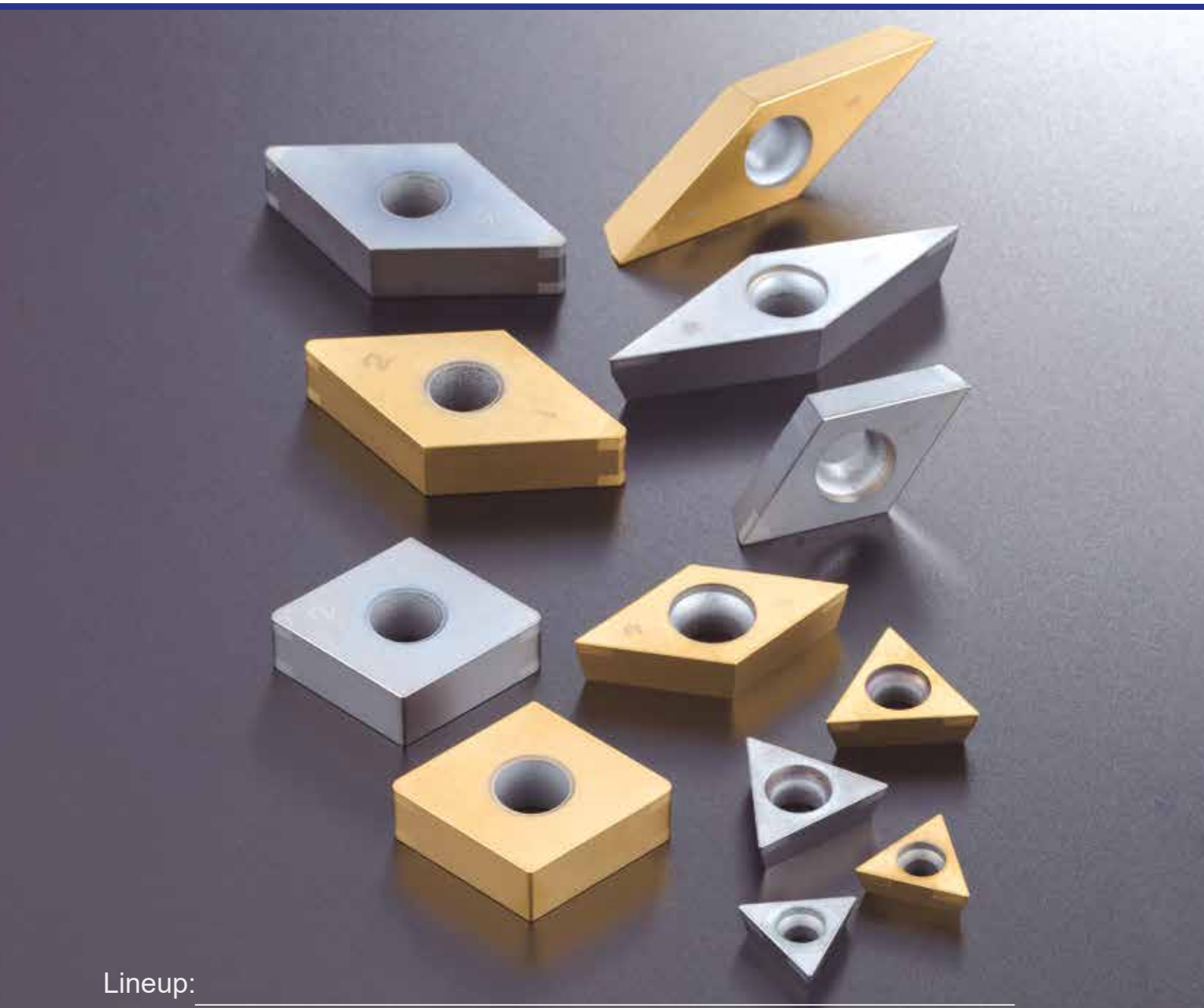
SUMITOMO
CARBIDE - CBN - DIAMOND

Coated SUMIBORON

BNC2115 / BNC2125

Coated SUMIBORON Series for Hardened Steel



Lineup:

BNC2125 BNC2020	General Machining
BNC2115 BNC2010	High-Precision Machining
BNC300	Heavy Interrupted Machining

P M K N S H

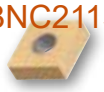
SUMITOMO ELECTRIC GROUP

BNC2115/BNC2125/BNC2010/BNC2020/BNC300

General Features

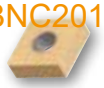
BNC2115/BNC2125 have been added to our coated SUMIBORON series and are our first recommendations for hardened steel machining, for even higher efficiency machining. It's the pinnacle of high accuracy and high efficiency cutting.
In combination with BNC2010/BNC2020, which emphasize stable tool life, they improve productivity in all kinds of hardened steel machining.

Features



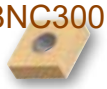
BNC2115 **The definitive grade in high-accurancy machining**
Realises long tool life with excellent surface roughness and stable machining.
Further maintains excellent surface roughness
Maintains excellent surface roughness thanks to a coating with high notch wear resistance and tough CBN substrate.

BNC2125 **First recommendation for hardened steel machining**
Superb wear and fracture resistance.
Achieves long, stable tool life even in high-efficiency and interrupted machining
Along with a tough CBN substrate, the coating combines wear resistance and toughness to realise stable machining.



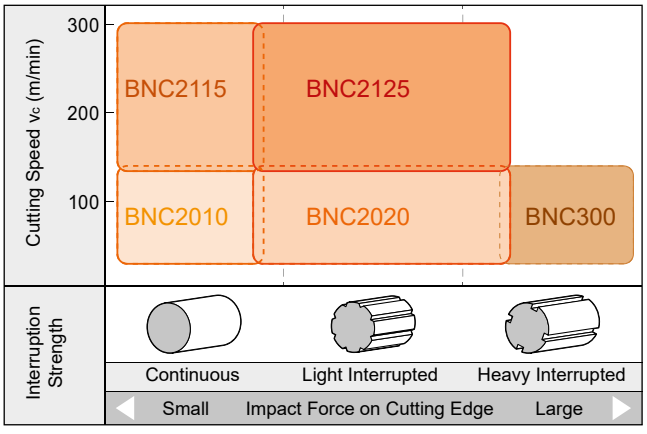
BNC2010 **Grade for high-precision machining with excellent surface roughness and finished surface accuracy**
Grade ideal for high-precision machining, with highly wear-resistant CBN substrate and coating.

BNC2020 **General-purpose grade suitable for typical hardened steel machining applications**
Achieves further stability in machining of a wide range of hardened steel components.

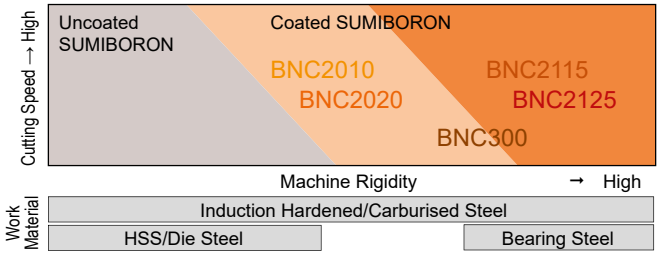


BNC300 **Achieves long, stable tool life even in machining including heavy interrupted cutting**
Achieves long, stable tool life even on work material requiring both continuous and interrupted cutting.

Application Range



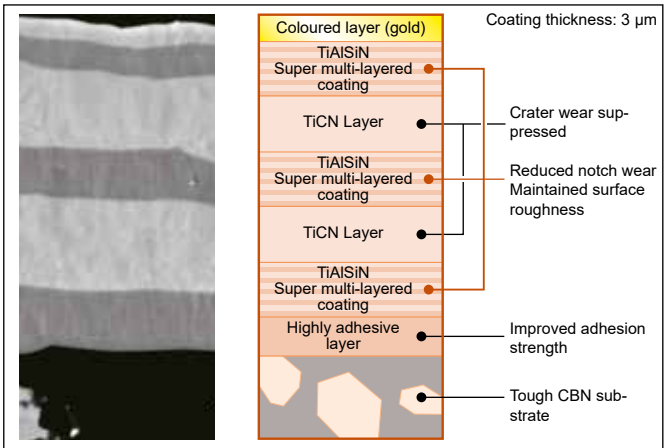
Differentiation



CBN Substrate und Coating Structure

BNC2115

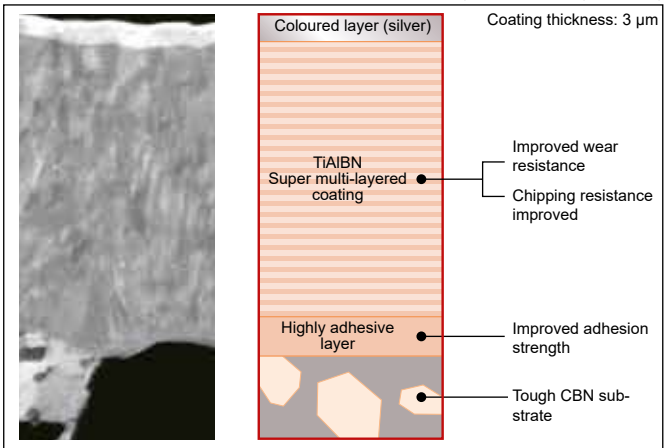
High-Precision Machining
(Medium- to high-speed)



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

BNC2125

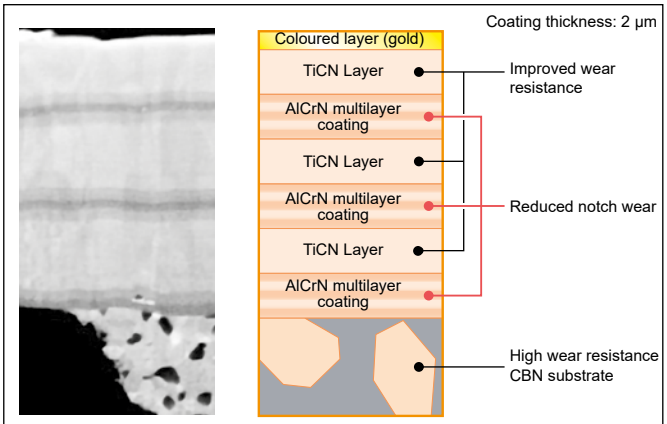
General Machining
(Medium- to high-speed)



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

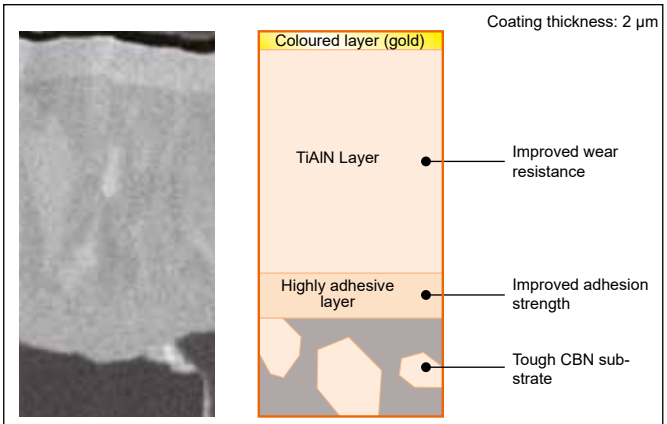
High-Precision Machining
(Low- to medium-speed)



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.

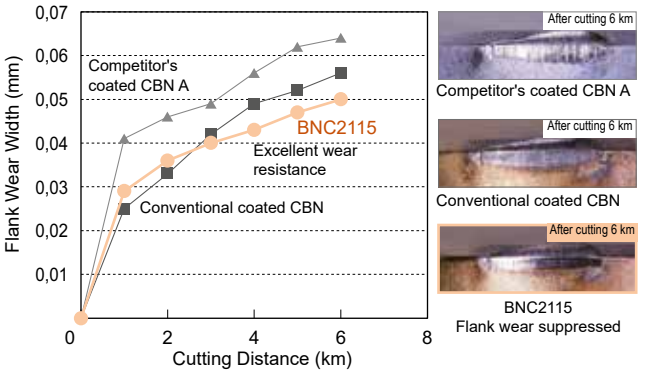
Recommended Cutting Conditions

Grade	Cutting Speed v_c (m/min) Min.–**Optimum**–Max.	Feed Rate f (mm/rev) Min.–**Optimum**–Max.	Depth of Cut a_p (min) 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

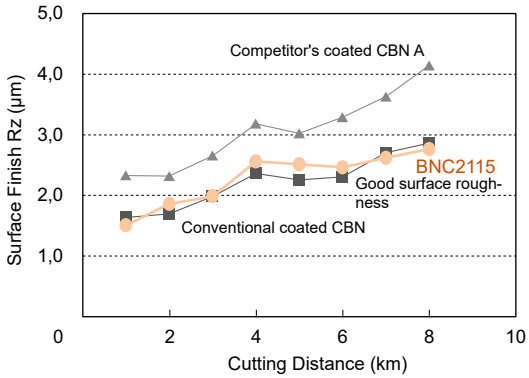
BNC2115

Continuous Cutting, Wear Resistance



Work Material:	16CrMo4 (58–62 HRC)
Insert:	DNGA150408NC4
Cutting Data:	v_c = 200 m/min, f = 0,1 mm/rev, a_p = 0,15 mm, wet

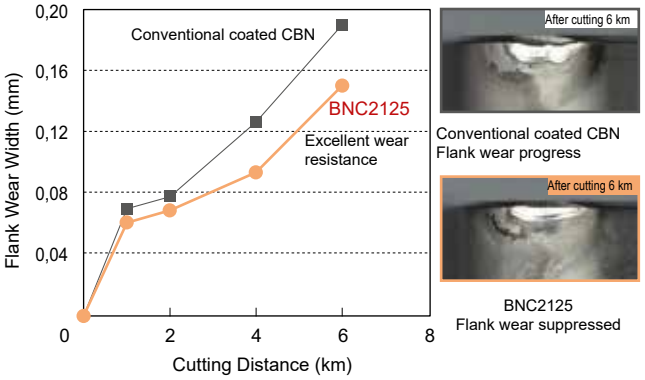
Continuous Cutting, Machined Surface Roughness



Work Material:	16CrMo4 (58–62 HRC)
Insert:	DNGA150408NC4
Cutting Data:	v_c = 200 m/min, f = 0,1 mm/rev, a_p = 0,15 mm, wet

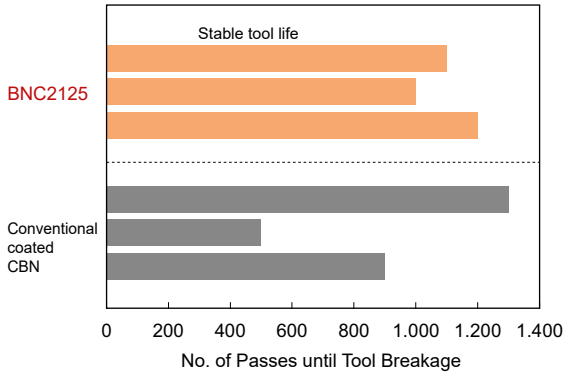
BNC2125

Continuous Cutting, Wear Resistance



Work Material:	100Cr6 (58–62 HRC)
Insert:	DNGA150408NC4
Cutting Data:	v_c = 150 m/min, f = 0,1 mm/rev, a_p = 0,2 mm, wet

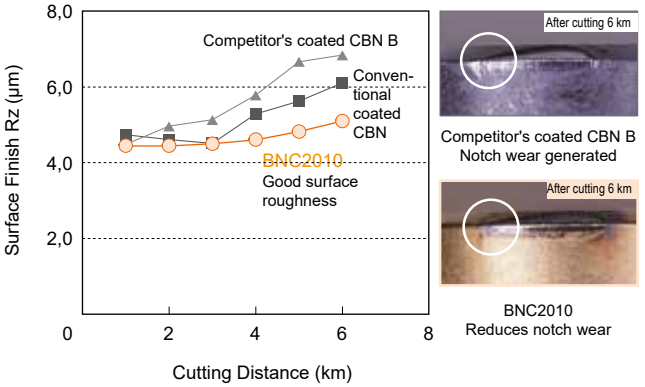
High-Load Cutting, Fracture Resistance



Work Material:	100Cr6 (58–62 HRC)
Insert:	DNGA150408NC4
Cutting Data:	v_c = 150 m/min, f = 0,15 mm/rev, a_p = 0,5 mm, 63 m/times, wet

BNC2010

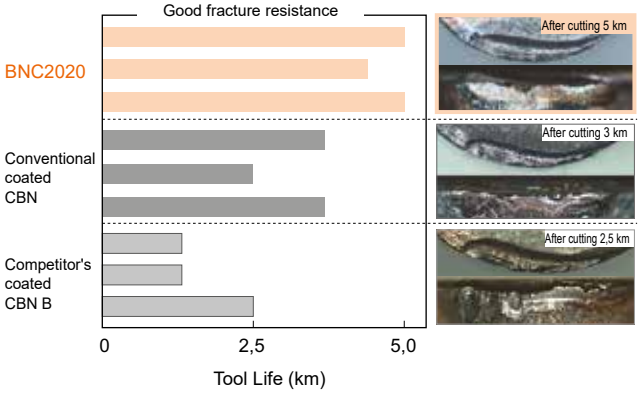
Continuous Cutting, Machined Surface Roughness



Work Material:	16CrMo4 (58–62 HRC)
Insert:	DNGA150408NC4
Cutting Data:	v_c = 120 m/min, f = 0,14 mm/rev, a_p = 0,15mm, wet

BNC2020

Interrupted Cutting, Fracture Resistance

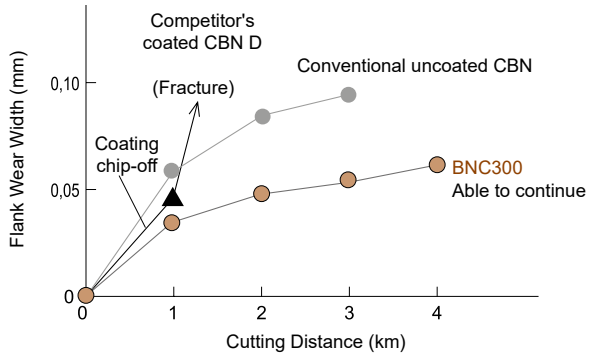


Work Material:	16CrMo4 with 5 grooves (58–62 HRC)
Insert:	DNGA1204012NC4
Cutting Data:	v_c = 130 m/min, f = 0,1 mm/rev, a_p = 0,6 mm, dry

Cutting Performance

BNC300

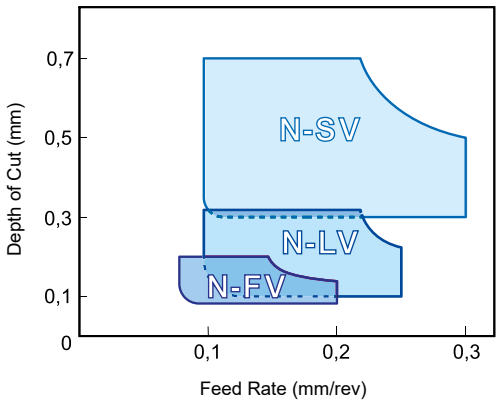
Interrupted Cutting, Fracture Resistance

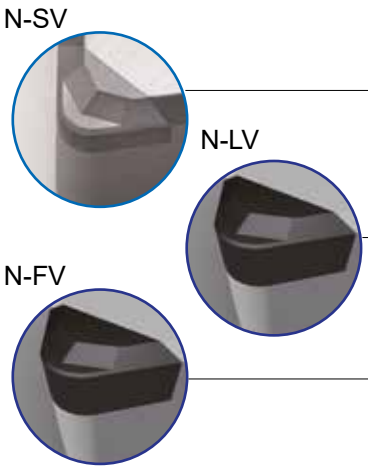


Work Material:	Grooved 15CrMo5 (58–62 HRC)
Insert:	CNGA120408NC4
Cutting Data:	v_c = 120 m/min, f = 0,1 mm/rev, a_p = 0,2 mm, dry

One-use Inserts with Chipbreaker Breakmaster

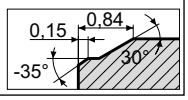
Application Range





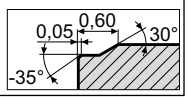
N-SV For Carburised Layer Removal

Ideal for carburised layer removal.



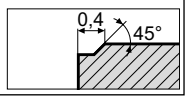
N-LV For Light Cutting

Excellent chip evacuation under conditions with depth of cut at ≤ 0,3 mm.



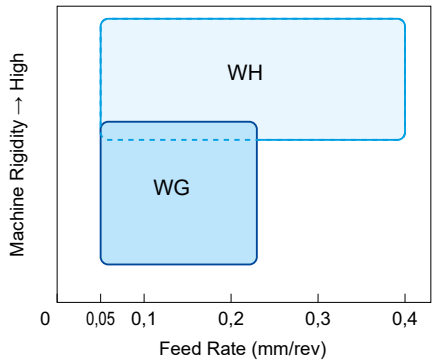
N-FV For Finishing

Excellent chip evacuation under finishing conditions with depth of cut at ≤ 0,2 mm.



One-use Wiper Inserts

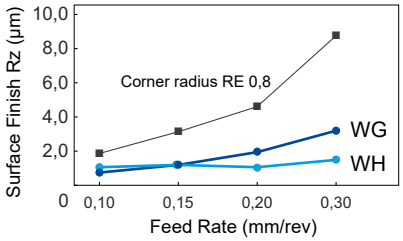
Application Range



WH type:
→ for high-rigidity workpieces and equipment

WG type:
→ for issues of undulation or chatter

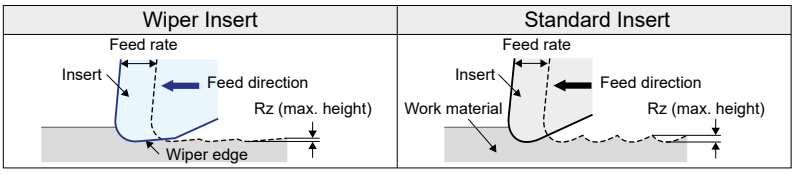
Finished Surface Roughness



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

Work Material:	15CrMo5 (60 HRC)
Insert:	CNGA120408NC4
Cutting Data:	vc = 135 m/min, ap = 0,1 mm, dry

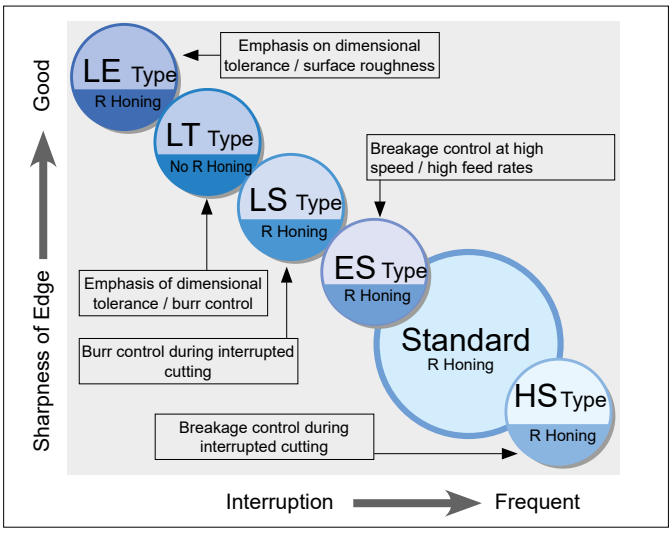
Wiper Insert Operation



BNC2115/BNC2125/BNC2010/BNC2020/BNC300

Cutting Edge Specification

Treatment with the optimum cutting edge preparation for the various grades and geometries avoids cutting edge fracture caused by the heavy loads generated during the machining of high-hardness materials such as hardened steel.



High Precision Types LE, LT, LS

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

High Efficiency Type ES

Suppresses crater wear and resulting fractures. Stabilises tool life in high-speed, high-feed machining.

Strong Edge Type HS

Suppresses cutting edge chipping and fracture. Stabilises tool life in interrupted machining.

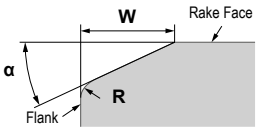
Insert Cutting Edge Specification

Work Material	Grade	Negative / Positive	Standard				Low Cutting Force Type **L** / High Efficiency Type **E**					Strong Edge Type **H**				
			Identification Code	α	W	Honing	Notation	Identification Code	α	W	Honing	Notation	Identification Code	α	W	Honing
Hardened Steel	**BNC2115**	Neg./Pos.	S01225	25°	0,12	Yes	**LS**	S00515	15°	0,05	Yes	**HS**	S01730	30°	0,17	Yes
	BNC2125	Neg./Pos.	S01225	25°	0,12	Yes	**LS**	S00515	15°	0,05	Yes	**HS**	S02735	35°	0,27	Yes
	BNC2010	Neg./Pos.	S01225	25°	0,12	Yes	**LE**	(Sharp edge)	0°	0	Yes	**HS**	S01730	30°	0,17	Yes
	BNC2020	Neg./Pos.	S01225	25°	0,12	Yes	**LT**	T00515	15°	0,05	No	**HS**	S02735	35°	0,27	Yes
							ES	S00535	35°	0,05	Yes					
	BNC300	Neg./Pos.	S01225	25°	0,12	Yes	**LS**	S00515	15°	0,05	Yes	**HS**	S01735	35°	0,17	Yes

Cutting Edge Preparation with Wiper/Chipbreaker

Type	Notation	Negative / Positive	Identification Code	α	W	Honing
Wiper Insert	WG	Neg./Pos.	S01215	15°	0,12	Yes
	WH	Neg./Pos.	S01215	15°	0,12	Yes
Insert with chip breaker	N-FV	Neg./Pos.	–	0°	0	Yes
	N-LV	Neg./Pos.	S00535	35°	0,05	Yes
	N-SV	Neg.	S01235	35°	0,12	Yes

Edge Preparation Identification Code



S 0 1 2 2 5

Negative land width (**W**) — Negative land angle (**α**)

Cutting edge: **T** - Negative land
S - Negative land + Honing

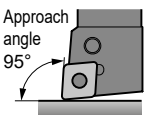
Example: **S01225**
25°/0,12 mm width negative land with honing

Tool-Setup WG / WH Wiper

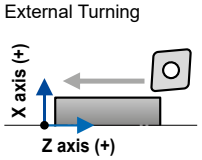
CNGA / CCGW / WNGA Type Wiper

1. Use a holder with a 95° approach angle.
2. Tool compensation required.

CNGA / CCGW / WNGA type wiper inserts do not follow the ISO standard. Correction of the tool offset of the cutting edge as explained on the right.



Cutting Edge Position Compensation, Outer Processing

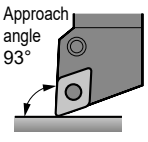


Nose Radius	Type	X-Direction	Z-Direction
RE 0,4	WG	-0,02	-0,02
	WH	-0,06	-0,06
RE 0,8/1,2	WG	-0,01	-0,01
	WH	-0,06	-0,06

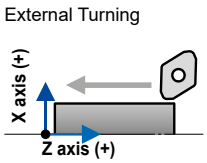
DNGA / DCGW Type Wiper

1. Use a holder with a 93° approach angle.
2. Tool compensation required.

DNGA / DCGW type wiper inserts do not follow the ISO standard. Correction of the tool offset of the cutting edge as explained on the right.
Note: DNGA/DCGW type wiper inserts are only possible for external and internal turning, not for facing.



Cutting Edge Position Compensation, Outer Processing



Nose Radius	Type	X-Direction	Z-Direction
RE 0,4	WG	-0,17	-0,01
	WH	-0,70	-0,06
RE 0,8	WG	-0,05	0
	WH	-0,58	-0,05

Multi-Cornered, One-Use Inserts, Negative

80° Diamond Type

Shape	Cat. No.	Stock BNC2115	BNC2125	BNC2010	BNC2020	BNC300	No. of Cutt. Edges	Dimensions (mm) Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	CNGA 120404 NC2		❍		❍		2	2,5	12,7	4,76	5,16	0,4
	120408 NC2		❍	❍	❍			2,4				0,8
	120412 NC2		❍	❍	❍			2,3				1,2
	CNGA 120416 NC2*1			❍	❍	❍	2	3,3	12,7	4,76	5,16	1,6
	120420 NC2*1			❍	❍	❍		3,2				2,0
	120424 NC2*1			❍	❍	❍		3,1				2,4
	CNGA 120402 NC4	❍	❍	❍	❍		4	2,5	12,7	4,76	5,16	0,2
	120404 NC4	●	●	●	●	●		2,5				0,4
	120408 NC4	❍	●	●	●	●		2,4				0,8
	120412 NC4	●	●	●	●	●		2,3				1,2
	CNGA 120416 NC4*1	❍	❍	❍	❍	❍		3,3	12,7	4,76	5,16	1,6
	120420 NC4*1	❍	❍					3,2				2,0
	120424 NC4*1	❍	❍	❍	❍	❍		3,1				2,4
	CNGA 120404 NCW4	●	●					2,5	12,7	4,76	5,16	0,4
	120408 NCW4	●	●	❍	❍			2,4				0,8
	CNGA 120404 NC-WG4	●	●	●	●		4	2,4	12,7	4,76	5,16	0,4
	120408 NC-WG4	●	●	●	●			2,4				0,8
	120412 NC-WG4	●	●	●	●			2,3				1,2
	CNGA 120404 NC-WH4	●	●	●	●		4	2,4	12,7	4,76	5,16	0,4
	120408 NC-WH4	●	●	●	●			2,3				0,8
	120412 NC-WH4	●	●	●	●			2,2				1,2
	CNGG 120404 N-FV NC4	●	●	●	●		4	2,5	12,7	4,76	5,16	0,4
	120408 N-FV NC4	●	●	●	●			2,4				0,8
	120412 N-FV NC4	●	●	●	●			2,3				1,2
	CNGG 120404 N-LV NC4	●	●	●	●		4	2,5	12,7	4,76	5,16	0,4
	120408 N-LV NC4	●	●	●	●			2,4				0,8
	120412 N-LV NC4	●	●	●	●			2,3				1,2
	CNGG 120408 N-SV NC4	●	●		●		4	2,4	12,7	4,76	5,16	0,8
	120412 N-SV NC4	●	●		●			2,3				1,2
	CNGA 120404 LE-NC2			●			2	2,5	12,7	4,76	5,16	0,4
	120408 LE-NC2			●				2,4				0,8
	120412 LE-NC2			●				2,3				1,2
	CNGA 120402 LT-NC2				❍		2	2,5	12,7	4,76	5,16	0,2
	120404 LT-NC2				●			2,5				0,4
	120408 LT-NC2				●			2,5				0,8
	120412 LT-NC2				●			2,3				1,2
	CNGA 120402 LS-NC2		❍				2	2,5	12,7	4,76	5,16	0,2
	120404 LS-NC2	●	●			●		2,5				0,4
	120408 LS-NC2	●	●			●		2,4				0,8
	120412 LS-NC2	●	●			❍		2,3				1,2
	CNGA 120404 ES-NC4				●		4	2,5	12,7	4,76	5,16	0,4
	120408 ES-NC4				●			2,4				0,8
	120412 ES-NC4				●			2,3				1,2
	CNGA 120404 HS-NC2		●	●	●	●	2	2,5	12,7	4,76	5,16	0,4
	120408 HS-NC2		●	●	●	●		2,4				0,8
	120412 HS-NC2		●	●	●	●		2,3				1,2
	CNGA 120404 HS-NC4	❍	❍		❍	❍	4	2,5	12,7	4,76	5,16	0,4
	120408 HS-NC4	❍	❍		❍			2,4				0,8
	120412 HS-NC4	❍	❍		❍	❍		2,3				1,2

*1 For use with SUMIBORON special holders for high-efficiency machining.
*2 Use a holder with a cutting angle of 93°.

● Euro stock ❍ Japan stock

55° Diamond Type

Shape	Cat. No.	Stock BNC2115	BNC2125	BNC2010	BNC2020	BNC300	No. of Cutt. Edges	Dimensions (mm) Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	DNGA 110404 NC2	●	●	❍	●		2	2,5	9,525	4,76	3,81	0,4
	110408 NC2	●	●	❍	●			2,1				0,8
	110412 NC2	❍	❍	❍	❍			2,0				1,2
	DNGA 150404 NC2		❍	❍	❍		2	2,5	12,7	4,76	5,16	0,4
	150408 NC2		❍	❍	❍			2,1				0,8
	150412 NC2		❍					2,0				1,2
	DNGA 150416 NC2*1			❍	❍	❍	2	3,4	12,7	4,76	5,16	1,6
	150420 NC2*1			❍	❍	❍		3,0				2,0
	150424 NC2*1			❍	❍	❍		2,7				2,4
	DNGA 150402 NC4	❍	❍	❍	❍		4	2,6	12,7	4,76	5,16	0,2
	150404 NC4	❍	❍	❍	❍			2,5				0,4
	150408 NC4	❍	❍	❍	❍	❍		2,1				0,8
	150412 NC4	❍	❍	❍	❍	❍		2,0				1,2
	DNGA 150416 NC4*1	❍	❍	❍	❍	❍	4	3,4	12,7	4,76	5,16	1,6
	150420 NC4*1	❍	❍	❍	❍	❍		3,0				2,0
	150424 NC4*1	❍	❍	❍	❍	❍		2,7				2,4
	DNGA 150604 NC4	●	●	●	●	●	4	2,5	12,7	6,35	5,16	0,4
	150608 NC4	●	●	●	●	●		2,1				0,8
	150612 NC4	●	●	●	●	●		2,0				1,2
	DNGA 150404 NC-WG4*2	❍	❍		❍		4	2,3	12,7	4,76	5,16	0,4
	150408 NC-WG4*2	❍	❍	❍	❍			2,0				0,8
	DNGA 150604 NC-WG4*2		●	●	●			2,3				0,4
	150608 NC-WG4*2		●	●	●		4	2,0	12,7	4,76	5,16	0,8
	150612 NC-WG4*2			●	●			2,1				1,2
	DNGA 150404 NC-WH4*2	❍	❍				4	2,1	12,7	4,76	5,16	0,4
	150408 NC-WH4*2	❍	❍					1,8				0,8
	DNGA 150604 NC-WH4*2		●	●	●			2,1				0,4
	150608 NC-WH4*2		●	●	●		4	1,8	12,7	6,35	5,16	0,8
	150612 NC-WH4*2		●	●	●			1,5				1,2
	DNGG 150404 N-FV NC4	❍	❍	❍	❍		4	2,5	12,7	4,76	5,16	0,4
	150408 N-FV NC4	❍	❍		❍			2,1				0,8
	150412 N-FV NC4	❍	❍	❍	❍			2,0				1,2
	DNGG 150604 N-FV NC4		●	●	●			2,5				0,4
	150608 N-FV NC4		●	●	●		4	2,1	12,7	6,35	5,16	0,8
	150612 N-FV NC4			●	●			2,0				1,2
	DNGG 150404 N-LV NC4	❍	❍	❍	❍		4	2,5	12,7	4,76	5,16	0,4
	150408 N-LV NC4	❍	❍	❍	❍			2,1				0,8
	150412 N-LV NC4	❍	❍	❍	❍			2,0				1,2
	DNGG 150604 N-LV NC4		●	●	●			2,5				0,4
	150608 N-LV NC4		●	●	●		4	2,1	12,7	6,35	5,16	0,8
	150612 N-LV NC4		●	●	●			2,0				1,2
	DNGG 150408 N-SV NC4	❍	❍	❍	❍		4	2,1	12,7	4,76	5,16	0,8
	150412 N-SV NC4	❍	❍	❍	❍			2,0				1,2
	DNGG 150608 N-SV NC4		●		●		4	2,1	12,7	6,35	5,16	0,8
	150612 N-SV NC4		●	●	●			2,0				1,2
	DNGA 150404 LE-NC2			❍			2	2,5	12,7	4,76	5,16	0,4
	150408 LE-NC2			❍				2,1				0,8
	150412 LE-NC2			❍				2,0				1,2
	DNGA 150604 LE-NC2			●				2,5				0,4
	150608 LE-NC2			●			2	2,1	12,7	6,35	5,16	0,8
	150612 LE-NC2			●				2,0				1,2
	DNGA 150402 LT-NC2				❍		2	2,6	12,7	4,76	5,16	0,2
	150404 LT-NC2				❍			2,5				0,4
	150408 LT-NC2				❍			2,1				0,8
	150412 LT-NC2				❍			2,0				1,2
	DNGA 150604 LT-NC2				●			2,5				0,4
	150608 LT-NC2				●		2	2,1	12,7	6,35	5,16	0,8
	150612 LT-NC2				●			2,0				1,2
	DNGA 150402 LS-NC2		❍				2	2,5	12,7	4,76	5,16	0,2
	150404 LS-NC2	❍	❍			❍		2,5				0,4
	150408 LS-NC2	❍	❍			❍		2,1				0,8
	150412 LS-NC2	❍	❍			❍		2,0				1,2
	DNGA 150604 LS-NC2		●			●		2,5				0,4
	150608 LS-NC2		●			●	2	2,1	12,7	6,35	5,16	0,8
	150612 LS-NC2		●			●		2,0				1,2
	DNGA 150404 ES-NC4				❍		4	2,5	12,7	4,76	5,16	0,4
	150408 ES-NC4				❍			2,1				0,8
	150412 ES-NC4				❍			2,0				1,2
	DNGA 150604 ES-NC2				●			2,5				0,4
	150608 ES-NC2				●		2	2,1	12,7	6,35	5,16	0,8
	150612 ES-NC2		❍		●			2,0				1,2
	DNGA 150404 HS-NC4	❍	❍			❍	4	2,5	12,7	4,76	5,16	0,4
	150408 HS-NC4	❍	❍	❍	❍	❍		2,1				0,8
	150412 HS-NC4	❍	❍			❍		2,0				1,2
	DNGA 150604 HS-NC2		●	●	●	●		2,5				0,4
	150608 HS-NC2		●	●	●	●	2	2,1	12,7	6,35	5,15	0,8
	150612 HS-NC2		●	●	●	●		2,0				1,2

Multi-Cornered, One-Use Inserts, Negative

Square Type

Shape	Cat. No.	Stock BNC2115	BNC2125	BNC2010	BNC2020	BNC300	No. of Cutt. Edges	Dimensions (mm) Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	SNGA 120404 NC4	❍	❍					2,5				0,4
	120408 NC4	❍	●		●	●	4	2,3	12,7	4,76	5,16	0,8
	120412 NC4	●	●			●		2,1				1,2
	SNGA 120408 HS-NC2		●			●		2,3				0,8
	120412 HS-NC2		●			●	2	2,1	12,7	4,76	5,16	1,2

Triangular Type

Shape	Cat. No.	Stock BNC2115	BNC2125	BNC2010	BNC2020	BNC300	No. of Cutt. Edges	Dimensions (mm) Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	TNGA 160404 NC3		❍					2,3				0,4
	160408 NC3		❍		❍		3	2,0	9,525	4,76	3,81	0,8
	160412 NC3		❍					2,0				1,2
	TNGA 160416 NC3*1			❍	❍	❍		3,3				1,6
	160420 NC3*1				❍	❍	3	3,0	9,525	4,76	3,81	2,0
	160424 NC3*1			❍	❍	❍		2,7				2,4
	TNGA 160402 NC6	❍	❍	❍	❍			2,4				0,2
	160404 NC6	●	●	●	●	●	6	2,3	9,525	4,76	3,81	0,4
	160408 NC6	●	●	●	●	●		2,0				0,8
	160412 NC6	●	●	●	●	●		2,0				1,2
	TNGA 160416 NC6*1	❍	❍	❍	❍	❍		3,3				1,6
	160420 NC6*1	❍	❍	❍	❍	❍	6	3,0	9,525	4,76	3,81	2,0
	160424 NC6*1	❍	❍	❍	❍	❍		2,7				2,4
	TNGG 160404 N-FV NC6	❍	❍	●	●			2,3				0,4
	160408 N-FV NC6	❍	❍		●		6	2,0	9,525	4,76	3,81	0,8
	160412 N-FV NC6	❍	❍	●	●			2,0				1,2
	TNGG 160404 N-LV NC6	❍	❍		●			2,3				0,4
	160408 N-LV NC6	●	●	●	●		6	2,0	9,525	4,76	3,81	0,8
	160412 N-LV NC6	●	●	●	●			2,0				1,2
	TNGG 160404 N-SV NC6							2,3				0,4
	160408 N-SV NC6	●	●		●		6	2,0	9,525	4,76	3,81	0,8
	160412 N-SV NC6	❍	❍		❍			2,0				1,2
	TNGA 160404 LE-NC3			●				2,3				0,4
	160408 LE-NC3			●			3	2,0	9,525	4,76	3,81	0,8
	160412 LE-NC3			❍				2,0				1,2
	TNGA 160402 LT-NC3				❍			2,4				0,2
	160404 LT-NC3				❍			2,3				0,4
	160408 LT-NC3				❍		3	2,0	9,525	4,76	3,81	0,8
	160412 LT-NC3				❍			2,0				1,2
	TNGA 160402 LS-NC3		❍					2,4				0,2
	160404 LS-NC3	●	●			●		2,3				0,4
	160408 LS-NC3	●	●			●	3	2,0	9,525	4,76	3,81	0,8
	160412 LS-NC3	❍	❍			❍		2,0				1,2
	TNGA 160404 ES-NC6				●			2,3				0,4
	160408 ES-NC6				●		6	2,0	9,525	4,76	3,81	0,8
	160412 ES-NC6				❍			2,0				1,2
	TNGA 160404 HS-NC3		●	●	●	●		2,3				0,4
	160408 HS-NC3		●	●	●	●	3	2,0	9,525	4,76	3,81	0,8
	160412 HS-NC3		●	●	●	●		2,0				1,2
	TNGA 160404 HS-NC6	❍	❍					2,3				0,4
	160408 HS-NC6	❍	❍		❍	❍	6	2,0	9,525	4,76	3,81	0,8
	160412 HS-NC6	❍	❍			❍		2,0				1,2

35° Diamond Type

Shape	Cat. No.	Stock BNC2115	BNC2125	BNC2010	BNC2020	BNC300	No. of Cutt. Edges	Dimensions (mm) Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	VNGA 160404 NC2		❍	❍	●			2,8				0,4
	160408 NC2		❍	❍	●		2	2,0	9,525	4,76	3,81	0,8
	160412 NC2		❍					1,7				1,2
	VNGA 160402 NC4	❍	❍	❍	❍			3,3				0,2
	160404 NC4	❍	❍	❍	●	❍		2,8				0,4
	160408 NC4	●	●	❍	●	❍	4	2,0	9,525	4,76	3,81	0,8
	160412 NC4	❍	❍					1,7				1,2
	VNGG 160404 N-FV NC4		●	❍	●			2,8				0,4
	160408 N-FV NC4		●	●	●		4	2,0	9,525	4,76	3,81	0,8
	VNGG 160404 N-LV NC4		●	●	●			2,8				0,4
	160408 N-LV NC4		●	●	●		4	2,0	9,525	4,76	3,81	0,8
	VNGA 160402 LT-NC2				❍			3,3				0,2
	160404 LT-NC2				●			2,8				0,4
	160408 LT-NC2				●		2	2,0	9,525	4,76	3,81	0,8
	160412 LT-NC2				❍			1,7				1,2
	VNGA 160402 LS-NC2		❍					3,3				0,2
	160404 LS-NC2	❍	❍					2,8				0,4
	160408 LS-NC2	❍	❍				2	2,0	9,525	4,76	3,81	0,8
	160412 LS-NC2	❍	❍					1,7				1,2
	VNGA 160404 ES-NC4				●			2,8				0,4
	160408 ES-NC4				●		4	2,0	9,525	4,76	3,81	0,8
	160412 ES-NC4				❍			1,7				1,2
	VNGA 160404 HS-NC4	❍	❍					2,8				0,4
	160408 HS-NC4	❍	❍			❍	4	2,0	9,525	4,76	3,81	0,8
	160412 HS-NC4	❍	❍		❍			1,7				1,2

Trigon Type

Shape	Cat. No.	Stock BNC2115	BNC2125	BNC2010	BNC2020	BNC300	No. of Cutt. Edges	Dimensions (mm) Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	WNGA 080404 NC6	●	●	❍	●			2,3				0,4
	080408 NC6	●	●		●		6	2,0	12,7	4,76	5,16	0,8
	080412 NC6	●	●	❍	●			2,0				1,2
	WNGA 080408 NC-WG6	❍	❍	●	●		6	2,0	12,7	4,76	5,16	0,8
	WNGA 080408 NC-WH6	❍	❍	●	●		6	1,9	12,7	4,76	5,16	0,8
	WNGA 080408 LT-NC3				❍		3	2,0	12,7	4,76	5,16	0,8
	WNGA 080408 LS-NC3	❍	❍				3	2,0	12,7	4,76	5,16	0,8
	WNGA 080408 HS-NC6	❍	❍				6	2,0	12,7	4,76	5,16	0,8

*1 For use with SUMIBORON special holders for high-efficiency machining.

● Euro stock ❍ Japan stock

■ Multi-Cornered, One-Use Inserts, Positive

80° Diamond Type

Shape	Relief Angle	Cat. No.	Stock BNC2115	BNC2125	BNC2010	BNC2020	BNC300	No. of Cutt. Edges	Dimensions (mm) Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	7°	CCGW060202 NC2	●	●	●	●	❍		2,4				0,2
		060204 NC2	●	●	●	●	●	2	2,3	6,35	2,38	2,8	0,4
		060208 NC2	●	●	❍	●	●		2,3				0,8
		CCGW09T302 NC2	●	●	❍	●	❍		2,5				0,2
		09T304 NC2	●	●	●	●	●	2	2,5	9,525	3,97	4,4	0,4
		09T308 NC2	●	●	●	●	●		2,4				0,8
	7°	CCGW09T304 NCW2		●			❍	2	2,5	9,525	3,97	4,4	0,4
		09T308 NCW2		●	❍	❍	❍		2,4				0,8
	7°	CCGW09T304 NC-WG2	●	●	●	●		2	2,4	9,525	3,97	4,4	0,4
		09T308 NC-WG2	●	●	●	●			2,4				0,8
	7°	CCGW09T304 NC-WH2	●	●	●	●		2	2,4	9,525	3,97	4,4	0,4
		09T308 NC-WH2	●	●	●	●			2,3				0,8
	7°	CCGT 060204 N-FV NC2	❍	❍	●	●		2	2,3	6,35	2,38	2,8	0,4
		09T304 N-FV NC2	●	●	●	●	❍	2	2,4	9,525	3,97	4,4	0,4
		09T308 N-FV NC2	●	●	●	●			2,3				0,8
	7°	CCGT 09T304 N-LV NC2	●	●	●	●		2	2,4	9,525	3,97	4,4	0,4
		09T308 N-LV NC2	●	●	●	●			2,3				0,8
	7°	CCGW060202 LE-NC2			●			2	2,4	6,35	2,38	2,8	0,2
		060204 LE-NC2			●	❍			2,3				0,4
		CCGW09T302 LE-NC2			●				2,5				0,2
		09T304 LE-NC2			●		❍	2	2,5	9,525	3,97	4,4	0,4
		09T308 LE-NC2			●				2,3				0,8
	7°	CCGW060202 LT-NC2				●		2	2,4	6,35	2,38	2,8	0,2
		060204 LT-NC2				●			2,3				0,4
		CCGW09T302 LT-NC2				❍			2,5				0,2
		09T304 LT-NC2				●		2	2,5	9,525	3,97	4,4	0,4
		09T308 LT-NC2				●			2,4				0,8
	7°	CCGW060202 LS-NC2	●	●					2,4				0,2
		060204 LS-NC2	●	●				2	2,3	6,35	2,38	2,8	0,4
		060208 LS-NC2	❍	❍					2,3				0,8
		CCGW09T302 LS-NC2	❍	❍					2,5				0,2
		09T304 LS-NC2	●	●			●	2	2,5	9,525	3,97	4,4	0,4
		09T308 LS-NC2	❍	●			●		2,4				0,8
	7°	CCGW09T308 ES-NC2					❍	2	2,4	9,525	3,97	4,4	0,8
	7°	CCGW060208 HS-NC2					●	2	2,3	6,35	2,38	2,8	0,4
		CCGW09T304 HS-NC2		●		●	●	2	2,5	9,525	3,97	4,4	0,4
		09T308 HS-NC2		●		●	●		2,4				0,8
	11°	CPGW080202 NC2			❍	❍		2	2,5	7,94	2,38	3,4	0,2
		080204 NC2			❍	❍			2,5				0,4
		CPGW090302 NC2			❍	❍		2	2,5	7,94	2,38	3,4	0,2
		090304 NC2			❍	❍			2,5				0,4

Triangular Type

Shape	Relief Angle	Cat. No.	Stock BNC2115	BNC2125	BNC2010	BNC2020	BNC300	No. of Cutt. Edges	Dimensions (mm) Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	7°	TCGW 16T304 NC3		●		●		3	2,3	9,525	3,97	4,3	0,4
		16T308 NC3		●		●			2,0				0,8
	7°	TPGW 080202 NC3	❍	❍	●	●		3	2,6	4,76	2,39	2,3	0,2
		080204 NC3	❍	❍	●	●			2,5				0,4
	7°	TPGW090202 NC3	❍	❍	❍	❍		3	2,6	5,56	2,38	2,5	0,2
		090204 NC3	❍	❍	❍	❍			2,5				0,4
		TPGW110302 NC3	❍	❍					2,4				0,2
	7°	110304 NC3	❍	❍		❍		3	2,3	6,35	3,18	3,4	0,4
		110308 NC3	❍	❍					2,0				0,8
	7°	TPGW160404 NC3	❍	❍				3	2,3	9,525	4,76	4,4	0,4
		160408 NC3	❍	❍					2,0				0,8
	7°	TPGT 110304 N-FV NC3	●	●	❍	●		3	2,2	6,35	3,18	3,4	0,4
		110308 N-FV NC3	❍	❍	❍	●			1,9				0,8
	7°	TPGW 110302 LE-NC3			❍			3	2,4	6,35	3,18	3,4	0,2
		110304 LE-NC3			❍				2,3				0,4
		110308 LE-NC3			❍				2,0				0,8
	7°	TPGW 110302 LT-NC3				❍		3	2,4	6,35	3,18	3,4	0,2
		110304 LT-NC3				❍			2,3				0,4
		110308 LT-NC3				❍			2,0				0,8
	7°	TPGW 110302 LS-NC3	❍	❍				3	2,6	6,35	3,18	3,4	0,2
		110304 LS-NC3	❍	❍			❍		2,3				0,4
		110308 LS-NC3	❍	❍			❍		2,0				0,8
	7°	TPGW 160404 HS-NC3		❍				3	2,3	9,525	4,76	4,4	0,4
		160408 HS-NC3		❍					2,0				0,8

55° Diamond Type

Shape	Relief Angle	Cat. No.	Stock BNC2115	BNC2125	BNC2010	BNC2020	BNC300	No. of Cutt. Edges	Dimensions (mm) Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	7°	DCGW070202 NC2	●	●	●	●	●		2,6				0,2
		070204 NC2	●	●	●	●	●	2	2,5	6,35	2,38	2,8	0,4
		070208 NC2	❍	●	❍	●	●		2,1				0,8
	7°	DCGW11T302 NC2	●	●	●	●	●		2,7				0,2
		11T304 NC2	●	●	●	●	●	2	2,5	9,525	3,97	4,4	0,4
		11T308 NC2	❍	●	●	●	●		2,1				0,8
	7°	DCGW11T304 NC-WG2*2	●	●	●	●	❍		2,3	9,525	3,97	4,4	0,4
		11T308 NC-WG2*2	●	●	●	●		2	2,1				0,8
	7°	DCGW11T304 NC-WH2*2	●	●	●	●			2,1	9,525	3,97	4,4	0,4
		11T308 NC-WH2*2	●	●	●	●		2	1,8				0,8
	7°	DCGT 070204 N-FV NC2	●	●	●	●		2	2,4	6,35	2,38	2,8	0,4
		11T304 N-FV NC2	❍	❍	●	●			2,4				0,4
		11T308 N-FV NC2	●	●	●	●		2	2,0	9,525	3,97	4,4	0,8
	7°	DCGT 11T304 N-LV NC2	●	●	●	●			2,4				0,4
		11T308 N-LV NC2	●	●	●	●		2	2,0	9,525	3,97	4,4	0,8
		DCGW11T302 LE-NC2			❍				2,7				0,2
		11T304 LE-NC2			●	●		2	2,5	9,525	3,18	4,4	0,4
		11T308 LE-NC2			●				2,1				0,8
	7°	DCGW070202 LT-NC2				●		2	2,6	6,35	2,38	2,8	0,2
		070204 LT-NC2				●			2,5				0,4
	7°	DCGW11T302 LT-NC2				●			2,7				0,2
		11T304 LT-NC2				●		2	2,5	9,525	3,18	4,4	0,4
		11T308 LT-NC2				●			2,1				0,8
	7°	DCGW070202 LS-NC2	●	●					2,6				0,2
		070204 LS-NC2	●	●				2	2,5	6,35	2,38	2,8	0,4
		070208 LS-NC2	❍	❍					2,1				0,8
	7°	DCGW11T302 LS-NC2	❍	❍					2,7				0,2
		11T304 LS-NC2	●	●			●	2	2,5	9,525	3,97	4,4	0,4
		11T308 LS-NC2	●	●	❍	❍	●		2,1				0,8
	7°	DCGW11T304 HS-NC2		●		●	●	2	2,5	9,525	3,97	4,4	0,4
		11T308 HS-NC2		●	❍	●	●		2,1				0,8

35° Diamond Type

Shape	Relief Angle	Cat. No.	Stock BNC2115	BNC2125	BNC2010	BNC2020	BNC300	No. of Cutt. Edges	Dimensions (mm) Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	5°	VBGW 110302 NC2	❍	❍	❍				3,2				0,2
		110304 NC2	❍	❍	❍	❍		2	2,8	6,35	3,18	2,8	0,4
		110308 NC2	❍	❍	❍	❍			2,0				0,8
	5°	VBGW 160402 NC2	❍	❍	❍	❍			3,8				0,2
		160404 NC2	●	●	●	●	●	2	3,3	9,525	4,76	4,4	0,4
		160408 NC2	❍	●	●	●	●		2,5				0,8
		160412 NC2			❍	●	❍		2,2				1,2
	5°	VBGW 160402 LE-NC2			●				3,8				0,2
		160404 LE-NC2			●			2	3,3	9,525	4,76	4,4	0,4
		160408 LE-NC2			●				2,5				0,8
	5°	VBGW 110302 LT-NC2				❍		2	3,2	6,35	3,18	2,8	0,2
		110304 LT-NC2				●			2,8				0,4
	5°	VBGW 160402 LT-NC2				❍			3,8				0,2
		160404 LT-NC2				●		2	3,3	9,525	4,76	4,4	0,4
		160408 LT-NC2				●			2,5				0,8
	5°	VBGW 110302 LS-NC2	❍	❍					3,2				0,2
		110304 LS-NC2	❍	❍				2	2,8	6,35	3,18	2,8	0,4
		110308 LS-NC2	❍	❍					2,0				0,8
	5°	VBGW 160402 LS-NC2	❍	❍					3,8				0,2
		160404 LS-NC2	●	●				2	3,3	9,525	4,76	4,4	0,4
		160408 LS-NC2	❍	●					2,5				0,8
	5°	VBGW 160404 HS-NC2		●		●	●		3,3	9,525	4,76	4,4	0,4
		160408 HS-NC2		●		●	●		2,5				0,8
	7°	VCGW 080202 NC2			❍	❍		2	3,3	4,76	2,38	2,3	0,2
		080204 NC2			❍	❍			2,8				0,4
	7°	160404 NC2	❍	❍				2	2,8	9,525	4,76	4,4	0,4
		160408 NC2	❍	❍		❍			1,9				0,8
	7°	VCGW 160404 LS-NC2	❍	❍				2	2,8	9,525	4,76	4,4	0,4
		160408 LS-NC2	❍	❍					1,9				0,8
	7°	VCGW 160404 HS-NC2		❍				2	2,8	9,525	4,76	4,4	0,4
		160408 HS-NC2		❍			❍		1,9				0,8

*2 Use a holder with a cutting angle of 93°.

● Euro stock ❍ Japan stock

Single-Cornered, One-Use Inserts, Positive

Triangular Type

Shape	Relief Angle	Cat. No.	Stock BNC2115	Stock BNC2125	Stock BNC2010	Stock BNC2020	Stock BNC300	No. of Cutt. Edges	Dimensions (mm) Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	7°	TCGW 090204 NC	●	●		●		1	2,2	5,56	2,38	2,5	0,4
		090208 NC	●	●		●			1,9				0,8
	7°	TCGW 110202 NC	●	●		●			2,5				0,2
		110204 NC	●	●		●	❍	1	2,4	6,35	2,38	2,8	0,4
		110208 NC	●	●		●			2,1				0,8
	7°	TPGW 080202 NC	●	●		●		1	2,6	4,76	2,39	2,3	0,2
		080204 NC		●		●			2,5				0,4
	7°	TPGW 110304 NC		●		●		1	2,3	6,35	3,18	3,4	0,4
		110308 NC		●		●			2,0				0,8
													0,8

35° Diamond Type

Shape	Relief Angle	Cat. No.	Stock BNC2115	Stock BNC2125	Stock BNC2010	Stock BNC2020	Stock BNC300	No. of Cutt. Edges	Dimensions (mm) Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	5°	VBGW 110202 NC	●	●		●			3,2				0,2
		110204 NC		●		●		1	2,8	6,35	2,38	2,8	0,4
		110208 NC		●		●	❍		2,0				0,8

80° Special

Shape	Relief Angle	Cat. No.	Stock BNC2115	Stock BNC2125	Stock BNC2010	Stock BNC2020	Stock BNC300	No. of Cutt. Edges	Dimensions (mm) Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	5°	ZNEX 040102 NC		●		●		1	2,3	4,76	1,59	2,3	0,2
		040104 NC		●		●			2,3				0,4
	5°	ZNEX 040102 LE-NC			❍			1	2,3	4,76	1,59	2,3	0,2
		040104 LE-NC			❍				2,3				0,4
	5°	ZNEX 040102 LT-NC				❍		1	2,3	4,76	1,59	2,3	0,2
		040104 LT-NC				❍			2,3				0,4

Positive CBN Inserts, Full Top Type

Triangular Type

Shape	Relief Angle	Cat. No.	Stock BNC2115	Stock BNC2125	Stock BNC2010	Stock BNC2020	Stock BNC300	No. of Cutt. Edges	Dimensions (mm) Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	5°	TBGN 060102 B		●				1	6,5	6,35	2,38	2,8	0,2
		060104 B		●					6,3				0,4

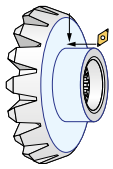
● Euro stock ❍ Japan stock

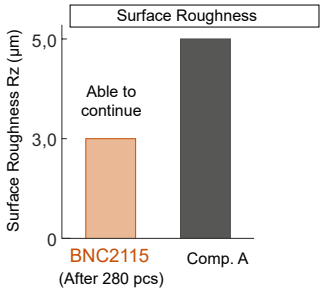
Application Examples

BNC2115

15CrMo5, Gear (60 HRC), Surface Roughness

Compared to competitors' coated CBN, BNC2115 reduces flank wear width by 30%, able to continue with good surface roughness.



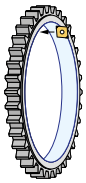


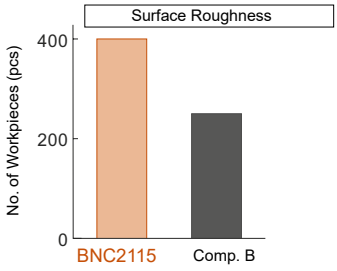
Insert:	DNGA150404 NC4 (BNC2115)
Cutting Data:	v_c = 160 m/min, f = 0,10 mm/rev, a_p = 0,25 mm, wet

BNC2115

41Cr4, Ring Gear (60 HRC), Surface Roughness

BNC2115 with a WH type wiper insert maintains excellent surface roughness for a long time compared to competitors' coated CBN (wiper insert).



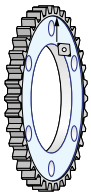


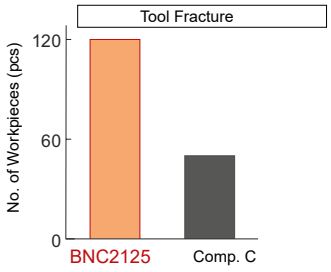
Insert:	CCGW09T308 NC-WH2 (BNC2115)
Cutting Data:	v_c = 150 m/min, f = 0,12 mm/rev, a_p = 0,10 mm, wet

BNC2125

20Cr4, Ring Gear (60 HRC), Tool Fracture

BNC2125 suppresses fractures due to crater wear and realises at least double the tool life.



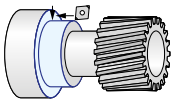


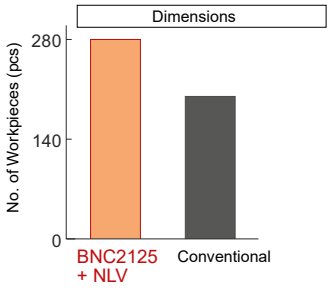
Insert:	CNGA120412 NC4 (BNC2125)
Cutting Data:	v_c = 150 m/min, f = 0,20 mm/rev, a_p = 0,30 mm, dry

BNC2125

C15, Sun Gear (60 HRC), Dimensions

BNC2125 Break Master N-LV Type offers long tool life and resolves chip control problems.





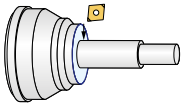
Insert:	CNGG120408 NLV NC4 (BNC2125)
Cutting Data:	v_c = 190 m/min, f = 0,13 mm/rev, a_p = 0,30 mm, wet

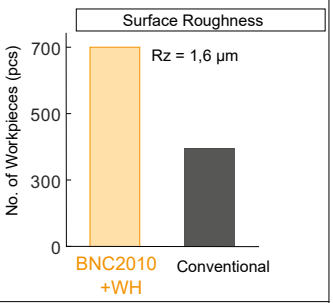
Application Examples

BNC2010

C45, CVJ Outer Race (60 HRC), Surface Roughness

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



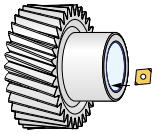


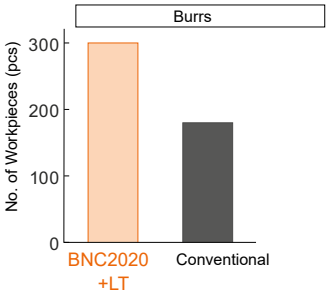
Insert:	CNGA120412 NC-WH2 (BNC2010)
Cutting Data:	v_c = 150 m/min, f = 0,20 mm/rev, a_p = 0,20 mm, dry

BNC2020

20Cr4, Gear (60 HRC), Burrs

BNC2020 high-precision LT Type cutting edge treatment suppresses burrs and improves tool life.



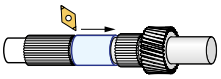


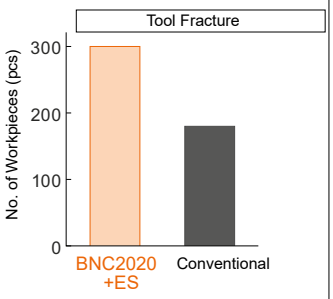
Insert:	CNGA120408 LT-NC2 (BNC2020)
Cutting Data:	v_c = 100 m/min, f = 0,10 mm/rev, a_p = 0,15 mm, dry

BNC2020

20Cr4, Shaft (60 HRC), Tool Fracture

BNC2020 high-efficiency ES Type cutting edge treatment suppresses fractures due to crater wear and offers long tool life.



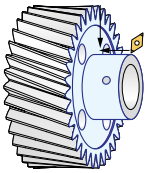


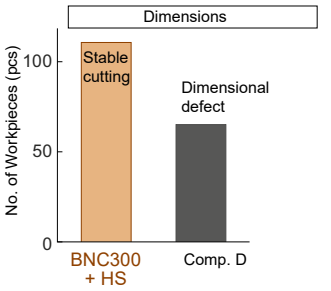
Insert:	DNGA150408 ES-NC4 (BNC2020)
Cutting Data:	v_c = 150 m/min, f = 0,15 mm/rev, a_p = 0,10 mm, dry

BNC300

20CrM05, Gear (62 HRC), Dimensions

BNC300 strong edged HS Type cutting edge treatment enables stable machining without fractures in interrupted cutting.





Insert:	DNGA150408 HS-NC4 (BNC300)
Cutting Data:	v_c = 100 m/min, f = 0,10 mm/rev, a_p = 0,30 mm, dry

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