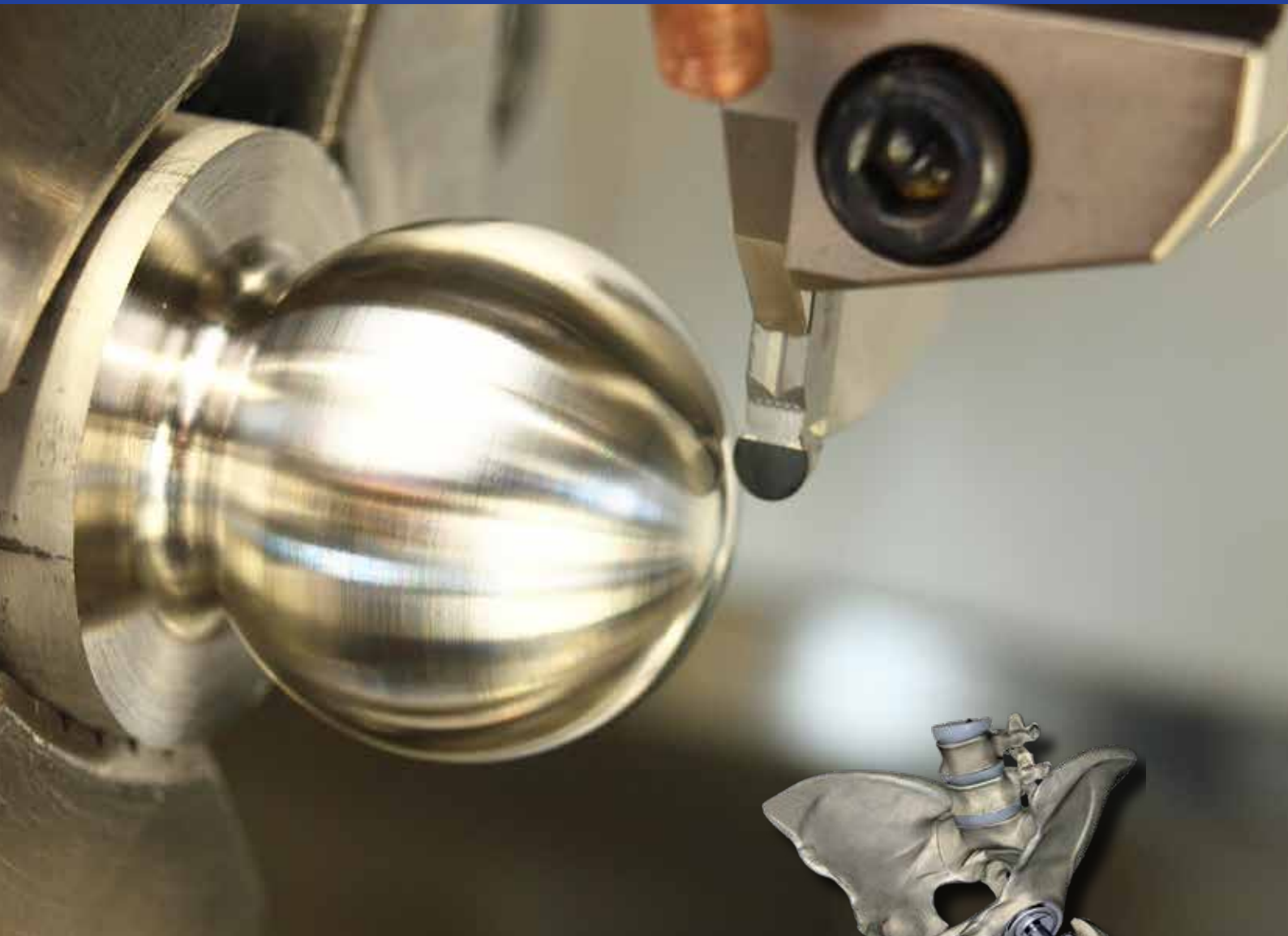


SUMIBORON CBN Inserts for Medical

for Finish Turning of Titanium and Co-Cr Alloys



- Excellent surface quality
- Stable and long tool life
- Suitable for hip-joints, knee-joints and screws

SUMIBORON Binderless CBN CBN Inserts for Medical

■ Features

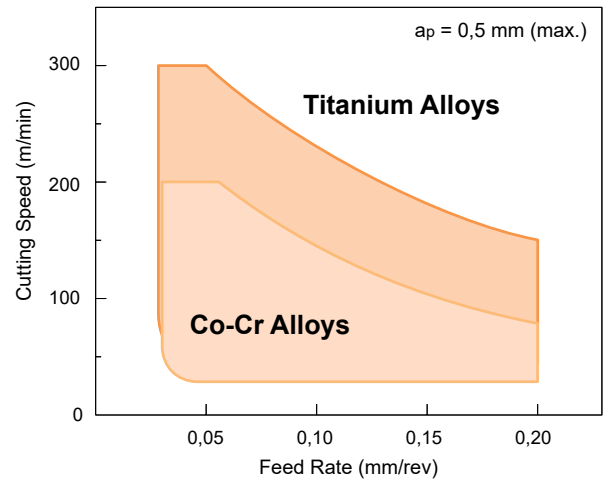
Excellent Surface Quality


With CBN grains which are combined strongly each other, the cutting edge is kept sharp in long cutting time. As a result the machining accuracy and surface quality are kept in excellent level.

High Productivity and Long Tool Life

With excellent hardness and thermal conductivity, high speed machining of Titanium and Co-Cr alloys are available with overwhelming longer tool life than current carbide tools.

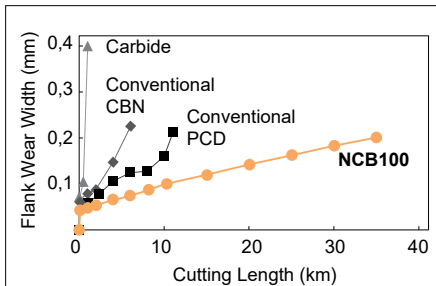
■ Application Range



Work Material	Grade	Binder	CBN Content (%)	Grain Size (µm)	Hardness HV (GPa)	TRS (Gpa)	Features
 Titanium Co-Cr	NCB100	–	100	<0,5	51 – 54	1,8 – 1,9	Ultimate CBN sintered body which does not contain any binder materials, nano-submicron CBN particles are bonded directly and strongly.
	BN7500	Co Compound	90 – 95	1	41 – 44	2,0 – 2,1	CBN sintered body with high content fine CBN grains, enable high productivity and excellent surface finish and cost effective.

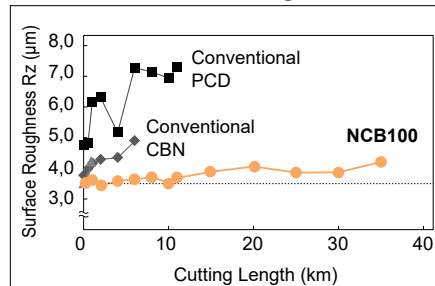
■ Cutting Performance (Machining of Titanium Alloy)

Wear Resistance

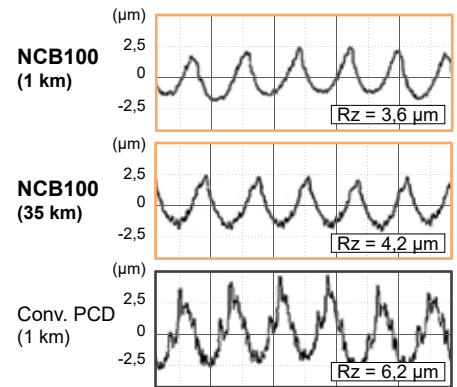


Work Material: Titanium Alloy (Ti-6Al-4V)
 Insert: CNGA 120408 NU
 Cutting Conditions: $v_c = 150$ m/min, $f = 0,15$ mm/rev, $a_p = 0,5$ mm, wet

Machined Surface Roughness

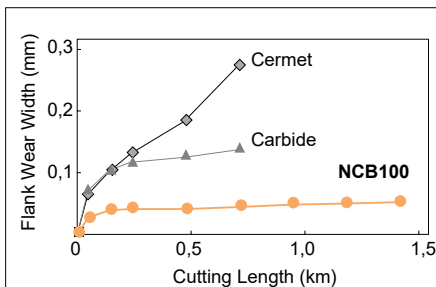


Work Material: Titanium Alloy (Ti-6Al-4V)
 Insert: CNGA 120408 NU
 Cutting Conditions: $v_c = 150$ m/min, $f = 0,15$ mm/rev, $a_p = 0,5$ mm, wet



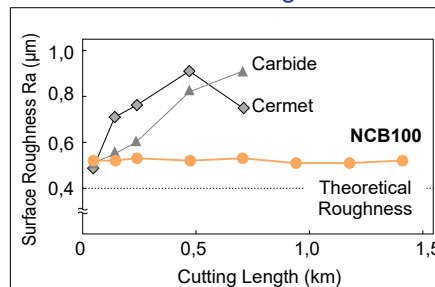
■ Cutting Performance (Machining of Cobalt-Chrome Alloy)

Wear Resistance

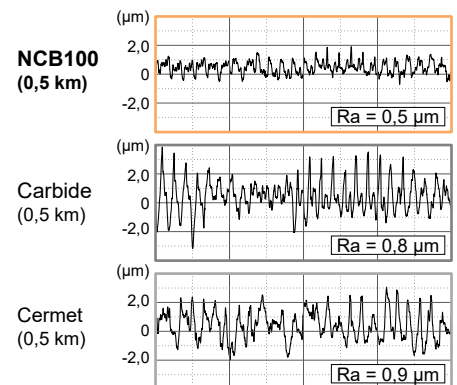


Work Material: Co-Cr
 Insert: CNGA 120408 NU
 Cutting Conditions: $v_c = 60$ m/min, $f = 0,1$ mm/rev, $a_p = 0,4$ mm, wet

Machined Surface Roughness



Work Material: Co-Cr
 Insert: CNGA 120408 NU
 Cutting Conditions: $v_c = 60$ m/min, $f = 0,1$ mm/rev, $a_p = 0,4$ mm, wet



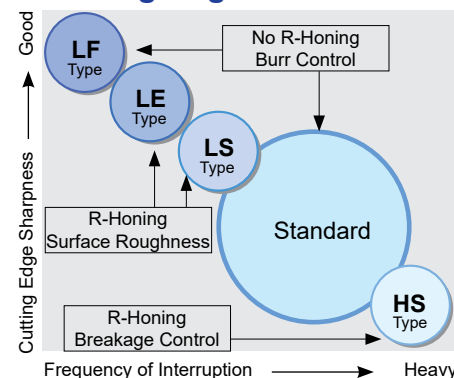
Negative Type Inserts

Shape	Cat. No.	No. Cutt. Edges		Dimensions (mm)				
		NCB100	BN7500	Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	CNGA 120404 NU	○		2,5				0,4
	120408 NU	○	1	2,4	12,7	4,76	5,16	0,8
	120412 NU	○		2,3				1,2
	DNGA 150404 NU	○		2,5				0,4
	150408 NU	○	1	2,1	12,7	4,76	5,16	0,8
	150412 NU	○		2,0				1,2
	VNGA 160404 NU	○	1	2,5	9,525	4,76	3,81	0,4
	160408 NU	○		1,6				0,8
	CNGA 120404 NU2	○		2,5				0,4
	120408 NU2	●	2	2,4	12,7	4,76	5,16	0,8
	120412 NU2	○		2,3				1,2
	VNGA 160404 NU2	○	2	0,4	9,525	4,76	3,81	0,4
	160408 NU2	○		0,8				0,8
	CNGA 120404 LF NU2	○	2	2,5	12,7	4,76	5,16	0,4
	120408 LF NU2	○		2,4				0,8
	CNGA 120404 LE NU2	○	2	2,5	12,7	4,76	5,16	0,4
	120408 LE NU2	○		2,4				0,8
	CNGA 120404 LS NU2	○	2	2,5	12,7	4,76	5,16	0,4
120408 LS NU2	○		2,4				0,8	
	CNGA 120408 HS NU2	●	2	2,4	12,7	4,76	5,16	0,8
	DNGA 150404 NU2	○	2	2,5	12,7	4,76	5,16	0,4
	150408 NU2	○		2,1				0,8
	DNGA 150608 NU2	●	2	2,0	12,7	6,35	5,16	0,8
	TNGA 160404 NU3	○	3	2,3	9,525	4,76	3,81	0,4
	160408 NU3	○		2,0				0,8
	160412 NU3	○		2,0				1,2
	TNGA 160404 LF NU3	○	3	2,3	9,525	4,76	3,81	0,4
	160408 LF NU3	○		2,0				0,8
	TNGA 160404 LE NU3	○	3	2,3	9,525	4,76	3,81	0,4
	160408 LE NU3	○		2,0				0,8
	TNGA 160404 LS NU3	○	3	2,3	9,525	4,76	3,81	0,4
	160408 LS NU3	○		2,0				0,8
TNGA 160404 HS NU3	○	3	2,3	9,525	4,76	3,81	0,4	
160408 HS NU3	○		2,0				0,8	

Grooving Inserts

Shape	Cat. No.	BN7500	No. Cutt. Edges	Width of Cut	Tolerance	Overall Length	Thickness	Nose Radius
	GCMN 2010 P	●		2,0		21,7	3,6	1,0
	3015 P	●	1	3,0	±0,03	22,4	3,8	1,5
	4020 P	●		4,0		28,0	4,0	2,0
	GCMN 3015 PLF	●	1	3,0	±0,03	22,4	3,8	1,5
	4020 PLF	●		4,0		28,0	4,0	2,0
	GCMN 30040 N	●	1	3,0	±0,03	21,1	3,8	0,4
	40040 N	●		4,0		26,4	4,0	0,4

Cutting Edge Treatment



● = Euro stock

○ = Japan stock

Positive Type Inserts

Shape	Relief Angle	Cat. No.	No. Cutt. Edges		Dimensions (mm)				
			NCB100	BN7500	Cutting Edge Length	Inscribed Circle	Thick-ness	Screw Hole Ø	Nose Radius
	7°	CCEW 03X102 LF NU	○	1	1,2	3,5	1,4	1,9	0,2
	7°	CCGW 060204 NU	○	1	2,5	6,35	2,38	2,8	0,4
	7°	CCGW 09T304 NU	○	1	2,5	9,525	3,97	4,4	0,4
		09T308 NU	○		2,4				0,8
	7°	DCGW 070204 NU	○	1	2,5	6,35	2,38	2,8	0,4
	7°	DCGW 11T301 NU	●		2,8				0,1
		11T302 NU	○	1	2,7	9,525	3,97	4,4	0,2
		11T304 NU	○		2,5				0,4
		11T308 NU	○		2,1				0,8
	5°	VBGW 110304 NU	○	1	2,8	6,35	3,18	2,8	0,4
		110308 NU	○		2,0				0,8
	5°	VBGW 160404 NU	○	1	3,3	9,525	4,76	4,4	0,4
		160408 NU	○		2,5				0,8
	7°	VCGW 110301 NU	●	1	3,4	6,35	3,18	2,8	0,1
		110302 NU	●		3,3				0,2
		VCGW 160404 NU	○	1	2,8	9,525	4,76	4,4	0,4
		160408 NU	○		1,9				0,8
	7°	CCGW 060204 NU2	●	2	2,5	6,35	2,38	2,8	0,4
		060208 NU2	●		2,4				0,8
		CCGW 09T304 NU2	●	2	2,5	9,525	3,97	4,4	0,4
		09T308 NU2	●		2,4				0,8
		CCGW 09T304 LF NU2	●	2	2,5	9,525	3,97	4,4	0,4
		09T308 LF NU2	●		2,4				0,8
	7°	CCGW 09T304 HS NU2	●	2	2,5	9,525	3,97	4,4	0,4
		09T308 HS NU2	●		2,4				0,8
	7°	DCGW 070204 NU2	●	2	2,5	6,35	2,38	2,8	0,4
		070208 NU2	●		2,1				0,8
		DCGW 11T301 NU2	●		2,8				0,1
		11T302 NU2	●	2	2,7	9,525	3,97	4,4	0,2
		11T304 NU2	●		2,5				0,4
		11T308 NU2	●		2,1				0,8
		DCGW 070202 LF NU2	●	2	2,7	6,35	2,38	2,8	0,2
		070204 LF NU2	●		2,5				0,4
		070208 LF NU2	●		2,1				0,8
		DCGW 11T302 LF NU2	○	2	2,7	9,525	3,97	4,4	0,2
11T304 LF NU2	●		2,5				0,4		
11T308 LF NU2	●		2,1				0,8		
	7°	DCGW 11T304 LE NU2	○	2	2,5	9,525	3,97	4,4	0,4
		11T308 LE NU2	○		2,1				0,8
	7°	DCGW 11T302 LS NU2	○	2	2,7	9,525	3,97	4,4	0,2
		11T304 LS NU2	○		2,5				0,4
		11T308 LS NU2	○		2,1				0,8
	7°	DCGW 070204 HS NU2	●	2	2,5	6,35	2,38	2,8	0,4
		070208 HS NU2	●		2,1				0,8
	7°	DCGW 11T304 HS NU2	●	2	2,5	9,525	3,97	4,4	0,4
		11T308 HS NU2	●		2,1				0,8
	11°	TPGW 110204 NU3	○	3	2,3	6,35	2,38	2,8	0,4
		110208 NU3	○		2,0				0,8
		TPGW 110302 NU3	○		2,6				0,2
		110304 NU3	○	3	2,5	6,35	3,18	3,4	0,4
110308 NU3	○		2,2				0,8		
	11°	TPGW 110204 LF NU3	○	3	2,3	6,35	2,38	2,8	0,4
		110302 LF NU3	○		2,6				0,2
		110304 LF NU3	○	3	2,5	6,35	3,18	3,4	0,4
		110308 LF NU3	○		2,2				0,8
	11°	TPGW 110204 LE NU3	○	3	2,3	6,35	2,38	2,8	0,4
		110304 LE NU3	○	3	2,5	6,35	3,18	3,4	0,4
	11°	TPGW 110204 LS NU3	○	3	2,5	6,35	2,38	2,8	0,4

	α	W	Honing	BN7500	NCB100
Standard	15°	0,12 mm	No	●	●
LF Type	$\alpha = 0^\circ$			●	
LE Type	(No negative Land)			●	
LS Type	15°	0,07 mm	Yes	●	
HS Type	25°	0,05 mm		●	

SUMIBORON Binderless CBN

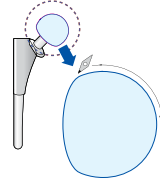
CBN Inserts for Medical

Application Examples

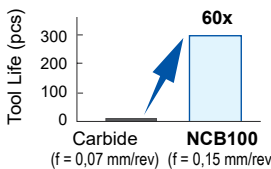
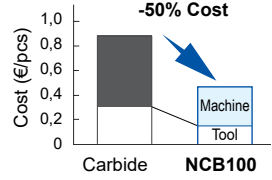
Co-Cr Alloy, Hip-Joint-Head

Much longer tool life in double efficiency than carbide.

→ Total cost reduction



Appearance, Roughness

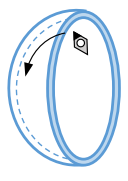



Insert: VNGA 160408 NU NCB100
Cutting Conditions: $v_c = 65$ m/min, $f = 0,15$ mm/rev, $a_p = 0,2$ mm, wet

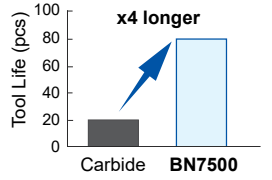
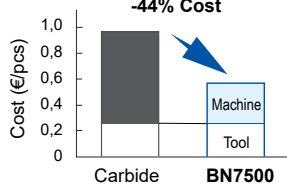
Ti-6Al-4V, Hip-Joint Cup

Excellent surface quality even in high speed finishing.

→ Total cost reduction



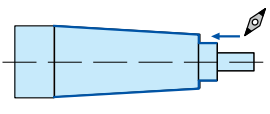
Dimension

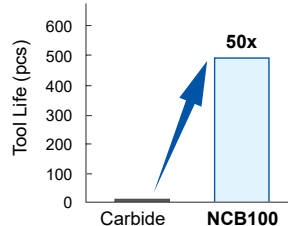
Insert: DCGW 070204 NU2 BN7500
Cutting Conditions: $v_c = 150$ m/min, $f = 0,12$ mm/rev, $a_p = 0,2$ mm, wet

Co-Cr Alloy, Dental Implant, OD/Face Finishing

Binderless PCBN NCB100 realized excellent surface finish and achieved much longer tool life than carbide.



Surface Roughness

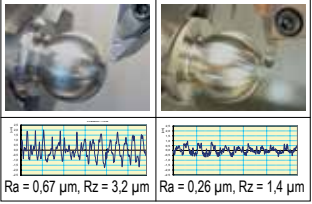
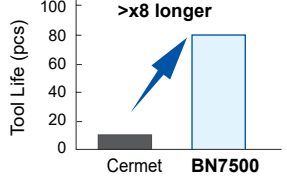
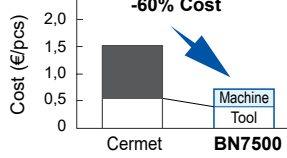


Insert: VCGW 110301 NU NCB100
Cutting Conditions: $v_c = 50$ m/min, $f = 0,01$ mm/rev, $a_p = 0,1$ mm, oil

Co-Cr Alloy, Hip-Joint-Head

BN7500 achieved better quality, double productivity and longer tool life as a result 60% cost saving.

Conventional Cermet	BN7500
VNMG 160408 ($v_c = 40$, $f = 0,08$)	GCMN 4020 P ($v_c = 100$, $f = 0,12$)

Inserts and Cutting Conditions:
Convent. Cermet: VNMG 160408, $v_c = 40$ m/min, $f = 0,08$ mm/rev
BN7500: GCMN 4020 P, $v_c = 100$ m/min, $f = 0,12$ mm/rev



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