

SUMIBORON

L1 to L143

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SUMIBORON



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Stock Markings and Symbols

- mark: Standard stocked item
- mark: To be replaced with the new item featured on the same page
- ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability).

- * mark: Semi-standard stock (please confirm stock availability)
- mark: Stock or planned stock (please confirm stock availability)
- Blank: Made-to-order item
- mark: Not available

SUMIBORON

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General Features

Sintered CBN tool "SUMIBORON", which has CBN (cubic boron nitride) - a hard material second only to diamond - as its main component, is sintered with a metal or special ceramic binder under ultra-high pressure and temperature.

SUMIBORON has high hardness, excellent thermal resistance and excellent properties including being unreactive to ferrous metals, enabling exotic alloys, hardened steel or hard cast iron to be machined. Excellent efficiency and longer tool life can also be achieved from high-speed finishing of cast iron.

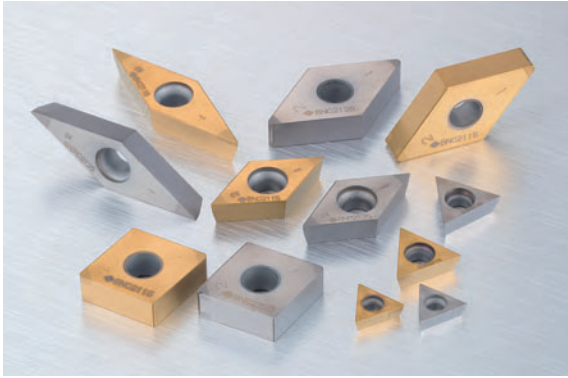
"SUMIBORON" was first successfully developed in Japan by our company in 1977. "Coated SUMIBORON" with a special ceramic coating and "SUMIBORON BINDERLESS" made by directly bonding CBN particles without a binder are new additions to our product lineup.

Features The sintered CBN tool SUMIBORON is mainly used for the machining of ferrous metals due to its low chemical reactivity with iron. There are 4 different classifications of SUMIBORON as follows:

Classifications/Applications

	Classifications	Structure	Diagram	Grade	Work Material
(A)	With a high CBN content, where each grain is fused together, this group can be used for the machining of high-hardness materials like cast iron, heat-resistant alloys and sintered alloys.			BN700	K (FC) S
				BN7000	
				BN7115	
				BN7500	
				BNS8125	K (FC/FCD) S
				BNS800	K (FC) S
(B)	The group where CBN grains are held together by a special ceramic binder with a strong binding force provides excellent wear resistance and toughness in the machining of hardened steel and cast iron.			BN1000	H
				BN2000	
BN350					
BNX10					
BNX20					
BN500	K (FC/FCD)				
(C)	SUMIBORON with special ceramic coating. The CBN and coating exhibit the hardness, toughness, thermal resistance and oxidation resistance that tool material requires for excellent cutting performance.			BNC2115	H
				BNC2125	
				BNC2010	
				BNC2020	
				BNC300	
				BNC100	
				BNC160	
				BNC200	
BNC500	K (FCD)				
(D)	Products containing no binder, with a structure of directly bonded nano- to sub-micron CBN particles which provides excellent hardness and thermal conductivity, making them highly efficient with long tool life when machining exotic alloys such as titanium alloys and cobalt-chrome alloys.			NCB100	K (FC) S

Coated SUMIBORON Series



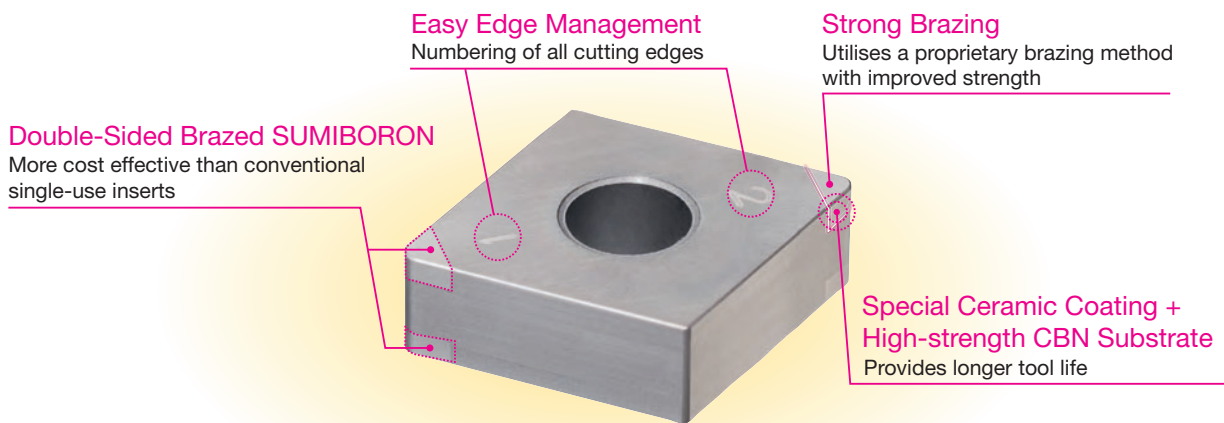
Achieves higher speed, higher efficiency and higher precision Coated SUMIBORON Series

■ General Features

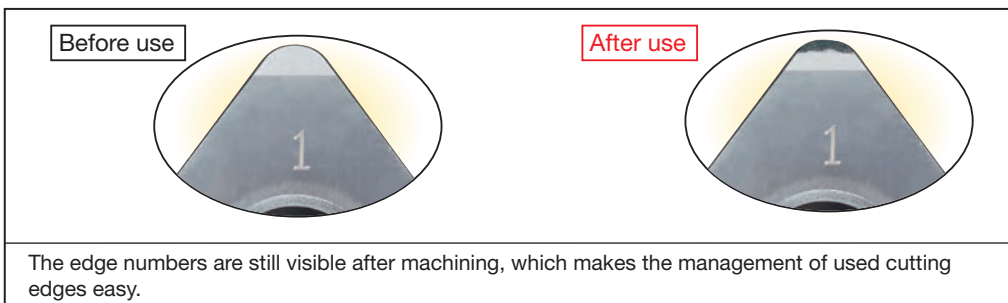
With a highly thermal-resistant and tough CBN substrate coupled with a special ceramic coating, this series caters to a wide variety of applications, with improved precision and longer tool life compared to conventional CBN.

Our extensive range, including more cost-effective, double-sided, multi-cornered one-use inserts, offers a selection of economical and easy-to-use tools.

■ Features



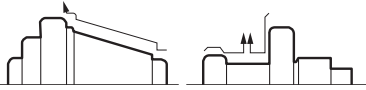
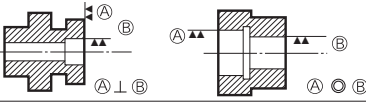
■ Cutting Edge Management

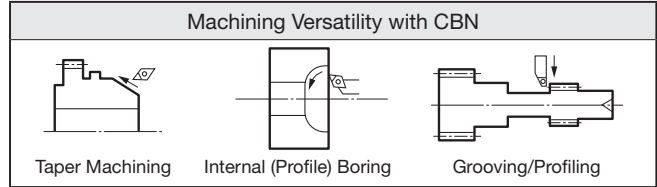


HARDENED STEEL MACHINING




Advantages of SUMIBORON for hardened steel cutting

Below is an analysis of the use of CBN tools compared to grinding. Much lower investment in terms of machine cost and overhead cost due to the fact that a CNC lathe is cheaper than a grinding machine. In terms of surface finish quality, inserts can machine different profiles with the finished workpiece equivalent to grinding. The chips from the turning process can also be collected and recycled to mitigate the environmental impact of sludge treatment for grinding. The workpieces shown at the bottom right of the table are shapes which will particularly benefit from cutting as opposed to grinding.

	Advantages	Remarks
Cost	Facility investment is low	· Cheaper machines · Reduced processes · Improved machining efficiency with less machining required
	Complex finishing in a single set-up	
Quality	Improved precision	
Environment	Environmentally-friendly	Sludge management → Chip control (Recyclable)



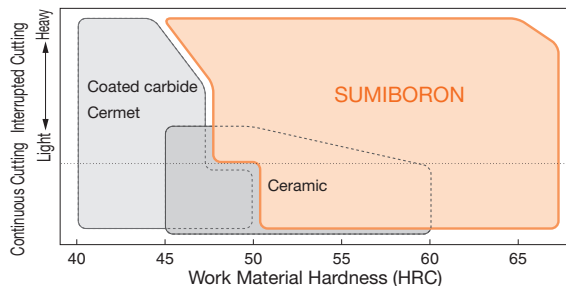
Recommended Grades

	Grade	Binder	CBN Content (%)	Grain Size (µm)	Hardness HV (GPa)	TRS (GPa)	Main Coating Components	Coating Thickness (µm)	Features
Coated	 BNC2115	TiN	60 to 65	3	31 to 33	1.3 to 1.4	TiAlN Super Multi-layered Coating	3	Maintains excellent surface roughness thanks to coating with high notch wear resistance and tough CBN substrate.
	 BNC2125	TiN	65 to 70	4	33 to 35	1.5 to 1.6	TiAlN Super Multi-layered Coating	3	Along with a tough CBN substrate, the coating combines wear resistance and toughness to achieve even more stable machining.
	BNC2010	TiCN	50 to 55	2	30 to 32	1.1 to 1.2	TiCN Multiple Layers	2	Improved wear resistance from coating and substrate, achieves excellent and consistent surface finish.
	BNC2020	TiN	70 to 75	5	34 to 36	1.4 to 1.5	TiAlN Multiple Layers	2	Utilising a tough substrate along with a highly wear-resistant and adhesive coating layer, to achieve long tool life in general-purpose to high-efficiency machining.
	BNC300	TiN	60 to 65	1	33 to 35	1.5 to 1.6	TiAlN	1	Suitable for finishing work materials combining continuous and interrupted cutting.
	BNC100	TiN	40 to 45	1	29 to 32	1.0 to 1.1	TiAlN/TiCN	3	Suitable for high-speed finishing thanks to highly wear-resistant coating.
	BNC160	TiN	60 to 65	3	31 to 33	1.2 to 1.3	TiAlN/TiCN	3	Achieves stable, high-precision finishing of hardened steel.
	BNC200	TiN	65 to 70	4	33 to 35	1.4 to 1.5	TiAlN	3	Provides long tool life thanks to tough substrate and highly wear-resistant coating.
Uncoated	 BNC8115	Al Alloy	85 to 90	8	39 to 42	0.95 to 1.15	TiAlN	2	Grade with 100% solid CBN structure, using PVD coating with excellent wear resistance to enable roughing operations.
	BN1000	TiCN	40 to 45	1	27 to 31	0.9 to 1.0	—	—	Achieves ultimate wear and fracture resistance. Suitable for high-speed cutting.
	BN2000	TiN	50 to 55	2	31 to 34	1.1 to 1.2	—	—	General-purpose grade for hardened steel machining with a high degree of fracture and wear resistance.
	BNX20	TiN	55 to 60	3	31 to 33	1.0 to 1.1	—	—	Achieves excellent crater wear resistance. Suitable for high-efficiency cutting under high-temperature conditions.
	BN350	TiN	60 to 65	1	33 to 35	1.5 to 1.6	—	—	Achieves ultimate cutting edge strength. Suitable for heavy interrupted cutting.
	BNX10	TiCN	40 to 45	3	27 to 31	0.9 to 1.0	—	—	Excellent wear resistance. Suited to continuous high-speed cutting.

Transverse rupture strength measured with test piece equivalent to insert CBN layer.

Recommended Range

Work Material Hardness and Recommended Ranges for SUMIBORON

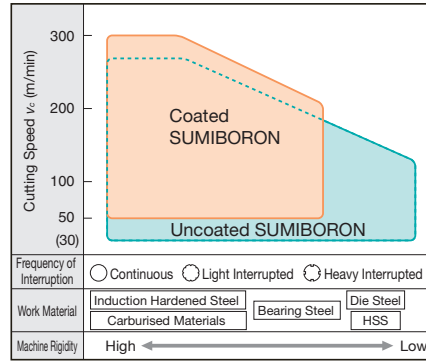


Applications

Coated SUMIBORON: **1st recommendation** for hardened steel machining, excellent performance in high-speed, high-efficiency machining.

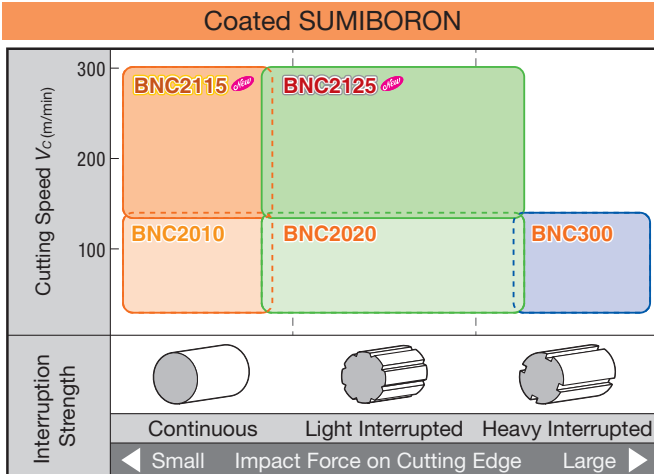
Uncoated SUMIBORON: Optimal for machining small items with a limited cutting speed and hardened steel.

Series	Applications
Coated SUMIBORON	<ul style="list-style-type: none"> First recommendation for hardened steel machining Machining requiring high speed and high accuracy Machining requiring high efficiency, such as carburised layer removal
Uncoated SUMIBORON	<ul style="list-style-type: none"> Machining where cutting speed cannot be increased, such as small product machining Machining of workpieces containing hard particles such as mold components Machining with low tool rigidity

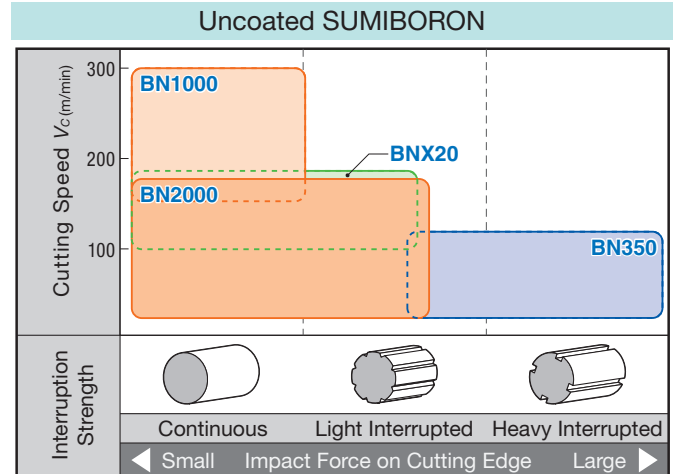


Application Range

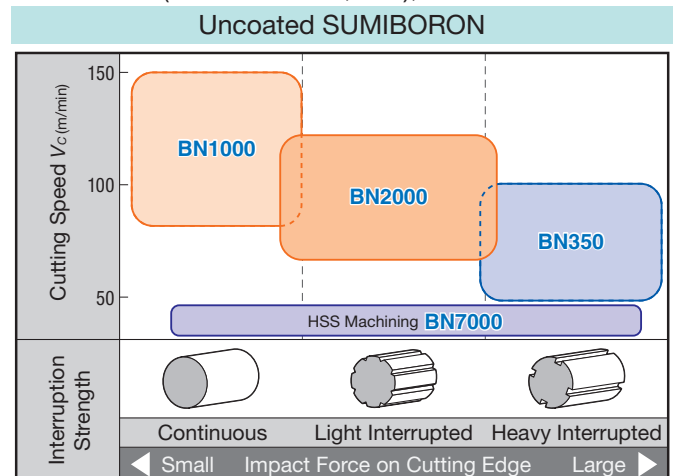
● Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



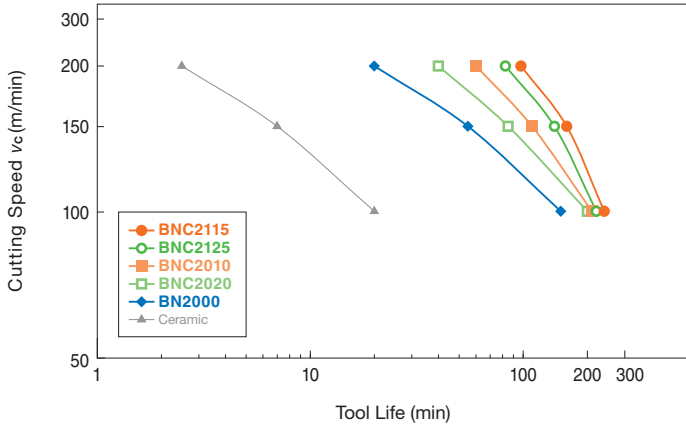
● Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



● Die Steel (SKD11/SKD61, etc.), HSS



Cutting Performance (Continuous Cutting)

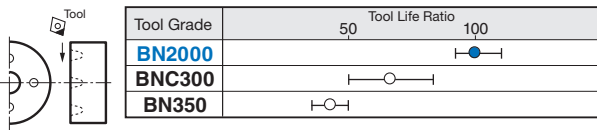


Tool Life Criterion: $V_{max} = 0.1\text{mm}$

Work Material : SCM415H (58 to 62HRC)
 Tool Cat. No. : DNGA150408
 Cutting Conditions: $f = 0.1\text{mm/rev}$, $a_p = 0.2\text{mm}$ Wet

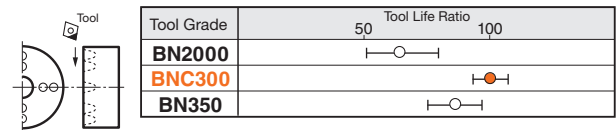
Cutting Performance (Interrupted Cutting)

[Light Int. - Chamfered 4-Holed Face (Interrupted Cutting 25%)]



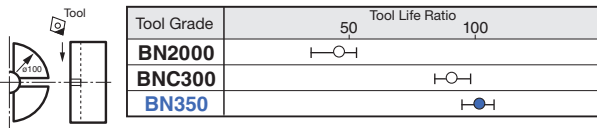
Work Material : SCr420H (58 to 62 HRC)
 Tool Cat. No. : CNGA120408
 Cutting Conditions: $v_c = 100\text{m/min}$, $f = 0.1\text{mm/rev}$, $a_p = 0.2\text{mm}$ Dry

[Medium Int. - Chamfered 8-Holed Face (Interrupted Cutting 50%)]



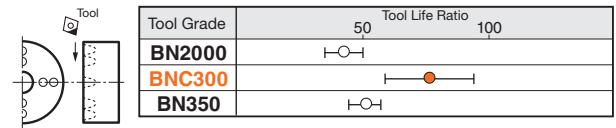
Work Material : SCr420H (58 to 62 HRC)
 Tool Cat. No. : CNGA120408
 Cutting Conditions: $v_c = 100\text{m/min}$, $f = 0.1\text{mm/rev}$, $a_p = 0.2\text{mm}$ Dry

[Heavy Int. - U-Grooved Face (Interrupted Cutting 100%)]



Work Material : SCr420H (58 to 62 HRC)
 Tool Cat. No. : CNGA120408
 Cutting Conditions: $v_c = 100\text{m/min}$, $f = 0.1\text{mm/rev}$, $a_p = 0.2\text{mm}$ Dry

[High Speed Int. - Chamfered 8-Holed Face (Interrupted Cutting 50%)]



Work Material : SCr420H (58 to 62 HRC)
 Tool Cat. No. : CNGA120408
 Cutting Conditions: $v_c = 200\text{m/min}$, $f = 0.1\text{mm/rev}$, $a_p = 0.2\text{mm}$ Dry

CAST IRON MACHINING

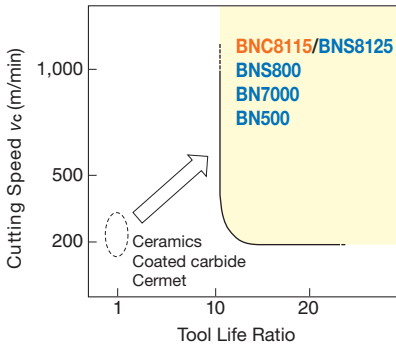
● Advantages of machining cast iron with SUMIBORON

Compared with conventional tools, a longer tool life for high speed machining is realized, machining efficiency is improved and better wear resistance, a sharper edge, excellent surface roughness and dimensional tolerance are achieved.

SUMIBORON is ideal for finishing of gray cast iron and special cast iron through FCD (ductile cast iron) and heat-treated high-grade cast iron such as ADI.

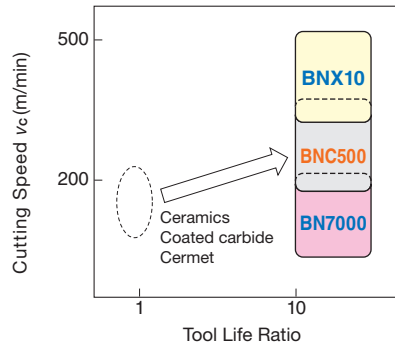
High-speed Machining

● Gray Cast Iron

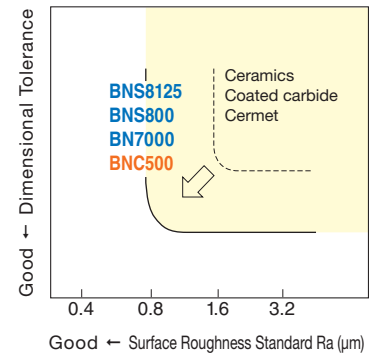


High-speed Machining

● Ductile Cast Iron



High-precision Machining



Recommended Grades

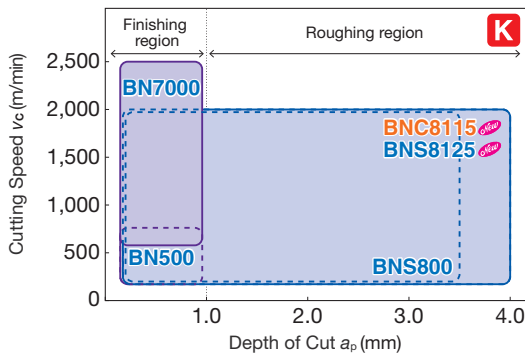
	Grade	Binder	CBN Content (%)	Grain Size (µm)	Hardness HV (GPa)	TRS (GPa)	Main Coating Components	Coating Thickness (µm)	Features
Uncoated	BNS8125	Al Alloy	85 to 90	8	39 to 42	0.95 to 1.15	—	—	Grade with 100% solid CBN structure that exhibits excellent wear and fracture resistance.
	BNS800	Al Alloy	85 to 90	8	39 to 42	0.9 to 1.1	—	—	Grade with solid CBN structure that has excellent thermal shock resistance.
	BN7000	Co Compound	90 to 95	2	41 to 44	1.8 to 1.9	—	—	Grade exhibiting wear and fracture resistance in cutting of cast iron and exotic alloys.
	BN500	TiC	65 to 70	6	32 to 34	1.0 to 1.1	—	—	Grade optimised for cast iron cutting. Provides superior wear and fracture resistance.
Coated	BNC8115	Al Alloy	85 to 90	8	39 to 42	0.95 to 1.15	TiAlN	2	Grade with 100% solid CBN structure, using PVD coating with excellent wear resistance that enables roughing operations.
	BNC500 (For Ductile Cast Iron)	TiC	60 to 65	4	32 to 34	1.1 to 1.2	TiAlN	3	Suitable for machining of hard-to-cut cast iron, thanks to the highly wear-resistant substrate and coating.

Transverse rupture strength measured with test piece equivalent to insert CBN layer.

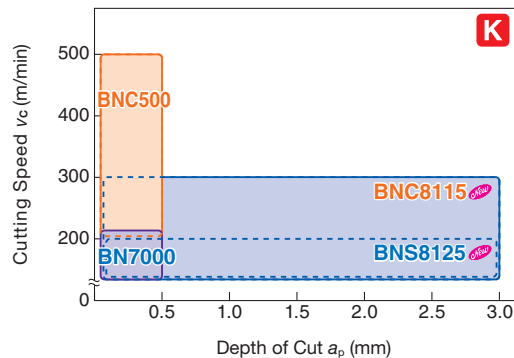
Refer to pages L9 to L11 for machining of sintered components, rolls, hard facing alloys, hardened stainless steel, titanium alloys, and heat-resistant alloys.

Application Range

● Gray Cast Iron



● Ductile Cast Iron



● Special Cast Iron

Work Material	Hardness (HB)	Work Material Structure	Examples	Cutting Speed v_c (m/min)				
				100	200	300	350	400
Ni-resistant Cast Iron	150 to 200	Austenite	Piston ring	BNC500				
High-Cr Cast Iron	250 to 350	Austenite	Pump Part	BNS8125/BNS800				
FCV (CGI)	400 to 580	Pearlite	Engine blocks Cylinder heads Brake discs	BNC500				

Recommended Cutting Conditions

● Turning

Work Material		Recommended Grade	Recommended Cutting Conditions			
Material	Standard (Hardness)		Cutting Speed v_c (m/min)		Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
Gray Cast Iron	FC200 to FC300 (HB ≤ 230)	BN7000	500 — 2,000		0.1 to 0.5	≤ 1.0
		BNC8115 / BNS8125	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
		BNS8125 / BNS800	200 — 1,000		0.1 to 0.8	≤ 2.0
Ductile Cast Iron	FCD450 to FCD550	BNC8115	80 — 300		0.1 to 0.5	≤ 3.0
		BNS8125	80 — 200		0.1 to 0.5	≤ 3.0
		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

Cutting Oil: Wet cut (BNC8115/BNS8125/BNS800 can also be used dry)

● Milling

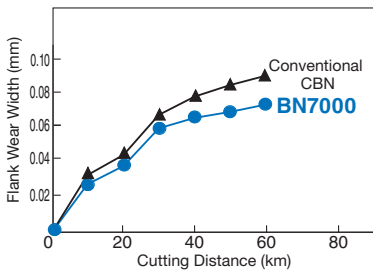
Work Material		Recommended Grade	Recommended Cutting Conditions			
Material	Standard (Hardness)		Cutting Speed v_c (m/min)		Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
Gray Cast Iron	FC200 to FC300 (HB ≤ 200)	BN7000	800 — 2,000		0.1 to 0.5	≤ 0.5
		BNS8125 / BNS800	800 — 2,000		0.1 to 1.0	≤ 4.0

Cutting Oil: Dry cut

Cutting Performance

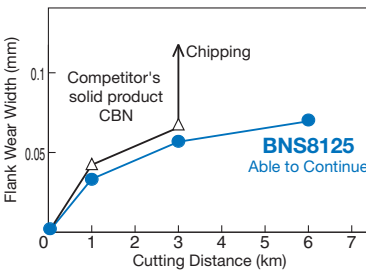
Gray Cast Iron Turning **BN7000/BNC8115/BNS8125/BN500**

● High Speed Continuous Cutting



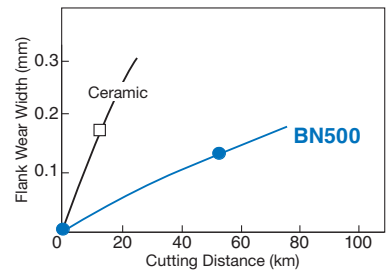
Work Material: FC300 (Pearlite)
Tool Cat. No.: 2NU-CNGA120408
Cutting Conditions: $v_c=800$ m/min, $f=0.15$ mm/rev, $a_p=0.2$ mm Wet

● Interrupted Cutting



Work Material: FC300 (Pearlite)
Tool Cat. No.: SNGN090308
Cutting Conditions: $v_c=600$ m/min, $f=0.3$ mm/rev, $a_p=0.5$ mm Dry

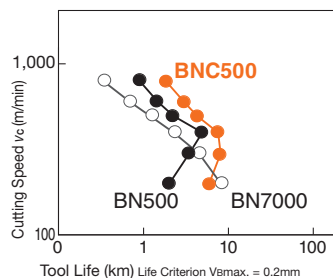
● Continuous Cutting



Work Material: FC300 (Pearlite)
Tool Cat. No.: SNGN120412
Cutting Conditions: $v_c=500$ m/min, $f=0.3$ mm/rev, $a_p=0.15$ mm Wet

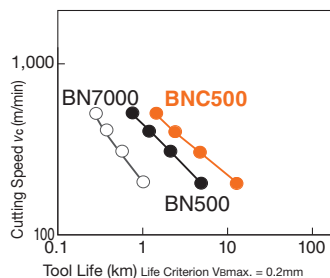
Ductile Cast Iron Turning **BNC500**

● FCD450



Work Material: FCD450 (Continuous Cutting)
Cutting Conditions: $f=0.2$ mm/rev, $a_p=0.2$ mm Wet

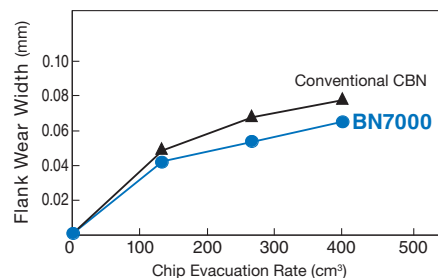
● FCD700



Work Material: FCD700 (Continuous Cutting)
Cutting Conditions: $f=0.2$ mm/rev, $a_p=0.2$ mm Wet

Milling Gray Cast Iron **BNC8115/BNS8125/BN7000**

● Cast Iron Milling



Work Material: FC250 (Pearlite)
Tool Cat. No.: FMU4100R SNEW1203ADTR
Cutting Conditions: $v_c=1,500$ m/min, $f=0.2$ mm/rev, $a_p=0.3$ mm Dry

SINTERED COMPONENT MACHINING

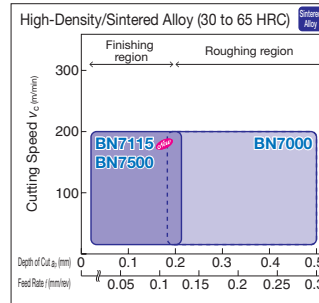
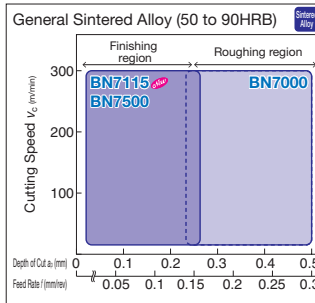
- Advantages of cutting sintered components with SUMIBORON
SUMIBORON has much smaller edge wear than cemented carbide or cermet. It also has better wear resistance and can form a sharp edge easily. SUMIBORON is able to prevent burrs and chipping on the edges of the workpiece, achieving good machining precision and surface roughness.

Sintered Components

Recommended Grades

● General Sintered Alloy

● High-Density/Sintered Alloy

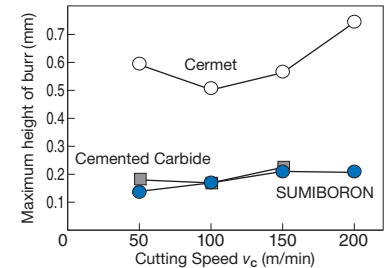
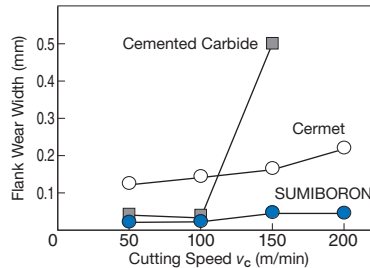
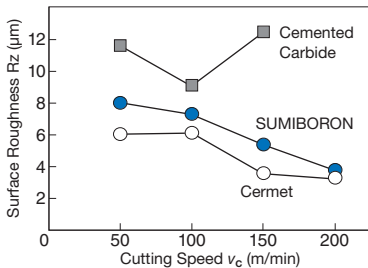


Grade	Binder	CBN Content (%)	Grain Size (μm)	Hardness HV (GPa)	TRS (GPa)	Main Coating Components	Coating Thickness (μm)	Features
NEW BN7115	Co Compound	90 to 95	1	41 to 44	2.2 to 2.3	—	—	Grade balancing ultimate cutting edge sharpness with fracture resistance, suitable for finishing of sintered alloy.
BN7500	Co Compound	90 to 95	1	41 to 44	2.0 to 2.1	—	—	Grade maintaining good cutting edge sharpness, suitable for finishing of sintered alloy.
BN7000	Co Compound	90 to 95	2	41 to 44	1.8 to 1.9	—	—	Grade exhibiting improved wear and fracture resistance in roughing of sintered materials.

Transverse rupture strength measured with test piece equivalent to insert CBN layer.

Cutting Performance

● Grade Performance Comparison



Work Material: Sintered Alloy F-08C2 equivalent
Machining Application: ø80-ø100 heavy interrupted facing with grooves and drilled holes (after 40 passes)
Tool Cat. No.: TNGA160404
Cutting Conditions: $f = 0.1\text{mm/rev}$, $a_p = 0.1\text{mm Wet}$

For general sintered alloy, cemented carbide and cermet grades can perform up to $v_c = 100\text{m/min}$. However, around $v_c = 120\text{m/min}$, wear becomes rapid and surface roughness deteriorates with increased burrs. On the other hand, SUMIBORON exhibits stability and superior wear resistance, burr prevention and surface roughness, especially at high speeds.

Valve Seat Ring (VSR)

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

Recommended Grades

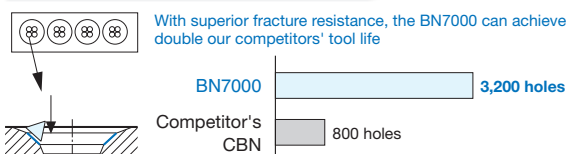
● Recommended Grade by Machining Application

	Gasoline VSR material	Diesel VSR material
Plunge cut	BN7000 BN7115 BN7500	BN7000 BN7115 BN7500
Traverse cut	BN7000 BN7115 BN7500	BN7000 BN7115 BN7500
Work material 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



Work Material : Sintered Alloy (150 to 250 HV)
Machining Application : VSR(IN) 45° Surface Finishing
Tool Cat. No. : TBGN060104B
Cutting Conditions : $v_c=100\text{m/min}$, $f=0.08\text{mm/rev Wet}$

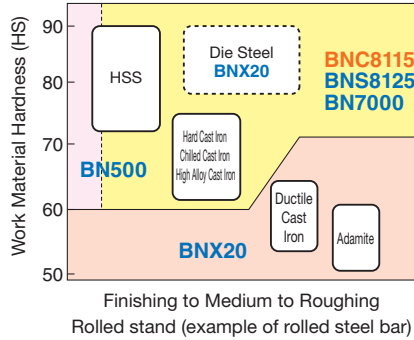
Grade Guidance H Hardened Steel K Cast Iron S Exotic Alloy

ROLL MACHINING

● Advantages of roll machining with SUMIBORON

SUMIBORON enables the machining of high-hardness rolls that were previously difficult to machine with conventional tools, drastically improving machining efficiency.

Recommended Grades



Recommended Cutting Conditions

Work Material	Hardness (HS)	Recommended Cutting Conditions								
		Cutting Speed v_c (m/min)								
Category	Hardness (HS)	20	40	60	80	100	120	140	Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
Adamite	≥ 40	[Bar from 60 to 120]						0.1 to 0.5		0.2 to 3.0
Chilled cast iron	≥ 60	[Bar from 60 to 120]						0.1 to 0.5		0.2 to 3.0
High-alloy cast iron	≥ 60	[Bar from 60 to 120]						0.1 to 0.5		0.2 to 3.0
HSS	≥ 70	[Bar from 40 to 80]						0.1 to 0.4		0.1 to 3.0

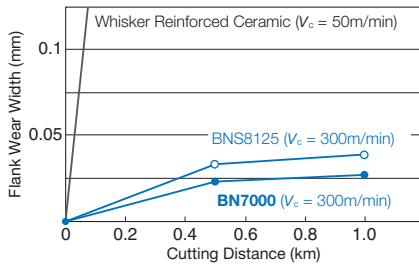
HARD FACING ALLOY MACHINING

● Advantages of hard facing alloy machining with SUMIBORON

SUMIBORON enables the machining of high-hardness facing alloys that were previously difficult to machine with conventional tools, drastically improving machining efficiency.

The first recommended grade is BN7000, followed by BNS8125.

Cutting Performance



Work Material : Colmonoy No.6 (NiCr-Based Self-Fluxing Alloy)
 Tool Cat. No. : SNGN090308
 Cutting Conditions : $f = 0.1$ mm/rev, $a_p = 0.2$ mm Dry

● BN7000 has a long tool life and minimal wear with high speed cutting

Recommended Cutting Conditions

Work Material	Material	Recommended Cutting Conditions					
		Cutting Speed v_c (m/min)					
Category	Material	50	100	200	300	Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
Ni-Based Self-Fluxing Alloy	Colmonoy No.6	[Bar from 100 to 300]				0.05 to 0.2	0.1 to 3.0
Co-Based Self-Fluxing Alloy	Stellite	[Bar from 50 to 100]				0.05 to 0.2	0.1 to 1.0

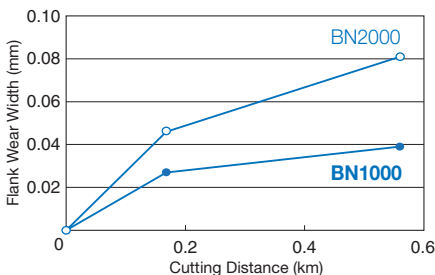
HARDENED STAINLESS STEEL MACHINING

● Hardened Stainless Steel Machining with SUMIBORON

SUMIBORON enables the machining of hardened stainless steel, previously difficult to machine with conventional tools, drastically improving machining efficiency.

The first recommended grade is BN1000. When strength is required, we recommend BN2000.

Cutting Performance



Work Material : SUS440C (59 to 61HRC, continuous)
 Tool Cat. No. : 2NU-CNGA120408
 Cutting Conditions : $v_c = 200$ m/min, $f = 0.1$ mm/rev, $a_p = 0.1$ mm Wet

Recommended Cutting Conditions

Work Material	Recommended Cutting Conditions					
	Cutting Speed v_c (m/min)					
Category	50	100	200	300	Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
Hardened Stainless Steel	[Bar from 100 to 200]				0.03 to 0.2	0.03 to 0.3

TITANIUM ALLOY CUTTING

● Advantages of titanium alloy machining with SUMIBORON

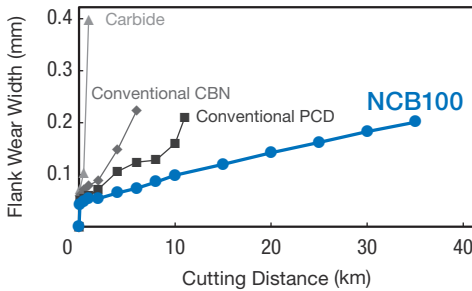
SUMIBORON enables high speed machining of titanium alloys that were previously difficult to machine with conventional tools, drastically improving machining efficiency.

Recommended Grades

Grade	Binder	CBN Content (%)	Grain Size (µm)	Hardness HV (GPa)	TRS (GPa)	Main Coating Components	Coating Thickness (µm)	Features
NCB100	—	100	up to 0.5	51 to 54	1.8 to 1.9	—	—	Ideal for high-efficiency finishing of titanium alloy.

Transverse rupture strength measured with test piece equivalent to insert CBN layer.

Cutting Performance



Work Material : Titanium Alloy (Ti-6Al-4V)
 Tool Cat. No. : CNGA120408
 Cutting Conditions: $v_c = 150\text{m/min}$, $f = 0.15\text{mm/rev}$, $a_p = 0.5\text{mm}$
 Wet (High Pressure Coolant)

Recommended Cutting Conditions

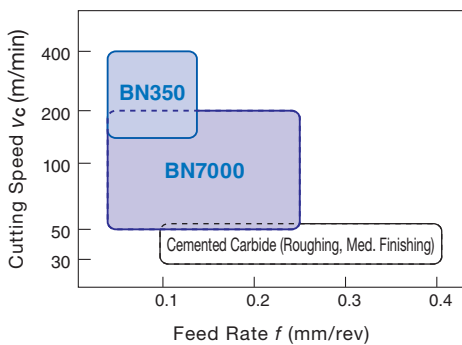
Work Material		Grade	Recommended Cutting Conditions <small>Min. - Optimum - Max.</small>			
Composition	Hardness (HRC)		Cutting Speed v_c (m/min)		Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
Ti-6Al-4V	30 - 35	NCB100	50	100 - 250	0.05 - 0.15 - 0.20	0.10 - 0.30 - 0.50
Ti-5Al-5V-5Mo-3Cr	32 - 38	NCB100	50	100 - 250	0.05 - 0.10 - 0.20	0.10 - 0.30 - 0.50
Ti-10V-2Fe-3Al	32 - 38	NCB100	50	100 - 250	0.05 - 0.10 - 0.20	0.10 - 0.30 - 0.50

HEAT-RESISTANT ALLOY MACHINING

● Advantages of heat-resistant alloy machining with SUMIBORON

SUMIBORON provides long tool life in the finishing of heat-resistant alloys.

Recommended Grades



SUMIBORON is best suited for finishing of heat resistant steel

Recommended Cutting Conditions

Work Material		Recommended Cutting Conditions			
Category	Material	Cutting Speed v_c (m/min)		Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
Ni-based Heat-resistant Alloy	Inconel 718	50	100 - 200	0.05 to 0.2	0.1 to 1.0
Co-Based Heat-Resistant Alloy	Stellite	50	100 - 200	0.05 to 0.2	0.1 to 1.0

BNC2115/BNC2125/BNC2010/BNC2020



New

SUMIBORON



The Pinnacle of High Accuracy/High-efficiency Cutting

General Features

BNC2115/BNC2125 have been added to our coated SUMIBORON series and are our first recommendations for hardened steel machining, for even higher efficiency machining.

In combination with BNC2010/BNC2020, which emphasize stable tool life, they improve productivity in all kinds of hardened steel machining.

Features

● BNC2115 *New*

- **The definitive grade in high-accuracy machining**

Realises long tool life with excellent surface roughness and stable machining.

- **Further maintains excellent surface roughness**

Maintains excellent surface roughness thanks to a coating with high notch wear resistance and tough CBN substrate.

● BNC2125 *New*

- **First recommendation for hardened steel machining**

Superb wear and fracture resistance.

- **Along with a tough CBN substrate, the coating combines wear resistance and toughness to realise stabler machining**

Achieves long, stable tool life even in high-efficiency and interrupted machining.

● BNC2010

- **Grade for high-precision finishing requiring good surface roughness and finished surface accuracy**

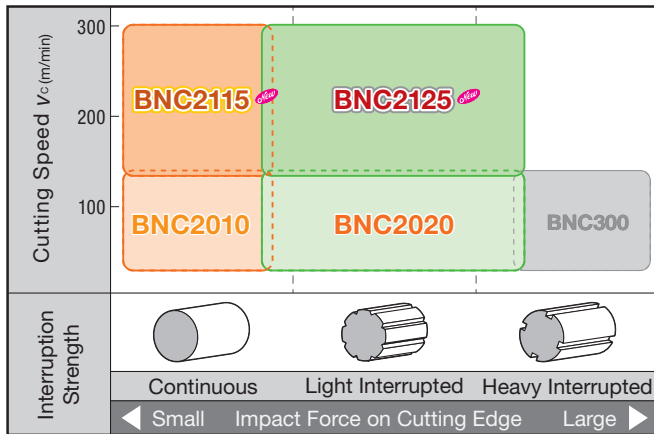
Grade ideal for high-precision machining, with highly wear-resistant CBN substrate and coating.

● BNC2020

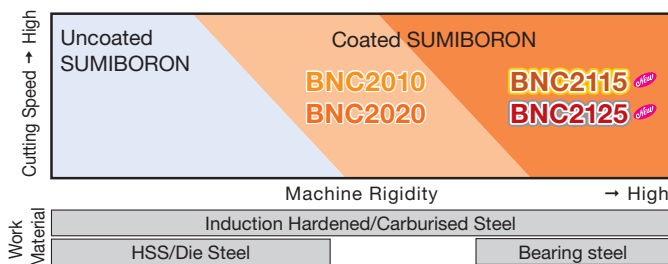
- **General-purpose grade suitable for typical hardened steel machining applications**

Achieves further stability in machining of a wide range of hardened steel components.

Application Range

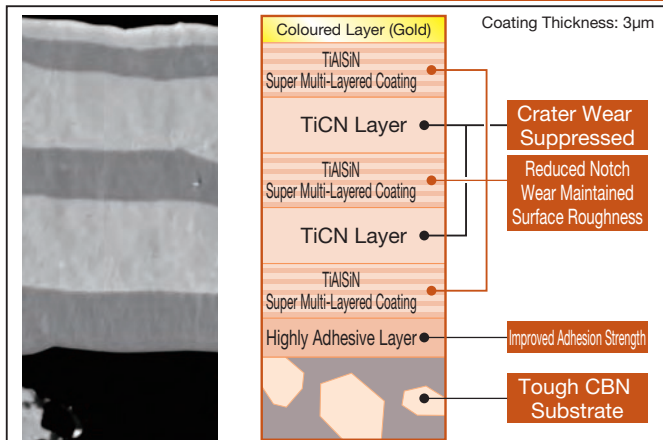


Differentiation



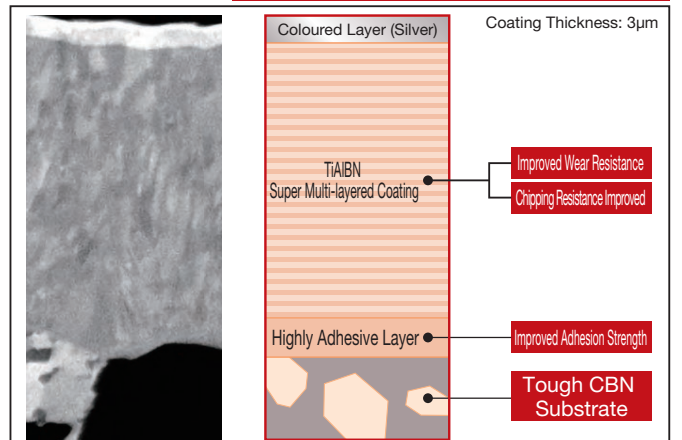
■ CBN Substrate and Coating Structure

BNC2115 ^{NEW} High-precision Machining (Medium- to High-speed)



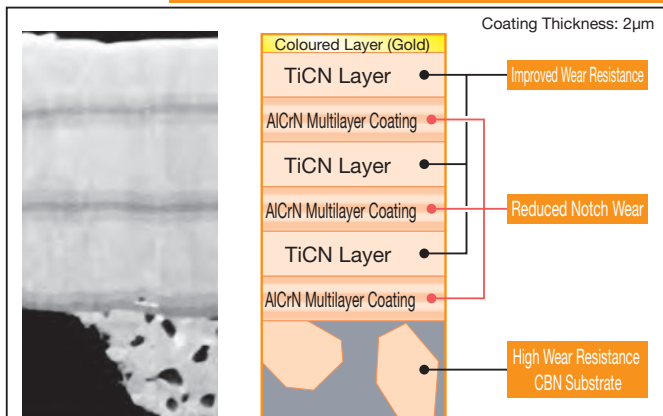
Thick layer of laminated high-strength TiAlSiN super multi-layered coating and highly heat-resistant TiCN coating. Achieves excellent surface finish quality with application to a tough substrate

BNC2125 ^{NEW} General Machining (Medium- to High-speed)



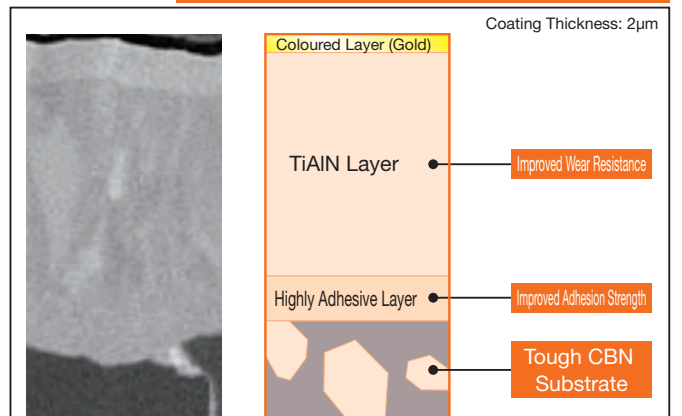
Thick layer of super-multilayered ultra-fine TiAlBN coating, with high strength and high hardness High performance in a wide range of cutting through application to a tough substrate

BNC2010 High-precision Machining (Low- to Medium-speed)



Laminated high-strength AlCrN multi-layered coating and highly heat-resistant TiCN coating is applied to a highly wear-resistant substrate to maintain excellent surface finish quality

BNC2020 General-purpose Machining (Low- to Medium-speed, Unstable Cutting)



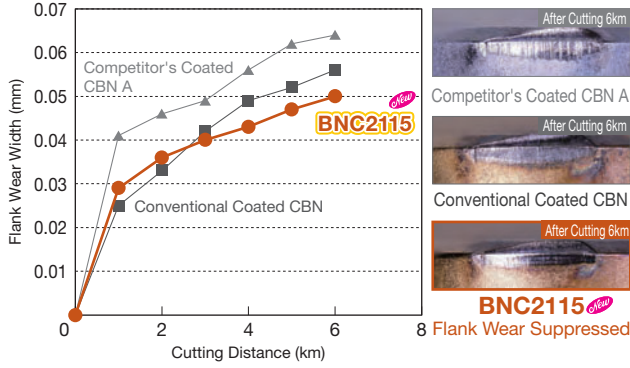
Application of highly wear-resistant TiAlN coating to a tough substrate Machining stability in low-rigidity environments and high-load cutting is dramatically improved

■ Recommended Cutting Conditions

Grade	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Depth of Cut a_p (mm)
	Min. - Optimum - Max.	Min. - Optimum - Max.	Min. - Optimum - Max.
BNC2115	110- 180 -300	0.03- 0.10 -0.20	0.03-0.20-0.35
BNC2125	110- 160 -300	0.05- 0.20 -0.40	0.05-0.30-0.50
BNC2010	50- 140 -180	0.03- 0.10 -0.20	0.03-0.20-0.35
BNC2020	50- 120 -180	0.03- 0.20 -0.40	0.05-0.30-0.50
BNC300	50- 100 -150	0.03- 0.10 -0.20	0.03-0.20-0.30

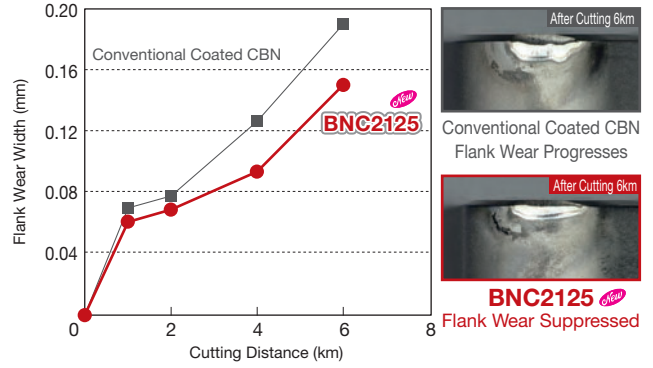
Cutting Performance

BNC2115

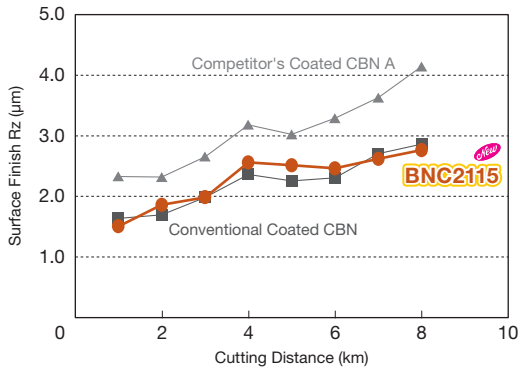


Work Material : SCM415H (58 to 62HRC)
 Tool Cat. No. : 4NC-DNGA150408
 Cutting Conditions : $V_c = 200\text{m/min}$, $f = 0.1\text{mm/rev}$, $a_p = 0.15\text{mm}$ Wet

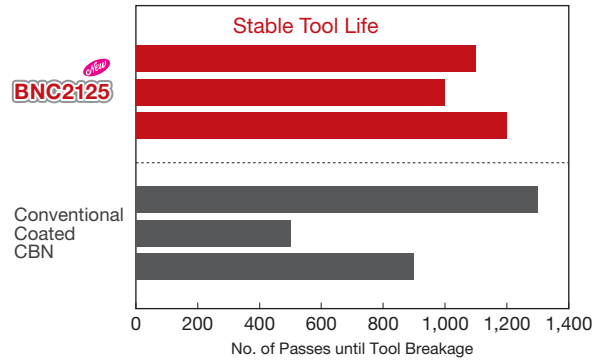
BNC2125



Work Material : SUJ2 (58 to 62HRC)
 Tool Cat. No. : 4NC-DNGA150408
 Cutting Conditions : $V_c = 150\text{m/min}$, $f = 0.1\text{mm/rev}$, $a_p = 0.2\text{mm}$ Wet

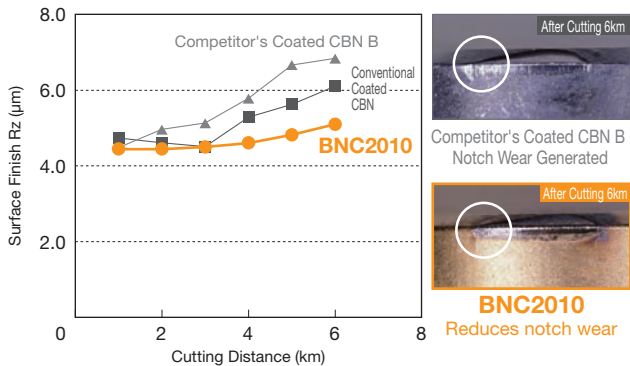


Work Material : SCM415H (58 to 62HRC)
 Tool Cat. No. : 4NC-DNGA150408
 Cutting Conditions : $V_c = 200\text{m/min}$, $f = 0.1\text{mm/rev}$, $a_p = 0.15\text{mm}$ Wet



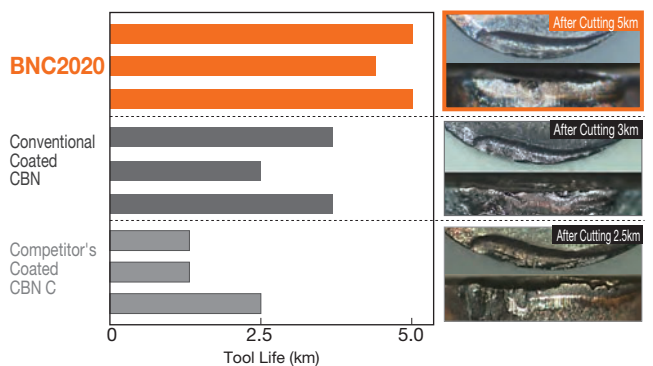
Work Material : SUJ2 (58 to 62HRC)
 Tool Cat. No. : 4NC-DNGA150408
 Cutting Conditions : $V_c = 150\text{m/min}$, $f = 0.15\text{mm/rev}$, $a_p = 0.5\text{mm}$, 63m/times, Wet

BNC2010



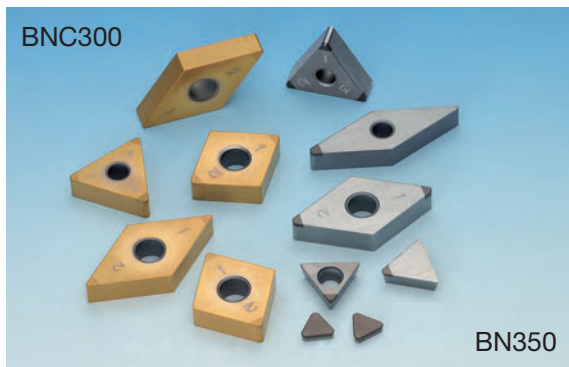
Work Material : SCM415H (58 to 62HRC)
 Tool Cat. No. : 4NC-DNGA150408
 Cutting Conditions : $V_c = 120\text{m/min}$, $f = 0.14\text{mm/rev}$, $a_p = 0.15\text{mm}$ Wet

BNC2020



Work Material : SCM415H with 5 grooves (58 to 62HRC)
 Tool Cat. No. : 4NC-CNGA120412
 Cutting Conditions : $V_c = 130\text{m/min}$, $f = 0.1\text{mm/rev}$, $a_p = 0.6\text{mm}$ Dry

BNC300/BN350



The Ultimate in Interrupted Cutting of Hardened Steel

General Features

BNC300

A CBN substrate that emphasizes toughness is coupled with a highly wear-resistant TiAlN-based coating layer that has improved adhesion strength. With a good balance of fracture and wear resistance, this grade achieves a long, stable tool life in interrupted cutting 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.

Features

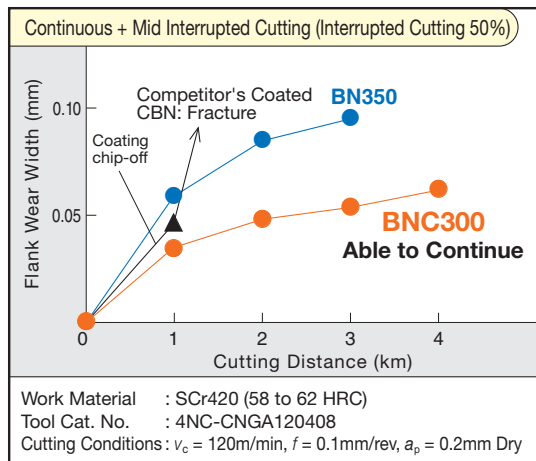
BNC300

- **Long, stable tool life in interrupted cutting**
Achieving long, stable tool life in heavy interrupted cutting, with superior fracture resistance.
- **Superior dimensional tolerance**
TiAlN-based high-wear-resistance coating achieves superior dimensional tolerance even in interrupted cutting.
- **Supports various work material shapes**
Achieves long, stable tool life even in workpieces requiring both continuous and interrupted cutting.

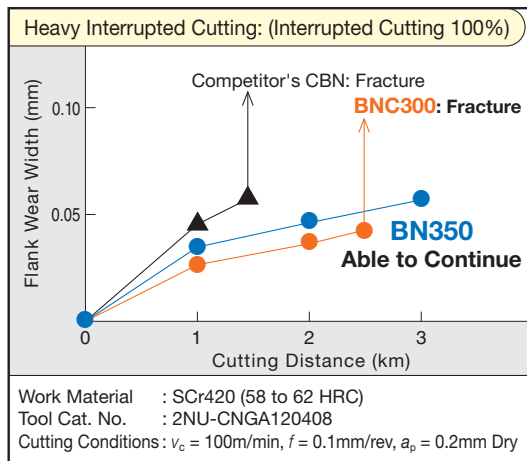
BN350

- **Superb stability with regard to fracture**
Superior fracture resistance, preventing the fractures that commonly occur during interrupted cutting. Achieves a long, stable tool life.

Cutting Performance



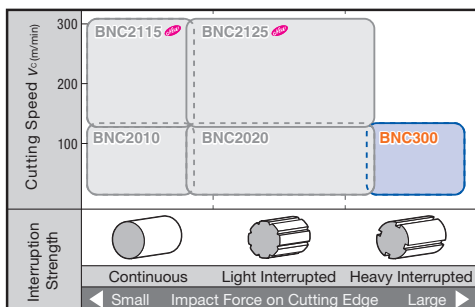
● **BNC300** has a superior balance of fracture and wear resistance.



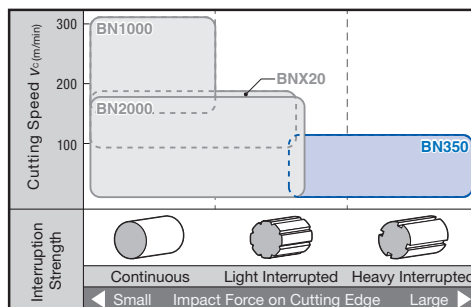
● **BN350** exhibits very good fracture resistance.

Application Range

Coated SUMIBORON



SUMIBORON



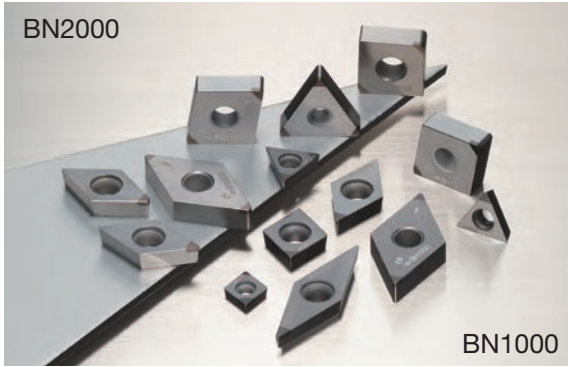
Recommended Cutting Conditions (BNC300/BN350 common)

Cutting Speed v_c (m/min)				
50	80	100	120	150
Feed Rate f (mm/rev)		Depth of Cut a_p (mm)		
0.03 to 0.20		0.03 to 0.30		

Coolant: Dry

BN1000/BN2000 H Hardened Steel

SUMIBORON



General Features

Uncoated SUMIBORON grades that have a newly developed high-purity ceramic binder applied to them. 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.

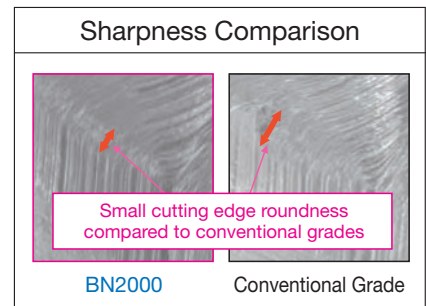
Features

● BN1000

- **SUMIBORON grade for high-speed machining with the best wear resistance**
Providing superior tool life in continuous cutting to light interrupted cutting.
- **Improved fracture resistance while also emphasizing wear resistance**
Hardness and thermal resistance from the high-purity TiCN ceramic binder.

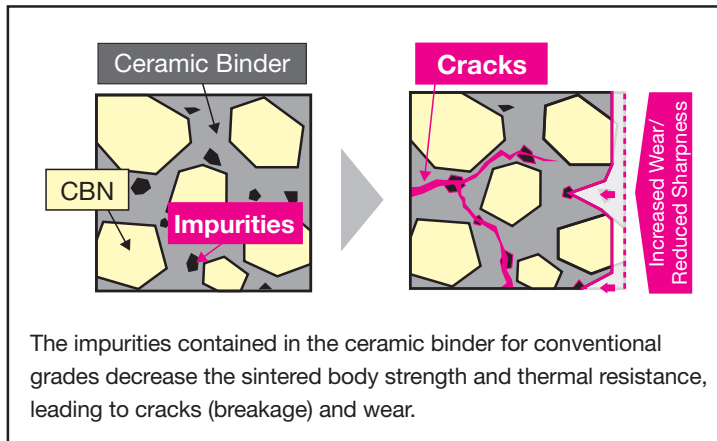
● BN2000

- **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.
- **Has a high degree of both fracture and wear resistance**
Significant improvements in the performance of both by employing a high-purity ceramic binder.
- **Stable surface roughness achieved by increasing edge sharpness**
(right figure)

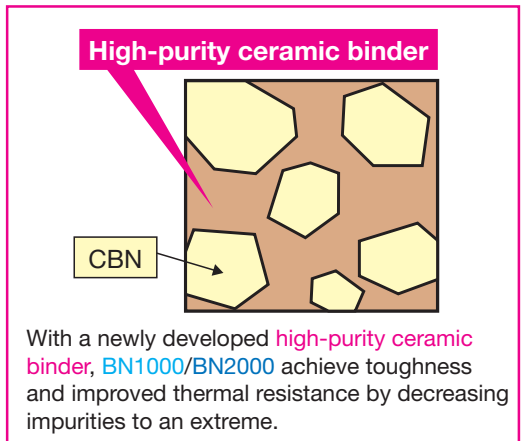


Newly Developed High-purity Ceramic Binder

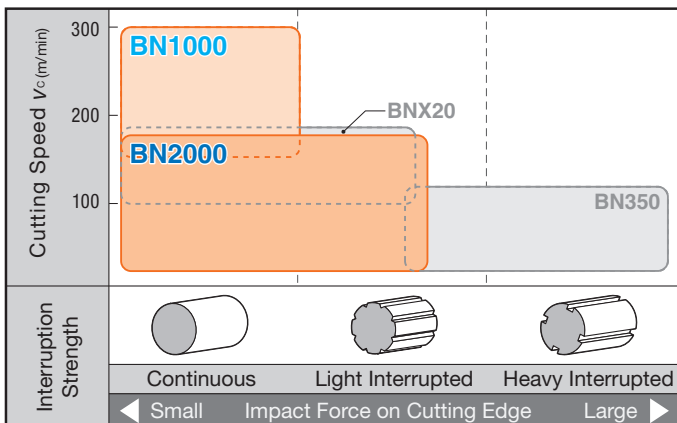
Conventional Grade



BN1000/BN2000



Application Range



Recommended Cutting Conditions

● BN1000

Cutting Speed v_c (m/min)	
30	100 120 150 200 250 300
Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
0.03 to 0.15	0.03 to 0.2

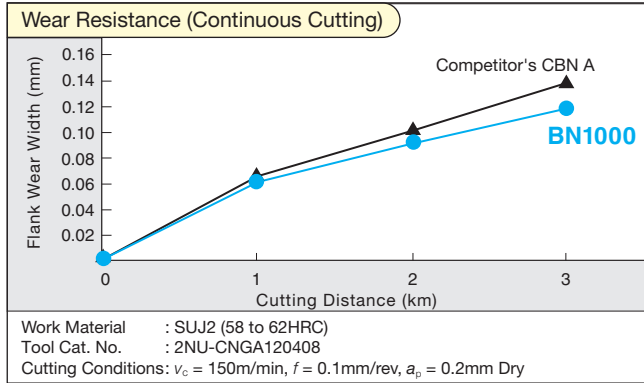
● BN2000

Cutting Speed v_c (m/min)	
30	80 100 120 150 200 250 300
Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
0.03 to 0.2	0.03 to 0.3

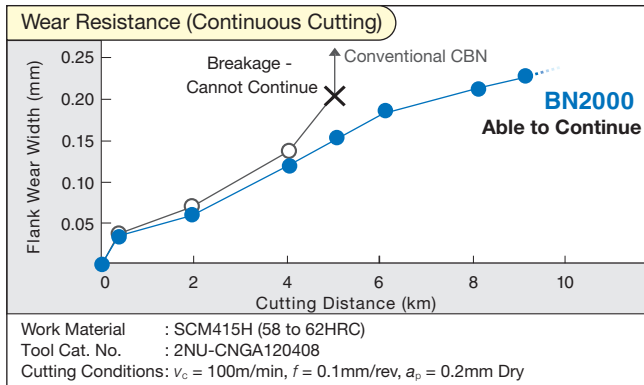
Cutting Oil: Continuous Cutting Dry, Wet
Interrupted Cutting Dry

■ Cutting Performance

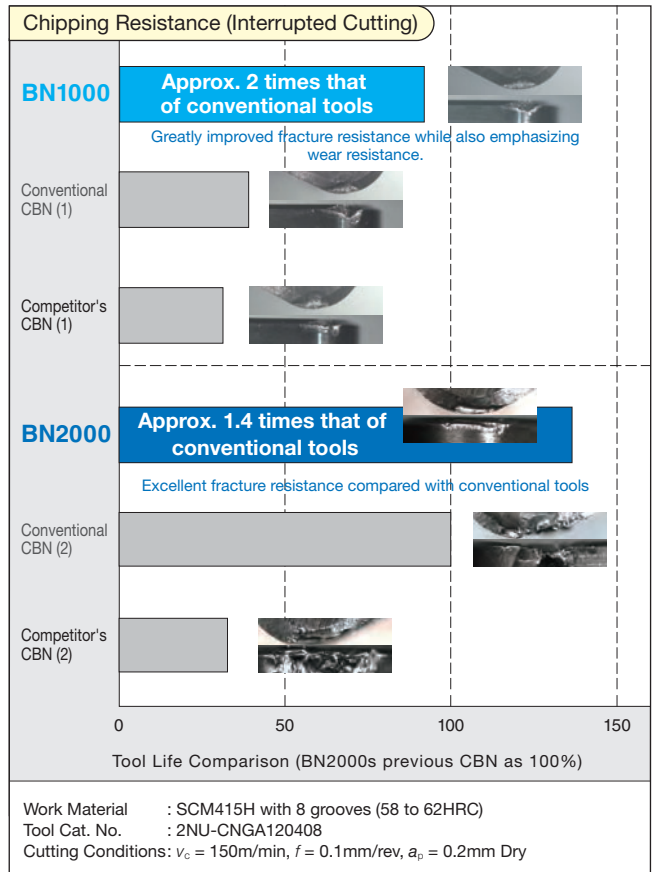
● BN1000



● BN2000

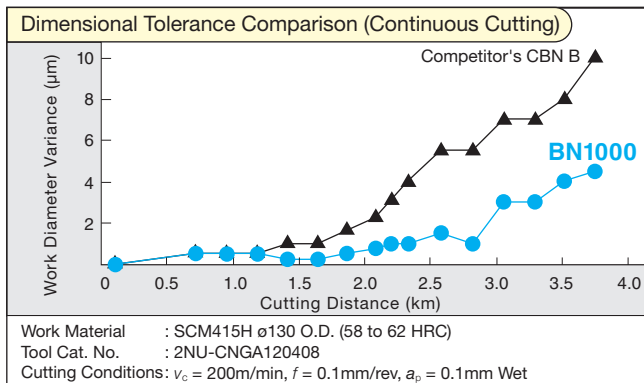


● BN1000/BN2000

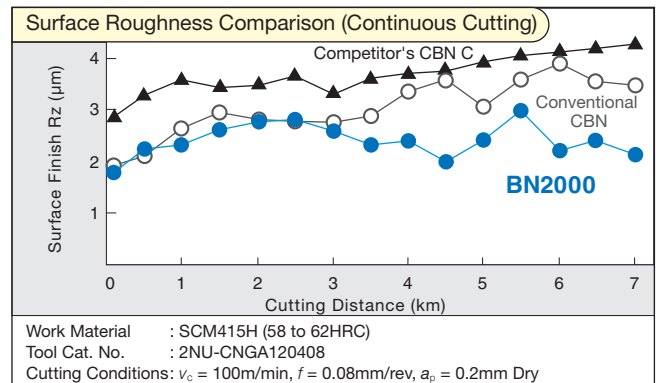


■ Machining Precision

● BN1000

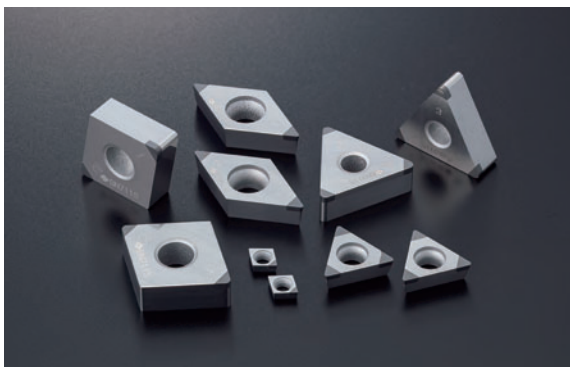


● BN2000



BN7000 / BN7115

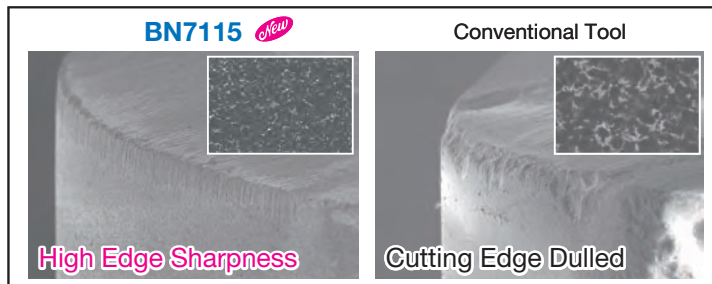
New



SUMIBORON

General Features

Good wear resistance through high CBN content also delivers superior fracture resistance by increasing the binding strength between CBN particles. Provides stable performance for high-speed finishing work with cast iron, sintered alloys and exotic alloys.



Removal of Binder → Comparison of CBN Particles' Binding Strength

Features ● BN7000

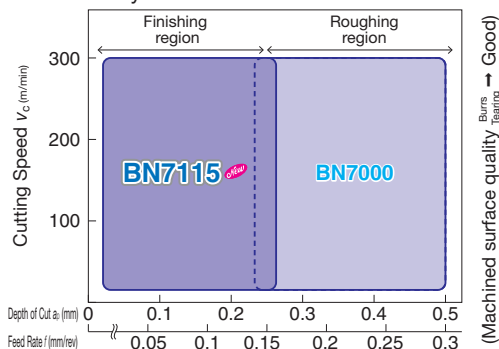
Achieves high-efficiency machining of sintered alloys of various shapes with a standard + 2 types of cutting edge variations. Also exhibits high performance for difficult-to-cut materials such as rolls, high speed steel and heat-resistive alloys. Exhibits good thermal crack resistance in high-speed machining of cast iron.

● BN7115 *New*

With improved CBN particle/binder boundary strength due to the special binder and improved binding strength between CBN particles thanks to our proprietary sintering process, the edge sharpness in sintered alloy machining is excellent and burrs and tearing are suppressed.

Application Range

● Sintered Alloy



Recommended Cutting Conditions

● Cast Iron

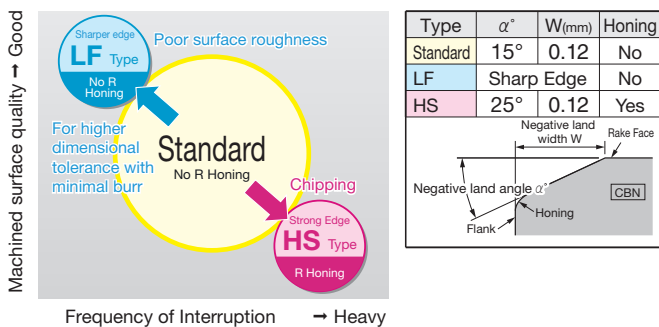
Work Material	Grade	Recommended Cutting Conditions			Min. - Optimum - Max.
		Cutting speed v_c (m/min)	Feed Rate f (mm/rev)	Depth of Cut a_p (mm)	
Cast Iron	BN7000	100-1,000-2,500	0.05-0.30-0.60	0.05-0.50-1.00	

● Sintered Alloy

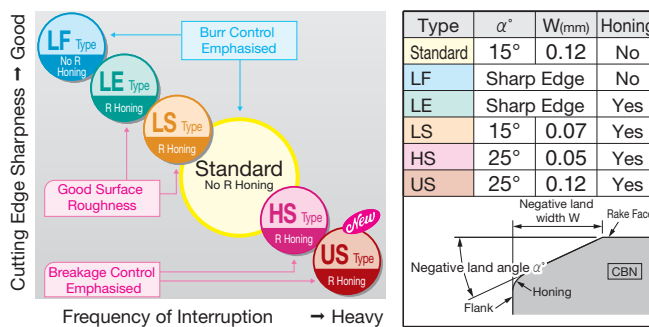
Work Material	Grade	Recommended Cutting Conditions			Min. - Optimum - Max.
		Cutting speed v_c (m/min)	Feed Rate f (mm/rev)	Depth of Cut a_p (mm)	
General Sintered Alloy	BN7115	10 - 150 - 300	0.01-0.08-0.15	0.05-0.13-0.25	
	BN7000	10 - 150 - 300	0.01-0.15-0.30	0.05-0.25-0.50	
High-density Sintered Alloy	BN7115	10 - 100 - 200	0.01-0.06-0.12	0.05-0.10-0.20	
	BN7000	10 - 100 - 200	0.01-0.15-0.30	0.05-0.25-0.50	

Recommended Cutting Edge Treatment

BN7000

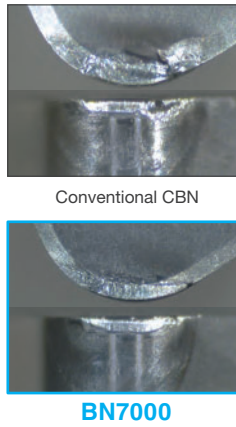
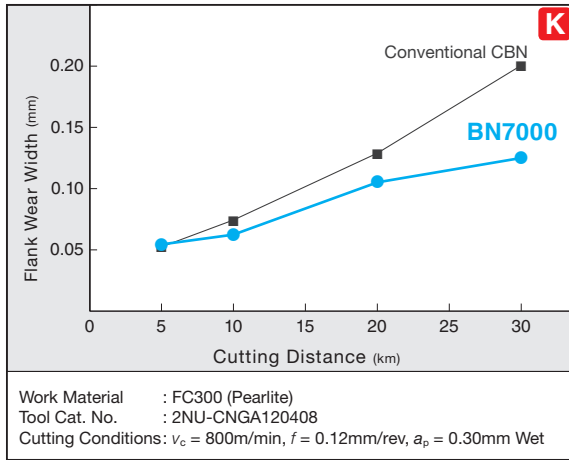


BN7115



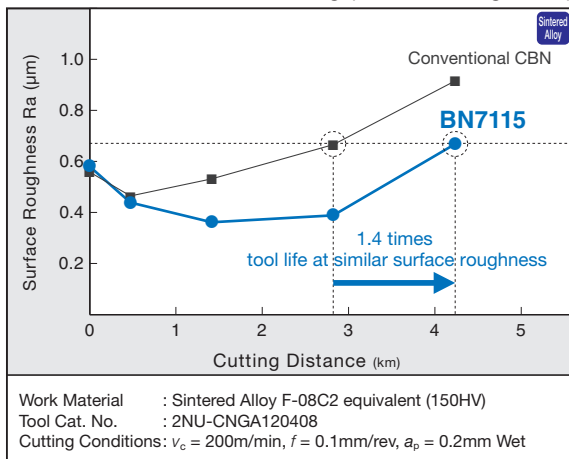
■ Cutting Performance (Cast Iron)

● BN7000 Continuous Cutting (Flank Wear)

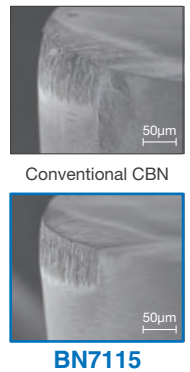
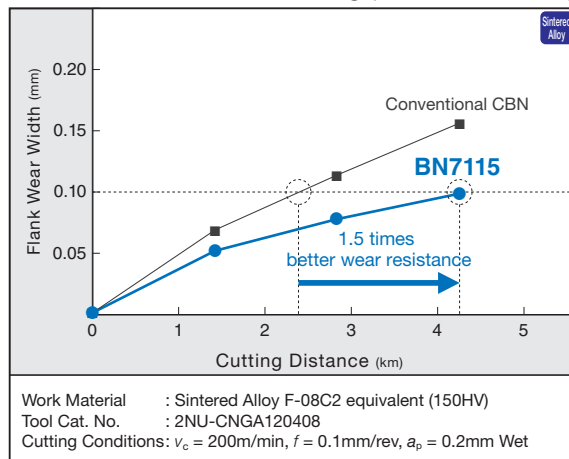


■ Cutting Performance (Sintered Alloy)

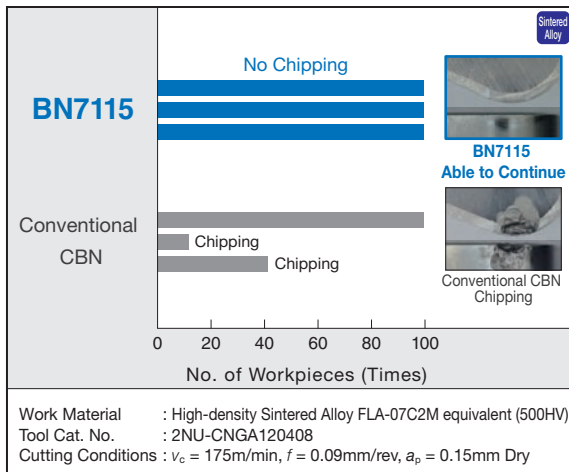
● BN7115 Continuous Cutting (Surface Roughness)



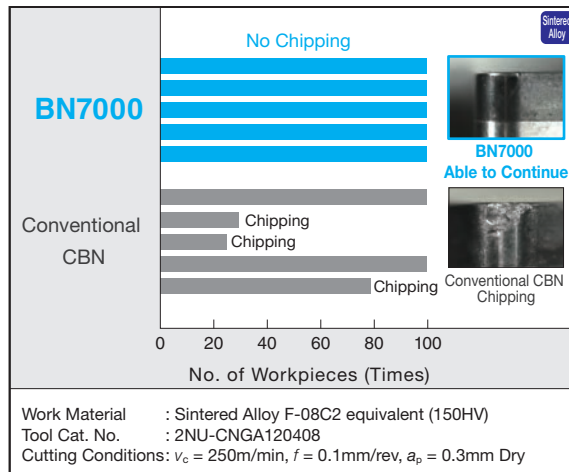
● BN7115 Continuous Cutting (Wear Resistance)



● BN7115 Interrupted Cutting (Fracture Resistance)



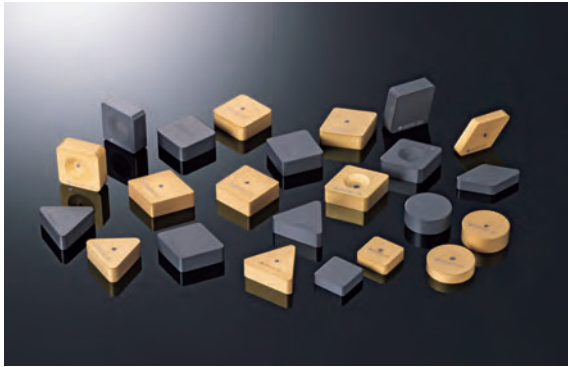
● BN7000 Interrupted Cutting (Fracture Resistance)



BNC8115/BNS8125



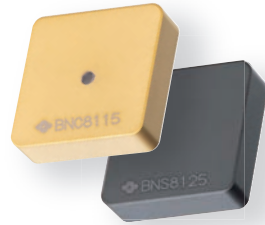
New



SUMIBORON

General Features

Enables a wide range of machining from roughing to finishing of cast iron, exotic alloy cast iron, and hardened steel. 100% solid CBN structure enables depth-of-cut of 0.5mm and above.



Features

BNC8115 New

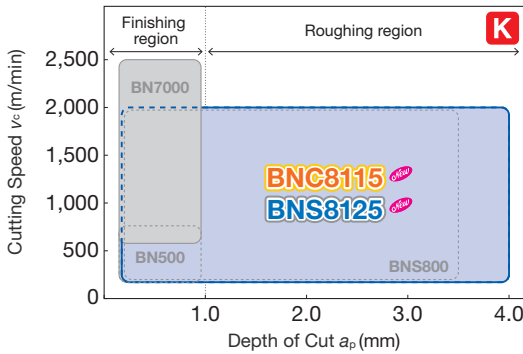
PVD coating with excellent wear resistance suppresses flank wear when machining difficult-to-cut cast iron and hardened steel. Ideal for roughing and depth-of-cut of 0.5 to 3.0mm. Can also be used for roughing and finishing of gray cast iron. Gold coating improves visibility of used corners.

BNS8125 New

Optimising the particle size distribution of the CBN particles has resulted in improved chipping resistance and longer life while maintaining wear resistance during gray cast iron machining.

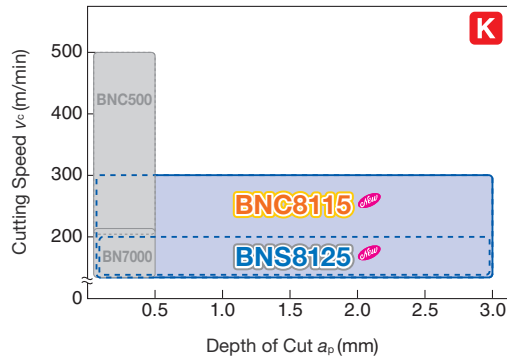
Application Range

Gray Cast Iron

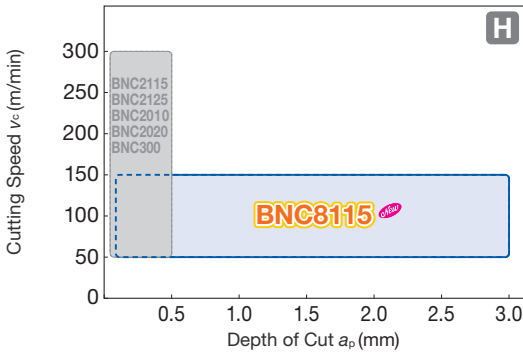


Wet machining is recommended for gray cast iron
For dry machining, BNC8115/BNS8125 are recommended for both roughing and finishing

Ductile Cast Iron



Hardened Steel



Recommended Cutting Conditions

Cast Iron (Turning) K

Work Material	Grade	Recommended Cutting Conditions <small>Min. - Optimum - Max.</small>		
		Cutting Speed v_c (m/min)	Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
Gray Cast Iron	BNC8115	200-1,000-2,000	0.10-0.50-1.00	≤ 4.0
	BNS8125	200-1,000-2,000	0.10-0.50-1.00	≤ 4.0
Ductile Cast Iron	BNC8115	80 - 160 - 300	0.10-0.30-0.50	≤ 3.0
	BNS8125	80 - 120 - 200	0.10-0.30-0.50	≤ 3.0

Hardened Steel (Turning) H

Work Material	Grade	Recommended Cutting Conditions <small>Min. - Optimum - Max.</small>		
		Cutting Speed v_c (m/min)	Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
Hardened Steel	BNC8115	50 - 100 - 150	0.10-0.25-0.40	≤ 3.0

Cast Iron (Milling) K

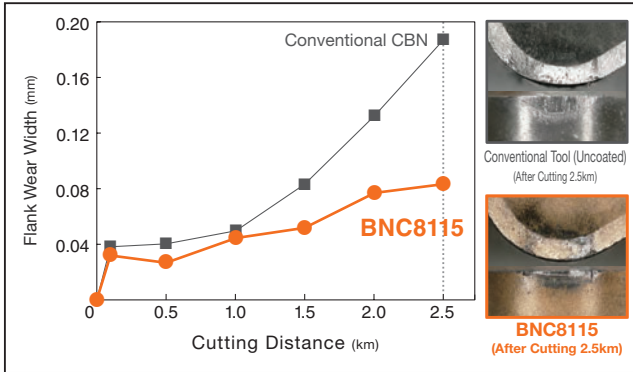
Work Material	Grade	Recommended Cutting Conditions <small>Min. - Optimum - Max.</small>		
		Cutting Speed v_c (m/min)	Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
Gray Cast Iron	BNC8115	800-1,400-2,000	0.10-0.50-1.00	≤ 4.0
	BNS8125	800-1,400-2,000	0.10-0.50-1.00	≤ 4.0

BNC8115/BNS8125



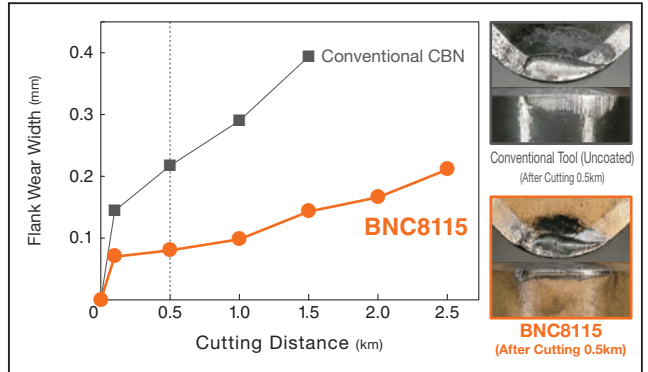
■ Cutting Performance (BNC8115)

● Wear Resistance (Ductile Cast Iron Machining) **K**



Work Material : FCD450
 Tool Cat. No. : SNGN090308
 Cutting Conditions : $V_c = 300\text{m/min}$, $f = 0.2\text{mm/rev}$, $a_p = 0.2\text{mm Wet}$

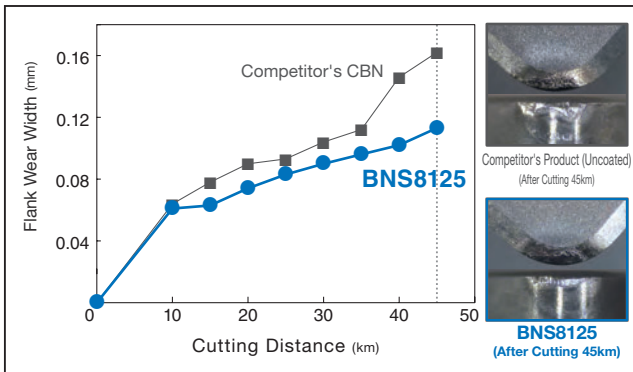
● Wear Resistance (Hardened Steel Machining) **H**



Work Material : SUJ2 (58 to 62HRC)
 Tool Cat. No. : SNGN090308
 Cutting Conditions : $V_c = 150\text{m/min}$, $f = 0.2\text{mm/rev}$, $a_p = 0.3\text{mm Wet}$

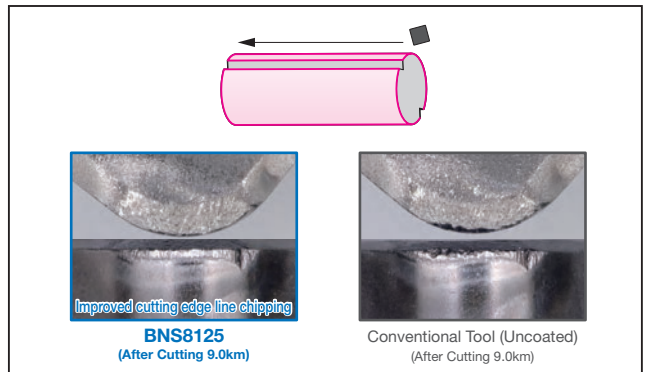
■ Cutting Performance (BNS8125)

● Wear Resistance (Gray Cast Iron Machining) **K**



Work Material : FC300
 Tool Cat. No. : SNGN090308
 Cutting Conditions : $V_c = 800\text{m/min}$, $f = 0.1\text{mm/rev}$, $a_p = 0.2\text{mm Wet}$

● Fracture Resistance (Ductile Cast Iron Machining) **K**



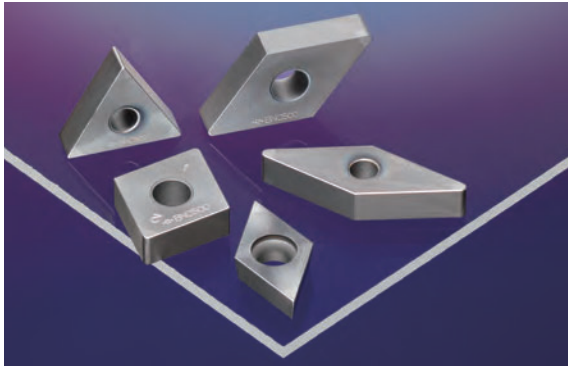
Work Material : FCD450 with 2 V-grooves
 Tool Cat. No. : SNGN120408
 Cutting Conditions : $V_c = 200\text{m/min}$, $f = 0.2\text{mm/rev}$, $a_p = 0.5\text{mm Wet}$

■ Choosing between BNC8115 and BNS8125 (Cast Iron/Hardened Steel)

Work Material	Coated SUMIBORON BNC8115		SUMIBORON BNS8125		SUMIBORON BN7000		Coated SUMIBORON BNC500		Coated SUMIBORON BNC2125	
	Turning	Milling	Turning	Milling	Turning	Milling	Turning	Turning	Turning	
K Gray Cast Iron	○	Best	○	Best Economical	○	Depth of Cut 1.0mm or below High-speed Finishing	×	Impossible	×	Impossible
	○	Depth of Cut 0.5mm or above	○	Interrupted Machining	○	Depth of Cut 0.5mm or below Low-speed Machining	○	Depth of Cut 0.5mm or below	×	Impossible
H Hardened Steel	○	Depth of Cut 0.5mm or above	×	Impossible	×	Impossible	×	Impossible	○	Depth of Cut 0.5mm or below High-speed Machining

○ : Recommendation × : Impossible





Coated CBN Grades for Ductile Cast Iron Machining

■ General Features

Broad improvements in the toughness of the CBN substrate and wear resistance through the use of a newly developed high-purity TiC binder. In addition, it demonstrates exceptional wear resistance by combining a ceramic coating with excellent thermal resistance. High-speed, high-precision machining is achieved when finishing ductile cast iron. It also provides a long, stable tool life for machining high-strength ductile cast iron, special cast irons such as vermicular cast iron and centrifugally-cast cast iron.

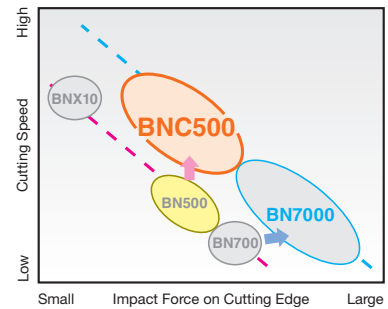
■ Features

● Achieves stable tool life for high-speed machining of ductile cast iron

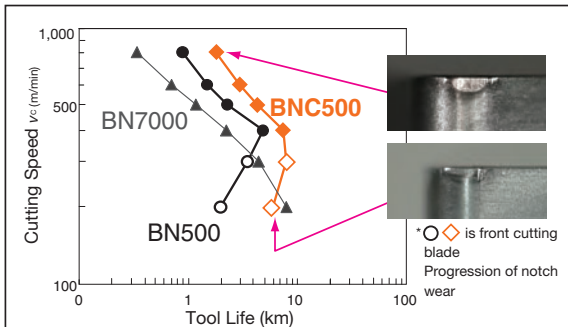
Superior wear resistance, making stable machining possible under high-speed conditions.

● Supports High-precision Machining

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

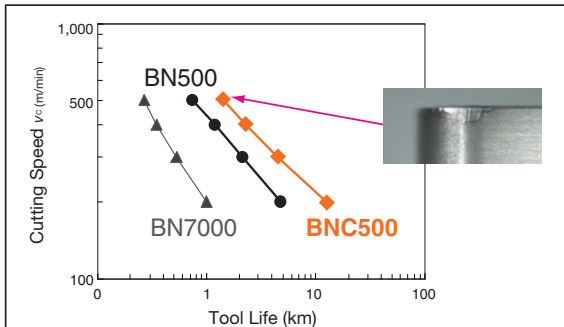


● FCD450 Continuous Cutting (V-T Chart)



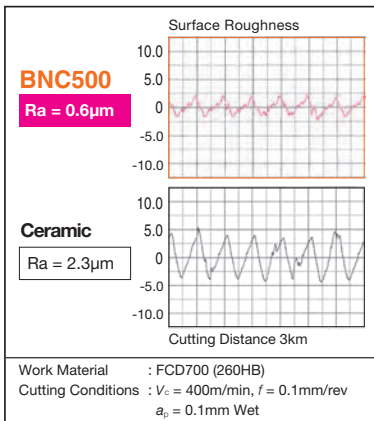
Work Material : FCD450 (160HB) Tool Cat. No.: 4NC-CNGA120408
 Cutting Conditions : $f = 0.2\text{mm/rev}$, $a_p = 0.2\text{mm}$ Wet
 Tool Life Criterion : $V_{Bmax.} = 0.2\text{mm}$

● FCD700 Continuous Cutting (V-T Chart)

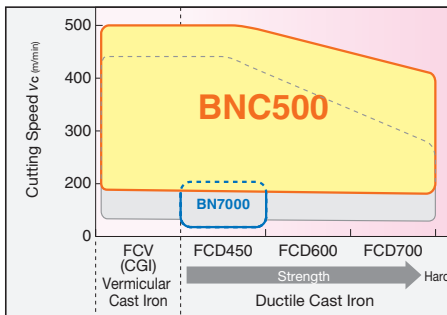


Work Material : FCD700 (260HB) Tool Cat. No.: 4NC-CNGA120408
 Cutting Conditions : $f = 0.2\text{mm/rev}$, $a_p = 0.2\text{mm}$ Wet
 Tool Life Criterion : $V_{Bmax.} = 0.2\text{mm}$

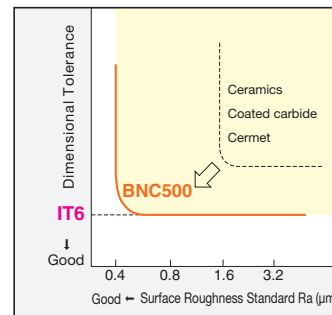
■ Machined Surface Quality



■ Application Range



■ High-precision Machining

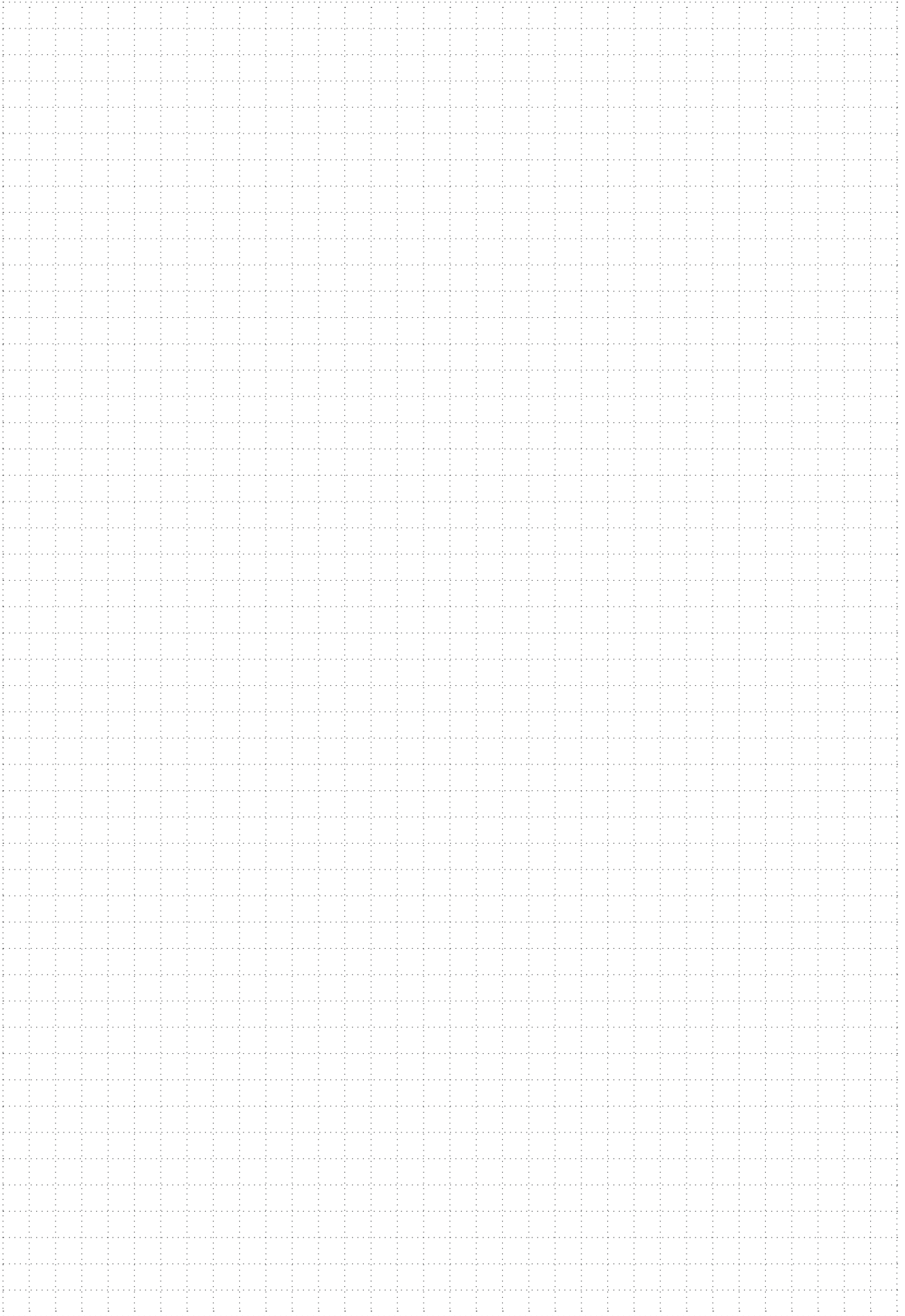


■ Recommended Cutting Conditions

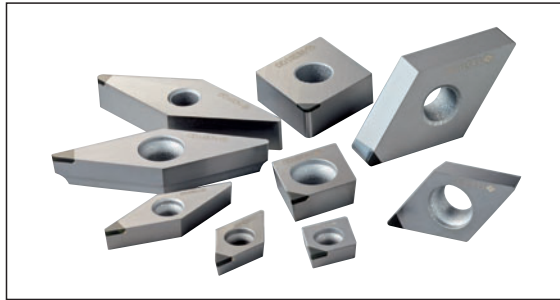
Cutting Speed V_c (m/min)	
200	300 400 500
Feed Rate f (mm/rev)	Depth of Cut a_p (mm)
0.10 to 0.40	≤ 0.50

Cutting Oil: Wet

MEMO



Nano-polycrystalline CBN

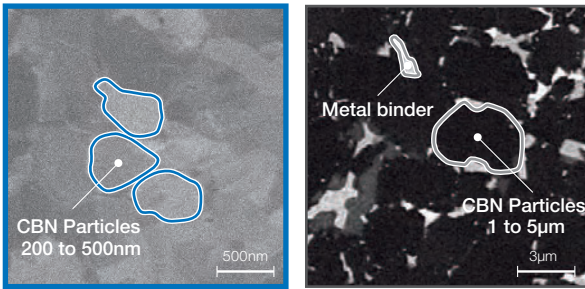


■ **General Features**

SUMIBORON BINDERLESS, which does not contain any binders, is a CBN sintered product with directly and strongly bonded nano- to sub-micron CBN particles.

Compared to conventional CBN grades, this provides high hardness and thermal conductivity, making it highly efficient with a long tool life when machining exotic alloys such as titanium alloys and cobalt-chrome alloys.

■ **Sintered Composition (SEM Image)**



SUMIBORON BINDERLESS

Conventional CBN

■ **Physical Values**

	SUMIBORON BINDERLESS	Conventional CBN
CBN Content (vol%)	100	90 to 95
Binder	—	WC-Co
Hardness Hv (GPa)	51 to 54	41 to 44
Thermal Conductivity (W/m-K)	180 to 200	100 to 120

SUMIBORON BINDERLESS NCB100



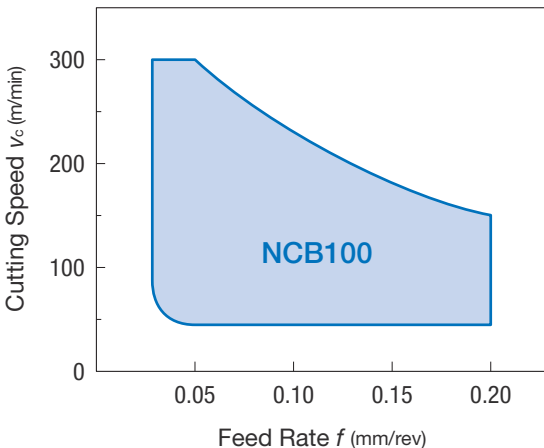
■ **General Features**

Adopts a nano-polycrystalline CBN sintered structure with hardness and thermal conductivity significantly higher than conventional sintered CBN. Enables overwhelmingly longer tool life and improved efficiency and machining accuracy when machining exotic alloys such as titanium alloys or cobalt-chrome alloys.

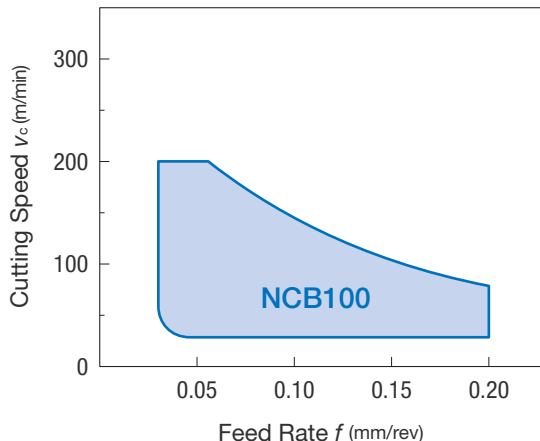
■ **Features**

- **Ideal for high-efficiency finishing of exotic alloys such as titanium alloys and cobalt-chrome alloys**
Exhibits outstanding wear resistance due to the excellent hardness and thermal conductivity of nano-polycrystalline CBN
- **Excellent dimensional tolerance and machined surface roughness maintained for extended periods**
Number of tool changes can be drastically reduced compared to conventional grades, enabling work efficiency to be improved and total costs to be reduced

■ **Application Range (Machining Titanium Alloy)**



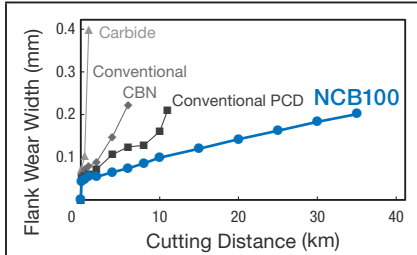
■ **Application Range (Machining Cobalt-chrome Alloy)**





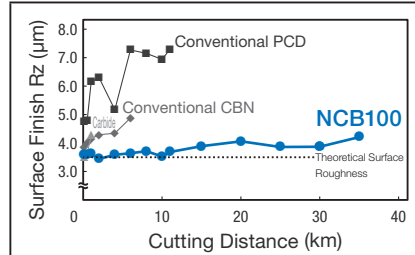
■ Cutting Performance (Machining Titanium Alloy)

● Wear Resistance

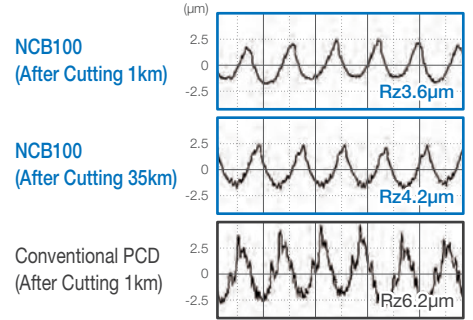


Work Material : Titanium Alloy (Ti-6Al-4V)
 Tool Cat. No. : CNGA120408
 Cutting Conditions: $V_c = 150\text{m/min}$, $f = 0.15\text{mm/rev}$
 $a_p = 0.5\text{mm}$ Wet (High Pressure Coolant)

● Machined Surface Roughness

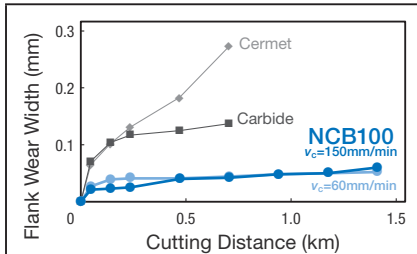


Work Material : Titanium Alloy (Ti-6Al-4V)
 Tool Cat. No. : CNGA120408
 Cutting Conditions: $V_c = 150\text{m/min}$, $f = 0.15\text{mm/rev}$
 $a_p = 0.5\text{mm}$ Wet (High Pressure Coolant)



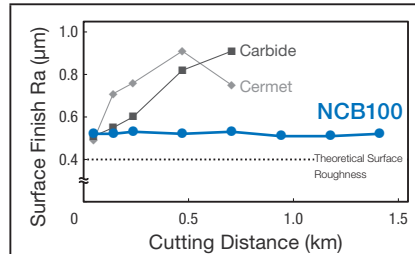
■ Cutting Performance (Machining Cobalt-chrome Alloy)

● Wear Resistance

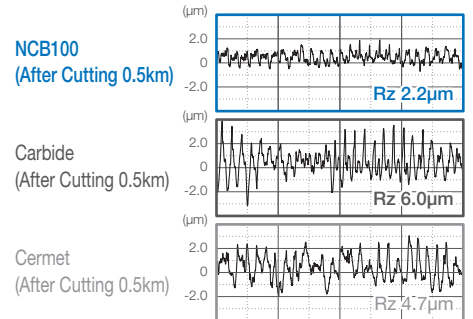


Work Material : Cobalt-chrome alloy (forging)
 Tool Cat. No. : VNGA160408
 Cutting Conditions: $V_c = 60, 150\text{m/min}$, $f = 0.1\text{mm/rev}$
 $a_p = 0.4\text{mm}$ Wet

● Machined Surface Roughness



Work Material : Cobalt-chrome alloy (forging)
 Tool Cat. No. : VNGA160408
 Cutting Conditions: $V_c = 60\text{m/min}$, $f = 0.1\text{mm/rev}$
 $a_p = 0.4\text{mm}$ Wet



■ Recommended Cutting Conditions

● Titanium Alloy

Work Material		Grade	Recommended Cutting Conditions			Min. - Optimum - Max.				
Composition	Hardness (HRC)		Cutting Speed v_c (m/min)		Feed Rate f (mm/rev)	Depth of Cut a_p (mm)				
Ti-6Al-4V	30 - 35	NCB100	50	100	150	200	250	300	0.05 - 0.15 - 0.20	0.10 - 0.30 - 0.50
Ti-5Al-5V-5Mo-3Cr	32 - 38	NCB100	50	100	150	200	250	300	0.05 - 0.10 - 0.20	0.10 - 0.30 - 0.50
Ti-10V-2Fe-3Al	32 - 38	NCB100	50	100	150	200	250	300	0.05 - 0.10 - 0.20	0.10 - 0.30 - 0.50

● Cobalt-chrome alloy

Work Material		Grade	Recommended Cutting Conditions			Min. - Optimum - Max.				
Composition	Hardness (HRC)		Cutting Speed v_c (m/min)		Feed Rate f (mm/rev)	Depth of Cut a_p (mm)				
Co-30Cr-5Mo	35 - 45	NCB100	50	100	150	200	250	300	0.05 - 0.15 - 0.20	0.10 - 0.15 - 0.30

● Cemented Carbide

Work Material		Grade	Recommended Cutting Conditions			Min. - Optimum - Max.						
Composition	Hardness (HRA)		Cutting Speed v_c (m/min)		Feed Rate f (mm/rev)	Depth of Cut a_p (mm)						
WC-20Co	Less than 85	NCB100	5	10	15	20	25	30	35	40	0.03 - 0.10 - 0.20	0.03 - 0.10 - 0.20

*SUMIDIA BINDERLESS NPD10 is recommended for cemented carbide machining of 83HRA or more.

● Others

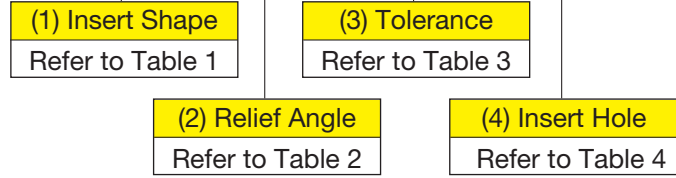
Work Material		Grade	Recommended Cutting Conditions			Min. - Optimum - Max.				
Composition/Material	Hardness (HV)		Cutting Speed v_c (m/min)		Feed Rate f (mm/rev)	Depth of Cut a_p (mm)				
Pure Titanium	130 - 230	NCB100	10	50	100	200	300	400	0.05 - 0.10 - 0.20	0.10 - 0.30 - 0.50
Cermet Material (Ferrous metal including binder)	1,000 - 1,500	NCB100	10	50	100	200	300	400	0.05 - 0.10 - 0.20	0.10 - 0.20 - 0.30



Insert Cat. No. Identification Table

Regrindable Type

Example **C N M A**
 (1) (2) (3) (4)



One-use Type
(Disposable)

Example **2 NU - C N G A**
 (9) (10) (1) (2) (3) (4)

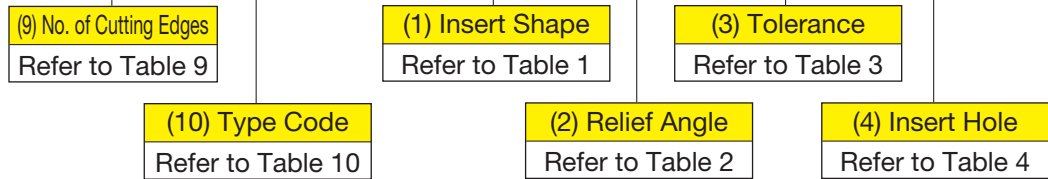


Table 1: (1) Insert Shape

Symbol	Insert Shape	Apex Angle
C		80°
D		Diamond Type
V		
R		Round Type
S		Square Type
T		Triangular Type
W		Trigon Type

Table 2: (2) Relief Angle

Symbol	Relief Angle
B	5°
C	7°
N	0°
P	11°

Table 3: (3) Tolerance

Symbol	Tolerance of Nose Height (mm)	Tolerance of Inscribed Circle (mm)	Thickness Tolerance (mm)
E	± 0.025	± 0.025	± 0.025
G	± 0.025	± 0.025	± 0.13
M*	± 0.08 to ± 0.2	± 0.05 to ± 0.15	± 0.13

* Generally, these inserts have unground side faces
 Refer to page B2 for details on M Class precision

Table 4: (4) Insert Hole

Symbol	Hole Y/N	Hole Style	Chipbreaker	Shape (Cross Section)	Symbol	Hole Y/N	Hole Style	Chipbreaker	Shape (Cross Section)
N	No	No	No		A			No	
W	Yes	Straight Hole + Single Chamfer (40° to 60°)	No		M	Yes	Cylinder Shape	One Face	
T			One Face		G			Double-sided	
					X	-	-	-	Special

Table 9: (9) No. of Cutting Edges

Symbol	No. of Cutting Edges	Type
No	1	1-Cornered Type
2	2	Multi-Cornered Type
3	3	
4	4	
6	6	

Table 10: (10) Type Code (One-use Type)

Symbol	Type	Grade
NC	Coated SUMIBORON	BNC2115, BNC2125, BNC2010, BNC2020, BNC100, BNC160, BNC200, BNC300, BNC500
NU	Uncoated SUMIBORON	BNX10, BNX20, BN1000, BN2000, BN350, BN500, BN7000, BN700, BN7115, BN7500
	SUMIBORON BINDERLESS	NCB100
NS	Uncoated SUMIBORON	BNX25

*The NS type is a single-use insert for the BNX25 grade, using the latest brazing technique. The shape is the same as the NU type.

*Cat. numbers that begin with a "T-" are 10-piece packs

Insert Cat. No. Identification Table

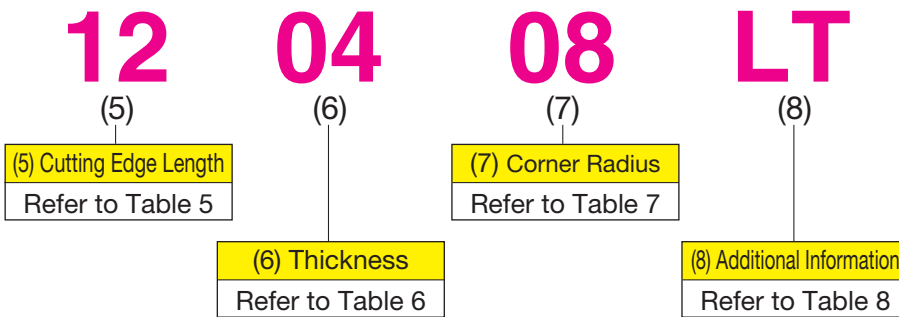
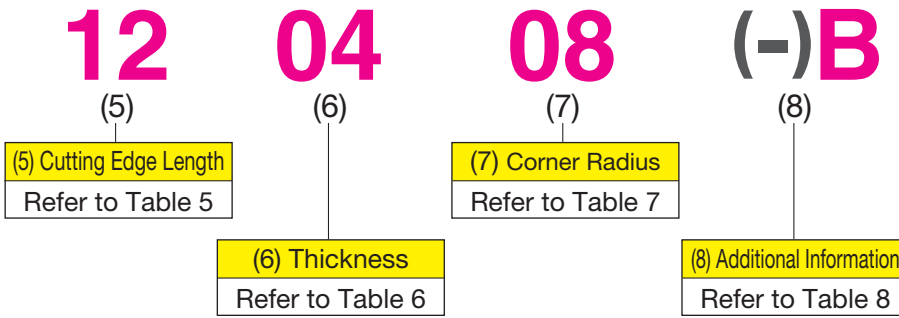


Table 5: (5) Cutting Edge Length (Typical Examples)

Note: Cutting edge length indicated is measured without nose radiuses. (mm)

Shape	Symbol	Cutting Edge Length (Side Length)		Shape	Symbol	Cutting Edge Length (Side Length)		Shape	Symbol	Cutting Edge Length (Side Length)		Inscribed Circle	
		Negative	Positive			Negative	Positive			Negative	Positive		
C 80° Diamond Type 	04	4.97	4.30	S Square Type 	09	9.525	9.525	W Trigon Type 	06		3.2		3.97
	06	6.4	6.35		12	12.70	12.70		08	8.7	4.6	12.70	4.76
	08	8.0	7.94										
	09	9.7	9.525										
D 55° Diamond Type 	07	7.7	6.35	T Triangular Type 	06	6.9	3.97	For the One-use Type, cutting edge length indicates side length. See L32 on for the One-use Type cutting edge length					
	11	11.6	9.525		08	8.2	4.76						
	15	15.5	12.70		09	9.6	5.56						
					11	11.0	6.35						
R Round Type 	09	9.525	9.525	V 35° Diamond Type 	16	16.5	9.525						
	12	12.70	12.70		22	22.0	12.70						
					08	8.3	4.76						
					11	11.1	6.35						
				16	16.6	9.525							

Table 6: (6) Thickness

Symbol	Thickness (mm)
X1	*
01	1.59
02	2.38
03	3.18
T3	3.97
04	4.76
06	6.35

Table 7: (7) Corner Radius

Symbol	Corner Radius (mm)
00	Sharp Edge
01	0.1
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4

(*)
CC□T03X1 Insert Thickness: 1.40
CC□T04X1 Insert Thickness: 1.80

Table 8: (8) Additional Information L30

Symbol	Old symbol	Code Description		Symbol	Code Description
		Uncoated	Coated		
No	No	Standard Cutting Edge		WG	Wiper Insert Type
(-)B	(-)B	Full-top CBN Type		WH	
-BSTN	-BSN	Full-top CBN Type (emphasis on edge sharpness)		W	
LF	F	Sharp Edge Type		LFW	Wiper Sharp Edge Type
LE				N-FV	Chipbreaker Type
LT	S	Emphasis on Edge Sharpness	N-LV		
LS	M	General-purpose Type for Continuous Cutting	Emphasis on Edge Sharpness	N-SV	
ES	—	—	High-efficiency Type		
HT	T	Strong Edge Type			
HS					
US					

FV Type/LV Type/SV Type

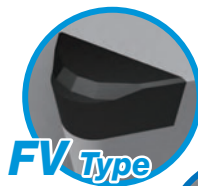
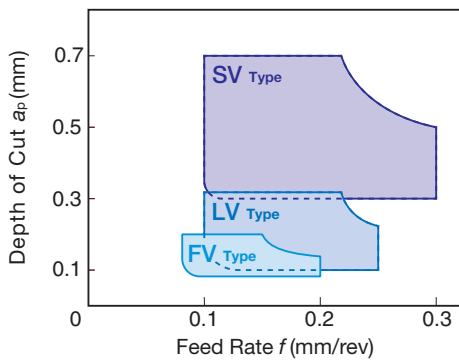
SUMIBORON



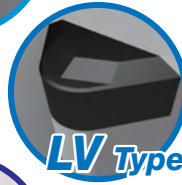
■ Features

- One-use SUMIBORON insert with chipbreaker. SV type is ideal for carburised layer removal, while FV and LV types are ideal for hardened steel machining.
- Chipbreaker incorporated on the CBN cutting edge to maintain chip control capabilities throughout the machining process.
- Unique chipbreaker design can be applied to both hardened and non-hardened parts with effective chip control.

■ Application Range



FV Type



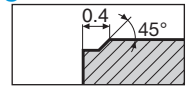
LV Type



SV Type

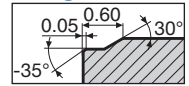
FV Type For Finishing

Excellent chip evacuation under finishing conditions with depth of cut at 0.2mm or below



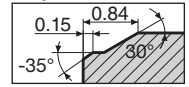
LV Type For Light Cutting

Excellent chip evacuation under conditions with depth of cut at 0.3mm or below



SV Type For Carburised Layer Removal

Ideal for carburised layer removal. Eliminates short stoppages and dimensional defects

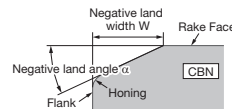


■ FV Type / LV Type / SV Type Cutting Edge Specifications

Type	Material	Notation	Edge Specification Identification Code	α	W	Honing
With Chipbreaker	FV Type	N-FV	—	0°	0	Yes
	LV Type	N-LV	S00535	35°	0.05	Yes
	SV Type	N-SV	S01235	35°	0.12	Yes

Edge specification identification code

S 0 0 5 3 5



S: Negative land width
 0: Negative land angle
 0: Cutting Edge Shape
 5: Negative land
 3: Negative land + Honing
 5: Honing

Example: S00535
→ 35°/0.05mm Negative Land with Honing

■ Application Examples

External Carburized Layer Removal

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

Work Material : SCr420 Carburised Steel (Shaft)
Tool Cat. No. : 4NC-CNGG120408N-SV (BNC200)
Cutting Conditions: $v_c = 150\text{m/min}$, $f = 0.15\text{mm/rev}$, $a_p = 0.5\text{mm}$, 2 passes Wet

BREAK MASTER SV Type

Tool Life = 200 pcs.

BNC200 (No Breaker)

Tool Life = 200 pcs.

Competitor CBN (with chipbreaker)

Tool Life = 100 pcs.

Finishing of Hardened Steel

· Improved chip control for internal boring

Work Material : Carburised Steel (60HRC Automotive Component)
Tool Cat. No. : 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

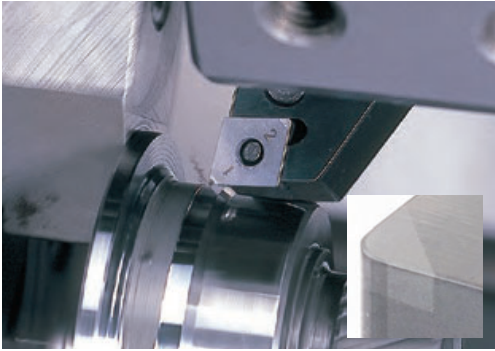
BREAK MASTER FV Type

Tool Life = 300 pcs.

BNC200 (No Breaker)

Tool Life = 300 pcs.

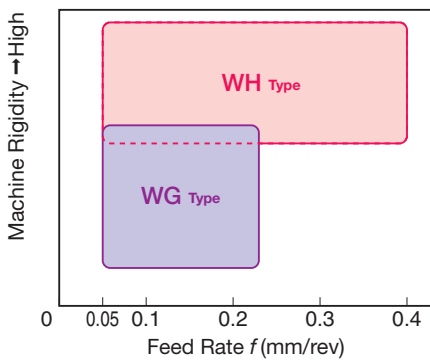
WG Type / WH Type



■ Features

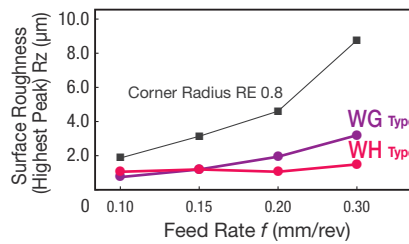
- SUMIBORON single-use insert with wiper flat for hardened steel machining.
- Excellent surface roughness comparable to grinding.
- Improved machining efficiency with higher speeds and feeds.
- Lineup of low feed WG type and high feed WH type.

■ Application Range



Use WH Type for high-rigidity workpieces and equipment, and WG Type for issues of undulation or chatter.

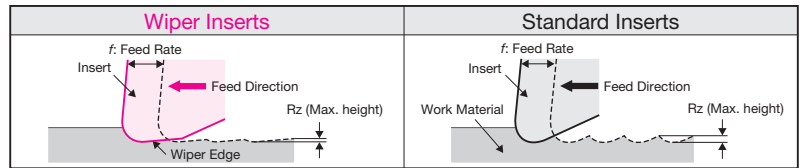
■ Finished Surface Roughness



The wiper insert offers good finished surface roughness and improved machining efficiency.

Work Material: SCM415H (60HRC)
Tool Cat. No.: CNGA120408
Cutting Conditions: $v_c=135\text{m/min}$ $a_p=0.1\text{mm}$ Dry

■ Wiper Insert Operation

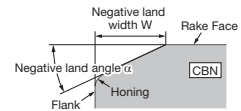


■ WG Type / WH Type Cutting Edge Specifications

Type	Material	Notation	Edge Specification Identification Code	α	W	Honing
Wiper	WG Type	WG	S01215	15°	0.12	Yes
	WH Type	WH	S01215	15°	0.12	Yes

Edge specification identification code

S 0 1 2 1 5



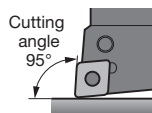
— Negative land width
— Negative land angle
— Cutting Edge Shape T: Negative land S: Negative land + Honing

Example: S01215
→ 15°/0.12mm Negative Land with Honing

■ Precautions when Using Wiper Inserts

CNGA Type / CCGW Type / WNGA Type WG Type / WH Type Wiper Insert

- Use a holder with a cutting angle of 95°.
- Machining program **modification required** CNGA Type / CCGW Type / WNGA Type wiper inserts do not comply with the ISO standard. Correct the cutting edge position (tool offset) as explained on the right.

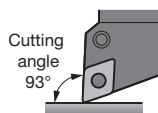


CNGA Type / CCGW Type / WNGA Type Wiper Insert Cutting Edge Position Offset (WG Type / WH Type)

Corner Radius	Type	X-axis direction	Z-axis direction
R0.4	WG Type	-0.02	-0.02
	WH Type	-0.06	-0.06
R0.8/R1.2	WG Type	-0.01	-0.01
	WH Type	-0.06	-0.06

DNGA Type / DCGW Type WG Type / WH Type Wiper Insert

- Use a holder with a cutting angle of 93°.
- Machining program **modification required** DNGA Type / DCGW Type wiper inserts do not comply with the ISO standard. Correct the cutting edge position (tool offset) as explained on the right.



DNGA Type / DCGW Type Wiper Insert Cutting Edge Position Offset (WG Type / WH Type)

Corner Radius	Type	X-axis direction	Z-axis direction
R0.4	WG Type	-0.17	-0.01
	WH Type	-0.70	-0.06
R0.8	WG Type	-0.05	0
	WH Type	-0.58	-0.05

Note: Unlike other contour shapes, the DNGA/DCGW Type can only exhibit wiper effect for outer and inner diameter machining, and cannot be used for facing.

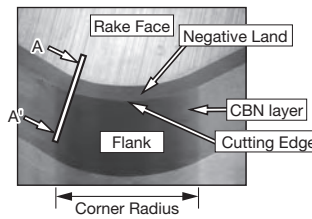
SUMIBORON Insert Edge Specifications

SUMIBORON Insert Edge Treatment

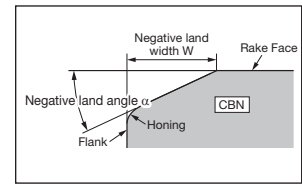
All SUMIBORON inserts are enhanced with the optimum cutting edge preparation for the various grades and geometries (shown on the right). This is to avoid cutting edge fracture caused by the heavy loads generated during the machining of high-hardness materials such as hardened steel.

As the pioneer of CBN tools, SUMIBORON's vast selection of grades and edge treatment combinations is our trump card for hardened steel machining.

Close-up of cutting edge



Section A-A'



SUMIBORON Insert Edge Specification Overview

Series	Work Material	Grade	Negative/Positive	Standard			Low Cutting Force L / High-efficiency Type E			Strong Edge Type H / U							
				Edge Specification Identification Code	α	W	Honing	Notation	Edge Specification Identification Code	α	W	Honing	Notation	Edge Specification Identification Code	α	W	Honing
Uncoated SUMIBORON	Hardened Steel	BNX10	Negative/Positive	T01225	25°	0.12	No	—	—	—	—	—	—	—	—	—	—
		BNX20	Negative/Positive	S01225	25°	0.12	Yes	LT	T01215 ^{*1}	15°	0.12	No	—	—	—	—	—
		BNX25	Negative/Positive	S01725	25°	0.17	Yes	—	—	—	—	—	—	—	—	—	—
		BN1000	Negative/Positive	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/Positive	T01225	25°	0.12	No	—	—	—	—	—	HT	T01235	35°	0.12	No
	Cast Iron Sintered Alloy 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
		BN7115	Negative/Positive	T01215	15°	0.12	No	LF	Sharp Edge	0°	0	No	HS	S00525	25°	0.05	Yes
		BN7115	Negative/Positive	T01215	15°	0.12	No	LE	Sharp Edge	0°	0	Yes	US	S01225	25°	0.12	Yes
		BN7115	Negative/Positive	T01215	15°	0.12	No	LS	S00515	15°	0.05	—	—	—	—	—	—
		BN7500	Negative/Positive	T01215	15°	0.12	No	LF	Sharp Edge	0°	0	No	—	—	—	—	—
		BN7500	Negative/Positive	T01215	15°	0.12	No	LE	Sharp Edge	0°	0	Yes	HS	S00525	25°	0.05	Yes
BN7500	Negative/Positive	T01215	15°	0.12	No	LS	S00715	15°	0.07	Yes	—	—	—	—	—		
BNS8125	Negative	T02020	20°	0.2	No	—	—	—	—	—	—	—	—	—	—	—	
BNS800	Negative	T02020	20°	0.20	No	LF	Sharp Edge	0°	0	No	—	—	—	—	—	—	
Coated SUMIBORON	Hardened Steel	BNC2115	Negative/Positive	S01225	25°	0.12	Yes	LS	S00515	15°	0.05	Yes	HS	S01730	30°	0.17	Yes
		BNC2125	Negative/Positive	S01225	25°	0.12	Yes	LS	S00515	15°	0.05	Yes	HS	S02735	35°	0.27	Yes
		BNC2010	Negative/Positive	S01225	25°	0.12	Yes	LE	Sharp Edge	0°	0	Yes	HS	S01730	30°	0.17	Yes
		BNC2020	Negative/Positive	S01225	25°	0.12	Yes	LT	T00515	15°	0.05	No	HS	S02735	35°	0.27	Yes
		BNC2020	Negative/Positive	S01225	25°	0.12	Yes	ES	S00535	35°	0.05	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	LS	S00515	15°	0.05	Yes	HS	S01735	35°	0.17	Yes
	Cast Iron	BNC500	Negative/Positive	S01215	15°	0.12	Yes	—	—	—	—	—	HS	S01225	25°	0.12	Yes
	Cast Iron/Hardened Steel	BNC8115	Negative	S02020	20°	0.2	Yes	—	—	—	—	—	—	—	—	—	—
SUMIBORON BINDERLESS	Cast Iron / Exotic Alloy Cemented Carbide / Hard Brittle Material	NCB100	Negative/Positive	T01215	15°	0.12	No	—	—	—	—	—	—	—	—	—	

*1 BNX20 inserts with an inscribed circle of less than $\phi 4.76$ will have an identification code of T00715.

Insert Edge Specification with Wiper/Chipbreaker

Type	Notation	Edge Specification Identification Code	α	W	Honing	Uncoated SUMIBORON		Coated SUMIBORON									
						BN2000	BNS8125	BNS800	BNC2115	BNC2125	BNC2010	BNC2020	BNC100	BNC160	BNC200	BNC500	BNC8115
Wiper	WG	S01215	15°	0.12	Yes	●		●	●	●	●	●	●	●	●	●	●
	WH	S01215	15°	0.12	Yes	●		●	●	●	●	●	●	●	●	●	●
	W	S01215	15°	0.12	Yes												
		S01715	15°	0.17	Yes												
		S02020	20°	0.20	Yes												
	T02020	20°	0.20	No			●	●									
Wiper Sharp Edge	LFW	Sharp Edge	0°	0	No			●									
With Chipbreaker	N-FV	—	0°	0	Yes	●		●	●	●	●	●	●	●	●	●	●
	N-LV	S00535	35°	0.05	Yes	●		●	●	●	●	●	●	●	●	●	●
	N-SV	S01235	35°	0.12	Yes	●		●	●	●	●	●	●	●	●	●	●

● mark: Standard stocked item

Edge Specification Identification Code

Edge Treatment Notation	
No	Standard Cutting Edge
L	Low Cutting Force
E	High Efficiency
H	Strong Edge
U	Strong Edge
WG/WH/W	Wiper
N-FV/N-LV/N-SV	With Chipbreaker

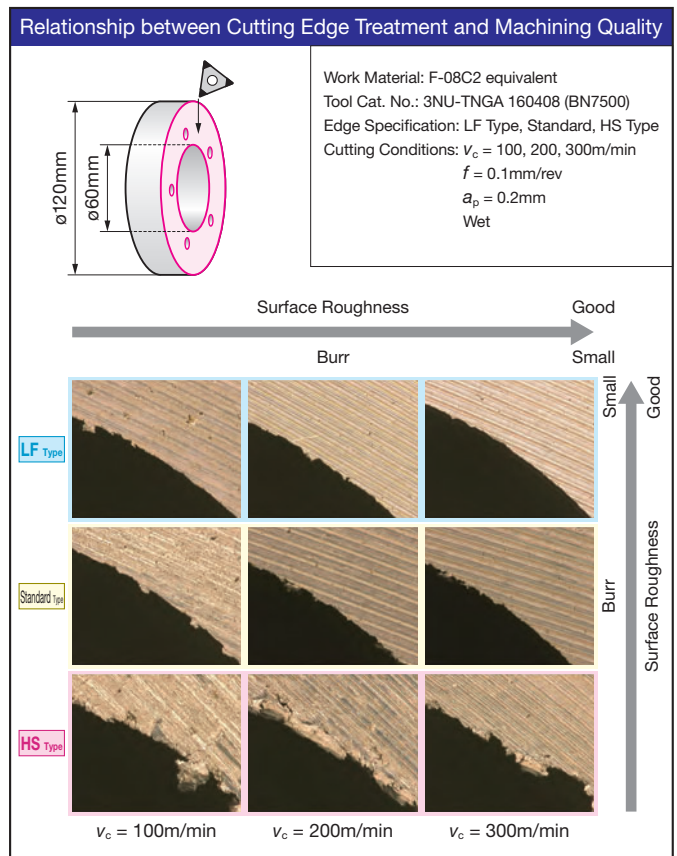
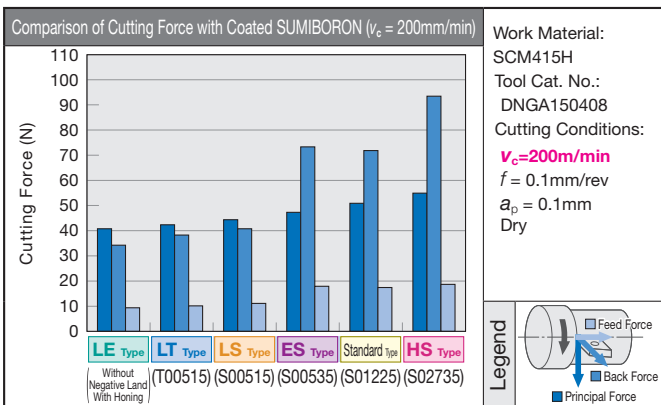
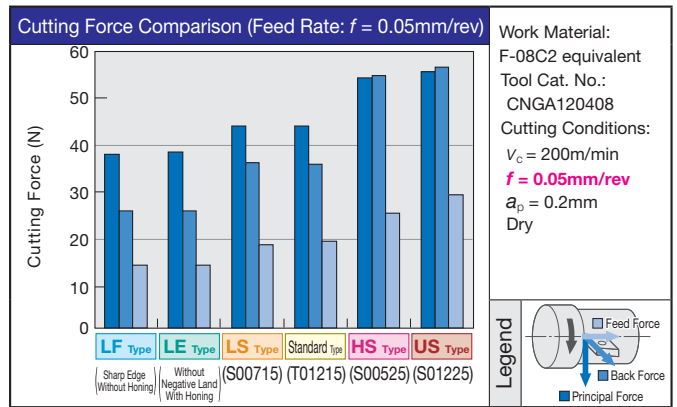
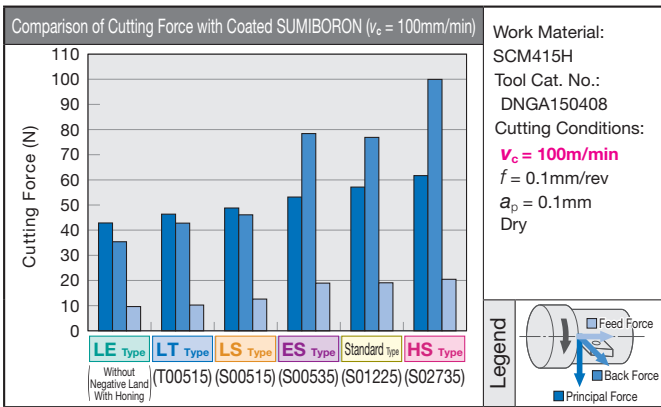
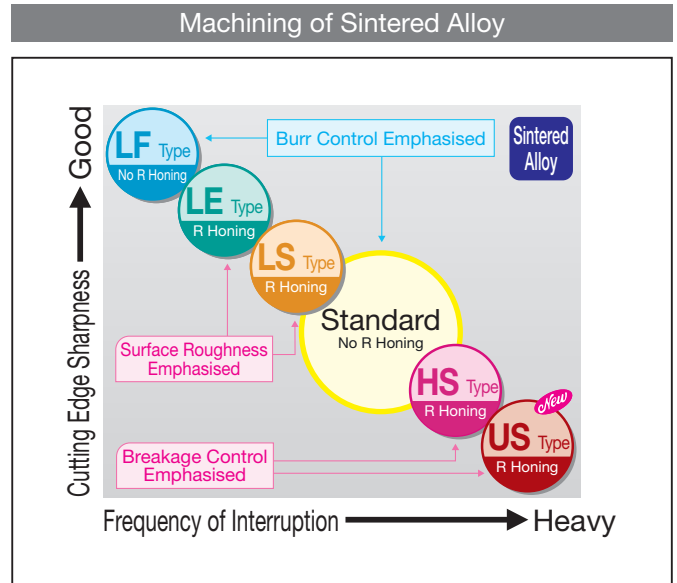
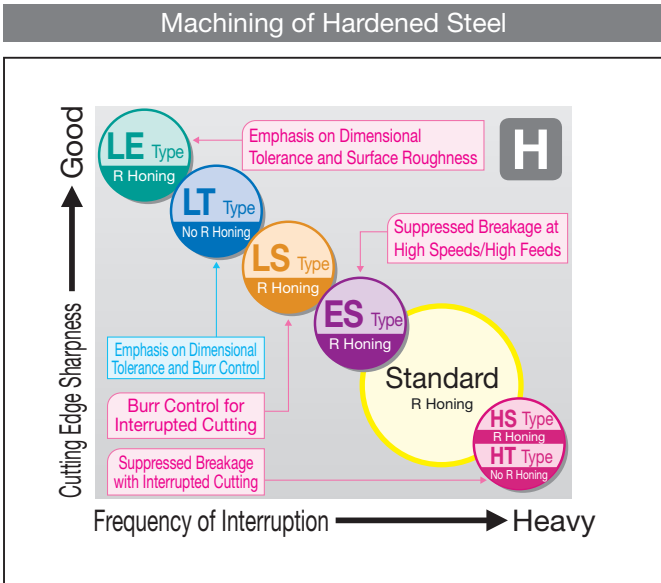
● Edge specification identification code

S 0 1 2 2 5

EX: S01225
→ 25°/0.12mm Negative Land with Honing

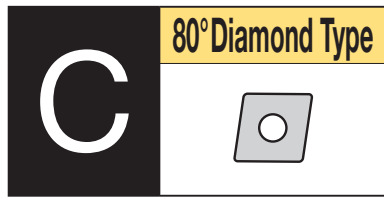
SUMIBORON Insert Edge Specifications

Edge Treatment Performance



SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

CN 1204 Uncoated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

Applicable External Holders **C8 to C10** Applicable Internal Holders **E15, E23 to E25**

(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting □ 1st Recommendation □ 2nd Recommendation Interrupted Cutting ⊕ 1st Recommendation ⊕ 2nd Recommendation

Recommended Application	K Cast Iron	S Exotic Alloy	H Hardened Steel	Sintered Components	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100
Cast Iron	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Exotic Alloy	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Hardened Steel	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Sintered Components	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Uncoated SUMIBORON

Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON												
							BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	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	●	●		●	●	●	●	●	●	●	●	●	
		T-NU-CNMA 120402			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			0.4	2.5			▲										
		120408			0.8	2.4			▲										
120412	1.2	2.3			▲														
	Standard	NU-CNGA 120404	1	1	0.4	2.5											●		
		120408			0.8	2.4												●	
		120412			1.2	2.3													●

*Depth of cut for single-use types is 0.5mm or less.

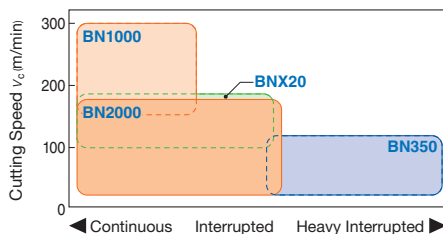
Multi-Cornered Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON													
							BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100		
	Standard	2NU-CNGA 120404	1	2	0.4	2.5														
		120408			0.8	2.4	●			●	●	●	●	●	●	●	●			
		120412			1.2	2.3	●			●	●	●	●	●	●	●	●	●		
		T-2NU-CNGA 120404			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			0.4	2.5			▲											
		120408			0.8	2.4			▲											
120412	1.2	2.3			▲															

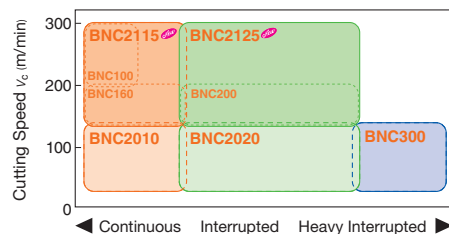
*Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

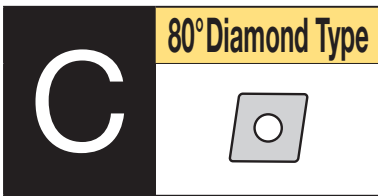


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



CN 1204 ●● Uncoated				
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

Applicable External Holders **C8 to C10** Applicable Internal Holders **E15, E23 to E25**

Multi-Cornered Single-Use Type/Negative (With Hole)

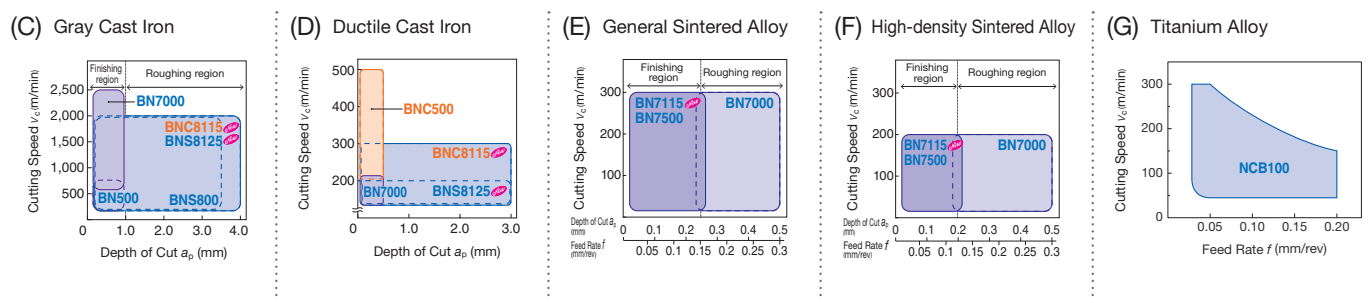
(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ● 1st Recommendation ○ 2nd Recommendation Interrupted Cutting ● 1st Recommendation ○ 2nd Recommendation

Recommended Application	K Cast Iron								○	●											
	S Exotic Alloy										●										
	H Hardened Steel	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Sintered Components																				

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																			
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100						
	S01215	2NU-CNGA 120404WG 120408WG 120412WG	1	2	0.4	2.4																				
	S01215	2NU-CNGA 120404WH 120408WH 120412WH	1	2	0.4	2.4																				
	S00535	2NU-CNGM 120404N-LV 120408N-LV 120412N-LV	1	2	0.4	2.5																				
	Sharp Edge	2NU-CNGA 120404LF 120408LF 120412LF	1	2	0.4	2.5																				
	Honing	2NU-CNGA 120404LE 120408LE	1	2	0.4	2.5																				
	T01215	2NU-CNGA 120404LT 120408LT 120412LT	1	2	0.4	2.5																				
	BN7115→S00515 BN7500→S00715	2NU-CNGA 120404LS 120408LS	1	2	0.4	2.5																				
	T01235	2NU-CNGA 120404HT 120408HT 120412HT	1	2	0.4	2.5																				

*Depth of cut for single-use types is 0.5mm or less.

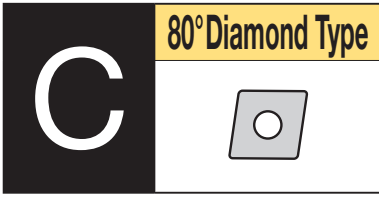
SUMIBORON Application Range Map



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability).

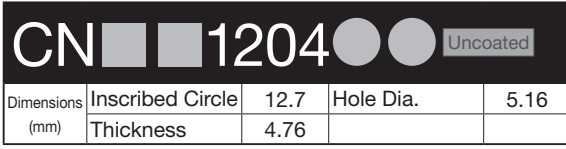
SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.	T01235				T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**



Applicable External Holders **C8 to C10** Applicable Internal Holders **E15, E23 to E25**

Multi-Cornered Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON													
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100
	BN2000→S01235 BN7000→S01225 BN700→S01225 BN7115→S00525 BN7500→S00525	2NU-CNGA 120404HS 120408HS 120412HS	1	2	0.4	2.5	—	—	—	—	●	—	—	●	▲	●	—	—	—	
							—	—	—	—	●	—	—	●	▲	—	—	—	—	—
							—	—	—	—	●	—	—	●	▲	—	—	—	—	—
		Strong Edge Type		2NU-CNGA 120404US <i>New</i>	1	2	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—
	S01225		1	2	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—		
Strong Edge Type																				

*Depth of cut for single-use types is 0.5mm or less.

Negative Type (With Hole)

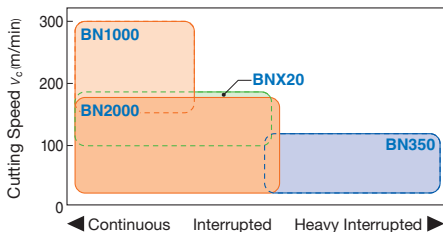
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON													
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100
	Standard	CNMA 120404 120408 120412	1	1	0.4	4.6	—	●	—	—	●	—	—	●	—	—	—	—	—	
							—	●	—	—	●	—	—	●	▲	—	—	—	—	—
							—	●	—	—	●	—	—	●	▲	—	—	—	—	—

Solid Type/Negative (With Hole)

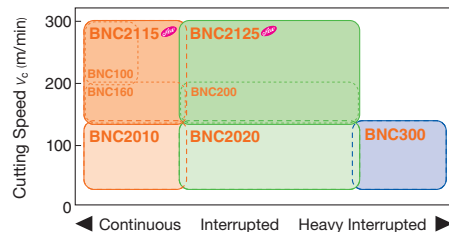
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON												
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800
	Standard	CNGA 120408 120412	1	Solid	0.8	12.9	—	—	—	—	—	—	—	—	—	—	—	—	—
							—	—	—	—	—	—	—	—	—	—	—	—	—

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)



(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert

CNG 1204 Coated			
Dimensions (mm)	Inscribed Circle Thickness	12.7 4.76	Hole Dia. 5.16

Applicable External Holders C8 to C10 Applicable Internal Holders E15, E23 to E25

Multi-Cornered Single-Use Type/Negative (With Hole)

(Legend) Continuous Cutting 1st Recommendation 2nd Recommendation General Cutting 1st Recommendation 2nd Recommendation Interrupted Cutting 1st Recommendation 2nd Recommendation

Recommended Application	K Cast Iron												
	S Exotic Alloy												
	H Hardened Steel												
	Sintered Components												

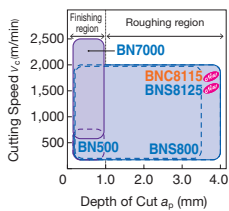
Coated SUMIBORON

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Application																		
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115									
	Standard	2NC-CNGA 120404	1	2	0.4	2.5																			
		120408			0.8	2.4																			
		120412			1.2	2.3																			
		120416 ^{†1}			1.6	3.3																			
		120420 ^{†1}			2.0	3.2																			
120424 ^{†1}	2.4	3.1																							
	Standard	4NC-CNGA 120402	1	4	0.2	2.5																			
		120404			0.4	2.5																			
		120408			0.8	2.4																			
		120412			1.2	2.3																			
		120416 ^{†1}			1.6	3.3																			
120420 ^{†1}	2.0	3.2																							
120424 ^{†1}	2.4	3.1																							
	S01215	4NC-CNGA 120404WG	1	4	0.4	2.4																			
		120408WG			0.8	2.4																			
		120412WG			1.2	2.3																			
	S01215	4NC-CNGA 120404WH	1	4	0.4	2.4																			
		120408WH			0.8	2.3																			
		120412WH			1.2	2.2																			
	BNC100→S01715 BNC160→S01215 BNC200→S01215 BNC500→S01215	4NC-CNGA 120404W	1	4	0.4	2.5																			
		120408W			0.8	2.4																			
		120412W			1.2	2.3																			
	Honing	4NC-CNGG 120404N-FV	1	4	0.4	2.5																			
		120408N-FV			0.8	2.4																			
		120412N-FV			1.2	2.3																			
	S00535	4NC-CNGG 120404N-LV	1	4	0.4	2.5																			
		120408N-LV			0.8	2.4																			
		120412N-LV			1.2	2.3																			
	S01235	4NC-CNGG 120404N-SV	1	4	0.4	2.5																			
		120408N-SV			0.8	2.4																			
		120412N-SV			1.2	2.3																			

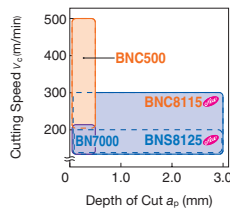
^{†1} For use with the SUMIBORON Special Holders for High-Efficiency Machining shown on page L117.

SUMIBORON Application Range Map

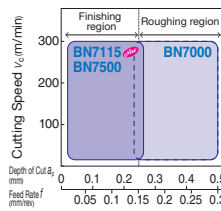
(C) Gray Cast Iron



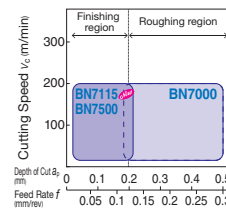
(D) Ductile Cast Iron



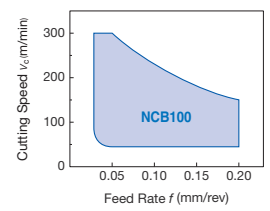
(E) General Sintered Alloy



(F) High-density Sintered Alloy



(G) Titanium Alloy

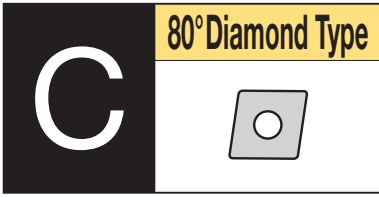


○ mark: Stock or planned stock (please confirm stock availability)

SUMIBORON
Neg.
Pos.
C
D
R
S
T
V
W

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.	T01235				T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

CNG 1204 Coated				
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

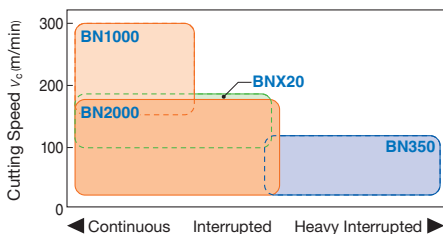
Applicable External Holders **C8 to C10** Applicable Internal Holders **E15, E23 to E25**

Multi-Cornered Single-Use Type/Negative (With Hole)

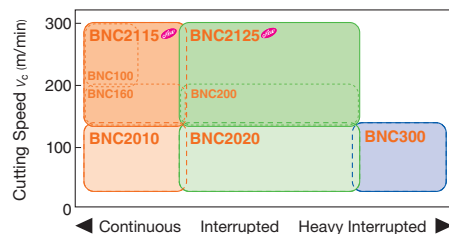
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON										
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115	
 Low Cutting Force	Honing	2NC-CNGA 120404LE	1	2	0.4	2.5	—	—	●	—	—	—	—	—	—	—	—
		120408LE					—	—	●	—	—	—	—	—	—	—	—
		120412LE					—	—	●	—	—	—	—	—	—	—	—
 Sharper Edge Type	T00515	2NC-CNGA 120402LT	1	2	0.2	2.5	—	—	●	—	—	—	—	—	—	—	
		120404LT					—	—	●	—	—	—	—	—	—	—	
		120408LT					—	—	●	—	—	—	—	—	—	—	
		120412LT					—	—	●	—	—	—	—	—	—	—	
 Sharper Edge Type	BNC2115~S00515 BNC2125~S00515 BNC100~S01715 BNC160~S01020 BNC200~S01015 BNC300~S00515	2NC-CNGA 120402LS <i>NEW</i>	1	2	0.2	2.5	—	○	—	—	—	—	—	—	—	—	
		120404LS					—	○	—	—	●	—	—	—	—	—	
		120408LS					—	○	—	—	●	—	—	—	—	—	
		120412LS					—	○	—	—	●	—	—	—	—	—	
 Sharper Edge Type	BNC2115~S00515 BNC2125~S00515 BNC100~S01715 BNC160~S01020 BNC200~S01015 BNC300~S00515	4NC-CNGA 120404LS	1	4	0.4	2.5	—	—	—	—	—	—	—	—	—	—	
		120408LS					—	—	—	—	—	●	●	●	—	—	—
		120412LS					—	—	—	—	—	—	●	●	●	—	—
 Strong Edge Type	BNC2115~S01730 BNC2125~S02735 BNC2010~S01730 BNC2020~S02735 BNC160~S01730 BNC200~S01735 BNC300~S01735 BNC500~S01225	4NC-CNGA 120404HS	1	4	0.4	2.5	○	○	●	●	●	—	—	—	—	—	
		120408HS					○	○	●	●	●	—	—	—	—	—	
		120412HS					○	○	●	●	●	—	—	—	—	—	
							○	○	●	●	●	—	—	—	—	—	
 High-efficiency Type	S00535	4NC-CNGA 120404ES	1	4	0.4	2.5	—	—	—	●	—	—	—	—	—	—	
		120408ES					—	—	—	●	—	—	—	—	—	—	
		120412ES					—	—	—	●	—	—	—	—	—	—	

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

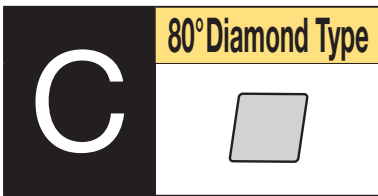


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



CNGN0903 Uncoated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	—
	Thickness	3.18		

Applicable External Holders L113

Solid Type/Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON														
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN7115	BN7500	BNS8125	BNS800	NCB100		
	Standard	CNGN 090308 090312	1	Solid	0.8 1.2	9.5 9.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
							—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Sharp Edge	CNGN 090308LF 090312LF	1	Solid	0.8 1.2	9.5 9.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
							—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Low Cutting Force

(Legend) Continuous Cutting 1st Recommendation 2nd Recommendation General Cutting 1st Recommendation 2nd Recommendation Interrupted Cutting 1st Recommendation 2nd Recommendation

Recommended Application	K Cast Iron																							
	S Exotic Alloy																							
	H Hardened Steel																							
	Sintered Components																							

CNGN0903 Coated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	—
	Thickness	3.18		

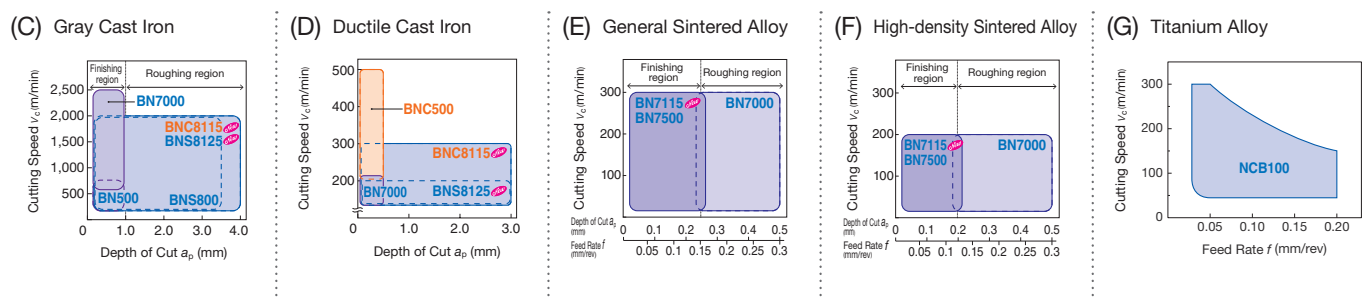
Applicable External Holders L113

Solid Type/Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON															
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115						
	Standard	CNGN 090308 New 090312 New	1	Solid	0.8 1.2	9.5 9.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
							—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

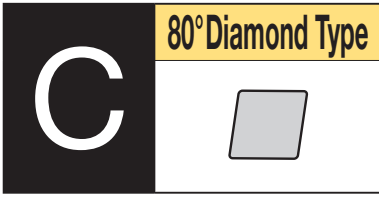
Recommended Application	K Cast Iron																						
	S Exotic Alloy																						
	H Hardened Steel																						
	Sintered Components																						

SUMIBORON Application Range Map



SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

CNG 1204 Uncoated			
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.
	Thickness	4.76	

Applicable External Holders **L113**

Solid Type/Negative (Dimple Lock)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100		
	Standard	CNGX 120408	1	Solid	0.8	12.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
		120412			1.2	12.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		120416			1.6	12.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Solid Type/Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100		
	Standard	CNGN 120408	1	Solid	0.8	12.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
		120412			1.2	12.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		120416			1.6	12.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

CNG 1204 Coated			
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.
	Thickness	4.76	

Applicable External Holders **L113**

Solid Type/Negative (Dimple Lock)

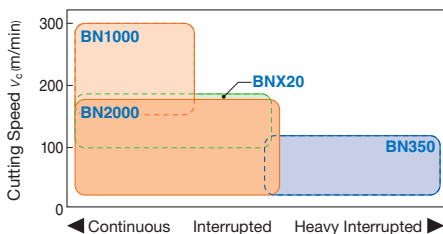
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	CNGX 120412 <i>New</i>	1	Solid	1.2	12.6	—	—	—	—	—	—	—	—	—	—
		120416 <i>New</i>			1.6	12.5	—	—	—	—	—	—	—	—	—	—

Solid Type/Negative (Without Hole)

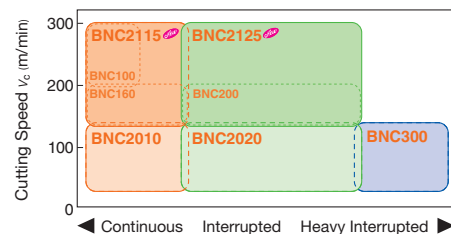
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115		
	Standard	CNGN 120408 <i>New</i>	1	Solid	0.8	12.7	—	—	—	—	—	—	—	—	—	—		
		120412 <i>New</i>			1.2	12.6	—	—	—	—	—	—	—	—	—	—	—	—
		120416 <i>New</i>			1.6	12.5	—	—	—	—	—	—	—	—	—	—	—	—

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

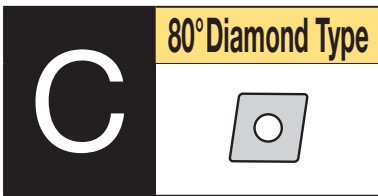


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



CCEW03X1 Uncoated				
Dimensions (mm)	Inscribed Circle	3.5	Hole Dia.	1.9
	Thickness	1.4		

Applicable Internal Holders E18, E20

Single-Use Type/7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON														
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
 Low Cutting Force	Sharp Edge	NU-CCEW 03X102LF 03X104LF	1	1	0.2 0.4	1.2 1.1	—	—	—	—	—	—	—	—	●	●	●	●	—	—	—
 Sharper Edge Type	T00715	NU-CCEW 03X102LT 03X104LT	1	1	0.2 0.4	1.2 1.1	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—

*Depth of cut for single-use types is 0.5mm or less.

CCEW03X1 Coated				
Dimensions (mm)	Inscribed Circle	3.5	Hole Dia.	1.9
	Thickness	1.4		

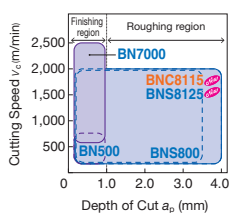
Applicable Internal Holders E18, E20

Single-Use Type/7° Positive (With Hole)

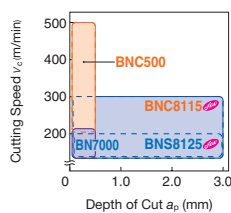
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON													
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115				
 Low Cutting Force	Honing	NC-CCEW 03X102LE 03X104LE	1	1	0.2 0.4	1.2 1.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
 Sharper Edge Type	T00515	NC-CCEW 03X102LT 03X104LT	1	1	0.2 0.4	1.2 1.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—

SUMIBORON Application Range Map

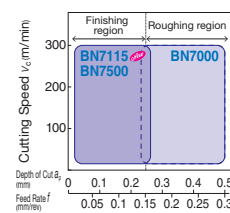
(C) Gray Cast Iron



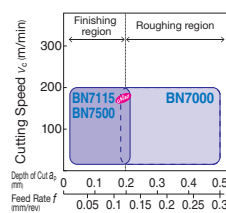
(D) Ductile Cast Iron



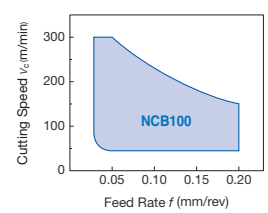
(E) General Sintered Alloy



(F) High-density Sintered Alloy



(G) Titanium Alloy



SUMIBORON

Neg.

Pos.

C

D

R

S

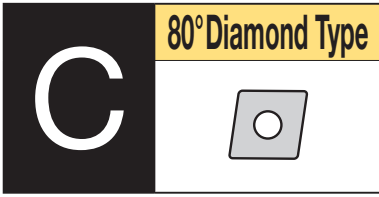
T

V

W

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

CCEW04X1 Uncoated

Dimensions (mm)	Inscribed Circle	4.3	Hole Dia.	2.3
	Thickness	1.8		

Applicable Internal Holders **E18, E20**

Single-Use Type/7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
 Low Cutting Force	Sharp Edge	NU-CCEW 04X102LF 04X104LF	1	1	0.2 0.4	2.0 1.9	—	—	—	—	—	●	○	○	○	○	○	○	○
 Sharper Edge Type	T00715	NU-CCEW 04X102LT 04X104LT	1	1	0.2 0.4	2.0 1.9	●	●	—	—	—	—	—	—	—	—	—	—	—

*Depth of cut for single-use types is 0.5mm or less.

CCEW04X1 Coated

Dimensions (mm)	Inscribed Circle	4.3	Hole Dia.	2.3
	Thickness	1.8		

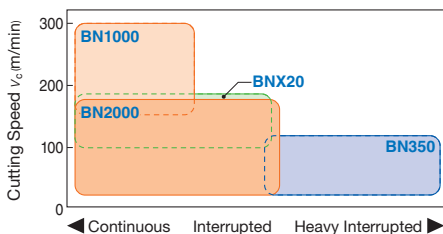
Applicable Internal Holders **E18, E20**

Single-Use Type/7° Positive (With Hole)

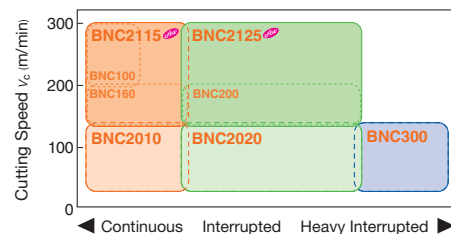
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2115 BNC2125	BNC2010 BNC2020	BNC300	BNC100 BNC160	BNC200	BNC500	BNC8115
 Low Cutting Force	Honing	NC-CCEW 04X102LE 04X104LE	1	1	0.2 0.4	2.0 1.9	—	—	—	—	—	—	—
 Sharper Edge Type	T00515	NC-CCEW 04X102LT 04X104LT	1	1	0.2 0.4	2.0 1.9	—	—	—	—	—	—	—

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

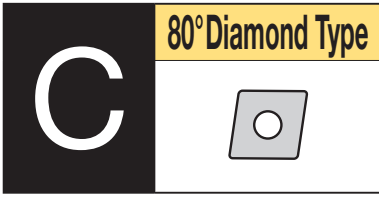


(B) Hardened Steel (Coated SUMIBORON)



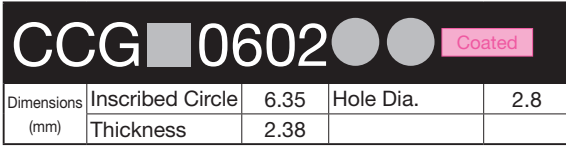
SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**



Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	2.8
	Thickness	2.38		

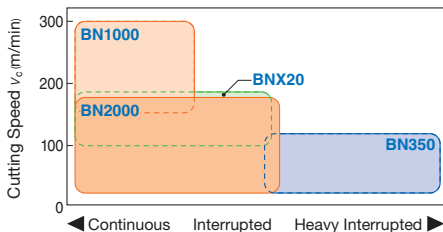
Applicable External Holders **C11, D13, D17, D22, D23** Applicable Internal Holders **E18 to E20**

Multi-Cornered Single-Use Type/7° Positive (With Hole)

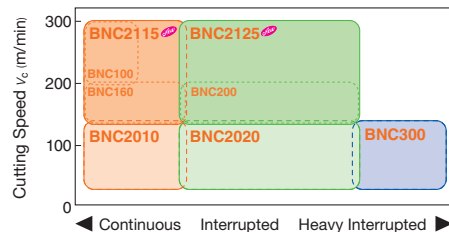
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON										
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115	
	Standard	2NC-CCGW 060202	1	2	0.2	2.4	○	○	●	●						●	○
		060204				2.3	○	○	●	●					●	●	
		060208				2.3	○	○							●	●	
	Honing	2NC-CCGT 060204N-FV	1	2	0.4	2.3	○	○	●	●			●	●			
	Honing	2NC-CCGW 060202LE	1	2	0.2	2.4			●								
		060204LE				2.3			●								
	T00515	2NC-CCGW 060202LT	1	2	0.2	2.4				●							
		060204LT				2.3				●							
	Sharper Edge Type	2NC-CCGW 060202LS	1	2	0.2	2.4	○	○							●		
		060204LS				2.3	○	○							●		
		060208LS <i>new</i>				2.3	○	○									

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

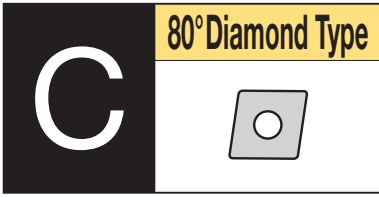


(B) Hardened Steel (Coated SUMIBORON)



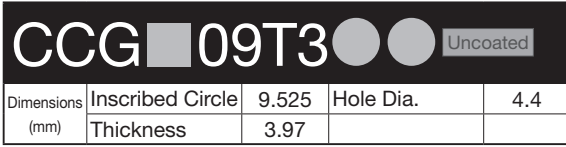
SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.	T01235				T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**



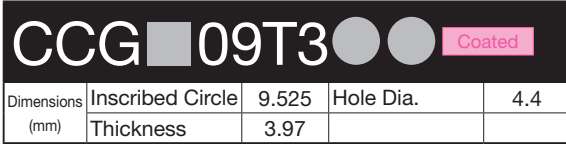
Applicable External Holders **C11, D13, D17, D22, D23**

Applicable Internal Holders **E12, E18 to E20**

Multi-Cornered Single-Use Type/7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON												
							BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	2NU-CCGW 09T304 09T308	1	2	0.4 0.8	2.5 2.4													
	S01215	2NU-CCGW 09T304WG 09T308WG	1	2	0.4 0.8	2.4 2.4													
	S01215	2NU-CCGW 09T304WH 09T308WH	1	2	0.4 0.8	2.4 2.3													
	Honing	2NU-CCGT 09T304N-FV 09T308N-FV	1	2	0.4 0.8	2.4 2.3													
	S00535	2NU-CCGT 09T304N-LV 09T308N-LV	1	2	0.4 0.8	2.4 2.3													

*Use NS Type (NS-CCGW) for BNX25. *Depth of cut for single-use types is 0.5mm or less.



Applicable External Holders **C11, D13, D22, D23**

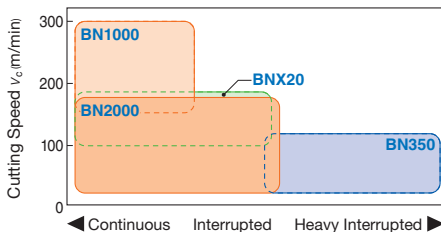
Applicable Internal Holders **E12, E18 to E20**

Multi-Cornered Single-Use Type/7° Positive (With Hole)

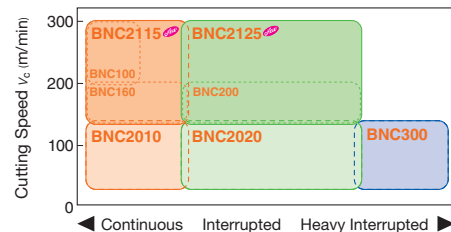
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON														
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115					
	Standard	2NC-CCGW 09T302 09T304 09T308	1	2	0.2 0.4 0.8	2.5 2.5 2.4															

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

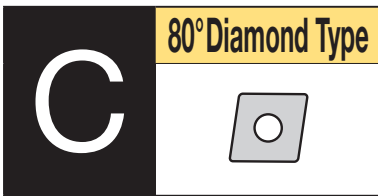


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



CCG 09T3 Coated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.97		

(Legend) ●: Continuous Cutting ○: 1st Recommendation ○: 2nd Recommendation ○: General Cutting ○: 1st Recommendation ○: 2nd Recommendation ○: Interrupted Cutting ○: 1st Recommendation ○: 2nd Recommendation

Recommended Application	K Cast Iron																		
	S Exotic Alloy																		
	H Hardened Steel	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Sintered Components																		

Applicable External Holders ● C11, D13, D17, D22, D23 Applicable Internal Holders ● E12, E18 to E20

Multi-Cornered Single-Use Type/7° Positive (With Hole)

Coated SUMIBORON

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON														
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115					
 Wiper Insert	S01215	2NC-CCGW 09T304WG 09T308WG	1	2	0.4 0.8	2.4	○	○													
						2.4	○	○	●	●			●	●							
 Wiper Insert	S01215	2NC-CCGW 09T304WH 09T308WH	1	2	0.4 0.8	2.4	○	○	●	●											
						2.3	○	○	●	●			●	●							
 Honing	Honing	2NC-CCGT 09T304N-FV 09T308N-FV	1	2	0.4 0.8	2.4	○	○	●	●											
						2.3	○	○	●	●			●	●							
 BREAK MASTER	S00535	2NC-CCGT 09T304N-LV 09T308N-LV	1	2	0.4 0.8	2.4	○	○	●	●											
						2.3	○	○	●	●			●	●							
 Low Cutting Force	Honing	2NC-CCGW 09T302LE 09T304LE 09T308LE	1	2	0.2	2.5			●												
					0.4	2.5			●												
					0.8	2.4			●												
 Sharper Edge Type	T00515	2NC-CCGW 09T302LT 09T304LT 09T308LT	1	2	0.2	2.5			●												
					0.4	2.5			●												
					0.8	2.4			●												
 Sharper Edge Type	BNC2115~S00515 BNC2125~S00515 BNC100~S01715 BNC160~S01020 BNC200~S01015 BNC300~S00515	2NC-CCGW 09T302LS 09T304LS 09T308LS	1	2	0.2	2.5	○	○													
					0.4	2.5	○	○			●	●									
					0.8	2.4	○	○			●	●									
					0.8	2.4	○	○			●	●									
 Strong Edge Type	BNC2115~S01730 BNC2125~S02735 BNC2010~S01730 BNC2020~S02735 BNC160~S01730 BNC200~S01735 BNC300~S01735 BNC500~S01225	2NC-CCGW 09T304HS 09T308HS	1	2	0.4	2.5					●										
					0.8	2.4					●										

SUMIBORON

Neg.

Pos.

C

D

R

S

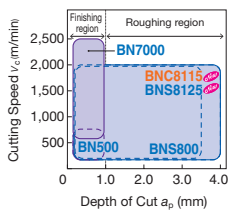
T

V

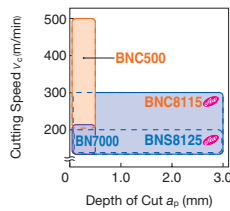
W

SUMIBORON Application Range Map

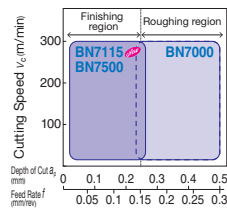
(C) Gray Cast Iron



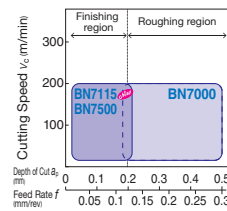
(D) Ductile Cast Iron



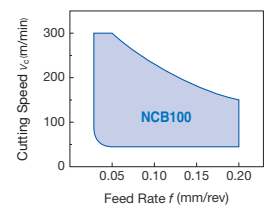
(E) General Sintered Alloy



(F) High-density Sintered Alloy



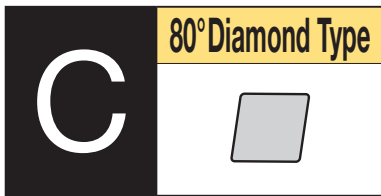
(G) Titanium Alloy



○ mark: Stock or planned stock (please confirm stock availability)

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

CCGN0401 Uncoated			
Dimensions (mm)	Inscribed Circle	4.76	Hole Dia.
	Thickness	1.59	—

Applicable Holder: Special Holder

Single-Use Type/7° Positive (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON													
							BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100		
	Standard	NU-CCGN 040104 040108	1	1	0.4 0.8	2.5 2.4														
		T-NU-CCGN 040104 040108	10	1	0.4 0.8	2.5 2.4														
	S01235	NU-CCGN 040104HS 040108HS	1	1	0.4 0.8	2.5 2.4														

*Use NS Type (NS-CCGN) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

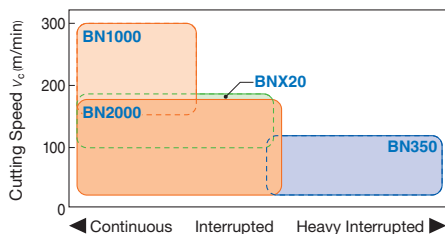
(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ● 1st Recommendation ○ 2nd Recommendation Interrupted Cutting ● 1st Recommendation ○ 2nd Recommendation

Recommended Application	K Cast Iron																			
	S Exotic Alloy																			
	H Hardened Steel																			
	Sintered Components																			

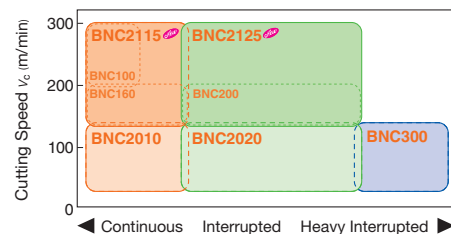
- SUMIBORON
- L
- Neg.
- Pos.
- C
- D
- R
- S
- T
- V
- W

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

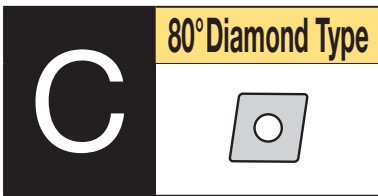


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



CPGW0802 Uncoated				
Dimensions (mm)	Inscribed Circle	7.94	Hole Dia.	3.4
	Thickness	2.38		

Applicable Internal Holders E21, E22

Single-Use Type/11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																				
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BN8000	NCB100							
	Standard	NU-CPGW 080202 080204 080208	1	1	0.2	2.5																					
					0.4	2.5																					
					0.8	2.4																					
	T01215	NU-CPGW 080204LT	1	1	0.4	2.5																					
	S01235	NU-CPGW 080202HS 080204HS 080208HS	1	1	0.2	2.5																					
					0.4	2.5																					
					0.8	2.4																					

*Use NS Type (NS-CPGW) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

CPGW0802 Coated				
Dimensions (mm)	Inscribed Circle	7.94	Hole Dia.	3.4
	Thickness	2.38		

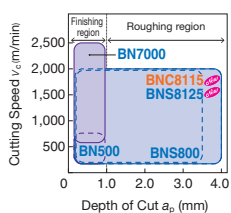
Applicable Internal Holders E21, E22

Multi-Cornered Single-Use Type/11° Positive (With Hole)

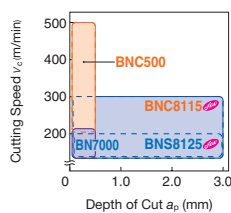
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON									
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	2NC-CPGW 080202 080204	1	2	0.2	2.5										
					0.4	2.5										

SUMIBORON Application Range Map

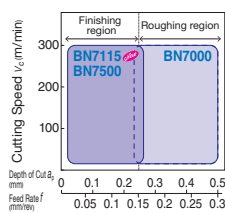
(C) Gray Cast Iron



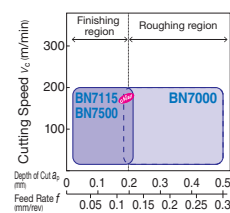
(D) Ductile Cast Iron



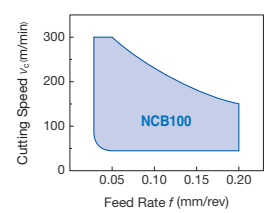
(E) General Sintered Alloy



(F) High-density Sintered Alloy



(G) Titanium Alloy



SUMIBORON

Neg.

Pos.

C

D

R

S

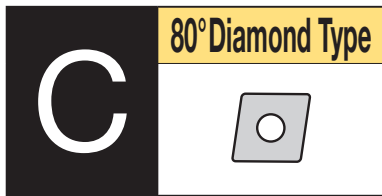
T

V

W

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ⊕ 1st Recommendation ⊖ 2nd Recommendation Interrupted Cutting ⊕⊖ 1st Recommendation ⊖⊕ 2nd Recommendation

CPGW0903 ●●● Uncoated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.18		

Applicable Internal Holders **E12, E21, E22**

Single-Use Type/11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																		
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100					
	Standard	NU-CPGW 090302 090304 090308	1	1	0.2 0.4 0.8	2.5 2.5 2.4																			
	T01215	NU-CPGW 090302LT 090304LT 090308LT	1	1	0.2 0.4 0.8	2.5 2.5 2.4																			
	S01235	NU-CPGW 090302HS 090304HS 090308HS	1	1	0.2 0.4 0.8	2.5 2.5 2.4																			

*Use NS Type (NS-CPGW) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

CPGW0903 ●●● Coated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.18		

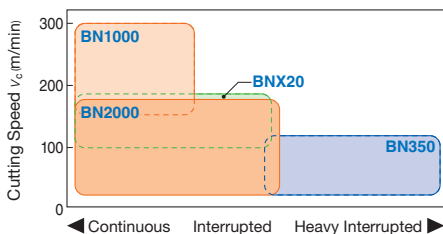
Applicable Internal Holders **E12, E21, E22**

Multi-Cornered Single-Use Type/11° Positive (With Hole)

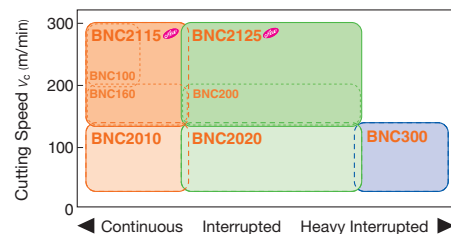
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON														
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115					
	Standard	2NC-CPGW 090302 090304	1	2	0.2 0.4	2.5 2.5															

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

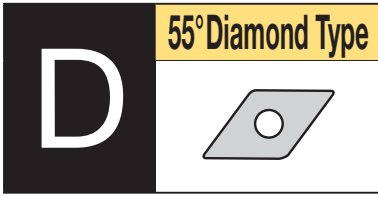


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



DNGA1104 Coated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

Applicable External Holders C14 Applicable Internal Holders E34, E35

Multi-Cornered Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115			
	Standard	2NC-DNGA 110404 110408 110412	1	2	0.4	2.5	○	○	●	●	●	●	●	●	●	●	○		
					0.8	2.1	○	○	○	○	○	○	○	○	○	○	○	○	○
					1.2	2.0	○	○	○	○	○	○	○	○	○	○	○	○	○

(Legend) Continuous Cutting ○ 1st Recommendation ● 2nd Recommendation General Cutting ○ 1st Recommendation ● 2nd Recommendation Interrupted Cutting ○ 1st Recommendation ● 2nd Recommendation

Recommended Application	K Cast Iron																
	S Exotic Alloy																
	H Hardened Steel	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Sintered Components																

Coated SUMIBORON

DN1504 Uncoated				
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

Applicable External Holders C12 to C14 Applicable Internal Holders E15, E33 to E35

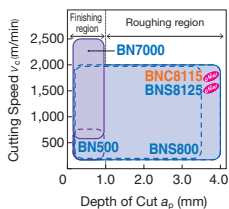
Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100					
	Standard	NU-DNMA 150401 150402 150404 150408 150412	1	1	0.1	2.7																			
					0.2	2.5																			
					0.4	2.5	●	●																	
					0.8	2.1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
					1.2	2.0																			
	Standard	T-NU-DNMA 150401 150402 150404 150408 150412	10	1	0.1	2.7																			
					0.2	2.5																			
					0.4	2.5	●	●																	
					0.8	2.1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
					1.2	2.0																			
	Standard	NS-DNMA 150404 150408 150412	1	1	0.4	2.5			▲																
					0.8	2.1			▲																
					1.2	2.0																			
					0.4	2.5							▲												
					0.8	2.1							▲												
	Standard	NU-DNGA 150404 150408 150412	1	1	0.4	2.5															●				
					0.8	2.1																	●		
					1.2	2.0																		●	

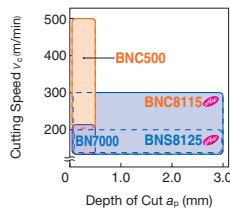
*Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map

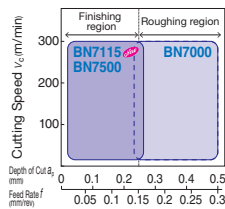
(C) Gray Cast Iron



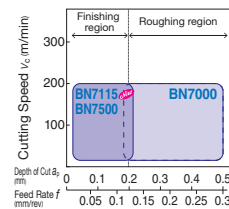
(D) Ductile Cast Iron



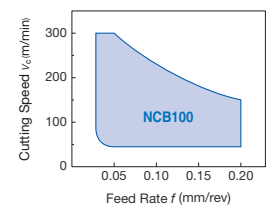
(E) General Sintered Alloy



(F) High-density Sintered Alloy



(G) Titanium Alloy



○ mark: Stock or planned stock item (please confirm stock availability) ▲: To be replaced by new item (please confirm stock availability)

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ● 1st Recommendation ○ 2nd Recommendation Interrupted Cutting ● 1st Recommendation ○ 2nd Recommendation

DN 1504 Uncoated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

Recommended Application	K Cast Iron	S Exotic Alloy	H Hardened Steel	Sintered Components	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
K Cast Iron	●													
S Exotic Alloy		●												
H Hardened Steel			●											
Sintered Components				●										

Applicable External Holders **C12 to C14** Applicable Internal Holders **E15, E33 to E35**

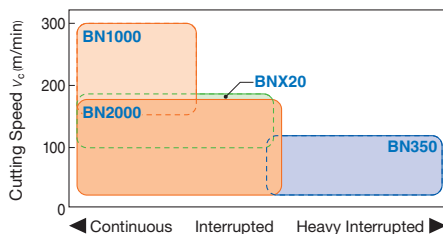
Multi-Cornered Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON													
							BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100		
	Standard	2NU-DNGA 150404	1	2	0.4	2.5	●	—	●	●	●	●	●	●	●	●	●	●		
		150408			0.8	2.1	●	—	●	●	●	●	●	●	●	●	●	●	●	●
		150412			1.2	2.0	●	—	●	●	●	●	●	●	●	●	●	●	●	●
	Standard	T-2NU-DNGA 150404	10	2	0.4	2.5	●	—	●	●	●	●	●	●	●	●	●	●		
		150408			0.8	2.1	●	—	●	●	●	●	●	●	●	●	●	●	●	●
		150412			1.2	2.0	●	—	●	●	●	●	●	●	●	●	●	●	●	●
	Standard	2NS-DNGA 150404	1	2	0.4	2.5	—	▲	—	—	—	—	—	—	—	—	—	—		
		150408			0.8	2.1	—	▲	—	—	—	—	—	—	—	—	—	—	—	—
		150412			1.2	2.0	—	▲	—	—	—	—	—	—	—	—	—	—	—	—
	Standard	T-2NS-DNGA 150404	10	2	0.4	2.5	—	▲	—	—	—	—	—	—	—	—	—	—		
		150408			0.8	2.1	—	▲	—	—	—	—	—	—	—	—	—	—	—	—
		150412			1.2	2.0	—	▲	—	—	—	—	—	—	—	—	—	—	—	—

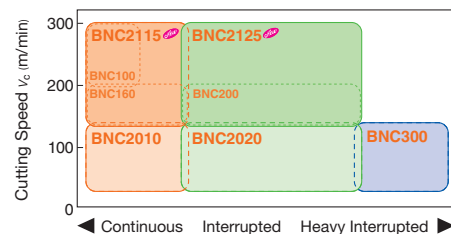
*Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)



(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



DN 1504 Uncoated				
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

(Legend) Continuous Cutting: ○ (1st Recommendation), ● (2nd Recommendation); General Cutting: ◐ (1st Recommendation), ◑ (2nd Recommendation); Interrupted Cutting: ◒ (1st Recommendation), ◓ (2nd Recommendation)

Recommended Application	K Cast Iron	S Exotic Alloy	H Hardened Steel	Sintered Components	General Cutting	Interrupted Cutting	...
	○	○	○	○	○	○	...

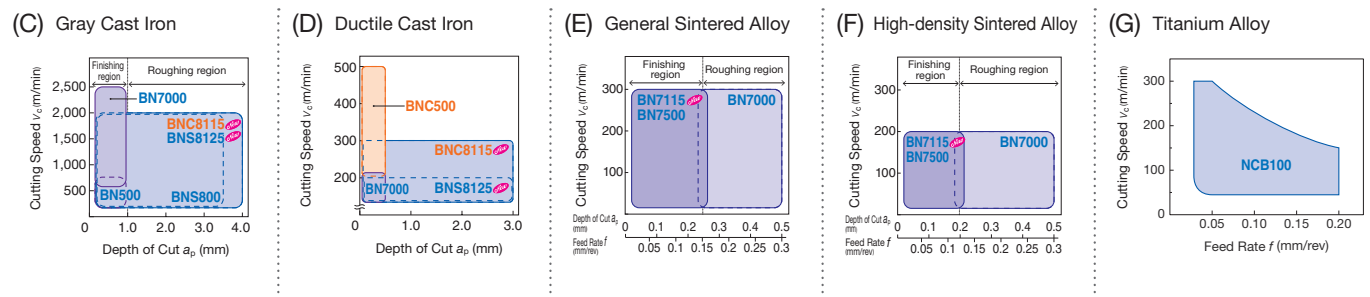
Applicable External Holders: C12 to C14; Applicable Internal Holders: E15, E33 to E35

Multi-Cornered Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																	
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100				
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 Cutting Force	Sharp Edge	2NU-DNGA 150404LF 150408LF 150412LF	1	2	0.4 0.8 1.2	2.5 2.1 2.0						●	▲											
Sharper Edge 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	1	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	1	2	0.4 0.8 1.2	2.5 2.1 2.0					●		●	▲										

*Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map

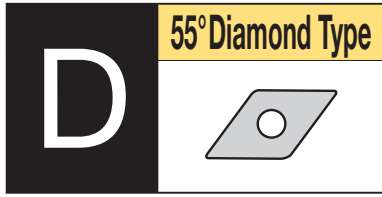


▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability).

SUMIBORON
Neg.
Pos.
C
D
R
S
T
V
W

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ● 1st Recommendation ○ 2nd Recommendation Interrupted Cutting ● 1st Recommendation ○ 2nd Recommendation

DN 1504 Uncoated				
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

Applicable External Holders **C12 to C14** Applicable Internal Holders **E15, E33 to E35**

Negative Type (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100			
	Standard	DNMA 150404	1	1	0.4	5.0	●			●											
		150408			0.8	4.7	●														
		150412			1.2	4.3	●														

DNG 1504 Coated				
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

Applicable External Holders **C12 to C14** Applicable Internal Holders **E15, E33 to E35**

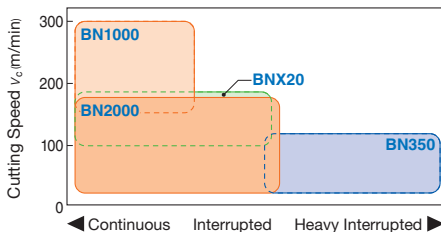
Multi-Cornered Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	2NC-DNGA 150404	1	2	0.4	2.5	○	●	●	●						
		150408			0.8	2.1	○	●	●	●						
		150412			1.2	2.0	○	●	●	●						
		150416^{*1}			1.6	3.4	○	●	●	●						
		150420^{*1}			2.0	3.0	○	●	●	●						
	Standard	4NC-DNGA 150402	1	4	0.2	2.6	○	○	●	●	●	●	●	●	●	●
		150404			0.4	2.5	○	○	●	●	●	●	●	●	●	
		150408			0.8	2.1	○	○	●	●	●	●	●	●	●	
		150412			1.2	2.0	○	○	●	●	●	●	●	●	●	
	S01215	4NC-DNGA 150404WG^{*2}	1	4	0.4	2.3	○	○	●	●				●	●	
		150408WG^{*2}			0.8	2.0	○	○	●	●				●	●	
		150424^{*1}			2.4	2.7	○	○	●	●				●	●	
	S01215	4NC-DNGA 150404WH^{*2}	1	4	0.4	2.1	○	○	●	●				●	●	
		150408WH^{*2}			0.8	1.8	○	○	●	●				●	●	

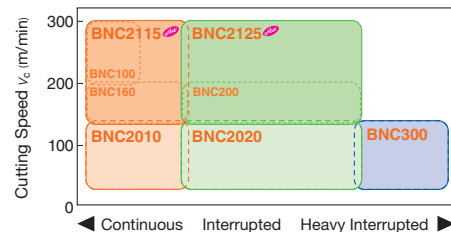
*1 For use with the SUMIBORON Special Holders for High-Efficiency Machining shown on pages L117 and L118. *2 Use a holder with a cutting angle of 93°.

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)



(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert

DNG 1504 Coated				
Dimensions (mm)	Inscribed Circle Thickness	12.7	Hole Dia.	5.16
	Thickness	4.76		

Applicable External Holders **C12 to C14** Applicable Internal Holders **E15, E33 to E35**

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation General Cutting ●: 1st Recommendation ○: 2nd Recommendation Interrupted Cutting ●: 1st Recommendation ○: 2nd Recommendation

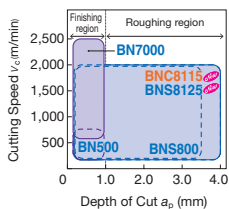
Recommended Application	K Cast Iron													●	○
	S Exotic Alloy														
	H Hardened Steel	●	○	○	○	○	+								
	Sintered Components														

Multi-Cornered Single-Use Type/Negative (With Hole)

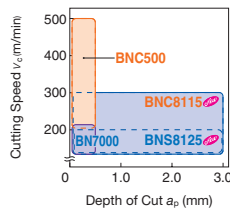
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON													
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115				
 BREAK MASTER	Honing	4NC-DNGG 150404N-FV	1	4	0.4	2.5	○	○	●	●	—	—	—	—	—	—	—	—	—	
		150408N-FV			0.8	2.1	○	○	●	●	—	—	—	—	—	—	—	—	—	—
		150412N-FV			1.2	2.0	○	○	●	●	—	—	—	—	—	—	—	—	—	—
 BREAK MASTER	S00535	4NC-DNGG 150404N-LV	1	4	0.4	2.5	○	○	●	●	—	—	—	—	—	—	—	—		
		150408N-LV			0.8	2.1	○	○	●	●	—	—	—	—	—	—	—	—	—	—
		150412N-LV			1.2	2.0	○	○	●	●	—	—	—	—	—	—	—	—	—	—
 BREAK MASTER	S01235	4NC-DNGG 150404N-SV	1	4	0.4	2.5	○	○	●	●	—	—	—	—	—	—	—	—		
		150408N-SV			0.8	2.1	○	○	●	●	—	—	—	—	—	—	—	—	—	—
		150412N-SV			1.2	2.0	○	○	●	●	—	—	—	—	—	—	—	—	—	—
 Low Cutting Force	Honing	2NC-DNGA 150404LE	1	2	0.4	2.5	—	—	●	—	—	—	—	—	—	—	—	—		
		150408LE			0.8	2.1	—	—	●	—	—	—	—	—	—	—	—	—	—	—
		150412LE			1.2	2.0	—	—	●	—	—	—	—	—	—	—	—	—	—	—
 Sharper Edge Type	T00515	2NC-DNGA 150402LT	1	2	0.2	2.6	—	—	—	●	—	—	—	—	—	—	—	—		
		150404LT			0.4	2.5	—	—	—	●	—	—	—	—	—	—	—	—	—	—
		150408LT			0.8	2.1	—	—	—	●	—	—	—	—	—	—	—	—	—	—
		150412LT			1.2	2.0	—	—	—	●	—	—	—	—	—	—	—	—	—	—
 Sharper Edge Type	BNC2115-S00515 BNC2125-S00515 BNC100-S01715 BNC160-S01020 BNC200-S01015 BNC300-S00515	2NC-DNGA 150402LS New	1	2	0.2	2.5	—	○	—	—	—	—	—	—	—	—	—	—		
		150404LS			0.4	2.5	—	○	—	—	●	—	—	—	—	—	—	—	—	—
		150408LS			0.8	2.1	—	○	—	—	●	—	—	—	—	—	—	—	—	—
		150412LS			1.2	2.0	—	○	—	—	●	—	—	—	—	—	—	—	—	—
 Sharper Edge Type	BNC2115-S00515 BNC2125-S00515 BNC100-S01715 BNC160-S01020 BNC200-S01015 BNC300-S00515	4NC-DNGA 150404LS	1	4	0.4	2.5	—	—	—	—	—	—	—	●	●	●	—	—		
		150408LS			0.8	2.1	—	—	—	—	—	—	—	—	●	●	●	—	—	
		150412LS			1.2	2.0	—	—	—	—	—	—	—	—	—	●	●	—	—	
 Strong Edge Type	BNC2115-S01730 BNC2125-S02735 BNC2010-S01730 BNC2020-S02735 BNC160-S01730 BNC200-S01735 BNC300-S01735 BNC500-S01225	4NC-DNGA 150404HS	1	4	0.4	2.5	○	○	●	●	—	—	—	—	—	—	—	—		
		150408HS			0.8	2.1	○	○	●	●	—	—	—	—	—	—	—	—	—	—
		150412HS			1.2	2.0	○	○	●	●	—	—	—	—	—	—	—	—	—	—
 High-efficiency Type	S00535	4NC-DNGA 150404ES	1	4	0.4	2.5	—	—	—	—	—	—	—	●	—	—	—	—		
		150408ES			0.8	2.1	—	—	—	—	—	—	—	—	—	●	—	—	—	
		150412ES			1.2	2.0	—	—	—	—	—	—	—	—	—	—	●	—	—	

SUMIBORON Application Range Map

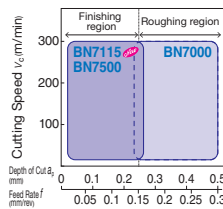
(C) Gray Cast Iron



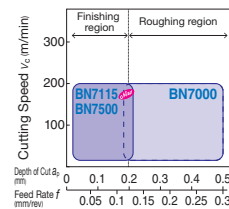
(D) Ductile Cast Iron



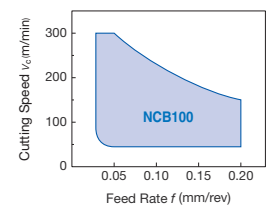
(E) General Sintered Alloy



(F) High-density Sintered Alloy



(G) Titanium Alloy



○ mark: Stock or planned stock (please confirm stock availability)

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ● 1st Recommendation ○ 2nd Recommendation Interrupted Cutting ● 1st Recommendation ○ 2nd Recommendation

DNMA1506 Uncoated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	6.35		

Applicable External Holders **C12, C14** Applicable External Holders **E34**

Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100			
	Standard	NU-DNMA 150604	1	1	0.4	2.5					●												
		150608			0.8	2.1																	
		150612			1.2	2.0																	

*Use NS Type (NS-DNMA) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

DNGA1506 Coated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	6.35		

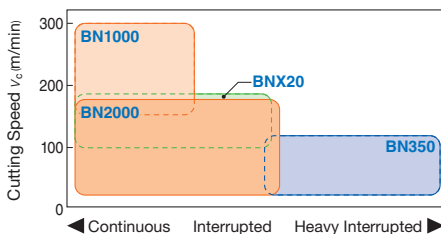
Applicable External Holders **C12, C14** Applicable External Holders **E34**

Multi-Cornered Single-Use Type/Negative (With Hole)

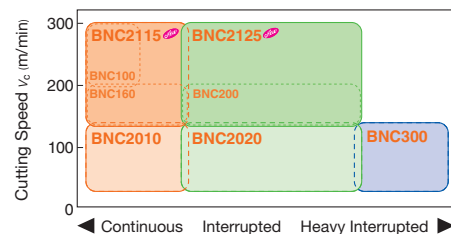
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115		
	Standard	4NC-DNGA 150604	1	4	0.4	2.5			●	●								
		150608			0.8	2.1			●	●								
		150612			1.2	2.0			●	●								

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

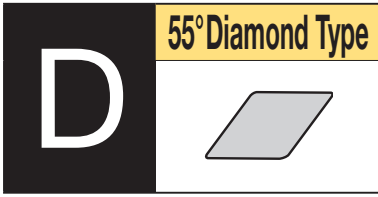


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



DNGN1103 Uncoated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	—
	Thickness	3.18		

Applicable External Holders **L113**

Solid Type/Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BN8125	BNS800	NCB100
	Standard	DNGN 110308 110312	1	Solid	0.8 1.2	10.8 10.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Sharp Edge	DNGN 110308LF 110312LF	1	Solid	0.8 1.2	10.8 10.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Low Cutting Force

(Legend) Continuous Cutting 1st Recommendation 2nd Recommendation General Cutting 1st Recommendation 2nd Recommendation Interrupted Cutting 1st Recommendation 2nd Recommendation

Recommended Application	K Cast Iron																			
	S Exotic Alloy																			
	H Hardened Steel																			
	Sintered Components																			

Uncoated SUMIBORON

BINDERLESS SUMIBORON

DNGN1103 Coated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	—
	Thickness	3.18		

Applicable External Holders **L113**

Solid Type/Negative (Without Hole)

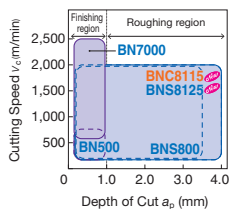
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	DNGN 110308 <i>new</i> 110312 <i>new</i>	1	Solid	0.8 1.2	10.8 10.5	—	—	—	—	—	—	—	—	—	—

Recommended Application	K Cast Iron																			
	S Exotic Alloy																			
	H Hardened Steel																			
	Sintered Components																			

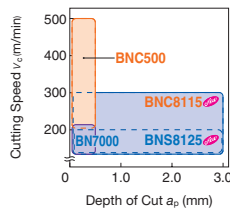
Coated SUMIBORON

SUMIBORON Application Range Map

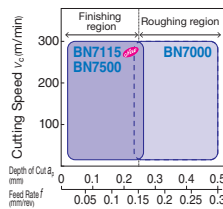
(C) Gray Cast Iron



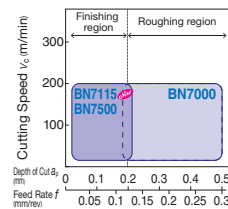
(D) Ductile Cast Iron



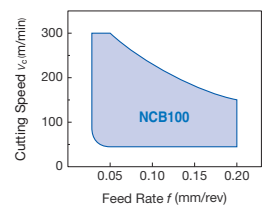
(E) General Sintered Alloy



(F) High-density Sintered Alloy

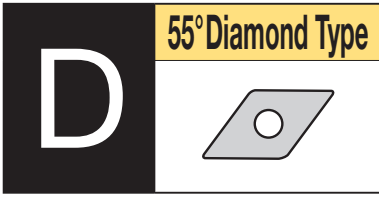


(G) Titanium Alloy



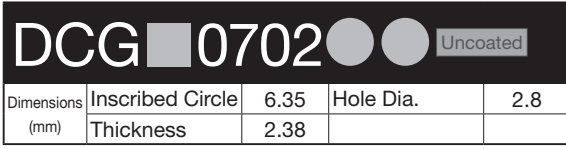
SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**



Applicable External Holders **C17, D14, D18, D19, D24, D25** Applicable Internal Holders **E16, E28 to E32**

Single-Use Type/7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON												
							BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	NU-DCGW 070202	1	1	0.2	2.7													
		070204			0.4	2.5													
		070208			0.8	2.1													
	Standard	T-NU-DCGW 070202	10	1	0.2	2.7													
		070204			0.4	2.5													
		070208			0.8	2.1													
	T01215	NU-DCGW 070202LT	1	1	0.2	2.7													
		070204LT			0.4	2.5													
		070208LT			0.8	2.1													
	S01235	NU-DCGW 070202HS	1	1	0.2	2.7													
		070204HS			0.4	2.5													

*Use NS Type (NS-DCGW) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

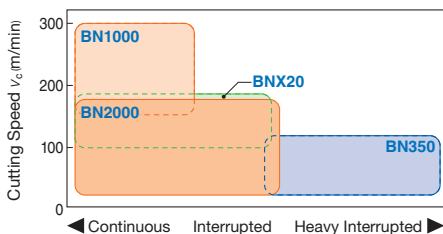
Multi-Cornered Single-Use Type/7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON											
							BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100
	Standard	2NU-DCGW 070204	1	2	0.4	2.5												
		070208			0.8	2.1												
	Honing	2NU-DCGT 070204N-FV	1	2	0.4	2.4												

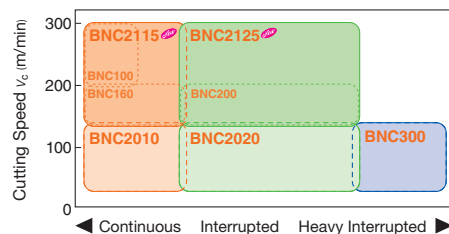
*Use 2NS Type (2NS-DCGW) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)



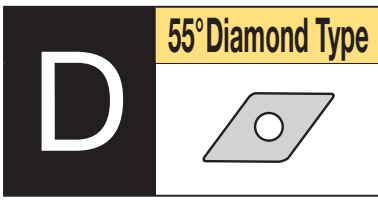
(B) Hardened Steel (Coated SUMIBORON)



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability).

SUMIBORON Inserts

Indexable Insert



DCG 0702 Coated				
Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	2.8
	Thickness	2.38		

(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ⚙ 1st Recommendation ⚙ 2nd Recommendation Interrupted Cutting ⚙ 1st Recommendation ⚙ 2nd Recommendation

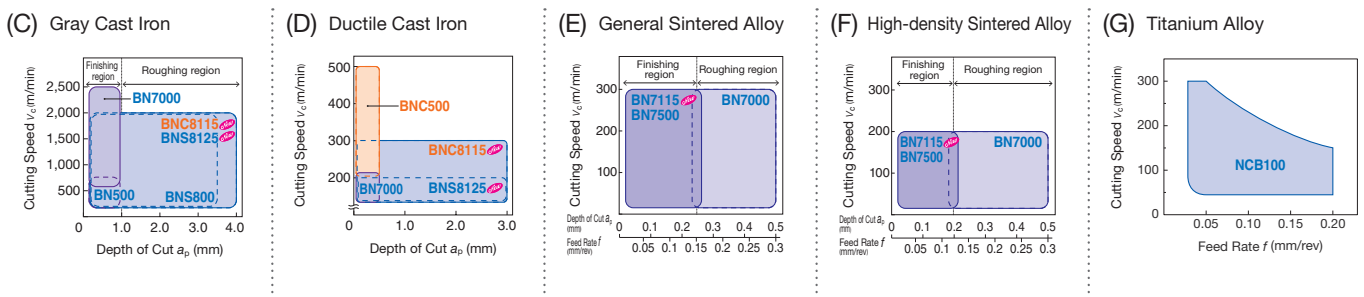
Recommended Application	K Cast Iron																		
	S Exotic Alloy																		
	H Hardened Steel	●	●	○	○	○													
	Sintered Components																		

Applicable External Holders **C17, D14, D18, D19, D24, D25** Applicable Internal Holders **E16, E28 to E32**

Multi-Cornered Single-Use Type/7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON									
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	2NC-DCGW 070202	1	2	0.2	2.6	○	○	●	●					●	
		070204			0.4	2.5	○	○	●	●					●	●
		070208			0.8	2.1	○	○	●	●						
	Honing	2NC-DCGT 070204N-FV	1	2	0.4	2.4	○	○	●	●				●	●	
	T00515	2NC-DCGW 070202LT	1	2	0.2	2.6				●						
		070204LT			0.4	2.5				●						
	Sharper Edge Type	2NC-DCGW 070202LS	1	2	0.2	2.6	○	○						●		
		070204LS			0.4	2.5	○	○					●			
		070208LS <i>new</i>			0.8	2.1	○	○								

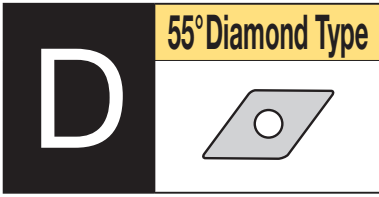
SUMIBORON Application Range Map



○ mark: Stock or planned stock (please confirm stock availability)

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

DCG 11T3 Uncoated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.97		

Applicable External Holders **C17, D14, D24, D25** Applicable Internal Holders **E13, E28 to E32**

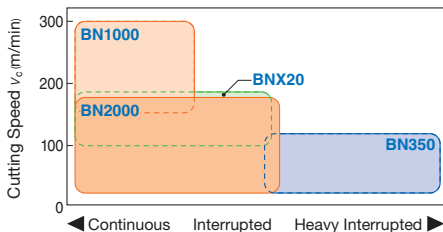
Single-Use Type/7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																	
							BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100						
	Standard	NU-DCGW 11T302	1	1	0.2	2.7																		
		11T304			0.4	2.5																		
		11T308			0.8	2.1																		
		11T312			1.2	2.0																		
	T-NU-DCGW	11T302	10	1	0.2	2.7																		
		11T304			0.4	2.5																		
		11T308			0.8	2.1																		
		11T312			1.2	2.0																		
	Sharp Edge	NU-DCGW 11T302LF	1	1	0.2	2.7																		
		11T304LF			0.4	2.5																		
		11T308LF			0.8	2.1																		
	T01215	NU-DCGW 11T302LT	1	1	0.2	2.7																		
		11T304LT			0.4	2.5																		
		11T308LT			0.8	2.1																		
		11T312LT			1.2	2.0																		
	S01235	NU-DCGW 11T302HS	1	1	0.2	2.7																		
		11T304HS			0.4	2.5																		
		11T308HS			0.8	2.1																		

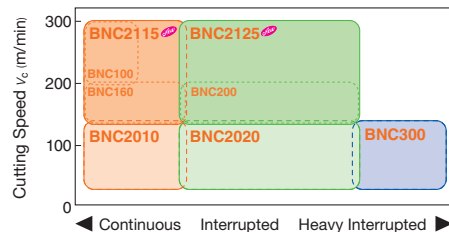
*Use NS Type (NS-DCGW) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)



(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



DCG 11T3 Uncoated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.97		

(Legend) Continuous Cutting (●) 1st Recommendation (○) 2nd Recommendation General Cutting (●) 1st Recommendation (○) 2nd Recommendation Interrupted Cutting (✳) 1st Recommendation (✳) 2nd Recommendation

Recommended Application	K Cast Iron																	
	S Exotic Alloy																	
	H Hardened Steel																	
	Sintered Components																	

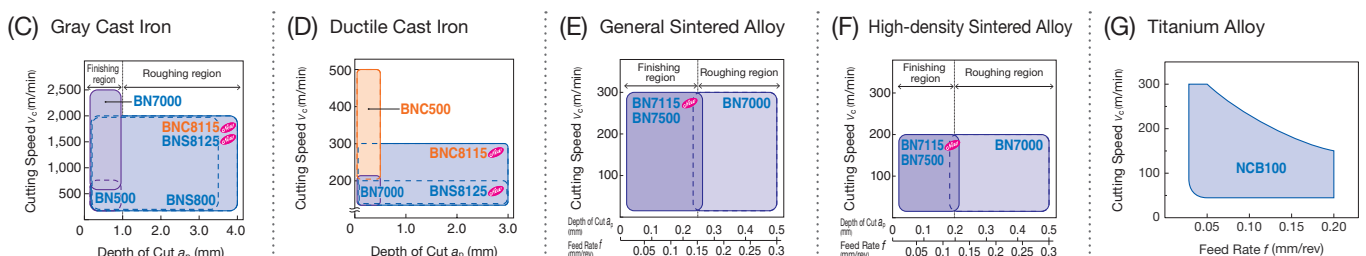
Applicable External Holders **C17, D14, D18, D19, D24, D25** Applicable Internal Holders **E13, E28 to E32**

Multi-Cornered Single-Use Type/7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON												
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800
	Standard	2NU-DCGW 11T302 11T304 11T308	1	2	0.2 0.4 0.8	2.7 2.5 2.1													
		T-2NU-DCGW 11T302 11T304 11T308	10	2	0.2 0.4 0.8	2.7 2.5 2.1													
	S01215	2NU-DCGW 11T304WG ^{*1} 11T308WG ^{*1}	1	2	0.4 0.8	2.3 2.1													
	S01215	2NU-DCGW 11T304WH ^{*1} 11T308WH ^{*1}	1	2	0.4 0.8	2.1 1.8													
	Honing	2NU-DCGT 11T304N-FV 11T308N-FV	1	2	0.4 0.8	2.4 2.0													
	S00535	2NU-DCGT 11T304N-LV 11T308N-LV	1	2	0.4 0.8	2.4 2.0													
	Sharp Edge	2NU-DCGW 11T302LF 11T304LF 11T308LF	1	2	0.2 0.4 0.8	2.7 2.5 2.1													
	Honing	2NU-DCGW 11T302LE 11T304LE 11T308LE	1	2	0.2 0.4 0.8	2.7 2.5 2.1													
	BN7115-S00515 BN7500-S00715	2NU-DCGW 11T302LS 11T304LS 11T308LS	1	2	0.2 0.4 0.8	2.7 2.5 2.1													

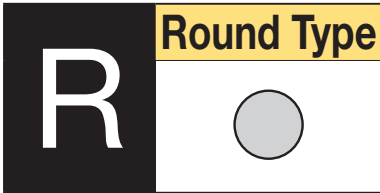
*Use 2NS Type (2NS-DCGW) for BNX25.
*Depth of cut for single-use types is 0.5mm or less.
*1 Use a holder with a cutting angle of 93°.

SUMIBORON Application Range Map



SUMIBORON Inserts

Indexable Insert



RNGN Uncoated			
Dimensions (mm)	Inscribed Circle	9.525 to 12.7	Hole Dia.
	Thickness	3.18 to 4.76	

Applicable External Holders L114

Solid Type/Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Uncoated SUMIBORON														
						BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	RNGN 090300	1	Solid	9.5															
	Sharp Edge <small>Low Cutting Force</small>	RNGN 090300LF	1	Solid	9.5															
	Standard	RNGN 120300	1	Solid	12.7															
	Sharp Edge <small>Low Cutting Force</small>	RNGN 120300LF	1	Solid	12.7															
	Standard	RNGN 120400	1	Solid	12.7															

(Legend) Continuous Cutting 1st Recommendation 2nd Recommendation General Cutting 1st Recommendation 2nd Recommendation Interrupted Cutting 1st Recommendation 2nd Recommendation

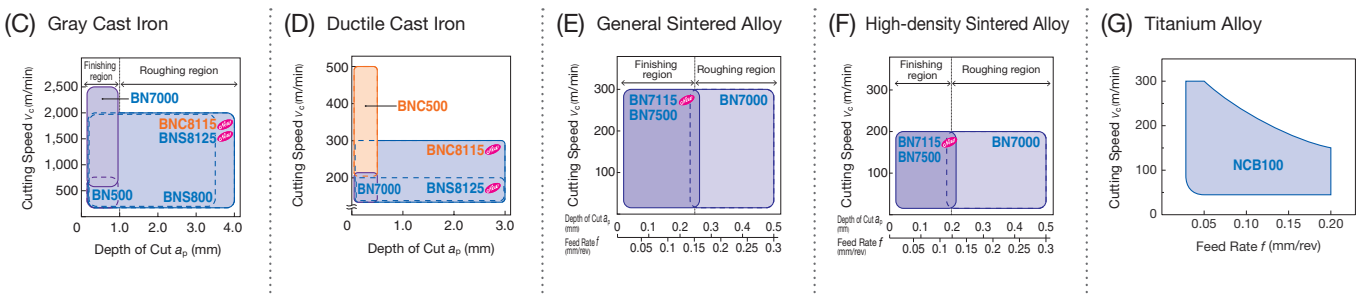
Recommended Application	K Cast Iron																			
	S Exotic Alloy																			
	H Hardened Steel																			
	Sintered Components																			

SUMIBORON

Neg.

Pos.

SUMIBORON Application Range Map



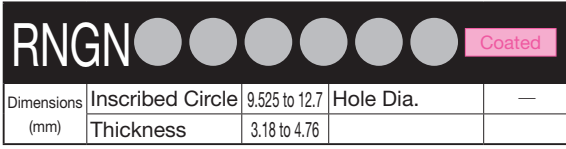
SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**



Applicable External Holders **L114**

Solid Type/Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Coated SUMIBORON														
						BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115					
	Standard	RNGN 090300 <i>new</i>	1	Solid	9.5															
	Standard	RNGN 120300 <i>new</i>	1	Solid	12.7															
	Standard	RNGN 120400 <i>new</i>	1	Solid	12.7															

(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ● 1st Recommendation ○ 2nd Recommendation Interrupted Cutting ● 1st Recommendation ○ 2nd Recommendation

Recommended Application	K Cast Iron																			
	S Exotic Alloy																			
	H Hardened Steel	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Sintered Components																			

SUMIBORON

L

Neg.

Pos.

C

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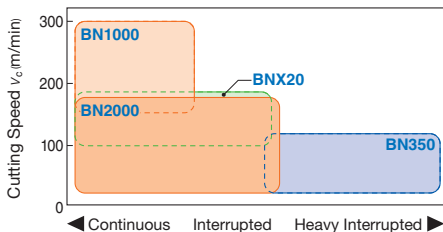
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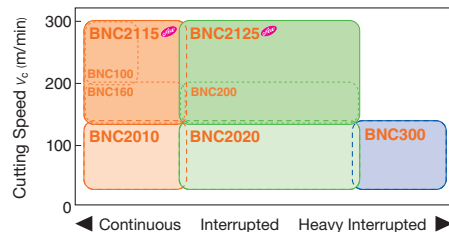
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SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

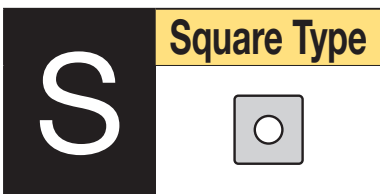


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



SN A1204		Uncoated		
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
Thickness	4.76			

(Legend) Continuous Cutting ○ 1st Recommendation ● 2nd Recommendation General Cutting ○ 1st Recommendation ● 2nd Recommendation Interrupted Cutting ⚙ 1st Recommendation ⚙ 2nd Recommendation

Recommended Application	K Cast Iron																				
	S Exotic Alloy																				
	H Hardened Steel	○	○	⚙	⚙	⚙	⚙	⚙	⚙	⚙	⚙	⚙	⚙	⚙	⚙	⚙	⚙	⚙	⚙	⚙	⚙
	Sintered Components																				

Applicable External Holders **C19 to C24** Applicable Internal Holders **E51 to E53**

Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																	
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100				
	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																		
		120408			0.8	2.3	●				●													
		120412			1.2	2.1	●				●													

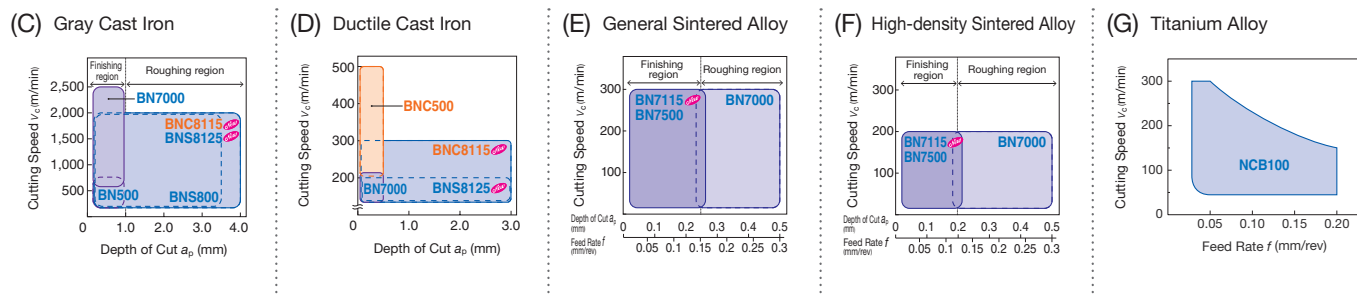
*Depth of cut for single-use types is 0.5mm or less.

Multi-Cornered Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																	
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100				
	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		●																
		120408			0.8	2.3	●																	
		120412			1.2	2.1	●																	
	T01215	2NU-SNGA 120404LT	1	2	0.4	2.5																		
		120408LT			0.8	2.3																		
		120412LT			1.2	2.1																		
	S01235	2NU-SNGA 120404HS	1	2	0.4	2.5																		
		120408HS			0.8	2.3																		
		120412HS			1.2	2.1																		

*Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability).

SUMIBORON

Neg.

Pos.

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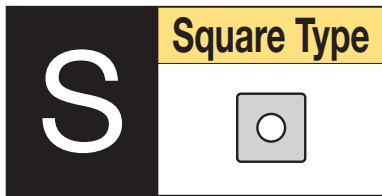
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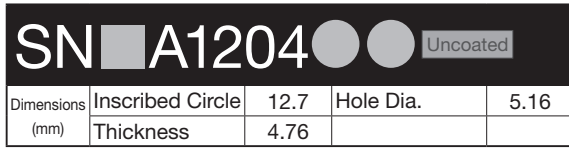
SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**



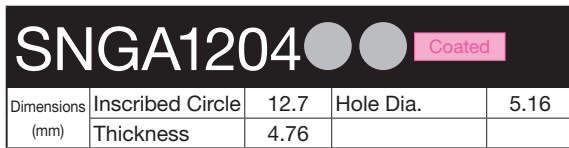
Applicable External Holders **C19 to C24** Applicable Internal Holders **E51 to E53**

Negative Type (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100			
	Standard	SNMA 120404	1	1	0.4	4.8																	
		120408			0.8	4.7	●																
		120412			1.2	4.6	●																

Solid Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	SNGA 120408	1	Solid	0.8	12.7															
		120412			1.2	12.7															



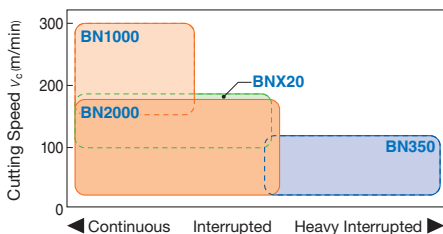
Applicable External Holders **C19 to C24** Applicable Internal Holders **E51 to E53**

Multi-Cornered Single-Use Type/Negative (With Hole)

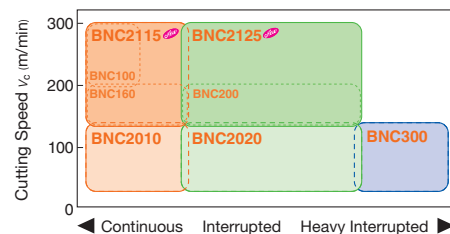
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115	
	Standard	2NC-SNGA 120408	1	2	0.8	2.3											
		120412			1.2	2.1											
	Standard	4NC-SNGA 120404	1	4	0.4	2.5	○	○	●	●							
		120408			0.8	2.3	○	○	●	●							
		120412			1.2	2.1	○	○	●	●							

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

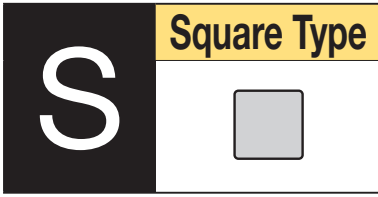


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



SN N0903 Uncoated			
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.
	Thickness	3.18	

Applicable External Holders **L112**

Negative Type (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100		
	Standard	SNGN 090308-B	1	4	0.8	9.5								●	▲							
		090312-B			1.2	9.5																
		090316-B			1.6	9.5																

Solid Type/Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	SNGN 090308 090312	1	Solid	0.8 1.2	9.5 9.5													●	●	
 Low Cutting Force	Sharp Edge	SNGN 090308LF 090312LF	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	1	Solid	0.8	9.5														●	

(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ● 1st Recommendation ○ 2nd Recommendation Interrupted Cutting ● 1st Recommendation ○ 2nd Recommendation

Recommended Application	K Cast Iron	S Exotic Alloy	H Hardened Steel	Sintered Components	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	

Uncoated SUMIBORON

SUMIBORON

NEG.

POS.

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D

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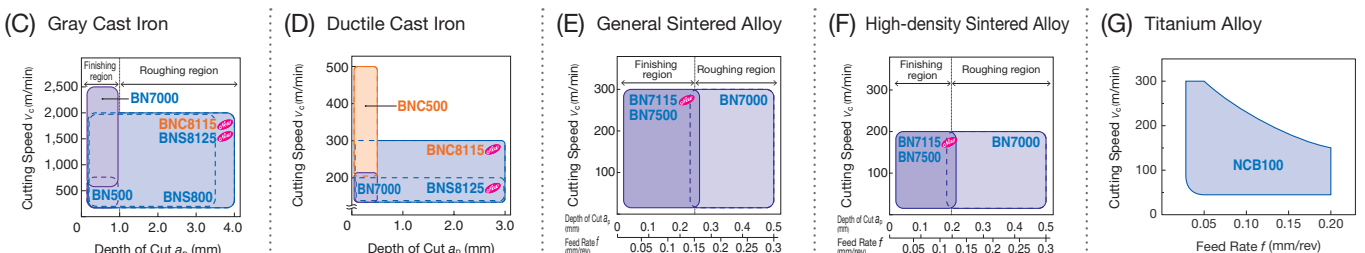
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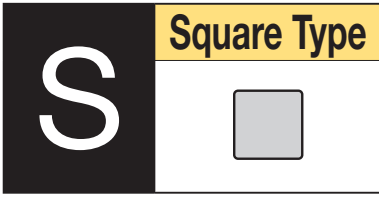
SUMIBORON Application Range Map



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability).

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

SN N0903 Coated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	—
	Thickness	3.18		

Applicable External Holders **L112**

Solid Type/Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON										
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115	
	Standard	SNGN 090308 <i>New</i> 090312 <i>New</i>	1	Solid	0.8 1.2	9.5 9.5	—	—	—	—	—	—	—	—	—	—	●
							—	—	—	—	—	—	—	—	—	—	—
	S02020	SNEN 090308W <i>New</i>	1	Solid	0.8	9.5	—	—	—	—	—	—	—	—	—	—	●

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation General Cutting ●: 1st Recommendation ○: 2nd Recommendation Interrupted Cutting ●: 1st Recommendation ○: 2nd Recommendation

Recommended Application	K Cast Iron																	○	
	S Exotic Alloy																		
	H Hardened Steel	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Sintered Components																		

SUMIBORON

L

Neg.

Pos.

C

D

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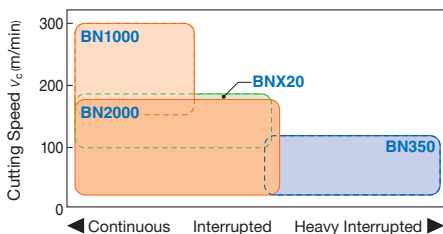
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V

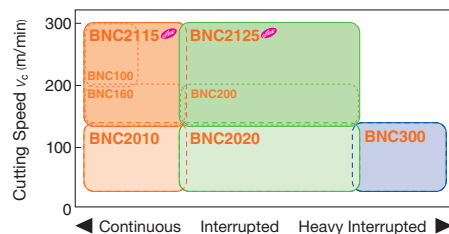
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SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

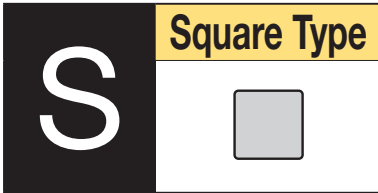


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



SNGN1203 Uncoated				
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	—
	Thickness	3.18		

Applicable External Holders L112

Solid Type/Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	SNGN 120308 120312	1	Solid	0.8 1.2	12.7 12.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Sharp Edge	SNGN 120308LF 120312LF	1	Solid	0.8 1.2	12.7 12.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Low Cutting Force

(Legend) Continuous Cutting 1st Recommendation 2nd Recommendation General Cutting 1st Recommendation 2nd Recommendation Interrupted Cutting 1st Recommendation 2nd Recommendation

Recommended Application	K Cast Iron	S Exotic Alloy	H Hardened Steel	Sintered Components	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
K Cast Iron	○													○					
S Exotic Alloy		○																	
H Hardened Steel			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Sintered Components				○															

Uncoated SUMIBORON

SNGN1203 Coated				
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	—
	Thickness	3.18		

Applicable External Holders L112

Solid Type/Negative (Without Hole)

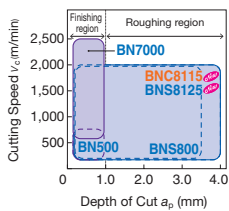
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115	
	Standard	SNGN 120308 New 120312 New	1	Solid	0.8 1.2	12.7 12.7	—	—	—	—	—	—	—	—	—	—	—

Recommended Application	K Cast Iron	S Exotic Alloy	H Hardened Steel	Sintered Components
K Cast Iron	○			
S Exotic Alloy		○		
H Hardened Steel	○	○	○	○
Sintered Components			○	○

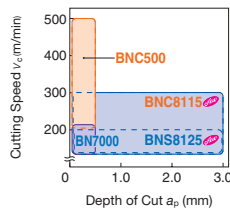
Coated SUMIBORON

SUMIBORON Application Range Map

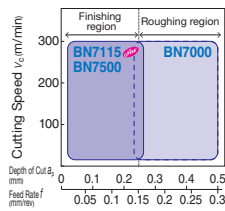
(C) Gray Cast Iron



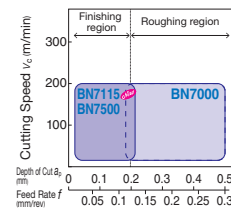
(D) Ductile Cast Iron



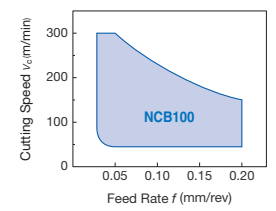
(E) General Sintered Alloy



(F) High-density Sintered Alloy

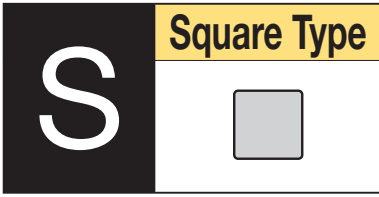


(G) Titanium Alloy



SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg. Pos.	T01225	S01225	S01725	S01225	T01225 T01235	S01225	S01225	S01225	S01225
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg. Pos.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215

Standard cutting edge specification Code Details **L30, L31**

SNG 1204 Uncoated			
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia. —
	Thickness	4.76	

Applicable External Holders **L112**

Negative Type (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																							
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100										
	Standard	SNGN 120408 120412	1	1	0.8 1.2	4.8 4.8	●																							
								●			●																			
	Standard	SNGN 120408-B 120412-B 120416-B	1	4	0.8 1.2 1.6	12.7 12.7 12.7																								

Solid Type/Negative (Dimple Lock)

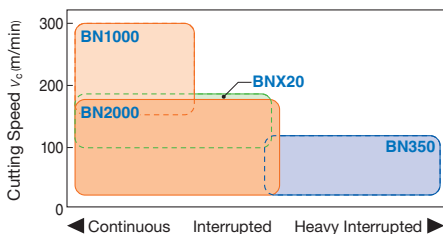
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																								
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100											
	Standard	SNGX 120408 120412 120416	1	Solid	0.8 1.2 1.6	12.7 12.7 12.7																									

Solid Type/Negative (Without Hole)

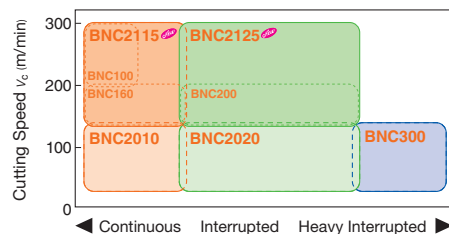
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																										
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100													
	Standard	SNGN 120408 120412 120416 120420	1	Solid	0.8 1.2 1.6 2.0	12.7 12.7 12.7 12.7																											

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

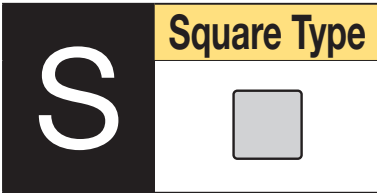


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



SNG 1204				Coated
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	—
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation General Cutting ●: 1st Recommendation ○: 2nd Recommendation Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application	K Cast Iron	S Exotic Alloy	H Hardened Steel	Sintered Components													
			●	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Applicable External Holders **L112**

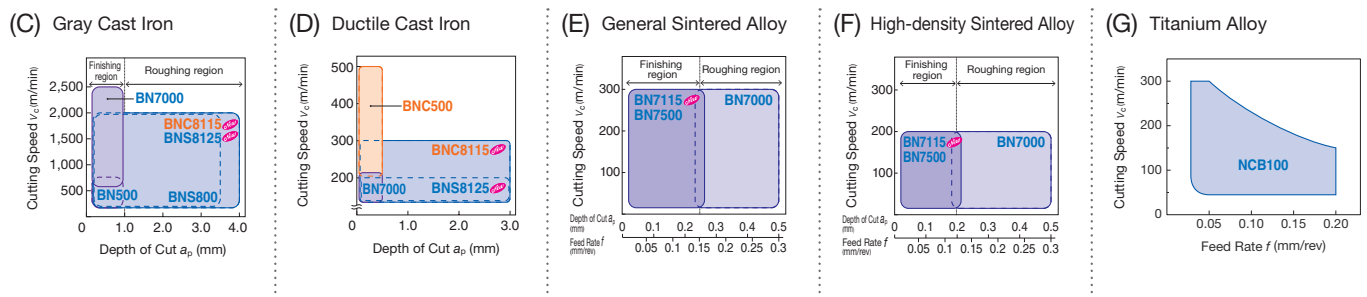
Solid Type/Negative (Dimple Lock)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	SNGX 120412 <i>New</i>	1	Solid	1.2	12.7	○									○
		120416 <i>New</i>			1.6	12.7	●									

Solid Type/Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115			
	Standard	SNGN 120408 <i>New</i>	1	Solid	0.8	12.7	○									○			
		120412 <i>New</i>			1.2	12.7	○											○	
		120416 <i>New</i>			1.6	12.7	○												○
		120420 <i>New</i>			2.0	12.7	○												○

SUMIBORON Application Range Map



SUMIBORON



Neg.

Pos.



SUMIBORON Inserts

Indexable Insert

S	Square Type		BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
	Neg. Pos.	T01225	S01225	S01725	S01225	T01225 T01235	S01225	S01225	S01225	S01225	S01225
		BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100	
Neg. Pos.	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T02020	T01215

Standard cutting edge specification Code Details **L30, L31**

(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ● 1st Recommendation ○ 2nd Recommendation Interrupted Cutting ⚙ 1st Recommendation ⚙ 2nd Recommendation

SPGN0903 Uncoated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	—
	Thickness	3.18		

Applicable Internal Holders **E49**

Single-Use Type/11° Positive (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON														
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	NU-SPGN 090304	1	1	0.4	2.5	●														
		090308			0.8	2.5	●						●	●	▲						
	T01215	NU-SPGN 090304LT	1	1	0.4	2.5	●														
		090308LT			0.8	2.5	●														
	S01235	NU-SPGN 090304HS	1	1	0.4	2.5					●										
		090308HS			0.8	2.5							●								

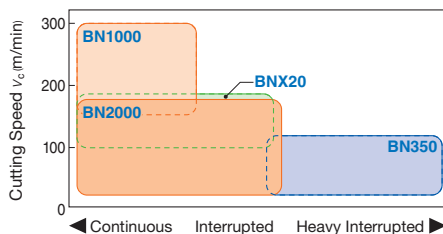
*Use NS Type (NS-SPGN) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

11° Positive Type (Without Hole)

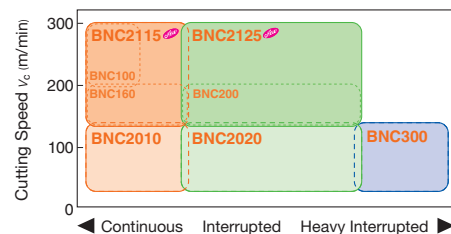
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON															
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100		
	Standard	SPGN 090304	1	1	0.4	4.8																
		090308			0.8	4.8								●	▲							
		090312			1.2	4.8								●	▲							

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

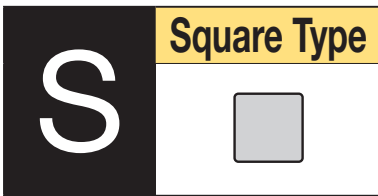


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



SPGN1203 Uncoated			
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.
	Thickness	3.18	—

Applicable External Holders **C25, C26**

11° Positive Type (Without Hole)

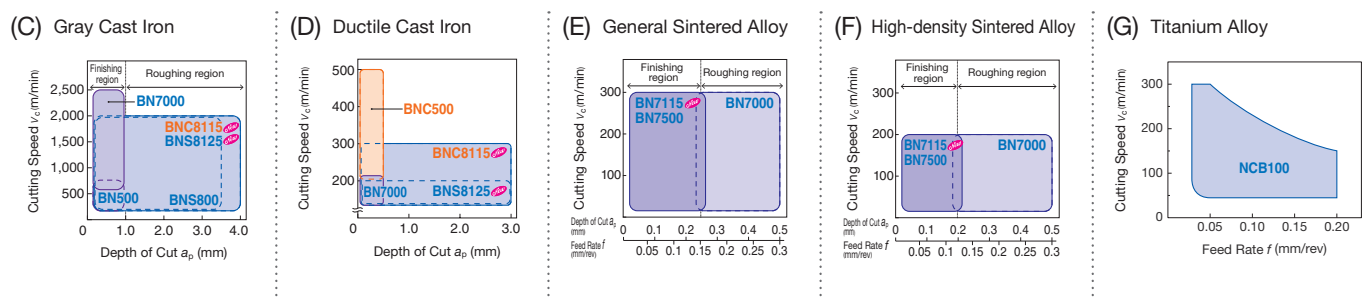
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON													
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100
	Standard	SPGN 120308	1	1	0.8	4.8														
		120312			1.2	4.8														

(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ⚙ 1st Recommendation ⚙ 2nd Recommendation Interrupted Cutting ⚙ 1st Recommendation ⚙ 2nd Recommendation

Recommended Application	K Cast Iron																			
	S Exotic Alloy																			
	H Hardened Steel	○	⚙	⚙	⚙	⚙														
	Sintered Components																			

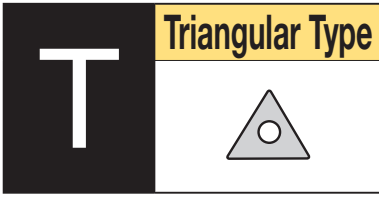
- SUMIBORON
-
- Neg.
- Pos.
-
-
-
-
-
-
-

SUMIBORON Application Range Map



SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

TN 1604 Uncoated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

Applicable External Holders **C27 to C33, D16, D20** Applicable Internal Holders **E15, E61 to E63**

(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ● 1st Recommendation ○ 2nd Recommendation Interrupted Cutting ● 1st Recommendation ○ 2nd Recommendation

Recommended Application	K Cast Iron																			
	S Exotic Alloy																			
	H Hardened Steel	○	○	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Sintered Components																			

Uncoated SUMIBORON

Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100			
	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																	
		T-NS-TNMA 160404			0.4	2.3						▲											
		160408			0.8	2.0						▲											
160412	1.2	2.0							▲														

*Depth of cut for single-use types is 0.5mm or less.

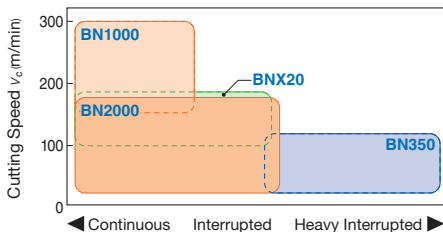
Multi-Cornered Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100			
	Standard	3NU-TNGA 160404	1	3	0.4	2.3	●			●	●	●	●	●	●	●	●	●	●	●			
		160408			0.8	2.0	●			●	●	●	●	●	●	●	●	●	●	●	●	●	
		160412			1.2	2.0	●			●			●			●	●	▲	●	●	●	●	●
		T-3NU-TNGA 160404			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																	
		T-3NS-TNGA 160404			0.4	2.3						▲											
		160408			0.8	2.0						▲											
160412	1.2	2.0							▲														

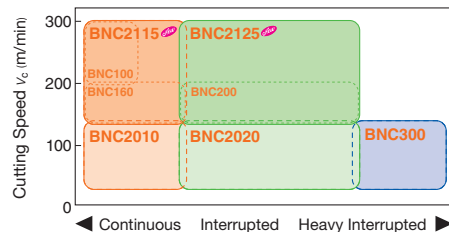
*Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

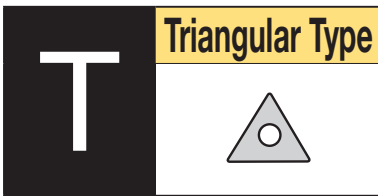


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



TN ■ ■ 1604 ● ● Uncoated			
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia. 3.81
	Thickness	4.76	

(Legend) Continuous Cutting ○ 1st Recommendation ○ 2nd Recommendation General Cutting ● 1st Recommendation ● 2nd Recommendation Interrupted Cutting ✖ 1st Recommendation ✖ 2nd Recommendation

Recommended Application	K Cast Iron												○	●							
	S Exotic Alloy														●				●	○	●
	H Hardened Steel	○	○	✖	✖	✖	✖	✖	✖												
	Sintered Components																				

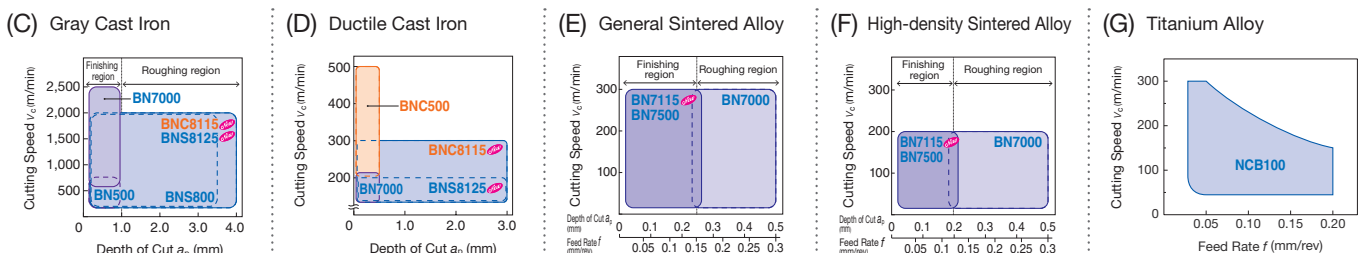
Applicable External Holders **C27 to C33, D16, D20** Applicable Internal Holders **E15, E61 to E63**

Multi-Cornered Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON															
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100		
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 Cutting Force	Sharp Edge	3NU-TNGA 160404LF 160408LF 160412LF	1	3	0.4 0.8 1.2	2.3 2.0 2.0																
Low Cutting Force	Honing	3NU-TNGA 160404LE 160408LE	1	3	0.4 0.8	2.3 2.0																
Sharper Edge Type	T01215	3NU-TNGA 160404LT 160408LT 160412LT	1	3	0.4 0.8 1.2	2.3 2.0 2.0																
General-purpose Type for Continuous Cutting	BN7115~S00515 BN7500~S00715	3NU-TNGA 160404LS 160408LS	1	3	0.4 0.8	2.3 2.0																
Strong Edge Type	T01235	3NU-TNGA 160404HT 160408HT 160412HT	1	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	1	3	0.4 0.8 1.2	2.3 2.0 2.0																

*Depth of cut for single-use types is 0.5mm or less.

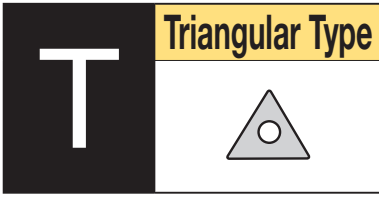
SUMIBORON Application Range Map



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability).

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

TN 1604 Uncoated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

Applicable External Holders **C27 to C33, D16, D20** Applicable Internal Holders **E15, E61 to E63**

Multi-Cornered Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON															
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100		
	S01225	3NU-TNGA 160404US <i>New</i>	1	3	0.4	2.3																

*Depth of cut for single-use types is 0.5mm or less.

Negative Type (With Hole)

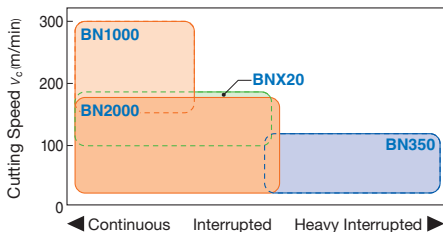
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100			
	Standard	TNMA 160402 160404 160408 160412	1	1	0.2 0.4 0.8 1.2	3.6 3.5 3.2 2.9	●				●												

Solid Type/Negative (With Hole)

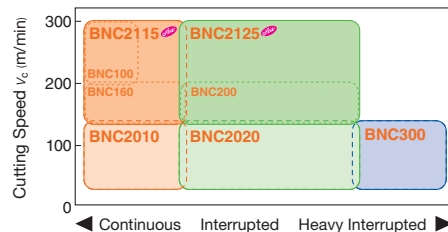
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100			
	Standard	TNGA 160408 160412	1	Solid	0.8 1.2	15.3 15.7																	

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

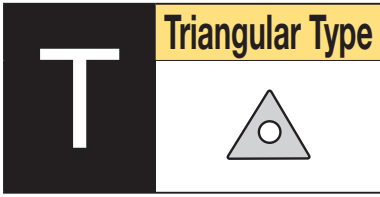


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



TNG 1604 Coated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

(Legend) Continuous Cutting ○ 1st Recommendation ○ 2nd Recommendation General Cutting ● 1st Recommendation ● 2nd Recommendation Interrupted Cutting ⊕ 1st Recommendation ⊕ 2nd Recommendation

Recommended Application	K Cast Iron																		○
	S Exotic Alloy																		○
	H Hardened Steel	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Sintered Components																		○

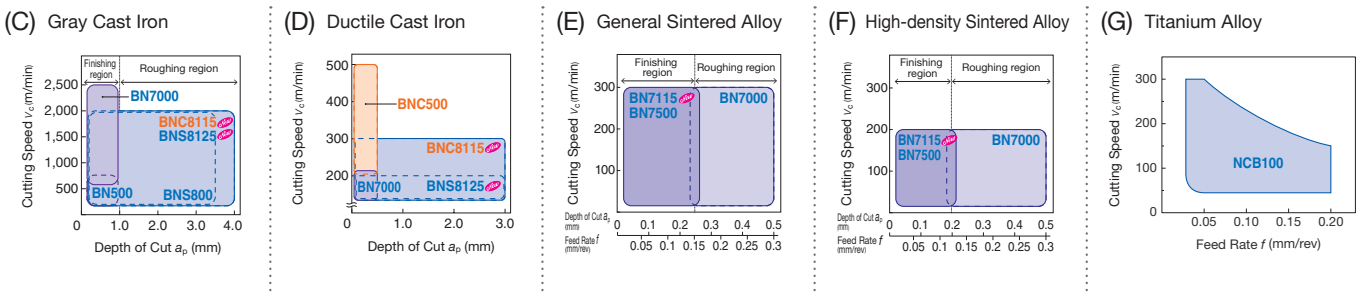
Applicable External Holders **E15, E61 to E63** Applicable Internal Holders **C27 to C33, D16, D20**

Multi-Cornered Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON															
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115						
	Standard	3NC-TNGA 160404	1	3	0.4	2.3		○	●	●												
		160408			0.8	2.0		○	●	●												
		160412			1.2	2.0		○	●	●												
		160416^{*1}			1.6	3.3		○	○	○												
		160420^{*1}			2.0	3.0		○	○	○												
		160424^{*1}			2.4	2.7		○	○	○												
	Standard	6NC-TNGA 160402	1	6	0.2	2.4		○	○	○												
		160404			0.4	2.3		○	○	○												
		160408			0.8	2.0		○	○	○												
		160412			1.2	2.0		○	○	○												
		160416^{*1}			1.6	3.3		○	○	○												
		160420^{*1}			2.0	3.0		○	○	○												
		160424^{*1}			2.4	2.7		○	○	○												
	Honing	6NC-TNGG 160404N-FV	1	6	0.4	2.3		○	○	○												
		160408N-FV			0.8	2.0		○	○	○												
		160412N-FV			1.2	2.0		○	○	○												
	S00535	6NC-TNGG 160404N-LV	1	6	0.4	2.3		○	○	○												
		160408N-LV			0.8	2.0		○	○	○												
		160412N-LV			1.2	2.0		○	○	○												
	S01235	6NC-TNGG 160404N-SV	1	6	0.4	2.3		○	○	○												
		160408N-SV			0.8	2.0		○	○	○												
		160412N-SV			1.2	2.0		○	○	○												
	Honing	3NC-TNGA 160404LE	1	3	0.4	2.3			○	○												
		160408LE			0.8	2.0			○	○												
		160412LE			1.2	2.0			○	○												
	T00515	3NC-TNGA 160402LT	1	3	0.2	2.4					○											
		160404LT			0.4	2.3					○											
		160408LT			0.8	2.0						○										
		160412LT			1.2	2.0							○									

*1 For use with the SUMIBORON Special Holders for High-Efficiency Machining shown on page L118.

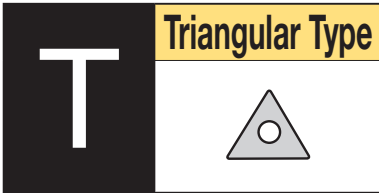
SUMIBORON Application Range Map



○ mark: Stock or planned stock (please confirm stock availability)

SUMIBORON Inserts

Indexable Insert







	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

TNG 1604 Coated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

Applicable External Holders **C27 to C33, D16, D20** Applicable Internal Holders **E15, E61 to E63**

Multi-Cornered Single-Use Type/Negative (With Hole)

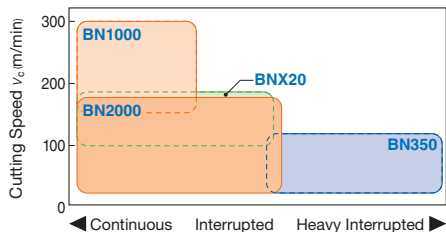
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON												
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115			
 Sharper Edge Type	BNC2115~S00515 BNC2125~S00515 BNC100~S01715 BNC160~S01020 BNC200~S01015 BNC300~S00515	3NC-TNGA 160402LS new	1	3	0.2	2.4	○	○											
		160404LS					○	○			●								
		160408LS					○	○			●								
		160412LS					○	○			●								
 Sharper Edge Type	BNC2115~S00515 BNC2125~S00515 BNC100~S01715 BNC160~S01020 BNC200~S01015 BNC300~S00515	6NC-TNGA 160404LS	1	6	0.4	2.3													
		160408LS									●	●	●						
		160412LS									●	●	●						
														●	●				
 Strong Edge Type	BNC2115~S01730 BNC2125~S02735 BNC2010~S01730 BNC2020~S02735 BNC160~S01730 BNC200~S01735 BNC300~S01735 BNC500~S01225	6NC-TNGA 160404HS	1	6	0.4	2.3	○	○	●	●	●								
		160408HS					○	○	●	●	●			●	●	●			
		160412HS					○	○	●	●	●			●	●	●			
							○	○	●	●	●			●	●	●			
 High-efficiency Type	S00535	6NC-TNGA 160404ES	1	6	0.4	2.3					●								
		160408ES									●								
		160412ES									●								
											●								

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation General Cutting ●: 1st Recommendation ○: 2nd Recommendation Interrupted Cutting ●: 1st Recommendation ○: 2nd Recommendation

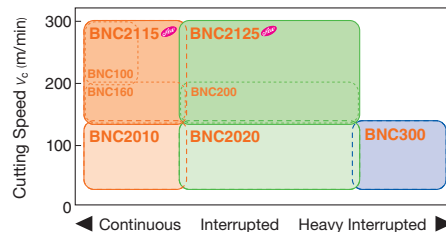
Recommended Application	K Cast Iron	S Exotic Alloy	H Hardened Steel	Sintered Components	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
			●		○	○	○	○	○	○	○	○	○	○
			○		○	○	○	○	○	○	○	○	○	○
			○		○	○	○	○	○	○	○	○	○	○

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

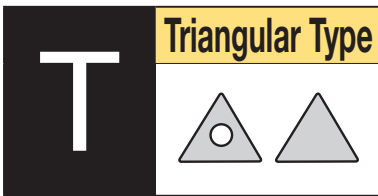


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



TNMA2204

Uncoated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

Applicable External Holders **C28 to C32** Applicable Internal Holders **E62, E63**

Negative Type (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	TNMA 220408 220412	1	1	0.8 1.2	3.2 2.9	●				●										

TNGN1103

Uncoated

Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	—
	Thickness	3.18		

Applicable External Holders **L112**

Solid Type/Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	TNGN 110308 110312	1	Solid	0.8 1.2	9.8 9.2															
	Sharp Edge	TNGN 110308LF 110312LF	1	Solid	0.8 1.2	9.8 9.2															

TNGN1103

Coated

Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	—
	Thickness	3.18		

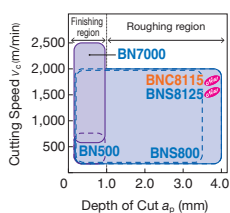
Applicable External Holders **L112**

Solid Type/Negative (Without Hole)

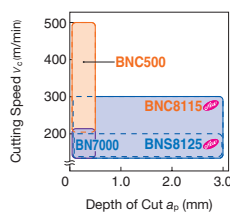
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115	
	Standard	TNGN 110308 110312	1	Solid	0.8 1.2	9.8 9.2											

SUMIBORON Application Range Map

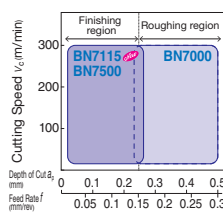
(C) Gray Cast Iron



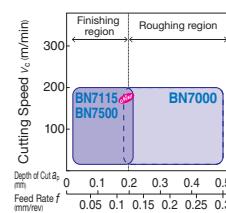
(D) Ductile Cast Iron



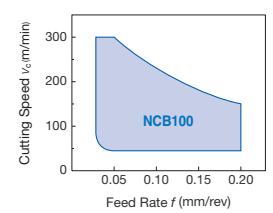
(E) General Sintered Alloy



(F) High-density Sintered Alloy



(G) Titanium Alloy



SUMIBORON

Neg.

Pos.

C

D

R

S

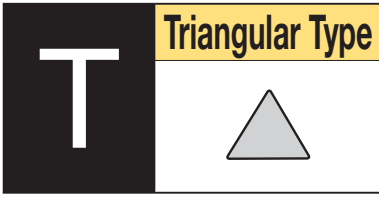
T

V

W

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

TNGN1604 Uncoated			
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.
	Thickness	4.76	

Applicable External Holders **L112**

Negative Type (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100			
	Standard	TNGN 160404	1	1	0.4	3.5	●																
		160408			0.8	3.2	●																
		160412			1.2	2.9	●																

Solid Type/Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100				
	Standard	TNGN 160408	1	Solid	0.8	15.3																		
		160412			1.2	14.8																		
		160416			1.6	14.2																		
		160420			2.0	13.6																		

TNGN1604 Coated			
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.
	Thickness	4.76	

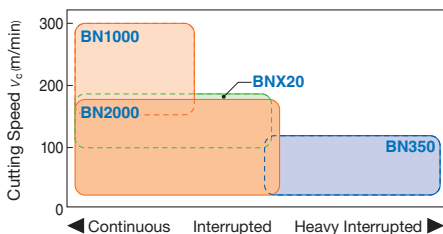
Applicable External Holders **L112**

Solid Type/Negative (Without Hole)

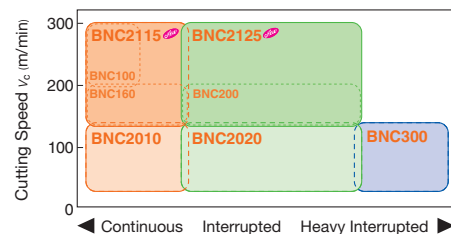
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	TNGN 160408 <i>New</i>	1	Solid	0.8	15.3										
		160412 <i>New</i>			1.2	14.8										
		160416 <i>New</i>			1.6	14.2										
		160420 <i>New</i>			2.0	13.6										

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

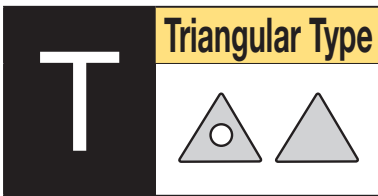


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



TBEW0601

Uncoated

Dimensions (mm)	Inscribed Circle	3.97	Hole Dia.	2.2
	Thickness	1.59		

Applicable Internal Holders **E56, E58**

Single-Use Type/5° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON														
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
 Low Cutting Force	Sharp Edge	NU-TBEW 060102LF	1	1	0.2	2.1															
 Sharper Edge Type	T00715	NU-TBEW 060102LT	1	1	0.2	2.1															

*Depth of cut for single-use types is 0.5mm or less.

TBGN0601

Uncoated

Dimensions (mm)	Inscribed Circle	3.97	Hole Dia.	—
	Thickness	1.59		

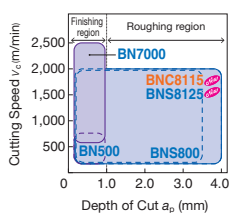
Applicable Internal Holders **E76**

5° Positive Type (Without Hole)

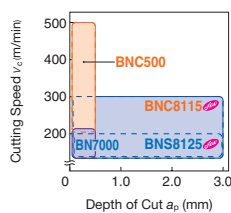
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON														
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	TBGN 060102B 060104B 060108B	1	3	0.2	6.5															
 Sharper Edge Type	Standard	TBGN 060102-BSTN 060104-BSTN 060108-BSTN	1	3	0.2	6.5															

SUMIBORON Application Range Map

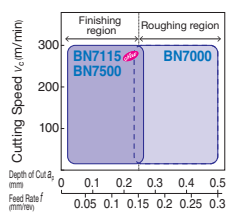
(C) Gray Cast Iron



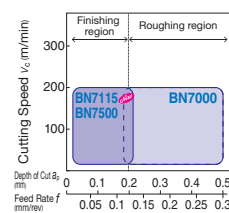
(D) Ductile Cast Iron



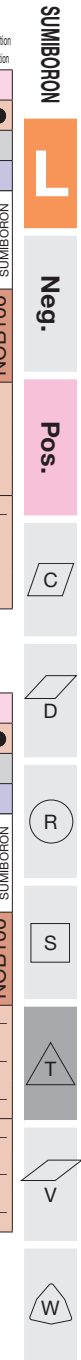
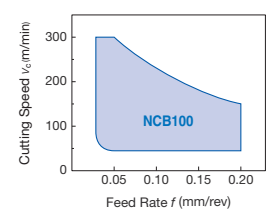
(E) General Sintered Alloy



(F) High-density Sintered Alloy

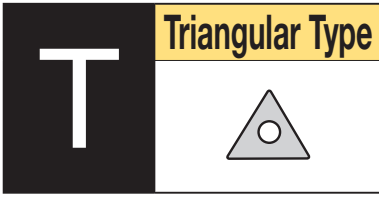


(G) Titanium Alloy



SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

TPGW0802 Uncoated				
Dimensions (mm)	Inscribed Circle	4.76	Hole Dia.	2.4
	Thickness	2.38		

Applicable Internal Holders **E56 to E59**

Single-Use Type/11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON															
							BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100				
	Standard	NU-TPGW 080202	1	1	0.2	2.6																
		080204			0.4	2.5	●			●	●											●
		080208			0.8	2.2																
	Sharp Edge	NU-TPGW 080202LF	1	1	0.2	2.6																
		080204LF			0.4	2.5																
		080208LF			0.8	2.2																
	T01215	NU-TPGW 080202LT	1	1	0.2	2.6				●												
		080204LT			0.4	2.5						●										
		080208LT			0.8	2.2																
	S01235	NU-TPGW 080202HS	1	1	0.2	2.6				●												
		080204HS			0.4	2.5						●										
		080208HS			0.8	2.2						●										

*Use NS Type (NS-TPGW) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

TPGW0802 Coated				
Dimensions (mm)	Inscribed Circle	4.76	Hole Dia.	2.4
	Thickness	2.38		

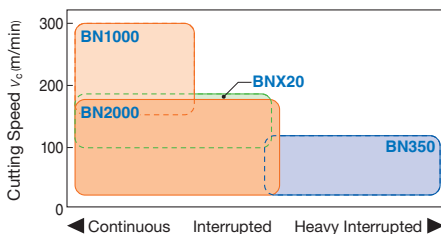
Applicable Internal Holders **E56 to E59**

Multi-Cornered Single-Use Type/11° Positive (With Hole)

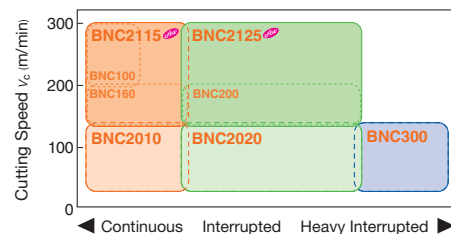
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON										
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115	
	Standard	3NC-TPGW 080202	1	3	0.2	2.6	○	○	●	●							
		080204			0.4	2.5	○	○	●	●							

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

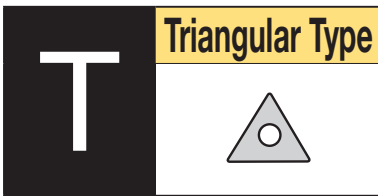


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



TPGW0902 Uncoated				
Dimensions (mm)	Inscribed Circle	5.56	Hole Dia.	2.8
	Thickness	2.38		

Applicable Internal Holders E56

Single-Use Type/11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																	
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100				
	Standard	NU-TPGW 090202 090204 090208	1	1	0.2	2.6																		
	T01215	NU-TPGW 090202LT 090204LT	1	1	0.2	2.6																		
	S01235	NU-TPGW 090202HS 090204HS	1	1	0.2	2.6																		

*Use NS Type (NS-TPGW) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

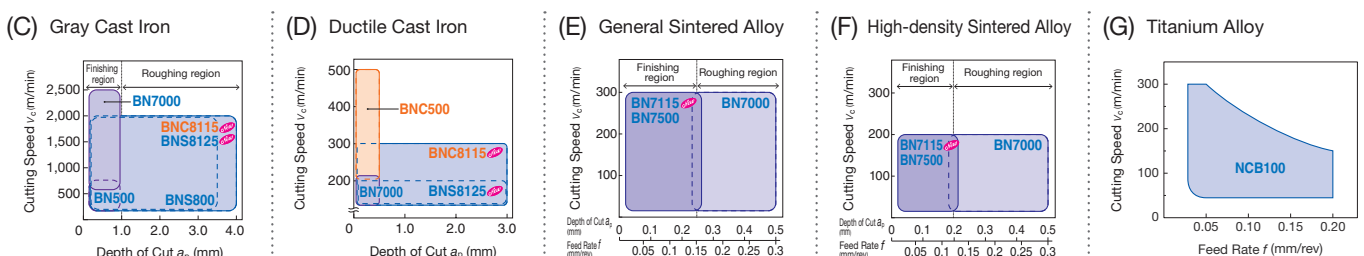
TPGW0902 Coated				
Dimensions (mm)	Inscribed Circle	5.56	Hole Dia.	2.8
	Thickness	2.38		

Applicable Internal Holders E56

Multi-Cornered Single-Use Type/11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON																	
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115								
	Standard	3NC-TPGW 090202 090204	1	3	0.2	2.6																		

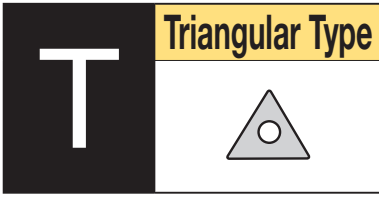
SUMIBORON Application Range Map



○ mark: Stock or planned stock item (please confirm stock availability) ▲: To be replaced by new item (please confirm stock availability)

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

TPGW1102 Uncoated				
Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	2.8
	Thickness	2.38		

Applicable Internal Holders **E56**

Single-Use Type/11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON														
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	NU-TPGW 110202	1	1	0.2	2.5															
		110204			0.4	2.3	●														
		110208			0.8	2.0															
	Standard	T-NU-TPGW 110202	10	1	0.2	2.5															
		110204			0.4	2.3	●														
		110208			0.8	2.0															
	T01215	NU-TPGW 110202LT	1	1	0.2	2.5															
		110204LT			0.4	2.3															
		110208LT			0.8	2.0															
	S01235	NU-TPGW 110204HS	1	1	0.4	2.3															

*Use NS Type (NS-TPGW) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

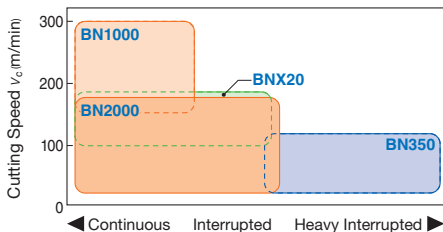
Multi-Cornered Single-Use Type/11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON													
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100
	Standard	3NU-TPGW 110204	1	3	0.4	2.3														
		110208			0.8	2.0														
	Sharp Edge	3NU-TPGW 110204LF	1	3	0.4	2.3														
	Honing	3NU-TPGW 110204LE	1	3	0.4	2.3														
	S00715	3NU-TPGW 110204LS	1	3	0.4	2.3														

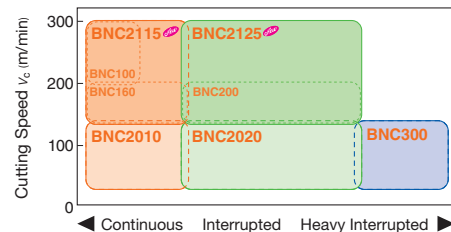
*Use 3NS Type (3NS-TPGW) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

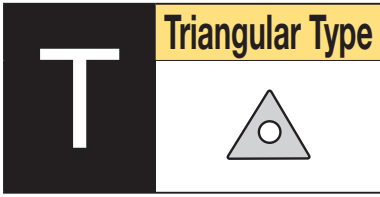


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



TPG 1103 Uncoated				
Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	3.4
	Thickness	3.18		

Applicable Internal Holders E14, E56 to E59

Single-Use Type/11° Positive (With Hole)

(Legend) Continuous Cutting: ● (1st Recommendation), ○ (2nd Recommendation); General Cutting: ● (1st Recommendation), ○ (2nd Recommendation); Interrupted Cutting: ⚡ (1st Recommendation), ⚡ (2nd Recommendation)

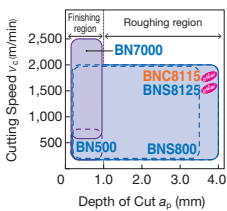
Recommended Application	K Cast Iron	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	S Exotic Alloy	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	H Hardened Steel	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Sintered Components	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON															
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100		
Standard	Standard	NU-TPGW 110302	1	1	0.2	2.6	●	●	—	●	●	●	●	●	●	●	●	●	●	●		
		110304			0.4	2.5	●	●	—	●	●	●	●	●	●	●	●	●	●	●	●	
		110308			0.8	2.2	●	●	—	●	●	●	●	●	●	●	●	●	●	●	●	●
	T-NU-TPGW 110302	110302	10	1	0.2	2.6	●	●	—	●	●	●	●	●	●	●	●	●	●	●		
		110304			0.4	2.5	●	●	—	●	●	●	●	●	●	●	●	●	●	●	●	
		110308			0.8	2.2	●	●	—	●	●	●	●	●	●	●	●	●	●	●	●	●
Standard	Standard	NS-TPGW 110302	1	1	0.2	2.6	—	—	—	—	—	—	—	—	—	—	—	—	—			
		110304			0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
		110308			0.8	2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	T-NS-TPGW 110302	110302	10	1	0.2	2.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
		110304			0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		110308			0.8	2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sharp Edge	Sharp Edge	NU-TPGW 110302LF	1	1	0.2	2.6	—	—	—	—	—	—	—	—	—	—	—	—	—			
		110304LF			0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
		110308LF			0.8	2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
T01215	T01215	NU-TPGW 110302LT	1	1	0.2	2.6	—	●	—	—	●	—	—	—	—	—	—	—	—			
		110304LT			0.4	2.5	—	●	—	—	●	—	—	—	—	—	—	—	—	—	—	
		110308LT			0.8	2.2	—	●	—	—	●	—	—	—	—	—	—	—	—	—	—	—
S01235	S01235	NU-TPGW 110302HS	1	1	0.2	2.6	—	—	—	—	—	—	—	—	—	—	—	—	—			
		110304HS			0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		110308HS			0.8	2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

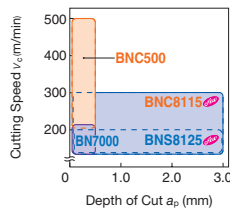
*Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map

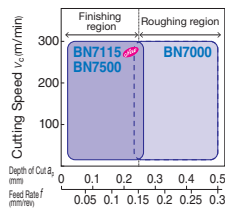
(C) Gray Cast Iron



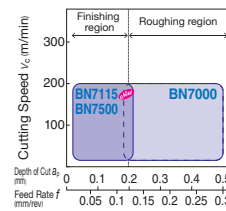
(D) Ductile Cast Iron



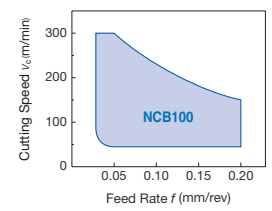
(E) General Sintered Alloy



(F) High-density Sintered Alloy



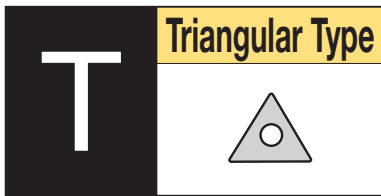
(G) Titanium Alloy



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability).

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

TPG 1103 Uncoated				
Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	3.4
	Thickness	3.18		

Applicable Internal Holders **E14, E56 to E59**

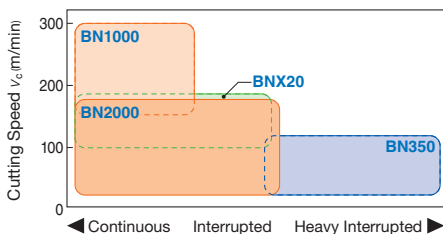
Multi-Cornered Single-Use Type/11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON												
							BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	3NU-TPGW 110304	1	3	0.4	2.5													
		110308			0.8	2.2													
	Honing	3NU-TPGT 110304N-FV	1	3	0.4	2.2													
		110308N-FV			0.8	1.9													
	Sharp Edge	3NU-TPGW 110302LF	1	3	0.2	2.6													
		110304LF			0.4	2.5													
	Low Cutting Force	110308LF			0.8	2.2													
		3NU-TPGW 110304LE	1	3	0.4	2.5													
	Honing	3NU-TPGW 110304LS	1	3	0.4	2.5													
		S00715																	

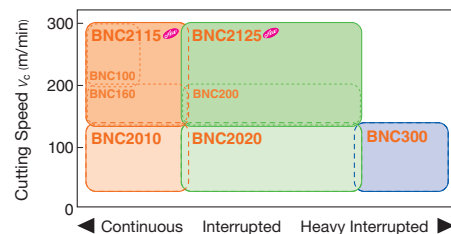
*Use 3NS Type (3NS-TPGW) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

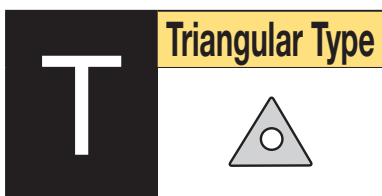


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



TPG 1103 Uncoated				
Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	3.4
	Thickness	3.18		

Applicable Internal Holders **E14, E56 to E59**

11° Positive Type (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON															
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100		
	Standard	TPGW 110304 110308	1	1	0.4	3.5	●															
							●															
	S01235	TPGW 110304HS 110308HS	1	1	0.4	3.5					●											

(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ● 1st Recommendation ○ 2nd Recommendation Interrupted Cutting ✚ 1st Recommendation ✚ 2nd Recommendation

Recommended Application	K Cast Iron																						
	S Exotic Alloy																						
	H Hardened Steel	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Sintered Components																						

SUMIBORON

Neg.

Pos.

C

D

R

S

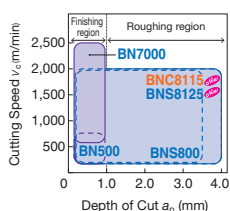
T

V

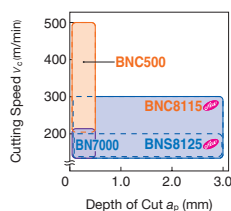
W

SUMIBORON Application Range Map

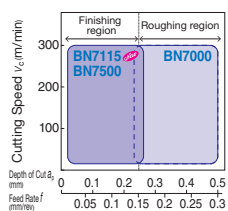
(C) Gray Cast Iron



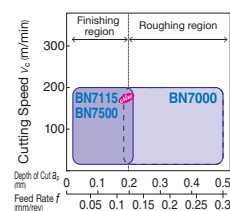
(D) Ductile Cast Iron



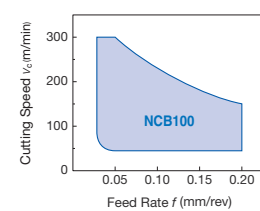
(E) General Sintered Alloy



(F) High-density Sintered Alloy



(G) Titanium Alloy

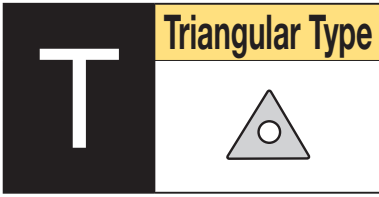


▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability).

L85

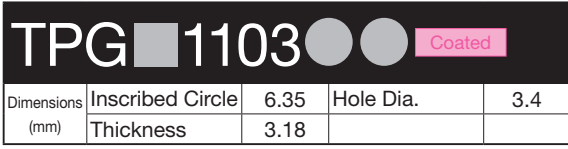
SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**



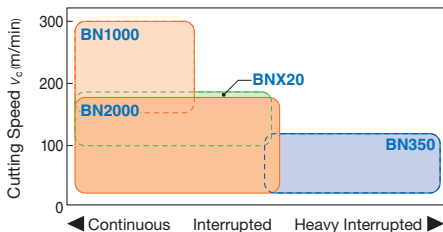
Applicable Internal Holders **E14, E56 to E59**

Multi-Cornered Single-Use Type/11° Positive (With Hole)

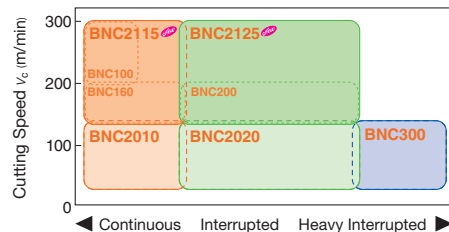
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON											
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115		
	Standard	3NC-TPGW 110302	1	3	0.2	2.4	○	○	●	●								
		110304			0.4	2.3	○	○	●	●	●	●	●	●	●	●	●	●
		110308			0.8	2.0	○	○	●	●	●	●	●	●	●	●	●	●
	Honing	3NC-TPGT 110304N-FV	1	3	0.4	2.2	○	○	●	●								
		110308N-FV			0.8	1.9	○	○	●	●								
	Honing	3NC-TPGW 110302LE	1	3	0.2	2.4			●									
		110304LE			0.4	2.3			●									
		110308LE			0.8	2.0			●									
	T00515	3NC-TPGW 110302LT	1	3	0.2	2.4				●								
		110304LT			0.4	2.3				●								
		110308LT			0.8	2.0				●								
	Sharper Edge Type	3NC-TPGW 110302LS <i>New</i>	1	3	0.2	2.6	○	○										
		110304LS			0.4	2.3	○	○			●	●	●	●	●	●	●	●
		110308LS			0.8	2.0	○	○			●	●	●	●	●	●	●	●
	Strong Edge Type	3NC-TPGW 110304HS	1	3	0.4	2.3					●							
		110308HS			0.8	2.0					●							

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

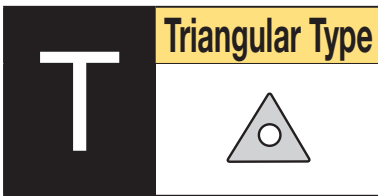


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



TPGW1603 ●●● Uncoated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.18		

Applicable Internal Holders E56

Single-Use Type/11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON														
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	NU-TPGW 160302	1	1	0.2	2.4															
		160304			0.4	2.3															
		160308			0.8	2.0															

*Depth of cut for single-use types is 0.5mm or less.

TPGW1604 ●●● Uncoated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	4.76		

Applicable Internal Holders E14, E56 to E58

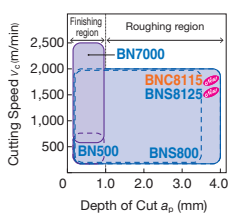
Single-Use Type/11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON														
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	NU-TPGW 160402	1	1	0.2	2.6															
		160404			0.4	2.5															
		160408			0.8	2.2															
		T-NU-TPGW 160402	10	1	0.2	2.6															
		160404			0.4	2.5															
		160408			0.8	2.2															
	Standard	NS-TPGW 160402	1	1	0.2	2.6															
		160404			0.4	2.5															
		160408			0.8	2.2															
		T-NS-TPGW 160402	10	1	0.2	2.6															
		160404			0.4	2.5															
		160408			0.8	2.2															

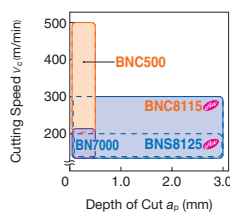
*Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map

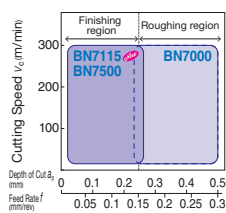
(C) Gray Cast Iron



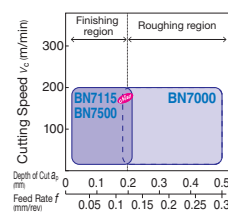
(D) Ductile Cast Iron



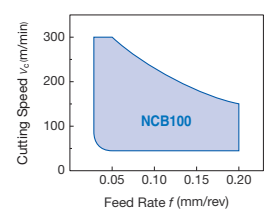
(E) General Sintered Alloy



(F) High-density Sintered Alloy



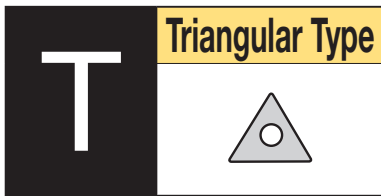
(G) Titanium Alloy



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability).

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

TPGW1604 Uncoated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	4.76		

Applicable Internal Holders **E14, E56 to E58**

Single-Use Type/11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																	
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100				
 Sharp Edge Low Cutting Force	T01215	NU-TPGW 160402LF 160404LF 160408LF	1	1	0.2	2.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
							—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
							—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
 T01215 Sharper Edge Type	S01235	NU-TPGW 160402LT 160404LT 160408LT	1	1	0.2	2.6	—	—	—	—	—	—	—	—	—	—	—	—	—					
							—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
							—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
 S01235 Strong Edge Type		NU-TPGW 160404HS 160408HS	1	1	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—	—					
							—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
							—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

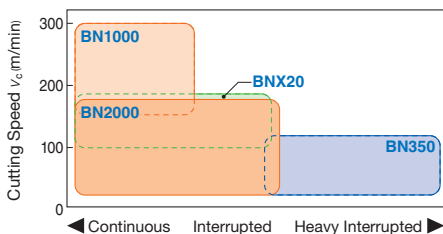
*Depth of cut for single-use types is 0.5mm or less.

11° Positive Type (With Hole)

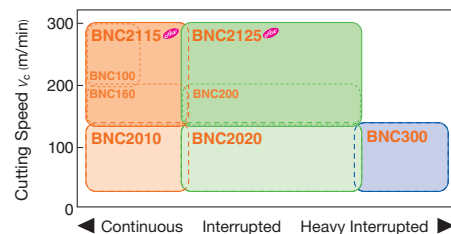
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																	
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100				
 Standard	S01235	TPGW 160404 160408 160412	1	1	0.4	3.5	—	—	—	—	—	—	—	—	—	—	—	—	—					
							—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
							—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
 S01235 Strong Edge Type		TPGW 160404HS 160408HS	1	1	0.4	3.5	—	—	—	—	—	—	—	—	—	—	—	—	—					
							—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
							—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

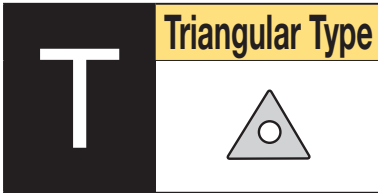


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



TPGW1604 Coated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	4.76		

Applicable Internal Holders E14, E56 to E58

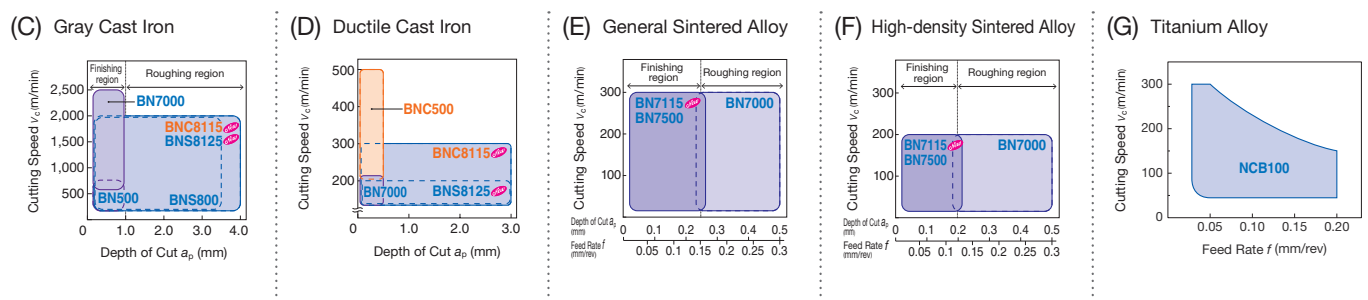
Multi-Cornered Single-Use Type/11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON									
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	3NC-TPGW 160402 160404 160408	1	3	0.2	2.4										
					0.4	2.3	○	○	●	●		●	●	●		
					0.8	2.0	○	○	●	●		●	●	●		
	BNC2115~S00515 BNC2125~S00515 BNC100~S01715 BNC160~S01020 BNC200~S01015 BNC300~S00515 Sharper Edge Type	3NC-TPGW 160404LS 160408LS	1	3	0.4	2.3										
					0.8	2.0						●	●	●		
	BNC2115~S01730 BNC2125~S02735 BNC2010~S01730 BNC2020~S02735 BNC160~S01730 BNC200~S01735 BNC300~S01735 BNC500~S01225 Strong Edge Type	3NC-TPGW 160404HS 160408HS	1	3	0.4	2.3		○	●	●						
					0.8	2.0		○	●	●			●			

(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ○ 1st Recommendation ○ 2nd Recommendation Interrupted Cutting ✖ 1st Recommendation ✖ 2nd Recommendation

Recommended Application	K Cast Iron																		
	S Exotic Alloy																		
	H Hardened Steel	●	○	○	○	✖													
	Sintered Components																		

SUMIBORON Application Range Map

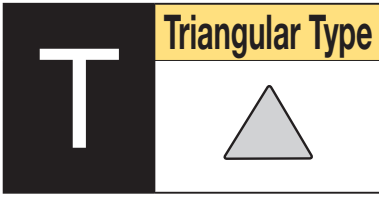


○ mark: Stock or planned stock (please confirm stock availability)



SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.	T01235				T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

TPGN0902 Uncoated

Dimensions (mm)	Inscribed Circle	5.56	Hole Dia.	—
	Thickness	2.38		

11° Positive Type (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	TPGN 090204	1	1	0.4	3.5	●						●								
		090208			0.8	3.2															
	S01235	TPGN 090204HS	1	1	0.4	3.5					●										

TPGN1103 Uncoated

Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	—
	Thickness	3.18		

Applicable Internal Holders **E60**

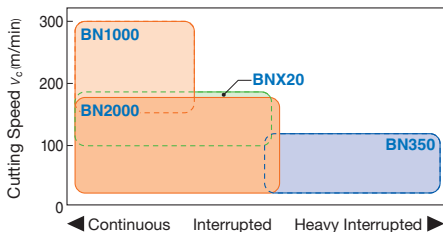
Single-Use Type/11° Positive (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100				
	Standard	NU-TPGN 110302	1	1	0.2	2.4							●											
		110304			0.4	2.3	●				●				●	●	▲							
		110308			0.8	2.0	●				●				●	●	▲							
		110312			1.2	2.0																		
		T-NU-TPGN 110302			0.2	2.4																		
	Standard	110304	10	1	0.4	2.3	●				●													
		110308			0.8	2.0	●				●													
		110312			1.2	2.0																		
		NU-TPGN 110302LT			0.2	2.4								●										
	T01215	110304LT	1	1	0.4	2.3					●													
		110308LT			0.8	2.0							●											
		110312LT			1.2	2.0							●											

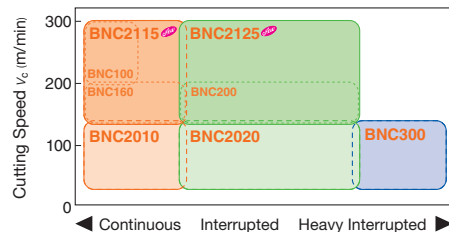
*Use NS Type (NS-TPGN) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

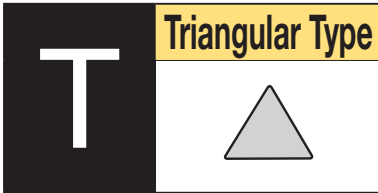


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



TPGN1103 Uncoated				
Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	—
	Thickness	3.18		

Applicable Internal Holders E60

Single-Use Type/11° Positive (Without Hole)

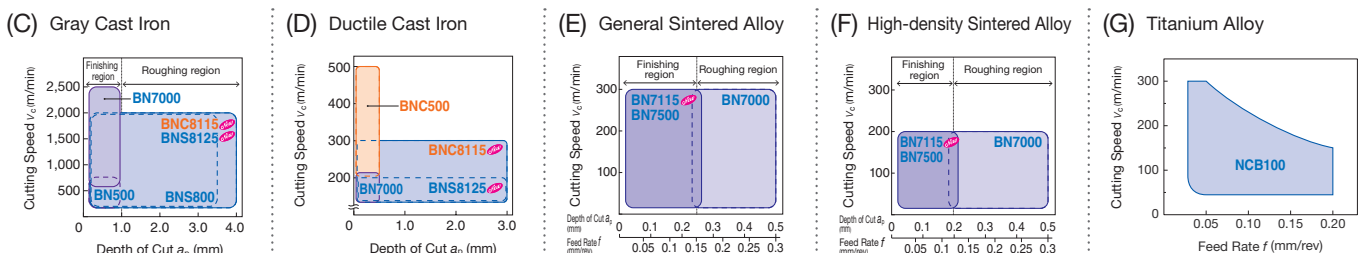
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON													
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100
 Strong Edge Type	S01235	NU-TPGN 110304HS 110308HS	1	1	0.4 0.8	2.3 2.0	—	—	—	—	●	—	—	—	—	—	—	—	—	—
							—	—	—	—	●	—	—	—	—	—	—	—	—	—

*Depth of cut for single-use types is 0.5mm or less.

11° Positive Type (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON														
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
 Standard	Standard	TPGN 110304 110308	1	1	0.4 0.8	3.5 3.2	●	—	—	—	●	—	—	—	—	●	▲	—	—	—	—
							—	—	—	—	●	—	—	—	—	—	—	—	—	—	—
 Strong Edge Type	S01235	TPGN 110304HS 110308HS	1	1	0.4 0.8	2.3 2.0	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—
							—	—	—	—	●	—	—	—	—	—	—	—	—	—	—

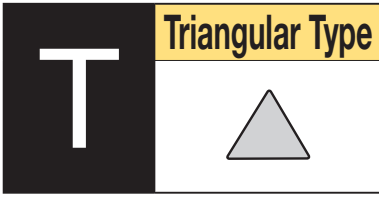
SUMIBORON Application Range Map



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability).

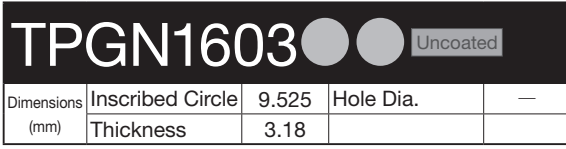
SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**



Applicable External Holders **C34, C35** Applicable Internal Holders **E60**

Single-Use Type/11° Positive (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON														
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	NU-TPGN 160302	1	1	0.2	2.4															
		160304			0.4	2.3															
		160308			0.8	2.0															
	Standard	T-NU-TPGN 160302	10	1	0.2	2.4															
		160304			0.4	2.3															
		160308			0.8	2.0															
	T01215	NU-TPGN 160304LT	1	1	0.4	2.3															
		160308LT			0.8	2.0															
	S01235	NU-TPGN 160304HS	1	1	0.4	2.3															
		160308HS			0.8	2.0															

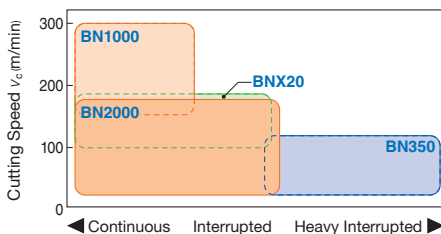
*Use NS Type (NS-TPGN) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

11° Positive Type (Without Hole)

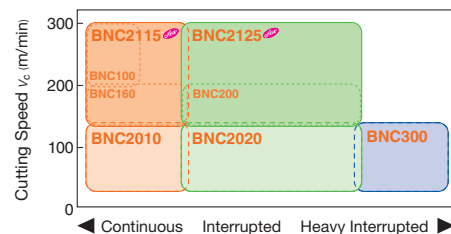
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON														
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	TPGN 160304	1	1	0.4	3.5															
		160308			0.8	3.2															
		160312			1.2	2.9															
	S01235	TPGN 160304HS	1	1	0.4	3.5															
		160308HS			0.8	3.5															

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

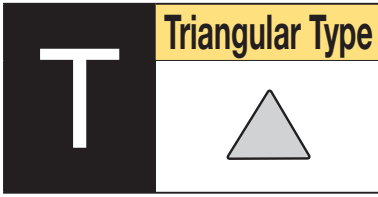


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



TPGN2204 Uncoated			
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.
	Thickness	4.76	

Applicable External Holders C34, C35

11° Positive Type (Without Hole)

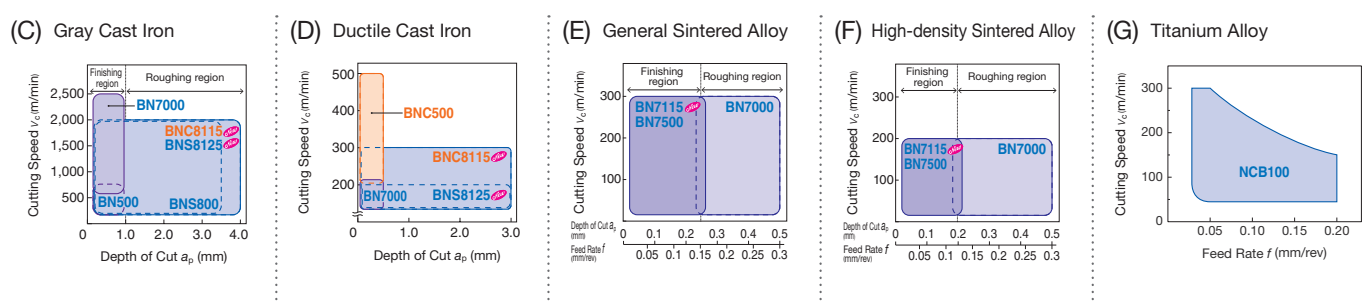
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON															
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100		
	Standard	TPGN 220408	1	1	0.8	3.2	●				●											
	S01235	TPGN 220408HS	1	1	0.8	3.2					●											

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation General Cutting ●: 1st Recommendation ○: 2nd Recommendation Interrupted Cutting ●: 1st Recommendation ○: 2nd Recommendation

Recommended Application	K Cast Iron																						
	S Exotic Alloy																						
	H Hardened Steel																						
	Sintered Components																						

- SUMIBORON
-
- Neg.
- Pos.
-
-
-
-
-
-
-

SUMIBORON Application Range Map



SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

VN 1604 Uncoated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

Applicable External Holders **C36, C37**

Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																
							BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100					
	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	●	●		●	●	●	●	●	▲								
	Standard	T-NU-VNMA 160401	10	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	●	●		●	●	●	●	▲									
	Standard	NS-VNMA 160404	1	1	0.4	2.8			▲														
		160408			0.8	2.0			▲														
	Standard	T-NS-VNMA 160404	10	1	0.4	2.8			▲														
		160408			0.8	2.0			▲														
	Standard	NU-VNGA 160404	1	1	0.4	2.5														●			
		160408			0.8	1.6																●	

*Depth of cut for single-use types is 0.5mm or less.

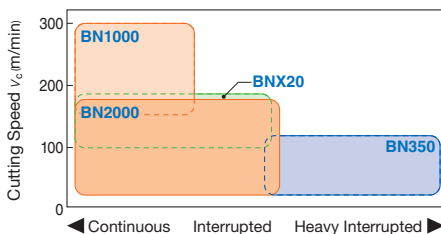
Multi-Cornered Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON													
							BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100		
	Standard	2NU-VNGA 160404	1	2	0.4	2.8														
		160408			0.8	2.0	●	●		●	●	●	●	●	▲					
	Standard	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			▲											
	Standard	T-2NS-VNGA 160404	10	2	0.4	2.8			▲											
		160408			0.8	2.0			▲											

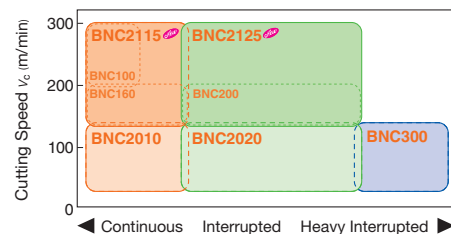
*Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)



(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

VNG 1604 Coated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

Applicable External Holders **C36, C37**

Multi-Cornered Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON										
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115	
	Standard	2NC-VNGA 160404	1	2	0.4	2.8	○	●	●					●			
		160408			0.8	2.0	○	●	●					●			
		160412			1.2	1.7	○										
	Standard	4NC-VNGA 160402	1	4	0.2	3.3	○	○	●	●							
		160404			0.4	2.8	○	○	●	●	●	●	●	●	●	●	
		160408			0.8	2.0	○	○	●	●	●	●	●	●	●	●	●
160412	1.2	1.7	○	○		●											
	Honing	4NC-VNGG 160404N-FV	1	4	0.4	2.8	○	●	●					●			
		160408N-FV			0.8	2.0	○	●	●					●			
	S00535	4NC-VNGG 160404N-LV	1	4	0.4	2.8	○	●	●					●			
		160408N-LV			0.8	2.0	○	●	●					●			
	T00515	2NC-VNGA 160402LT	1	2	0.2	3.3			●								
		160404LT			0.4	2.8			●								
		160408LT			0.8	2.0			●								
		160412LT			1.2	1.7			●								

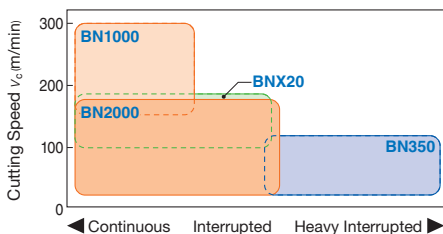
(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ● 1st Recommendation ○ 2nd Recommendation Interrupted Cutting ● 1st Recommendation ○ 2nd Recommendation

Recommended Application	K Cast Iron																
	S Exotic Alloy																
	H Hardened Steel	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Sintered Components																

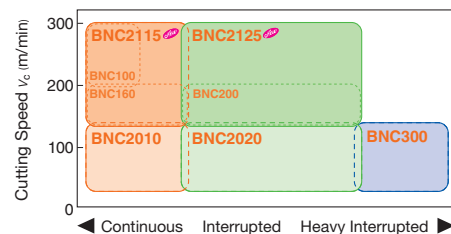
- SUMIBORON
- L
- Neg.
- Pos.
- C
- D
- R
- S
- T
- V
- W

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

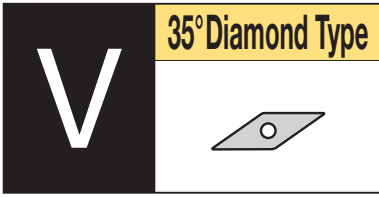


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

VBGW1103 Uncoated				
Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	2.8
	Thickness	3.18		

Applicable Internal Holders **E37, E39, E40, E42, E43, E45, E46**

Single-Use Type/5° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100				
	Standard	NU-VBGW 110302	1	1	0.2	3.2				●	●													
		110304			0.4	2.8 ^{*1}						●	●											
		110308			0.8	2.0 ^{*2}							●	●										
	T01215	NU-VBGW 110302LT	1	1	0.2	3.2				●	●													
		110304LT			0.4	2.8						●	●											
		110308LT			0.8	2.0							●	●										
	S01235	NU-VBGW 110302HS	1	1	0.2	3.2				●	●													
		110304HS			0.4	2.8						●	●											
		110308HS			0.8	2.0							●	●										

*Use NS Type (NS-VBGW) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

*1 NCB100 cutting edge length is 2.5.

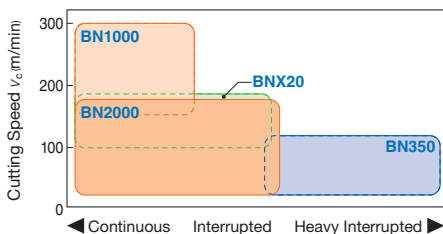
*2 NCB100 cutting edge length is 1.6.

Multi-Cornered Single-Use Type/5° Positive (With Hole)

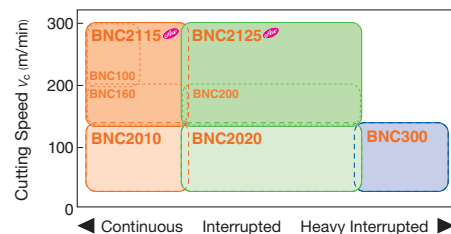
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	2NU-VBGW 110304	1	2	0.4	2.8								●		●					
		110308			0.8	2.0										●					

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)



(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



VBGW1103				
Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	2.8
	Thickness	3.18		

Applicable Internal Holders: E37, E39, E40, E42, E43, E45, E46

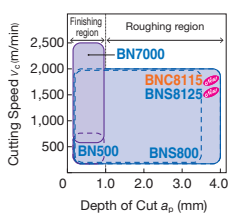
Multi-Cornered Single-Use Type/5° Positive (With Hole)

Recommended Application	Continuous Cutting		General Cutting		Interrupted Cutting	
	1st Recommendation	2nd Recommendation	1st Recommendation	2nd Recommendation	1st Recommendation	2nd Recommendation
K Cast Iron	○	○	○	○	○	○
S Exotic Alloy	○	○	○	○	○	○
H Hardened Steel	●	○	○	○	○	○
Sintered Components						

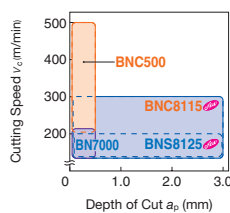
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON										
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115	
	Standard	2NC-VBGW 110302	1	2	0.2	3.2	○	○	●	●							
		110304			0.4	2.8	○	○	●	●				●			
		110308			0.8	2.0	○	○	●	●				●			
	T00515	2NC-VBGW 110302LT	1	2	0.2	3.2				●							
		110304LT			0.4	2.8				●							
	Sharper Edge Type	2NC-VBGW 110302LS <i>New</i>	1	2	0.2	3.2	○	○									
		110304LS <i>New</i>			0.4	2.8	○	○									
		110308LS <i>New</i>			0.8	2.0	○	○									

SUMIBORON Application Range Map

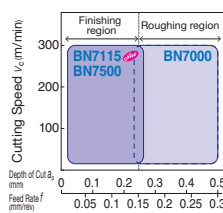
(C) Gray Cast Iron



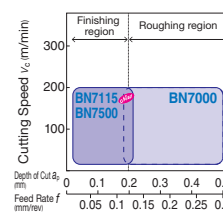
(D) Ductile Cast Iron



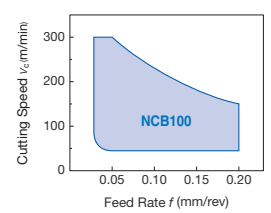
(E) General Sintered Alloy



(F) High-density Sintered Alloy



(G) Titanium Alloy



○ mark: Stock or planned stock (please confirm stock availability)

SUMIBORON
Neg.
Pos.
C
D
R
S
T
V
W

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

VBGW1604 Uncoated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	4.76		

Applicable Internal Holders **E14, E37, E39, E42, E45**

Single-Use Type/5° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON													
							BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100		
	Standard	NU-VBGW 160402	1	1	0.2	3.8														
		160404			0.4	3.3 ^{*1}														
		160408			0.8	2.5 ^{*2}														
	T01215	NU-VBGW 160402LT	1	1	0.2	3.8														
		160404LT			0.4	3.3														
		160408LT			0.8	2.5														
	S01235	NU-VBGW 160404HS	1	1	0.4	3.3														
		160408HS			0.8	2.5														

*Depth of cut for single-use types is 0.5mm or less.

*1 NCB100 cutting edge length is 2.5.

*2 NCB100 cutting edge length is 1.6.

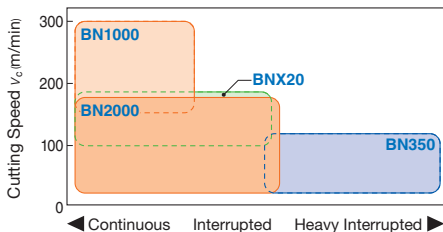
Multi-Cornered Single-Use Type/5° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON												
							BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	2NU-VBGW 160404	1	2	0.4	3.3													
		160408			0.8	2.5													

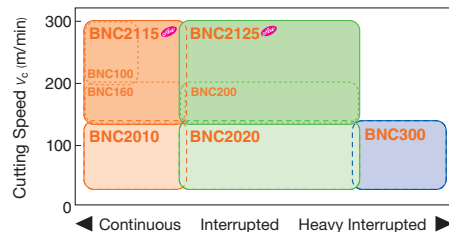
*Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

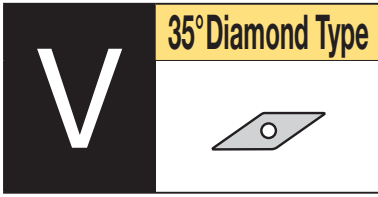


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



VBGW1604 Coated				
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	4.76		

Applicable Internal Holders **E14, E37, E39, E42, E45**

Multi-Cornered Single-Use Type/5° Positive (With Hole)

(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ⊕ 1st Recommendation ⊖ 2nd Recommendation Interrupted Cutting ⊕⊖ 1st Recommendation ⊖⊕ 2nd Recommendation

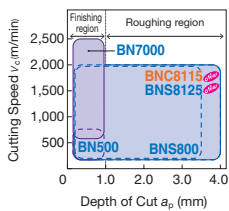
Recommended Application	K Cast Iron	S Exotic Alloy	H Hardened Steel	Sintered Components	General Cutting	Interrupted Cutting
	○	○	●	○	⊕	⊖

Coated SUMIBORON

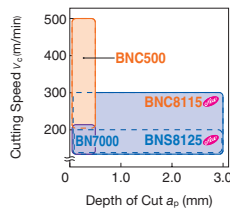
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115	
	Standard	2NC-VBGW 160402	1	2	0.2	3.8	○	○	●	●							
		160404			0.4	3.3	○	○	●	●							
		160408			0.8	2.5	○	○	●	●							
 Low Cutting Force	Honing	2NC-VBGW 160402LE	1	2	0.2	3.8			●								
		160404LE			0.4	3.3			●								
		160408LE			0.8	2.5			●								
 Sharper Edge Type	T00515	2NC-VBGW 160402LT	1	2	0.2	3.8				●							
		160404LT			0.4	3.3				●							
		160408LT			0.8	2.5				●							
 Sharper Edge Type	BNC2115-S00515 BNC2125-S00515 BNC100-S01715 BNC160-S01020 BNC200-S01015 BNC300-S00515	2NC-VBGW 160402LS New	1	2	0.2	3.8	○	○									
		160404LS New			0.4	3.3	○	○									
		160408LS New			0.8	2.5	○	○									

SUMIBORON Application Range Map

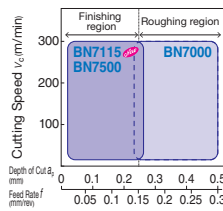
(C) Gray Cast Iron



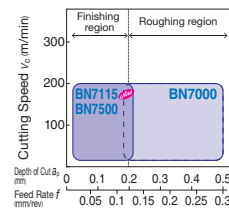
(D) Ductile Cast Iron



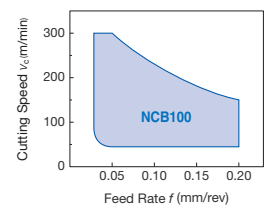
(E) General Sintered Alloy



(F) High-density Sintered Alloy



(G) Titanium Alloy



○ mark: Stock or planned stock (please confirm stock availability)

SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

(Legend) Continuous Cutting ● 1st Recommendation ○ 2nd Recommendation General Cutting ● 1st Recommendation ○ 2nd Recommendation Interrupted Cutting ● 1st Recommendation ○ 2nd Recommendation

VCGW0802 ● ● Uncoated

Dimensions (mm)	Inscribed Circle	4.76	Hole Dia.	2.3
	Thickness	2.38		

Applicable Internal Holders **E38, E41, E44, E47**

Single-Use Type/7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON														
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	NU-VCGW 080202	1	1	0.2	3.3															
		080204			0.4	2.8															
		080208			0.8	2.0															
	T01215	NU-VCGW 080202LT	1	1	0.2	3.3															
		080204LT			0.4	2.8															
		080208LT			0.8	2.0															
	S01235	NU-VCGW 080204HS	1	1	0.4	2.8															
		080208HS			0.8	2.0															

*Depth of cut for single-use types is 0.5mm or less.

VCGW0802 ● ● Coated

Dimensions (mm)	Inscribed Circle	4.76	Hole Dia.	2.3
	Thickness	2.38		

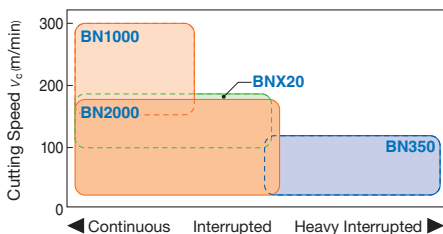
Applicable Internal Holders **E38, E41, E44, E47**

Multi-Cornered Single-Use Type/7° Positive (With Hole)

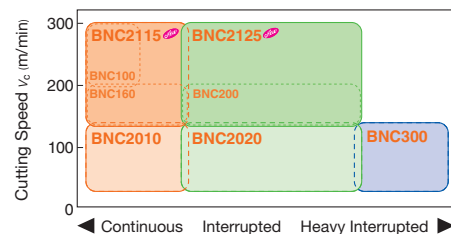
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON										
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115	
	Standard	2NC-VCGW 080202	1	2	0.2	3.3											
		080204			0.4	2.8											

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)

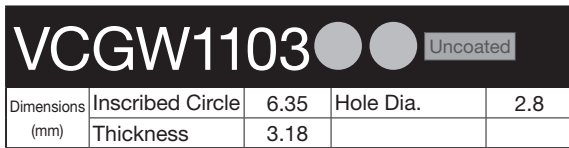


(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



(Legend) Continuous Cutting ○ : 1st Recommendation ○ : 2nd Recommendation General Cutting ● : 1st Recommendation ● : 2nd Recommendation Interrupted Cutting ⊕ : 1st Recommendation ⊕ : 2nd Recommendation

Recommended Application	K Cast Iron	S Exotic Alloy	H Hardened Steel	Sintered Components	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100
	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

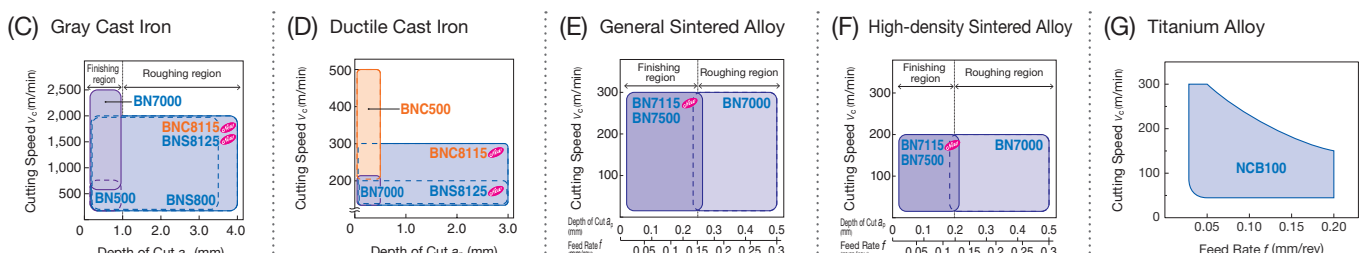
Applicable External Holders **C38, C39, D15, D28** Applicable Internal Holders **E41, E44, E47**

Single-Use Type/7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON											
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125
	Standard	NU-VCGW 110302	1	1	0.2	3.3												
		110304			0.4	2.8			●	●								
	S01235	NU-VCGW 110302HS	1	1	0.2	3.3												
		110304HS			0.4	2.8			●									

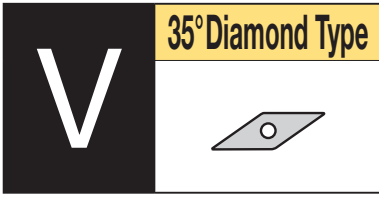
*Use NS Type (NS-VCGW) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

SUMIBORON Application Range Map



SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**

VC 1604		Uncoated		
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	4.76		

Applicable External Holders **C38, C39** Applicable Internal Holders **E41, E44**

Single-Use Type/7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	NU-VCGW 160404 160408	1	1	0.4 0.8	2.8 ^{*1} 1.9 ^{*2}							●	▲					●

*Use NS Type (NS-VCGW) for BNX25. *Depth of cut for single-use types is 0.5mm or less.
*1 NCB100 cutting edge length is 2.5. *2 NCB100 cutting edge length is 1.6.

7° Positive Type (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7000 BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	VCMW 160404 160408	1	1	0.4 0.8	5.2 4.3		●				●							

VCGW1604		Coated		
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	4.76		

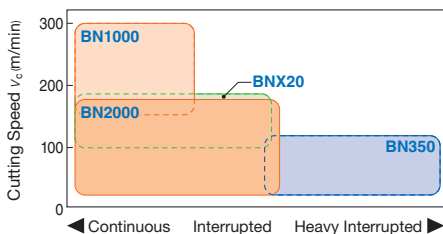
Applicable External Holders **C38, C39** Applicable Internal Holders **E41, E44**

Multi-Cornered Single-Use Type/7° Positive (With Hole)

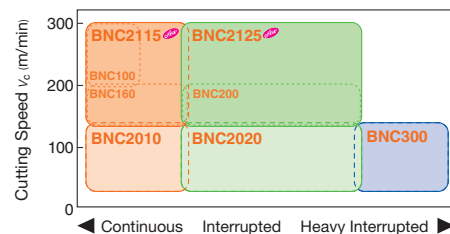
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	2NC-VCGW 160404 160408	1	2	0.4 0.8	2.8 1.9	○	○	●	●		●	●	●		
	Standard	2NC-VCGW 160404LS 160408LS	1	2	0.4 0.8	2.8 1.9	○	○				●	●	●		
	Standard	2NC-VCGW 160404HS 160408HS	1	2	0.4 0.8	2.8 1.9	○	○	●	●		●	●	●		

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)



(B) Hardened Steel (Coated SUMIBORON)



SUMIBORON Inserts

Indexable Insert



WNMA0804 Uncoated				
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

Applicable External Holders **C40, C41** Applicable Internal Holders **E26, E27**

Single-Use Type/Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON														
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100	
	Standard	NU-WNMA 080404 080408	1	1	0.4	3.3															
					0.8	2.8															

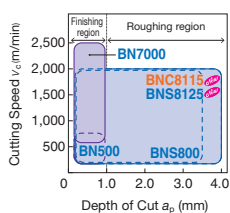
*Use NS Type (NS-WNMA) for BNX25. *Depth of cut for single-use types is 0.5mm or less.

Negative Type (With Hole)

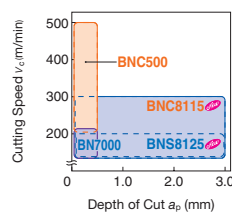
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON																
							BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7000	BN700	BN7115	BN7500	BNS8125	BNS800	NCB100			
	Standard	WNMA 080404 080408 080412	1	1	0.4	4.5																	
					0.8	4.4																	
					1.2	4.3																	

SUMIBORON Application Range Map

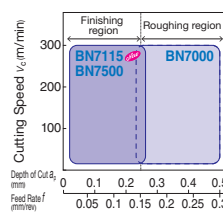
(C) Gray Cast Iron



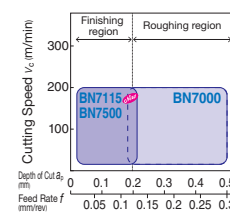
(D) Ductile Cast Iron



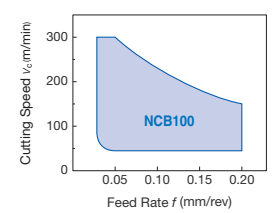
(E) General Sintered Alloy



(F) High-density Sintered Alloy

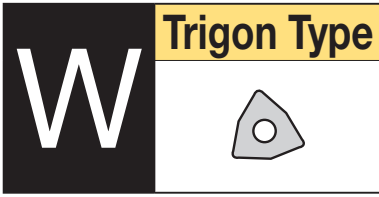


(G) Titanium Alloy



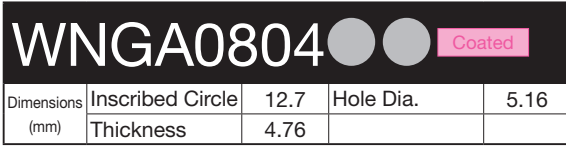
SUMIBORON Inserts

Indexable Insert



	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Neg.	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225
Pos.					T01235				
	BNC500	BN500	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	BNS800	NCB100
Neg.	S01215	T01215	T01215	T01215	T01215	S02020	T02020	T02020	T01215
Pos.									

Standard cutting edge specification Code Details **L30, L31**



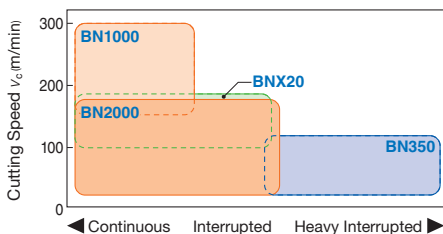
Applicable External Holders **C40, C41** Applicable Internal Holders **E26, E27**

Multi-Cornered Single-Use Type/Negative (With Hole)

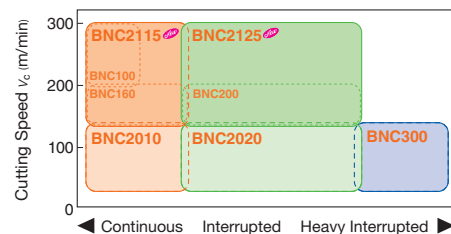
Shape	Cutting Edge Specification	Cat. No.	Pcs/Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON												
							BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115			
	Standard	6NC-WNGA 080404	1	6	0.4	2.3	○	○	●	●									
		080408			0.8	2.0	○	○	●	●	●	●							
		080412			1.2	2.0	○	○	●	●									
	S01215	6NC-WNGA 080408WG	1	6	0.8	2.0	○	○	●	●				●	●				
		6NC-WNGA 080408WH			0.8	1.9	○	○	●	●				●	●				
	S01215	6NC-WNGA 080408LT	1	3	0.8	2.0			●										
	T00515	3NC-WNGA 080408LS <i>cNew</i>	1	3	0.8	2.0	○	○											
	BNC2115~S00515 BNC2125~S00515 BNC100~S01715 BNC160~S01020 BNC200~S01015 BNC300~S00515	6NC-WNGA 080408LS	1	6	0.8	2.0								●	●				
		6NC-WNGA 080408HS			0.8	2.0	○	○	●	●				●	●				
	BNC2115~S01730 BNC2125~S02735 BNC2010~S01730 BNC2020~S02735 BNC160~S01730 BNC200~S01735 BNC300~S01735 BNC500~S01225	6NC-WNGA 080408HS	1	6	0.8	2.0	○	○	●	●				●	●				

SUMIBORON Application Range Map

(A) Hardened Steel (Uncoated SUMIBORON)



(B) Hardened Steel (Coated SUMIBORON)


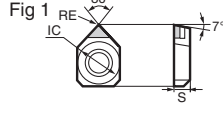


SUMIBORON Inserts

Indexable Insert

Turning Insert

Dimensions (mm)

Shape	Cat. No.	BN1000	BN2000	BNX20	BN350	BNX25	BNX10	BN500	BN7000	BN700	Inscribed Circle IC	Thickness S	Corner Radius RE	Hole Dia.	Applicable Holders	Fig
		●	●					●	▲							
 Fig 1 	NU-ZNEX 040102	●	●						●	▲	4.76	1.59	0.2	2.3	SUMIBORON	1
	NU-ZNEX 040104	●	●						●	▲	4.76	1.59	0.4	2.3	Small Hole Boring	1
	T-NU-ZNEX 040102	●	●						●	▲	4.76	1.59	0.2	2.3	Bars	1
	T-NU-ZNEX 040104	●	●						●	▲	4.76	1.59	0.4	2.3	(BNZ Type)	1


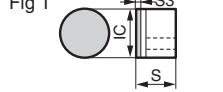

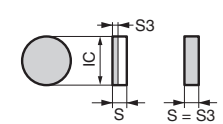

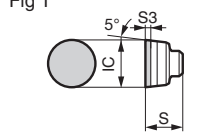

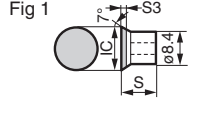

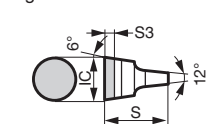
*Use NS Type (NS-ZNEX) for BNX25.

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

Round Insert




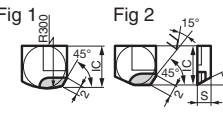

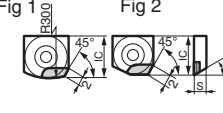
Expansion

Dimensions (mm)

Shape	Cat. No.	BN1000	BN2000	BNX20	BN350	BNX25	BNX10	BN500	BN7000	BN700	BNS8125	BNS800	BNC8115	Inscribed Circle IC	Thickness S	Thickness of CBN S3	Applicable Holders	Fig
			●	●														
 Fig 1 	RNGA 0906M0		●	●										9.00	6.35	0.80	SUMIBORON Round Insert Holders (PRGN Type)	1
 Fig 1 	RNGN 120400-B								●	▲				12.70	4.76	0.80	Special Holder	1
	RNGN 150400-B													15.88	4.76	0.80		1
	RNGN 090300										●	●	●	9.525	3.18	3.18	Tool Holder for Solid SUMIBORON	2
	RNGN 090300 LF										●	●	●	9.525	3.18	3.18	(CRDN, CRSN Types)	2
	RNGN 120300										●	●	●	12.70	3.18	3.18		2
	RNGN 120300 LF										●	●	●	12.70	3.18	3.18		2
 Fig 1 	RBG 08-B RBG 10-B RBG 12-B RBG 16-B RBG 20-B RBG 26-B								●	●				8.00	6.50	0.80	SUMIBORON Tool Holder for Roll Turning (BNRN Type)	1
 Fig 1 	RCGA 0906M0		●											9.00	6.35	0.80	SUMIBORON Round Insert Holders (PRGC Type, PRDC Type)	1
	RTGN 0508M0			●										5.00	7.50	0.80	SUMIBORON Small Diameter Round Insert Holders (TRGT Type)	1
	RTGN 0608M0			●										6.00	7.50	0.80		1
	RTGN 0711M0			●										7.00	11.0	0.80		1
	RTGN 0811M0			●										8.00	11.0	0.80		1
 Fig 1 	RTGN 0914M0			●										9.00	14.0	0.80		1
	RTGN 1014M0			●										10.00	14.0	0.80		1
	RTGN 1214M0			●										12.00	14.0	0.80		1

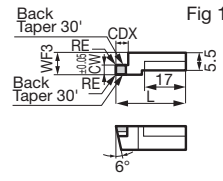
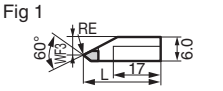
Milling Insert

Dimensions (mm)

Shape	Cat. No.	BN1000	BN2000	BN7000	BN700	Inscribed Circle IC	Thickness S	Applicable Holders	Fig
			●	●	▲				
 Fig 1 	CSN 43MT		●			12.70	4.76	SEC-ACE Mill (DNF Type)	1
 Fig 1 	SNEN 1504ADTR			●	▲	15.875	4.76	BN Finish Mill	1
	SNEN 1504ADTL					15.875	4.76	(FM Type, FMF Type)	1
	SNEN 1504ADTR-S			●	▲	15.875	4.76		2
	SNEN 1504ADTL-S					15.875	4.76		2
 Fig 1 	SNEW 1203ADTR			●	▲	12.70	3.18	BN Finish Mill EASY	1
	SNEW 1203ADTR-S			●	▲	12.70	3.18	(FMU Type)	2

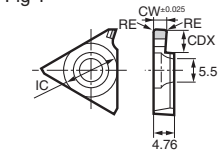
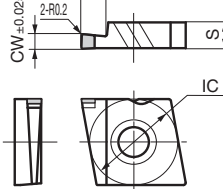
Grooving/Threading Tool Insert

Dimensions (mm)

Shape (Right Hand)	Cat. No.	BN2000				BN250		BNX20		BN350		Width of Cut CW	Groove Depth CDX	Corner Radius RE	Overall Length L	Cutting Edge Distance WF3	Applicable Holders	Fig
		R	L	R	L	R	L	R	L									
 <p>Back Taper 30° WF3 RE CDX 17 6°</p>	BNGNT 0200 R/L BNGNT 0250 R/L BNGNT 0300 R/L BNGNT 0400 R/L BNGNT 0500 R/L BNGNT 0600 R/L			●					●		2.0	4.0	0.2	25	6.0	SUMIBORON Grooving Tool (BNGG Type) →L131	1	
				●					●		2.5	4.0	0.2	25	6.0		1	
				●					●		3.0	5.0	0.4	25	6.0		1	
				●					●		4.0	6.0	0.4	26	6.0		1	
				●					●		5.0	6.0	0.4	26	6.0		1	
				●					●		6.0	7.0	0.4	27	6.0		1	
 <p>Fig 1 60° WF3 RE 17 6.0</p>	BNTT 1020 R/L BNTT 1530 R/L			●						Pitch = 1.0 to 2.0	0.14	25	4.0	SUMIBORON Grooving Tool (BNGG Type) →L131	1			
				●							Pitch = 1.5 to 3.0	0.20	25		4.0	1		

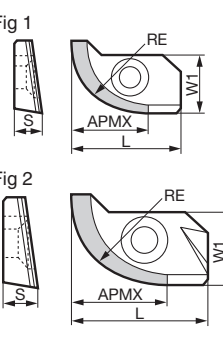
Insert for Grooving Tool Holders

Dimensions (mm)

Shape	Cat. No.	BN2000		BNC30G		Inscribed Circle IC	Width of Cut CW	Corner Radius RE	Groove Depth CDX	Hole Dia.	Applicable Holders	Fig
		R	L	R	L							
 <p>Fig 1 RE CW_{±0.025} CDX 5.5 4.76</p>	TGA R/L4125 TGA R/L4150 TGA R/L4200 TGA R/L4250 TGA R/L4300 TGA R/L4350 TGA R/L4400	●				12.70	1.25	0.2	2.0	5.5	SEC-Grooving Tools (GWC Type, GWCS Type, GWCI Type) →F4 to F5	1
		●				12.70	1.50	0.2	3.5	5.5		1
		●				12.70	2.00	0.2	3.5	5.5		1
		●				12.70	2.50	0.2	4.0	5.5		1
		●				12.70	3.00	0.2	4.0	5.5		1
		●				12.70	3.50	0.2	5.0	5.5		1
		●				12.70	4.00	0.2	5.0	5.5		1
 <p>Fig 1 CW_{±0.025} 2-R0.2 CDX S IC</p>	CGA R/L 1504150 CGA R/L 1504200 CGA R/L 1504250 CGA R/L 1504300 CGA R/L 1504350 CGA R/L 1504400 CGA R/L 1504450 CGA R/L 1506500 CGA R/L 1506550 CGA R/L 1506600	●	●	●	●	15.875	1.5	0.2	3.5	5.5	SUMIBORON Grooving Tool (GWB Type) →L130	1
		●	●	●	●	15.875	2.0	0.2	3.5	5.5		1
		●	●	●	●	15.875	2.5	0.2	4.0	5.5		1
		●	●	●	●	15.875	3.0	0.2	4.0	5.5		1
		●	●	●	●	15.875	3.5	0.2	5.0	5.5		1
		●	●	●	●	15.875	4.0	0.2	5.0	5.5		1
		●	●	●	●	15.875	4.5	0.2	5.0	5.5		1
		●	●	●	●	15.875	5.0	0.2	5.0	5.5		1
		●	●	●	●	15.875	5.5	0.2	5.0	5.5		1
		●	●	●	●	15.875	6.0	0.2	5.0	5.5		1

Endmill Insert

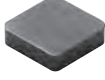

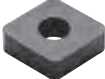

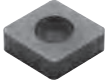





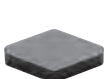

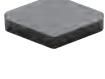



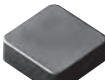





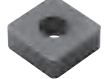




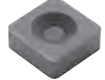











Dimensions (mm)

Shape	Cat. No.	BN350	BN500	BN7000	BN700	Ballnose Radius RE	Overall Length L	Width W1	Cutting Edge APMX	Thickness S	Applicable Cutters	Fig
 <p>Fig 1 RE WT APMX L S</p> <p>Fig 2 RE WT APMX L S</p>	BEST 160S BEST 160L BEST 200S BEST 200L BEST 250S BEST 250L BEST 300S BEST 300L BEST 400S BEST 400L BEST 500S BEST 500L	—	—	—	—	8.0	13.0	6.8	10.0	3.5	SUMIBORON Ballnose Endmill (BES Type) →L136	1
		—	—	—	—	8.0	13.0	6.8	13.0	3.5		1
		—	—	—	—	10.0	20.0	8.5	13.0	4.5		1
		—	—	—	—	10.0	20.0	8.5	20.0	4.5		1
		—	●	—	—	12.5	22.5	10.5	15.5	5.0		1
		—	●	—	—	12.5	22.5	10.5	22.5	5.0		1
		—	●	—	—	15.0	25.0	12.0	18.0	6.0		1
		—	●	—	—	15.0	25.0	12.0	25.0	6.0		1
		—	—	—	—	20.0	30.0	16.0	23.0	7.5		2
		—	—	—	—	20.0	30.0	16.0	30.0	7.5		2
		—	—	—	—	25.0	35.0	20.0	28.0	8.0		2
		—	—	—	—	25.0	35.0	20.0	35.0	8.0		2

Refer to pages L112 to L115 for solid SUMIBORON dedicated holders.

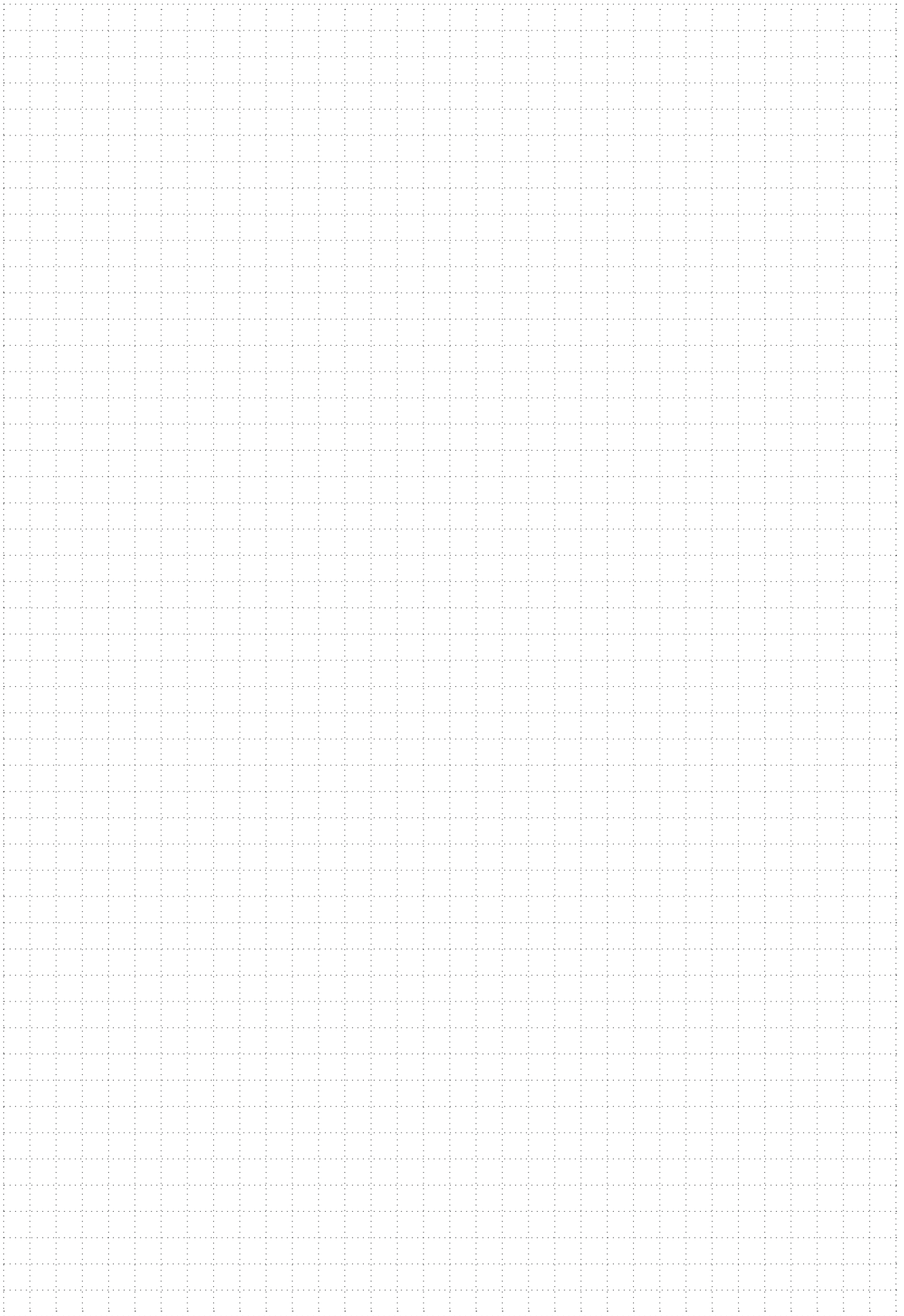
SUMIBORON

Applications **K** Cast Iron **H** Hardened Steel

Shape	Cat. No.	BNC8115	BNS8125	BNS800	Dimensions (mm)				Applicable Holders	
					Inscribed Circle	Thickness	Corner Radius	Hole Y/N		
	CNGN 090308	●	●	●	9.525	3.18	0.8	No	External 	
	CNGN 090308LF	●	●	●			0.8			
	CNGN 090312	●	●	●			1.2			
	CNGN 090312LF	●	●	●			1.2			
	CNGN 120408	●	●	●			0.8			
	CNGN 120412	●	●	●	12.70	4.76	1.2	No	External 	
	CNGN 120416	●	●	●			1.6			
	CNGA 120408	—	—	●			0.8			
	CNGA 120412	—	—	●	12.70	4.76	1.2	Yes	External  to  Internal  ,  to 	
	CNGX 120408	●	●	●			0.8			
	CNGX 120412	●	●	●	12.70	4.76	1.2	Dimple	External 	
	CNGX 120416	●	●	●			1.6			
	DNGN 110308	●	●	●			0.8			
	DNGN 110308LF	●	●	●	9.525	3.18	0.8	No	External 	
	DNGN 110312	●	●	●			1.2			
	DNGN 110312LF	●	●	●			1.2			
	RNGN 090300	●	●	●	9.525	3.18	—	No	External 	
	RNGN 090300LF	●	●	●			—			
	RNGN 120300	●	●	●			3.18			
	RNGN 120300LF	●	●	●			3.18			
	RNGN 120400	●	●	●			4.76			
	SNGN 090308	●	●	●	9.525	3.18	0.8	No	External  Milling Cutters  	
	SNGN 090308LF	●	●	●			0.8			
	SNEN 090308W	●	●	●			1.2			
	SNEN 090308LFW	●	●	●			1.2			
	SNGN 090312	●	●	●			1.2			
	SNGN 090312LF	●	●	●	1.2					
		SNGN 120308	●	●	●	12.70	3.18	0.8	No	External 
		SNGN 120308LF	●	●	●			0.8		
		SNGN 120312	●	●	●			1.2		
		SNGN 120312LF	●	●	●			1.2		
		SNGN 120408	●	●	●			0.8		
		SNGN 120412	●	●	●			1.2		
		SNGN 120416	●	●	●			1.6		
	SNGN 120420	●	●	●	2.0					
		SNGA 120408	—	—	●	12.70	4.76	0.8	Yes	External  to  Internal  , 
SNGA 120412		—	—	●	1.2					
	SNGX 120408	●	●	●	12.70	4.76	0.8	Dimple	External 	
	SNGX 120412	●	●	●			1.2			
	SNGX 120416	●	●	●			1.6			
	TNGN 110308	●	●	●	6.35	3.18	0.8	No	External 	
	TNGN 110308LF	●	●	●			0.8			
	TNGN 110312	●	●	●			1.2			
	TNGN 110312LF	●	●	●			1.2			
	TNGN 160408	●	●	●			0.8			
	TNGN 160412	●	●	●			1.2			
	TNGN 160416	●	●	●			1.6			
TNGN 160420	●	●	●	2.0						
	TNGA 160408	—	—	●	9.525	4.76	0.8	Yes	External  to  External  ,  Internal  ,  to 	
	TNGA 160412	—	—	●			1.2			

*Part number suffix: LF: Sharp edge type W: Wiper type LFW: Wiper sharp edge type

MEMO



Tool Holders for Solid SUMIBORON

SUMIBORON



General Turning
Clamp-on

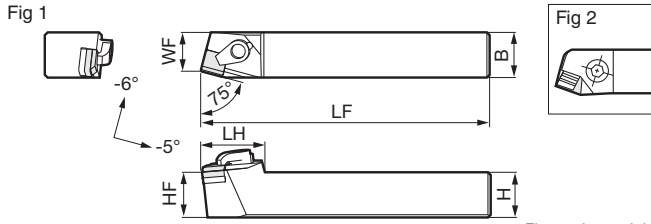
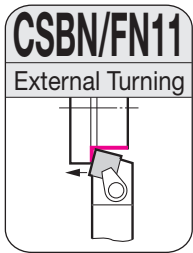
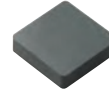


Figure shows right-hand (R) tool.

Insert L110



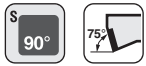
- (1) SNGN090300
- (2) SNGN120300
- (3) SNGN120400

Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert	Fig	Clamp Plate	Chipbreaker	Double Screw	Bolt	Shim	Shim Retainer	Spring	Wrench
	R	L																
CSBN R/L2525-32	●		25	25	160	21.5	25	30	SNGN090300	1	CCM8UL	CBS13	WB8-22T	—	SSN0903	SPP3	—	LT27
R/L2525-42	●		25	25	160	21.5	25	35	SNGN120300	1	CCM8UL	CBS14	WB8-22T	—	SSND423			
FN11 R/L-44A	●	●	25	25	160	21.5	25	33	SNGN120400	2	DCR/L1	CBD4R/L	—	BH0830R/L	SSND423		DSP5	LH040



Facing
Clamp-on

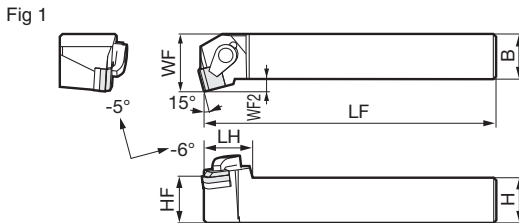
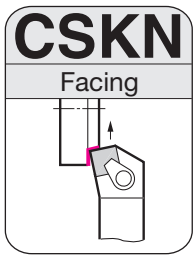
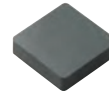


Figure shows right-hand (R) tool.

Insert L110



- (1) SNGN090300
- (2) SNGN120300

Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Offset WF2	Applicable Insert	Fig	Clamp Plate	Chipbreaker	Double Screw	Shim	Shim Retainer	Wrench
	R	L															
CSKN R/L2525-32	●		25	25	160	32	25	25	7	SNGN090300	1	CCM8UL	CBS13	WB8-22T	SSN0903	SPP3	LT27
R/L2525-42	●		25	25	160	32	25	25	7	SNGN120300	1	CCM8UL	CBS14	WB8-22T	SSND423		



General Turning
Clamp-on

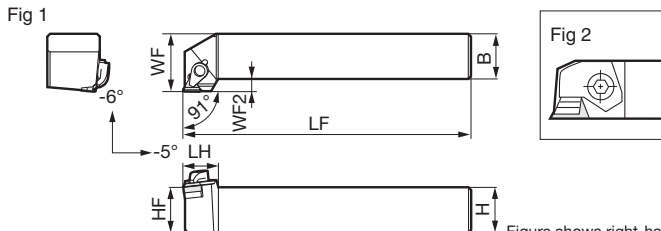
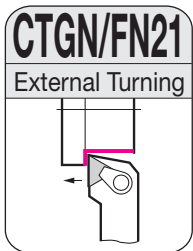


Figure shows right-hand (R) tool.

Insert L110



- (1) TNGN110300
- (2) TNGN160400

Holder

Parts

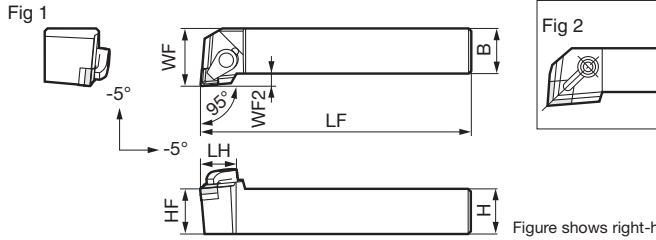
Dimensions (mm)

Cat. No.	Stock		Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Offset WF2	Applicable Insert	Fig	Clamp Plate	Chipbreaker	Double Screw	Bolt	Shim	Shim Retainer	Spring	Wrench
	R	L																	
CTGN R/L2525-22	●		25	25	160	32	25	20	7	TNGN110300	1	CCM6UL	CBT12	WB6-16T	—	STN1103	SPP3	—	LT20
FN21 R/L-44A	●	●	25	25	160	25	25	32	—	TNGN160400	2	DCR/L2	CBD4R/L	—	BH0830R/L	STND323			DSP5

Tool Holders for Solid SUMIBORON



General Turning and Facing
Clamp-on



Insert L110

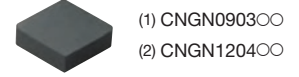


Figure shows right-hand (R) tool.

Holder

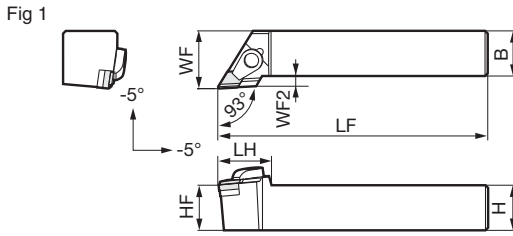
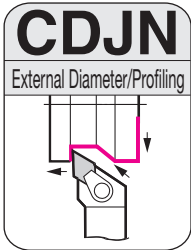
Parts

Dimensions (mm)

Cat. No.	Stock		Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Offset WF2	Applicable Insert	Fig	Clamp Plate	Chipbreaker	Double Screw	Shim	Shim Retainer	Wrench
	R	L															
CCLN R/L2525-32	●		25	25	150	32	25	25	7	CNGN090300	1	CCM8UL	CBC0903	WB8-22T	SCN0903	SPP3	LT27
FCLN R/L2525-43	●	●	25	25	150	32	25	30	7	CNGN120400	2	CCM8-LONG	CBC4	WB8-30	SCND433	SPP3	LH040



General Turning and Profiling
Clamp-on



Insert L110



Figure shows right-hand (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Offset WF2	Applicable Insert	Fig	Clamp Plate	Chipbreaker	Double Screw	Shim	Shim Retainer	Wrench
	R	L															
CDJN R/L2525-32	●		25	25	150	32	25	30	7	DNGN110300	1	CCM8UL	CBD1103	WB8-22T	SDN1103	SPP3	LT27

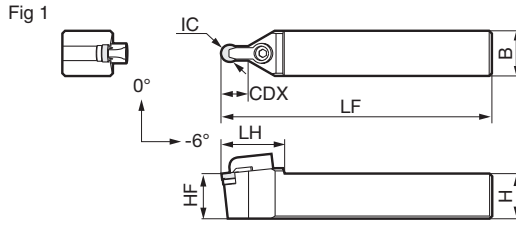
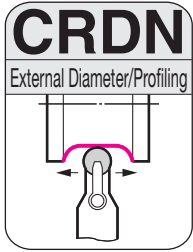


Tool Holders for Solid SUMIBORON

SUMIBORON



General Turning and Profiling
Clamp-on



Insert L110



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

Holder

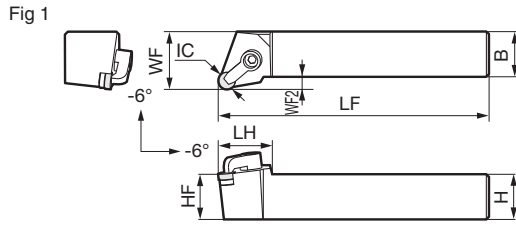
Parts

Dimensions (mm)

Cat. No.	Stock	Inscribed Circle IC	Height H	Width B	Overall Length LF	Cutting Edge Height HF	Head LH	Depth of Cut CDX	Applicable Insert	Fig	Clamp Plate	Double Screw	Shim	Shim Retainer	Wrench
CRDN N2525-32	●	9.525	25	25	150	25	35	15	RNGN090300	1	CCM8-LONG	WB8-22T	SRND32	SPP3	LT27
N2525-42	●	12.7	25	25	150	25	35	20	RNGN120300	1			SRND42		
N2525-43	●	12.7	25	25	150	25	35	20	RNGN120400	1					



General Turning and Face Grooving
Clamp-on



Insert L110



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

Figure shows right-hand (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Inscribed Circle IC	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Offset WF2	Applicable Insert	Fig	Clamp Plate	Double Screw	Shim	Shim Retainer	Wrench
	R	L															
CRSN R/L2525-32	●		9.525	25	25	150	32	25	30	7	RNGN090300	1	CCM8-LONG	WB8-22T	SRND32	SPP3	LT27
R/L2525-42	●		12.7	25	25	150	32	25	30	7	RNGN120300	1			SRND42		
R/L2525-43	●		12.7	25	25	150	32	25	30	7	RNGN120400	1					

Tool Holders for Solid SUMIBORON



General Turning
Dimple Lock

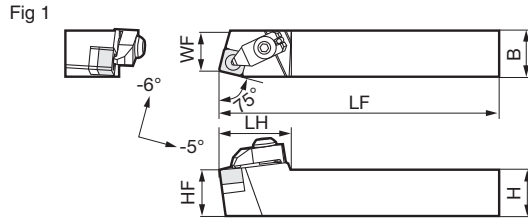
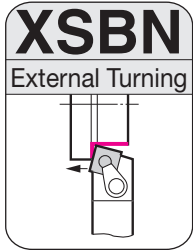


Figure shows right-hand (R) tool.

Insert L110

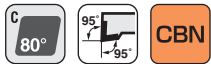


Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert	Fig	Parts					
	R	L									Clamp Plate	Bolt	Shim	Shim Retainer	Spring	Wrench
XSBN R/L2525-43	●		25	25	150	21.5	25	38	SNGX120400	1	DSLX8	BH0825	SSND433	SPP3	GSP10	LH050



General Turning and Facing
Dimple Lock

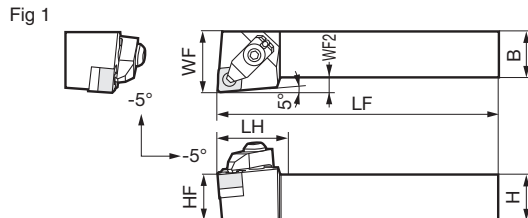


Figure shows right-hand (R) tool.

Insert L110



Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Offset WF2	Applicable Insert	Fig	Parts					
	R	L										Clamp Plate	Bolt	Shim	Shim Retainer	Spring	Wrench
XCLN R/L2525-43	●		25	25	150	32	25	33	7	CNGX120400	1	DSLX8	BH0825	SCND433	SPP3	GSP10	LH050



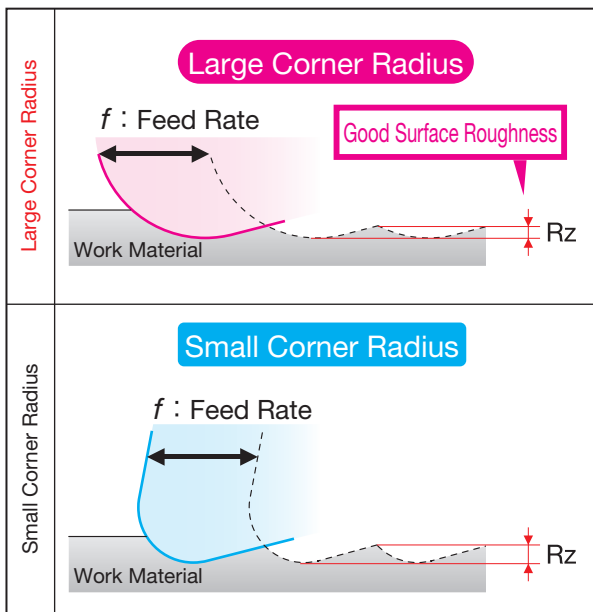
Inserts & Special Holders for High-efficiency Machining



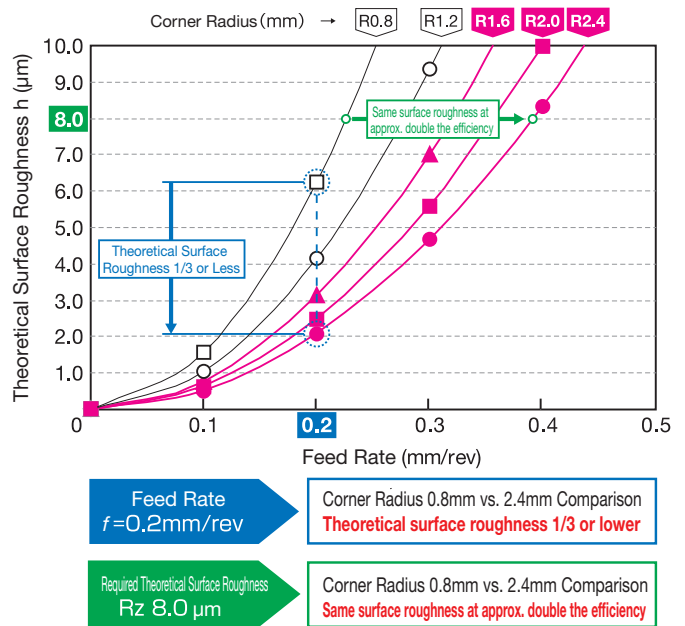
Features

- Improved finished surface roughness with high-feed cutting
- Ideal for profiling when surface roughness is required

Operation with different corner radius

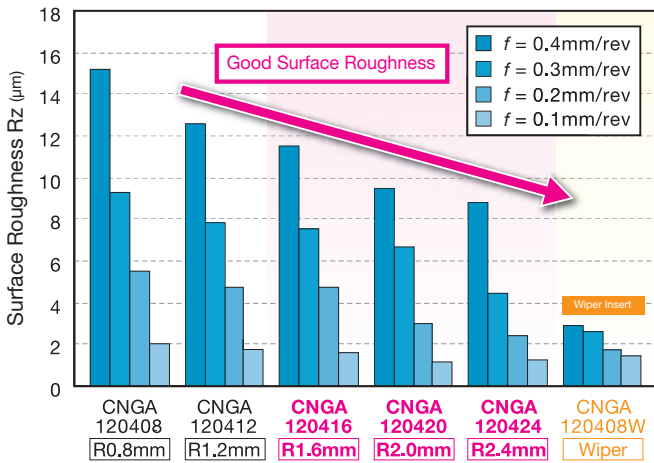


Comparison of Theoretical Surface Roughness



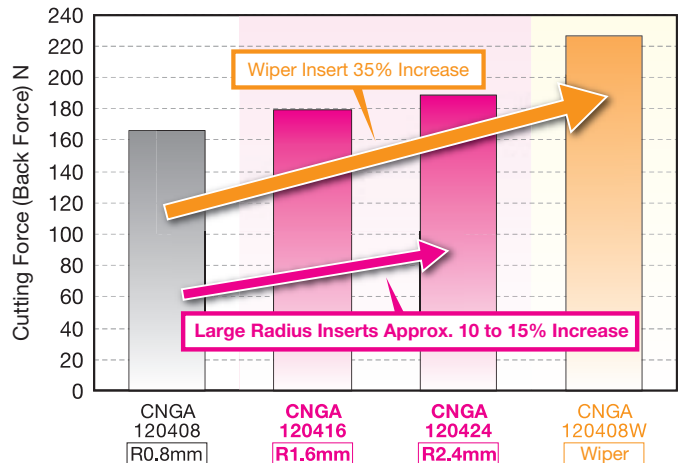
* Actual value of surface roughness is approximately 1.5 to 3 times higher (for steel).
 * Theoretical surface roughness is calculated using the following formula: $[h = (f^2 / 8r) \times 10^3]$.

Machined surface roughness comparison with different corner radius



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

Cutting force comparison with different corner radius



Low cutting force compared to wiper insert enables high-feed cutting

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

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

Inserts & Special Holders for High-efficiency Machining

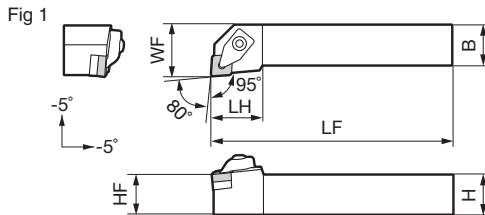
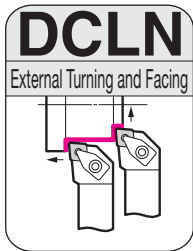
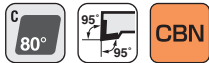
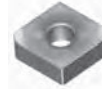


Figure shows right-hand (R) tool.

Insert **L119**



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

Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height	Width	Overall Length	Cutting Edge	Cutting Edge Height	Head	Applicable Insert	Fig	Clamp Set		Shim	Shim Screw	Wrench for Shims	Top Hex Wrench	Bottom Hex Wrench
	R	L									H	N·m					
DCLN R/L 2525M12-R24	●	●	25	25	150	32	25	32	0NC-CNGA120400	1	SCP-2	5.0	CNS1204-R24	BFTX0409N	TRX15 (*1)	LH040	LH025
R/L 3225P12-R24	●	●	32	25	170	32	32	32		1							
R/L 3232P12-R24	●	●	32	32	170	40	32	32		1							

*Dedicated tool holder for 1.6mm/2.0mm/2.4mm corner radius inserts. Other sizes cannot be used.

*1 Wrench for shim is sold separately from the main body.

Clamp Set Parts **C46**

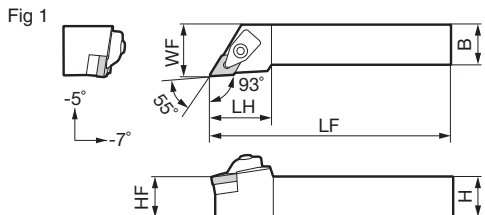
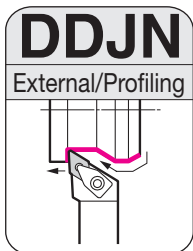


Figure shows right-hand (R) tool.

Insert **L119**



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

Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height	Width	Overall Length	Cutting Edge	Cutting Edge Height	Head	Applicable Insert	Fig	Clamp Set		Shim	Shim Screw	Wrench for Shims	Top Hex Wrench	Bottom Hex Wrench
	R	L									H	N·m					
DDJN R/L 2525M15-R24	●	●	25	25	150	32	25	32	0NC-DNGA150400	1	SCP-2	5.0	DNS1504-R24	BFTX0409N	TRX15 (*1)	LH040	LH025
R/L 3225P15-R24	●	●	32	25	170	32	32	38		1							
R/L 3232P15-R24	●	●	32	32	170	40	32	38		1							

*Dedicated tool holder for 1.6mm/2.0mm/2.4mm corner radius inserts. Other sizes cannot be used.

*1 Wrench for shim is sold separately from the main body.

Clamp Set Parts **C46**

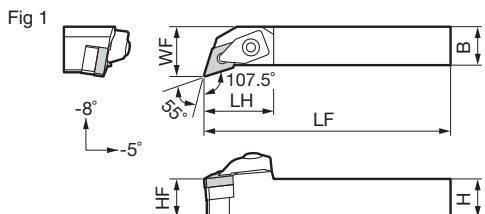
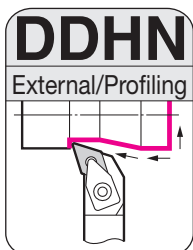


Figure shows right-hand (R) tool.

Insert **L119**



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

Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height	Width	Overall Length	Cutting Edge	Cutting Edge Height	Head	Applicable Insert	Fig	Clamp Set		Shim	Shim Screw	Wrench for Shims	Top Hex Wrench	Bottom Hex Wrench
	R	L									H	N·m					
DDHN R/L 2525M15-R24	●	●	25	25	150	35	25	35	0NC-DNGA150400	1	SCP-2	5.0	DNS1504-R24	BFTX0409N	TRX15 (*1)	LH040	LH025

*Dedicated tool holder for 1.6mm/2.0mm/2.4mm corner radius inserts. Other sizes cannot be used.

*1 Wrench for shim is sold separately from the main body.

Clamp Set Parts **C46**

Recommended Tightening Torque (N·m)

Inserts & Special Holders for High-efficiency Machining

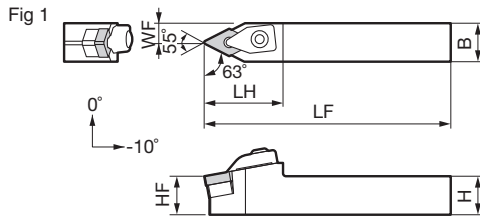
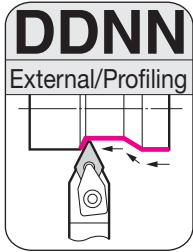


Figure shows right-hand (R) tool.

Insert **L119**



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

Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert	Fig	Clamp Set		Shim	Shim Screw	Wrench for Shims	Top Hex Wrench	Bottom Hex Wrench
	R	L									N-m	N-m					
DDNN N 2525M15-R24	●		25	25	150	13	25	40	0NC-DNGA150400	1	SCP-2	5.0	DNS1504-R24	BFTX0409N	TRX15 (*1)	LH040	LH025

*Dedicated tool holder for 1.6mm/2.0mm/2.4mm corner radius inserts. Other sizes cannot be used.

*1 Wrench for shim is sold separately from the main body.

Clamp Set Parts **C46**

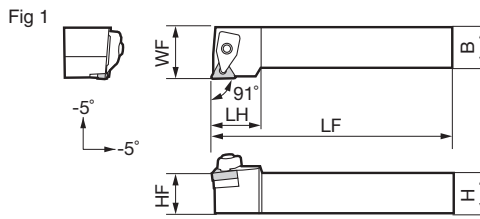
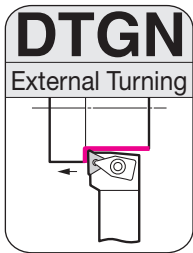


Figure shows right-hand (R) tool.

Insert **L119**



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

Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert	Fig	Clamp Set		Shim	Shim Screw	Wrench for Shims	Top Hex Wrench	Bottom Hex Wrench
	R	L									N-m	N-m					
DTGN R/L 2525M16-R24	●	●	25	25	150	32	25	32	0NC-TNGA160400	1	SCP-1	5.0	TNS1604-R24	BFTX0307N	TRX10 (*1)	LH040	LH025
R/L 3225P16-R24	●		32	25	170	32	32										
R/L 3232P16-R24	●		32	32	170	40	32										

*Dedicated tool holder for 1.6mm/2.0mm/2.4mm corner radius inserts. Other sizes cannot be used.

*1 Wrench for shim is sold separately from the main body.

Clamp Set Parts **C46**

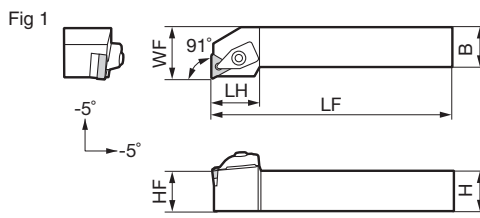
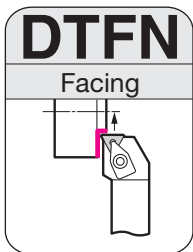


Figure shows right-hand (R) tool.

Insert **L119**



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

Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert	Fig	Clamp Set		Shim	Shim Screw	Wrench for Shims	Top Hex Wrench	Bottom Hex Wrench
	R	L									N-m	N-m					
DTFN R/L 2525M16-R24	●	●	25	25	150	32	25	30	0NC-TNGA160400	1	SCP-1	5.0	TNS1604-R24	BFTX0307N	TRX10 (*1)	LH040	LH025

*Dedicated tool holder for 1.6mm/2.0mm/2.4mm corner radius inserts. Other sizes cannot be used.

*1 Wrench for shim is sold separately from the main body.

Clamp Set Parts **C46**

Inserts & Special Holders for High-efficiency Machining



Single-Sided Insert Type (SUMIBORON)

Dimensions (mm)

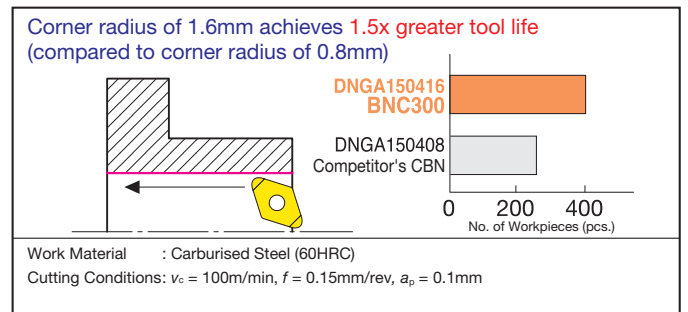
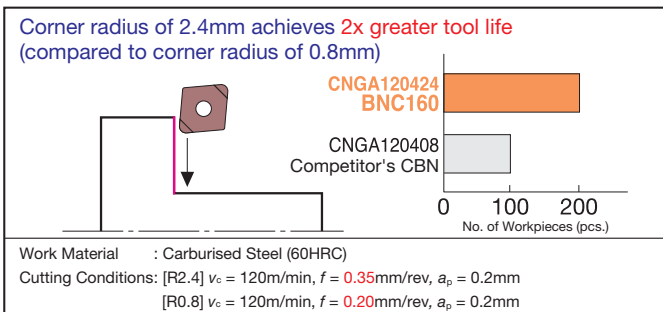
Appearance	Cat. No.	No. of Cutting Edges	Stock/Planned Stock							Corner Radius	CBN Cutting Edge Length	Inscribed Circle	Thickness	Hole Dia.
			BNC2115	BNC2125	BNC2010	BNC2020	BNC160	BNC200	BNC300					
	2NC-CNGA 120416	2			●	●	●	●	●	1.6	3.3	12.7	4.76	5.16
	120420	2			●	●	●	●	●	2.0	3.2	12.7	4.76	5.16
	120424	2			●	●	●	●	●	2.4	3.1	12.7	4.76	5.16
	2NC-DNGA 150416	2			●	●	●	●	●	1.6	3.4	12.7	4.76	5.16
	150420	2			●	●	●	●	●	2.0	3.0	12.7	4.76	5.16
	150424	2			●	●	●	●	●	2.4	2.7	12.7	4.76	5.16
	3NC-TNGA 160416	3			●	●	●	●	●	1.6	3.3	9.525	4.76	3.81
	160420	3			●	●	●	●	●	2.0	3.0	9.525	4.76	3.81
	160424	3			●	●	●	●	●	2.4	2.7	9.525	4.76	3.81

Double-Sided Insert Type (SUMIBORON)

Dimensions (mm)

Appearance	Cat. No.	No. of Cutting Edges	Stock/Planned Stock							Corner Radius	CBN Cutting Edge Length	Inscribed Circle	Thickness	Hole Dia.
			BNC2115	BNC2125	BNC2010	BNC2020	BNC160	BNC200	BNC300					
	4NC-CNGA 120416	4	○	○	●	●	●	●	●	1.6	3.3	12.7	4.76	5.16
	120420	4	○	○	●	●	●	●	●	2.0	3.2	12.7	4.76	5.16
	120424	4	○	○	●	●	●	●	●	2.4	3.1	12.7	4.76	5.16
	4NC-DNGA 150416	4	○	○	●	●	●	●	●	1.6	3.4	12.7	4.76	5.16
	150420	4	○	○	●	●	●	●	●	2.0	3.0	12.7	4.76	5.16
	150424	4	○	○	●	●	●	●	●	2.4	2.7	12.7	4.76	5.16
	6NC-TNGA 160416	6	○	○	●	●	●	●	●	1.6	3.3	9.525	4.76	3.81
	160420	6	○	○	●	●	●	●	●	2.0	3.0	9.525	4.76	3.81
	160424	6	○	○	●	●	●	●	●	2.4	2.7	9.525	4.76	3.81

Application Examples (For Automotive Components)



BSME Type

SUMIBORON

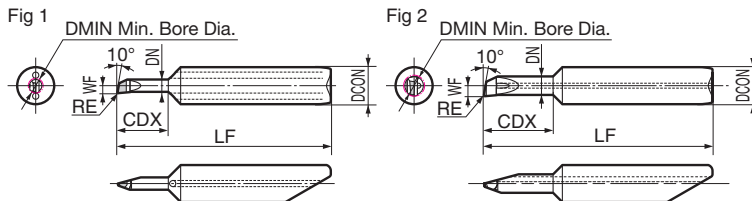
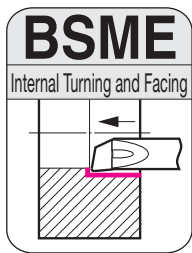


■ Features

- Applicable to min. bore diameters from $\phi 2.5\text{mm}$ in internal 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
- BSME Type (Brazed Type)
Can be used with bore diameters from $\phi 2.5$ to 5.0mm
- SEXC Type (Indexable Insert Type)
Can be used with bore diameters from $\phi 4.0$ to 6.0mm



SUMIBORON
Brazed



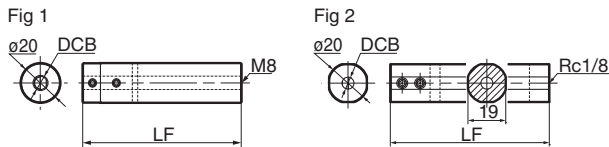
SumiSmall

Holder (SUMIBORON)

Dimensions (mm)

Cat. No.	BN2000		Min. Bore Dia. DMIN	Diameter DCON	Neck Dia. DN	Overall Length LF	Cutting Edge Distance WF	Max. Depth of Cut CDX	Corner Radius RE	Applicable Sleeve	Fig
	R	L									
BSME R/L25020D2S6	●	●	2.5	6.0	2.0	32.0	1.20	5.3	0.2	HBSM6020 HBSM6020A	1
BSME R/L25020D3S6	●	●	2.5	6.0	2.0	34.5	1.20	7.8	0.2		1
BSME R/L25020D4S6	●	●	2.5	6.0	2.0	37.0	1.20	10.3	0.2		1
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		2
BSME R/L30020D4S6	●	●	3.0	6.0	2.5	38.8	1.45	12.3	0.2		2
BSME R/L35020D2S6	●	●	3.5	6.0	3.0	33.5	1.70	7.3	0.2		2
BSME R/L35020D3S6	●	●	3.5	6.0	3.0	37.0	1.70	10.8	0.2		2
BSME R/L35020D4S6	●	●	3.5	6.0	3.0	40.5	1.70	14.3	0.2		2
BSME R/L40020D2S6	●	●	4.0	6.0	3.5	33.9	1.95	8.3	0.2		2
BSME R/L40020D3S6	●	●	4.0	6.0	3.5	37.9	1.95	12.3	0.2		2
BSME R/L40020D4S6	●	●	4.0	6.0	3.5	41.9	1.95	16.3	0.2		2
BSME R/L45020D2S6	●	●	4.5	6.0	4.0	35.0	2.20	9.3	0.2		2
BSME R/L45020D3S6	●	●	4.5	6.0	4.0	39.5	2.20	13.8	0.2		2
BSME R/L45020D4S6	●	●	4.5	6.0	4.0	44.0	2.20	18.3	0.2		2
BSME R/L50020D2S6	●	●	5.0	6.0	4.5	35.8	2.45	10.3	0.2		2
BSME R/L50020D3S6	●	●	5.0	6.0	4.5	40.8	2.45	15.3	0.2		2
BSME R/L50020D4S6	●	●	5.0	6.0	4.5	45.8	2.45	20.3	0.2		2

The BSME Type requires HBSM6020(A) adapter sleeve (sold separately).



Alignment Jig (For Adapter Sleeve)

Cat. No.	Stock
AFBSM60	●

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

Sleeve

Dimensions (mm)

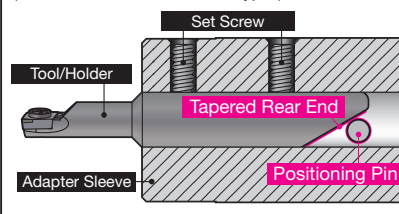
Cat. No.	Stock	Bore Dia. DCB	Overall Length LF	Fig	Set Screw	Wrench
					Fig	Image
HBSM6020	●	6.0	80	1	BT0506	TH025
HBSM6020A	●	6.0	80	2	BT0506	TH025

Adapter sleeve is optional.

Mounting Method L122

Newly Developed Clamp Mechanism

Achieves high-precision cutting edge positioning by combining a tool/holder that has a tapered rear end with a sleeve having an internal positioning pin. (common to BSME and SEXC types).



SEXC Type



SUMIBORON Screw-on

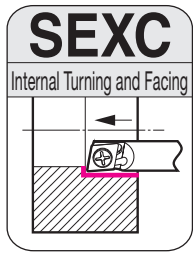
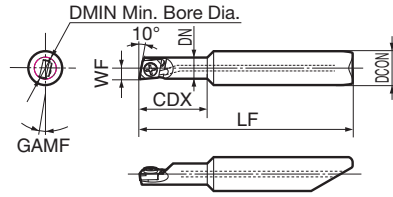


Fig 1



SUMIBORON

Holder

Parts

Dimensions (mm)

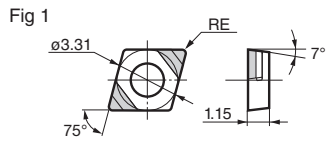
Cat. No.	Stock		Min. Bore Dia.	Diameter	Neck Dia.	Overall Length	Cutting Edge Distance	Boring Depth	Rake Angle	Applicable Sleeve	Fig	Bolt		Wrench
	R	L										DMIN	DCON	
E06D2-SEXC R/L03-04P	●	●	4.0	6.0	3.75	33.75	1.95	8	-13°	HBSM6020 HBSM6020A	1	MIB1.6-2	0.2	SDBSM
E06D3-SEXC R/L03-04P	●	●	4.0	6.0	3.75	37.75	1.95	12	-13°					
E06D2-SEXC R/L03-05P	●	●	5.0	6.0	4.75	35.25	2.45	10	-12°					
E06D3-SEXC R/L03-05P	●	●	5.0	6.0	4.75	40.25	2.45	15	-12°					
E06D2-SEXC R/L03-06P	●	●	6.0	6.0	5.75	36.75	2.95	12	-11°					
E06D3-SEXC R/L03-06P	●	●	6.0	6.0	5.75	42.75	2.95	18	-11°					

The SEXC Type requires HBSM6020(A) adapter sleeve (sold separately).

Insert (SUMIBORON)

Dimensions (mm)

Cat. No.	BN2000	BN7000	Corner Radius	RE	Fig
2NU-ECXA 030X02LE	●		0.2	1	
2NU-ECXA 030X02LF	●	●	0.2	1	



Part Number Suffix: LE: Honing, LF: Sharp Edge

Fig 1

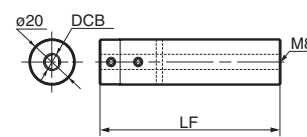
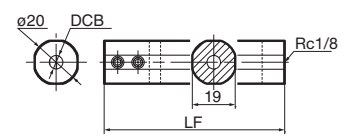


Fig 2



Sleeve

Dimensions (mm)

Cat. No.	Stock	Bore Dia.	Overall Length	Fig	Set Screw	Wrench
HBSM6020	●	6.0	80	1	BT0506	TH025
HBSM6020A	●	6.0	80	2		

Sleeve is optional.

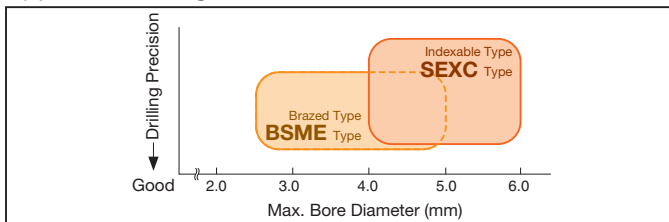
Mounting Method **L122**

Alignment Jig (For Adapter Sleeve)

Cat. No.	Stock
AFBSM60	●

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

Application Range



Recommended Cutting Conditions

Spindle Speed n	Above 2,000 min^{-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 depth of cut causes deformation of the tool, which consequently leads to deterioration of dimensional tolerance.
Feed Rate f	0.01 to 0.10mm/rev	—

Application Examples

Hardened Alloy Steel Valve Components **BSME**

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

Tool Type	No. of Workpieces (pcs.)
Brazed Type BSME Type	1,700
Competitor's CBN Tool	600

Work Material: Hardened Alloy Steel Valve Component (Automotive Component)
 Tool: BSME R50020D2S6 Grade: BN2000
 Cutting Conditions: $v_c = 118\text{m/min}$ ($7,500\text{min}^{-1}$), $f = 0.02\text{mm/rev}$, $a_p = 0.10\text{mm}$ Dry

Bearing Steel: Small Automotive Components **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.

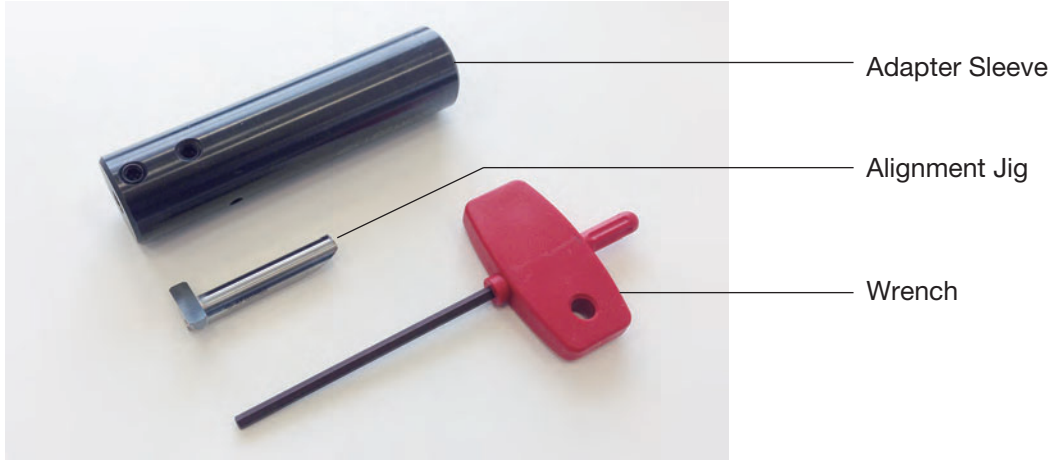
Tool Type	No. of Workpieces (pcs.)
Indexable Insert Type SEXC Type	1,500
Competitor's Brazed CBN Tool	1,000

Work Material: Bearing Steel Small Automotive Component (60HRC)
 Holder: E06D2-SEXC R/L03-04P Insert: 2NU-ECXA 030X02LF (BN2000)
 Cutting Conditions: $v_c = 50\text{m/min}$ ($4,000\text{min}^{-1}$), $f = 0.02\text{mm/rev}$, $a_p = 0.02\text{mm}$ Wet

BSME Type/SEXC Type



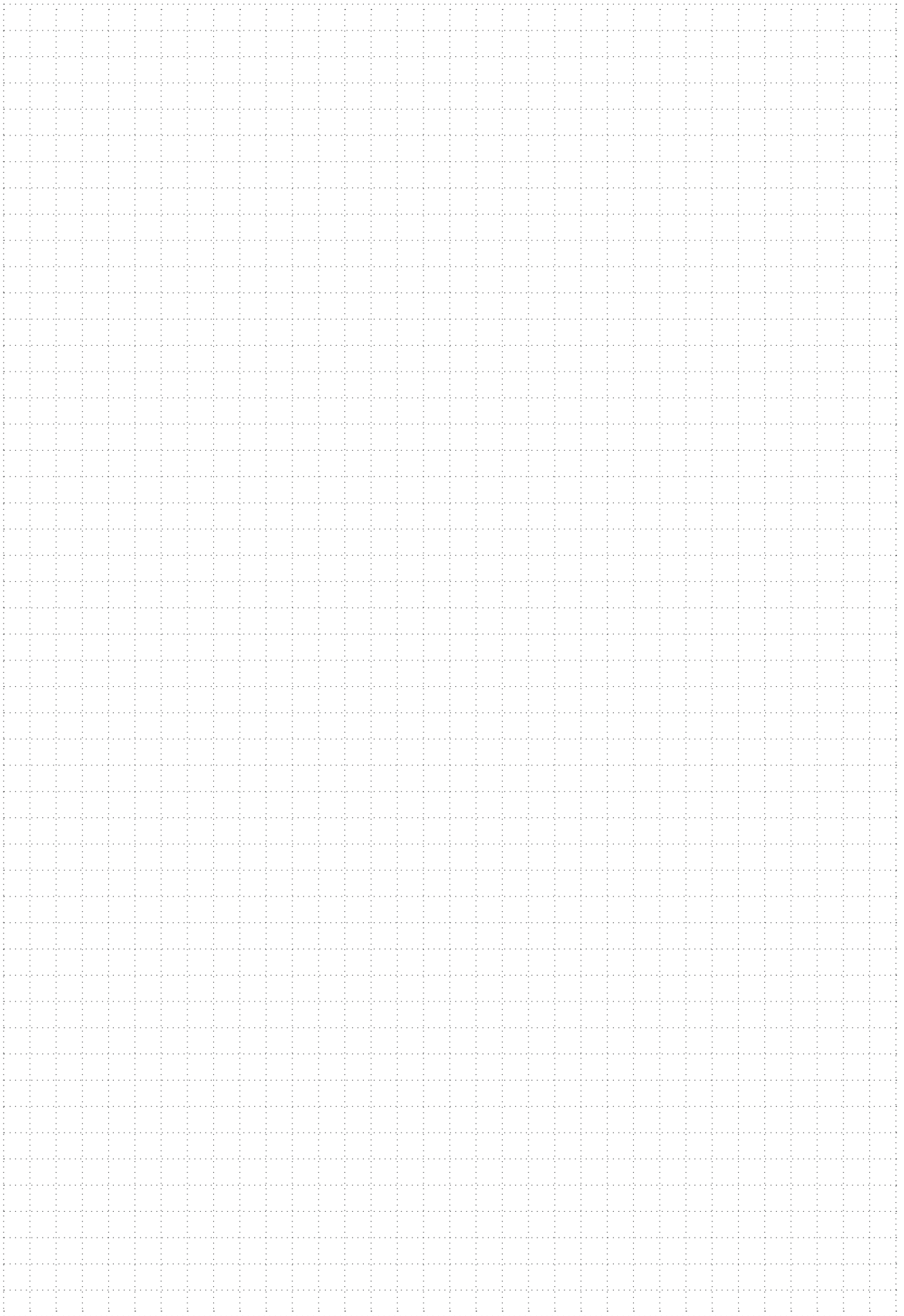
■ Dedicated Adapter Sleeve/Alignment Jig



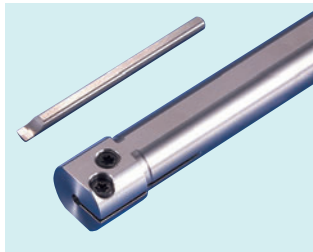
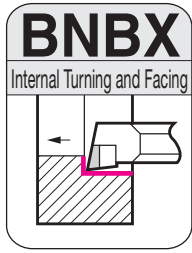
■ Mounting Method

<p>1. Insert the alignment jig until it hits the positioning pin set in the adapter sleeve, and fasten the two set screws. Also fix the alignment jig.</p>	<p>(1) Insert until it hits the positioning pin. →</p> <p>(2) Tighten the two set screws</p>
<p>2. Mount the sleeve on the equipment and temporarily fasten with a bolt.</p>	<p>Temporary screw fastening</p>
<p>3. Rotate the sleeve gradually to adjust until the alignment jig side lock flat is horizontal.</p>	<p>When you set the sleeve adjusted with the alignment jig on the holder, the cutting edge position will automatically be set on center.</p>
<p>4. Using a tool presetter, measure the holder diameter dimensions.</p>	

MEMO



BNBX Type



- Newly developed high rigidity slit-clamping system, excellent for small hole internal boring.
 - Enables maximum overhang of L/D = 5
 - Minimal deformation produces boring with excellent dimensional tolerance.
 - Minimal chatter produces superior surface finish
 - Easy bar indexing while clamped
- Series now includes BN2000 for hardened steel and BN7000 for sintered alloy

SUMIBORON

Holder (SUMIBORON)

Dimensions (mm)

Cat. No.	BN2000	BN7000	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Corner Radius RE	Applicable Sleeve	Fig
BNBX 020R	●	●	2.5	2.0	1.8	40	0.2	HBX 2016	1
BNBX 025R	●	●	3.0	2.5	2.2	40	0.2	HBX 2516	1
BNBX 030R	●	●	3.5	3.0	2.7	40	0.2	HBX 3016	1
BNBX 035R	●	●	4.0	3.5	3.2	40	0.2	HBX 3516	1
BNBX 040R	●	●	4.5	4.0	3.7	40	0.2	HBX 4016	1
BNBX 045R	●	●	5.0	4.5	4.2	40	0.2	HBX 4516	1
BNBX 050R	●	●	5.5	5.0	4.7	60	0.2	HBX 5016	1
BNBX 055R	●	●	6.0	5.5	5.2	60	0.2	HBX 5516	1
BNBX 060R	●	●	6.5	6.0	5.7	60	0.2	HBX 6016	1
BNBX 065R	●	●	7.0	6.5	6.2	60	0.2	HBB 6516	1
BNBX 070R	●	●	7.5	7.0	6.7	80	0.2	HBB 716	1
BNBX 075R	●	●	8.0	7.5	7.2	80	0.2	HBB 7516	1
BNBX 080R	●	●	8.5	8.0	7.7	80	0.2	HBB 816	1

BNBX bars can be used with HBB type sleeves, but HBX type sleeves are recommended for bars below ø6mm.

Fig 1

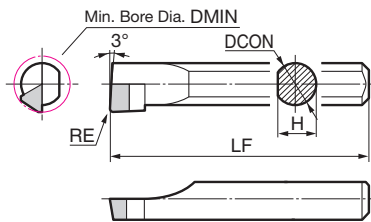


Fig 1

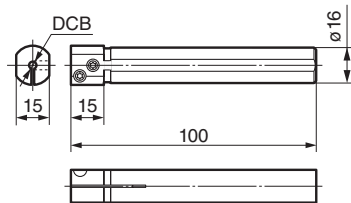
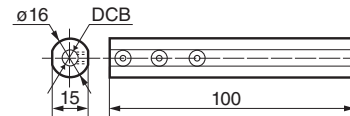


Fig 1



Sleeve (HBX Type)

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Applicable Tool Holder	Fig
HBX 2016	●	2.0	BNBX 020R	1
HBX 2516	●	2.5	BNBX 025R	1
HBX 3016	●	3.0	BNBX 030R	1
HBX 3516	●	3.5	BNBX 035R	1
HBX 4016	●	4.0	BNBX 040R	1
HBX 4516	●	4.5	BNBX 045R	1
HBX 5016	●	5.0	BNBX 050R	1
HBX 5516	●	5.5	BNBX 055R	1
HBX 6016	●	6.0	BNBX 060R	1

Sleeve (HBB Type)

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Applicable Tool Holder	Fig
HBB 6516	●	6.5	BNBX 065R	1
HBB 716	●	7.0	BNBX 070R	1
HBB 7516	●	7.5	BNBX 075R	1
HBB 816	●	8.0	BNBX 080R	1

HBB Type sleeve can also be used with ø2.5 to 6.0mm holders.

Spare Parts (for Adapter Sleeve)

Applicable Sleeve	Screw		Set Screw	Wrench
	Image	(N·m)	Image	Image
HBX2000		1.5	BT06035T	TRD (For Torx Holes)
HBX3000			BT0404	LH (For Hex Socket)
HBX4000			BT06035T	TRD15
HBX5000			BT06035T	TRD15
HBX6000			BT0404	LH020

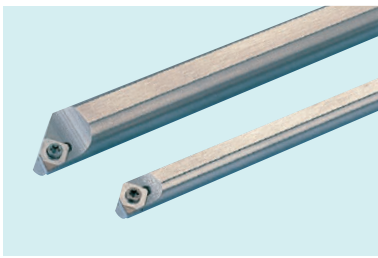
Recommended Cutting Conditions

Spindle Speed <i>n</i>	Above 2,000 min ⁻¹	Low speeds may cause chattering and chipping on the cutting edge.
Depth of Cut <i>a_p</i>	0.01 to 0.2mm	Excessive depth of cut may cause larger tool deformation, resulting in deterioration of bore accuracy.
Feed Rate <i>f</i>	0.01 to 0.1mm/rev	—

Important Notes

- (1) Make the holder overhang as short as possible. (Maximum L/D = 5)
- (2) Even minor workpiece runout may affect tool life.
- (3) Select a boring bar with a diameter as close to the bore diameter as possible.
- (4) Although it is difficult to increase the rotational speed in small-diameter boring applications, higher speeds are recommended whenever possible to extend tool life.

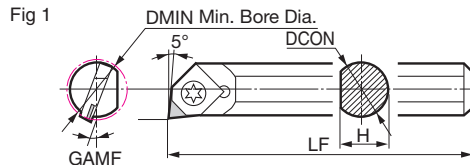
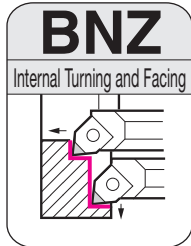
BNZ Type



- $\phi 7$ mm minimum bore diameter with special one-use insert
- High-rigidity indexable type boring bar with all-cemented carbide shank and powerful clamp
- Economical and easy tool management with single-use type inserts



SUMIBORON
Screw-on



Sumi Small

Holder

Parts

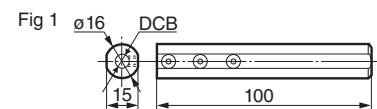
Dimensions (mm)

Cat. No.	Stock	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Rake Angle GAMF	Fig	Dimensions (mm)				
								Flat Insert Screw	Wrench	Adapter Sleeve		
BNZ 606R	●	7.0	6.0	5.5	80	-14°	1	BFTX0204N	0.5	TRX06	—	HBB616
BNZ 608R	●	9.0	8.0	7.5	100	-12°	1					HBB816
BNZ 610R	●	11.0	10.0	9.5	125	-10°	1					
BNZ 612R	●	13.0	12.0	11.0	130	-8°	1					
BNZ 616R	●	17.0	16.0	15.0	145	-6°	1					
BNZ 620R	●	21.0	20.0	19.0	160	-5°	1					

Insert (SUMIBORON)

Dimensions (mm)

Quantity	Cat. No.	BNC2010	BNC2020	BN1000	BN2000	BN7000	Corner Radius RE	Fig 1
Single pack	NU-ZNEX 040102	—	—	●	●	●	0.2	
	NU-ZNEX 040104	—	—	●	●	—	0.4	
	NC-ZNEX 040102LE	●	—	—	—	—	0.2	
	NC-ZNEX 040104LE	●	—	—	—	—	0.4	
	NC-ZNEX 040102LT	—	●	—	—	—	0.2	
NC-ZNEX 040104LT	—	●	—	—	—	0.4		
10 pack	T-NU-ZNEX 040102	—	—	●	—	—	0.2	
	T-NU-ZNEX 040104	—	—	●	—	—	0.4	



Sleeve

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Applicable Holder	Fig
HBB 616	●	6.0	BNZ 606R	1
HBB 816	●	8.0	BNZ 608R	1

HBX Type sleeve (HBB6016) can also be used with BNZ606R.

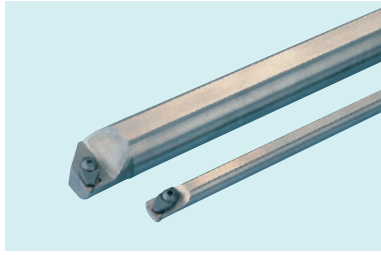
Recommended Cutting Conditions

Spindle Speed n	Above 2,000 min ⁻¹	Low speeds 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	—

Important Notes

- (1) Make the holder overhang as short as possible. (Maximum L/D = 5)
- (2) Even minor workpiece runout may affect tool life.
- (3) Select a boring bar with a diameter as close to the bore diameter as possible.
- (4) Although it is difficult to increase the rotational speed in small-diameter boring applications, higher speeds are recommended whenever possible to extend tool life.

BNB Type

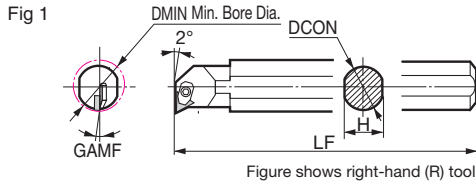
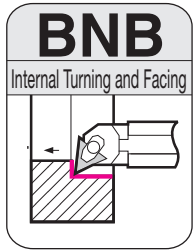


- High rigidity full cemented carbide boring bar shank
 - Minimal deformation produces boring with excellent dimensional tolerance.
 - Minimal chatter produces superior surface finish.
- Full-top SUMIBORON insert enables 3 cutting edges
- Can be used with SUMIDIA inserts for non-ferrous metal machining
- Now with economical single-corner NF Type SUMIDIA insert

SUMIBORON



SUMIBORON
Clamp-on



SumiSmall

Holder

Parts

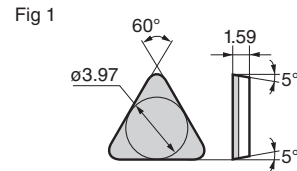
Dimensions (mm)

Cat. No.	Stock	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Rake Angle GAMF	Fig	Clamp Plate	Bolt	Nut	Wrench
BNB 508R	●	10.0	8.0	7.0	140	-9°	1	BNBC	BH0306	BNBW-2	TH020
BNB 510R	●	12.0	10.0	9.0	140	-8°	1		FBUP3-A0-9	BNBW-4	
BNB 512R	●	14.0	12.0	11.0	160	-6°	1				
BNB 516R	●	18.0	16.0	14.0	180	-5°	1				
BNB 520R	●	22.0	20.0	18.0	180	-4°	1		BH0310	BNBW-7	

Insert (SUMIBORON, SUMIDIA)

Dimensions (mm)

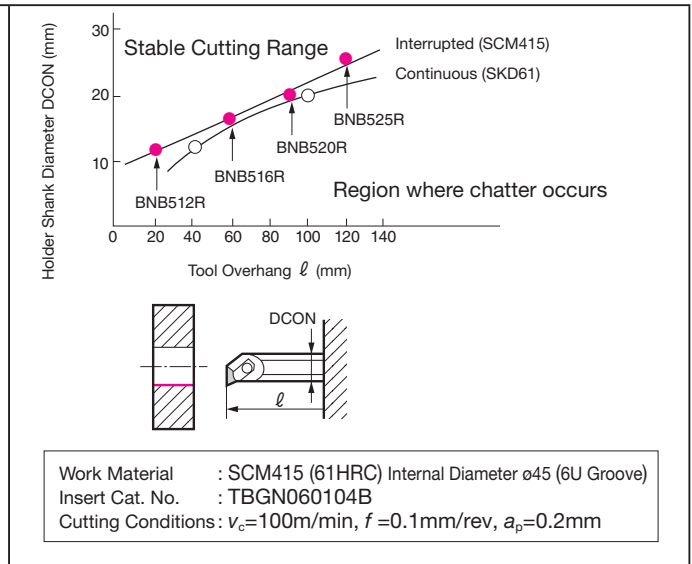
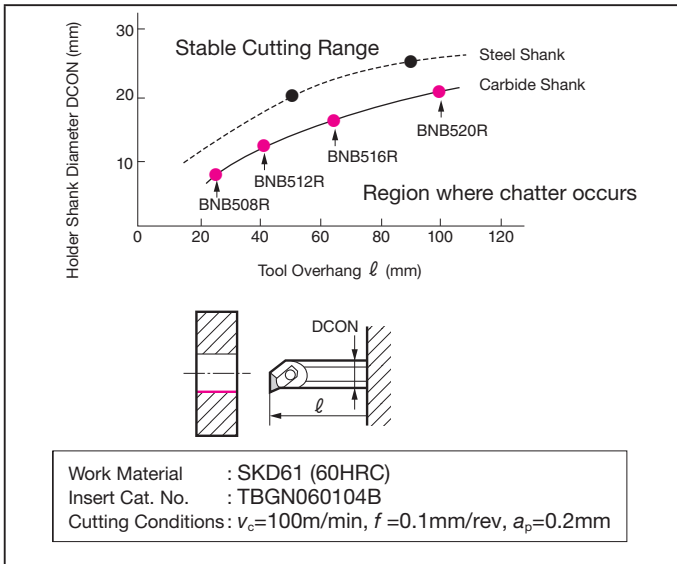
Cat. No.	SUMIBORON							SUMIDIA		Corner Radius RE
	BNX10	BNX20	BN2000	BN350	BN500	BN7000	DA150	DA1000		
TBGN 060102B	●	●	●	●	●	●	●	●	0.2	
TBGN 060104B	●	●	●	●	●	●	●	●	0.4	
TBGN 060108B	—	●	●	●	●	●	—	—	0.8	
TBGN 060102-BSTN¹	—	●	—	—	—	—	—	—	0.2	
TBGN 060104-BSTN¹	—	●	—	—	—	—	—	—	0.4	
TBGN 060108-BSTN¹	—	●	—	—	—	—	—	—	0.8	
NF-TBGN 060102²	—	—	—	—	—	—	—	●	0.2	
NF-TBGN 060104²	—	—	—	—	—	—	—	●	0.4	



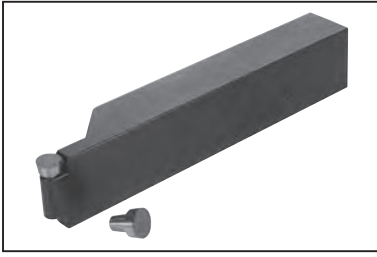
¹ TBGN ○○○○○○-BSTN is only available in BNX20 grade and has a smaller negative land angle. (BSTN: -15°, B: -25°. However, the negative land angle is uniquely configured for each grade.)

² NF-TBGN is a single corner insert. (This is not a Full-Top insert)

Cutting Performance



TRGT Type



- Clamping by cutting force alone
 - Secure clamping is achieved by inserting the tapered portion of the insert into the holder.
 - The lack of protrusions on the insert rake face allows smooth chip evacuation.
- Round insert enables various machining operations
 - Small round insert with stable clamping can be applied to various machining operations.

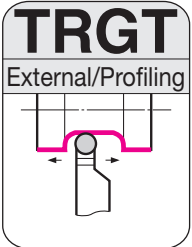


Fig 1

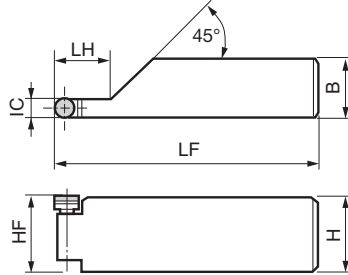


Figure shows right-hand (R) tool.

Holder

Dimensions (mm)

Cat. No.	Stock		Inscribed Circle IC	Height H	Width B	Overall Length LF	Cutting Edge Height HF	Head LH	Applicable Insert	Fig
	R	L								
TRGT R/L2020K05	●		5	20	20	125	20	16	RTGN 0508M0	1
R/L2020K06	●		6	20	20	125	20	16	RTGN 0608M0	1
R/L2525M07			7	25	25	150	25	20	RTGN 0711M0	1
R/L2525M08	●		8	25	25	150	25	20	RTGN 0811M0	1
TRGT R/L3225P09	●		9	32	25	170	32	25	RTGN 0914M0	1
	●		10	32	25	170	32	25	RTGN 1014M0	1
TRGT R/L3225P12			12	32	25	170	32	25	RTGN 1214M0	1

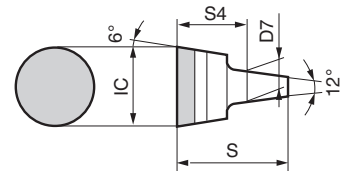
Inserts are not embedded into tool holders.

Insert (SUMIBORON)

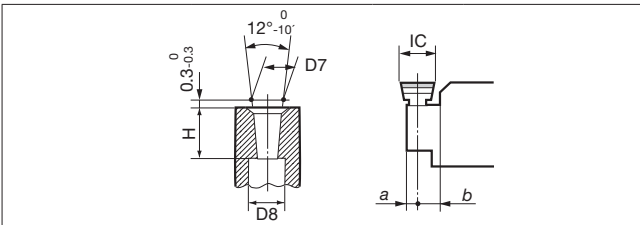
Dimensions (mm)

Cat. No.	BN2000	BNX20	BN7000	Inscribed Circle IC	Diameter D7	Thickness		Fig
						S	S4	
RTGN 0508M0		●		5	2.5	7.5	3.5	1
0608M0		●		6	3.5	7.5	3.5	1
RTGN 0711M0		●		7	3.5	11.0	5.0	1
0811M0		●		8	4.5	11.0	5.0	1
RTGN 0914M0		●		9	5.5	14.0	6.0	1
1014M0		●		10	5.5	14.0	6.0	1
1214M0		●		12	7.5	14.0	6.0	1

Fig 1



Insert Mounting Details

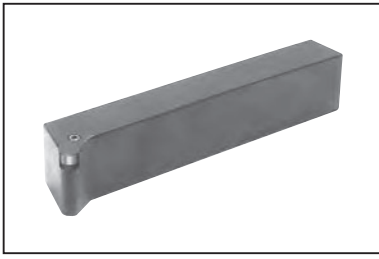


Supported Insert Diameter IC	H	D7	D8	a	b
5	4.0	2.5	1.9	1.85	3.2
6	4.0	3.5	2.9	2.35	3.7
7	6.0	3.5	2.5	2.75	4.3
8	6.0	4.5	3.5	3.25	4.8
9	7.5	5.5	4.2	4.15	5.9
10	7.5	5.5	4.2	4.15	5.9
12	7.5	7.5	6.2	5.15	6.9



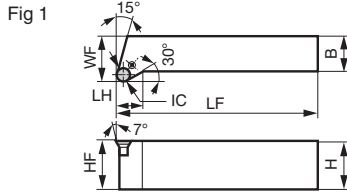
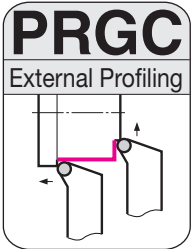
PR Type/SJB Type

SUMIBORON



- Lever lock clamping system
 - Easy operation; the lack of protrusions on the insert rake face allows smooth chip evacuation.
- Versatile round insert can be applied to various operations.

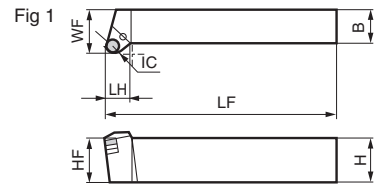
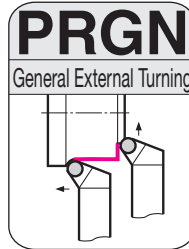
L



Holder

Dimensions (mm)

Cat. No.	Stock		Inscribed Circle IC	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert	Fig
	R	L									
PRGC R/L3225P9	●	●	9	32	25	170	32	32	18	RCGA 0906M0	1

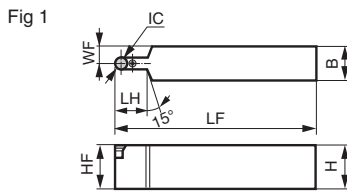
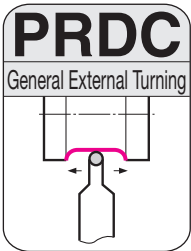


Holder

Dimensions (mm)

Cat. No.	Stock		Inscribed Circle IC	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert	Fig
	R	L									
PRGN R/L3225P9	●	●	9	32	25	170	32	32	10	RNGA 0906M0	1

Inserts are not embedded into tool holders.



Holder

Dimensions (mm)

Cat. No.	Stock		Inscribed Circle IC	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert	Fig
	R	L									
PRDC N 3225P9	●		9	32	25	170	12.5	32	25	RCGA 0906M0	1

Insert (SUMIBORON)

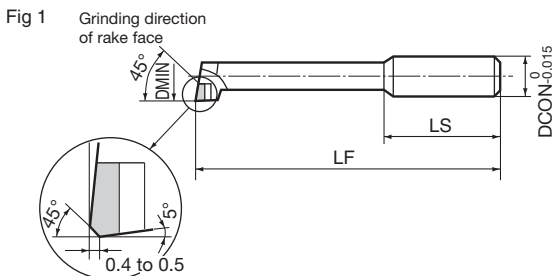
Dimensions (mm)

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

Parts

Applicable Holder	Shim	Lever Pin	Bolt	Shim Retainer	Wrench
PRGC R/L3225P9					
PRDC N 3225P9					
PRGN R/L3225P9	LSR917				

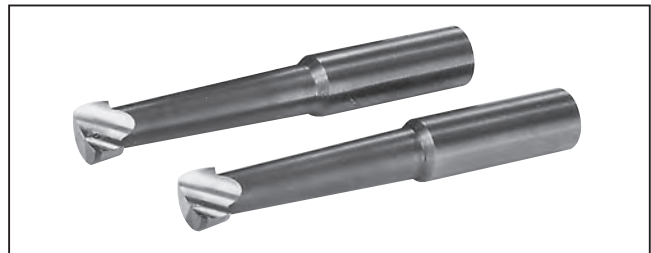
SJB Jig Boring



Holder (SUMIBORON)

Dimensions (mm)

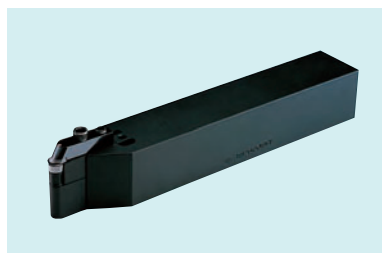
Cat. No.	BN250	Diameter		Min. Bore Dia. DMIN	Overall Length LF	Length LS	Fig
		DCON	DCON				
SJB 0804	▲	8	4	45	32	1	
0805	▲	8	5	45	32	1	
0806	▲	8	6	50	30	1	
0808	▲	8	8	60	30	1	
1006	▲	10	6	50	30	1	
1008	▲	10	8	60	30	1	
1010	▲	10	10	70	30	1	
1012	▲	10	12	70	30	1	
1015	▲	10	15	70	30	1	



Recommended Cutting Conditions (SJB Type)

Spindle Speed n	Above 800 min ⁻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 0.1 mm/rev	—

BNRN Type



- Insert can be reground and used again
 - The same holder can be used for a reground insert by adjusting the slide locator with a clamp
- Reliable holder design
 - The tip of the clamp plate is a cemented carbide chipbreaker that can withstand wear from chips
 - Slide locator uses HSS for durability.

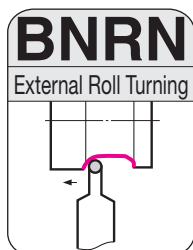
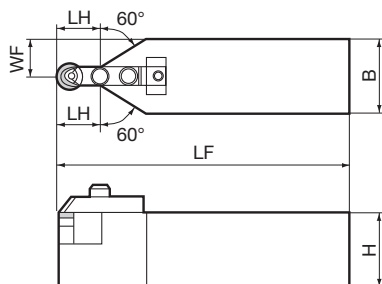


Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge WF	Head LH	Applicable Insert New Product Cat. No.	Applicable Insert (Regrindable Range)	Fig
BNRN 3232-08-07		32	32	200	16	13	RBG08-B	8.0 to 7.0	1
BNRN 4038-10-09		40	38	250	19	17	RBG10-B	10.0 to 9.0	1
4038-12-11		40	38	250	19	20	RBG12-B	12.0 to 11.0	1
BNRN 5050-14-12		50	50	350	25	25	*1	14.0 to 12.0	1
5050-16-14		50	50	350	25	25	RBG16-B	16.0 to 14.0	1
5050-18-16		50	50	350	25	30	*1	18.0 to 16.0	1
5050-20-18		50	50	350	25	30	RBG20-B	20.0 to 18.0	1
5050-22-20		50	50	350	25	35	*1	22.0 to 20.0	1
5050-24-22		50	50	350	25	35	*1	24.0 to 22.0	1
5050-26-24		50	50	350	25	35	RBG26-B	26.0 to 24.0	1

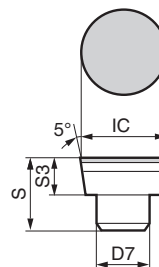
*1 Blank space indicates holders for reground inserts. Inserts are sold separately.

Insert (SUMIBORON)

Dimensions (mm)

Cat. No.	BN7000	Inscribed Circle IC	Diameter D7	Thickness 2 S3	Thickness S	Fig
RBG 08-B	●	8.0	4.0	4.0	6.5	1
10-B	●	10.0	5.0	5.0	9.0	1
12-B	●	12.0	6.0	6.0	11.0	1
16-B	●	16.0	8.0	8.0	13.0	1
20-B	●	20.0	10.0	10.0	15.0	1
26-B	●	26.0	14.0	10.0	15.0	1

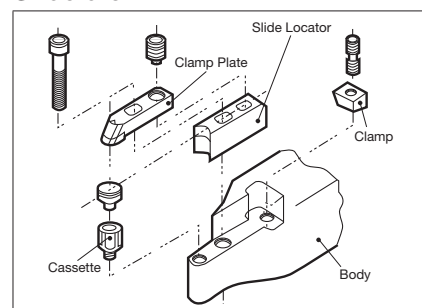
Fig 1



Parts

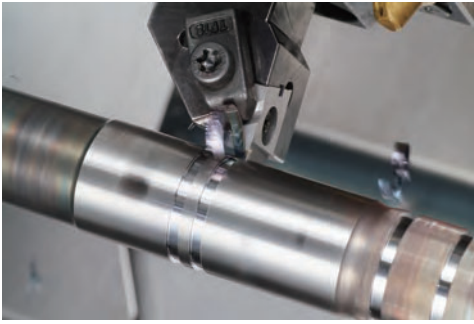
Applicable Holder	Slide Locator	Clamp	Cassette	Clamp Plate	Cap Screw	Set Screw	Double Screw	Wrench
BNRN 3232-08-07 BNRN 4038-10-09	BNRS R-08 BNRS R-10	BNRC-08	BNRE-08 BNRE-10	BNRW-08	BX0425	BTD0609	WB5-18	LH025 LH030
BNRN 4038-12-11	BNRS R-12	BNRC-12	BNRE-12	BNRW-12	BX0635	BTD0812	WB6-20	LH030 LH040 LH050
BNRN 5050-14-12	BNRS R-14		BNRE-14					
BNRN 5050-16-14 BNRN 5050-18-16	BNRS R-16 BNRS R-18	BNRC-16	BNRE-16 BNRE-18	BNRW-16	BX0640	BTD0812	WB8-30	LH040 LH050
BNRN 5050-20-18	BNRS R-20	BNRC-20	BNRE-20	BNRW-20			WB6-30	
BNRN 5050-22-20	BNRS R-22		BNRE-22				WB8-30	
BNRN 5050-24-22	BNRS R-24	BNRC-26	BNRE-24	BNRW-26	BX0840	BTD0818	WB6-30	LH040 LH060
BNRN 5050-26-24	BNRS R-26		BNRE-26				WB8-30	

Structure



GWB Type

SUMIBORON



■ Features

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



Double Clamp
for Hardened Steel Shallow Grooves

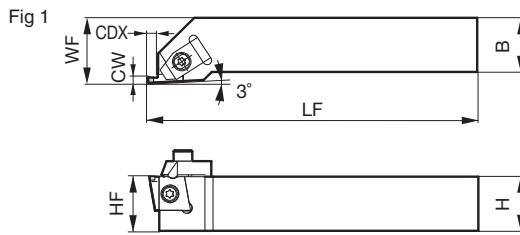
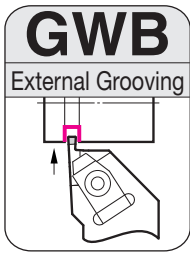


Figure shows right hand (R) tool.

Holder

Parts

Dimensions (mm)

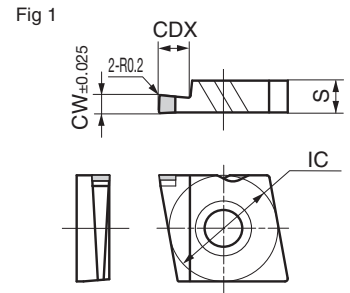
Cat. No.	Stock		Height	Width	Overall Length	Cutting Edge Distance	Cutting Edge Height	Width of Cut	Max. Groove Depth	Group	Fig	Clamp Plate	Cap Screw	Screw	Spring	Wrench	
	R	L										H	B	LF	WF	HF	CW
GWB R/L 2525-45	●	●	25	25	151 (150)	30	25	1.5 ≤ CW ≤ 4.5	3.5 to 5.0	1	1	TF72/TF73	BX0520T	5.0	BFTX0511N	GSP06	TRX20
GWB R/L 2525-60	●	●	25	25	151	30	25	4.5 < CW ≤ 6.0	5.0	2	1						

Dimensions in () are for width of cut (CW) of 3.0 or less. Right-handed (R) tool holders are applicable with right-handed (R) inserts and clamp plates (TF72).

Insert (SUMIBORON)

Dimensions (mm)

Cat. No.	BN2000		BNC30G		Width of Cut	Groove Depth	Inscribed Circle	Thickness	Group	Applicable Holder	Fig
	R	L	R	L							
CGA R/L 1504150	●	●	●	●	1.5	3.5	15.875	4.76	1	GWB R/L 2525-45	1
CGA R/L 1504200	●	●	●	●	2.0	3.5	15.875	4.76			1
CGA R/L 1504250	●	●	●	●	2.5	4.0	15.875	4.76			1
CGA R/L 1504300	●	●	●	●	3.0	4.0	15.875	4.76			1
CGA R/L 1504350	●	●	●	●	3.5	5.0	15.875	4.76			1
CGA R/L 1504400	●	●	●	●	4.0	5.0	15.875	4.76			1
CGA R/L 1504450	●	●	●	●	4.5	5.0	15.875	4.76			1
CGA R/L 1506500	●	●	●	●	5.0	5.0	15.875	6.35	2	GWB R/L 2525-60	1
CGA R/L 1506550	●	●	●	●	5.5	5.0	15.875	6.35			1
CGA R/L 1506600	●	●	●	●	6.0	5.0	15.875	6.35			1



* It is also possible to manufacture widths of cut other than those listed above (CW = 1.5 to 6.0mm).

Grade Features

Recommended Cutting Conditions

Grade	Application Range	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 to interrupted grooving. Features tough substrate with special ceramic coating that exhibits both peel-off and wear resistance.	33 to 35	1.1 to 1.2

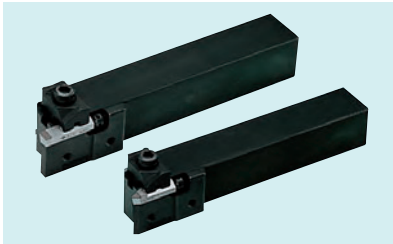
Cutting Conditions	Hardened Steel
Cutting Speed v_c (m/min)	80 to 120
Feed Rate f (mm/rev)	0.04 to 0.08

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

Application Examples

Tooling	Work Material	Tool Cat. No.	Cutting Conditions	Tool Life Comparison
Shaft Grooving: Continuous Required Surface Roughness for Groove Sides: Ra 0.4µm	Carburised steel 58 to 62 HRC	CGAR1504200 BN2000	v_c : 120m/min f : 0.05mm/rev Groove Depth: 2mm Dry	GWB Type BN2000: No Chipping Conventional Tool: Chipping
Spline Grooving: Interrupted 	Carburised steel 58 to 62 HRC	CGAR1504200 BNC30G	v_c : 100m/min f : 0.05mm/rev Groove Depth: 1.6mm Dry	GWB Type BNC30G: No Chipping Competitor's Product: Chipping

BNGG Type



■ Features

- Improved rigidity for longer tool life
Strong clamping reduces insert breakage and holder chatter
- Enhanced tooling for 2mm fine grooves or threading
Grooving and threading can be done by changing the support



Clamp-on
for Hardened Steel Shallow Grooves

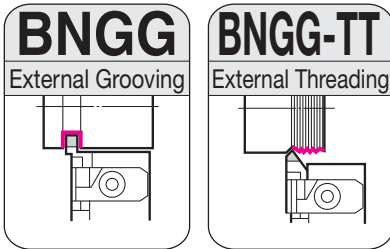


Fig 1 (Grooving)

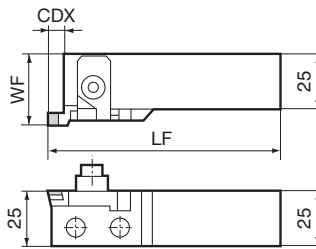
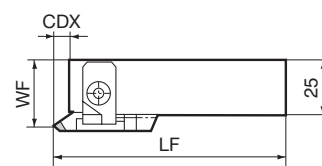


Fig 2 (Threading)



Holder

Dimensions (mm)

	Cat. No.	Stock		Cutting Edge Distance WF	Groove Depth CDX	Overall Length LF	Applicable Insert	Fig
		R	L					
Grooving	BNGG R/L2525-200	●		30.5	4	150	BNGNT0200 R/L	1
	BNGG R/L2525-250	●		30.5	4	150	BNGNT0250 R/L	1
	BNGG R/L2525-300	●		30.5	5	150	BNGNT0300 R/L	1
	BNGG R/L2525-400	●		30.5	6	151	BNGNT0400 R/L	1
	BNGG R/L2525-500	●		30.5	6	151	BNGNT0500 R/L	1
	BNGG R/L2525-600	●		30.5	7	152	BNGNT0600 R/L	1
Threading	BNGG R/L2525-TT	●		28.5	5	150	BNTT1020 R/L, BNTT1530 R/L	2

Inserts are not embedded into tool holders.

* Holder body is universal. The holder can be configured for different groove widths or threading by changing the support.

Insert (SUMIBORON)

Dimensions (mm)

	Cat. No.	BN250		BNX20		BN350		BNX25		Width of Cut CW	Groove Depth CDX	Corner Radius RE	Overall Length L	Cutting Edge Distance WF3	Applicable Holder	Fig
		R	L	R	L	R	L	R	L							
Grooving	BNGNT0200 R/L	●				●				2.0	4.0	0.2	25	6.0	BNGG R/L 2525-200	1
	BNGNT0250 R/L	●				●				2.5	4.0	0.2	25	6.0	BNGG R/L 2525-250	1
	BNGNT0300 R/L	●				●				3.0	5.0	0.4	25	6.0	BNGG R/L 2525-300	1
	BNGNT0400 R/L	●					●			4.0	6.0	0.4	26	6.0	BNGG R/L 2525-400	1
	BNGNT0500 R/L	●					●			5.0	6.0	0.4	26	6.0	BNGG R/L 2525-500	1
	BNGNT0600 R/L	●					●			6.0	7.0	0.4	27	6.0	BNGG R/L 2525-600	1
Threading	BNTT1020 R/L	●								Pitch 1.0 to 2.0	0.14	25	4.0	BNGG R/L 2525-TT	2	
	BNTT1530 R/L	●								Pitch 1.5 to 3.0	0.2	25	4.0	BNGG R/L 2525-TT	2	

Fig 1 (Grooving)

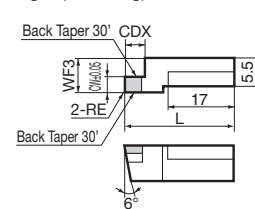
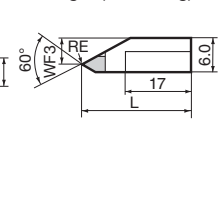


Fig 2 (Threading)



Parts

Applicable Holder	Support	Clamp Plate	Adjustment Screw	Spring	Cap Screw	Wrench
BNGG R/L2525-200	BNGS R/L 200	BNGC R/L	FMJ	GSP06	BX0615 (For Clamp Plate) BX0414 (For Support)	LH050 (For Clamp Plate) LH030 (For Support)
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					

Recommended Cutting Conditions

● 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

● Threading

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



FMU Type/FMU-E Type

High-speed Finishing for Cast Iron

SUMIBORON



- High speed finishing cutter for gray cast iron milling that uses removable cartridges for easy insert runout precision management.
- Utilises BN7000/BN700 grade insert with good wear and fracture resistance.
- Available in shell type and small diameter type with shank.

■ Features

- High-speed machining at $v_c =$ up to 2,000m/min.
- Surpasses $Rz=3.2$ finished surface roughness.
- Safety structure for centrifugal force under high-speed cutting conditions.
- Runout is less than $10\mu\text{m}$: just attach the cartridge.
- Easy runout adjustment using external setting.
- Running cost is reduced because of the economical insert.

■ Application Range

FC250 to FC300 (200 to 250HB) with pearlite matrix and gray cast iron (130 to 160HB) with ferrite matrix
[Example] Engine blocks, cylinder heads, etc.



■ Specifications

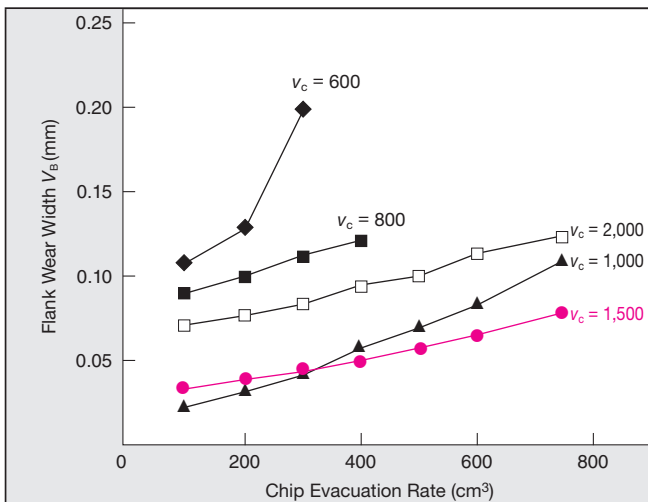
- Shell $\varnothing 80$ to $\varnothing 315\text{mm}$ (FMU Type)
- Shank Type $\varnothing 40$ to $\varnothing 63\text{mm}$ (FMU-E Type)
- Regular Blade SNEW1203ADTR/L
- Low Thrust Blade SNEW1203ADTR/L-S

■ Recommended Cutting Conditions

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

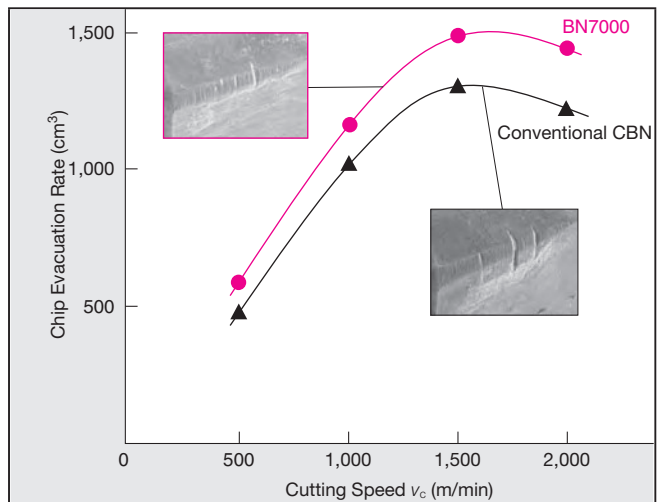
■ Cutting Performance

● Wear Diagram



Work Material: FC250 240HB (Pearlite)
Cutting Speed: $v_c = 600$ to 2,000m/min Feed Rate: $f_z = 0.15\text{mm/t}$
Depth of Cut: $a_p = 0.5\text{mm}$ Dry Tool Grade: BN700

● Estimated Tool Life



Work Material: FC250 (Pearlite)
Cutting Speed: $v_c = 500$ to 2,000m/min Feed Rate: $f_z = 0.2\text{mm/rev}$
Depth of Cut: $a_p = 0.3\text{mm}$ Dry Tool Cat. No.: FMU4100R SNEW1203ADTR

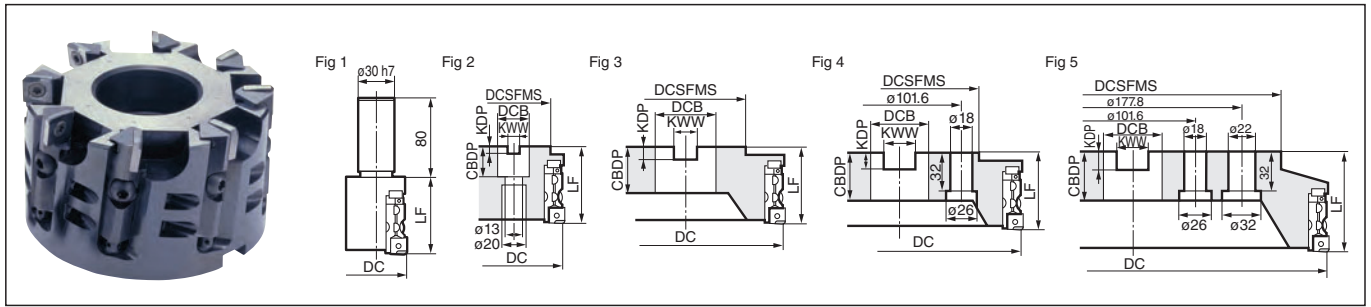
Milling of ductile cast iron and alloy steel casting does not produce the best results. Dry cutting is recommended. Wet cutting will result in breakage of cutting edges in the early stages due to thermal cracking.

FMU Type/FMU-E Type



Rake Angle	Radial	2°
	Axial	8°

0.5mm **90°**

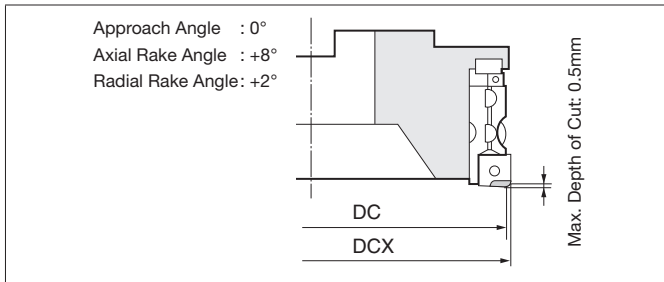


Body

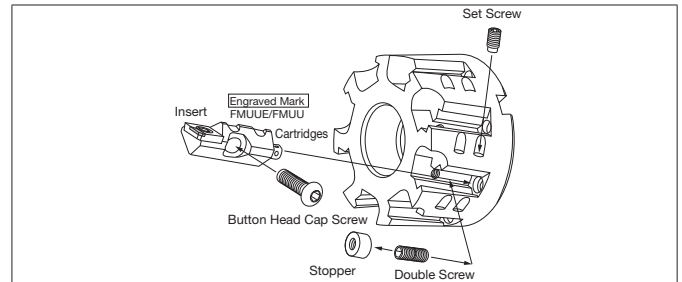
												Dimensions (mm)	
Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Overall Length LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CDBP	Number of Teeth	Weight (kg)	Fig	
FMU 4040ER	●	37	40	—	63	—	—	—	—	2	1.0	1	
4050ER	●	47	50	—	63	—	—	—	—	3	1.2	1	
4063ER	●	60	63	60	63	25.4	9.5	6	25	4	1.0	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 sold separately.

Maximum Depth of Cut



Structure



Insert

Grade Classification		SUMIBORON			
Process	High-speed/Light	K	K		
	General-purpose	K	K		
	Roughing				
Cat. No.		BN7000	BN700	Fig	
SNEW1203ADTR		●	▲	1	
1203ADTR-S		●	▲	2	

Part number suffix -S denotes a low-thrust insert.

Cartridges

Cartridges	Flat Insert Screw	Adjustment Bolt	O-ring	Wrench	Wrench
FMUU(E)*1	BFTX0509N	5.0	FMUJ	P3	TTX20
					TH015

*1 FMU4040ER/4050ER/4063ER use FMUUE type cartridges.

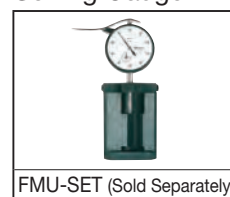
*1 FMUU/FMUUE are pre-assembled with flat insert screws and adjustment screws (with O-rings attached).

Parts

Bolt	Set Screw	Stopper	Double Screw	Wrench	Wrench	Wrench (Radial)	Anti-seizure Cream
BH0620*1	BTD0609	FMUE	WB5-10	TH040	LH030	LH025	SUMI-P

*1 FMU4040ER, 4050ER and 4063ER use BH0615 bolts.

Setting Gauge



FMU-SET (Sold Separately)

*Dial gauge is not included.

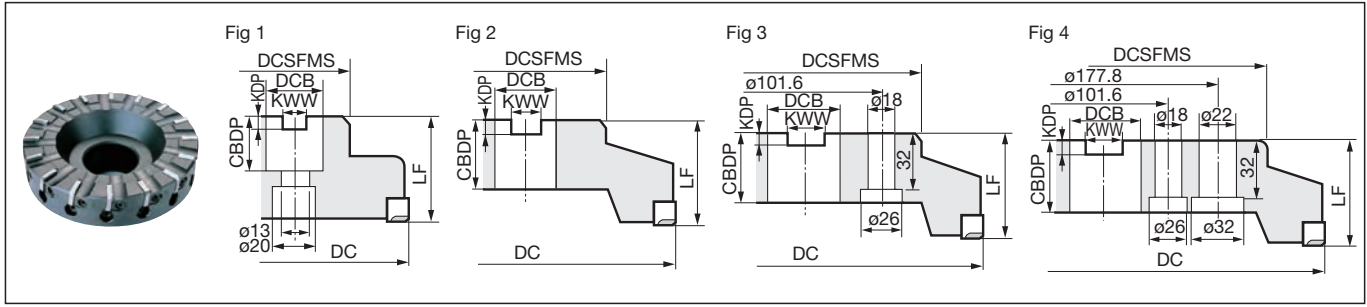
Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Insert Grade
K	Gray Cast Iron	250HB	800- 1,400 -2,000	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, depth of cut and other factors.

Rake Angle	Radial	2°
	Axial	8°

0.5mm 90°



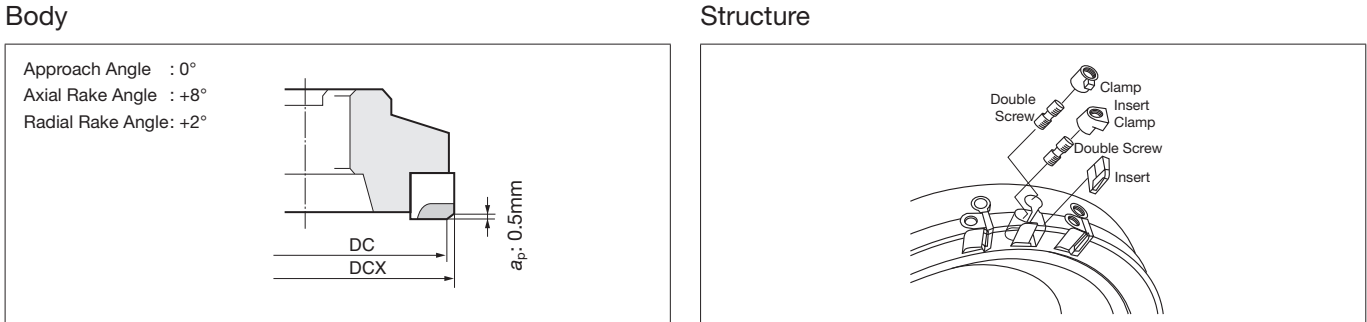
High-speed Finishing for Cast Iron

- Specially designed for use with SUMIBORON BN7000/BN700 in high-speed milling of gray cast iron.

Body Dimensions (mm)

Cat. No.	Stock		Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBBDP	Number of Teeth	Weight (kg)	Fig
	R	L											
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	19.1	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	19.1	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 sold separately.



Insert Dimensions (mm)

Grade Classification		SUMIBORON				Fig
Process	High-speed/Light	K		K		
	General-purpose	K		K		
	Roughing					
Cat. No.		BN7000		BN700		Fig
		R	L	R	L	
SNEN 1504ADT R/L		●		▲		1
1504ADT R/L-S		●		▲		2

Fig 1

Fig 2

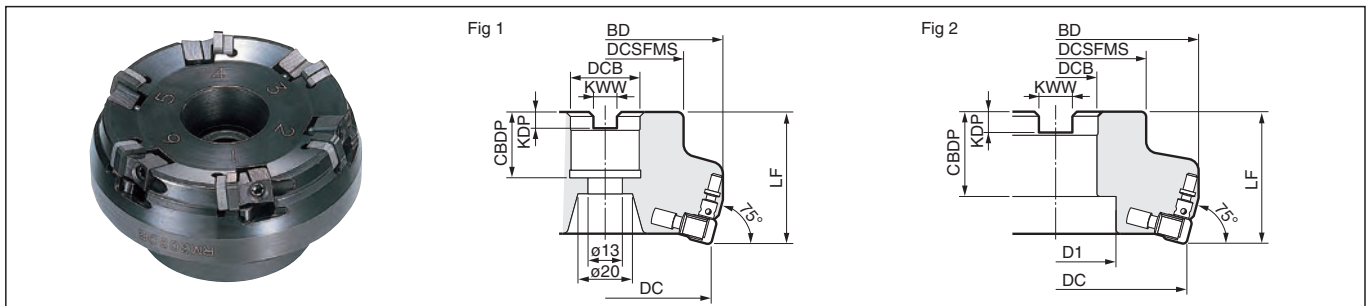
Parts

Applicable Cutter	Insert Clamp	Clamp	Adjustment Screw	Double Screw	Wrench	Wrench
FM5080R/L						
FM5100R/L						
FM5315R/L						
FM5080R/L	FMW	—	FMJ	WB7F-20TL	TT25	1.8 x 45
FM5100R/L		FME	—			—
FM5315R/L						

RM Type



Expansion	Rake	Radial	-6° 45'	3mm	75°
	Angle	Axial	-5° 45'		



High-speed, High-efficiency Milling for Cast Iron

- High-efficiency Milling of Gray Cast Iron
 - Utilises solid SUMIBORON BNS800 for high-speed cutting of $v_c = 1,500\text{m/min}$
 - High speed roughing with depth of cut up to 3.0mm
 - Wiper insert for high-speed finishing
- Low Cost
 - Economical double-sided insert with 8 usable corners
 - Insert can be reground and used again
- Simple Runout Adjustment Mechanism
 - Simple design for insert direct mounting
 - Easy yet precise runout precision adjustment

Body

Dimensions (mm)

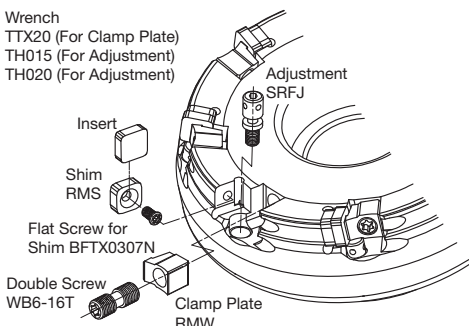
Cat. No.	Stock	Dia. DC	Body Dia. BD	Boss DCSFMS	Bolt D1	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CDBP	Number of Teeth	Maximum Spindle Speed (min ⁻¹)	Weight (kg)	Fig
RM 3080R		80	90	60	—	50	25.4	9.5	6	25	6	9,000	1.6	1
RM 3100R		100	110	70	46	50	31.75	12.7	8	32	8	8,000	2.1	2
3125R		125	135	80	59	63	38.1	15.9	10	38	10	7,000	3.9	2
3160R		160	170	100	80	63	50.8	19.1	11	38	12	6,000	5.9	2

Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		SUMIBORON			Fig
Process	High-speed/Light	K	K	K	
	General-purpose	K	K	K	
	Roughing	K	K	K	
Cat. No.		BNS8125	BNS800	BNC8115	
SNGN 090308		●	●	●	1
090312		●	●	●	1
SNEN 090308W		●	●	●	2



Parts

Shim	Shim Screw	Clamp Plate	Double Screw	Adjustment	Wrench (For Clamp Plate)	Wrench (For Adjustment)	Wrench (For Adjustment)	
RMS	BFTX0307N	2.0	RMW	WB6-16T	SRFJ	TTX20	TH015	TH020

Precautions for Use

- Do not use inserts with different catalogue numbers, such as a mix of standard and wiper inserts, on a single cutter setting.
- New and reground inserts cannot be mixed for use. Use either only new inserts or only reground inserts.
- Inserts can only be reground once (inscribed circle dimension must be at least 9.125mm).

For hardened steel machining, use the SEC-ACE MILL DNF Type.

Body: **H45** Insert: **L108**

Recommended Cutting Conditions

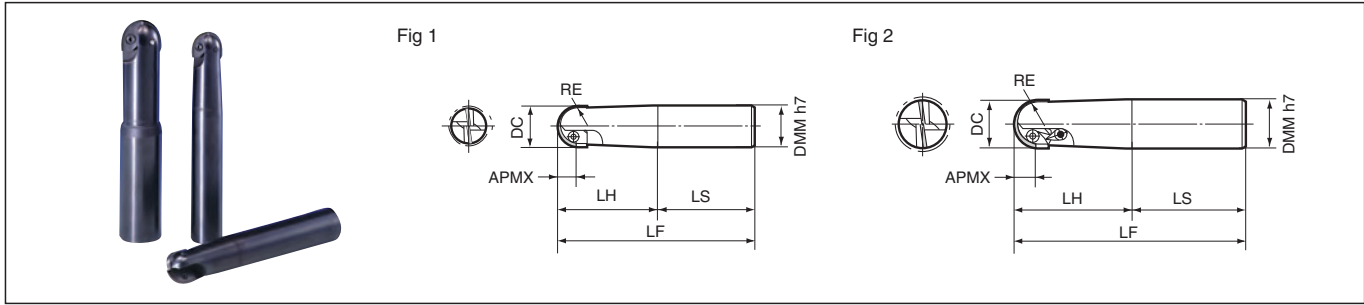
ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Insert Grade
K	Gray Cast Iron	250HB	800- 1,150 -1,500	0.05- 0.13 -0.20	BNS800 (Dry)

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

BES Type



Rake Angle	Radial	0°
	Axial	0°



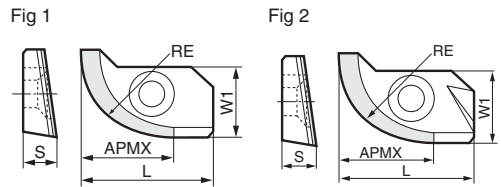
● High-speed Endmilling of Cast Iron Die Molds

- Balanced cutting with 2 effective teeth for high-efficiency finishing process
- Unique blade type design with improved central insert fracture resistance for high-precision machining
- Good fracture and wear resistance with SUMIBORON BN500 grade for longer FC/FCD materials tool life

									Dimensions (mm)	
Cat. No.	Stock	Ballnose Radius RE	Dia. DC	Depth APMX	Neck LH	Shank LS	Overall Length LF	Shank DMM	Fig	
BES 160S		8.0	16	10.0	50	60	110	20	1	
200S		10.0	20	13.0	60	80	140	25	1	
250S		12.5	25	15.5	70	80	150	32	1	
300S		15.0	30	18.0	80	80	160	32	1	
BES 400S		20.0	40	23.0	100	100	200	42	2	
500S		25.0	50	28.0	120	100	220	50	2	

Inserts are sold separately.

										Dimensions (mm)	
Cat. No.	BN500	Ballnose Radius RE	Depth APMX	Length L	Width W1	Thickness S	Applicable Endmill	Fig			
BEST 160S		8.0	10.0	13.0	6.8	3.5	BES 160S	1			
160L		8.0	13.0	13.0	6.8	3.5	BES 160S	1			
BEST 200S		10.0	13.0	20.0	8.5	4.5	BES 200S	1			
200L		10.0	20.0	20.0	8.5	4.5	BES 200S	1			
BEST 250S	●	12.5	15.5	22.5	10.5	5.0	BES 250S	1			
250L	●	12.5	22.5	22.5	10.5	5.0	BES 250S	1			
BEST 300S	●	15.0	18.0	25.0	12.0	6.0	BES 300S	1			
300L	●	15.0	25.0	25.0	12.0	6.0	BES 300S	1			
BEST 400S		20.0	23.0	30.0	16.0	7.5	BES 400S	2			
400L		20.0	30.0	30.0	16.0	7.5	BES 400S	2			
BEST 500S		25.0	28.0	35.0	20.0	8.0	BES 500S	2			
500L		25.0	35.0	35.0	20.0	8.0	BES 500S	2			



Parts

Applicable Endmill	Clamp Plate	Double Screw	Flat Insert Screw	Wrench	Wrench
BES 160S	—	—	BFTX 0306N	2.0	TRX 10
BES 200S	—	—	BFTX 0407N	3.0	TRX 15
BES 250S	—	—	BFTX 0509N	5.0	TRX 20
BES 300S	—	—	BFTX 0511N	5.0	TRX 20
BES 400S	CCM 6BL	WB 6-13	BXF 0616	—	LH 030 LH 040
BES 500S	CCM 6BL	WB 6-16	BXF 0616	—	LH 030 LH 040

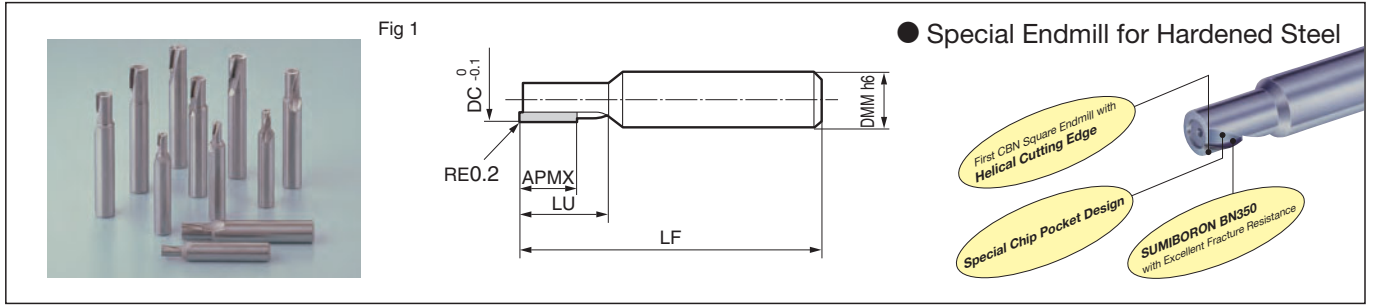
Important Notes

- (1) Use a high-rigidity machine and select a high cutting speed with a low depth of cut.
- (2) Use dry cutting conditions.

Recommended Cutting Conditions

(Min. - Optimum - Max.)

ISO	Cat. No.	Cast Iron (FC)				Ductile Cast Iron (FCD)			
		Cutting Speed v_c (m/min)	Feed Rate f (mm/rev)	Depth of Cut a_p (mm)	Pick Feed p_r (mm)	Cutting Speed v_c (m/min)	Feed Rate f (mm/rev)	Depth of Cut a_p (mm)	Pick Feed p_r (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



Body

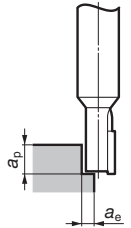
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
BNES 1060	●	6.0	7.0	11.0	60	10	1
1080	●	8.0	10.0	14.0	70	10	1
1100	●	10.0	12.0	17.0	75	12	1
1120	●	12.0	14.0	20.0	80	12	1
1140	●	14.0	16.0	21.5	80	16	1
BNES 1160	●	16.0	18.0	24.0	80	16	1

Grade: BN350

Recommended Cutting Conditions

1. Use dry cutting (air blow) conditions.
2. Down cut is recommended.
3. Make overhang as short as possible and use a high-rigidity machine.



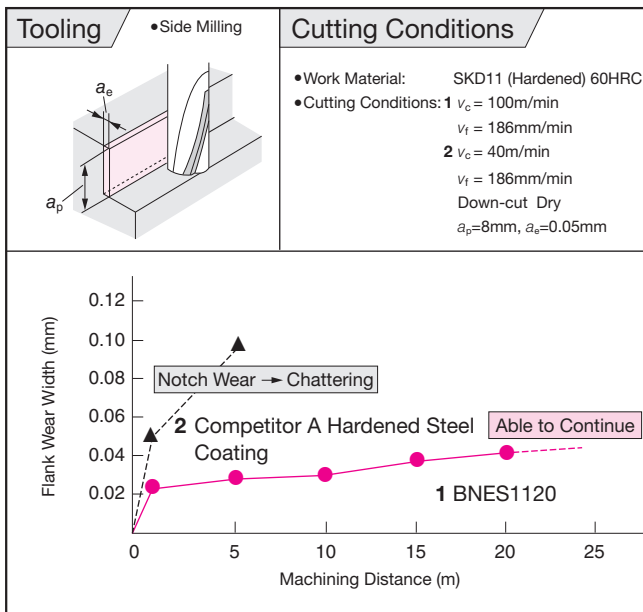
Side Milling

Work Material (Hardness)	High-Hardness Hardened Steel (50 to 57HRC)		
Cutting Conditions	Cutting Speed V_c 100 to 170m/min		
DC(mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Depth of Cut a_e (mm)
ø6 to 8	4,000 to 9,000	240 to 540	up to 0.1
ø10 to 12	2,700 to 5,400	180 to 360	up to 0.15
ø14 to 16	2,000 to 3,800	140 to 260	up to 0.2

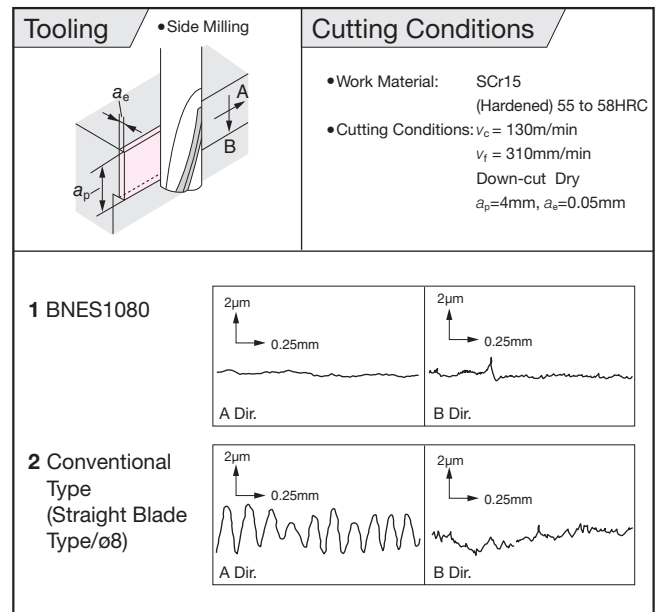
Work Material (Hardness)	High-Hardness Hardened Steel (58 to 65HRC)		
Cutting Conditions	Cutting Speed V_c 80 to 150m/min		
DC(mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Depth of Cut a_e (mm)
ø6 to 8	3,200 to 8,000	150 to 370	up to 0.08
ø10 to 12	2,100 to 4,800	120 to 370	up to 0.12
ø14 to 16	1,600 to 3,400	110 to 230	up to 0.15

Cutting Performance

- Wear resistance guaranteeing high-efficiency machining



- Finished surface roughness similar to grinding



BNBR Type

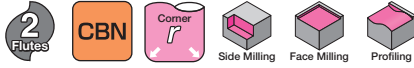
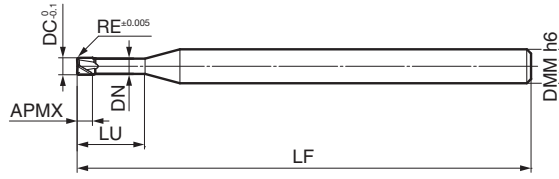


Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Radius RE	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Head Dia. DN	Shank Dia. DMM	Wiper Flat	Fig
BNBR 2D020R005-0054	●	0.2	0.05	0.1	0.5	50	0.17	4	No	1
2D030R005-0054	●	0.3	0.05	0.15	0.5	50	0.27	4	No	1
2D040R005-0054	●	0.4	0.05	0.2	0.5	50	0.37	4	No	1
2D050R005-0054	●	0.5	0.05	0.3	0.5	50	0.47	4	No	1
2D050R005-0154	●	0.5	0.05	0.3	1.5	50	0.47	4	No	1
BNBR 2D050R005-0254	●	0.5	0.05	0.3	2.5	50	0.47	4	No	1
2D050R010-0154	●	0.5	0.10	0.3	1.5	50	0.47	4	No	1
2D050R010-0254	●	0.5	0.10	0.3	2.5	50	0.47	4	No	1
2D100R005-0304	●	1.0	0.05	0.7	3.0	50	0.97	4	Yes	1
2D100R005-0504	●	1.0	0.05	0.7	5.0	50	0.97	4	Yes	1
BNBR 2D100R010-0304	●	1.0	0.10	0.7	3.0	50	0.97	4	Yes	1
2D100R010-0504	●	1.0	0.10	0.7	5.0	50	0.97	4	Yes	1
2D100R020-0304	●	1.0	0.20	0.7	3.0	50	0.97	4	Yes	1
2D100R020-0504	●	1.0	0.20	0.7	5.0	50	0.97	4	Yes	1
2D100R030-0304	●	1.0	0.30	0.7	3.0	50	0.97	4	Yes	1
BNBR 2D100R030-0504	●	1.0	0.30	0.7	5.0	50	0.97	4	Yes	1
2D150R010-0454	●	1.5	0.10	1.2	4.5	50	1.47	4	Yes	1
2D150R010-0754	●	1.5	0.10	1.2	7.5	50	1.47	4	Yes	1
2D150R020-0454	●	1.5	0.20	1.2	4.5	50	1.47	4	Yes	1
2D150R020-0754	●	1.5	0.20	1.2	7.5	50	1.47	4	Yes	1
BNBR 2D150R030-0454	●	1.5	0.30	1.2	4.5	50	1.47	4	Yes	1
2D150R030-0754	●	1.5	0.30	1.2	7.5	50	1.47	4	Yes	1
2D200R010-0604	●	2.0	0.10	1.5	6.0	50	1.97	4	Yes	1
2D200R020-0604	●	2.0	0.20	1.5	6.0	50	1.97	4	Yes	1
2D200R030-0604	●	2.0	0.30	1.5	6.0	50	1.97	4	Yes	1
BNBR 2D200R050-0604	●	2.0	0.50	1.5	6.0	50	1.97	4	Yes	1

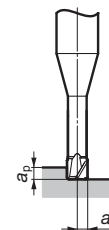
Grade: BNX20

Identification Code

BNBR 2 D050 R010 - 015 4

Series Code Number of Teeth Dia. Corner Radius Neck Length Shank Dia.

BNBR Type



Recommended Cutting Conditions

1. Use a machine with high rigidity for stable cutting.
2. Non-water soluble cutting oil is recommended. Supply as a mist or external coolant.
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 cutting conditions as necessary as machine rigidity and other conditions may vary.
5. Depths of cut shown in the table of conditions are maximum depths. Adjust the actual depth of cut to the desired machined surface roughness.

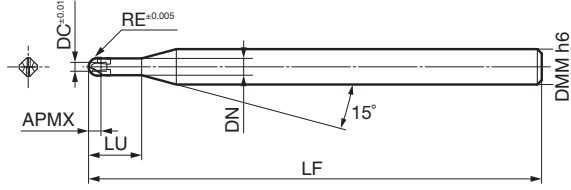
Work Material			STAVAX, NAK80, SKD61 (Up to 52HRC)				ELMAX, DC53, SKD11 Modified (Up to 62HRC)				YXR3, SKH (Up to 70HRC)			
DC (mm)	RE (mm)	LU (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p (mm)	a _e (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p (mm)	a _e (mm)	Spindle Speed (min ⁻¹)	Feed 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		0.01	0.05
	0.1	40,000	0.01		0.05	40,000	0.01		0.05	35,000				
	0.05	2.5	40,000		0.01	0.05	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	0.02	0.2	35,000										
0.2	35,000	0.02	0.2	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		0.03	0.5	26,000							
0.3	26,000		0.03	0.5	20,000									
2.0	0.1	6.0	20,000	800	0.03	0.7	20,000	800	0.03	0.7	15,000	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			

BNBP Type

Pre-hardened Steel
 Hardened Steel 45 to 53HRC
 Hardened Steel 55 to 60HRC
 Hardened Steel 60 to 65HRC



Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Radius RE	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Head Dia. DN	Shank Dia. DMM	Fig
BNBP 2R020-0124	●	0.20	0.4	0.3	1.2	50	0.37	4	1
2R020-0126	●	0.20	0.4	0.3	1.2	50	0.37	6	1
2R020-0204	●	0.20	0.4	0.3	2.0	50	0.37	4	1
2R020-0304	●	0.20	0.4	0.3	3.0	50	0.37	4	1
2R020-0404	●	0.20	0.4	0.3	4.0	50	0.37	4	1
BNBP 2R030-0154	●	0.30	0.6	0.4	1.5	50	0.57	4	1
2R030-0156	●	0.30	0.6	0.4	1.5	50	0.57	6	1
2R030-0304	●	0.30	0.6	0.4	3.0	50	0.57	4	1
2R030-0404	●	0.30	0.6	0.4	4.0	50	0.57	4	1
2R030-0504	●	0.30	0.6	0.4	5.0	50	0.57	4	1
BNBP 2R030-0604	●	0.30	0.6	0.4	6.0	50	0.57	4	1
2R050-0254	●	0.50	1.0	0.6	2.5	50	0.97	4	1
2R050-0256	●	0.50	1.0	0.6	2.5	50	0.97	6	1
2R050-0304	●	0.50	1.0	0.6	3.0	50	0.97	4	1
2R050-0404	●	0.50	1.0	0.6	4.0	50	0.97	4	1
BNBP 2R050-0604	●	0.50	1.0	0.6	6.0	50	0.97	4	1
2R050-0804	●	0.50	1.0	0.6	8.0	50	0.97	4	1
2R075-0404	●	0.75	1.5	0.9	4.0	50	1.47	4	1
2R075-0406	●	0.75	1.5	0.9	4.0	50	1.47	6	1
2R100-0554	●	1.00	2.0	1.4	5.5	50	1.97	4	1
BNBP 2R100-0556	●	1.00	2.0	1.4	5.5	50	1.97	6	1
2R100-0804	●	1.00	2.0	1.4	8.0	50	1.97	4	1

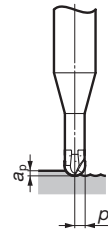
Grade: BN350

Identification Code

BNBP 2 R030 - 015 4

Series Code Number of Teeth Ballnose Radius Neck Length Shank Dia.

BNBP Type



Recommended Cutting Conditions

1. Use a machine with high rigidity for stable cutting.
2. Non-water soluble cutting oil is recommended. Supply as a mist or external coolant.
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 cutting conditions as necessary as machine rigidity and other conditions may vary.
5. Depths of cut shown in the table of conditions are maximum depths. Adjust the actual depth of cut to the desired machined surface roughness.

Work Material		STAVAX, NAK80, SKD61 (Up to 52HRC)				ELMAX, DC53, SKD11 Modified (Up to 62HRC)				YXR3, SKH (Up to 70HRC)			
RE (mm)	LU (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	ap (mm)	pi (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	ap (mm)	pi (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	ap (mm)	pi (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
	2.0	40,000	1,500	0.010	0.020	40,000	1,300	0.010	0.020	40,000	1,100	0.010	0.010
	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
	6.0	30,000	600	0.005	0.010	30,000	500	0.005	0.005	30,000	400	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
	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
0.75	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
1.0	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

Radius accuracy inspection test results

Radius accuracy inspection report is attached as below with the ballnose type.

Measurement Data Sheet of Radius accuracy.

Lot No. SHMY × × × × ×
No. × ×

R tolerance 1.00 0.005
 -0.005

Angle	measurement	Error
0°	1.000	0.000
10°	1.001	0.001
		0.001



BNBC Type

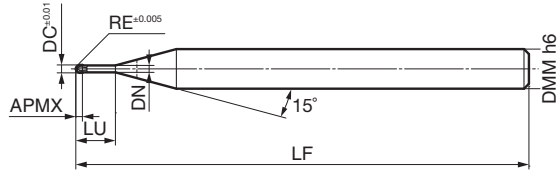
Copper Alloy



SUMIBORON

L

Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Radius RE	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Head Dia. DN	Shank Dia. DMM	Fig
BNBC 2R010-0034	●	0.1	0.2	0.2	0.3	50	0.17	4	1
2R010-0104	●	0.1	0.2	0.2	1.0	50	0.17	4	1
2R020-0054	●	0.2	0.4	0.3	0.5	50	0.37	4	1
2R020-0204	●	0.2	0.4	0.3	2.0	50	0.37	4	1
2R030-0104	●	0.3	0.6	0.4	1.0	50	0.57	4	1
BNBC 2R030-0304	●	0.3	0.6	0.4	3.0	50	0.57	4	1
2R050-0304	●	0.5	1.0	0.6	3.0	50	0.97	4	1

Grade: BN700

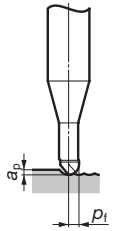
Identification Code

BNBC 2 R030 - 010 4

Series Code Number Ballnose Neck Shank
of Teeth Radius Length Dia.

Recommended Cutting Conditions

1. Use a machine with high rigidity for stable cutting.
2. Non-water soluble cutting oil is recommended. Supply as a mist or external coolant.
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 cutting conditions as necessary as machine rigidity and other conditions may vary.
5. Depths of cut shown in the table of conditions are maximum depths. Adjust the actual depth of cut to the desired machined surface roughness.



Side Milling

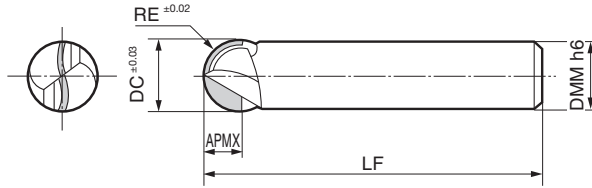
Work Material	Copper Alloy			
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Standard depth of cut (mm)	
Cat. No.			a_p	p_f
BNBC 2R010-0034	20,000	350	0.01	0.02
2R010-0104	-50,000	350	0.007	0.015
BNBC 2R020-0054	20,000	800	0.025	0.05
2R020-0204	-50,000	700	0.02	0.03
BNBC 2R030-0104	20,000	1,400	0.05	0.15
2R030-0304	-50,000	1,200	0.04	0.1
BNBC 2R050-0304	20,000 -50,000	2,200	0.15	0.35

BNBS Type



- **Combination of Special Grade and Spiral Cutting Edge Design:**
The combination of a special tough SUMIBORON grade with a unique cutting edge design is a breakthrough for high-efficiency and smooth endmilling of hardened steels.

Fig 1



Body

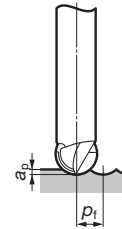
Dimensions (mm)

Cat. No.	Stock	Radius RE	Dia. DC	Cutting Edge Length APMX	Overall Length LF	Shank Dia. DMM	Fig
BNBS 2020S	●	1.0	2.0	1.5	50	4	1
2030S	●	1.5	3.0	2.0	60	6	1
2040S	●	2.0	4.0	3.0	70	6	1
2060S	●	3.0	6.0	4.5	80	6	1
2080S	●	4.0	8.0	5.5	90	8	1
BNBS 2100S	●	5.0	10.0	6.5	100	10	1
2120S	●	6.0	12.0	7.5	110	12	1

Grade: BN350

Recommended Cutting Conditions

1. Use a high-rigidity machine and select a high cutting speed with a low feed rate.
2. Use dry cutting conditions.
3. Make overhang as short as possible.
4. If the work material hardness is lower than 50HRC, try the GS MILL Hard Ballnose instead (→ I132).



Radius Milling

Work Material	Hardened Steel (50 to 57HRC)		Hardened Steel (58 to 65HRC)	
	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
RE(mm)				
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
Standard Depth of Cut	a _p	0.01DC	0.01DC	
	p _f	0.02DC	0.02DC	

Cutting Performance

Work Material: SKD11 (60HRC Hardness)

	BN350
Cutting Speed	250m/min
Feed Rate <i>f</i>	0.04mm/t
Pitch feed <i>p_f</i>	0.3mm
Depth of Cut <i>a_p</i>	0.3mm
Tool	BNBS2100S



Actual Cutting Length : 110m, *v_B* = 0.128mm → Continuous Machining Possible
 Finished Surface Roughness: Radial Feed Ry1.8μm, Axial Feed Direction Ry2.2μm

Results

Radial Feed

Feed Direction



