

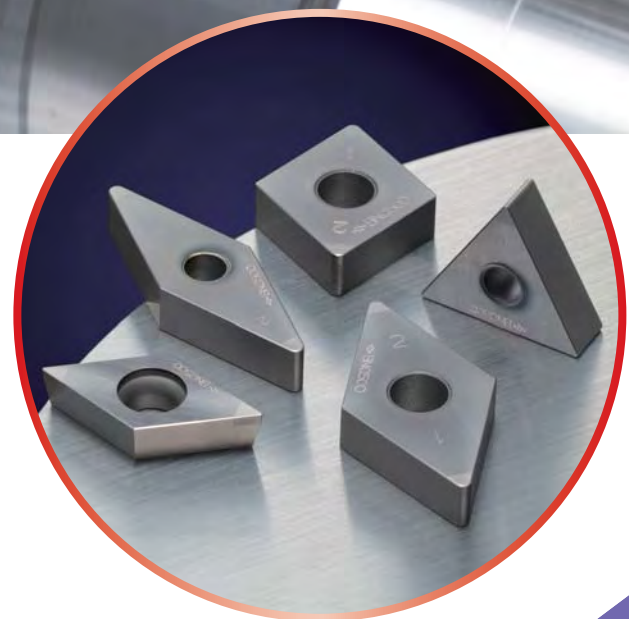
Coated CBN Grades for
Machining Ductile Cast Iron

Coated SUMIBORON **BNC500** series

Rev. 3



**High-speed and high-precision
machining is achieved when
finishing ductile cast iron.**



**For Machining Ductile Cast Iron
Coated SUMIBORON**

BNC500

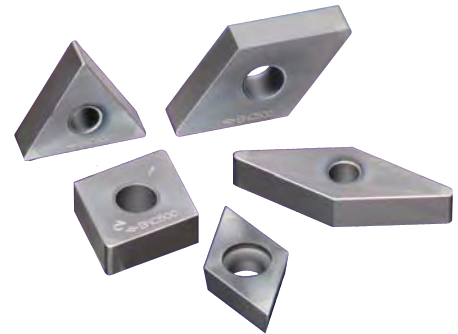
Broad improvements in the toughness of the sintered CBN and wear resistance from the application of a newly developed high-purity TiC binder. In addition, it achieves exceptional wear resistance by combining a ceramic coating with excellent heat resistance. High-speed and high-precision machining is achieved when finishing ductile cast iron. It also provides a long, stable tool life in machining high-strength ductile cast iron, special cast irons such as vermicular cast iron, and centrifugal casting iron.

● **Achieves a Long, Stable Tool Life at $V_c = 400\text{m/min}$ or Higher**

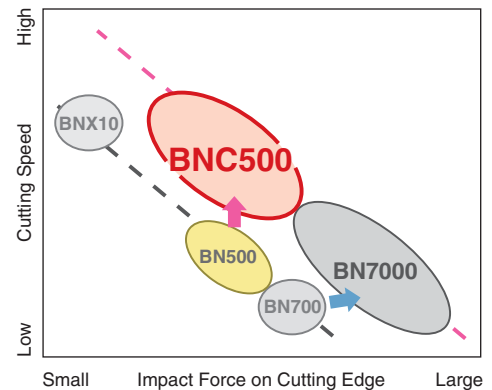
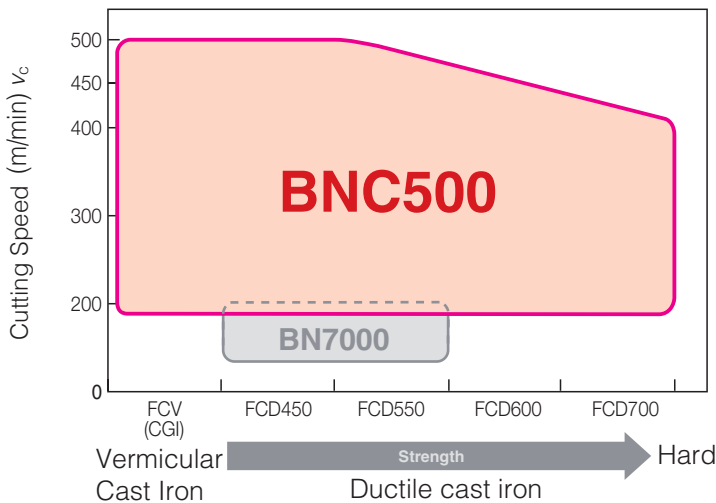
Superior wear resistance makes stable machining possible under high-speed conditions.

● **Supports High-precision Machining**

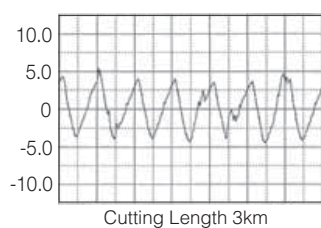
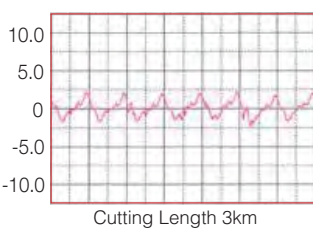
Can maintain excellent dimensional tolerance and surface roughness over many hours.



■ **Application Range**



■ **Machined Surface Quality (Surface Roughness)**

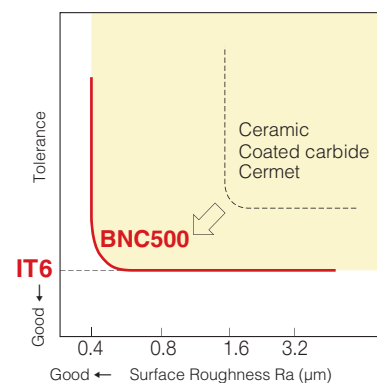


BNC500 Ra=0.6 μm

Ceramic Ra=2.3 μm

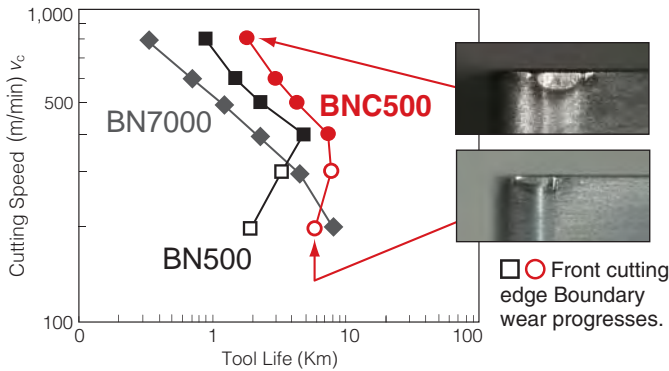
Work Material : FCD700(260HB)
Cutting Conditions : $v_c = 400\text{m/min}$, $f = 0.2\text{mm/rev}$, $a_p = 0.2\text{mm}$ Wet

■ **High Precision Machining**



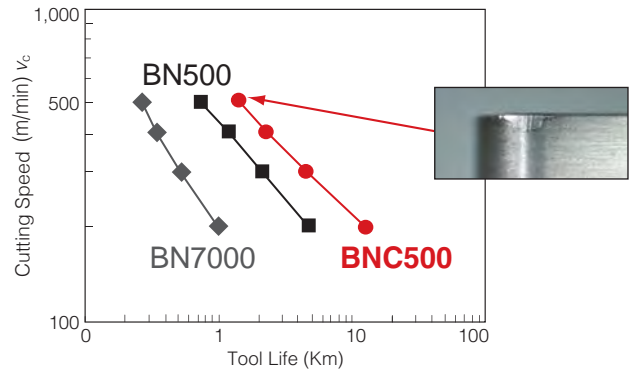
Cutting Performance

FCD450 Continuous Cutting (V-T Chart)



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

FCD700 Continuous Cutting (V-T Chart)



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

Stock Items

Multi-Cornered, Single-Use Type/Negative

Shape	Cat. No.	Stock	No. of Cutting Edges	Dimensions			
				Inscribed circle	Thickness	Hole Dia.	Nose Radius
	4NC-CNGA 120404	●	4	12.7	4.76	5.16	0.4
	120408	●					0.8
	120412	●					1.2
	4NC-CNGA 120408W	●	4	12.7	4.76	5.16	0.8
	4NC-CNGA 120404HS	●	4	12.7	4.76	5.16	0.4
	120408HS	●					0.8
120412HS	●	1.2					
	4NC-DNGA 150404	●	4	12.7	4.76	5.16	0.4
	150408	●					0.8
	150412	●					1.2
	4NC-DNGA 150404HS	●	4	12.7	4.76	5.16	0.4
	150408HS	●	4	12.7	4.76	5.16	0.8
	150412HS	●					1.2
	2NC-SNGA 120408	●	2	12.7	4.76	5.16	0.8
	120412	●					1.2
		6NC-TNGA 160404	●	6	9.525	4.76	3.81
160408		●	0.8				
160412		●	1.2				
6NC-TNGA 160404HS		●	6	9.525	4.76	3.81	0.4
160408HS		●					0.8
160412HS		●					1.2
	4NC-VNGA 160404	●	4	9.525	4.76	3.81	0.4
	160408	●					0.8
	4NC-VNGA 160404HS	●	4	9.525	4.76	3.81	0.4
	160408HS	●					0.8

*HS : for Strong Edge Type W : Wiper ● mark : Standard stocked item

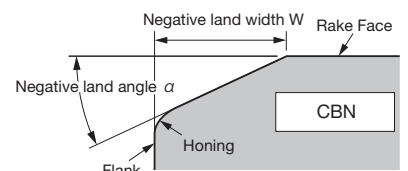
Multi-Cornered, Single-Use Type/Positive

Shape	Relief angle	Cat. No.	Stock	No. of Cutting Edges	Dimensions			
					Inscribed circle	Thickness	Hole Dia.	Nose Radius
	7°	2NC-CCGW 060202	●	2	6.35	2.38	2.8	0.2
		060204	●					0.4
		060208	●					0.8
		2NC-CCGW 09T302	●	2	9.525	3.97	4.4	0.4
		09T304	●					0.4
		09T308	●					0.8
	7°	2NC-DCGW 070204	●	2	6.35	2.38	2.8	0.4
		2NC-DCGW 11T302	●					0.2
		11T304	●	2	9.525	3.97	4.4	0.4
		11T308	●					0.8
	11°	3NC-TPGW 090202	●	3	5.56	2.38	2.8	0.2
		090204	●					0.4
		3NC-TPGW 110304	●					3
		110308	●	0.8				
		3NC-TPGW 160404	●	3	9.525	4.76	4.4	
		160408	●					0.8
	5°	2NC-VBGW 110304	●	2	6.35	3.18	2.8	0.4
		110308	●					0.8
		2NC-VBGW 160404	●	2	9.525	4.76	4.4	0.4
		160408	●					0.8

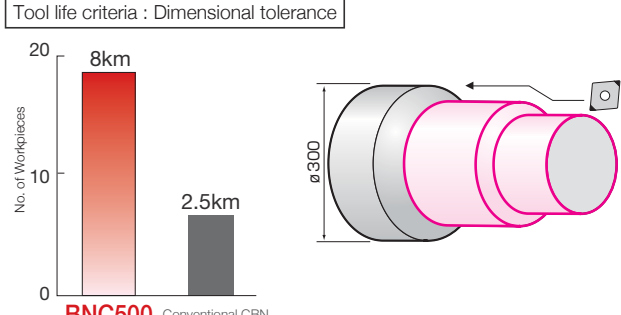
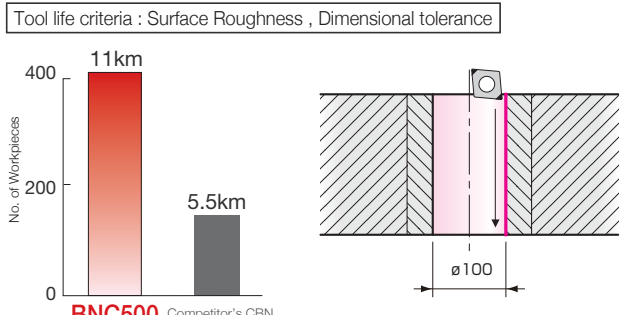
● mark : Standard stocked item

Inserts Edge Specification

Inserts Edge Specification	Standard				Notation	Strong Edge Type HS				Notation	Single-Use Wiper inserts W			
	Edge Specification Identification Code	α	W	Honing		Edge Specification Identification Code	α	W	Honing		Edge Specification Identification Code	α	W	Honing
	S01215	15°	0.12	Yes	HS	S01225	25°	0.12	Yes	W	S01215	15°	0.12	Yes



Application Examples

FCD700(260HB) Finishing of External Piston Part	FCD450(160HB) Finishing of Internal AT Case												
<p>Achieved three times longer tool life than conventional CBN by stable dimensional.</p> <p>Tool life criteria : Dimensional tolerance</p>  <table border="1"> <caption>Tool Life Comparison (External Piston Part)</caption> <thead> <tr> <th>Tool</th> <th>No. of Workpieces</th> </tr> </thead> <tbody> <tr> <td>BNC500</td> <td>8km</td> </tr> <tr> <td>Conventional CBN</td> <td>2.5km</td> </tr> </tbody> </table>	Tool	No. of Workpieces	BNC500	8km	Conventional CBN	2.5km	<p>Achieved two times longer tool life than competitor's CBN by excellent wear resistance because of less dimensional correction time.</p> <p>Tool life criteria : Surface Roughness , Dimensional tolerance</p>  <table border="1"> <caption>Tool Life Comparison (Internal AT Case)</caption> <thead> <tr> <th>Tool</th> <th>No. of Workpieces</th> </tr> </thead> <tbody> <tr> <td>BNC500</td> <td>11km</td> </tr> <tr> <td>Competitor's CBN</td> <td>5.5km</td> </tr> </tbody> </table>	Tool	No. of Workpieces	BNC500	11km	Competitor's CBN	5.5km
Tool	No. of Workpieces												
BNC500	8km												
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Tool	No. of Workpieces												
BNC500	11km												
Competitor's CBN	5.5km												
<p>Insert : 4NC-CNGA120408 Cutting Conditions : $v_c=200\text{m/min}$ $f=0.15\text{mm/rev}$ $a_p=0.1\text{mm}$ Wet</p>	<p>Insert : 2NC-CCGW09T304 Cutting Conditions : $v_c=350\text{m/min}$ $f=0.15\text{mm/rev}$ $a_p=0.3\text{mm}$ Wet(High pressure coolant)</p>												

< SAFETY NOTES >



- Very hot or lengthy chips may be discharged while the machine is in operation. Therefore, machine guards, safety goggles or other protective covers must be used. Fire safety precautions must also be considered.

- Please handle with care as this product has sharp edges.
- Improper cutting conditions or mis-handling of the tool may result in breakages or projectiles. Therefore, please use the tool within its recommended conditions.

- When using non-water soluble cutting oil, precautions against fire must be taken and please ensure that a fire extinguisher is placed near the machine.

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