy



SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱ : 2nd Choice

TPGW1603●●

Applicable holder ref. page, (Example)

I.C.: ø9.525 Thickness: 3.18 Hole: ø4.4

(Special holder)

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-TPGW 160302 160304 160308	—	1	1	Nose Radius Cutting Edge Length	0.2 2.4 0.4 2.3 0.8 2.0	—	—	—	●	●	—	—	—	—	—	—
	S01225	NU-TPGW 160302LS 160304LS 160308LS	NU-TPGW 160302M 160304M 160308M	1	1	Nose Radius Cutting Edge Length	0.2 2.4 0.4 2.3 0.8 2.0	—	—	—	—	▲	—	—	—	—	—	—
	Continuous cutting general type	T-NU-TPGW 160302LS 160304LS 160308LS	T-NU-TPGW 160302M 160304M 160308M	10	1	Nose Radius Cutting Edge Length	0.2 2.4 0.4 2.3 0.8 2.0	—	—	—	—	—	—	—	—	—	—	—

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

TPGW1604●●

Applicable holder ref. page, (Example)

I.C.: ø9.525 Thickness: 4.76 Hole: ø4.4

Applicable Internal Holders E25

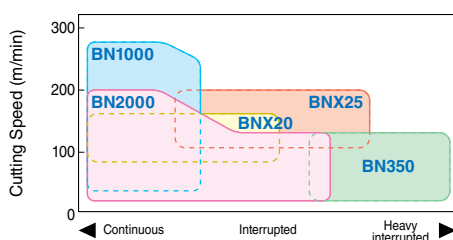
● One-use Type/11 ° Positive (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-TPGW 160402 160404 160408	—	1	1	Nose Radius Cutting Edge Length	0.2 2.6 0.4 2.5 0.8 2.2	●	●	—	●	▲	●	●	●	●	●	—
	Standard	T-NU-TPGW 160402 160404 160408	—	10	1	Nose Radius Cutting Edge Length	0.2 2.6 0.4 2.5 0.8 2.2	●	●	—	●	▲	●	●	●	●	●	—

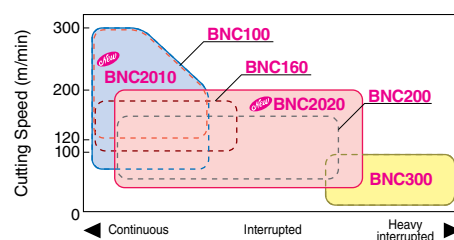
*For BNX25, use NS type code (NS-TPGW) *Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

A Uncoated SUMIBORON



B Coated SUMIBORON



SUMIBORON Indexable Inserts

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☺ : 1st Choice ☹ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱ : 2nd Choice

TPGW1604●●

Applicable holder ref. page, (Example)

Applicable Internal Holders **E25**

I.C.: ø9.525 Thickness: 4.76 Hole: ø4.4

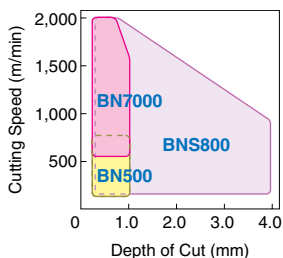
● One-use Type/11° Positive (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NS-TPGW 160402	—	1	1	Nose Radius	0.2	2.6	—	—	—	—	—	—	—	—	—	—
		160404				Radius	0.4	2.5	●	—	—	—	—	—	—	—	—	—
		160408				Length	0.8	2.2	●	—	—	—	—	—	—	—	—	—
		T-NS-TPGW 160402		10	1	Nose Radius	0.2	2.6	—	—	—	—	—	—	—	—	—	—
 Low Resistance Type	Sharp Edge	160404				Radius	0.4	2.5	●	—	—	—	—	—	—	—	—	—
		160408				Length	0.8	2.2	●	—	—	—	—	—	—	—	—	—
		T-NU-TPGW 160402LF				Nose Radius	0.2	2.6	—	—	—	—	—	—	—	—	—	—
 Fine Boring type	T01215	160404LF		1	1	Radius	0.4	2.5	—	—	—	—	—	—	—	—	—	—
		160408LF				Length	0.8	2.2	—	—	—	—	—	—	—	—	—	—
		T-NU-TPGW 160402LF		10	1	Nose Radius	0.2	2.6	—	—	—	—	—	—	—	—	—	—
		160404LF				Radius	0.4	2.5	—	—	—	—	—	—	—	—	—	—
 Continuous cutting general type	S01225	160408LF				Length	0.8	2.2	—	—	—	—	—	—	—	—	—	—
		NU-TPGW 160402LT		1	1	Nose Radius	0.2	2.6	—	—	—	—	—	—	—	—	—	—
		160404LT				Radius	0.4	2.5	●	—	—	—	—	—	—	—	—	—
		160408LT				Length	0.8	2.2	●	—	—	—	—	—	—	—	—	—
 Strong edge type	S01235	T-NU-TPGW 160402LT		10	1	Nose Radius	0.2	2.6	—	—	—	—	—	—	—	—	—	—
		160404LT				Radius	0.4	2.5	—	—	—	—	—	—	—	—	—	—
		160408LT				Length	0.8	2.2	—	—	—	—	—	—	—	—	—	—
		NU-TPGW 160404LS		1	1	Nose Radius	0.4	2.5	—	—	—	—	—	—	—	—	—	—
 Strong edge type	S01235	160408LS				Radius	0.8	2.2	—	—	—	—	—	—	—	—	—	—
		160412LS				Length	1.2	2.2	—	—	—	—	—	—	—	—	—	—
		T-NU-TPGW 160404LS		10	1	Nose Radius	0.4	2.5	—	—	—	—	—	—	—	—	—	—
		160408LS				Radius	0.8	2.2	—	—	—	—	—	—	—	—	—	—
		160412LS				Length	1.2	2.2	—	—	—	—	—	—	—	—	—	—
		NU-TPGW 160404HS		1	1	Nose Radius	0.4	2.5	—	—	—	—	—	—	—	—	—	—
 Strong edge type	S01235	160408HS				Radius	0.8	2.5	—	—	—	—	—	—	—	—	—	—
						Length	0.8	2.5	—	—	—	—	—	—	—	—	—	—
									●	—	—	—	—	—	—	—	—	—

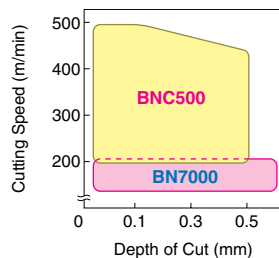
*Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

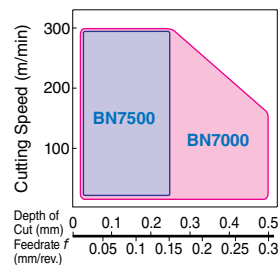
© Grey Cast Iron



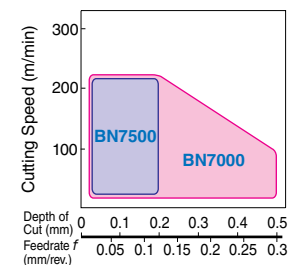
① Ductile Cast Iron



② General Sintered Alloy



③ High Density Sintered Alloy



▲mark: To be replaced by new item (Please confirm stock availability)

L77

Positive Inserts

C

D

R

S

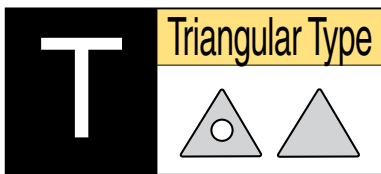
T

V

W

SUMIBORON

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☉ : 1st Choice ☼ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱✱ : 2nd Choice

TPGW1604

●●

Applicable holder ref. page, (Example)

I.C.: ø9.525 Thickness: 4.76 Hole: ø4.4

Applicable Internal Holders
E25

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN7500	BNS800
●▲=1 piece pack and 10 pieces pack both Stocked															
●▲=1 piece pack Stocked															

● 11° Positive Type (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN7500	BN7500	BNS800
	Standard	TPGW 160404 160408 160412	—	1	1	Nose Radius Cutting Edge Length	0.4 3.5 0.8 3.2 1.2 2.9	●			●	▲		▲				
	S01235	TPGW 160404HS 160408HS	—	1	1	0.4 3.5 0.8 3.5	—	—	—	—	●	—	—	—	—	—	—	—

TPGW1604

●●

Applicable holder ref. page, (Example)

I.C.: ø9.525 Thickness: 4.76 Hole: ø4.4

Applicable Internal Holders
E25

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN7500	BNS800
●=1 piece pack and 10 pieces pack both Stocked															
●▲=1 piece pack Stocked															

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

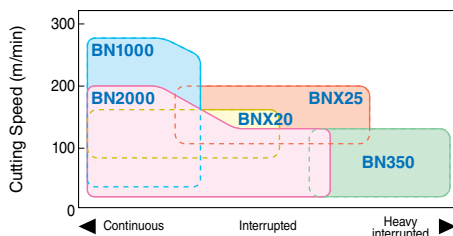
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN7500	BNS800
	Standard	3NC-TPGW 160402 160404 160408	—	1	3	Nose Radius Cutting Edge Length	0.2 2.4 0.4 2.3 0.8 2.0	●	●	●	●	●	●	●			
	BNC100 → S01715 BNC160 → S01020 BNC200 → S01015	3NC-TPGW 160404LS 160408LS	—	1	3	0.4 2.3 0.8 2.0				●	●	●					
	BNC2010 → S01730 BNC2020 → S02735 BNC300 → S01735 BNC160 → S01730 BNC200 → S01735 BNC500 → S01225	3NC-TPGW 160404HS 160408HS	—	1	3	0.4 2.3 0.8 2.0	●	●				●					

Coated CBN

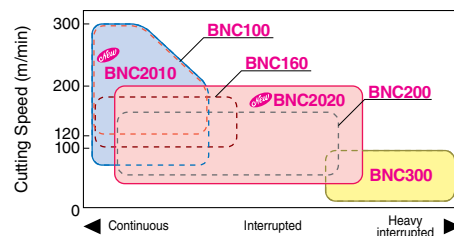
Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN7500	BNS800
●=1 piece pack and 10 pieces pack both Stocked															
●▲=1 piece pack Stocked															

SUMIBORON Application Range Map

A Uncoated SUMIBORON



B Coated SUMIBORON



SUMIBORON Indexable Inserts

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☺ : 1st Choice ☹ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

TPGN0902

I.C.: ø5.56 Thickness: 2.38 Hole: —

Applicable holder ref. page, (Example)

(Cartridge CP Type)

● 11 ° Positive Type (Without Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	TPGN 090204 090208	—	1	1	Nose Radius Cutting Edge Length	0.4 3.5 0.8 3.2	●			●	▲		●				
	S01235	TPGN 090204HS	—	1	1	0.4 3.5	—	—	—	—	●	—	—	—	—	—	—	—

TPGN1103

I.C.: ø6.35 Thickness: 3.18 Hole: —

Applicable holder ref. page, (Example)

Applicable Internal Holders E31

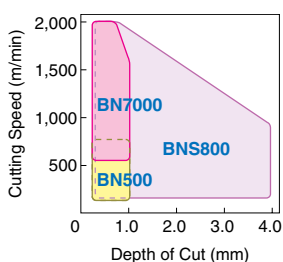
● One-use Type/11 ° Positive (Without Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-TPGN 110302 110304 110308 110312	—	1	1	Nose Radius Cutting Edge Length	0.2 2.4 0.4 2.3 0.8 2.0 1.2 2.0	●			●	▲	●	●	●	●		
		T-NU-TPGN 110302 110304 110308 110312	—	10	1	0.2 2.4 0.4 2.3 0.8 2.0 1.2 2.0	●	●		●	▲	●						
	T01215	NU-TPGN 110302LT 110304LT 110308LT	—	1	1	0.2 2.4 0.4 2.3 0.8 2.0	—	—	—	—	●	—	—	—	—	—	—	—

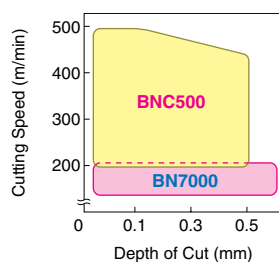
*For BNX25, use NS type code (NS-TPGN) *Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

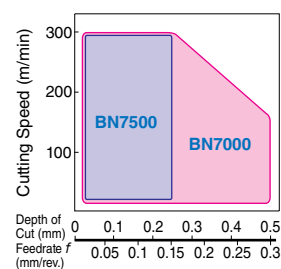
© Grey Cast Iron



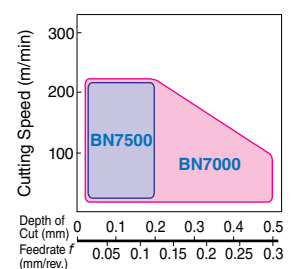
① Ductile Cast Iron



② General Sintered Alloy

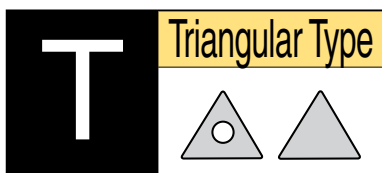


③ High Density Sintered Alloy



▲▲mark: To be replaced by new item (Please confirm stock availability)

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☉ : 1st Choice ☺ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱✱ : 2nd Choice

TPGN1103 ●●

Applicable holder ref. page, (Example)

I.C.: ø6.35 Thickness: 3.18 Hole: —

Applicable Internal Holders **E31**

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN7500	BNS800

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN7500	BNS800
	S01225	NU-TPGN 110302LS	NU-TPGN 110302M	1	1	0.2	2.4						▲					
		110304LS	110304M			0.4	2.3						▲					
		110308LS	110308M			0.8	2.0						▲					
	S01235	T-NU-TPGN 110302LS	T-NU-TPGN 110302M	10	1	0.2	2.4											
		110304LS	110304M			0.4	2.3											
		110308LS	110308M			0.8	2.0											
	S01235	NU-TPGN 110304HS	—	1	1	0.4	2.3					●						
		110308HS	—			0.8	2.0					●						

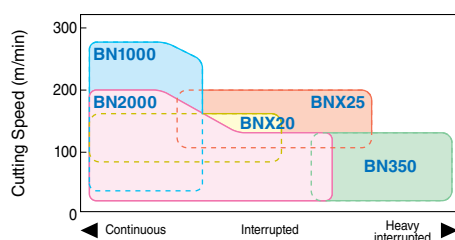
*Depth-of-cut for one-use type is 0.5mm or less

● 11 ° Positive Type (Without Hole)

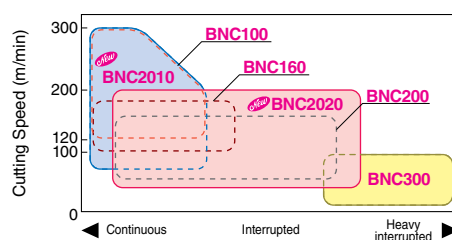
	Standard	TPGN 110304 110308	—	1	1	0.4	3.5	●				●	▲			●	●	—
						0.8	3.2					●	▲					
	S01235	TPGN 110304HS 110308HS	—	1	1	0.4	2.3					●						
						0.8	2.0					●						

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



SUMIBORON Indexable Inserts

TPGN1603●●

I.C.: ø9.525 Thickness: 3.18 Hole: —

Applicable holder ref. page, (Example)

Applicable External Holders C32Applicable Internal Holders E31

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☘ : 1st Choice ☙ : 2nd Choice Interrupted Cut ☒ : 1st Choice ☓ : 2nd Choice

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron								○	●				●
	S exotic alloy									●				●
	H hardened steel	○	☹	⚙	●	●	☹	⚙						
	sintered component									●			●	

CBN

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs	No. of Cu	Nose Radius	Cutting Length	BNX	BNXX	BNXX	BN11	BN22	BN22	BN33	BN55	BN77	BN77	BN77	BN77
	Standard	NU-TPGN 160302 160304 160308	—	1	1	0.2	2.4					●	●	▲	●	●	●		
						0.4	2.3	●		●	▲	●							
						0.8	2.0	●		●	▲	●							
		T-NU-TPGN 160302 160304 160308	—	10	1	0.2	2.4					●	▲						
						0.4	2.3	●				●	▲						
						0.8	2.0	●				●	▲						
 Fine Boring type	T01215	NU-TPGN 160304LT 160308LT	—	1	1	0.4	2.3	—	—	—	—	●	—	—	—	—	—	—	—
						0.8	2.0	—	—	—	—	●	—	—	—	—	—	—	—
 Continuous cutting general type	S01225	NU-TPGN 160302LS 160304LS 160308LS	NU-TPGN 160302M 160304M 160308M	1	1	0.2	2.4	—	—	—	—	—	▲	—	—	—	—	—	—
						0.4	2.3	—	—	—	—	▲	—	—	—	—	—	—	—
						0.8	2.0	—	—	—	—	▲	—	—	—	—	—	—	—
		T-NU-TPGN 160302LS 160304LS 160308LS	T-NU-TPGN 160302M 160304M 160308M	10	1	0.2	2.4	—	—	—	—	—	—	—	—	—	—	—	—
						0.4	2.3	—	—	—	—	—	—	—	—	—	—	—	—
						0.8	2.0	—	—	—	—	—	—	—	—	—	—	—	—
 Strong edge type	S01235	NU-TPGN 160304HS 160308HS	—	1	1	0.4	2.3	—	—	—	—	●	—	—	—	—	—	—	—
						0.8	2.0	—	—	—	—	●	—	—	—	—	—	—	—

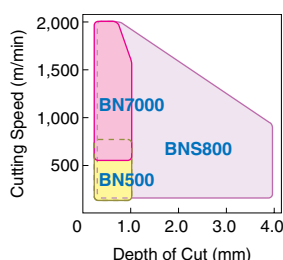
*For BNX25, use NS type code (NS-TPGN) *Depth-of-cut for one-use type is 0.5mm or less

● 11 ° Positive Type (Without Hole)

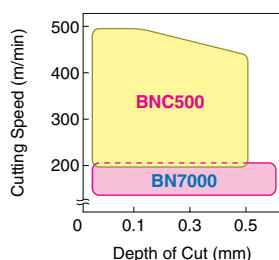
	Standard	TPGN 160304 160308 160312	—	1	1	0.4 0.8 1.2	3.5 3.2 2.9	● ●			● ●	▲ ▲	● ● ●			
 Strong edge type	S01235	TPGN 160304HS 160308HS	—	1	1	0.4 0.8	3.5 3.5	— —	— —	— —	● ●	— —	— —	— —	— —	— —

SUMIBORON Application Range Map

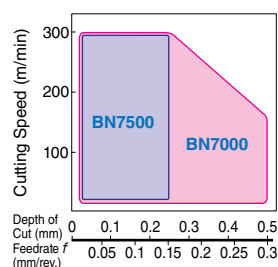
© Grey Cast Iron



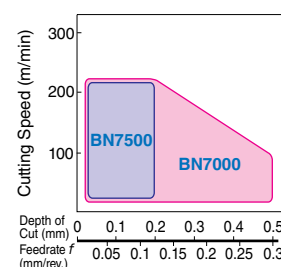
☒ Ductile Cast Iron



⑤ General Sintered Alloy

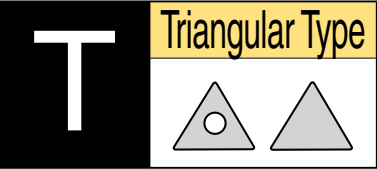


Ⓕ High Density Sintered Alloy



▲▲mark: To be replaced by new item (Please confirm stock availability)

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive				S01235	S01235	T01235								

TPGN2204●●

Applicable holder ref. page, (Example)

Applicable External Holders **C32**

I.C.: ø12.7 Thickness: 4.76 Hole: —

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ✖ : 1st Choice ✖ : 2nd Choice

●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

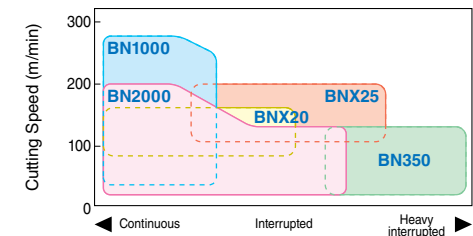
Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component										

● 11 ° Positive Type (Without Hole)

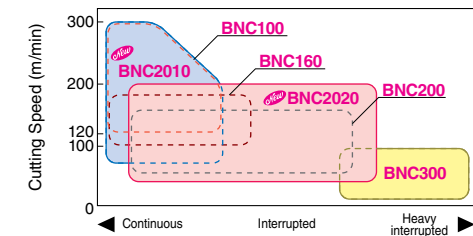
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	TPGN 220408	—	1	1	0.8	3.2	●				●	▲						
	S01235	TPGN 220408HS	—	1	1	0.8	3.2	—	—	—	—	●	—	—	—	—	—	—	—

SUMIBORON Application Range Map

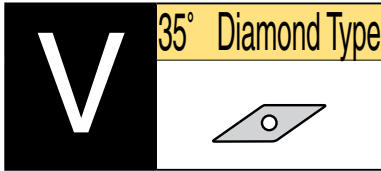
① Uncoated SUMIBORON



② Coated SUMIBORON



SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☉ : 1st Choice ☺ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN7500	BNS800
	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★
	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆

VN 1604 Applicable holder ref. page, (Example)

I.C.: ø9.525 Thickness: 4.76 Hole: ø3.81

Applicable External Holders **C26**

● One-use Type/Negative (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN7500	BNS800
	Standard	NU-VNMA 160401	—	1	1	0.1	3.5	●	●	—	●	●	●	●	●	●	●	●
		160402				0.2	3.3	●	●	—	●	●	●	●	●	●	●	●
		160404				0.4	2.8	●	●	—	●	●	●	●	●	●	●	●
		160408				0.8	2.0	●	●	—	●	●	●	●	●	●	●	●
		160412				1.2	1.7	●	●	—	●	●	●	●	●	●	●	●
		T-NU-VNMA 160401		10	1	0.1	3.5	●	●	—	●	●	●	●	●	●	●	●
	Standard	160402				0.2	3.3	●	●	—	●	●	●	●	●	●	●	●
		160404				0.4	2.8	●	●	—	●	●	●	●	●	●	●	●
		160408				0.8	2.0	●	●	—	●	●	●	●	●	●	●	●
		160412				1.2	1.7	●	●	—	●	●	●	●	●	●	●	●
		T-NS-VNMA 160404		10	1	0.4	2.8	—	●	—	—	—	—	—	—	—	—	—
	Standard	160408				0.8	2.0	—	●	—	—	—	—	—	—	—	—	—
		2NS-VNMA 160404				0.4	2.8	—	●	—	—	—	—	—	—	—	—	—
		160408				0.8	2.0	—	●	—	—	—	—	—	—	—	—	—
		T-2NS-VNMA 160404				0.4	2.8	—	●	—	—	—	—	—	—	—	—	—
		160408				0.8	2.0	—	●	—	—	—	—	—	—	—	—	—

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

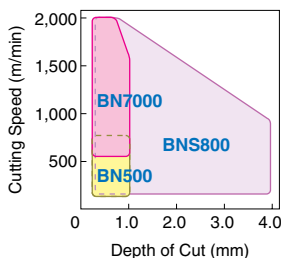
● Multi-cornered,One-use Type/Negative (With Hole)

	Standard	2NU-VNGA 160404	—	1	2	0.4	2.8	●	—	●	●	●	●	●	●	●	●	●
		160408				0.8	2.0	●	—	●	●	●	●	●	●	●	●	●
		T-2NU-VNGA 160404		10	2	0.4	2.8	●	—	●	●	●	●	●	●	●	●	●
		160408				0.8	2.0	●	—	●	●	●	●	●	●	●	●	●
	Standard	2NS-VNGA 160404	—	1	2	0.4	2.8	—	●	—	—	—	—	—	—	—	—	—
		160408				0.8	2.0	—	●	—	—	—	—	—	—	—	—	—
		T-2NS-VNGA 160404		10	2	0.4	2.8	—	●	—	—	—	—	—	—	—	—	—
		160408				0.8	2.0	—	●	—	—	—	—	—	—	—	—	—

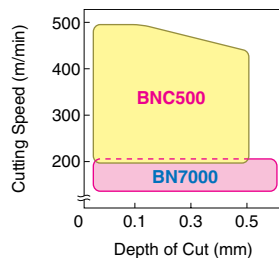
*For BNX25, use 2NS type code (2NS-VNGA) *Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

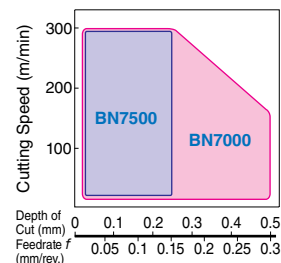
© Grey Cast Iron



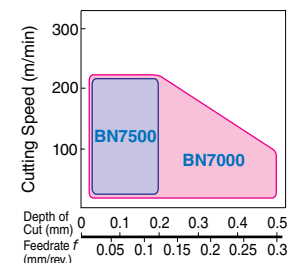
① Ductile Cast Iron



② General Sintered Alloy

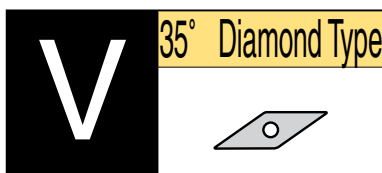


③ High Density Sintered Alloy



▲▲mark: To be replaced by new item (Please confirm stock availability)

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

VN

1604

●●

Applicable holder ref. page, (Example)
 Applicable External Holders **C26**

I.C.: ø9.525 Thickness: 4.76 Hole: ø3.81

Recommended Application	K cast iron	S exotic alloy	H hardened steel	simulated component	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN7500	BNS800
●▲=1 piece pack and 10 pieces pack both Stocked ▲=1 piece pack Stocked															

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN7500	BNS800
	S00535	2NU-VNGM 160404N-LV 160408N-LV	—	1	2	0.4	2.8	—	—	—	—	●	—	—	—	—	—	—
	T01215	2NU-VNGA 160404LT 160408LT	—	1	2	0.4	2.8	—	—	—	—	●	—	—	—	—	—	—
	T01235	2NU-VNGA 160404HT 160408HT	2NU-VNGA 160404T 160408T	1	2	0.4	2.8	—	—	—	—	—	●	—	—	—	—	—
	T01235	T-2NU-VNGA 160404HT 160408HT	T-2NU-VNGA 160404T 160408T	10	2	0.4	2.8	—	—	—	—	—	—	—	—	—	—	—
	BN2000 → S01235 BN7000 → S01225 BN700 → S01225 BN7500 → S00525	2NU-VNGA 160404HS 160408HS	2NU-VNGA 160404T 160408T	1	2	0.4	2.8	—	—	—	—	●	—	—	—	—	—	—
	BN2000 → S01235 BN7000 → S01225 BN700 → S01225 BN7500 → S00525	T-2NU-VNGA 160404HS 160408HS	T-2NU-VNGA 160404T 160408T	10	2	0.4	2.8	—	—	—	—	—	—	—	—	—	—	—

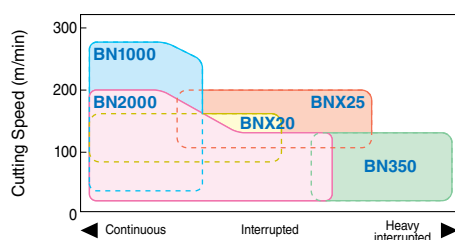
*Depth-of-cut for one-use type is 0.5mm or less

● Negative Type (With Hole)

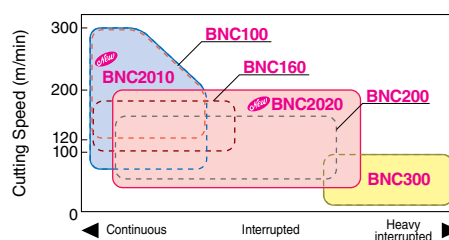
	Standard	VNMA 160404 160408	—	1	1	0.4	5.0	●	—	—	—	●	▲	—	—	—	—	—
						0.8	4.1	●	—	—	—	●	▲	—	—	—	—	—

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



▲mark: To be replaced by new item (Please confirm stock availability)

SUMIBORON Indexable Inserts

VNG 1604

Coated
SUMIBORON

Applicable holder ref. page, (Example)

Applicable External Holders C26

I.C.: $\phi 9.525$ Thickness: 4.76 Hole: $\phi 3.81$

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☺ : 1st Choice ☹ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱ : 2nd Choice

●=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component
	●	○	○	○

Coated CBN

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500
						Nose Radius							
						Cutting Edge Length							
	Standard	2NC-VNGA 160404 160408 160412	—	1	2	0.4 2.8	●	●				●	
						0.8 2.0	●	●				●	
						1.2 1.7							
	Standard	4NC-VNGA 160404 160408 160412	—	1	4	0.4 2.8	●	●	●	●	●	●	●
						0.8 2.0	●	●	●	●	●	●	●
						1.2 1.7							
	No edge treatment	4NC-VNGG 160404N-FV 160408N-FV	—	1	4	0.4 2.8	●	●	—	—	●	●	—
						0.8 2.0	●	●	—	—	●	●	—
	S00535	4NC-VNGG 160404N-LV 160408N-LV	—	1	4	0.4 2.8	●	●	—	—	●	●	—
						0.8 2.0	●	●	—	—	●	●	—
	Fine Boring type	4NC-VNGA 160404LS 160408LS 160412LS	—	1	4	0.4 2.8				●	●	●	
						0.8 2.0				●	●	●	
						1.2 1.7					●	●	
	Strong edge type	4NC-VNGA 160404HS 160408HS 160412HS	—	1	4	0.4 2.8	●	●	●	●	●	●	●
						0.8 2.0	●	●	●	●	●	●	●
						1.2 1.7	●	●			●	●	

L

Negative Inserts

C

D

R

S

T

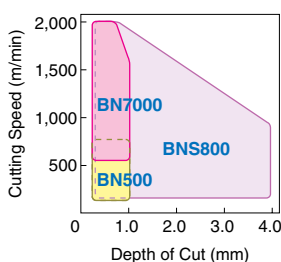
V

W

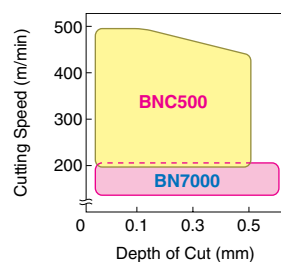
SUMIBORON

SUMIBORON Application Range Map

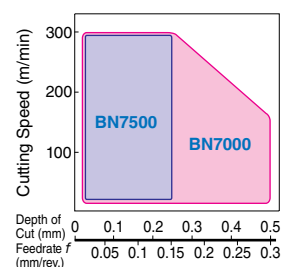
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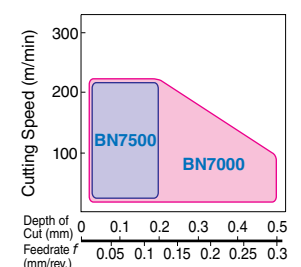
① Ductile Cast Iron



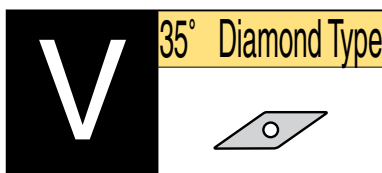
③ General Sintered Alloy



④ High Density Sintered Alloy



SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160 BNC300	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

VBGW1103 ●●
I.C.: ø6.35 Thickness: 3.18 Hole: ø2.8

Applicable holder ref. page, (Example)

Applicable Internal Holders **E55, 56, 58, 59**

Recommended Application	●▲=1 piece pack and 10 pieces pack both Stocked	●▲=1 piece pack Stocked
K cast iron		○●
S exotic alloy		●
H hardened steel	○●	●
stirred component	○●	●

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-VBGW 110302 110304 110308	—	1	1	0.2 3.2 0.4 2.8 0.8 2.0				●	●				●	●		
		T-NU-VBGW 110302 110304 110308	—	10	1	0.2 3.2 0.4 2.8 0.8 2.0												
		NU-VBGW 110302LT 110304LT 110308LT	—	1	1	0.2 3.2 0.4 2.8 0.8 2.0					●							
	T01215	NU-VBGW 110302LS 110304LS 110308LS	NU-VBGW 110302M 110304M 110308M	1	1	0.2 3.2 0.4 2.8 0.8 2.0					▲							
		T-NU-VBGW 110302LS 110304LS 110308LS	T-NU-VBGW 110302M 110304M 110308M	10	1	0.2 3.2 0.4 2.8 0.8 2.0												
	S01235	NU-VBGW 110302HS 110304HS 110308HS	—	1	1	0.2 3.2 0.4 2.8 0.8 2.0				●								

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

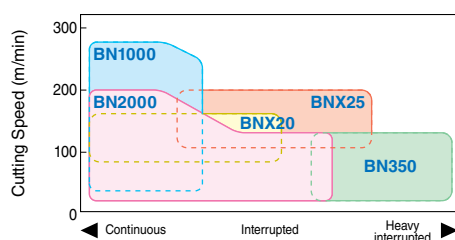
● Multi-cornered, One-use Type/5 ° Positive (With Hole)

	Standard	2NU-VBGW 110304 110308	—	1	2	0.4 2.8 0.8 2.0									●			
--	----------	---------------------------	---	---	---	--------------------	--	--	--	--	--	--	--	--	---	--	--	--

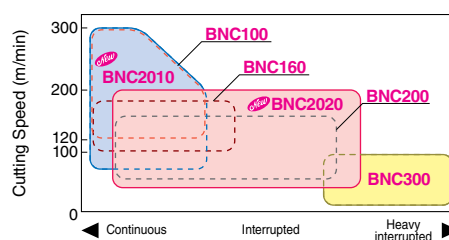
*Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



SUMIBORON Indexable Inserts

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☺ : 1st Choice ☹ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

VBGW1103

Coated SUMIBORON

Applicable holder ref. page, (Example)
 Applicable Internal Holders **E55, 56, 58, 59**

I.C.: ø6.35 Thickness: 3.18 Hole: ø2.8

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs	No. of	Nose Radi	Cutting Length	BNC	BNC	BNC	BNC	BNC	BNC	BNC
	Standard	2NC-VBGW 110302 <i>NEW</i> 110304 110308	—	1	2	0.2	3.2	●	●					
						0.4	2.8	●	●					
						0.8	2.0	●	●					

VBGW1604

(Special holder)

Applicable holder ref. page, (Example)
 (Special holder)

I.C.: ø9.525 Thickness: 4.76 Hole: ø4.4

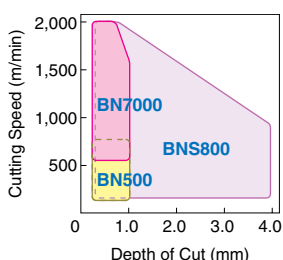
● One-use Type/5° Positive (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs	No. of C	Nose Radius	Cutting Length	BNX	BNX	BNX	BN1	BN2	BN2	BN3	BN5	BN7	BN7	BN7	BNS
	Standard	NU-VBGW 160402 160404 160408	—	1	1	0.2 0.4 0.8	3.8 3.3 2.5				●	●							
 Fine Boring type	T01215	NU-VBGW 160402LT 160404LT 160408LT	—	1	1	0.2 0.4 0.8	3.8 3.3 2.5	—	—	—	—	●	●						
 Continuous cutting general type	S01225	NU-VBGW 160402LS 160404LS 160408LS	NU-VBGW 160402M 160404M 160408M	1	1	0.2 0.4 0.8	3.8 3.3 2.5	—	—	—	—		▲	—					
		T-NU-VBGW 160402LS 160404LS 160408LS	T-NU-VBGW 160402M 160404M 160408M	10	1	0.2 0.4 0.8	3.8 3.3 2.5	—	—	—	—	—		—					
 Strong edge type	S01235	NU-VBGW 160404HS 160408HS	—	1	1	0.4 0.8	3.3 2.5	—	—	—		●	●						

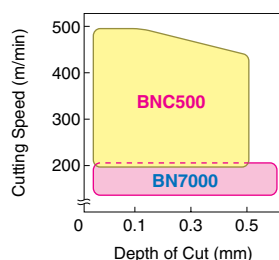
*Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

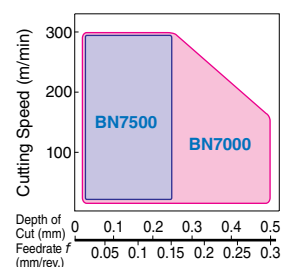
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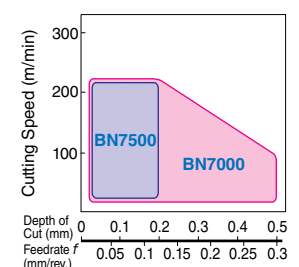
① Ductile Cast Iron



② General Sintered Alloy

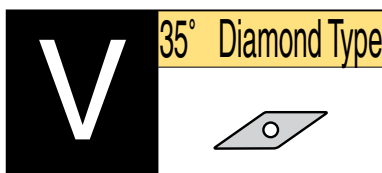


③ High Density Sintered Alloy



▲mark: To be replaced by new item (Please confirm stock availability)

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱ : 2nd Choice

VBGW1604 ●●

I.C.: ø9.525 Thickness: 4.76 Hole: ø4.4

Applicable holder ref. page, (Example)

(Special holder)

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	CBN
	Standard	2NU-VBGW 160404 160408	—	1	2	0.4	3.3	BNX10 BNX20 BNX25 BN1000 BN2000 BN250 BN350 BN500 BN7000 BN700 BN7500 BNS800
						0.8	2.5	

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

VBGW1604 ●● Coated SUMIBORON

I.C.: ø9.525 Thickness: 4.76 Hole: ø4.4

Applicable holder ref. page, (Example)

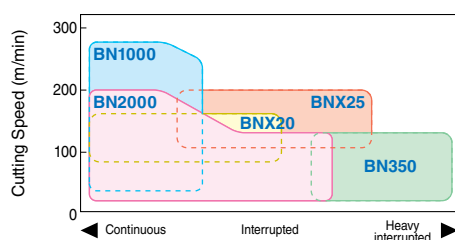
(Special holder)

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

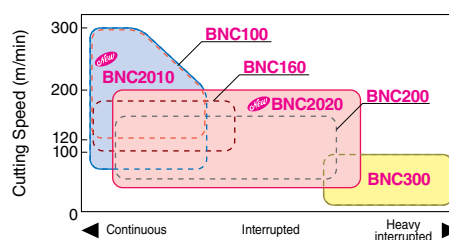
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	Coated CBN
	Standard	2NC-VBGW 160402 <i>New</i> 160404 160408	—	1	2	0.2	3.8	BNC2010 BNC2020 BNC300 BNC100 BNC160 BNC200 BNC500
						0.4	3.3	
						0.8	2.5	

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☹ : 1st Choice ☺ : 2nd Choice Interrupted Cut ⚙ : 1st Choice ⚙ : 2nd Choice

I.C.: $\varnothing 4.76$ Thickness: 2.38 Hole: $\varnothing 2.3$

Applicable Internal Holders E55, 57, 58, 60

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs	No. of Cl	Nose Radi	Cutting Length	BNX	BNX	BNX	BN1	BN2	BN2	BN3	BN5	BN7	BN7	BN7	BN9
	Standard	NU-VCGW 080202 080204 080208	—	1	1	0.2 0.4 0.8	3.3 2.8 2.0			—		●	●	●					
 Fine Boring type	T01215	NU-VCGW 080202LT 080204LT 080208LT	—	1	1	0.2 0.4 0.8	3.3 2.8 2.0	—	—	—	—	●	●	●					
 Continuous cutting general type	S01225	NU-VCGW 080202LS 080204LS 080208LS	NU-VCGW 080202M 080204M 080208M	1	1	0.2 0.4 0.8	3.3 2.8 2.0	—	—	—	—		▲	▲	▲				
		T-NU-VCGW 080202LS 080204LS 080208LS	T-NU-VCGW 080202M 080204M 080208M	10	1	0.2 0.4 0.8	3.3 2.8 2.0	—	—	—	—	—							
 Strong edge type	S01235	NU-VCGW 080204HS 080208HS	—	1	1	0.4 0.8	2.8 2.0	—	—	—	—	●	●						

Positive Inserts

C

D

R

S

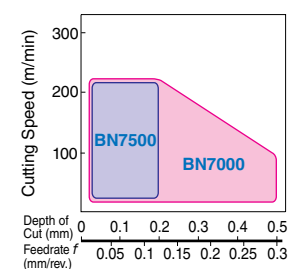
T



v

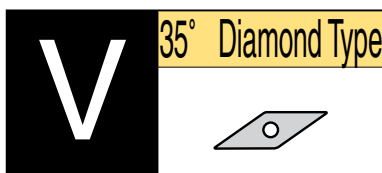
SUMIBORON

Ⓕ High Density Sintered Alloy



L89

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱ : 2nd Choice

VCGW1103

Applicable holder ref. page, (Example)

Applicable External Holders **C30, D15, 18, 31**

Applicable Internal Holders **E57 to E60**

I.C.: ø6.35 Thickness: 3.18 Hole: ø2.8

Recommended Application	●▲=1 piece pack and 10 pieces pack both Stocked	●▲=1 piece pack Stocked
K cast iron		
S exotic alloy		
H hardened steel		
simulated component		

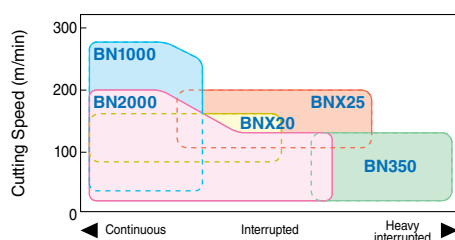
● One-use Type/7 ° Positive (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-VCGW 110302 110304	—	1	1	0.2	3.3				●	●	▲						
		T-NU-VCGW 110302 110304	—	10	1	0.2	3.3				●	●	▲						
	S01225	NU-VCGW 110302LS 110304LS	NU-VCGW 110302M 110304M	1	1	0.2	3.3						▲						
		T-NU-VCGW 110302LS 110304LS	T-NU-VCGW 110302M 110304M	10	1	0.2	3.3												
	S01235	NU-VCGW 110302HS 110304HS	—	1	1	0.2	3.3				●								
						0.4	2.8				●								

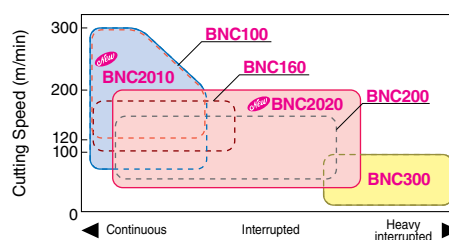
*For BNX25, use NS type code (NS-VCGW) *Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



▲mark: To be replaced by new item (Please confirm stock availability)

SUMIBORON Indexable Inserts

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ☉ : 1st Choice ☼ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱ : 2nd Choice

VCGW1604

I.C.: ø9.525 Thickness: 4.76 Hole: ø4.4

Applicable holder ref. page, (Example)

Applicable Internal Holders **E55, 56**

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

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-VCGW 160404 160408	—	1	1	Nose Radius 0.4 5.2 Cutting Edge Length 0.8 4.3								●				
		T-NU-VCGW 160404 160408	—	10	1	Nose Radius 0.4 5.2 Cutting Edge Length 0.8 4.3												

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

● 7 ° Positive Type (With Hole)

	Standard	VCMW 160404 160408	—	1	1	Nose Radius 0.4 5.2 Cutting Edge Length 0.8 4.3	●							●				
--	----------	-------------------------------------	---	---	---	--	---	--	--	--	--	--	--	---	--	--	--	--

VCGW1604

I.C.: ø9.525 Thickness: 4.76 Hole: ø4.4

Coated SUMIBORON

Applicable holder ref. page, (Example)

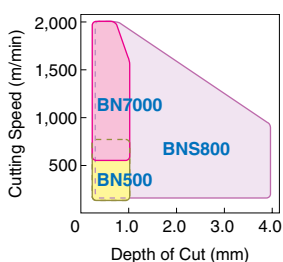
Applicable Internal Holders **E55, 56**

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

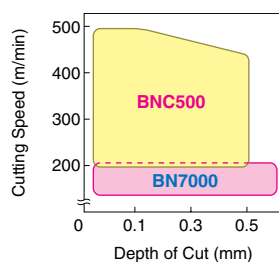
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Dimensions (mm)	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500
	Standard	2NC-VCGW 160404 160408	—	1	2	Nose Radius 0.4 2.8 Cutting Edge Length 0.8 1.9	●	●	●	●	●	●	
	BNC100 → S01715 BNC160 → S01020 BNC200 → S01015	2NC-VCGW 160404LS 160408LS	—	1	2	Nose Radius 0.4 2.8 Cutting Edge Length 0.8 1.9				●	●	●	
	BNC2010 → S01730 BNC2020 → S02735 BNC300 → S01735 BNC160 → S01730 BNC200 → S01735 BNC500 → S01225	2NC-VCGW 160404HS 160408HS	—	1	2	Nose Radius 0.4 2.8 Cutting Edge Length 0.8 1.9	●	●			●	●	

SUMIBORON Application Range Map

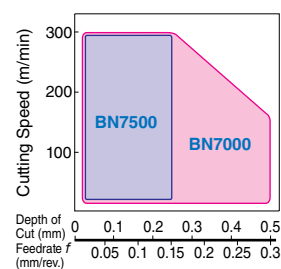
© Grey Cast Iron



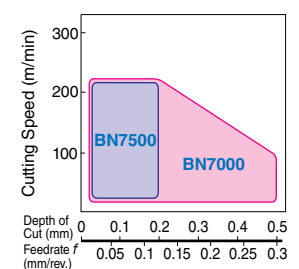
① Ductile Cast Iron



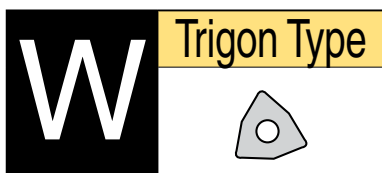
② General Sintered Alloy



③ High Density Sintered Alloy



SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ✱ : 1st Choice ✱ : 2nd Choice

WNMA0804

I.C.: ø12.7 Thickness: 4.76 Hole: ø5.16

Applicable holder ref. page, (Example)

Applicable External Holders **C27**

Applicable Internal Holders **E47, 48**

▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
									●	▲						
									●	▲						

● One-use Type/Negative (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	NU-WNMA 080404 080408	—	1	1	0.4	3.3					●	▲						
		T-NU-WNMA 080404 080408	—	10	1	0.8	2.8												
						0.8	2.8												

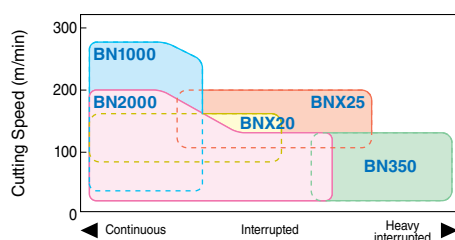
*For BNX25, use NS type code (NS-WNMA) *Depth-of-cut for one-use type is 0.5mm or less

● Negative Type (With Hole)

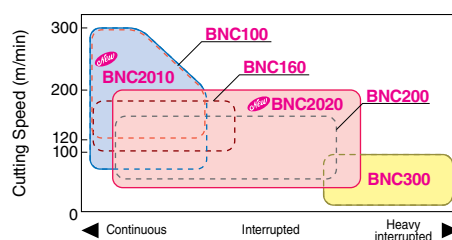
Appearance	Cutting edge specification	Cat. No.	Old Cat. No.	Pcs./Pack	No. of Cutting Edges	Nose Radius	Dimensions (mm)	BNX10	BNX20	BNX25*	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BNS800
	Standard	WNMA 080404 080408 080412	—	1	1	0.4	4.5	●											
						0.8	4.4	●											
						1.2	4.3												

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



▲mark: To be replaced by new item (Please confirm stock availability)

Negative Inserts

C

D

R

S

T

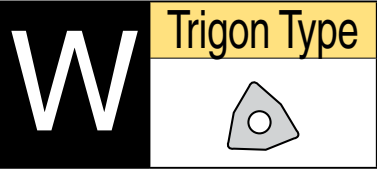
V

W

S
T
V
W

L93

SUMIBORON Indexable Inserts



Standard Cutting Edge Specification (Refer to L26 to L27 for details on symbols.)

	BNX10	BNX20	BNX25	BN1000 BN2000	BN250	BN350	BN2010 BN2020	BNC100 BNC160	BNC200 BNC300	BNC500	BN500	BN7000 BN700	BN7500	BNS800
Negative	T01225	S01225	S01725	S01225	S01225	T01225	S01225	S01225	S01225	S01215	T01215	T01215	T01215	T02020
Positive					S01235	T01235								

Legend: Continuous Cut ● : 1st Choice ○ : 2nd Choice Medium Cut ● : 1st Choice ○ : 2nd Choice Interrupted Cut ★ : 1st Choice ☆ : 2nd Choice

▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Recommended Application	K cast iron	S exotic alloy	H hardened steel	sintered component										

CBN																			
Pcs./Pack	No. of Cutting Edges	Dimensions (mm)		BNX10	BNX20	BNX25	BN1000	BN2000	BN250	BN350	BN500	BN7000	BN700	BN7500	BN7500	BN7500	BN7500	BN7500	BN7500
		Nose Radius	Cutting Edge Length																
1	1	0.2	1.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	1	0.2	1.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	1	0.2	1.3	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	1	0.2	1.3	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	1	0.4	1.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	1	0.4	1.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

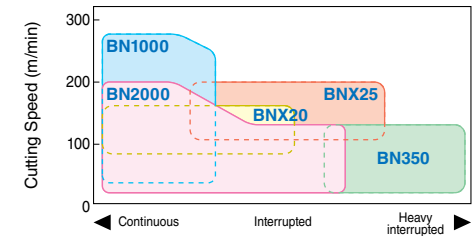
● One-use Type/5 ° Positive (With Hole)

Appearance	Cutting edge specification	Cat. No.	Old Cat. No.
 Low Resistance Type	Sharp Edge	NU-WBEW 060102L-LF 060104L-LF	NU-WBEW 060102L-F 060104L-F
		T-NU-WBEW 060102L-LF 060104L-LF	T-NU-WBEW 060102L-F 060104L-F
 Fine Boring type	T00715	NU-WBEW 060102L-LT 060104L-LT	NU-WBEW 060102L-S 060104L-S
		T-NU-WBEW 060102L-LT 060104L-LT	T-NU-WBEW 060102L-S 060104L-S

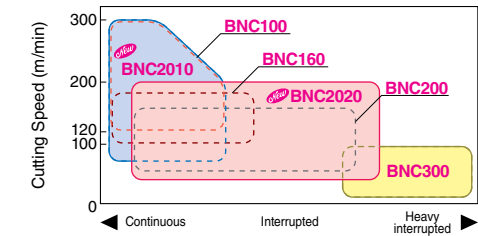
*Depth-of-cut for one-use type is 0.5mm or less

SUMIBORON Application Range Map

① Uncoated SUMIBORON



② Coated SUMIBORON



●▲=1 piece pack and 10 pieces pack both Stocked ●▲=1 piece pack Stocked

Applicable Internal Holders E21, 68[illegible]

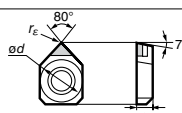






SUMIBORON Indexable Inserts

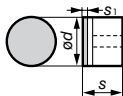
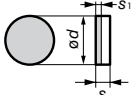
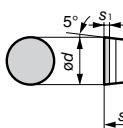
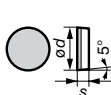
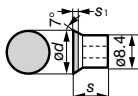
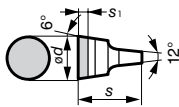
Turning Insert

Appearance	Shape	Cat. No.	Stock								Dimension (mm)				Applicable Holder	
			BN1000	BN2000	BN250	BNX20	BN350	BNX25 *	BNX10	BN500	BN7000	BN700	Inscribed Circle (ød)	Thickness (s)		Nose Radius (r _ε)
		NU-ZNEX 040102	●	●	▲					●	●	4.76	1.59	0.2	2.3	SUMIBORON Small Hole Boring Bar BNZ Type → L104
		NU-ZNEX 040104	●	●	▲					●	●			0.4		
		T-NU-ZNEX 040102		●	▲									0.2		
		T-NU-ZNEX 040104		●	▲									0.4		

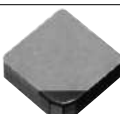
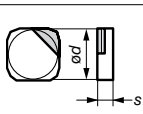
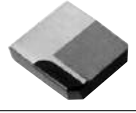
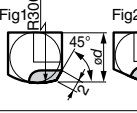
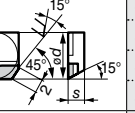
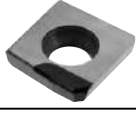
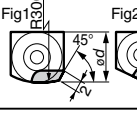
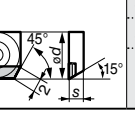
* BNX25, use NS type code (NS-ZNEX).

* T-NU-ZNEX is a 10 pieces pack.

Round Insert

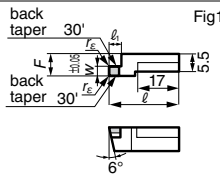
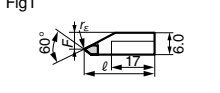
Appearance	Shape	Cat. No.	Stock										Dimension (mm)			Fig	Applicable Holder
			BN1000	BN2000	BN250	BNX20	BN350	BNX25	BNX10	BN500	BN7000	BN700	BN5800	Inscribed Circle (ød)	Thickness (s)		
	Fig1 	RNGA 0906M0		●	●	●							9.00	6.35	0.80	1	SUMIBORON Tool Holder for Round Insert (PRGN Type) → L109
	Fig1  Fig2 	RNGN 120400-B								●	●		12.70	4.76	0.80	1	Special Holder
		RNGN 150400-B											15.88				
		RNGN 090300	—	—	—	—	—	—	—	—	—	●	9.525				Tool Holder for Solid SUMIBORON (CRDN, CRSN Types) → L99
		RNGN 090300 LF	—	—	—	—	—	—	—	—	—	●		3.18	3.18		
		RNGN 120300	—	—	—	—	—	—	—	—	—	●	12.70				
		RNGN 120300 LF	—	—	—	—	—	—	—	—	—	●					
	Fig1 	RNGN 120400	—	—	—	—	—	—	—	—	●	12.70	4.76	4.76		SUMIBORON Tool Holder for Roll Turning (BNRN Type) → L110	
		RBG 08-B									●	●	8.00	6.50			0.80
		RBG 10-B									●	●	10.00	9.00			
		RBG 12-B									●	●	12.00	11.00			
		RBG 16-B									●	●	16.00	13.00			
		RBG 20-B									●	●	20.00	15.00			
	Fig1 	RBG 26-B								●	●	26.00	15.00				
		RBGN 12S3M0-B				▲						12.00			0.80	1	SUMIBORON Tool Holder for Roll Turning (BNR Type)
		RBGN 16S3M0-B									16.00	3.60					
		RBGN 20S3M0-B									20.00						
RBGN 29S3M0-B									29.00								
	Fig1 	RCGA 0906M0		●	●							9.00	6.35	0.80	1	SUMIBORON Tool Holder for Small Round Insert (PRGC, PRDC Types) → L109	
	Fig1 	RTGN 0508M0				●						5.00	7.50		0.80	1	SUMIBORON Tool Holder for Small Round Insert (TRGT Type) → L108
		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

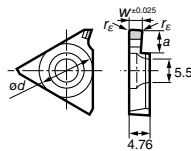
Appearance	Shape	Cat. No.	Stock					Dimension (mm)		Fig	Applicable Cutter
			BN1000	BN2000	BN250	BN7000	BN700	Inscribed Circle (ød)	Thickness (s)		
	Fig1 	CSN 43MT		●	●			12.70	4.76	1	SEC-ACE Mill DNF Type → H46
	Fig1  Fig2 	SNEN 1504ADTR				●	●	15.875	4.76	1	BN Finish Mill FM, FMF Types → L116
		SNEN 1504ADTL				●	●				
		SNEN 1504ADTR-S				●	●	15.875	4.76	2	
		SNEN 1504ADTL-S				●	●				
	Fig1  Fig2 	SNEW 1203ADTR				●	●	12.70	3.18	1	BN Finish Mill EASY FMU Types → L114
		SNEW 1203ADTR-S				●	●	12.70	3.18	2	

▲ mark: To be replaced by new item (Please confirm stock availability)

Grooving and Threading Insert

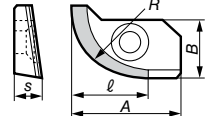
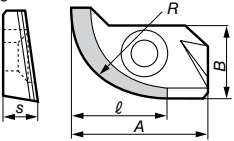
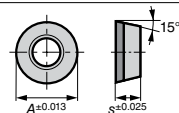
Appearance	Shape (Right-hand tool)	Cat. No.	Stock								Dimension (mm)						Fig	Applicable Holder
			BN2000		BN250		BNX20		BN350									
			R	L	R	L	R	L	R	L	w	ℓ_1	r_E	ℓ	F	s		
	 Fig1	BNGNT 0200 R/L			●				●		2.0	4.0	0.2	25	6.0	—	1	SUMIBORON Grooving Holder BNGG Type → L112
		BNGNT 0250 R/L			●				●		2.5	4.0	0.2	25	6.0	—		
		BNGNT 0300 R/L			●				●		3.0	5.0	0.4	25	6.0	—		
		BNGNT 0400 R/L			●				●		4.0	6.0	0.4	26	6.0	—		
		BNGNT 0500 R/L			●				●		5.0	6.0	0.4	26	6.0	—		
		BNGNT 0600 R/L			●				●		6.0	7.0	0.4	27	6.0	—		
	 Fig1	BNTT 1020 R/L			●					Pitch = 1.0-2.0	0.14	25	4.0	—	1	SUMIBORON Grooving Holder BNGG Type → L112		
		BNTT 1530 R/L			●					Pitch = 1.5-3.0	0.20	25	4.0	—				

Turning Insert

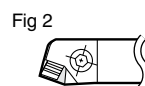
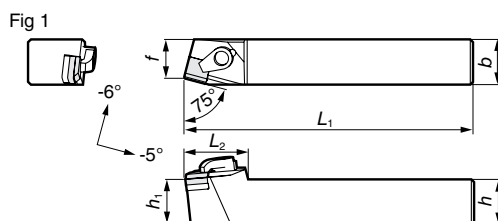
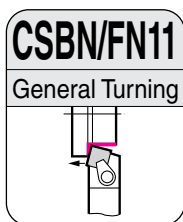
Appearance	Shape	Cat. No.	Stock				Dimension (mm)					Applicable Holder
			BN2000		BN250		Inscribed Circle (ød)	Edge Width (w)	Nose Radius (r _E)	Max. Groove Depth (a)	Hole Size	
			R	L	R	L						
		TGA R/L4125	●		●		12.70	1.25		2.0	5.5	SEC-Grooving Holder (GWC, GWCS, GWCI Type) → F4 to F5
		TGA R/L4150	●		●			1.50		3.5		
		TGA R/L4200	●		●			2.00		3.5		
		TGA R/L4250	●		●			2.50	0.2	4.0		
		TGA R/L4300	●		●			3.00		4.0		
		TGA R/L4350	●		●			3.50		5.0		
		TGA R/L4400	●		●			4.00		5.0		

Refer to page L111 for CGA Type SUMIBORON grooving inserts for hardened steel. (Applicable Toolholder GWB type → L105)

Endmill Insert

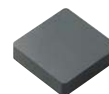
Appearance	Shape	Cat. No.	Stock				Dimension (mm)					Fig	Applicable Endmill	
			BN350	BN500	BN7000	BN700	R	A	B	ℓ	s			
	Fig1 Fig2	BEST 160S	—				8.0	13.0	6.8	10.0	3.5	1	SUMIBORON Ball Endmill BES Type → L117	
		BEST 160L	—				8.0	13.0	6.8	13.0	3.5			
		BEST 200S	—				10.0	20.0	8.5	13.0	4.5			
		BEST 200L	—				10.0	20.0	8.5	20.0	4.5			
		BEST 250S	—	●			12.5	22.5	10.5	15.5	5.0			
		BEST 250L	—	●			12.5	22.5	10.5	22.5	5.0			
		BEST 300S	—	●			15.0	25.0	12.0	18.0	6.0	2		
		BEST 300L	—	●			15.0	25.0	12.0	25.0	6.0			
		BEST 400S	—				20.0	30.0	16.0	23.0	7.5			
		BEST 400L	—				20.0	30.0	16.0	30.0	7.5			
		BEST 500S	—				25.0	35.0	20.0	28.0	8.0			
		BEST 500L	—				25.0	35.0	20.0	35.0	8.0			
	Fig1	RDHX 0701M0T	●		●	●	—	7.0	—	—	1.99	1	SUMIBORON Radius Endmill BRC Type → L118	
		RDHX 0702M0T	●		●	●	—	7.0	—	—	2.38			
		RDHX 1003M0T	●		●	●	—	10.0	—	—	3.18			
		RDHX 12T3M0T	●		●	●	—	12.0	—	—	3.97			

Top Clamp Type



Refer to page B128 for Solid SUMIBORON stock items.

■ Insert

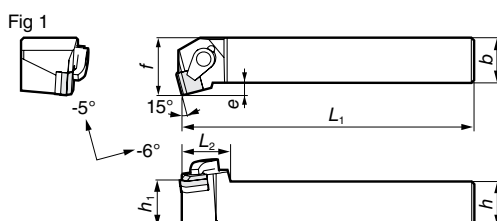
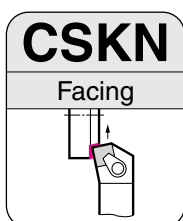


- (1) SNGN0903○○
(2) SNGN1203○○
(3) SNGN1204○○

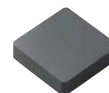
■ Holder

■ Parts

Cat. No.	Stock		Dimensions (mm)						Fig	Applicable Insert	Clamp	Chip Breaker	Double Screw	Shim	Shim Pin	Spring	Wrench
	R	L	h	b	L ₁	f	h ₁	L ₂									
CSBN R/L2525-32	●		25	25	160	21.5	25	30	1	SNGN0903○○	CCM8UL	CBS13	WB8-22T	SSN0903		—	LT27
R/L2525-42	●		25	25	160	21.5	25	35	1	SNGN1203○○	CCM8UL	CBS14	WB8-22T	SSND423	SPP3	—	LT27
FN11 R/L-44A	●	●	25	25	160	21.5	25	33	2	SNGN1204○○	DCR/L1	CBD4R/L	BH0830R/L	SSND423		DSP5	LH040



■ Insert

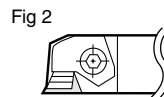
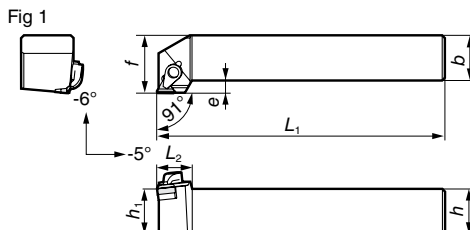
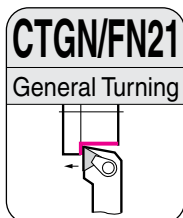


- (1) SNGN0903○○
(2) SNGN1203○○

■ Holder

■ Parts

Cat. No.	Stock		Dimensions (mm)						Fig	Applicable Insert	Clamp	Chip Breaker	Double Screw	Shim	Shim Pin	Wrench
	R	L	h	b	L ₁	f	h ₁	L ₂								
CSKN R/L2525-32	●		25	25	160	32	25	25	7	1	SNGN0903○○	CCM8UL	CBS13	WB8-22T	SSN0903	LT27
R/L2525-42	●		25	25	160	32	25	25	7	1	SNGN1203○○	CCM8UL	CBS14	WB8-22T	SSND423	LT27



■ Insert

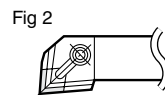
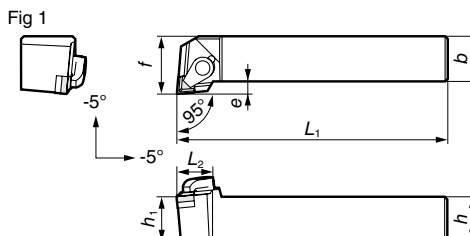


- (1) TNGN1103○○
(2) TNGN1604○○

■ Holder

■ Parts

Cat. No.	Stock		Dimensions (mm)						Fig	Applicable Insert	Clamp	Chip Breaker	Double Screw	Shim	Shim Pin	Spring	Wrench
	R	L	h	b	L ₁	f	h ₁	L ₂									
CTGN R/L2525-22	●		25	25	160	32	25	20	7	1	TNGN1103○○	CCM6UL	CBT12	WB6-16T	STN1103	—	LT20
FN21 R/L-44A	●	●	25	25	160	25	25	32	—	2	TNGN1604○○	DCR/L2	CBD4R/L	BH0830R/L	STND323	DSP5	LH040



■ Insert

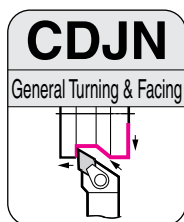


- (1) CNGN0903○○
(2) CNGN1204○○

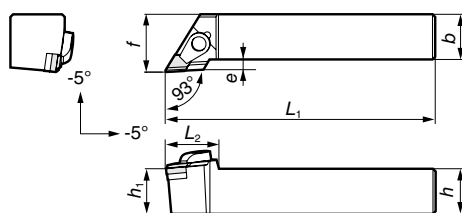
■ Holder

■ Parts

Cat. No.	Stock		Dimensions (mm)						Fig	Applicable Insert	Clamp	Chip Breaker	Double Screw	Shim	Shim Pin	Wrench
	R	L	h	b	L ₁	f	h ₁	L ₂								
CCLN R/L2525-32	●		25	25	150	32	25	25	7	1	CNGN0903○○	CCM8UL	CBC0903	WB8-22T	SCN0903	LT27
FCLN R/L2525-43	●	●	25	25	150	32	25	30	7	2	CNGN1204○○	CCM8-LONG	CBC4	WB8-30	SCND433	LH040



■ Holder



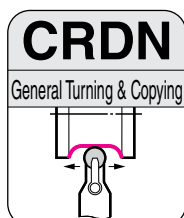
■ Insert



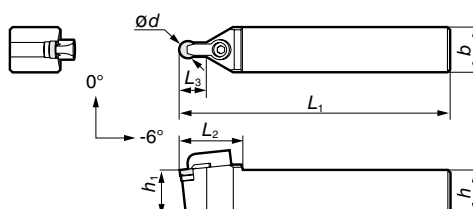
(1) DNGN110300

■ Parts

Cat. No.	Stock		Dimensions (mm)							Applicable Insert	Clamp	Chip Breaker	Double Screw	Shim	Shim Pin	Wrench
	R	L	h	b	L ₁	f	h ₁	L ₂	e							
CDJN R/L2525-32	●		25	25	150	32	25	30	7	DNGN110300	CCM8UL	CBD1103	WB8-22T	SDN1103	SPP3	LT27



■ Holder

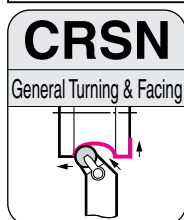


■ Insert

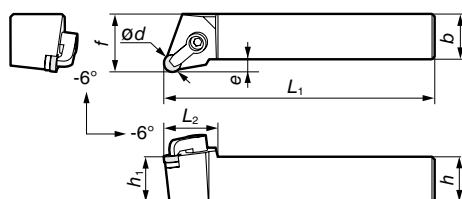
(1) RNGN090300
(2) RNGN120300
(3) RNGN120400

■ Parts

Cat. No.	Stock		Dimensions (mm)								Applicable Insert	Clamp	Double Screw	Shim	Shim Pin	Wrench
	R	L	ød	h	b	L ₁	h ₁	L ₂	L ₃	e						
CRDN N2525-32	●		9.525	25	25	150	25	35	15		RNGN090300	CCM8-LONG	WB8-22T	SRND32	SPP3	LT27
N2525-42	●		12.7	25	25	150	25	35	20		RNGN120300			SRND42		
N2525-43	●		12.7	25	25	150	25	35	20		RNGN120400			SRND42		



■ Holder

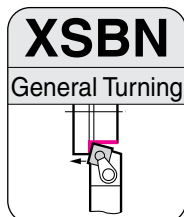


■ Insert

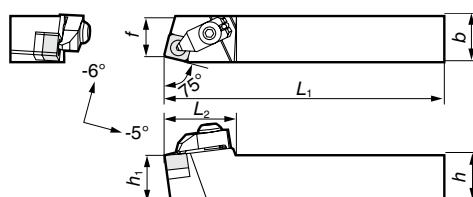
(1) RNGN090300
(2) RNGN120300
(3) RNGN120400

■ Parts

Cat. No.	Stock		Dimensions (mm)										Applicable Insert	Clamp	Double Screw	Shim	Shim Pin	Wrench
	R	L	ød	h	b	L ₁	f	h ₁	L ₂	e								
CRSN R/L2525-32	●		9.525	25	25	150	32	25	30	7		RNGN090300	CCM8-LONG	WB8-22T		SRND32	SPP3	LT27
R/L2525-42	●		12.7	25	25	150	32	25	30	7		RNGN120300				SRND42		
R/L2525-43	●		12.7	25	25	150	32	25	30	7		RNGN120400				SRND42		

Dimple Lock Type

■ Holder



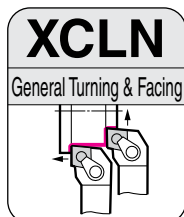
■ Insert



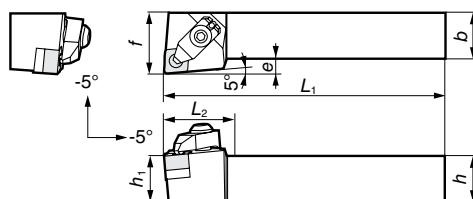
(1) SNGX120400

■ Parts

Cat. No.	Stock		Dimensions (mm)								Applicable Insert	Clamp	Bolt	Shim	Shim Pin	Spring	Wrench
	R	L	h	b	L ₁	f	h ₁	L ₂	e								
XSBN R/L2525-43	●		25	25	150	21.5	25	38			SNGX120400	DSLX8	BH0825	SSND433	SPP3	GSP10	LH050



■ Holder



■ Insert



(1) CNGX120400

■ Parts

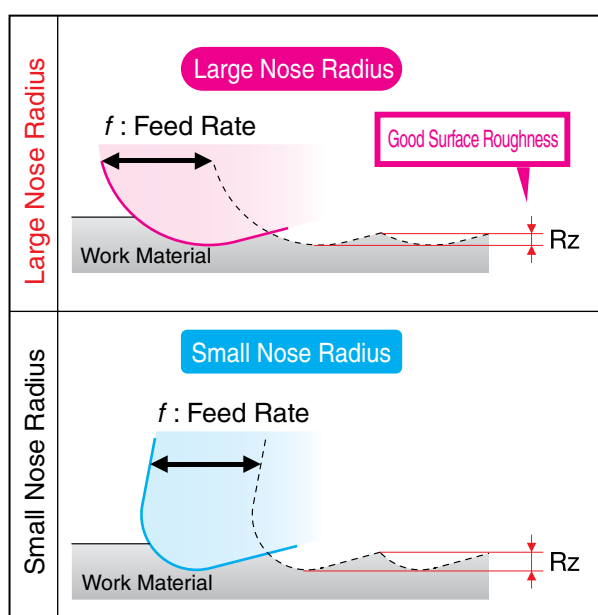
Cat. No.	Stock		Dimensions (mm)								Applicable Insert	Clamp	Bolt	Shim	Shim Pin	Spring	Wrench
	R	L	h	b	L ₁	f	h ₁	L ₂	e								
XCLN R/L2525-43	●		25	25	150	32	25	33	7		CNGX120400	DSLX8	BH0825	SCND433	SPP3	GSP10	LH050



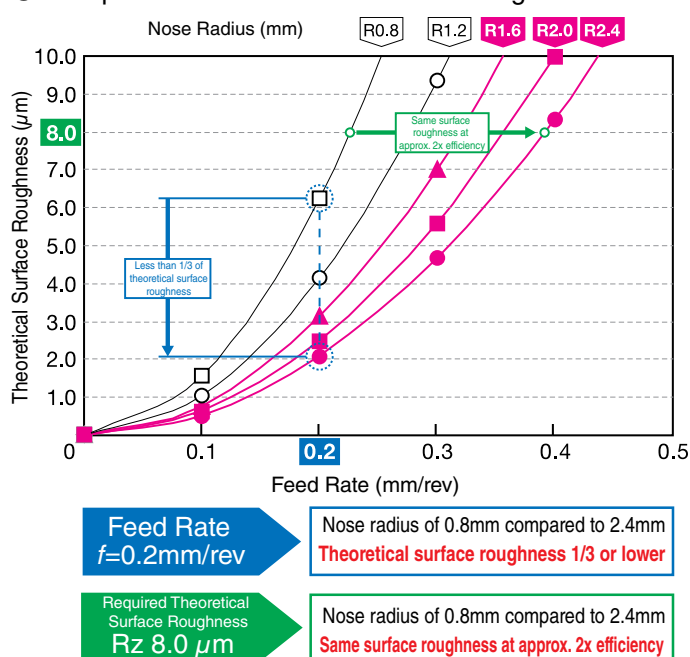
Characteristics

- Improved surface roughness in high-feed cutting.
- Perfect for copying where good surface roughness is required.

Effect of Different Nose Radii



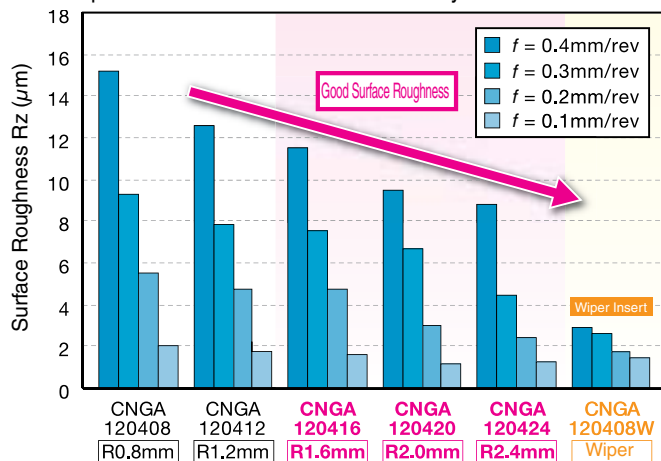
Comparison of Theoretical Surface Roughness



* Actual value of surface roughness is approximately 1.5 to 3 times higher (for steel).

* Theoretical surface roughness is calculated using the following formula: $h = (f^2/8r) \times 10^3$

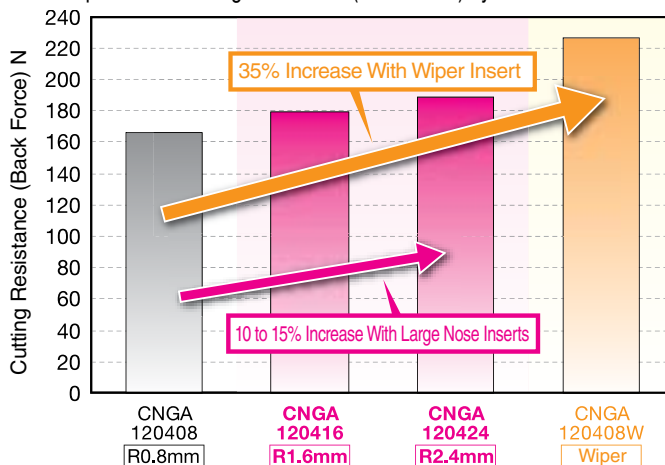
Comparison of Machined Surface Finish by Different Nose Radii



Inserts with a larger nose radius also give better surface roughness during actual machining.

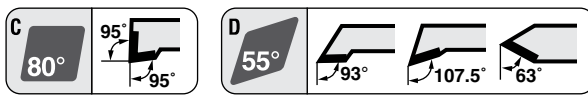
Work Material: SCM415H(60HRC)
Cutting Conditions: $V_c=100\text{m/min}$, $a_p=0.1\text{mm}$, Dry

Comparison of Cutting Resistance (Back Force) by Different Nose Radii



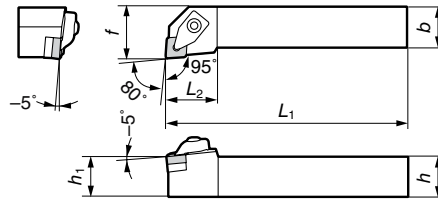
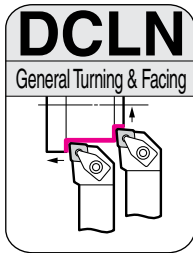
Lower cutting resistance than wiper inserts allows high-feed cutting.

Work Material: SCM415H(60HRC)
Cutting Conditions: $V_c=150\text{m/min}$, $f=0.3\text{mm/rev}$, $a_p=0.1\text{mm}$, Dry



SUMIBORON

Insert for High Efficiency Machining & Special Holders



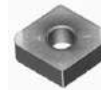
Holder

Above figures show right hand tools

Cat. No	Stock		Dimensions (mm)						Applicable Insert
	R	L	h	b	L ₁	f	h ₁	L ₂	
DCLN R/L 2525M12-R24	●	●	25	25	150	32	25	32	○ NC-CNGA1204 ○
R/L 3225P12-R24	●		32	25	170	32	32	32	
R/L 3232P12-R24	●		32	32	170	40	32	32	

* Holders are intended for use with inserts with a nose radius of 1.6mm, 2.0mm, or 2.4mm. They cannot be used with other sizes.

Insert → L102

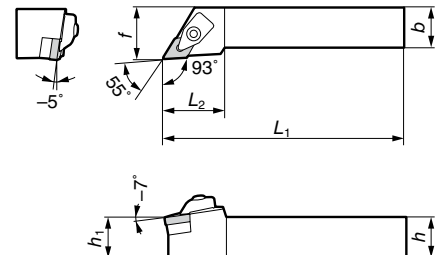
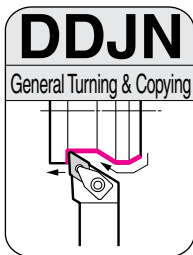


- | | |
|--------------------|--------------------|
| (1) 2NC-CNGA120416 | (4) 4NC-CNGA120416 |
| (2) 2NC-CNGA120420 | (5) 4NC-CNGA120420 |
| (3) 2NC-CNGA120424 | (6) 4NC-CNGA120424 |

Parts

*Item is sold separately.

SCP-2	5.0	CNS1204-R24	BFTX 0409N	TRX15 (*)	LH040	LH025



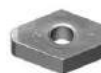
Holder

Above figures show right hand tools

Cat. No	Stock		Dimensions (mm)						Applicable Insert
	R	L	h	b	L ₁	f	h ₁	L ₂	
DDJN R/L 2525M15-R24	●	●	25	25	150	32	25	32	○ NC-DNGA1504 ○
R/L 3225P15-R24	●		32	25	170	32	32	38	
R/L 3232P15-R24	●		32	32	170	40	32	38	

* Holders are intended for use with inserts with a nose radius of 1.6mm, 2.0mm, or 2.4mm. They cannot be used with other sizes.

Insert → L102

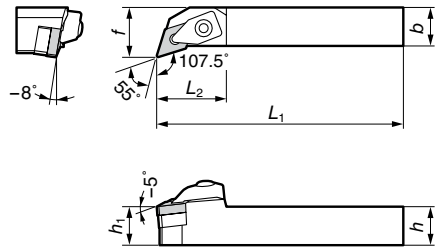
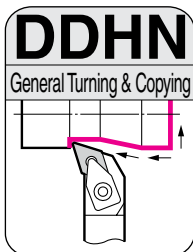


- | | |
|--------------------|--------------------|
| (1) 2NC-DNGA150416 | (4) 4NC-DNGA150416 |
| (2) 2NC-DNGA150420 | (5) 4NC-DNGA150420 |
| (3) 2NC-DNGA150424 | (6) 4NC-DNGA150424 |

Parts

*Item is sold separately.

SCP-2	5.0	DNS1504-R24	BFTX 0409N	TRX15 (*)	LH040	LH025



Holder

Above figures show right hand tools

Cat. No	Stock		Dimensions (mm)						Applicable Insert
	R	L	<i>h</i>	<i>b</i>	<i>L</i> ₁	<i>f</i>	<i>h</i> ₁	<i>L</i> ₂	
DDHN R/L 2525M15-R24	●	●	25	25	150	35	25	35	○ NC-DNGA1504 ○

* Holders are intended for use with inserts with a nose radius of 1.6mm, 2.0mm, or 2.4mm. They cannot be used with other sizes.

Insert → L102

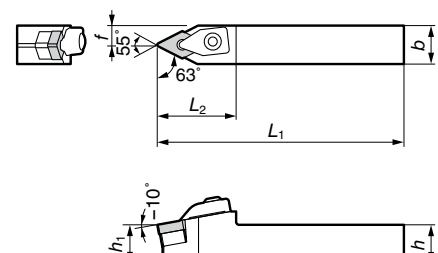
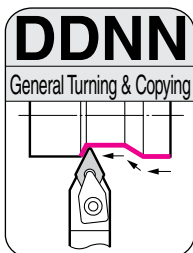


- | | |
|--------------------|--------------------|
| (1) 2NC-DNGA150416 | (4) 4NC-DNGA150416 |
| (2) 2NC-DNGA150420 | (5) 4NC-DNGA150420 |
| (3) 2NC-DNGA150424 | (6) 4NC-DNGA150424 |

Parts

*Item is sold separately.

SCP-2	5.0	DNS1504-R24	BFTX 0409N	TRX15 (*)	LH040	LH025



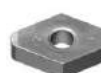
Holder

Above figures show right hand tools

Cat. No	Stock	Dimensions (mm)						Applicable Insert
		<i>h</i>	<i>b</i>	<i>L</i> ₁	<i>f</i>	<i>h</i> ₁	<i>L</i> ₂	
DDNN N 2525M15-R24	●	25	25	150	13	25	40	○ NC-DNGA1504 ○

* Holders are intended for use with inserts with a nose radius of 1.6mm, 2.0mm, or 2.4mm. They cannot be used with other sizes.

Insert → L102



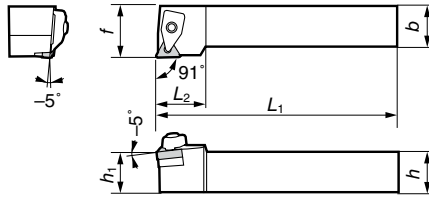
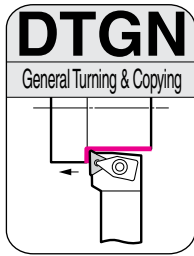
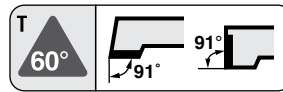
- | | |
|--------------------|--------------------|
| (1) 2NC-DNGA150416 | (4) 4NC-DNGA150416 |
| (2) 2NC-DNGA150420 | (5) 4NC-DNGA150420 |
| (3) 2NC-DNGA150424 | (6) 4NC-DNGA150424 |

Parts

*Item is sold separately.

SCP-2	5.0	DNS1504-R24	BFTX 0409N	TRX15 (*)	LH040	LH025

SUMIBORON



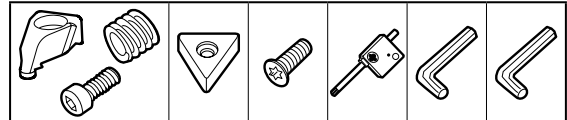
Insert



- (1) 3NC-TNGA160416 (4) 6NC-TNGA160416
(2) 3NC-TNGA160420 (5) 6NC-TNGA160420
(3) 3NC-TNGA160424 (6) 6NC-TNGA160424

Parts

*Item is sold separately.

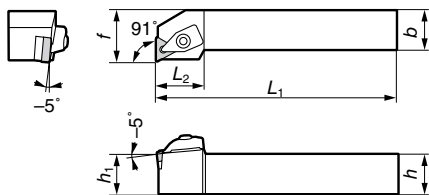
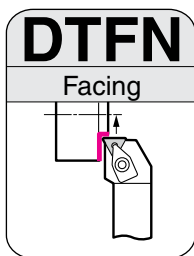


Holder

Above figures show right hand tools

Cat. No	Stock		Dimensions (mm)						Applicable Insert	Clamp Set	Recommended Tightening Torque (N·m)	Shim	Shim Screw	Shim Spanner	Wrench for Upper Surface	Wrench for Lower Surface
	R	L	h	b	L ₁	f	h ₁	L ₂								
DTGN R/L 2525M16-R24	●	●	25	25	150	32	25	32	○ NC-TNGA1604 ○	SCP-1	5.0	TNS1604-R24	BFTX 0307N	TRX10 (*)	LH040	LH025
R/L 3225P16-R24	●	●	32	25	170	32	32	32								
R/L 3232P16-R24	●	●	32	32	170	40	32	32								

* Holders are intended for use with inserts with a nose radius of 1.6mm, 2.0mm, or 2.4mm. They cannot be used with other sizes.



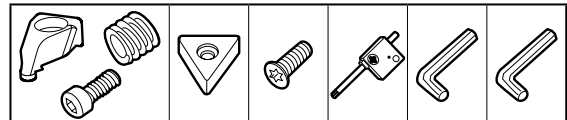
Insert



- (1) 3NC-TNGA160416 (4) 6NC-TNGA160416
(2) 3NC-TNGA160420 (5) 6NC-TNGA160420
(3) 3NC-TNGA160424 (6) 6NC-TNGA160424

Parts

*Item is sold separately.



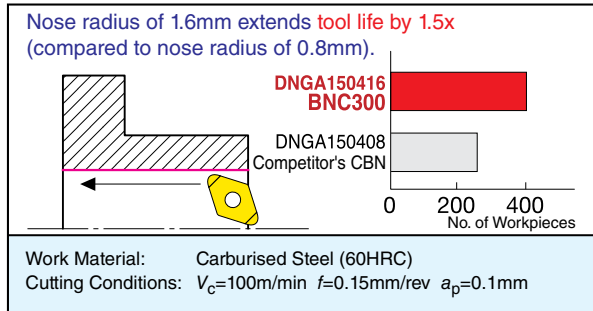
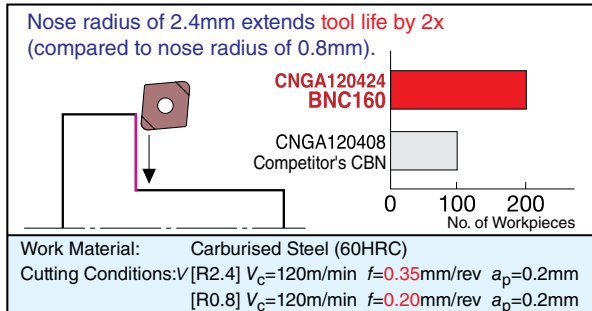
Holder

Above figures show right hand tools

Cat. No	Stock		Dimensions (mm)						Applicable Insert	Clamp Set	Recommended Tightening Torque (N·m)	Shim	Shim Screw	Shim Spanner	Wrench for Upper Surface	Wrench for Lower Surface
	R	L	h	b	L ₁	f	h ₁	L ₂								
DTFN R/L 2525M16-R24	●	●	25	25	150	32	25	30	○ NC-TNGA1604 ○	SCP-1	5.0	TNS1604-R24	BFTX 0307N	TRX10 (*)	LH040	LH025

* Holders are intended for use with inserts with a nose radius of 1.6mm, 2.0mm, or 2.4mm. They cannot be used with other sizes.

Application Example (Automotive Component)



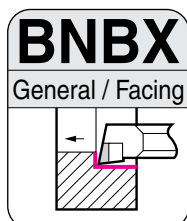
Insert

Single-sided Type

Appearance	Insert	No. of Cutting Edges	Coated CBN					Dimensions (mm)			
			BNC2010	BNC2020	BNC160	BNC200	BNC300	Nose Radius	Cutting Edge Length	Inscribed Circle	Hole
	2NC-CNGA 120416	2	●	●	●	●	●	1.6	3.3		
	120420		●	●	●	●	●	2.0	3.2	12.70	4.76
	120424		●	●	●	●	●	2.4	3.1		5.16
	2NC-DNGA 150416	2	●	●	●	●	●	1.6	3.4		
	150420		●	●	●	●	●	2.0	3.0	12.70	4.76
	150424		●	●	●	●	●	2.4	2.7		5.16
	3NC-TNGA 160416	3	●	●	●	●	●	1.6	3.3		
	160420		●	●	●	●	●	2.0	3.0	9.525	4.76
	160424		●	●	●	●	●	2.4	2.7		3.81

Double-sided Type

Appearance	Insert	No. of Cutting Edges	Coated CBN					Dimensions (mm)			
			BNC2010	BNC2020	BNC160	BNC200	BNC300	Nose Radius	Cutting Edge Length	Inscribed Circle	Hole
	4NC-CNGA 120416	4	●	●	●	●	●	1.6	3.3		
	120420		●	●	●	●	●	2.0	3.2	12.70	4.76
	120424		●	●	●	●	●	2.4	3.1		5.16
	4NC-DNGA 150416	4	●	●	●	●	●	1.6	3.4		
	150420		●	●	●	●	●	2.0	3.0	12.70	4.76
	150424		●	●	●	●	●	2.4	2.7		5.16
	6NC-TNGA 160416	6	●	●	●	●	●	1.6	3.3		
	160420		●	●	●	●	●	2.0	3.0	9.525	4.76
	160424		●	●	●	●	●	2.4	2.7		3.81



● 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.

● BN2000 for hardened steel and BN7000 for powdered metal are available

■ Brazed Boring Bar

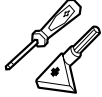
Technical drawing of a BNBX bar. The drawing shows a side view and a cross-section. The side view includes a 3° chamfer at the end, a fillet with radius r_E , and a dimension L_1 for the length of the bar. The cross-section shows the outer diameter ϕD_s and the inner bore diameter ϕD_m . The bore diameter is labeled as "Min Bore Dia".

Cat. No.	Stock				Min. Bore Dia.	Dimensions (mm)					Applicable Sleeve
	BN2000	BN250	BN7000	BN700	ϕD_m	ϕD_s	h	L_1	r_E		
BNBX 020R	●	▲	●	●	2.5	2.0	1.8	40	0.2	HBX 2016	
025R	●	▲	●	●	3.0	2.5	2.2	40	0.2	HBX 2516	
030R	●	▲	●	●	3.5	3.0	2.7	40	0.2	HBX 3016	
035R	●	▲	●	●	4.0	3.5	3.2	40	0.2	HBX 3516	
040R	●	▲	●	●	4.5	4.0	3.7	40	0.2	HBX 4016	
045R	●	▲	●	●	5.0	4.5	4.2	40	0.2	HBX 4516	
050R	●	▲	●	●	5.5	5.0	4.7	60	0.2	HBX 5016	
055R	●	▲	●	●	6.0	5.5	5.2	60	0.2	HBX 5516	
060R	●	▲	●	●	6.5	6.0	5.7	60	0.2	HBX 6016	
BNBX 065R	●	▲			7.0	6.5	6.2	60	0.2	HBB 6516	
070R	●	▲			7.5	7.0	6.7	80	0.2	HBB 716	
075R	●	▲			8.0	7.5	7.2	80	0.2	HBB 7516	
080R	●	▲			8.5	8.0	7.7	80	0.2	HBB 816	

■ Adaptor Sleeve

	Cat. No.	Stock	Diameter (ϕD_s)	Applicable Bar
	HBX 2016	●	2.0	BNBX 020R
	2516	●	2.5	BNBX 025R
	3016	●	3.0	BNBX 030R
	3516	●	3.5	BNBX 035R
	4016	●	4.0	BNBX 040R
	4516	●	4.5	BNBX 045R
	5016	●	5.0	BNBX 050R
	5516	●	5.5	BNBX 055R
	6016	●	6.0	BNBX 060R
	HBB 6516	●	6.5	BNBX 065R
	716	●	7.0	BNBX 070R
	7516	●	7.5	BNBX 075R
	816	●	8.0	BNBX 080R

■ Parts (For Sleeve)

				
Screw	Recommended Tightening Torque (N·m)	Set Screw	Wrench	Applicable Sleeve
BFTX 0409N	3.4	BT06035T	TRD15	HBX ○○○○
—	—	BT0404	TH020	HBB ○○○○

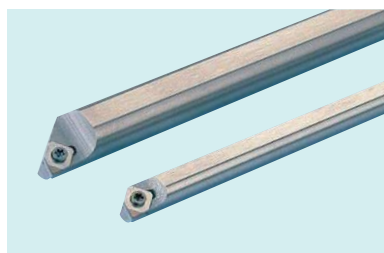
* BNBX bars can be use with HBB type sleeves, however, HBX type sleeves are recommended for bars below $\phi 6\text{mm}$.

■ Recommended Cutting Conditions

Spindle speed n	More than 2,000min ⁻¹	Low speed may cause chattering and chipping on the cutting edge.
Depth of cut a_p	0.01 to 0.2mm	Excessive depth of cut may cause larger tool deformation resulting in deterioration of bore accuracy.
Feed rate f	0.01 to 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.



- **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.**

■ Parts (for Holder)

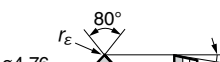
Cat. No.	Stock	Min. Bore Dia.	Dimensions (mm)				
		$\varnothing D_m$	$\varnothing D_s$	h	L_1	θ°	
BNZ 606R	●	7.0	6.0	5.5	80	-14	
608R	●	9.0	8.0	7.5	100	-12	
610R	●	11.0	10.0	9.5	125	-10	
612R	●	13.0	12.0	11.0	130	-8	
616R	●	17.0	16.0	15.0	145	-6	
620R	●	21.0	20.0	19.0	160	-5	

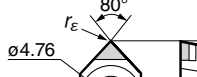
Inserts are not included.

■ Parts (for Adapter Sleeve)

	Cat. No.	Stock	Dimensions (mm) (ϕD_s)	Applicable Holder		
	HBB 616	●	6.0	BNZ 606R	Set Screw	Wrench
	816	●	8.0	BNZ 608R		
					BT0404	TH020

■ Insert (10 pieces pack)

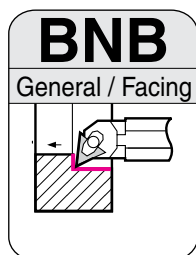
NU- ZNEX		Stock					Dimension (mm)
		BN1000	BN2000	BN250	BN7000	BN700	Nose Radius (r_e)
	Cat. No.	●	●	▲	●	●	0.2
	NU-ZNEX 040102 040104	●	●	▲	●	●	0.4

T-NU- ZNEX	Stock					Dimensions (mm)
	BN1000	BN2000	BN250	BN7000	BN700	Nose Radius (r_ϵ)
						
Cat. No.						
T-NU-ZNEX 040102		●	▲			0.2
040104		●	▲			0.4

■ Important notes

Spindle speed n	More than 2,000min ⁻¹	Low speed may cause chattering and chipping on the cutting edge.
Depth of cut a_p	0.03 to 0.2mm	Excessive depth of cut may cause larger tool deformation resulting in deterioration of bore accuracy.
Feed rate f	0.03 to 0.1mm/rev	—

- (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.



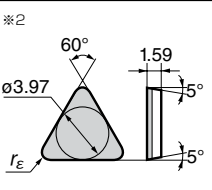
- **High rigidity full carbide boring bar**
 - Minimal bar deformation produces excellent boring accuracy.
 - Minimal vibration produces superior surface finish.
- **Full-Top SUMIBORON insert enables 3 cutting edges**
- **Can be used with SUMIDIA inserts for non-ferrous metal machining**
- **Now with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

Holder

	Cat. No.	Stock	Min. Bore Dia.	Dimensions (mm)				
			øD _m	øD _s	h	L ₁	θ°	
	BNB 508R	●	10.0	8.0	7.0	140	-9	
	510R	●	12.0	10.0	9.0	140	-8	
	512R	●	14.0	12.0	11.0	160	-6	
	516R	●	18.0	16.0	14.0	180	-5	
	520R	●	22.0	20.0	18.0	180	-4	

Inserts are not included.

Insert

TBGN		Cat. No.								Dimension (mm)		
		SUMIBORON							SUMIDIA		Nose Radius (r_ϵ)	
		BNX10	BNX20	BN2000	BN250	BN350	BN500	BN7000	BN700	DA150		DA1000
—												
Cat. No.												
TBGN 060102B			●	●	▲					●		0.2
060104B		●	●	●	▲	●	●	●	●	●		0.4
060108B			●	●	▲	●	●	●	●			0.8
060102-BSTN* ¹		—	●	—	—	—	—	—	—	—	—	0.2
060104-BSTN* ¹		—	●	—	—	—	—	—	—	—	—	0.4
060108-BSTN* ¹		—	●	—	—	—	—	—	—	—	—	0.8
NF-TBGN 060102* ²		—	—	—	—	—	—	—	—	—	●	0.2
060104* ²		—	—	—	—	—	—	—	—	—	●	0.4

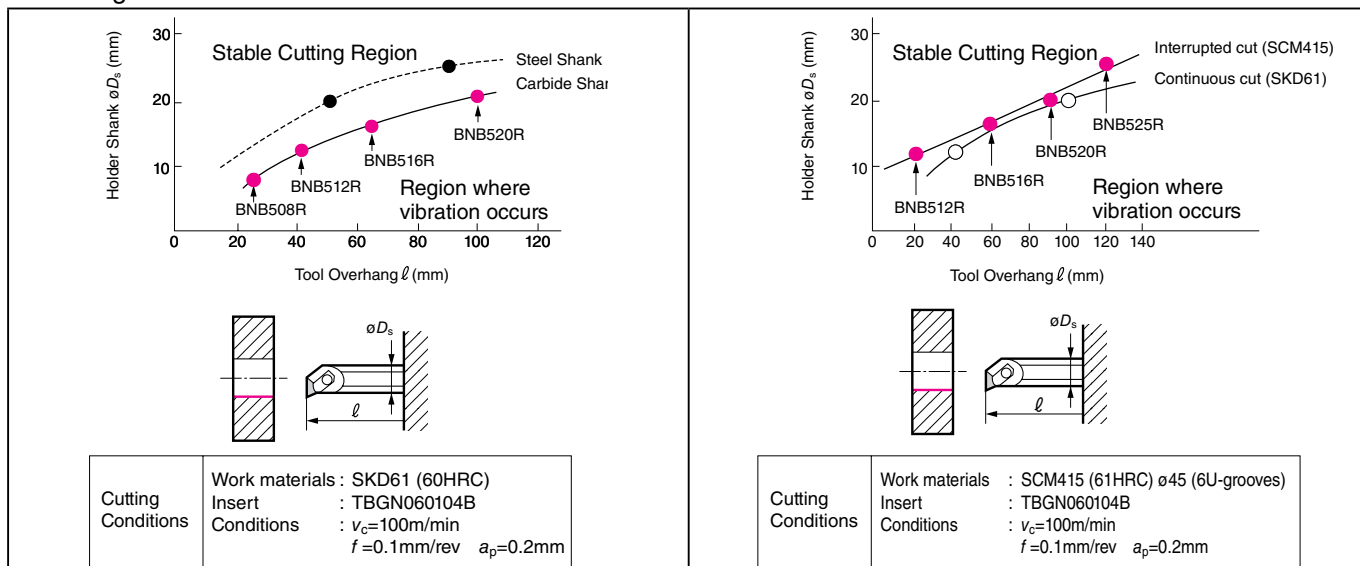
Parts

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

*1 TBGN ○○○○○○-BSTN 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

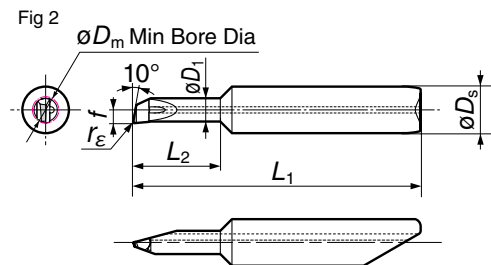
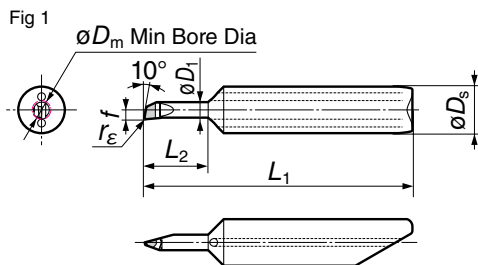
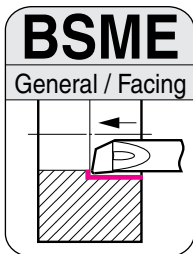




■ Characteristics

- Achieves the minimum bore diameter of $\phi 2.5\text{mm}$ in boring of hardened steel.
- Achieves high-precision cutting edge positioning thanks to the newly developed clamp mechanism.
- Expands the range of small hole boring to achieve more high-efficiency machining requiring no grinding.
- **Brazed Type BSME Type**
Applicable to bore diameters ranging from $\phi 2.5$ to 5.0mm
- **Indexable Insert Type SEXC Type**
Applicable to bore diameters ranging from $\phi 4.0$ to 6.0mm

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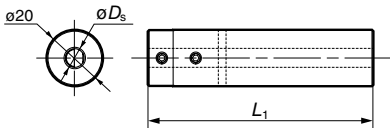


■ Brazed Boring Bar

Cat. No.	Stock		Min. Bore Dia.	Dimensions (mm)						Fig	Applicable Sleeve	
	BN2000			$\varnothing D_m$	$\varnothing D_s$	$\varnothing D_1$	L_1	f	L_2			r_ε
	R	L										
BSME R/L25020D2S6			2.5	6.0	2.0	32.0	1.20	5.3	0.2	1	HBSM6020	
BSME R/L25020D3S6			2.5	6.0	2.0	34.5	1.20	7.8	0.2			
BSME R/L25020D4S6			2.5	6.0	2.0	37.0	1.20	10.3	0.2			
BSME R/L30020D2S6			3.0	6.0	2.5	32.8	1.45	6.3	0.2	2		
BSME R/L30020D3S6			3.0	6.0	2.5	35.8	1.45	9.3	0.2			
BSME R/L30020D4S6			3.0	6.0	2.5	38.8	1.45	12.3	0.2			
BSME R/L35020D2S6			3.5	6.0	3.0	33.5	1.70	7.3	0.2			
BSME R/L35020D3S6			3.5	6.0	3.0	37.0	1.70	10.8	0.2			
BSME R/L35020D4S6			3.5	6.0	3.0	40.5	1.70	14.3	0.2			
BSME R/L40020D2S6			4.0	6.0	3.5	33.9	1.95	8.3	0.2			
BSME R/L40020D3S6			4.0	6.0	3.5	37.9	1.95	12.3	0.2			
BSME R/L40020D4S6			4.0	6.0	3.5	41.9	1.95	16.3	0.2			
BSME R/L45020D2S6			4.5	6.0	4.0	35.0	2.20	9.3	0.2			
BSME R/L45020D3S6			4.5	6.0	4.0	39.5	2.20	13.8	0.2			
BSME R/L45020D4S6			4.5	6.0	4.0	44.0	2.20	18.3	0.2			
BSME R/L50020D2S6			5.0	6.0	4.5	35.8	2.45	10.3	0.2			
BSME R/L50020D3S6			5.0	6.0	4.5	40.8	2.45	15.3	0.2			
BSME R/L50020D4S6			5.0	6.0	4.5	45.8	2.45	20.3	0.2			

The BSME type requires the separately sold HBSM6020 sleeve.

■ Adaptor Sleeve

					
Cat. No.	Stock	Dimensions (mm)		Set Screw	Wrench
		$\varnothing D_s$	L_1		
HBSM6020		6.0	80	BT0506	TH025

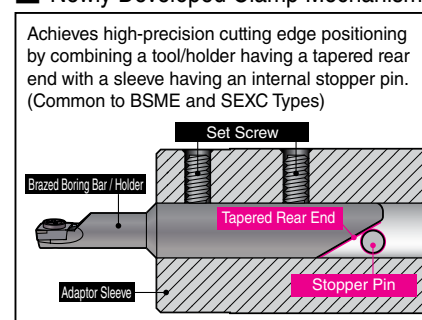
Adaptor sleeve is optional

■ Alignment Jig *

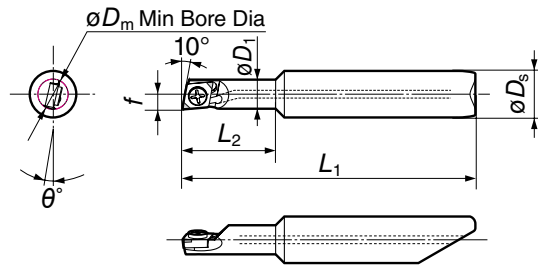
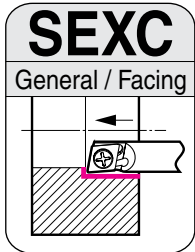
Cat. No.	Stock
AFBSM60	

* This jig is used for centering sleeves when setting them into holders.

■ Newly Developed Clamp Mechanism



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Parts

Clamp Bolt	Wrench
MIB1.6-2	SDBSM
MIB1.6-2.5	
MIB1.6-3	

Holder

Cat. No.	Stock		Min. Bore Dia.	Dimensions (mm)						Applicable Sleeve	Clamp Bolt	Recommended Tightening Torque (N·m)	Wrench
	R	L	ϕD_m	ϕD_s	ϕD_1	L_1	f	L_2	θ°				
E06D2-SEXC R/L03-04P			4.0	6.0	3.75	33.75	1.95	8	-13	HBSM6020	MIB1.6-2	0.2	SDBSM
E06D3-SEXC R/L03-04P			4.0	6.0	3.75	37.75	1.95	12	-13		MIB1.6-2.5		
E06D2-SEXC R/L03-05P			5.0	6.0	4.75	35.25	2.45	10	-12		MIB1.6-2.5		
E06D3-SEXC R/L03-05P			5.0	6.0	4.75	40.25	2.45	15	-12		MIB1.6-2.5		
E06D2-SEXC R/L03-06P			6.0	6.0	5.75	36.75	2.95	12	-11		MIB1.6-3		
E06D3-SEXC R/L03-06P			6.0	6.0	5.75	42.75	2.95	18	-11		MIB1.6-3		

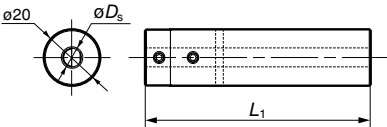
The SEXC type requires the separately sold HBSM6020 sleeve.

Insert

Cat. No.	Stock		Dimensions (mm)
	BN2000	BN7000	Nose Radius r_E
2NU-ECXA 030X02LE			0.2
2NU-ECXA 030X02LF			0.2

LE: Honing, LF: Sharp Edge

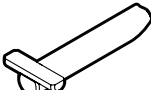
Adaptor Sleeve

					
Cat. No.	Stock	Dimensions (mm)		Set Screw	Wrench
		ϕD_s	L_1		
HBSM6020		6.0	80	BT0506	TH025

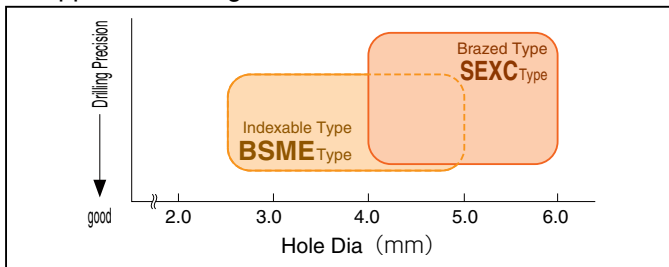
Adaptor sleeve is optional

* This jig is used for centering sleeves when setting them into holders.

Alignment Jig

	
Cat. No.	Stock
AFBSM60	

Application Range



Recommended Cutting Conditions

Spindle speed n	More than 2,000min ⁻¹	May cause chattering or chipping at the cutting edge in low-speed machining.
Depth of cut a_p	0.01 to 0.15mm	Excessive cutting depth causes deformation of the tool, which consequently leads to deterioration of dimensional accuracy.
Feed rate f	0.01 to 0.10mm/rev	—

Application Examples

Hardened Alloy Steel Valve Component **BSME**

The BSME type provides stable machining and a tool life that is over 2 times longer than our competitors' CBN tools.

The bar chart shows the 'No. of Workpieces' for 'Indexable Type BSME' (1,700) and 'Competitors' CBN tools' (600). The BSME tool life is significantly longer.

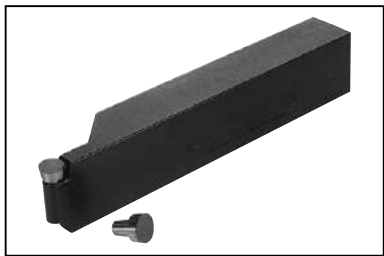
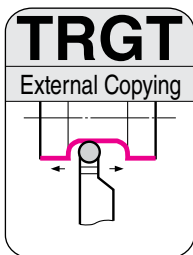
Work Material : Hardened Alloy Steel Valve Component (Automotive Component)
 Tool : BSME R50020D2S6 Grade : BN2000
 Cutting Conditions : $v_c=135\text{m/min}$ (7,500rpm) $f=0.02\text{mm/rev}$ $a_p=0.10\text{mm}$ Dry

Bearing Steel Small Automotive Component **SEXC**

The SEXC type provides drastically reduced tool costs and a tool life that is 1.5 times longer than our competitors' brazed CBN tools.

The bar chart shows the 'No. of Workpieces' for 'Brazed Type SEXC' (1,500) and 'Competitors' brazed CBN tools' (1,000). The SEXC tool life is 1.5 times longer.

Work Material : Bearing Steel Small Automotive Component (60HRC)
 Holder : E06D2-SEXC R/L03-04P Insert : 2NU-ECXA 030X02LF (BN2000)
 Cutting Conditions : $v_c=50\text{m/min}$ (4,000rpm) $f=0.02\text{mm/rev}$ $a_p=0.02\text{mm}$ Wet



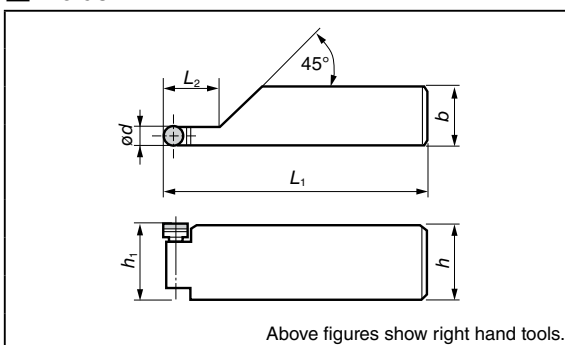
● Clamping by cutting force alone

- 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.

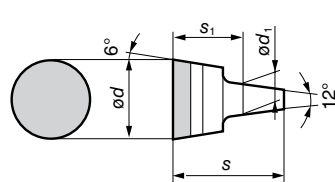
■ Holder



Cat. No.	Stock		Dimensions (mm)						Applicable Insert
	R	L	ϕd	h	b	L_1	h_1	L_2	
TRGT R/L2020K05	●		5	20	20	125	20	16	RTGN 0508M0
R/L2020K06	●		6	20	20	125	20	16	RTGN 0608M0
R/L2525M07			7	25	25	150	25	20	RTGN 0711M0
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

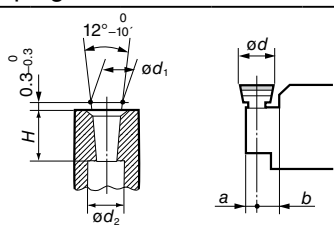
Inserts are not included.

■ Insert



Cat. No.	Stock			Dimensions (mm)			
	BN2000	BNX20	BN7000	ϕd	ϕd_1	s	s_1
RTGN 0508M0		●		5	2.5	7.5	3.5
0608M0		●		6	3.5	7.5	3.5
RTGN 0711M0		●		7	3.5	11.0	5.0
0811M0		●		8	4.5	11.0	5.0
RTGN 0914M0		●		9	5.5	14.0	6.0
1014M0		●		10	5.5	14.0	6.0
1214M0		●		12	7.5	14.0	6.0

■ Insert Clamping

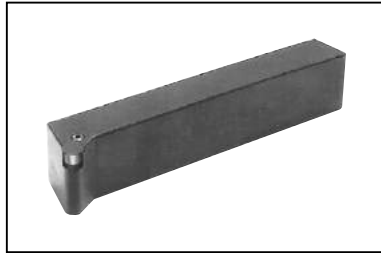


ϕd	H	ϕd_1	ϕd_2	a	b
5	4.0	2.5	1.9	1.85	3.2
6	4.0	3.5	2.9	2.35	3.7
7	6.0	3.5	2.5	2.75	4.3
8	6.0	4.5	3.5	3.25	4.8
9	7.5	5.5	4.2	4.15	5.9
10	7.5	5.5	4.2	4.15	5.9
12	7.5	7.5	6.2	5.15	6.9

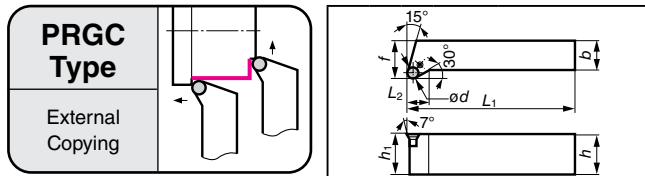
● **Lever Lock clamping system**

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

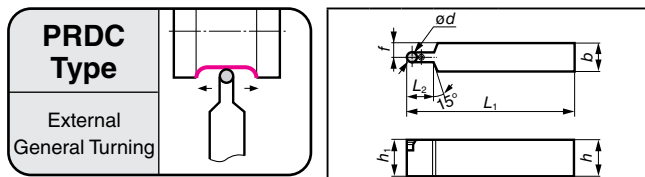
- **Versatile round insert can be applied to various operations.**



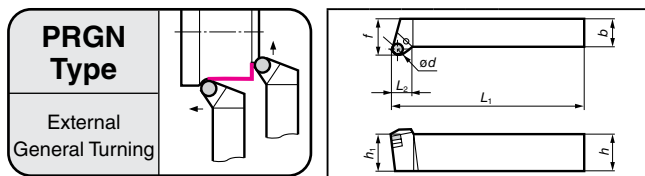
■ **Holder**



Cat. No.	Stock		Dimensions (mm)							Applicable Insert
	R	L	ϕd	h	b	L_1	f	h_1	L_2	
PRGC R/L3225P9	●	●	9	32	25	170	32	32	18	RCGA 0906M0



Cat. No.	Stock		Dimensions (mm)							Applicable Insert
	R	L	ϕd	h	b	L_1	f	h_1	L_2	
PRDC N 3225P9	●	●	9	32	25	170	12.5	32	25	RCGA 0906M0



Cat. No.	Stock		Dimensions (mm)							Applicable Insert
	R	L	ϕd	h	b	L_1	f	h_1	L_2	
PRGN R/L3225P9	●	●	9	32	25	170	32	32	10	RNGA 0906M0

Inserts are not included.

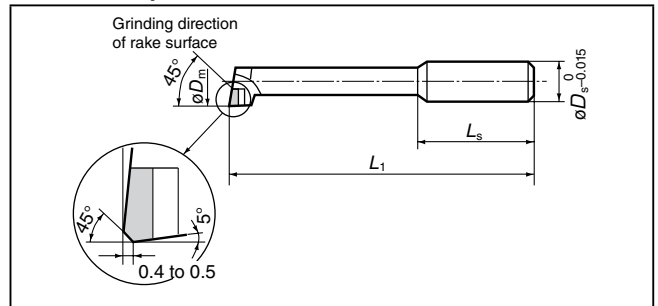
■ **Insert**

Cat. No.	Stock					Fig
	BN2000	BN250	BNX20	BN350	BN7000	
RCGA 0906M0	●	▲				1
RNGA 0906M0	●	▲	●			2

■ **Parts**

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

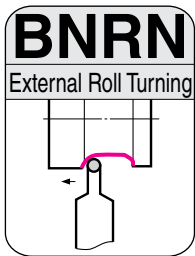
■ **Tool Body**



Cat. No.	Stock	Dimensions (mm)			
	BN250	ϕD_s	ϕD_m	L_1	L_s
SJB 0804	●	8	4	45	32
0805	●	8	5	45	32
0806	●	8	6	50	30
0808	●	8	8	60	30
SJB 1006	●	10	6	50	30
1008	●	10	8	60	30
1010	●	10	10	70	30
1012	●	10	12	70	30
1015	●	10	15	70	30

■ **Recommended Cutting Conditions**

Spindle Speed n	above 800min ⁻¹	Low speeds may cause chattering and chipping on the cutting edge.
Depth of cut a_p	0.03 to 0.3 mm/radius	Excessive depth of cut may cause larger tool deformation resulting in deterioration of bore accuracy.
Feed Rate f	0.03 to 0.1mm/rev	—



- Reground insert can be used.
 - Same holder can be used for reground 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

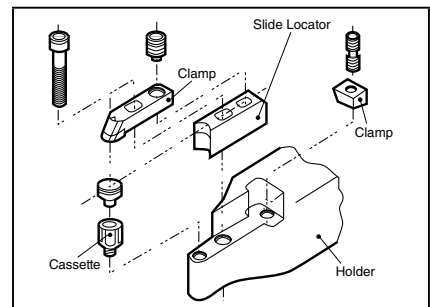
	Cat. No.	Stock	Dimensions (mm)					Applicable Insert	
			h	b	L_1	f	L_2	New Insert	Regrindable range
	BNRN 3232-08-07		32	32	200	16	13	RBG08-B	8.0 to 7.0
	BNRN 4038-10-09		40	38	250	19	17	RBG10-B	10.0 to 9.0
	4038-12-11		40	38	250	19	20	RBG12-B	12.0 to 11.0
	BNRN 5050-14-12		50	50	350	25	25	*	14.0 to 12.0
	5050-16-14		50	50	350	25	25	RBG16-B	16.0 to 14.0
	5050-18-16		50	50	350	25	30	*	18.0 to 16.0
	5050-20-18		50	50	350	25	30	RBG20-B	20.0 to 18.0
	5050-22-20		50	50	350	25	35	*	22.0 to 20.0
	5050-24-22		50	50	350	25	35	*	24.0 to 22.0
	5050-26-24		50	50	350	25	35	RBG26-B	26.0 to 24.0

* Blank space indicates holders for reground inserts. Inserts are not included.

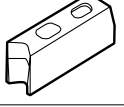
Insert

	Cat. No.	Stock			Dimensions (mm)			
		BN7000	BN700	BN500	ϕd	ϕd_1	s_1	s
	RBG 08-B	●	●		8.0	4.0	4.0	6.5
	10-B	●	●		10.0	5.0	5.0	9.0
	12-B	●	●		12.0	6.0	6.0	11.0
	16-B	●	●		16.0	8.0	8.0	13.0
	20-B	●	●		20.0	10.0	10.0	15.0
	26-B	●	●		26.0	14.0	10.0	15.0

Structure



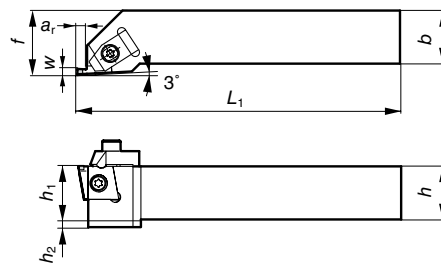
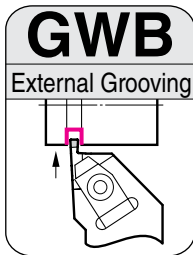
Parts

Applicable Holder	Slide Locator	Clamp	Cassette	Clamp	Cap Screw	Set Screw	Double Screw	Wrench
								
BNRN 3232-08-07	BNRS R-08	BNRC-08	BNRE-08	BNRW-08	BX0425	BTD0609	WB5-18	LH025 LH030
BNRN 4038-10-09	BNRS R-10		BNRE-10					
BNRN 4038-12-11	BNRS R-12	BNRC-12	BNRE-12	BNRW-12	BX0635	BTD0812	WB6-20	LH030 LH040 LH050
BNRN 5050-14-12	BNRS R-14		BNRE-14				WB6-30	
BNRN 5050-16-14	BNRS R-16	BNRC-16	BNRE-16	BNRW-16	BX0640			
BNRN 5050-18-16	BNRS R-18		BNRE-18					
BNRN 5050-20-18	BNRS R-20	BNRC-20	BNRE-20	BNRW-20			BTD0818	WB8-30
BNRN 5050-22-20	BNRS R-22		BNRE-22					
BNRN 5050-24-22	BNRS R-24	BNRC-26	BNRE-24	BNRW-26	BX0840	BTD0818		
BNRN 5050-26-24	BNRS R-26		BNRE-26					

GWB Type



Hardened Steel, Shallow Grooves



Characteristics

- Tangentially-mounted insert enhances tool rigidity.
- New double clamping holder design improves stability during continuous and interrupted cutting. Can also be used for turning.
- Long tool life in interrupted cutting applications with the new Coated SUMIBORON **BNC30G** for grooving (**BN2000** recommended for continuous cutting applications).
- Suited for grooving various types of hardened steel. Range of widths available from 1.5 to 6.0mm.

Parts

Clamp	Cap Screw	Screw	Spring	Wrench
TF-72 (Right-hand tool) TF-73 (Left-hand tool)	BX0520T	BFTX 0511N	5.0	GSP06 TRX20

Holder

Cat. No.	Stock		Dimensions (mm)						Width of Teeth(mm)	Max. Groove Depth (mm)	App	Clamp	Cap Screw	Screw	Spring	Wrench
	R	L	h	b	L ₁	f	h ₁	h ₂	w	a _r	Insert No.					
GWB R/L 2020-45			20	20	151 (150)	25	20	5	1.5≤w≤4.5	3.5 to 5.0	①	TF-72 (Right-hand tool) TF-73 (Left-hand tool)	BX0520T	BFTX 0511N	5.0	GSP06 TRX20
R/L 2525-45	●	●	25	25	151 (150)	30	25	—								
GWB R/L 2525-60	●	●	25	25	151	30	25	—	4.5<w≤6.0	5.0	②					

Dimension in parentheses for groove width w below 3.0. * Right handed toolholders are applicable with right handed inserts.

Insert

Technical drawing of a cylindrical component. The main view shows a cylinder with a total width of $W \pm 0.025$. A central section has a diameter of a_r and a length of $2 \cdot r_\epsilon$. The radius of this section is r_ϵ . The total length of the component is s . Two cross-sections are shown: a side view and a top view. The top view shows a circular cross-section with a diameter of ϕd .

Cat. No.	Stock						Dimensions (mm)					Insert No.	Applicable Holder		
	BN2000		BN250		BNC30G		w	a_r	r_ϵ	ϕd	s				
	R	L	R	L	R	L									
CGA R/L 1504150	●	●	▲	▲	●	●	1.5	3.5	0.2	15.875	4.76	①	GWB R/L 2020-45 GWB R/L 2525-45		
R/L 1504200	●	●	▲	▲	●	●	2.0	3.5							
R/L 1504250	●	●	▲	▲	●	●	2.5	4.0							
R/L 1504300	●	●	▲	▲	●	●	3.0	4.0							
R/L 1504350	●	●	▲	▲	●	●	3.5	5.0							
R/L 1504400	●	●	▲	▲	●	●	4.0	5.0							
R/L 1504450	●	●	▲	▲	●	●	4.5	5.0	0.2	15.875	6.35	②	GWB R/L 2525-60		
CGA R/L 1506500	●	●	▲	▲	●	●	5.0	5.0							
R/L 1506550	●	●	▲	▲	●	●	5.5	5.0							
R/L 1506600	●	●	▲	▲	●	●	6.0	5.0							

* It is also possible to manufacture grooving widths other than those listed above (from 1.5 to 6.0mm).

Characteristics of Grades

Grade	Application	Features	HV (GPa)	TRS (GPa)
BN2000 	Continuous Grooving	General purpose grade with superior wear resistance	31 to 34	1.0 to 1.1
BNC30G 	Interrupted Grooving	Grade suited for interrupted cutting. Features a tough substrate, and special ceramic coating that exhibits both peel-off and wear resistance.	33 to 35	1.1 to 1.2

Recommended Cutting Conditions

Cutting Conditions	H Hardened Steel
Cutting Speed v _c (m/min)	80 to 120
Feed rate f (mm/rev)	0.04 to 0.08

* In order to avoid thermal cracking of the SUMIBORON cutting edge during interrupted cutting, ensure that the work is thoroughly dry before cutting.

Application Example

Process	Work Material	Insert	Cutting Conditions	Tool Life Comparison
Shaft Grooving: Continuous Required finish on groove sides: Ra0.4μm	Carburised Steel 58 to 62HRC	CGAR1504200 BN2000	v _c : 120m/min f : 0.05mm/rev Groove Depth : 2mm Dry	GWB type BN2000 No Chipping Conventional Tool Chipping
Spline depth: Interrupted 	Carburised Steel 58 to 62HRC	CGAR1504200 BNC30G	v _c : 100m/min f : 0.05mm/rev Groove Depth : 1.6mm Dry	GWB type BNC30G No Chipping Comp. Chipping

▲mark: To be replaced by new item (Please confirm stock availability)

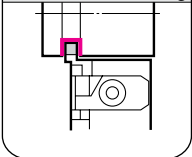
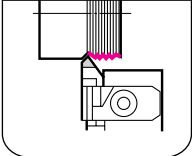
BNGG Type

■ Characteristics

- 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 used for Hardened steel grooving.

Hardened Steel, Shallow Grooves

BNGG
External Grooving**BNGG-TT**
External Threading

■ Holder

Inserts are not included.

Fig1 Grooving	Cat. No.	Stock		Dimensions (mm)			Fig	Applicable Holder
		R	L	f	ℓ_1	L_1		
Grooving	BNGG R/L2525-200	●		30.5	4	150	1	BNGNT0200 R/L
	R/L2525-250	●		30.5	4	150		BNGNT0250 R/L
	R/L2525-300	●		30.5	5	150		BNGNT0300 R/L
	R/L2525-400	●		30.5	6	151		BNGNT0400 R/L
	R/L2525-500	●		30.5	6	151		BNGNT0500 R/L
	R/L2525-600	●		30.5	7	152		BNGNT0600 R/L
Threading	BNGG R/L2525-TT	●		28.5	5	150	2	BNTT1020 R/L BNTT1530 R/L

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

■ Insert

Fig 1 Grooving

Fig 2 Threading

	Cat. No.	Stock								Dimensions (mm)					Fig	Applicable Holder		
		BN250		BNX20		BN350		BNX25		w	ℓ_1	r_ϵ	ℓ	F				
		R	L	R	L	R	L	R	L									
Grooving	BNGNT0200 R/L	●				●				2.0	4.0	0.2	25	6.0	1	BNGG R/L 2525-200		
	0250 R/L	●				●				2.5	4.0	0.2	25	6.0		BNGG R/L 2525-250		
	0300 R/L	●				●				3.0	5.0	0.4	25	6.0		BNGG R/L 2525-300		
	0400 R/L	●				●				4.0	6.0	0.4	26	6.0		BNGG R/L 2525-400		
	0500 R/L	●				●				5.0	6.0	0.4	26	6.0		BNGG R/L 2525-500		
	0600 R/L	●				●				6.0	7.0	0.4	27	6.0		BNGG R/L 2525-600		
Threading	BNTT1020 R/L	●								Pitch 1.0 to 2.0	0.14	25	4.0		2	BNGG R/L 2525-TT		
	1530 R/L	●								Pitch 1.5 to 3.0	0.2	25	4.0					

■ Parts

Applicable Holder	Support	Clamp	Adjustment Screw	Spring	Cap Screw	Wrench	
BNGG R/L2525-200	BNGS R/L 200	BNGC R/L	FMJ	GSP06	BX0615 (Clamp)	LH050 (Clamp)	1.8 × 45
BNGG R/L2525-250	BNGS R/L 250						
BNGG R/L2525-300	BNGS R/L 300						
BNGG R/L2525-400	BNGS R/L 400						
BNGG R/L2525-500	BNGS R/L 500						
BNGG R/L2525-600	BNGS R/L 600						
BNGG R/L2525-TT	BNGS R/L TT				BX0414 (Support)	LH030 (Support)	

■ Recommended Cutting Conditions

● For Grooving

Cutting Conditions	H Hardened Steel
Cutting Speed v_c (m/min)	80 to 120
Feed Rate f (mm/rev)	0.03 to 0.07

● For Threading

Cutting Conditions	H Hardened Steel
Cutting Speed v_c (m/min)	80 to 120
Feed Rate f (mm/rev)	Largest Pitch 3.0

SUMIBORON High-Speed Mill for Cast Iron **RM** Type

- **High speed, high efficiency milling of Grey Cast Iron**
 - Utilising solid SumiBoron BNS800 for high speed milling of $v_c = 1,500\text{m/min}$.
 - High speed roughing of up to $d=3.0\text{mm}$.
 - 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.

Inserts are not included.

Wiper Inserts

Fig 3

9.525

3.18

9.525

Fig 4

9.525

R0.8

9.525

3.18

- Do not use a mix of standard and wiper inserts on a single cutter setting.
- Do not mix new and reground inserts on a single cutter setting.
- Inserts can only be reground once (inscribed circle dimension must be at least 9.125mm)

Diagram illustrating the front view of the TTX20 assembly, showing various components and their labels:

- Wrench
- TTX20 (Clamp Screw)
- TH015 (For Adjustment Screw)
- TH020 (For Adjustment Screw)
- Adjustment Screw SRFJ
- Insert
- Shim RMS
- Shim Screw BFTX0307N
- Double Screw WB6-16T
- Clamp RMW

Clamp	Double Screw	Shim	Shim Screw	Recommended Tightening Torque (N·m) 2.0
RMW	WB6-16T	RMS	BFTX0307N	
Adjustment Screw	Wrench (Clamp Screw)	Wrench (For Adjustment Screw)	Wrench (For Adjustment Screw)	
SRFJ	TTX20	TH015	TH020	

ISO	Work	Hardness	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Grade
K	Grey Cast Iron	250HB	800- 1150 -1500	0.05- 0.13 -0.20	BNS800 (Dry)

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

High-speed Finishing for Grey Cast Iron



- High speed finishing cutter for Grey Cast Iron milling, that uses removable cartridges for easy insert run-out
- Utilising BN7000 / BN700 grade with both good wear and fracture resistance.
- Available in shell and small diameter endmill types.

■ Characteristics

- High speed machining $v_c=2,000\text{m/min}$
- Surface Roughness $R_z=3.2$ (1.0Ra)
- Safety structure for the centrifugal force under high speed cutting conditions
- Run-out is less than $10\mu\text{m}$
- Easy assembly method using the setting gauge
- Running cost is reduced with economical inserts.

■ Application

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



■ Specifications

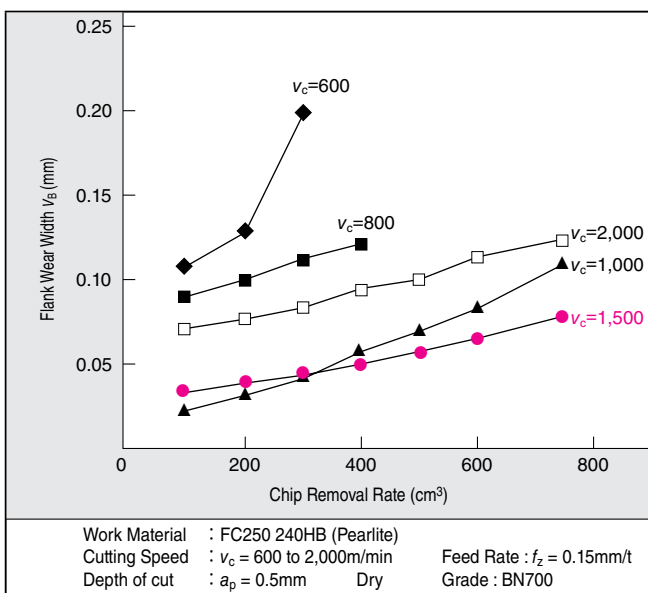
- Body $\varnothing 80$ to $\varnothing 315\text{mm}$ (FMU Type)
 $\varnothing 40$ to $\varnothing 63\text{mm}$ (FMU-E Type)
- Standard type SNEW1203ADTR/L
- Low cutting force type SNEW1203ADTR/L-S

■ Recommended Cutting Conditions

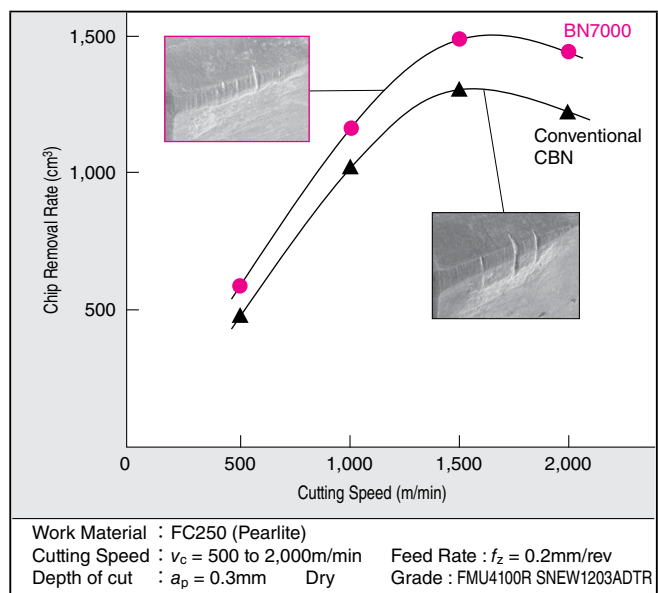
- Cutting Speed $v_c = 800$ to $2,000\text{m/min}$
- Feed Rate $f_z = 0.1$ to 0.3mm/tt
- Depth of cut $a_p = 0.5\text{mm}$ or less
- Coolant Dry

■ Performance

- Tool life diagram



- Estimated tool life



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.

Rake Angle	Radial	+2°
	Axial	+8°



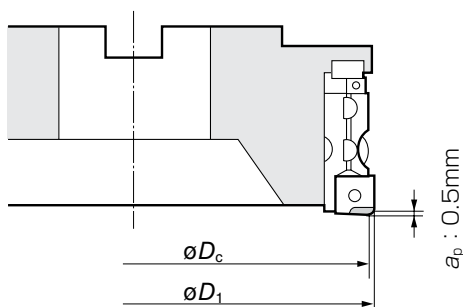
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BN Finish Mill EASY FMU FMU-E Type

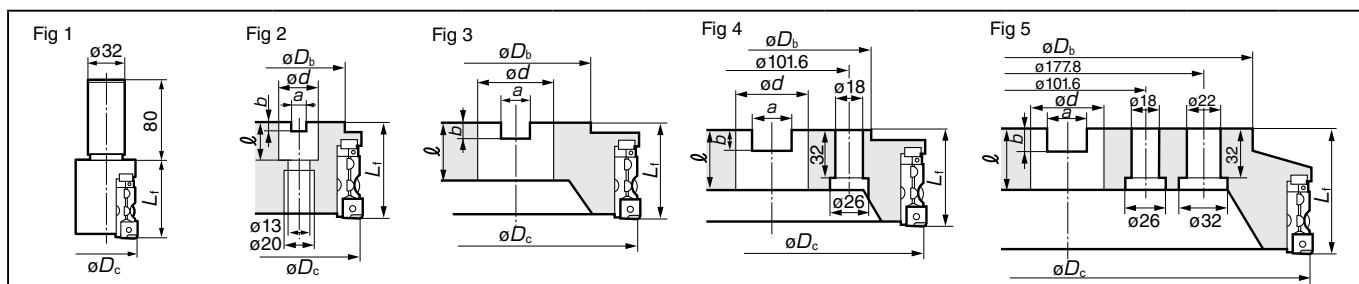
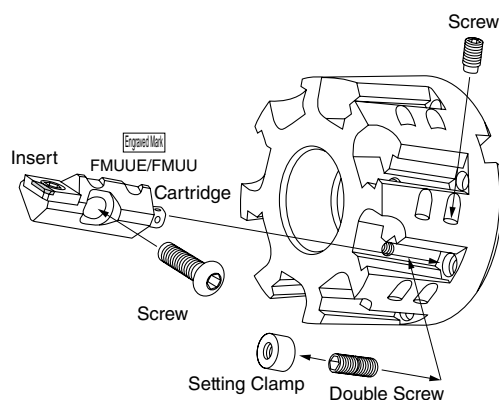
Body

inch

Approach Angle : 0°
Axial Rake : +8°
Radial Rake : +2°



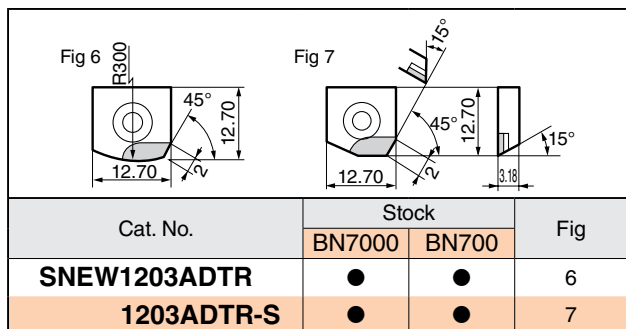
Structure



Cat. No.	Stock	Dimensions (mm)								No. of teeth	Weight (kg)	Fig
		øD _c	øD ₁	øD _b	L _f	ød	a	b	l			
FMU 4040ER	●	37	40	—	63	—	—	—	—	2	1.0	1
4050ER	●	47	50	—	63	—	—	—	—	3	1.2	1
4063ER	●	60	63	60	63	25.4	9.5	6	25	4	1.0	2
FMU 4080R	●	80	82.8	60	63	25.4	9.5	6	25	6	1.7	2
4100R	●	100	102.8	75	63	31.75	12.7	8	38	8	2.5	3
4125R	●	125	127.8	75	63	38.1	15.9	10	38	10	3.9	3
4160R	●	160	162.8	100	63	50.8	19.1	11	38	12	6.3	3
4200R	●	200	202.8	130	63	47.625	25.4	14	40	16	9.3	4
4250R	●	250	252.8	130	63	47.625	25.4	14	40	20	14.5	4
4315R	●	315	317.8	240	80	47.625	25.4	14	40	24	25.0	5

Inserts are not included.

Insert



Cat. No.	Stock		Fig
	BN7000	BN700	
SNEW1203ADTR	●	●	6
1203ADTR-S	●	●	7

* -S denotes low cutting force insert

Cartridge

Cartridge	Setting Screw	Adjustment screw	O-ring	Wrench	Wrench
FMUU(E)*	BFTX0509N	FMUJ	P3	TTX20	TH015

* FMU4040ER/4050ER/4063ERS uses FMUUE type cartridge

* FMUU/FMUUE uses similar screw (BFTX0509N), adjustment screw (FMUJ) and O-ring (P3)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v _c (m/min) Min. - Optimum - Max.	Feed Rate f _z (mm/t) Min. - Optimum - Max.	Grade
K	Gray Cast Iron	250HB	800-1400-2000	0.10-0.20-0.30	BN7000(Dry)

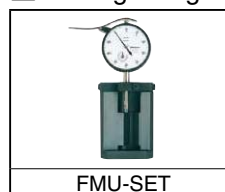
Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

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
* Anti-seizure cream SUMI-P included in the package.

Setting Gauge



* Dial-gauge is not included

Rake Angle	Radial	+2°
	Axial	+8°

0.5mm
90°

P	M	K	N	S	H
Steel	Cast Iron	Aluminum	Exotic Alloy	Stainless Steel	Hardened Steel

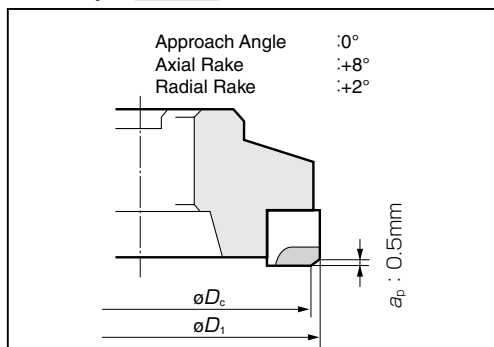
High-speed Finishing for Grey Cast Iron



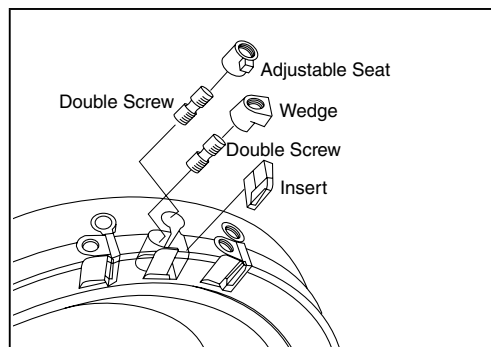
- Specially designed for use with SUMIBORON BN700 in the high speed milling of Grey Cast Iron

Body

Inch



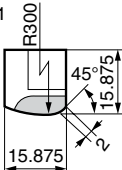
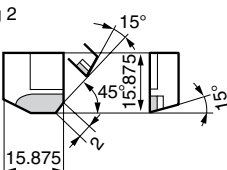
Structure



Cat. No.	Stock		Dimensions (mm)								No. of teeth	Weight (kg)	Fig
	R	L	ϕD_c	ϕD_1	ϕD_b	L_f	ϕd	a	b	ϕ			
FM 5080 R/L	●		80	82.8	60	50	25.4	9.5	6	25	6	1.6	1
5100 R/L	●		100	102.8	75	50	31.75	12.7	8	32	8	2.4	2
5125 R/L	●		125	127.8	75	63	38.1	15.9	10	38	10	3.4	2
5160 R/L	●		160	162.8	100	63	50.8	19.0	11	38	12	5.6	2
5200 R/L			200	202.8	130	63	47.625	25.4	14	40	16	8.3	3
5250 R/L			250	252.8	130	63	47.625	25.4	14	40	20	14.3	3
5315 R/L			315	317.8	240	80	47.625	25.4	14	40	24	27.8	4
FMF 5125 R/L			125	127.8	75	63	38.1	15.9	10	38	12	3.4	2
5160 R/L			160	162.8	100	63	50.8	19.0	11	38	16	5.6	2
5200 R/L			200	202.8	130	63	47.625	25.4	14	40	20	8.3	3
5250 R/L			250	252.8	130	63	47.625	25.4	14	40	24	14.3	3
5315 R/L			315	317.8	240	80	47.625	25.4	14	40	28	27.8	4

Inserts are not included.

Insert

Fig 1	
Fig 2	

Cat. No.	Stock				Fig
	BN7000		BN700		
	R	L	R	L	
SNEN 1504ADT R/L	●		●		1
1504ADT R/L-S	●		●		2

* -S denotes low cutting force insert

Parts

						Applicable Cutter
Wedge	Adjustable Seat	Adjustment Screw	Double Screw	Wrench	Wrench	
FMW	— FME	FMJ —	WB7F-20TL	TT25	1.8 x 45 —	

Rake Angle	Radial	0°
	Axial	0°



SUMIBORON Ball Nose Endmills

BES Type



- High Speed Finish Endmilling of Grey 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.

Body

Fig	Cat. No.	Stock	Dimensions (mm)						Fig
			R	øD _c	ℓ	ℓ ₂	ℓ _s	L	
Fig 1	BES 160S		8.0	16	10.0	50	60	110	1
	200S		10.0	20	13.0	60	80	140	1
	250S		12.5	25	15.5	70	80	150	1
	300S		15.0	30	18.0	80	80	160	1
Fig 2	BES 400S		20.0	40	23.0	100	100	200	2
	500S		25.0	50	28.0	120	100	220	2

Inserts are not included.

Insert

Cat. No.	Stock	Dimensions (mm)						Fig	Applicable Endmill
		R	ℓ	A	B	s			
BEST 160S		8.0	10.0	13.0	6.8	3.5	1	BES 160S	
160L		8.0	13.0	13.0	6.8	3.5	1	BES 160S	
BEST 200S		10.0	13.0	20.0	8.5	4.5	1	BES 200S	
200L		10.0	20.0	20.0	8.5	4.5	1	BES 200S	
BEST 250S	●	12.5	15.5	22.5	10.5	5.0	1	BES 250S	
250L	●	12.5	22.5	22.5	10.5	5.0	1	BES 250S	
BEST 300S	●	15.0	18.0	25.0	12.0	6.0	1	BES 300S	
300L	●	15.0	25.0	25.0	12.0	6.0	1	BES 300S	
BEST 400S		20.0	23.0	30.0	16.0	7.5	2	BES 400S	
400L		20.0	30.0	30.0	16.0	7.5	2	BES 400S	
BEST 500S		25.0	28.0	35.0	20.0	8.0	2	BES 500S	
500L		25.0	35.0	35.0	20.0	8.0	2	BES 500S	

Parts

Clamp	Double Screw	Screw	Recommended Tightening Torque (N·m)	Wrench	Wrench	Applicable Endmill
—	—	BFTX 0306N	2.0	TRX 10	—	BES 160S
—	—	BFTX 0407N	3.0	TRX 15	—	BES 200S
—	—	BFTX 0509N	5.0	TRX 20	—	BES 250S
—	—	BFTX 0511N	5.0	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 rigid machine components and select high Cutting Speed with low Feed Rate.
- (2) Use dry cutting conditions

Recommended Cutting Conditions

(Min. - Optimum - Max.)

ISO	Cat. No.	Grey Cast Iron (FC)				Ductile Grey Cast Iron (FCD)			
		Cutting Speed v_c (m/min)	Feed Rate f (mm/rev)	Depth of cut a_p (mm)	Pitch feed p_t (mm)	Cutting Speed v_c (m/min)	Feed Rate f (mm/rev)	Depth of cut a_p (mm)	Pitch feed p_t (mm)
K	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

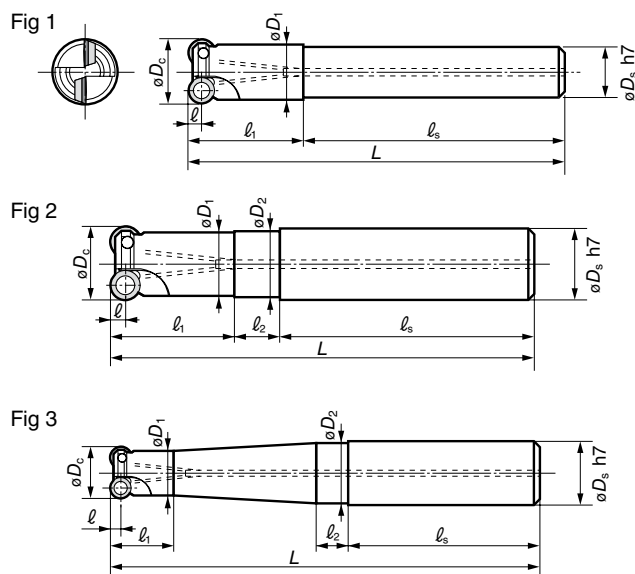
Rake Angle	Radial	0°
	Axial	0°



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)



Cat. No.	Stock	Dimensions (mm)									No. of teeth	Fig	Group No.
		ϕD_c	ϕD_s	ϕD_1	ϕD_2	ℓ	ℓ_1	ℓ_2	ℓ_s	L			
BRC 071207ES10	●	12	10	11.0	—	3.5	23	—	52	75	2	1	①
071207ES12	●	12	12	11.0	11.5	3.5	22	8	45	75	2	2	
071208ES16	●	12	16	11.0	15.5	3.5	16	8	48	88	2	3	
071210ES16	●	12	16	11.0	15.5	3.5	16	8	48	108	2	3	
071212ES16	●	12	16	11.0	15.5	3.5	16	8	48	128	2	3	
071507ES12	●	15	12	12.5	—	3.5	16	—	59	75	3	1	
071507ES16	●	15	16	12.5	13.0	3.5	19	11	48	78	3	2	②
BRC 071508ES16	●	15	16	13.5	15.5	3.5	20	8	48	88	2		
071510ES16	●	15	16	13.5	15.5	3.5	20	8	48	108	2		
071513ES20	●	15	20	13.5	19.5	3.5	22	8	50	130	2		
071515ES20	●	15	20	13.5	19.5	3.5	22	8	50	150	2		
071517ES25	●	15	25	13.5	24.5	3.5	22	8	56	176	2		
BRC 102009ES20	●	20	20	17.0	19.5	5.0	20	8	50	90	2		③
102011ES20	●	20	20	17.0	19.5	5.0	22	8	50	110	2		
102012ES25	●	20	25	17.0	24.5	5.0	24	8	56	136	2		
102015ES25	●	20	25	17.0	24.5	5.0	24	8	56	156	2		
102017ES25	●	20	25	17.0	24.5	5.0	24	8	56	176	2		

Inserts are not included.

Recommended Cutting Conditions

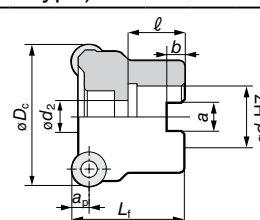
ISO	Work material	Hardness	Depth of cut a_p (mm)	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Grade
H	Hardened Steel	40 to 45HRC	Up to 0.5	200-500-800	0.1-0.25-0.4	BN7000
		47 to 55HRC	Up to 0.5	150-275-400	0.1-0.2-0.3	BN7000
		58 to 62HRC	Up to 0.5	80-140-200	0.1-0.15-0.2	BN350
K	Grey Cast Iron	—	Up to 0.5	300-900-1500	0.1-0.25-0.4	BN7000

* Use BRC Type cutter/endmill and RDHX Type inserts in combination with the applicable group number.

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

Body (Shell Type)

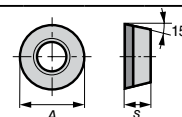
Metric



Cat. No.	Stock	Dimensions (mm)								No. of teeth	Group No.
		ϕD_c	ϕd	ϕd_2	a_p	L_f	ℓ	a	b		
BRC 10042R	●	42	16	9	5	44	20	8	6	6	③
10052R	●	52	22	11	5	50	30	10	7	7	
BRC 12042R	●	42	16	9	6	42	20	8	6	5	④
12052R	●	52	22	11	6	52	30	10	7	5	
12066R	●	66	27	13	6	52	30	12	7	6	

Inserts are not included.

Insert



Cat. No.	Stock			Dimensions (mm)		Applicable Endmill (Using Group No.)
	BN350	BN7000	BN700	A	s	
RDHX 0701M0T	●	●	●	7	1.99	①
0702M0T	●	●	●	7	2.38	②
1003M0T	●	●	●	10	3.18	③
12T3M0T	●	●	●	12	3.97	④

Parts

Screw	Recommended Tightening Torque (N·m)	Wrench	Applicable Endmill (Using Group No.)
BFTB 025048	1.0	TRD07	①
BFTB 02505	1.0	TRD07	②
BFTB 035074	3.4	TRD15	③④

Application Example

Coated Carbide
BRC (BN350)

BRC has higher efficiency at half the machining cost!

Cost/workpiece

Tool: BRC12052R
Work material: SNCM435 (Machine components) 55 to 60HRC Grade: BN350
 $v_c=250\text{m/min}$ $f_z=0.1\text{mm/t}$ $a_p=0.5\text{mm}$ $a_e=50\text{mm}$



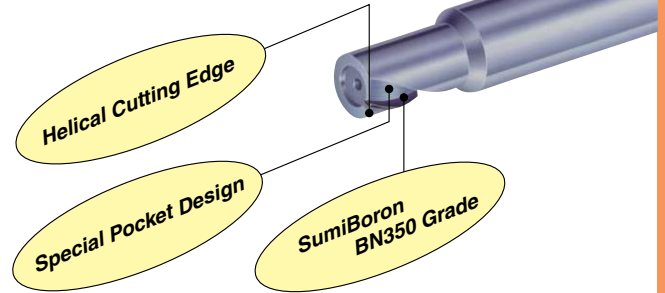
SUMIBORON

Helical Master BNES Type



Coated Carbide	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Steel	Hardened Steel	Stainless Steel	Ti Alloy	Cast Iron	Al Alloy	Copper Alloy	Graphite	CFRP
					48 to 55 HRC	55 to 60 HRC	60 to 65 HRC					

● Special Endmill for Hardened Steel



■ Cutter Body

Cat. No.	Stock		Dimensions (mm)				
	BN350		ϕD_c	ℓ	ℓ_2	L	ϕD_s
BNES 1060	●		6.0	7.0	11.0	60	10
1080	●		8.0	10.0	14.0	70	10
1100	●		10.0	12.0	17.0	75	12
1120	●		12.0	14.0	20.0	80	12
1140	●		14.0	16.0	21.5	80	16
BNES 1160	●		16.0	18.0	24.0	80	16



● For 3-dimensional profile milling, use SUMIBORON Ball Endmill BNBS Type, or MOLD FINISH MASTER BNBR Type or BNBP Type.

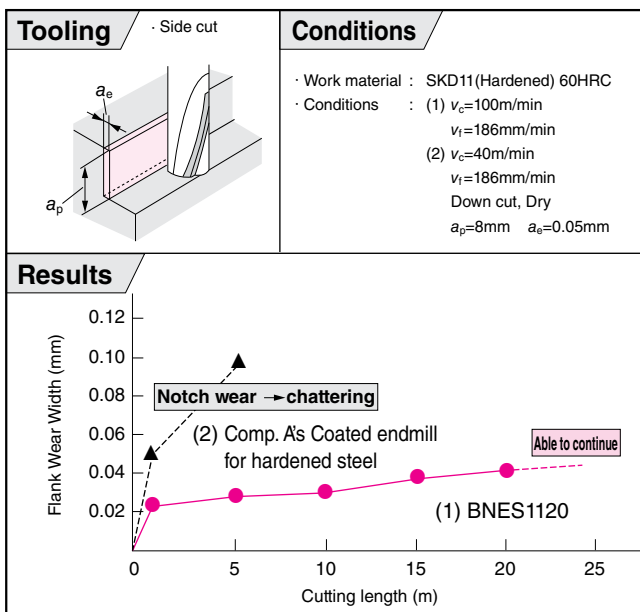
■ Recommended Cutting Conditions

Conditions	H 50 to 57HRC			H 58 to 65HRC		
	Cutting Speed 100 to 170m/min			Cutting Speed 80 to 150m/min		
	Cutting Speed n (min ⁻¹)	Feed Rate v_f (mm/min)	Depth of Cut a_e (mm)	Cutting Speed n (min ⁻¹)	Feed Rate v_f (mm/min)	Depth of Cut a_e (mm)
$\phi 6$ to 8	4,000 to 9,000	240 to 540	Up to 0.1	3,200 to 8,000	150 to 370	Up to 0.08
$\phi 10$ to 12	2,700 to 5,400	180 to 360	Up to 0.15	2,100 to 4,800	120 to 370	Up to 0.12
$\phi 14$ to 16	2,000 to 3,800	140 to 260	Up to 0.2	1,600 to 3,400	110 to 230	Up to 0.15

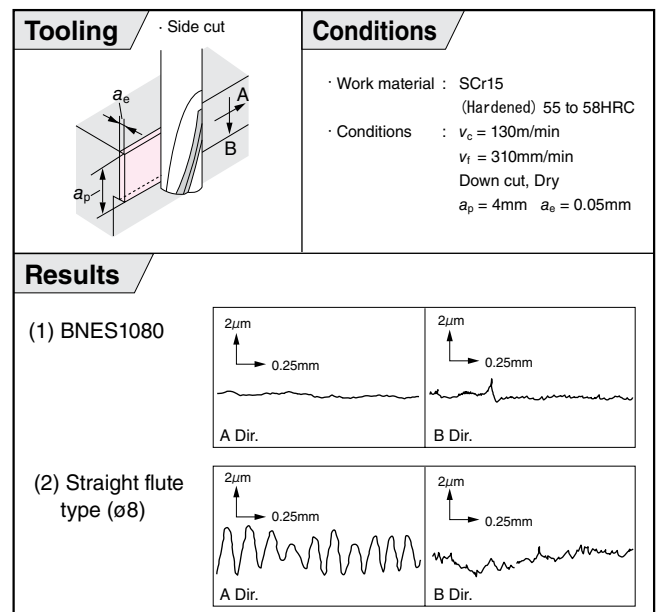
- Dry cut (Air Blow) and Down cut are recommended.
- Make the tool overhang as short as possible and use a rigid machine.

■ Performance

● Long Tool Life and High Efficiency

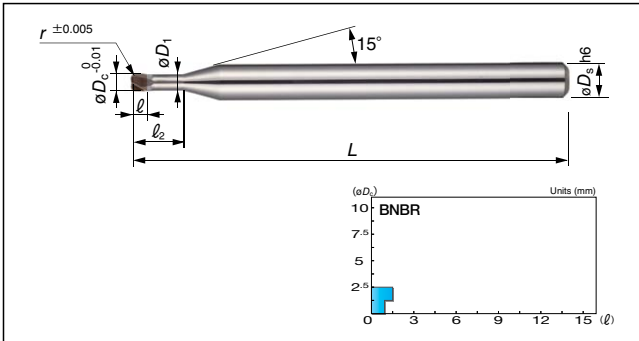


● Excellent Surface Roughness





General Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Steel	Hardened Steel	45 to 55 HRC	55 to 60 HRC	60 to 65 HRC	Stainless Steel	Titanium Alloy	Cast Iron	Al Alloy	Copper Alloy	Graphite	CFRP
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



■ Diameter and Corner Radius Combinations

D_c	$r0.05$	$r0.1$	$r0.2$	$r0.3$	$r0.5$
0.2	●				
0.3	●				
0.4	●				
0.5	●	●			
1.0	●	●	●	●	
1.5		●	●	●	
2.0		●	●	●	●

■ Cutter Body

Catalogue No.	Stock	Dimensions (mm)							Wiper Edge
		ϕD_c	r	l	l_2	L	ϕD_1	ϕD_s	
BNBR 2D020R005-0054	●	0.2	0.05	0.1	0.5	50	0.17	4	No
2D030R005-0054	●	0.3	0.05	0.15	0.5	50	0.27	4	
2D040R005-0054	●	0.4	0.05	0.2	0.5	50	0.37	4	
2D050R005-0054	●	0.5	0.05	0.3	0.5	50	0.47	4	
2D050R005-0154	●	0.5	0.05	0.3	1.5	50	0.47	4	
BNBR 2D050R005-0254	●	0.5	0.05	0.3	2.5	50	0.47	4	No
2D050R010-0154	●	0.5	0.10	0.3	1.5	50	0.47	4	
2D050R010-0254	●	0.5	0.10	0.3	2.5	50	0.47	4	
2D100R005-0304	●	1.0	0.05	0.7	3.0	50	0.97	4	
2D100R005-0504	●	1.0	0.05	0.7	5.0	50	0.97	4	
BNBR 2D100R010-0304	●	1.0	0.10	0.7	3.0	50	0.97	4	Yes
2D100R010-0504	●	1.0	0.10	0.7	5.0	50	0.97	4	
2D100R020-0304	●	1.0	0.20	0.7	3.0	50	0.97	4	
2D100R020-0504	●	1.0	0.20	0.7	5.0	50	0.97	4	
2D100R030-0304	●	1.0	0.30	0.7	3.0	50	0.97	4	
BNBR 2D100R030-0504	●	1.0	0.30	0.7	5.0	50	0.97	4	Yes
2D150R010-0454	●	1.5	0.10	1.2	4.5	50	1.47	4	
2D150R010-0754	●	1.5	0.10	1.2	7.5	50	1.47	4	
2D150R020-0454	●	1.5	0.20	1.2	4.5	50	1.47	4	
2D150R020-0754	●	1.5	0.20	1.2	7.5	50	1.47	4	
BNBR 2D150R030-0454	●	1.5	0.30	1.2	4.5	50	1.47	4	Yes
2D150R030-0754	●	1.5	0.30	1.2	7.5	50	1.47	4	
2D200R010-0604	●	2.0	0.10	1.5	6.0	50	1.97	4	
2D200R020-0604	●	2.0	0.20	1.5	6.0	50	1.97	4	
2D200R030-0604	●	2.0	0.30	1.5	6.0	50	1.97	4	
BNBR 2D200R050-0604	●	2.0	0.50	1.5	6.0	50	1.97	4	Yes

Grade BNX20

■ Endmill identification

BNBR	2	D050	R010	-015	4
No. of flutes	Diameter	Radius of ballnose	Length from neck to tip	Diameter of shank	



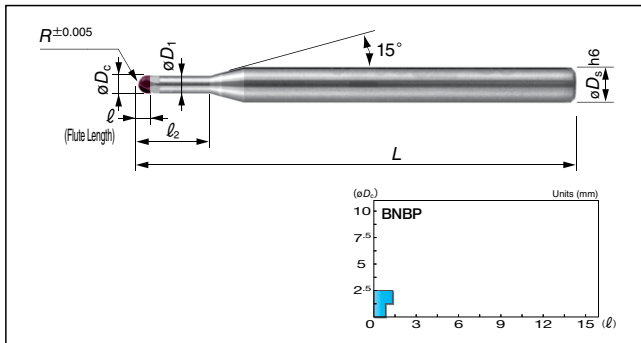
■ Recommended Cutting Conditions

- (1) For stable machining, a more rigid machine is recommended.
- (2) Non-water soluble coolant recommended. Supply as a mist or externally. Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
- (3) Shorten overhang as much as possible.
- (4) Adjust cuttings conditions as necessary as machine rigidity and other conditions may vary.
- (5) Depth of cut shown in the table of conditions are maximum depths. Adjust the actual depth of cut to the desired machined surface finish.

Work Material			STAVAX, NAK80, SKD61 (Up to 52HRC)				ELMAX, DC53, SKD11 Modified (Up to 62HRC)				YXR3, SKH (Up to 70HRC)			
Diameter (mm)	Corner R (mm)	Length below neck (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p (mm)	a _e (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p (mm)	a _e (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p (mm)	a _e (mm)
0.2	0.05	0.5	40,000	400	0.005	0.03	40,000	400	0.005	0.03	40,000	250	0.005	0.02
0.3	0.05	0.5	40,000	500	0.010	0.05	40,000	500	0.010	0.05	40,000	300	0.005	0.03
0.4	0.05	0.5	40,000	600	0.015	0.1	40,000	600	0.015	0.1	40,000	400	0.01	0.05
0.5	0.05	0.5	40,000	600	0.02	0.15	40,000	600	0.02	0.15	40,000	400	0.01	0.1
	0.05	1.5	40,000		0.02	0.1	40,000		0.02	0.1	35,000			
	0.1	40,000	0.02		0.1	35,000	0.05							
	0.05	2.5	40,000		0.01	0.05			35,000					
	0.1	40,000	0.01		0.05	35,000								
1.0	0.05	3.0	35,000	800	0.03	0.3	35,000	800	0.03	0.2	30,000	600	0.01	0.1
	0.1		35,000				35,000				30,000			
	0.2		35,000				35,000				30,000			
	0.3		35,000				35,000				30,000			
	0.05	5.0	35,000		0.02	0.2	35,000	800	0.02	0.1	30,000	600	0.01	0.1
	0.1		35,000				35,000				30,000			
	0.2		35,000				35,000				30,000			
1.5	0.1	4.5	26,000	800	0.03	0.5	26,000	800	0.03	0.3	20,000	600	0.02	0.3
	0.2		26,000				26,000				20,000			
	0.3		26,000				26,000				20,000			
	0.1	7.5	26,000		0.03	0.5	26,000	800	0.03	0.3	20,000	600	0.02	0.3
	0.2		26,000				26,000				20,000			
2.0	0.3	6.0	26,000	800	0.03	0.7	26,000	800	0.03	0.7	20,000	600	0.03	0.7
	0.2		20,000				20,000				15,000			
	0.3		20,000				20,000				15,000			
	0.5		20,000				20,000				15,000			



General	Carbon Steel	Alloy Steel	Pre-hardened Steel	Impressible Steel	Hardened Steel	Stainless Steel	Ti Alloy Heat Resistant Alloy	Cast Iron	Al Alloy	Copper Alloy	Graphite	CFRP
○	○	○	○	○	○	○	○	○	○	○	○	○



- Utilizing CBN SUMIBORON BN350 for excellent fracture resistance!
- Achieving longer tool life in high speed, high precision machining of pre-hardened and hardened steel! (up to HRC70)

■ Cutter Body (φ4mm Shank)

Cat No.	Stock	Dimensions (mm)							
		R	φD _c	l	l ₂	L	φD ₁	φD _s	
BNBP 2R020-0124	●	0.20	0.4	0.3	1.2	50	0.37	4	
2R020-0204	●	0.20	0.4	0.3	2.0	50	0.37	4	
2R020-0304	●	0.20	0.4	0.3	3.0	50	0.37	4	
2R020-0404	●	0.20	0.4	0.3	4.0	50	0.37	4	
2R030-0154	●	0.30	0.6	0.4	1.5	50	0.57	4	
BNBP 2R030-0204	●	0.30	0.6	0.4	2.0	50	0.57	4	
2R030-0304	●	0.30	0.6	0.4	3.0	50	0.57	4	
2R030-0404	●	0.30	0.6	0.4	4.0	50	0.57	4	
2R030-0504	●	0.30	0.6	0.4	5.0	50	0.57	4	
2R030-0604	●	0.30	0.6	0.4	6.0	50	0.57	4	
2R050-0254	●	0.50	1.0	0.6	2.5	50	0.97	4	
BNBP 2R050-0304	●	0.50	1.0	0.6	3.0	50	0.97	4	
2R050-0404	●	0.50	1.0	0.6	4.0	50	0.97	4	
2R050-0604	●	0.50	1.0	0.6	6.0	50	0.97	4	
2R050-0804	●	0.50	1.0	0.6	8.0	50	0.97	4	
2R075-0404	●	0.75	1.5	0.9	4.0	50	1.47	4	
BNBP 2R100-0554	●	1.00	2.0	1.4	5.5	50	1.97	4	
2R100-0804	●	1.00	2.0	1.4	8.0	50	1.97	4	

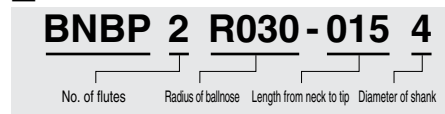
Grade BN350

■ Cutter Body (φ6mm Shank)

Cat No.	Stock	Dimensions (mm)							
		R	φD _c	l	l ₂	L	φD ₁	φD _s	
BNBP 2R020-0126	●	0.20	0.4	0.3	1.2	50	0.37	6	
2R030-0156	●	0.30	0.6	0.4	1.5	50	0.57	6	
2R050-0256	●	0.50	1.0	0.6	2.5	50	0.97	6	
2R075-0406	●	0.75	1.5	0.9	4.0	50	1.47	6	
2R100-0556	●	1.00	2.0	1.4	5.5	50	1.97	6	

Grade BN350

■ Endmill identification



■ Recommended Cutting Conditions

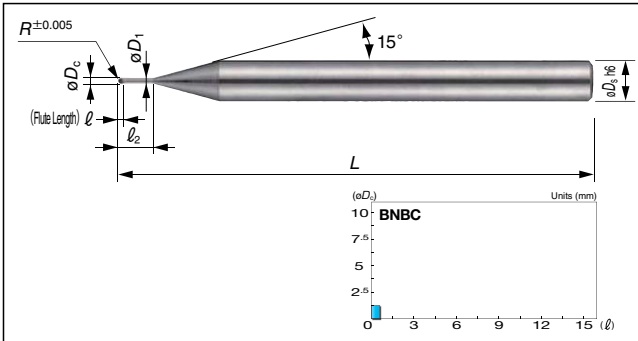
- (1) For stable machining, a more rigid machine is recommended.
- (2) Non-water soluble coolant recommended. Supply as a mist or externally. Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
- (3) Shorten overhang as much as possible.
- (4) Adjust cuttings conditions as necessary as machine rigidity and other conditions may vary.
- (5) Depth of cut shown in the table of conditions are maximum depths. Adjust the actual depth of cut to the desired machined surface finish.



Work Material		STAVAX, NAK80, SKD61 (Up to 52HRC)				DC53-SKD11 Modified (Up to 62HRC)				SKH (Up to 70HRC)			
R(mm)	l ₂ (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p (mm)	ρ _t (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p (mm)	ρ _t (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p (mm)	ρ _t (mm)
0.2	1.2	40,000	1,000	0.005	0.010	40,000	800	0.005	0.010	40,000	600	0.005	0.005
	2.0	40,000	800	0.005	0.010	40,000	600	0.005	0.010	40,000	400	0.005	0.005
	3.0	40,000	600	0.005	0.010	40,000	500	0.005	0.010	40,000	300	0.005	0.005
	4.0	40,000	500	0.005	0.010	40,000	400	0.005	0.005	40,000	200	0.005	0.005
0.3	1.5	40,000	1,600	0.020	0.020	40,000	1,400	0.010	0.020	40,000	1,200	0.010	0.020
	3.0	40,000	1,400	0.010	0.020	40,000	1,200	0.010	0.020	40,000	1,000	0.010	0.010
	4.0	30,000	1,200	0.010	0.010	30,000	1,000	0.010	0.010	30,000	700	0.005	0.010
	5.0	30,000	800	0.010	0.010	30,000	700	0.005	0.010	30,000	600	0.005	0.005
0.5	2.5	40,000	2,800	0.040	0.050	40,000	2,800	0.030	0.040	40,000	2,200	0.020	0.030
	3.0	40,000	2,600	0.040	0.050	40,000	2,600	0.030	0.040	40,000	2,100	0.020	0.030
	4.0	40,000	2,400	0.030	0.050	40,000	2,400	0.020	0.030	40,000	2,000	0.020	0.020
	6.0	25,000	1,500	0.020	0.030	25,000	1,500	0.010	0.020	25,000	1,300	0.010	0.010
0.75	8.0	16,000	1,200	0.020	0.020	16,000	1,100	0.010	0.020	16,000	850	0.010	0.010
	4.0	32,000	2,400	0.030	0.030	32,000	2,200	0.020	0.030	32,000	2,000	0.020	0.020
	5.5	40,000	4,000	0.050	0.050	40,000	4,000	0.030	0.030	40,000	3,000	0.020	0.030
	8.0	32,000	3,000	0.030	0.050	32,000	2,600	0.020	0.030	32,000	2,200	0.010	0.020



General Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Steel	Hardened Steel	Stainless Steel	Titanium Alloy	Cast Iron	Al Alloy	Copper Alloy	Graphite	CFRP
					45 to 55 HRC	55 to 60 HRC	60 to 65 HRC					



Endmill identification

BNBC 2 R030-010 4

No. of flutes Radius of ballnose Length from neck to tip Diameter of shank

Endmills

(Unit: mm)

Cat No.	Stock	Dimensions (mm)						
		R	ϕD_c	ℓ	ℓ_2	L	ϕD_1	ϕD_s
BNBC 2R010-0034	●	0.1	0.2	0.2	0.3	50	0.17	4
2R010-0104	●	0.1	0.2	0.2	1.0	50	0.17	4
2R020-0054	●	0.2	0.4	0.3	0.5	50	0.37	4
2R020-0204	●	0.2	0.4	0.3	2.0	50	0.37	4
2R030-0104	●	0.3	0.6	0.4	1.0	50	0.57	4
BNBC 2R030-0304	●	0.3	0.6	0.4	3.0	50	0.57	4
2R050-0304	●	0.5	1.0	0.6	3.0	50	0.97	4

*Endmills with a nose radius of 0.3mm or greater are available as long-neck flutes. Please contact us for details. Grade BN700

Recommended Cutting Conditions

- (1) For stable machining, a more rigid machine is recommended.
- (2) Non-water soluble coolant recommended. Supply as a mist or externally.
Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
- (3) Shorten overhang as much as possible.
- (4) Adjust cuttings conditions as necessary as machine rigidity and other conditions may vary.
- (5) Depth of cut shown in the table of conditions are maximum depths. Adjust the actual depth of cut to the desired machined surface finish.



Side Milling

Work Material	Copper Alloy			
Cutting Conditions	Spindle Speeds	Feed Rate	Depth of cut (mm)	
Cat No.	(min ⁻¹)	(mm/min)	a_p	p_t
BNBC 2R010-0034	20,000	350	0.01	0.02
2R010-0104	-50,000	350	0.007	0.015
BNBC 2R020-0054	20,000	800	0.025	0.05
2R020-0204	-50,000	700	0.02	0.03
BNBC 2R030-0104	20,000	1,400	0.05	0.15
2R030-0304	-50,000	1,200	0.04	0.1
BNBC 2R050-0304	20,000	2,200	0.15	0.35
	-50,000			

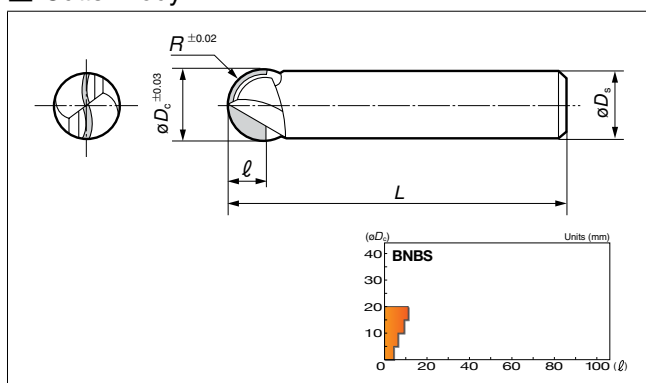


General Steel	Carbon Steel	Alloy Steel	Aluminum	Cast Iron	Stainless Steel	Hardened Steel	Titanium	Inconel	Copper	Aluminum	Graphite	CFRP
○	○	○	○	○	○	○	○	○	○	○	○	○



- Combination of Special Grade and Spiral Cutting Edge Design
- The combination of special SUMIBORON grade with unique spiral cutting edge design is a breakthrough for high efficiency and smooth end-milling of hardened steels.

Cutter Body



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

Grade BN350

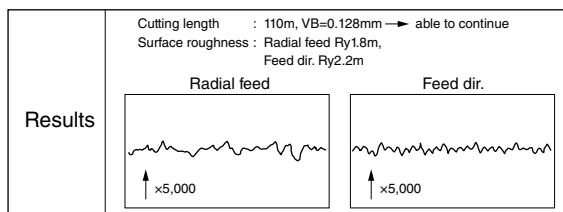
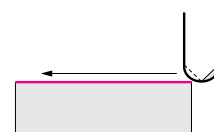
Recommended Cutting Conditions

Work Material	Hardened Steel (50-57HRC)		Hardened Steel (58-65HRC)	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
1.0	26,000	1,100	22,000	670
1.5	18,000	700	15,000	450
2.0	13,000	530	11,000	330
3.0	8,800	610	7,400	450
4.0	6,600	460	5,600	330
5.0	5,300	630	4,500	400
6.0	4,400	530	3,700	330
8.0	3,300	390	2,800	250
10.0	2,600	320	2,200	200
Depth of cut	a_p	$0.01D_c$	$0.01D_c$	$0.01D_c$
	p_r	$0.02D_c$	$0.02D_c$	$0.02D_c$

Performance

Work : SKD11 (60HRC)

	BN350
Cutting Speed	250m/min
Feed Rate	0.04mm/t
Pitch feed	0.3mm
Depth of cut	0.3mm
Tool	BNBS2100S



Important Notes

- (1) Use a rigid machine and select a high cutting speed with low feedrate.
- (2) Use dry cutting conditions.
- (3) Make overhang as short as possible.
- (4) If work hardness is lower than HRC50, try a coated or uncoated carbide ballnose endmill instead. (→I62)