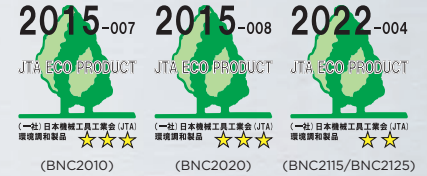


# Coated SUMIBORON series for Hardened Steel

Rev. 2

## The Pinnacle of High-speed / High-precision / High-efficiency Cutting



LINEUP

- General-purpose Machining **BNC2125**
- BNC2020**
- High-precision Machining **BNC2115**
- BNC2010**
- High-speed Machining **BNC2105**
- Heavy Interrupted Machining **BNC300**

**New** High-speed Machining Grade  
Introducing **BNC2105**

# Coated SUMIBORON for Hardened Steel Machining

BNC2115 / BNC2125

VIDEO OF CUTTING



BNC2010 / BNC2020

VIDEO OF CUTTING

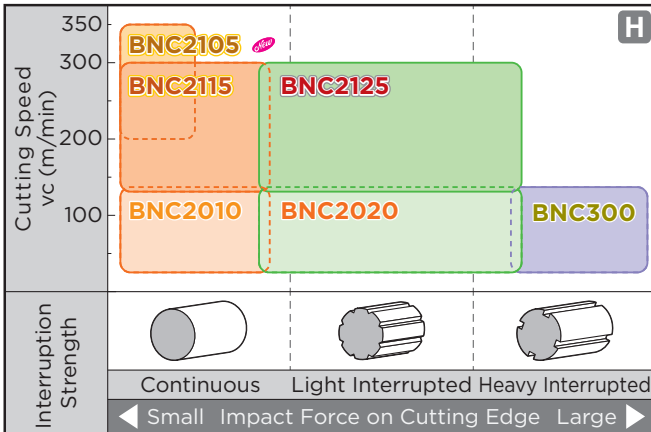


# BNC2105<sup>new</sup> / BNC2115 / BNC2125 BNC2010 / BNC2020 / BNC300

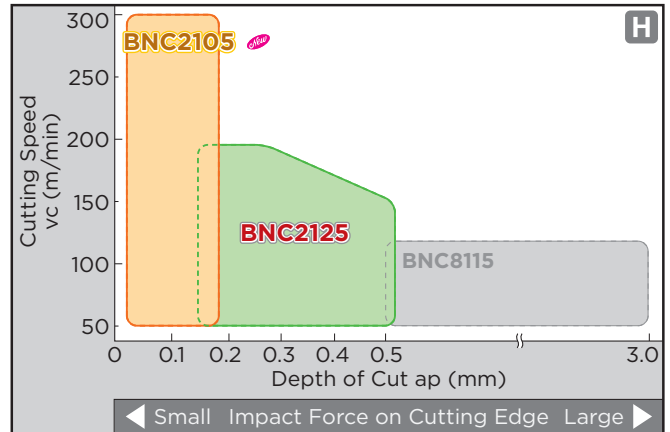
The Pinnacle of High-speed / High-precision / High-efficiency Cutting

## Application Range

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



● Bearing Steel (SUJ2, etc.)



## Features

**BNC2105**<sup>new</sup>

Highly wear-resistant grade for high-speed machining  
Excellent wear resistant coating and CBN substrate, achieve stable and long tool life in high-speed machining.

**BNC2115**

The ultimate in high-precision machining of hardened steel  
Utilizing a thick coating with exceptional notch wear resistance and a tough CBN substrate to achieve stable and excellent surface finish.

**BNC2125**

First recommendation for hardened steel machining  
Combination of a tough CBN substrate and a thick coating that has a balance of wear resistance and toughness, to achieve stable machining in a wide range of applications.

**BNC2010**

High-precision grade for low- to medium-speed machining  
Excellent wear resistant CBN substrate and coating layer, for high-precision machining that requires surface roughness and surface finish accuracy.

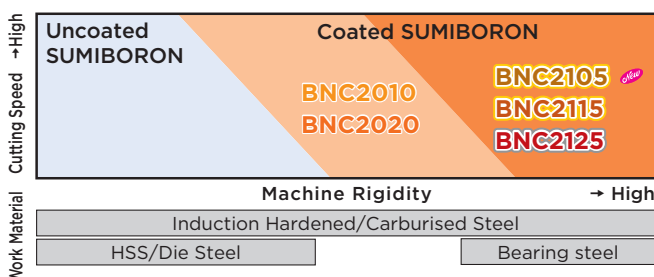
**BNC2020**

General-purpose grade for low- to medium-speed machining  
Utilizing an especially high wear resistant coating and a tough CBN substrate. Excellent machining stability in low-rigidity situations and high-load cutting

**BNC300**

Achieves long, stable tool life even in machining with heavy interrupted cutting  
Achieves long, stable tool life even on work pieces with both continuous and interrupted cutting

## Differentiation



## Recommended Cutting Conditions

Grade	Cutting Speed (vc) (m/min)	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
	Min. - Optimum -Max.	Min. - Optimum -Max.	Min. - Optimum -Max.
<b>BNC2105</b>	150 - 200 - 350	0.03 - 0.10 - 0.15	0.03 - 0.15 - 0.20
<b>BNC2115</b>	110 - 180 - 300	0.03 - 0.10 - 0.20	0.03 - 0.20 - 0.35
<b>BNC2125</b>	110 - 160 - 300	0.05 - 0.20 - 0.40	0.05 - 0.30 - 0.50
<b>BNC2010</b>	50 - 140 - 180	0.03 - 0.10 - 0.20	0.03 - 0.20 - 0.35
<b>BNC2020</b>	50 - 120 - 180	0.03 - 0.20 - 0.40	0.05 - 0.30 - 0.50
<b>BNC300</b>	50 - 100 - 150	0.03 - 0.10 - 0.20	0.03 - 0.20 - 0.30

## ■ CBN Substrate and Coating Structure

**BNC2105** *New* High-precision Machining (High-speed)  
Coating Thickness: 3µm

Coloured Layer (Gold)

TiAlN Super Multi-layered Coating

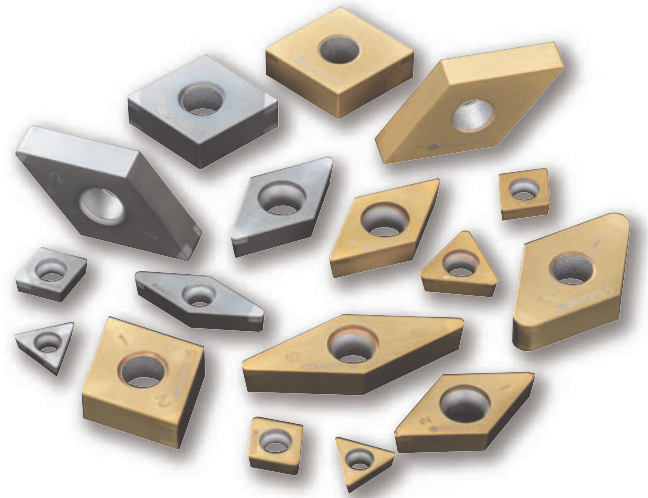
Highly Adhesive Layer

Improved Wear Resistance

Improved Adhesion Strength

High Wear Resistance CBN Substrate

Highly wear-resistant TiAlN super multi-layered coating is made thicker. Realises long tool life in high-speed cutting in combination with a substrate using a newly developed TiCN binder with excellent thermal resistance



**BNC2115** High-precision Machining (Medium- to High-speed)  
Coating Thickness: 3µm

Coloured Layer (Gold)

TiAlSiN Super Multi-Layered Coating

TiCN Layer

TiAlSiN Super Multi-Layered Coating

TiCN Layer

TiAlSiN Super Multi-Layered Coating

Highly Adhesive Layer

Suppresses Crater Wear

Suppresses Notch Wear  
Surface Roughness Maintained

Improved Adhesion Strength

Tough CBN Substrate

Thick layers of high-strength TiAlSiN super multi-layered coating and highly heat-resistant TiCN coating are applied to a tough substrate to realise excellent surface finish quality

**BNC2125** General-purpose Machining (Medium- to High-speed)  
Coating Thickness: 3µm

Coloured Layer (Silver)

TiAlBN Super Multi-layered Coating

Highly Adhesive Layer

Improved Wear Resistance

Improved Chipping Resistance

Improved Adhesion Strength

Tough CBN Substrate

Thick layer of super multi-layered ultra-fine TiAlBN coating with high strength and high hardness coupled with a tough substrate achieves high performance in a wide range of applications

**BNC2010** High-precision Machining (Low- to Medium-speed)  
Coating Thickness: 2µm

Coloured Layer (Gold)

TiCN Layer

AlCrN Multi-layered Coating

TiCN Layer

AlCrN Multi-layered Coating

TiCN Layer

AlCrN Multi-layered Coating

Highly Adhesive Layer

Improved Wear Resistance

Suppresses Notch Wear

High Wear Resistant CBN Substrate

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

**BNC2020** General-purpose Machining (Low- to Medium-speed, Unstable Cutting)  
Coating Thickness: 2µm

Coloured Layer (Gold)

TiAlN Layer

Highly Adhesive Layer

Improved Wear Resistance

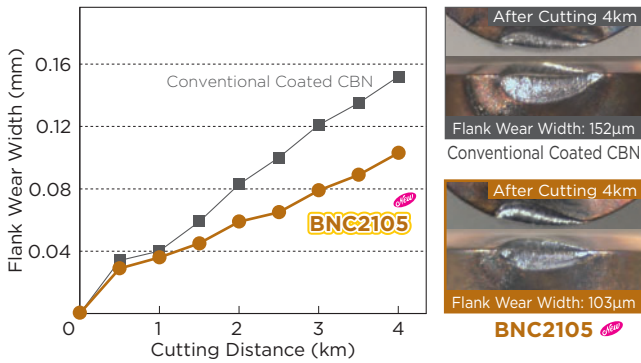
Improved Adhesion Strength

Tough CBN Substrate

Application of highly wear-resistant TiAlN coating to a tough substrate dramatically improves machining stability in low-rigidity setups and high-load cutting

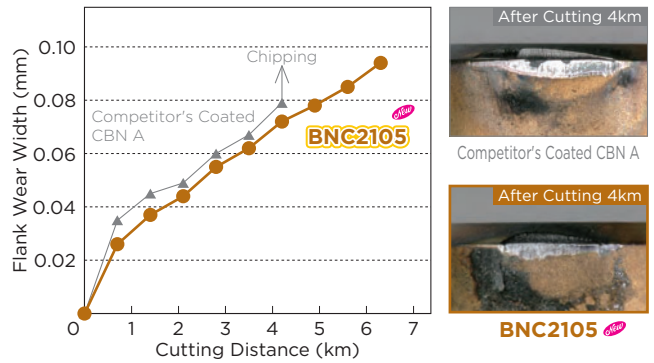
## Cutting Performance

### BNC2105 <sup>NEW</sup> Continuous Cutting (Wear Resistance)



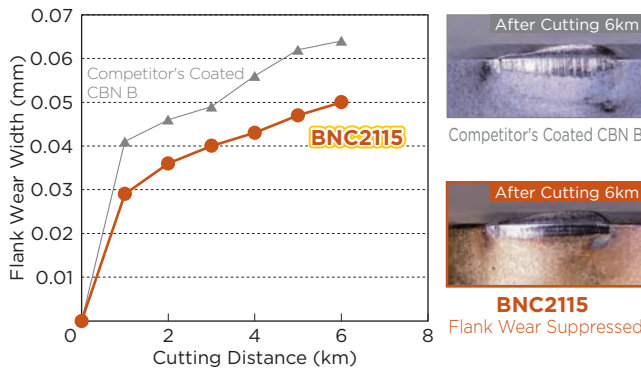
Work Material: SUJ2 (58-62HRC)  
Tool Cat. No.: 4NC-DNGA150408  
Cutting Conditions:  $v_c = 200\text{m/min}$ ,  $f = 0.1\text{mm/rev}$ ,  $a_p = 0.1\text{mm}$  Wet

### BNC2105 <sup>NEW</sup> Continuous Cutting (Wear Resistance)



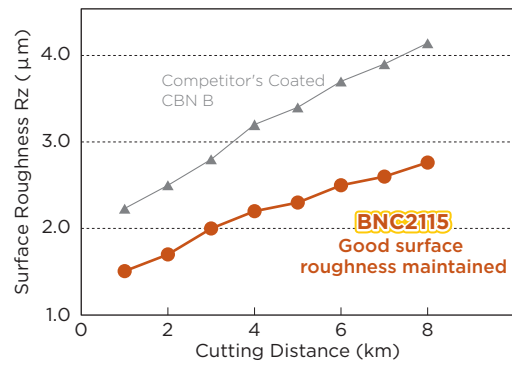
Work Material: SCM415H (58-62HRC)  
Tool Cat. No.: 4NC-DNGA150408  
Cutting Conditions:  $v_c = 250\text{m/min}$ ,  $f = 0.06\text{mm/rev}$ ,  $a_p = 0.1\text{mm}$  Wet

### BNC2115 Continuous Cutting (Wear Resistance)



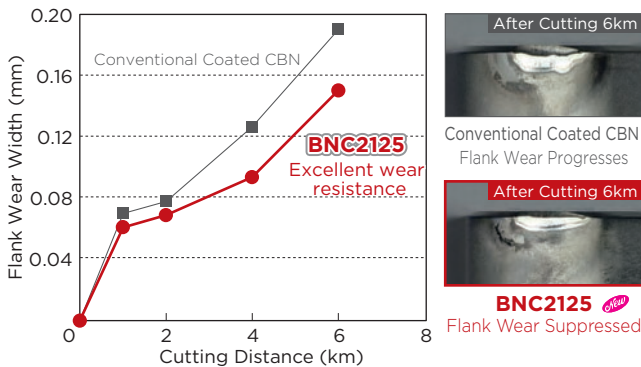
Work Material: SCM415H (58-62HRC)  
Tool Cat. No.: 4NC-DNGA150408  
Cutting Conditions:  $v_c = 200\text{m/min}$ ,  $f = 0.1\text{mm/rev}$ ,  $a_p = 0.15\text{mm}$  Wet

### BNC2115 Continuous Cutting (Machined Surface Roughness)



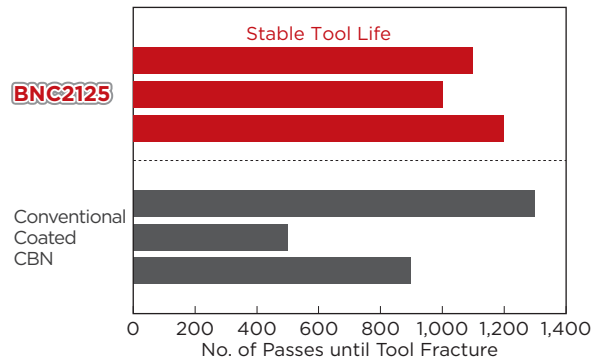
Work Material: SCM415H (58-62HRC)  
Tool Cat. No.: 4NC-DNGA150408  
Cutting Conditions:  $v_c = 200\text{m/min}$ ,  $f = 0.1\text{mm/rev}$ ,  $a_p = 0.15\text{mm}$  Wet

### BNC2125 Continuous Cutting (Wear Resistance)



Work Material: SUJ2 (58-62HRC)  
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

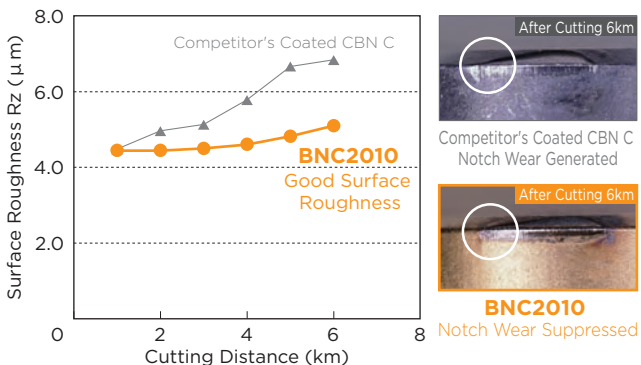
### BNC2125 High-load Cutting (Fracture Resistance)



Work Material: SUJ2 (58-62HRC)  
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/time Wet

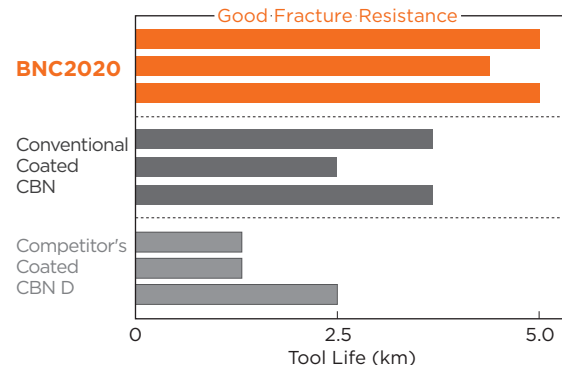
## ■ Cutting Performance

### BNC2010 Continuous Cutting (Machined Surface Roughness)



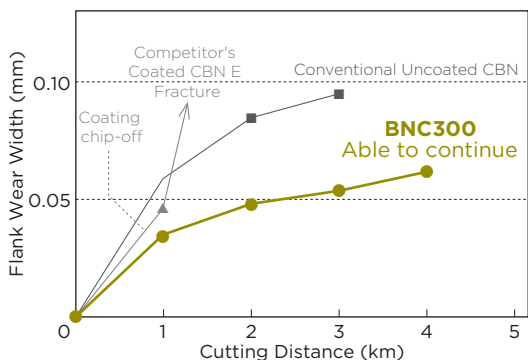
Work Material: SCM415H (58-62HRC)  
 Tool Cat. No.: 4NC-DNGA150408  
 Cutting Conditions:  $v_c = 120\text{m/min}$ ,  $f = 0.14\text{mm/rev}$ ,  $a_p = 0.15\text{mm}$  Wet

### BNC2020 Interrupted Cutting (Fracture Resistance)



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 Interrupted Cutting (Fracture Resistance)

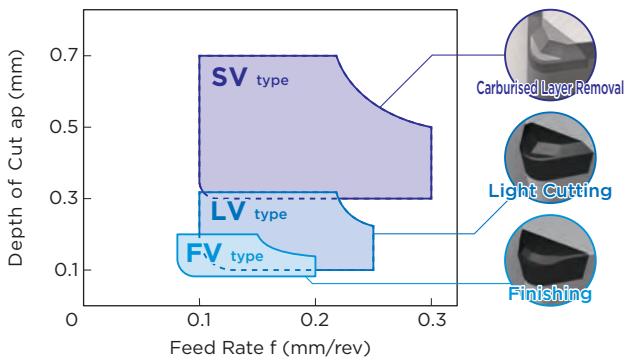


Work Material: Grooved SCr420 (58 to 62 HRC)  
 Tool Cat. No.: 4NC-CNGA120408  
 Cutting Conditions:  $v_c = 120\text{m/min}$ ,  $f = 0.1\text{mm/rev}$ ,  $a_p = 0.2\text{mm}$  Dry

# BNC2105/BNC2115/BNC2125/BNC2010/BNC2020/BNC300

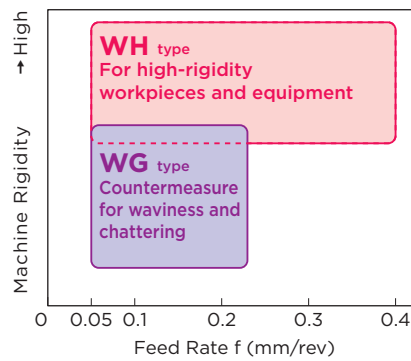
## ■ One-Use Insert with Chipbreaker BREAK MASTER

### ● Application Range



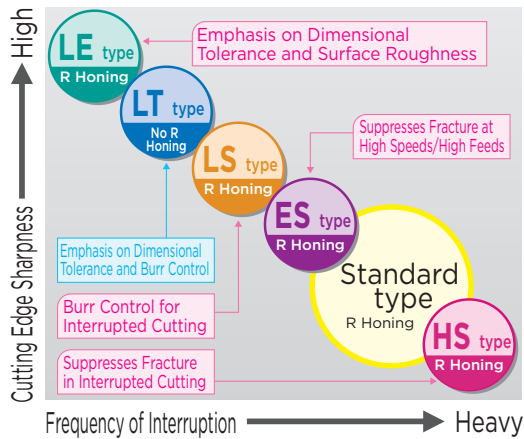
## ■ One-Use Wiper Insert

### ● Application Range Precautions when Using Wiper Inserts P12



## ■ Cutting Edge Treatment Specification

Optimal cutting edge treatment applied to various grades and geometries to avoid cutting edge fracture caused by the heavy loads generated during the machining of high-hardness materials such as hardened steel.



### High-precision type LE LT LS

World's smallest class edge treatment for coated CBN in hardened steel machining. Lowers cutting force

### Strong Edged HS

Suppresses cutting edge chipping and fracture  
Stable tool life in interrupted machining

### High-efficiency type ES

Suppresses crater wear and its resultant edge chipping  
Stable tool life in high-speed, high-feed machining

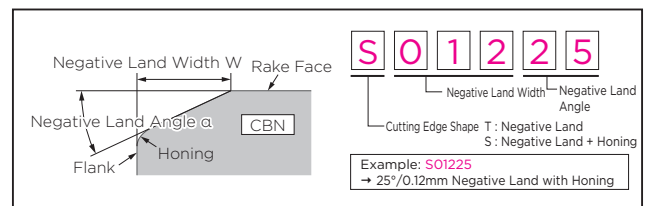
## ● Cutting Edge Specification List

Work Material	Grade	Neg.-Pos.	Standard				Low Cutting Force <span style="border: 1px solid black; padding: 2px;">L</span> / High-efficiency type <span style="border: 1px solid black; padding: 2px;">E</span>				Strong Edged <span style="border: 1px solid black; padding: 2px;">H</span>					
			Cutting Edge Specification Identification Code	$\alpha$	W	Honing	Notation	Cutting Edge Specification Identification Code	$\alpha$	W	Honing	Notation	Cutting Edge Specification Identification Code	$\alpha$	W	Honing
Hardened Steel	<b>BNC2105</b>	Negative/Positive	S01225	25°	0.12	Yes	<span style="border: 1px solid black; padding: 2px;">LS</span>	S00515	15°	0.05	Yes	-	-	-	-	-
	<b>BNC2115</b>	Negative/Positive	S01225	25°	0.12	Yes	<span style="border: 1px solid black; padding: 2px;">LS</span>	S00515	15°	0.05	Yes	<span style="border: 1px solid black; padding: 2px;">HS</span>	S01730	30°	0.17	Yes
	<b>BNC2125</b>	Negative/Positive	S01225	25°	0.12	Yes	<span style="border: 1px solid black; padding: 2px;">LS</span>	S00515	15°	0.05	Yes	<span style="border: 1px solid black; padding: 2px;">HS</span>	S02735	35°	0.27	Yes
	<b>BNC2010</b>	Negative/Positive	S01225	25°	0.12	Yes	<span style="border: 1px solid black; padding: 2px;">LE</span>	-	0°	0	Yes	<span style="border: 1px solid black; padding: 2px;">HS</span>	S01730	30°	0.17	Yes
	<b>BNC2020</b>	Negative/Positive	S01225	25°	0.12	Yes	<span style="border: 1px solid black; padding: 2px;">LT</span> <span style="border: 1px solid black; padding: 2px;">ES</span>	T00515 S00535	15° 35°	0.05 0.05	No Yes	<span style="border: 1px solid black; padding: 2px;">HS</span>	S02735	35°	0.27	Yes
	<b>BNC300</b>	Negative/Positive	S01225	25°	0.12	Yes	<span style="border: 1px solid black; padding: 2px;">LS</span>	S00515	15°	0.05	Yes	<span style="border: 1px solid black; padding: 2px;">HS</span>	S01735	35°	0.17	Yes

## ● Cutting Edge Specification of Wiper/Chipbreaker Inserts (Common)

Type	Notation	Neg.-Pos.	Cutting Edge Specification Identification Code	$\alpha$	W	Honing
Wiper Inserts	<span style="border: 1px solid black; padding: 2px;">WG</span>	Negative/Positive	S01215	15°	0.12	Yes
	<span style="border: 1px solid black; padding: 2px;">WH</span>	Negative/Positive	S01215	15°	0.12	Yes
Inserts with Chipbreaker	<span style="border: 1px solid black; padding: 2px;">N-FV</span>	Negative/Positive	-	0°	0	Yes
	<span style="border: 1px solid black; padding: 2px;">N-LV</span>	Negative/Positive	S00535	35°	0.05	Yes
	<span style="border: 1px solid black; padding: 2px;">N-SV</span>	Negative	S01235	35°	0.12	Yes

## ● Cutting Edge Specification Identification Code





# BNC2105/BNC2115/BNC2125/BNC2010/BNC2020/BNC300

## Stock Table: Negative type Multi-Cornered, One-Use Inserts

### Negative Triangular type

Appearance	Cat. No.	Stock					Dimensions (mm)						
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	No. of Cutting Edges	CBN Cutting Edge Length	Inscribed Circle	Thickness	Hole Dia.	Corner Radius
	3NC-TNGA160404			●	●			3	2.3				0.4
	3NC-TNGA160408			●	●			3	2.0	9.525	4.76	3.81	0.8
	3NC-TNGA160412			●	●				2.0				1.2
	3NC-TNGA160416 *1			●	●				3.3				1.6
	3NC-TNGA160420 *1			●	●			3	3.0	9.525	4.76	3.81	2.0
	3NC-TNGA160424 *1			●	●				2.7				2.4
	6NC-TNGA160402			●	●				2.4				0.2
	6NC-TNGA160404	●		●	●			6	2.3	9.525	4.76	3.81	0.4
	6NC-TNGA160408	●		●	●				2.0				0.8
	6NC-TNGA160412			●	●				2.0				1.2
	6NC-TNGA160416 *1			●	●				3.3				1.6
	6NC-TNGA160420 *1			●	●			6	3.0	9.525	4.76	3.81	2.0
	6NC-TNGA160424 *1			●	●				2.7				2.4
		6NC-TNGG160404N-FV			●	●				2.3			
6NC-TNGG160408N-FV				●	●			6	2.0	9.525	4.76	3.81	0.8
6NC-TNGG160412N-FV				●	●				2.0				1.2
	6NC-TNGG160404N-LV			●	●				2.3				0.4
	6NC-TNGG160408N-LV			●	●			6	2.0	9.525	4.76	3.81	0.8
	6NC-TNGG160412N-LV			●	●				2.0				1.2
	6NC-TNGG160404N-SV			●	●				2.3				0.4
	6NC-TNGG160408N-SV			●	●			6	2.0	9.525	4.76	3.81	0.8
	6NC-TNGG160412N-SV			●	●				2.0				1.2
	3NC-TNGA160404LE			●	●				2.3				0.4
	3NC-TNGA160408LE			●	●			3	2.0	9.525	4.76	3.81	0.8
	3NC-TNGA160412LE			●	●				2.0				1.2
	3NC-TNGA160402LT			●	●				2.4				0.2
	3NC-TNGA160404LT			●	●			3	2.3	9.525	4.76	3.81	0.4
	3NC-TNGA160408LT			●	●				2.0				0.8
	3NC-TNGA160412LT			●	●				2.0				1.2
	3NC-TNGA160402LS			●	●				2.4				0.2
	3NC-TNGA160404LS	●		●	●			3	2.3	9.525	4.76	3.81	0.4
	3NC-TNGA160408LS	●		●	●				2.0				0.8
	3NC-TNGA160412LS			●	●				2.0				1.2
	6NC-TNGA160404HS			●	●				2.3				0.4
	6NC-TNGA160408HS			●	●			6	2.0	9.525	4.76	3.81	0.8
	6NC-TNGA160412HS			●	●				2.0				1.2
	6NC-TNGA160404ES			●	●				2.3				0.4
	6NC-TNGA160408ES			●	●			6	2.0	9.525	4.76	3.81	0.8
	6NC-TNGA160412ES			●	●				2.0				1.2

\*1 For use with SUMIBORON Special Holders for High-Efficiency Machining.

### Negative Trigon type

Appearance	Cat. No.	Stock					Dimensions (mm)						
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	No. of Cutting Edges	CBN Cutting Edge Length	Inscribed Circle	Thickness	Hole Dia.	Corner Radius
	6NC-WNGA080404			●	●				2.3				0.4
	6NC-WNGA080408	●		●	●			6	2.0	12.7	4.76	5.16	0.8
	6NC-WNGA080412			●	●				2.0				1.2
	6NC-WNGA080408WG			●	●				2.0				0.8
	6NC-WNGA080408WH			●	●			6	1.9	12.7	4.76	5.16	0.8
	3NC-WNGA080408LT			●	●			3	2.0	12.7	4.76	5.16	0.8
	3NC-WNGA080408LS	●		●	●			3	2.0	12.7	4.76	5.16	0.8
	6NC-WNGA080408HS			●	●			6	2.0	12.7	4.76	5.16	0.8

### Negative 35° Diamond type

Appearance	Cat. No.	Stock					Dimensions (mm)						
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	No. of Cutting Edges	CBN Cutting Edge Length	Inscribed Circle	Thickness	Hole Dia.	Corner Radius
	2NC-VNGA160404			●	●				2.8				0.4
	2NC-VNGA160408			●	●			2	2.0	9.525	4.76	3.81	0.8
	2NC-VNGA160412			●	●				1.7				1.2
	4NC-VNGA160402			●	●				3.3				0.2
	4NC-VNGA160404	●		●	●			4	2.8	9.525	4.76	3.81	0.4
	4NC-VNGA160408	●		●	●				2.0				0.8
	4NC-VNGA160412			●	●				1.7				1.2
	4NC-VNGG160404N-FV			●	●			4	2.8	9.525	4.76	3.81	0.4
	4NC-VNGG160408N-FV			●	●				2.0				0.8
	4NC-VNGG160404N-LV			●	●				2.8				0.4
	4NC-VNGG160408N-LV			●	●			4	2.0	9.525	4.76	3.81	0.8
	2NC-VNGA160402LT			●	●				3.3				0.2
	2NC-VNGA160404LT			●	●				2.8				0.4
	2NC-VNGA160408LT			●	●			2	2.0	9.525	4.76	3.81	0.8
	2NC-VNGA160412LT			●	●				1.7				1.2
	2NC-VNGA160402LS			●	●				3.3				0.2
	2NC-VNGA160404LS	●		●	●				2.8				0.4
	2NC-VNGA160408LS	●		●	●			2	2.0	9.525	4.76	3.81	0.8
	2NC-VNGA160412LS			●	●				1.7				1.2
	4NC-VNGA160404HS			●	●				2.8				0.4
	4NC-VNGA160408HS			●	●			4	2.0	9.525	4.76	3.81	0.8
	4NC-VNGA160412HS			●	●				1.7				1.2
	4NC-VNGA160404ES			●	●				2.8				0.4
	4NC-VNGA160408ES			●	●			4	2.0	9.525	4.76	3.81	0.8
	4NC-VNGA160412ES			●	●				1.7				1.2

### Part Number Suffix Code Detailed Cutting Edge Specifications

Type	Symbol	Applications	Type	Symbol	Cutting Edge Treatment Specification
Wiper Insert	WG	Low-Feed	Standard type	LE	(With) Honing
	WH	High-Feed		LT	Low Resistance + With Honing
				LS	Low Resistance + Negative Land
With Chipbreaker	FV	Finishing	High-precision type	LT	Low Resistance + Negative Land
	LV	Light Cutting		LS	Low Resistance + Negative Land + With Honing
	SV	Carburised Layer Removal		HS	Strong Edge + Negative Land + With Honing
			Strong Edged	ES	High Efficiency + Negative Land + With Honing
			High-efficiency type		

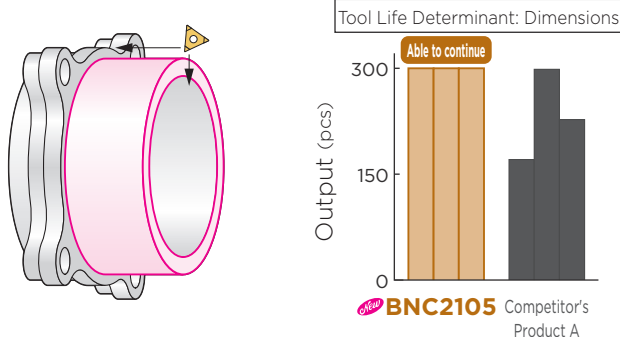
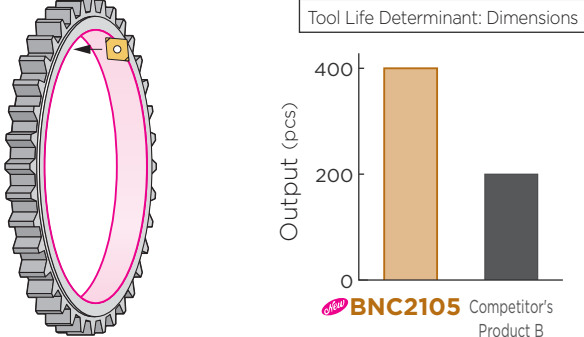
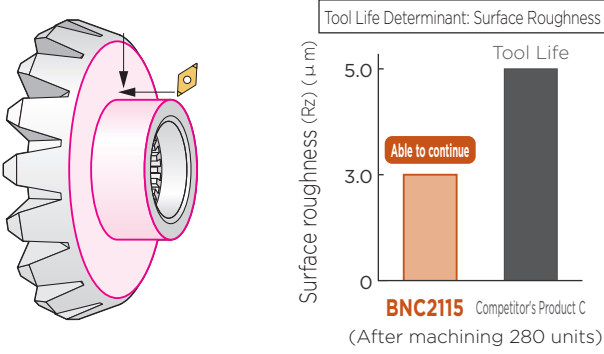
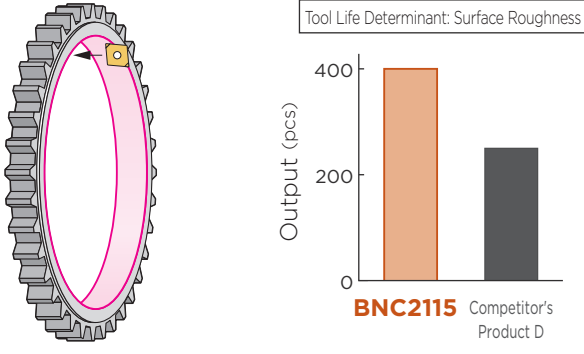
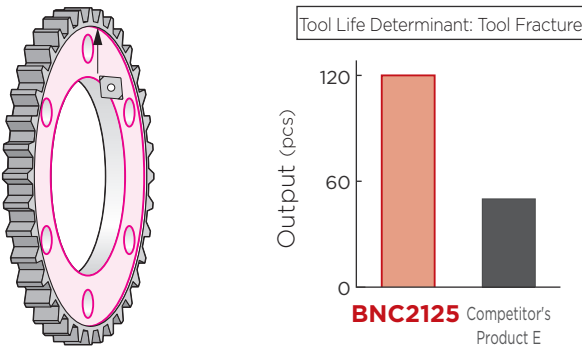
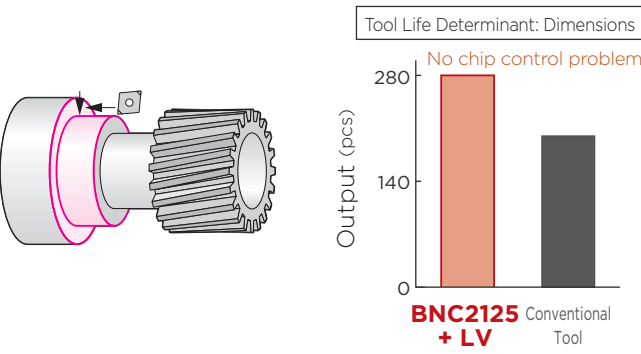
● mark: Standard stocked item ● mark: Standard stocked item (new product), Blank: Made-to-order item, - mark: Not available



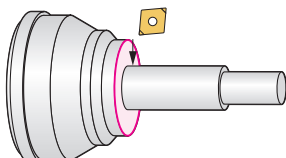
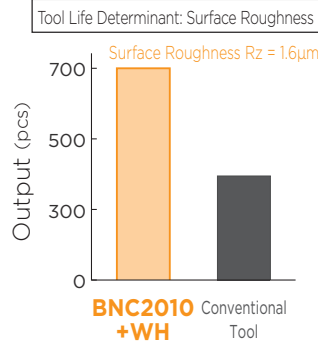
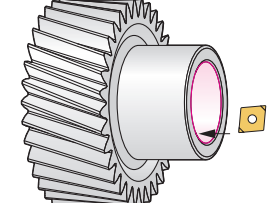
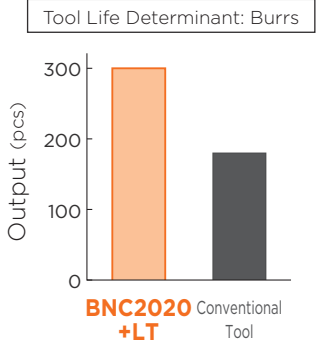
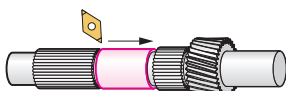
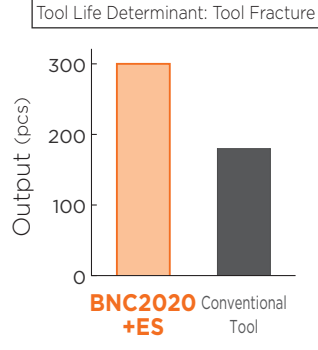
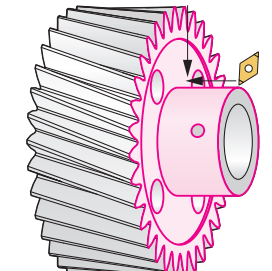
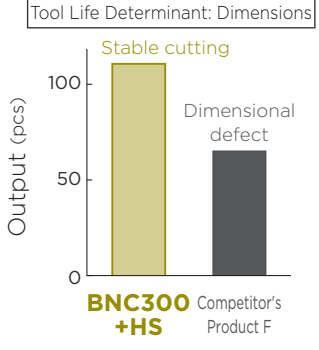


# BNC2105/BNC2115/BNC2125/BNC2010/BNC2020/BNC300

## Application Examples of BNC2105 / BNC2115 / BNC2125

<p><b>SUJ2 Bearing Steel Hub (60HRC)</b> <span style="float: right;">H</span></p> <p>BNC2105 suppresses fractures due to crater wear and realises stable machining</p>  <p>Tool: 6NC-TNGA160408 (BNC2105) Cutting Conditions: <math>v_c = 230\text{m/min}</math>, <math>f = 0.12\text{mm/rev}</math>, <math>a_p = 0.10\text{mm}</math> Wet</p>	<p><b>SCr420H Hardened Steel Ring Gear (60HRC)</b> <span style="float: right;">H</span></p> <p>BNC2105 maintains excellent wear resistance for a long time compared to competitors' coated CBN</p>  <p>Tool: 4NC-CNGA120412 (BNC2105) Cutting Conditions: <math>v_c = 200\text{m/min}</math>, <math>f = 0.10\text{mm/rev}</math>, <math>a_p = 0.10\text{mm}</math> Wet</p>
<p><b>SCM415H Hardened Steel Gear (60HRC)</b> <span style="float: right;">H</span></p> <p>Compared to competitors' coated CBN, BNC2115 reduces flank wear width by 30%, able to continue with good surface roughness</p>  <p>Tool: 4NC-DNGA150404 (BNC2115) Cutting Conditions: <math>v_c = 160\text{m/min}</math>, <math>f = 0.10\text{mm/rev}</math>, <math>a_p = 0.25\text{mm}</math> Wet</p>	<p><b>SCr440H Hardened Steel Ring Gear (60HRC)</b> <span style="float: right;">H</span></p> <p>BNC2115 WH type wiper insert maintains excellent surface roughness for a long time compared to competitors' coated CBN (wiper insert)</p>  <p>Tool: 2NC-CCGW09T308WH (BNC2115) Cutting Conditions: <math>v_c = 150\text{m/min}</math>, <math>f = 0.12\text{mm/rev}</math>, <math>a_p = 0.10\text{mm}</math> Wet</p>
<p><b>SCr420H Hardened Steel Ring Gear (60HRC)</b> <span style="float: right;">H</span></p> <p>BNC2125 suppresses fractures due to crater wear and realises at least double the tool life</p>  <p>Tool: 4NC-CNGA120412 (BNC2125) Cutting Conditions: <math>v_c = 150\text{m/min}</math>, <math>f = 0.2\text{mm/rev}</math>, <math>a_p = 0.3\text{mm}</math> Dry</p>	<p><b>S15C Hardened Steel Sun Gear (60HRC)</b> <span style="float: right;">H</span></p> <p>BNC2125 BREAK MASTER LV type offers long tool life and resolves chip control problems</p>  <p>Tool: 4NC-CNGG120408N-LV (BNC2125) Cutting Conditions: <math>v_c = 190\text{m/min}</math>, <math>f = 0.13\text{mm/rev}</math>, <math>a_p = 0.30\text{mm}</math> Wet</p>

Application Examples of **BNC2010** / **BNC2020** / **BNC300**

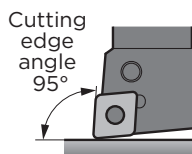
<p><b>S45C Hardened Steel CVJ Outer Race (60HRC) <span style="border: 1px solid black; padding: 2px;">H</span></b></p> <p>BNC2010 WH type wiper insert maintains excellent surface roughness for a long time</p>  <p>Tool Life Determinant: Surface Roughness</p> <p>Surface Roughness Rz = 1.6µm</p>  <p><b>BNC2010 +WH</b> Conventional Tool</p>	<p><b>SCr420H Hardened Steel Gear (60HRC) <span style="border: 1px solid black; padding: 2px;">H</span></b></p> <p>BNC2020 with high-precision LT type cutting edge treatment suppresses burrs and improves tool life</p>  <p>Tool Life Determinant: Burrs</p>  <p><b>BNC2020 +LT</b> Conventional Tool</p>
<p>Tool: 2NC-CNGA120412WH (<b>BNC2010</b>) Cutting Conditions: <math>v_c = 150\text{m/min}</math>, <math>f = 0.2\text{mm/rev}</math>, <math>a_p = 0.2\text{mm}</math> Dry</p>	<p>Tool: 2NC-CNGA120408LT (<b>BNC2020</b>) Cutting Conditions: <math>v_c = 100\text{m/min}</math>, <math>f = 0.10\text{mm/rev}</math>, <math>a_p = 0.15\text{mm}</math> Dry</p>
<p><b>SCr420H Hardened Steel Shaft (60HRC) <span style="border: 1px solid black; padding: 2px;">H</span></b></p> <p>BNC2020 with high-efficiency ES type cutting edge treatment suppresses fractures due to crater wear and offers long tool life</p>  <p>Tool Life Determinant: Tool Fracture</p>  <p><b>BNC2020 +ES</b> Conventional Tool</p>	<p><b>SCM420H Hardened Steel Gear (62HRC) <span style="border: 1px solid black; padding: 2px;">H</span></b></p> <p>BNC300 with strong edged HS type cutting edge treatment enables stable machining without fractures in interrupted cutting</p>  <p>Tool Life Determinant: Dimensions</p>  <p><b>BNC300 +HS</b> Competitor's Product F</p>
<p>Tool: 4NC-DNGA150408ES (<b>BNC2020</b>) Cutting Conditions: <math>v_c = 150\text{m/min}</math>, <math>f = 0.15\text{mm/rev}</math>, <math>a_p = 0.10\text{mm}</math> Dry</p>	<p>Tool: 4NC-DNGA150408HS (<b>BNC300</b>) Cutting Conditions: <math>v_c = 100\text{m/min}</math>, <math>f = 0.1\text{mm/rev}</math>, <math>a_p = 0.3\text{mm}</math> Dry</p>

## ■ Precautions when Using Wiper Inserts

### When using CNGA type / CCGW type / WNGA type Wiper Inserts

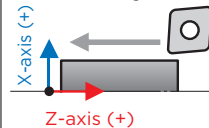
Use a holder with a cutting angle of 95°. Machining program **modification is required**.

CNGA, CCGW and WNGA type wiper inserts do not comply with the ISO standard profiles. Correct the cutting edge position (tool offset) as explained on the right.



Cutting Edge Position Correction for CNGA type / CCGW type / WNGA type (WG type / WH type)

External Turning

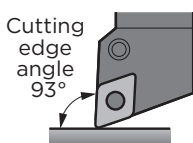


Corner Radius	Type	X-axis direction	Z-axis direction
R0.4	WG type	-0.02	-0.02
	WH type	-0.06	-0.06
R0.8 / R1.2	WG type	-0.01	-0.01
	WH type	-0.06	-0.06

### When using DNGA type / DCGW type Wiper Inserts

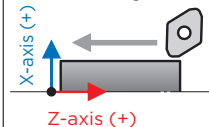
Use a holder with a cutting angle of 93°. Machining program **modification is required**.

DNGA and DCGW type wiper inserts do not comply with the ISO standard profiles. Correct the cutting edge position (tool offset) as explained on the right.



Cutting Edge Position Correction for DNGA type / DCGW type (WG type / WH type)

External Turning



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 types can only exhibit wiper effect for external and internal diameter machining, and cannot be used for facing.

### < 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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<https://www.sumitool.com/global>