

A-B



SUMITOMO

CARBIDE - CBN - DIAMOND

20|21

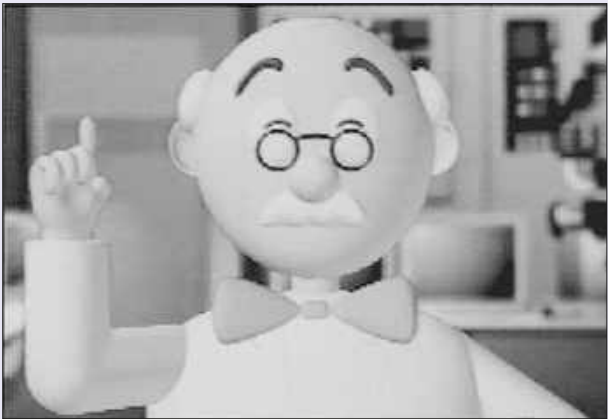
CUTTING MATERIALS

Insert Selection

A



A1–A20



Insert Selection

Insert Selection	<p>Sumitomo Grades (Turning) A2</p> <p>Sumitomo Grades (Milling) A3</p>
Chipbreaker and Grade Selection	<p>Steel Turning Inserts A 4–7</p> <p>Stainless Steel Turning Inserts A 8–9</p> <p>Cast Iron Turning Inserts A10–11</p> <p>Exotic Alloy Inserts A12–13</p> <p>Hardened Steel Turning Inserts A14–15</p> <p>Non-Ferrous Metal Turning Inserts A16–17</p> <p>Small Product Machining A18–19</p>

Selection of Sumitomo Grades (Turning)

Insert Selection

Work Material	P General Steel (Carbon Steel, Alloy Steel), Soft Steel					M Stainless Steel					K Cast Iron						
	Wear Resistance ← Fracture Resistance					Wear Resistance ← Fracture Resistance					Wear Resistance ← Fracture Resistance						
Classification	-	P01	P10	P20	P30	P40	-	M01	M10	M20	M30	M40	-	K01	K10	K20	K30
Coated Carbide	New AC8015P						AC6020M					New AC4010K					
	AC8025P						AC6030M					New AC4015K					
Small Product Machining	New AC8035P						AC6040M					AC420K					
	AC810P						AC610M AC630M					AC8025P					
Coated Cermet	AC820P						AC830P					AC405K					
	AC830P						AC520U AC530U					AC415K					
Cermet	AC1030U						AC1030U					AC1030U					
	T1500Z						T1000A					T1000A					
Carbide	T3000Z						T1500A					G10E					
	T1000A						T2500A					BN7000					
Uncoated CBN	ST10P ST20E A30						BN500					BNS800					
	BN7000						BNC500										
Coated CBN	BN500																
	BNC500																

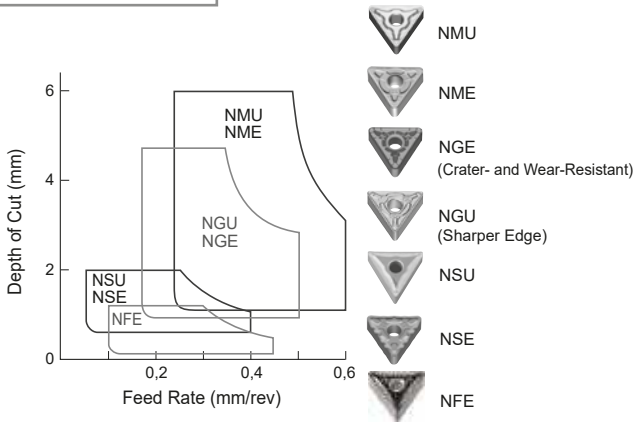
Work Material	S Exotic Alloy					H Hardened Steel				Work Material	N Non-Ferrous Metal				
	Wear Resistance ← Fracture Resistance					Wear Resistance ← Fracture Resistance					Wear Resistance ← Fracture Resist.				
Classification	-	S01	S10	S20	S30	-	H01	H10	H20	H30	-	N01	N10	N20	N30
Coated Carbide	New AC5015S									Carbide	H1				
	New AC5025S					AC503U					PCD	DA90			
Carbide	AC510U									DA150					
	AC520U									DA1000					
Coated CBN	EH510					BNC2010				Coated Carbide	AC510U				
	EH520					BNC2020 BNC300					Cermet	T1000A			
Uncoated CBN	BNC100 BNC160					BN1000				Uncoated CBN		BN7500			
	BNC200					BN2000					BN7000				
Uncoated CBN	BN1000					BNX10				PCD	NPD10				
	BN2000					BNX20					DA90				
Uncoated CBN	BN7000					BNX25									
	BNS800														

Selection of Sumitomo Grades (Milling)

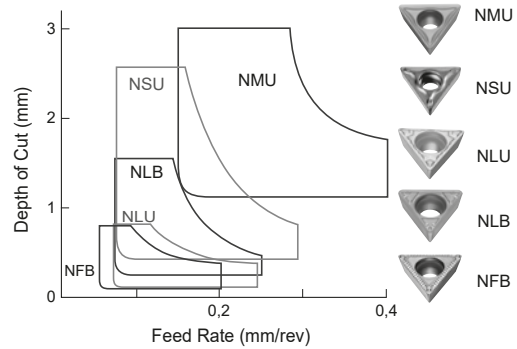
Work Material	P General Steel (Carbon Steel, Alloy Steel), Soft Steel						M Stainless Steel						K Cast Iron				
	Wear Resistance ← Fracture Resistance						Wear Resistance ← Fracture Resistance						Wear Resistance ← Fracture Resistance				
Classification	-	P01	P10	P20	P30	P40	-	M01	M10	M20	M30	M40	-	K01	K10	K20	K30
Coated Carbide		New ACP2000		New ACP3000				ACM100		ACM200		ACM300	New ACK2000		New ACK3000		New ACU2500
		ACP100		ACP200		ACP300		New ACU2500		ACK300		ACP300	ACK100		ACK200		ACK300
Cermet		New T2500A		T250A		T4500A		New T2500A		T250A		T4500A					
Carbide				A30N							A30N				G10E		
Uncoated CBN Coated CBN															BN7000		BNS800
Work Material	S Exotic Alloy						H Hardened Steel				N Non-Ferrous Metal						
Classification	Wear Resistance ← Fracture Resistance						Wear Resistance ← Fracture Resistance				Wear Resistance ← Fracture Resistance						
	-	S01	S10	S20	S30	S40	-	H01	H10	H20	H30	-	N01	N10	N20	N30	
Coated Carbide		ACM100		ACM200		ACM300								DL1000			
		New ACU2500		ACK300									New DL2000				
Carbide				EH520										H1		New H20	
Uncoated CBN								BN350	BN7000								
PCD														DA1000			

Main Chipbreakers

Negative Type



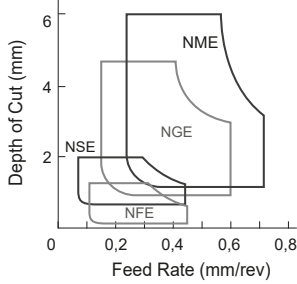
Positive Type



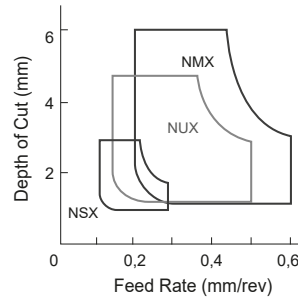
Sub-Chipbreakers

Negative Type

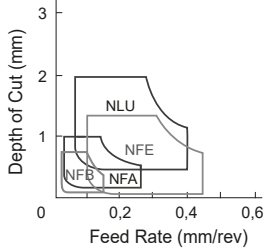
Chipbreakers for High-Efficiency Machining



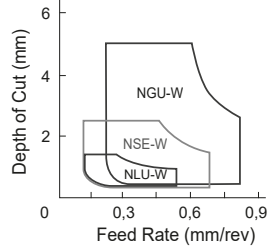
Strong Edge Chipbreakers



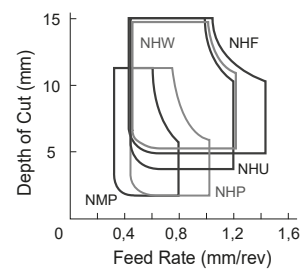
Chipbreakers for Small Depths



Wiper Inserts

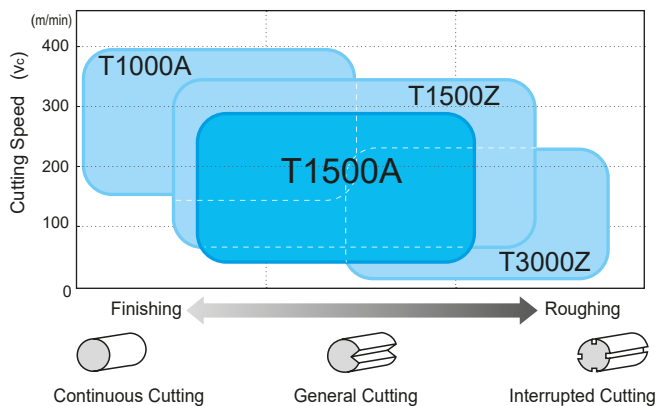


Chipbreakers for Heavy Cutting

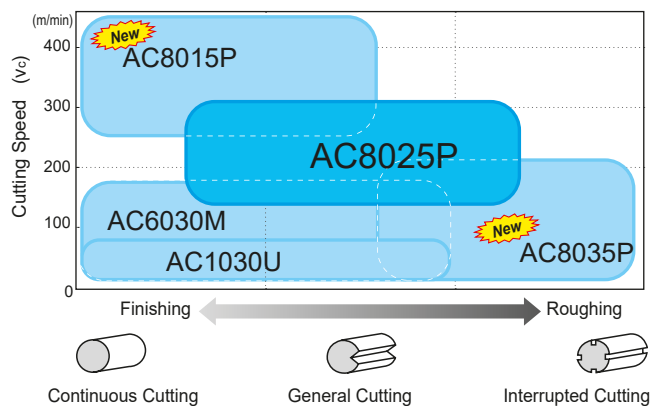


Grades

Fine Finishing to Finishing



Finishing to Rough Cutting



Grades

T1000A / T1500A / T1500Z

T1000A: An uncoated cermet grade designed with wear resistance in mind that provides long tool life and excellent wear resistance in continuous finishing and profiling applications.

T1500A: A general purpose uncoated cermet grade that provides excellent value for money and delivers improved finished surface quality while providing good wear and fracture resistance.

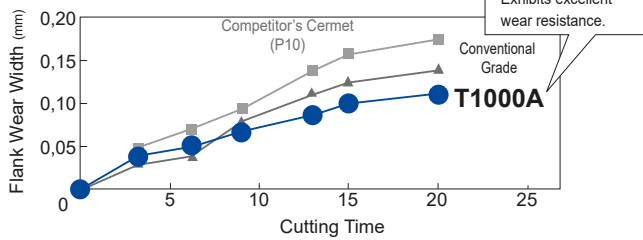
T1500Z: Superior turning quality thanks to „Brilliant Coat“. PVD coating with excellent adhesion resistance. A general purpose coated cermet grade capable of maintaining high-quality finished surfaces while providing excellent wear resistance.



Performance

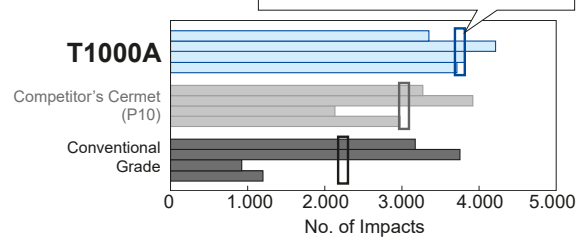
T1000A

Wear Resistance



Work Material: 34CrMo4 Insert: NMG120408NSU
Cutting Conditions: $v_c=320$ m/min, $f=0,20$ mm/rev, $a_p=1,5$ mm, dry

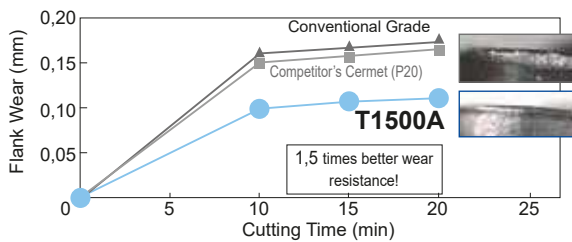
Fracture Resistance



Work Material: 34CrMo4, Insert: CNMG120408NSU
Cutting Conditions: $v_c=230$ m/min, $f=0,20$ mm/rev, $a_p=1,0$ mm, wet

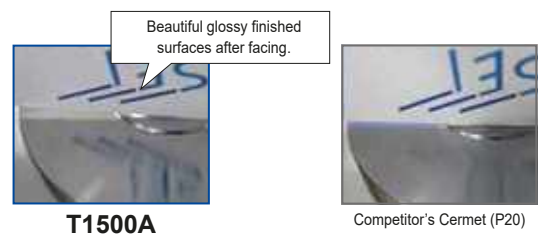
T1500A

Wear Resistance



Work Material: 34CrMo4 Insert: CNMG120408NSU
Cutting Conditions: $v_c = 230$ m/min, $f = 0,20$ mm/rev, $a_p = 1,0$ mm, wet

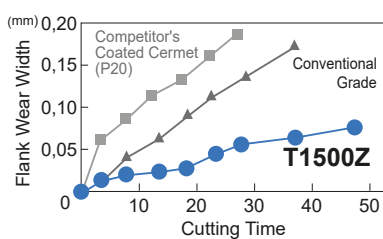
Machined Surface Finish



Work Material: C45, Insert: CNMG120408NLU,
Cutting Conditions: $v_c = 150$ m/min, $f = 0,12$ mm/rev, $a_p = 1,0$ mm, wet

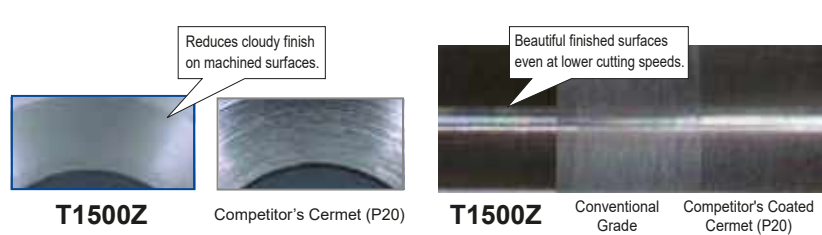
T1500Z

Wear Resistance



Work Material: 34CrMo; Insert: CNMG120408NSU
Cutting Conditions: $v_c=230$ m/min, $f=0,20$ mm/rev, $a_p=1,0$ mm, wet

Machined Surface Finish



Work Material: 21NiCrMo2, Insert:DNMG150408NSU
Cutting Conditions: $v_c=150$ m/min, $f=0,20$ mm/rev, $a_p=1,0$ mm, wet

Work Material: H240LA, Insert: CNMG120408NSU
Cutting Conditions: $v_c=100$ m/min, $f=0,15$ mm/rev, $a_p=1,0$ mm, wet



Recommended Cutting Conditions

(Min. - Optimum - Max.)

Work Material	Cutting Process	Chipbreaker	Grades	Depth of Cut (mm)	Feed Rate (mm/rev)	Cutting Speed (m/min)
Soft Steel	Fine Finishing	NFA / NFL	T1500Z	0,2–0,5–1,0	0,05–0,15–0,25	150–280–400
	Finishing	NLU	T3000Z	0,3–1,0–1,8	0,08–0,20–0,35	150–280–400
Alloy Steel Carbon Steel	Fine Finishing	NFA / NFL	T1500A	0,2–0,5–1,0	0,05–0,15–0,25	100–200–300
	Finishing	NSU / NSE	T1500A	0,5–1,0–2,0	0,08–0,20–0,35	100–200–300
	Medium	NGU	T1500Z	0,8–2,2–4,0	0,15–0,25–0,50	100–200–300
High Carbon Steel Carbon Steel	Fine Finishing	NFA / NFL	T1000A	0,2–0,5–1,0	0,05–0,15–0,25	50–150–250
	Finishing	NSU / NSE	T1500Z	0,5–1,0–2,0	0,08–0,20–0,35	50–150–250
	Medium	NGU	T1500Z	0,8–2,2–4,0	0,15–0,25–0,50	50–150–250

Grades

New

AC8015P / AC8025P / AC8035P / AC1030U

New

Covers a wide range of machining applications from high-speed cutting to interrupted cutting and small lathe machining.

AC8015P Development of crater damage is suppressed by controlling the orientation of the alumina crystal grains. Achieves long, stable tool life during high-speed and high feed cutting.

AC8025P The 1st recommendation grade for turning steel. Surface smoothing technology significantly suppresses adhesion of work material components. Achieves long, stable tool life with various cutting speeds and work materials.

AC8035P Tensile stress removal of the coating layer greatly improves fracture resistance. Achieves long, stable tool life during heavy interrupted cutting.

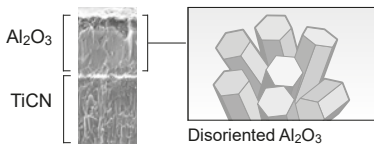
AC1030U Employs a new PVD coating and a dedicated tough carbide substrate. High-quality cutting edge grade suppresses adhesion and micro-chipping, realizing excellent machined surface quality.

Performance

AC8015P

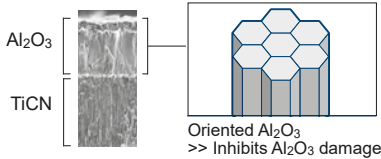
Reduced crater damage due to chip abrasion through optimized crystal orientation in the alumina layer.

Conventional Grade



Work Material: 100Cr6, 1.3505, External continuous, Insert: CNMG120408NGU
Cutting Conditions: $v_c = 300$ m/min, $f = 0,3$ mm/rev, $a_p = 1,5$ mm, wet

AC8015P



Improved crater wear resistance.

AC8025P

Improved tool surface smoothness and significantly reduced adhesion through special surface treatment.

Conventional Grade

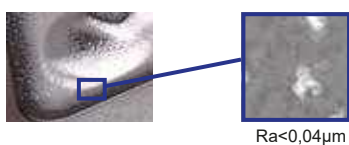


Adhesion resistance

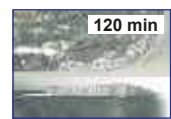


Work Material: 25CrMo4, 1.7218, Facing, Insert: CNMG120408NGU
Cutting Conditions: $v_c = 100-300$ m/min, $f = 0,3$ mm/rev, $a_p = 1,5$ mm, wet

AC8025P



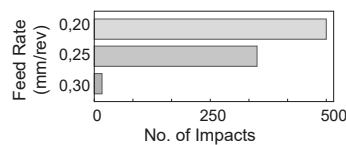
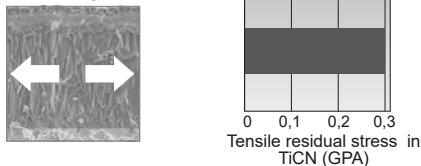
Adhesion resistance



AC8035P

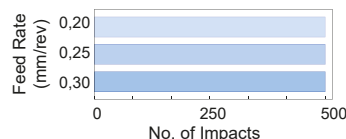
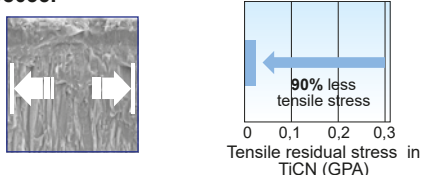
Drastically reduced tensile residual stress in coating through special surface treatment.

Conventional Grade



Work Material: 34CrMoS34, 1.7226, Interrupted cut, Insert: CNMG120408NGU
Cutting Conditions: $v_c = 160$ m/min, $f = 0,2-0,3$ mm/rev, $a_p = 2$ mm, dry

AC8035P



Cracks difficult to grow >>> excellent toughness

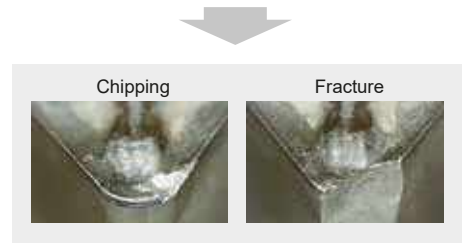
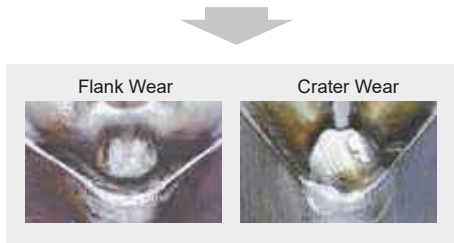
Grades and Chip breaker Selection Guide

1st Recommendation
General Purpose **AC8025P**



1st Recommendation
NGU

	Elevated Feed Rate Area		General Purpose	Tougher Cutting Edge
Finish– Small Depth	NFE	NSE	NSU	NSX
General Purpose	NGE		NGU	NUX
Rough– Larger Cutting Depth	NME		NMU	NMX



Better Wear Resistance
High Speed **AC8015P**

Better Toughness
Interrupted Cut **AC8035P**

1st Recommendation	NGU
Higher efficiency required	NGE

1st Recommendation	NGU
Higher stability required	NUX

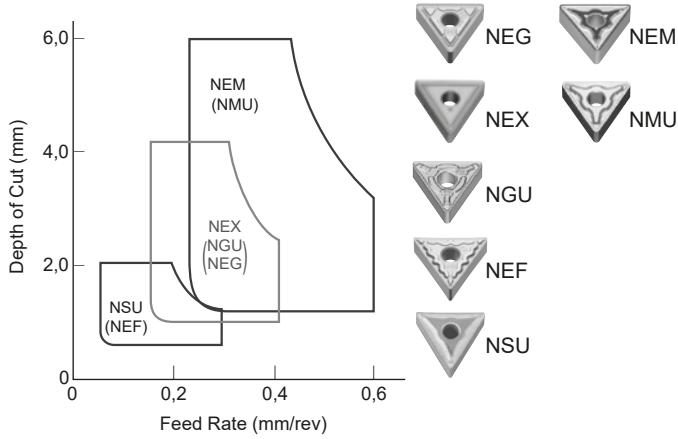
P Recommended Cutting Conditions

(Min. - Optimum - Max.)

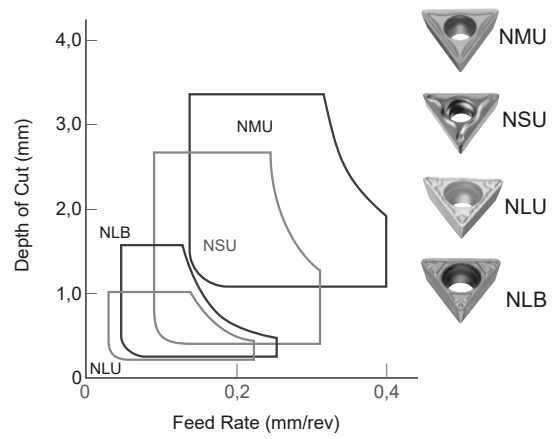
Work Material	Cutting Process	Chipbreaker	Grade	Depth of Cut (mm)	Feed Rate (mm/rev)	Cutting Speed (mm/min)
Soft Steel	Fine Finishing	NFB	T1500Z	0,2–0,6–1,0	0,05–0,15–0,25	100–250–400
	Finishing	NFE	AC8015P	0,5–1,0–1,5	0,1–0,25–0,4	260–350–440
	Medium Cutting	NGU	AC8025P	1,0–2,5–4,0	0,2–0,35–0,5	200–260–320
	Roughing	NMU	AC8035P	1,5–4,0–6,0	0,3–0,45–0,6	140–180–220
Alloy Steel Carbon Steel	Fine Finishing	NFB	T1500Z	0,2–0,6–1,0	0,05–0,15–0,25	100–200–300
	Finishing	NFE	AC8015P	0,5–1,0–1,5	0,1–0,25–0,4	210–285–360
	Medium Cutting	NGU	AC5025P	1,0–2,5–4,0	0,2–0,35–0,5	150–190–230
	Roughing	NMU	AC8035P	1,5–4,0–6,0	0,3–0,45–0,6	90–135–160
High Carbon Steel Carbon Steel	Fine Finishing	NFB	T1500Z	0,2–0,6–1,0	0,05–0,15–0,25	50–150–250
	Finishing	NFE	AC8015P	0,5–1,0–1,5	0,1–0,25–0,4	170–235–300
	Medium Cutting	NGU	AC8025P	1,0–2,5–4,0	0,2–0,35–0,5	130–165–200
	Roughing	NMU	AC8035P	1,5–4,0–6,0	0,3–0,45–0,6	90–135–160

Chipbreakers

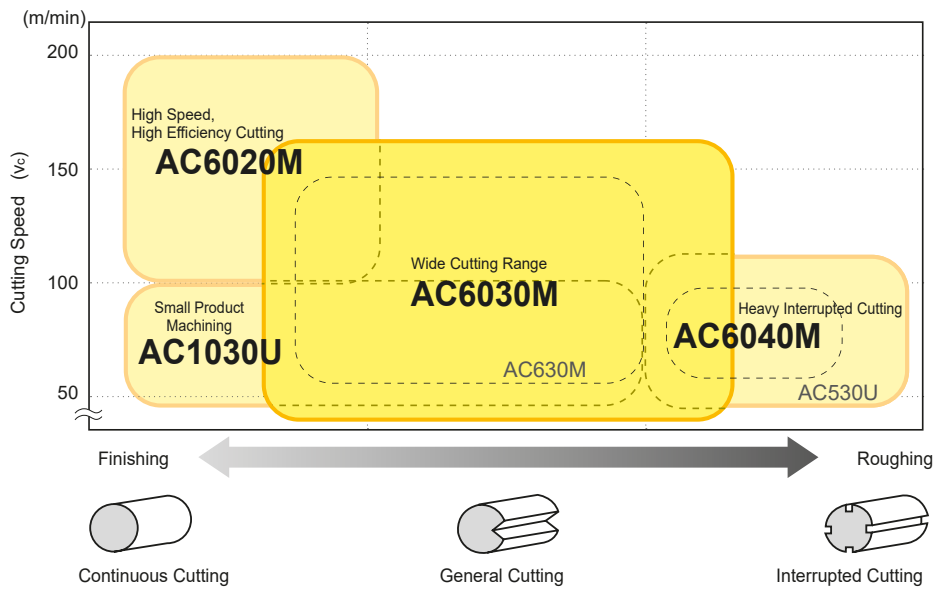
Negative Type



Positive Type



Grades



M Recommended Cutting Conditions

(Min. - Optimum - Max.)

Work Material			Cutting Range	Chipbreaker	Grade	Cutting Conditions		
						Depth of Cut a_p (mm)	Feed Rate f (mm/rev)	Cutting Speed v_c (m/min)
Cr-Based	Ferritic Materials	X6CrAl 13, X8CrNiS 18 9, X29CrS 13, X6CrMoS 17, X12CrS 13	Finishing	NEF (NSU)	AC6020M	0,5-1,5-2,0	0,05-0,15-0,25	170-230-300
			Medium	NEG · NEX · NGU	AC6030M	1,0-2,5-4,0	0,10-0,25-0,40	140-170-250
			Roughing	NEM	AC6040M	1,5-3,5-6,0	0,20-0,35-0,60	140-170-200
	Martensitic Materials	X12Cr 13, X20Cr 13, X30Cr 13, X6Cr 17, X19CrNi 17 2, X6CrNi 18 9	Finishing	NEF (NSU)	AC6020M	0,5-1,5-2,0	0,05-0,15-0,25	120-180-240
			Medium	NEG · NEX · NGU	AC6030M	1,0-2,5-4,0	0,10-0,25-0,40	100-150-200
			Roughing	NEM	AC6040M	1,5-3,5-6,0	0,20-0,35-0,60	80-130-180
Cr/Ni-Based	Austenitic Materials	X5CrNi 18 10, X2CrNi 19 11, X2CrNiMo 18 10, X4CrNiMo 17 12 2, X2CrNiMo 17 12 2, X5CrNiMo 17 13, X6CrNiTi 18 10, X7CrMo 15	Finishing	NEF (NSU)	AC6020M	0,5-1,5-2,0	0,05-0,15-0,25	120-180-240
			Medium	NEG · NEX · NGU	AC6030M	1,0-2,5-4,0	0,10-0,25-0,40	100-150-200
			Roughing	NEM	AC6040M	1,5-3,5-6,0	0,20-0,35-0,60	80-130-180
	Two-Phase (Austenite / Ferrite) Materials	X5CrNi 17 7, X2CrNi 18 9, X6CrNi 25 20, X2CrNiMoN 17 12 2, X6CrNiNb 18 10	Finishing	NEF (NSU)	AC6030M	0,5-1,5-2,0	0,05-0,15-0,25	100-145-180
			Medium	NEG · NEX · NGU	AC6030M	1,0-2,5-4,0	0,10-0,25-0,40	80-120-160
			Roughing	NEM	AC6040M	1,5-3,5-6,0	0,20-0,35-0,60	70-100-140
	Precipitation Hardening	X5CrNiCuNb 16 4, X7CrNiAl 17 7, X4CrNiMo 27 5 2, X2CrNiMoN 22 5 3, X2CrNiMoCuN 25 6 3	Finishing	NEF (NSU)	AC6030M	0,5-1,5-2,0	0,05-0,15-0,25	90-115-140
			Medium	NEG · NEX · NGU	AC6030M	1,0-2,5-4,0	0,10-0,25-0,40	70-90-110
			Roughing	NEM	AC6040M	1,5-3,5-6,0	0,20-0,35-0,60	50-80-120

Grades

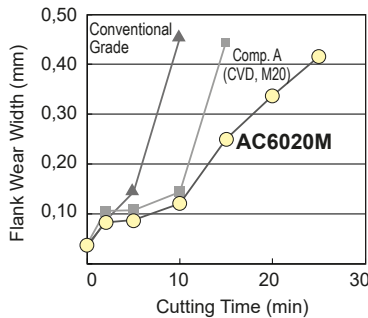
AC6020M / AC6030M / AC6040M / AC1030U

- AC6020M** Employs "Absotech Platinum", a new CVD coating. The first recommended grade for continuous stainless steel machining that achieves a good balance between wear resistance and fracture resistance by combining a hardened substrate with excellent wear resistance.
- AC6030M** Employs "Absotech Platinum", a new CVD coating. The first recommended grade for general machining of stainless steel that drastically reduces the occurrence of abnormal damage, which is a problem in stainless steel machining. Achieves long and stable machining thanks to the improved coating strength and excellent adhesion.
- AC6040M** Employs "Absotech Bronze", a new PVD coating and exclusive tough carbide substrate. The first recommended grade for interrupted machining of stainless steel that drastically improves the reliability in unstable machining thanks to the excellent adhesion and peel-off resistance of the new PVD coating as well as the improved fracture resistance of the exclusive carbide substrate.
- AC1030U** Employs "Absotech Bronze", a new PVD coating with a special tough carbide substrate. Achieving excellent machined surface quality with a high-quality cutting edge that reduces adhesion and micro-chipping.

Performance

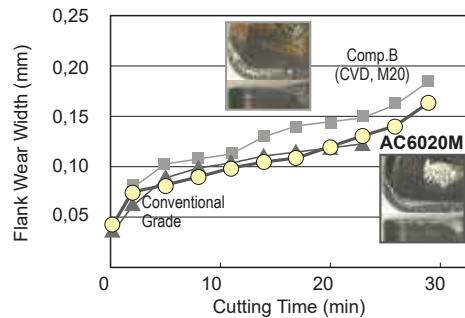
AC6020M

Continuous Cutting (Medium Speed)



Work Material: X2CrNiMo17 13 2 Insert: CNMG 120408 NGU
Cutting Conditions: $v_c = 150$ m/min, $f = 0,3$ mm/rev, $a_p = 2,0$ mm, wet

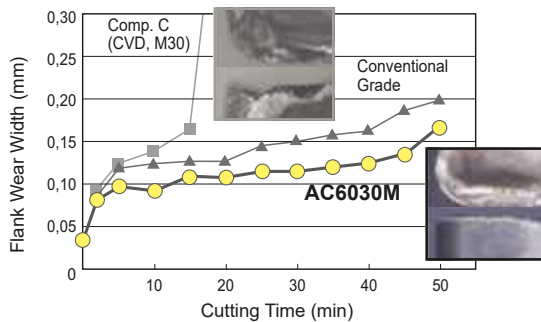
Continuous Cutting (High Speed)



Work Material: X2CrNiMo17 13 2 Insert: CNMG 120408 NGU
Cutting Conditions: $v_c = 200$ m/min, $f = 0,3$ mm/rev, $a_p = 2,0$ mm, wet

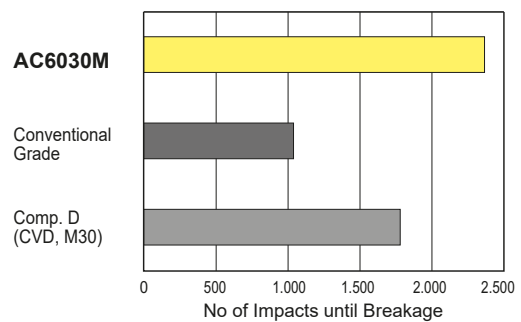
AC6030M

Continuous Cutting



Work Material: X6CrMo17 12 2 Insert: CNMG 120408 NEX
Cutting Conditions: $v_c = 200$ m/min, $f = 0,2$ mm/rev, $a_p = 2,0$ mm, wet

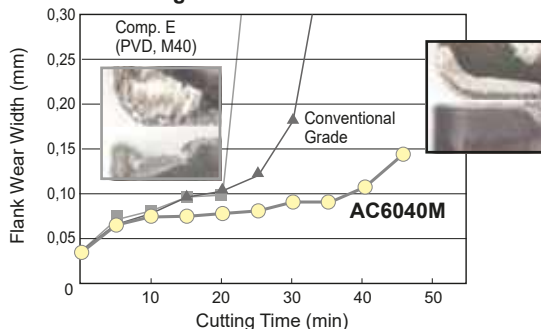
Interrupted Cutting



Work Material: X6CrMo17 12 2 Insert: CNMG 120408 NGU
Cutting Conditions: $v_c = 100$ m/min, $f = 0,1$ mm/rev, $a_p = 1,0$ mm, wet

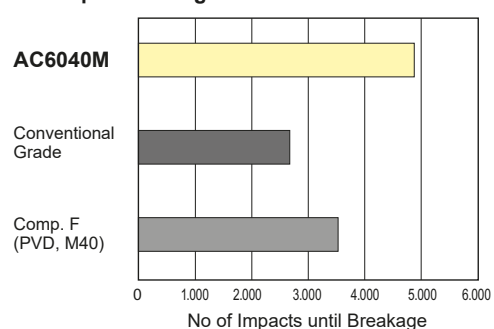
AC6040M

Continuous Cutting



Work Material: X6CrMo17 12 2 Insert: CNMG 120408 NGU
Cutting Conditions: $v_c = 150$ m/min, $f = 0,2$ mm/rev, $a_p = 2,0$ mm, wet

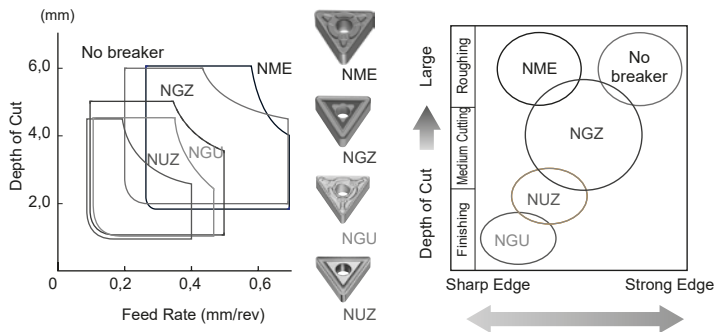
Interrupted Cutting



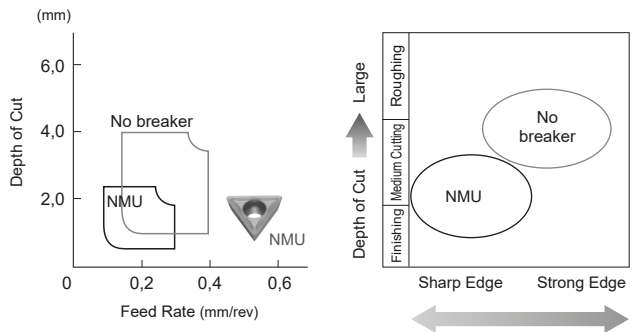
Work Material: CNMG 120408 NGU Insert: CNMG 120408 NGU
Cutting Conditions: $v_c = 230$ m/min, $f = 0,23$ mm/rev, $a_p = 0,80$ mm, dry

Chipbreakers

Negative Type

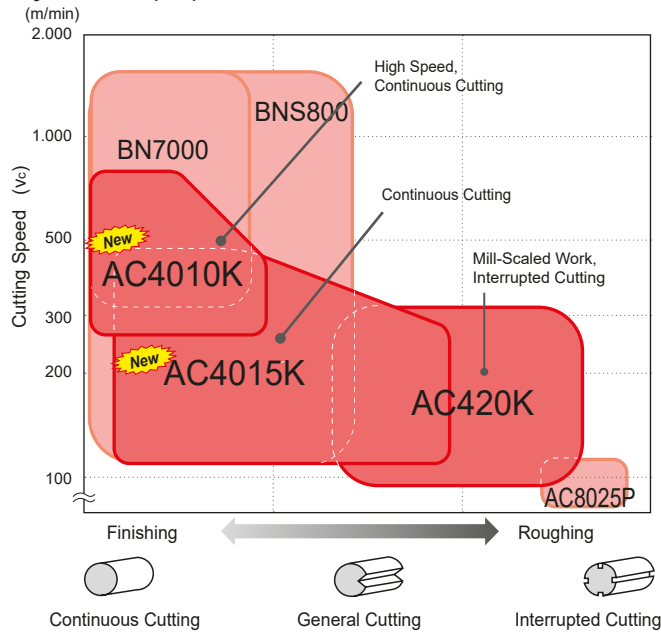


Positive Type

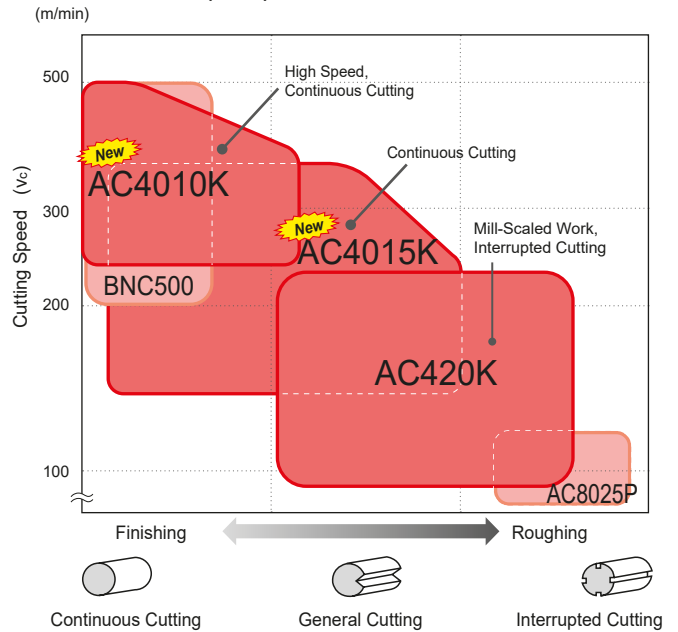


Grades

Grey Cast Iron (GG)



Ductile Cast Iron (GGG)



K Recommended Cutting Conditions

(Min. - Optimum - Max.)

Work Materials	Cutting Process	Grades	Cutting Conditions		
			Depth of Cut a_p (mm/rev)	Feed Rate f (mm/rev)	Cutting Speed v_c (m/min)
Gray Cast Iron (GG-25, etc.)	High Speed Cutting	BN7000	0,1-0,3-1,0	0,10-0,20-0,50	500-1.500-2.000
	Continuous - General	AC4010K	0,5-2,0-6,0	0,10-0,25-0,40	200-400-700
		AC4015K	0,5-2,0-6,0	0,10-0,30-0,50	180-300-450
		AC420K	0,5-2,0-6,0	0,10-0,30-0,60	150-200-300
Ductile Cast Iron (GGG-40.3, etc.)	High Speed Cutting	BNC500	0,1-0,2-0,5	0,10-0,20-0,40	150-350-500
	Continuous - General	AC4010K	0,5-2,0-6,0	0,10-0,25-0,40	180-300-450
		AC4015K	0,5-2,0-6,0	0,10-0,30-0,50	160-250-400
		AC420K	0,5-2,0-6,0	0,10-0,30-0,60	120-170-250
High-strength Ductile Cast Iron (GGG-70, etc.)	High Speed Cutting	BNC500	0,1-0,2-0,5	0,10-0,20-0,40	200-350-500
	Continuous - General	AC4010K	0,5-2,0-6,0	0,10-0,25-0,40	160-250-400
		AC4015K	0,5-2,0-6,0	0,10-0,30-0,50	140-200-350
		AC420K	0,5-2,0-6,0	0,10-0,30-0,60	80-150-220

Grades

AC4010K / AC4015K / AC420K

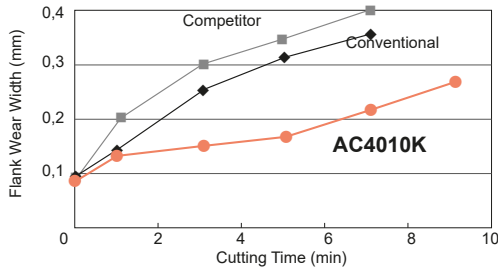
- AC4010K** The 1st recommended grade for machining grey cast iron. Adopts an ultra-thick new CVD coating to realise ultra-high-speed machining at $V_c = 700$ m/min.
- AC4015K** The 1st recommendation grade for ductile cast iron. New high-adhesion, high-strength CVD coating realises both wear resistance and chipping resistance.
- AC420K** Superior fracture resistance, providing excellent stability in interrupted unstable cutting and when cutting mill-scaled work.



Performance

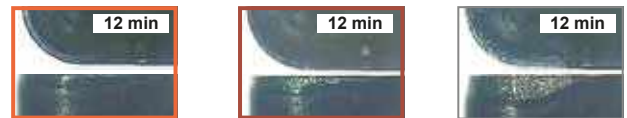
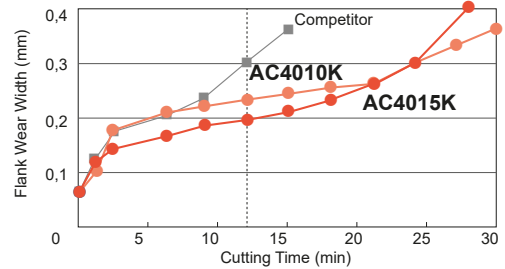
AC4010K / AC4015K

Wear Resistance, Gray Cast Iron (GG)



Work Material: GG-25, Continuous, Insert: CNMG120408
Cutting Conditions: $v_c = 600$ m/min, $f = 0,4$ mm/rev, $a_p = 2,0$ mm, dry

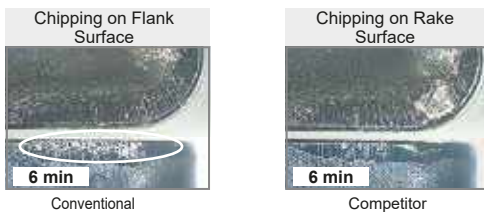
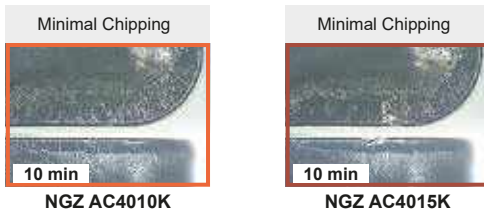
Wear Resistance, Ductile Cast Iron (GGG)



Work Material: GGG-70, Continuous, Insert: CNMG120408
Cutting Conditions: $v_c = 140$ m/min, $f = 0,3$ mm/rev, $a_p = 1,5$ mm, wet

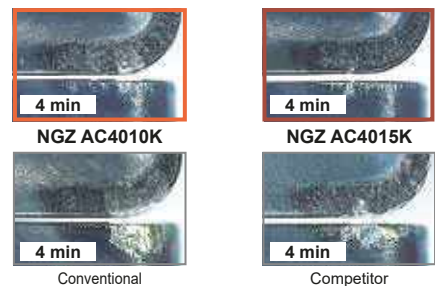
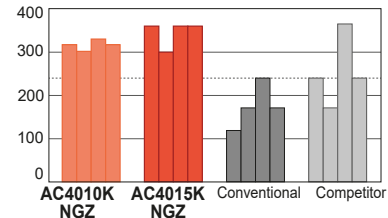
AC4010K / AC4015K

Chipping Resistance, Gray Cast Iron (GG)



Work Material: GG-25, Interrupted, Insert: CNMG120408
Cutting Conditions: $v_c = 400$ m/min, $f = 0,3$ mm/rev, $a_p = 2,0$ mm, wet

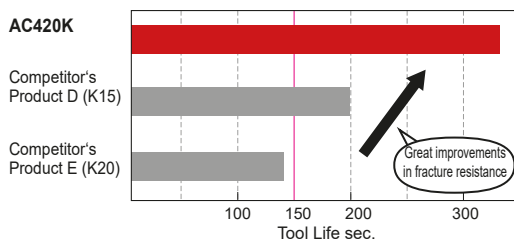
Chipping Resistance, Ductile Cast Iron (GGG)



Work Material: GGG-40.3, Interrupted, Insert: CNMG120408
Cutting Conditions: $v_c = 450$ m/min, $f = 0,3$ mm/rev, $a_p = 1,5$ mm, wet

AC420K Fracture Resistance

GGG-40.3 Grooved (Heavy Interrupted Acceleration Test)



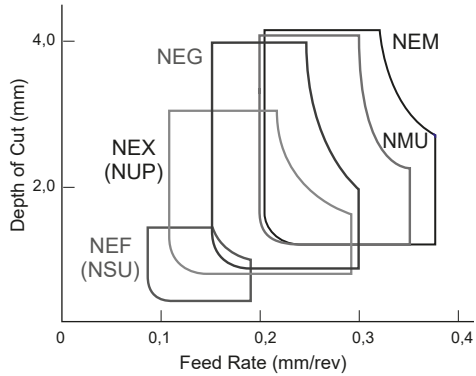
Edge Wear Comparison (After 150s)



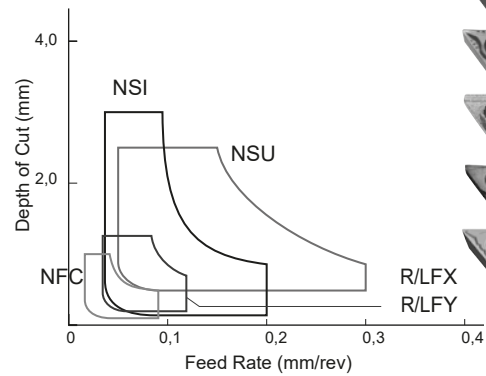
Work Material: GGG-40.3, Toolholder: PCLNR2525-43 Insert: CNMG120408
Cutting Conditions: $v_c = 350$ m/min, $f = 0,25$ mm/rev, $a_p = 1,5$ mm, wet

Chipbreakers

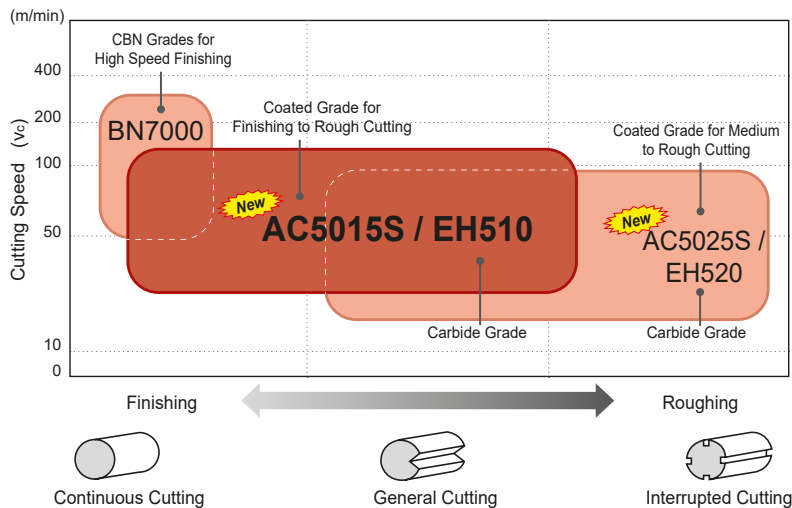
Negative Type



Positive Type



Grades



S Recommended Cutting Conditions

(Min. - Optimum - Max.)

Work Material	Cutting Process	Chipbreakers	Grades	Depth of Cut (mm)	Feed Rate (mm/rev)	Cutting Speed (m/min)
Heat-Resistant Alloy	Finishing	NEF (NSU)	AC5010S AC5025S	0,2-0,5-1,5	0,10-0,12-0,20	50-70-110
	Light	NEX	AC5015S AC5025S	0,5-1,0-3,0	0,10-0,20-0,30	40-60-90
	Medium	NEG	AC5015S AC5025S	0,5-2,0-4,0	0,15-0,25-0,30	40-60-90
	Rough	NMU/NEM	AC5015S AC5025S	1,0-2,0-4,0	0,20-0,25-0,40	30-55-80
Titanium Alloy	Finishing	NEF (NSU)	EH510 (AC5015S)	0,2-0,5-1,5	0,10-0,15-0,20	50-65-80
	Light	NEX	AC5015S	0,5-1,0-2,5	0,10-0,20-0,25	40-55-70
	Medium	NEG	EH510 (AC5015S)	0,5-2,0-3,5	0,15-0,25-0,30	40-55-70
	Rough	NMU/NEM	AC5025S	1,0-2,0-3,5	0,20-0,25-0,30	30-40-50

Grades

AC5015S / **AC5025S** / **EH510** / **EH520**

PVD (Super ZX Coat) grade with excellent wear and thermal resistance.

Carbides with excellent thermal, wear, and fracture resistance for use with exotic alloys. Lineup also includes new chipbreaker design.

AC5015S The 1st recommended grade for turning exotic alloys as it realises stable tool life with high-speed, high-efficiency machining.

EH510 General purpose grade for titanium machining that features excellent wear and thermal resistance. For applications from roughing to finishing.

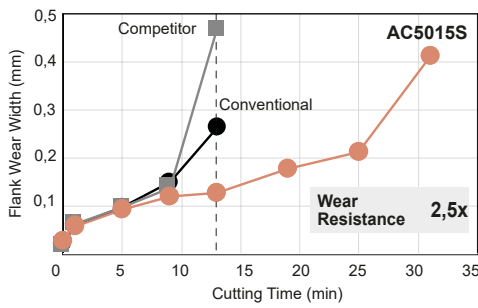
AC5025S High-toughness grade for realising stable tool life for interrupted cutting machining or mill-scaled work.

EH520 Tough grade for titanium machining with excellent fracture and thermal resistance. Perfect for interrupted cutting and mill-scaled work.

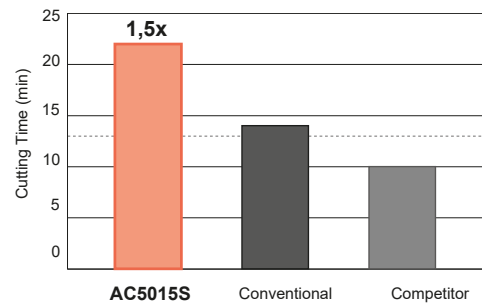
Performance

AC5015S

Wear Resistance



Fracture Resistance



AC5015S



Conventional

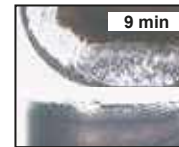


Competitor

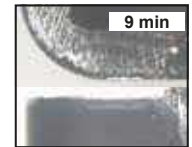
Work Material: Inconel 718 (44 HRC) Insert: CNMG120408
Cutting Conditions: $v_c = 40$ m/min, $f = 0,1$ mm/rev, $a_p = 1,5$ mm, wet



AC5015S



Conventional

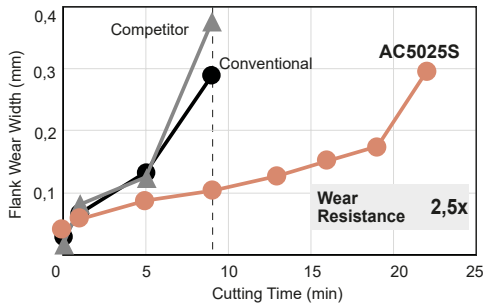


Competitor

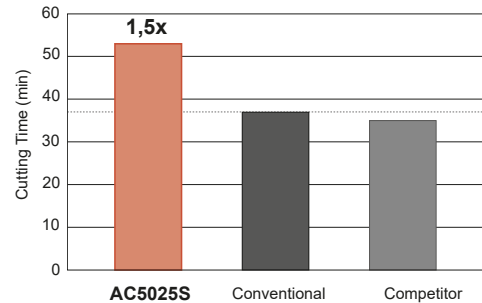
Work Material: Hastelloy (22 HRC), Insert: CNMG120408
Cutting Conditions: $v_c = 50$ m/min, $f = 0,1$ mm/rev, $a_p = 1,5$ mm, wet

AC5025S

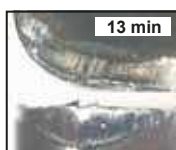
Wear Resistance



Fracture Resistance



AC5025S



Conventional

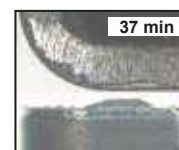


Competitor

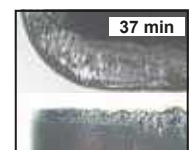
Work Material: Inconel 718 (44 HRC) Insert: CNMG120408
Cutting Conditions: $v_c = 40$ m/min, $f = 0,1$ mm/rev, $a_p = 1,5$ mm, wet



AC5025S



Conventional



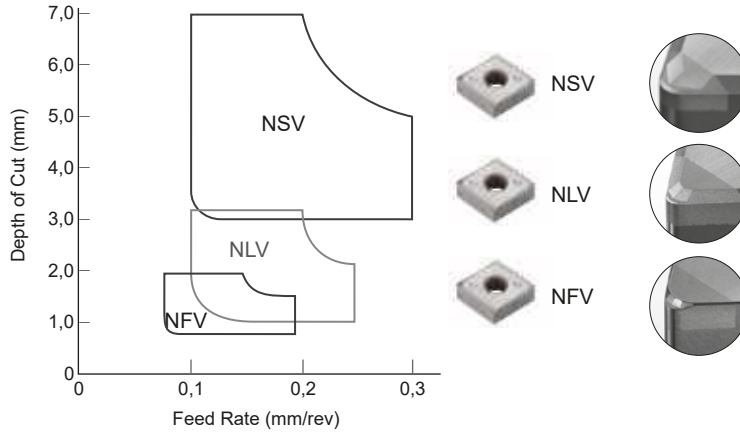
Competitor

Work Material: Hastelloy (22 HRC), Insert: CNMG120408
Cutting Conditions: $v_c = 50$ m/min, $f = 0,1$ mm/rev, $a_p = 1,5$ mm, wet

Chipbreakers

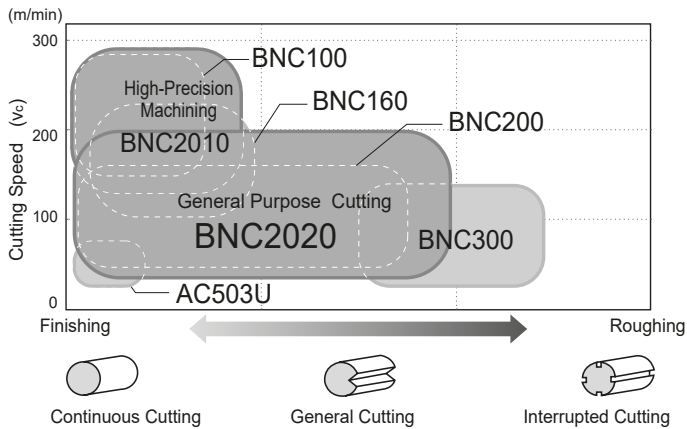
NSV Type Chipbreaker: For chip control during carburized layer removal

NLV Type / NFV Type Chipbreaker: For chip control during finishing of hardened steel

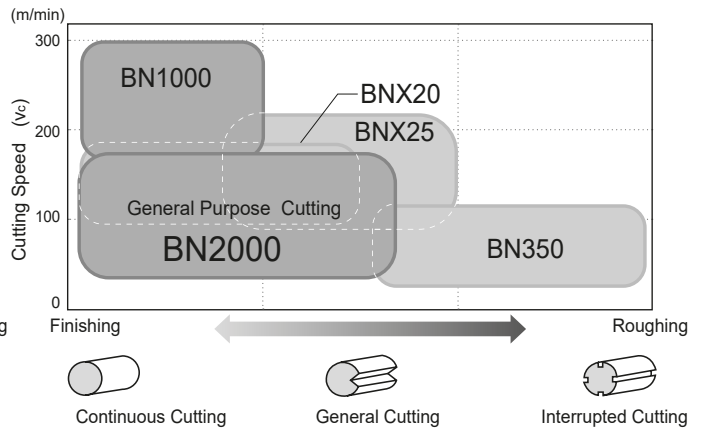


Grades

Coated SUMIBORON



Uncoated SUMIBORON



H Recommended Cutting Conditions

(Min. - Optimum - Max.)

Cutting Process	Grade	Depth of Cut (mm)	Feed Rate (mm/rev)	Cutting Speed (m/min)
Continuous Cutting	BNC2010	0,03- 0,20 -0,35	0,03- 0,10 -0,20	120- 200 -300
	BNC100	0,03- 0,20 -0,30	0,03- 0,10 -0,20	120- 200 -300
	BN1000	0,03- 0,15 -0,20	0,03- 0,10 -0,15	100- 150 -300
	BNX10	0,03- 0,10 -0,20	0,03- 0,10 -0,15	120- 180 -300
	AC503U	0,03- 0,50 -1,00	0,02- 0,05 -0,10	40- 70 -100
General Turning	BNC2020	0,03- 0,30 -0,50	0,03- 0,20 -0,40	50- 130 -220
	BNC160	0,03- 0,20 -0,35	0,03- 0,10 -0,25	120- 180 -220
	BNC200	0,03- 0,30 -0,50	0,03- 0,10 -0,30	50- 130 -220
	BN2000	0,03- 0,20 -0,30	0,03- 0,10 -0,20	50- 100 -200
	BNX20	0,03- 0,20 -0,35	0,03- 0,15 -0,30	70- 130 -170
Interrupted Cutting	BNC300	0,03- 0,20 -0,30	0,03- 0,10 -0,20	50- 100 -150
	BN350	0,03- 0,20 -0,30	0,03- 0,10 -0,20	50- 100 -150
	BNX25	0,03- 0,20 -0,50	0,03- 0,15 -0,30	120- 160 -220

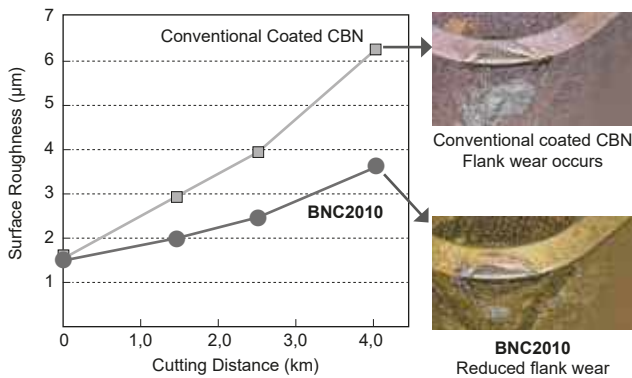
Grades

BNC2010 / BNC2020 / BN1000 / BN2000

- BNC2010** A grade for high-precision machining applicable for finishing requiring good surface roughness and dimensional accuracy. Provides further improved wear resistance thanks to a newly developed CBN substrate coated with a TiCN layer. Reduces flank wear and achieves excellent surface finish thanks to newly developed special stable multi-layered coating.
- BNC2020** A general-purpose grade applicable to general hardened steel machining. A newly developed tough CBN-substrate coated with a highly wear-resistant TiAlN layer. Achieves more stable machining and longer tool life by employing a highly adhesive layer for high chipping resistance.
- BN1000** For high speed machining. BN1000 provides the highest wear resistance of all uncoated SUMIBORON grades. Features improved fracture resistance while still placing a priority on wear resistance.
- BN2000** General purpose grade suitable for typical hardened steel machining applications. Provides a high degree of fracture and wear resistance.

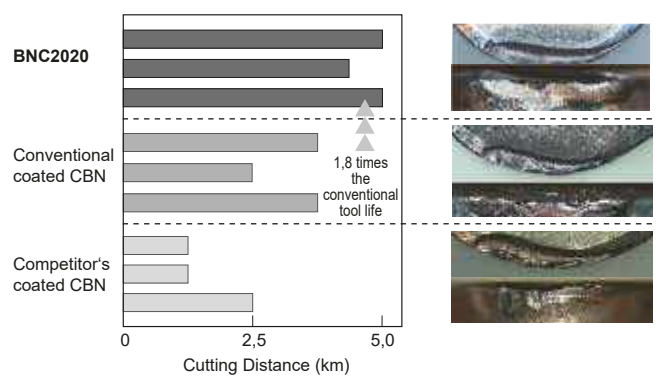
Performance

BNC2010



Work Material: 15CrMo5, 58-62HRC, Continuous
 Insert: DNGA 150408 NC4 (BNC2010)
 Cutting Edge Treatment: S01225
 Cutting Conditions: $v_c = 160$ m/min, $f = 0,08$ mm/rev, $a_p = 0,1$ mm, Wet

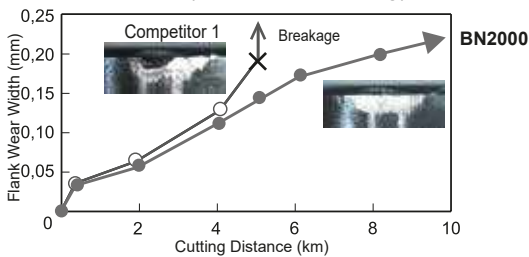
BNC2020



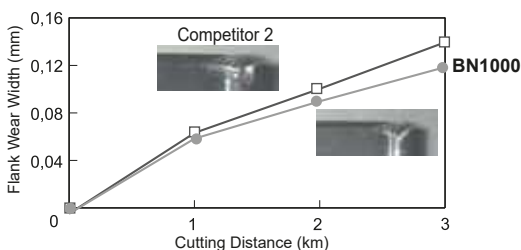
Work Material: SCM415-5V, 58-62HRC, Interrupted
 Insert: CNGA 120412 NC4 (BNC2020)
 Cutting Edge Treatment: S01225
 Cutting Conditions: $v_c = 130$ m/min, $f = 0,1$ mm/rev, $a_p = 0,6$ mm, Dry

BN1000 / BN2000

Wear Resistance (Continuous Cutting)



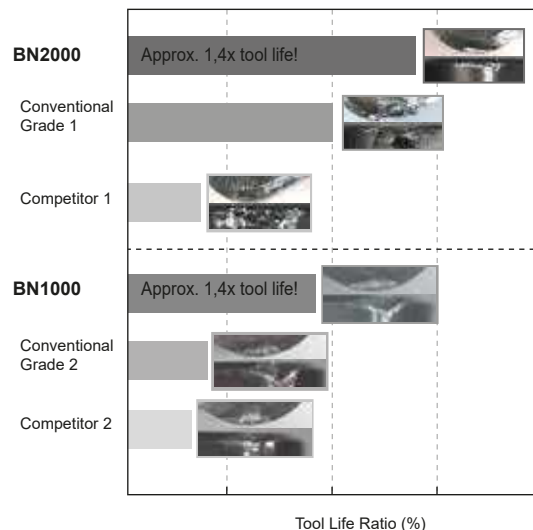
Work Material: 15CrMo5, Round Bar (58-62HRC)
 Cutting Conditions: $v_c = 100$ m/min, $f = 0,1$ mm/rev, $a_p = 0,2$ mm, Dry



Work Material: 100Cr6, Round Bar (58-62HRC)
 Cutting Conditions: $v_c = 150$ m/min, $f = 0,1$ mm/rev, $a_p = 0,2$ mm, Dry

Chipping Resistance (Interrupted Cutting)

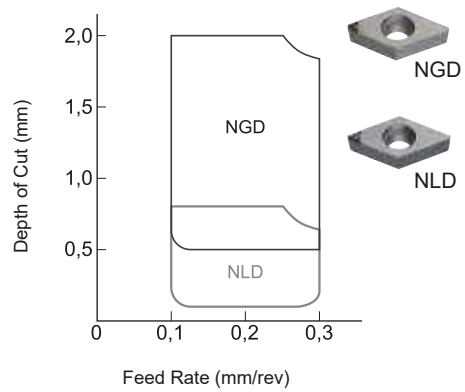
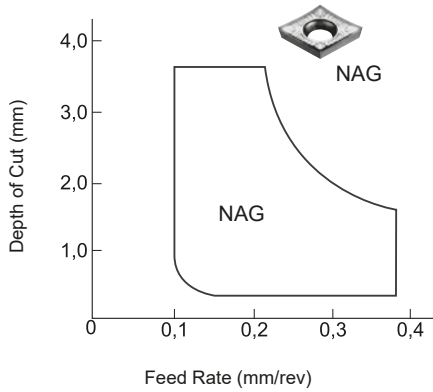
(Comparison based on conventional BN2000 as 100%.)



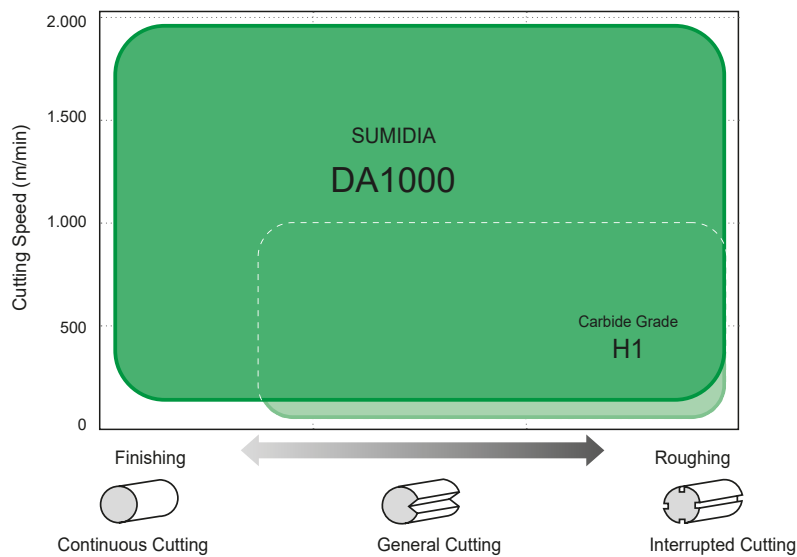
Work Material: 15CrMo5, 8V Grooved Material (58-62HRC)
 Insert: CNGA120408 NU-2
 Cutting Conditions: $v_c = 150$ m/min, $f = 0,1$ mm/rev, $a_p = 0,2$ mm, Dry

Chipbreakers

Positive Type



Grades



N Recommended Cutting Conditions

(Min. - Optimum - Max.)

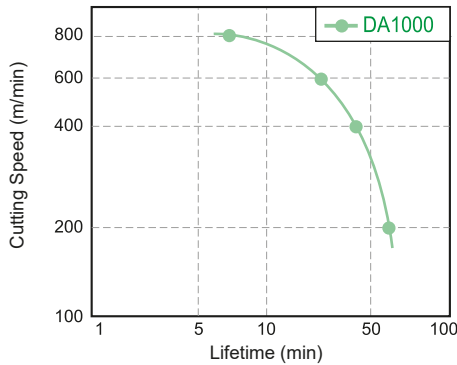
Cutting Process	Category	Grades	Cutting Conditions		
			Depth of Cut (mm)	Feed Rate (mm/rev)	Cutting Speed (m/min)
Continuous Cutting General Turning Interrupted Cutting	SUMIDIA	DA1000	0,1- 0,5 -3,0	0,05- 0,10 -0,20	-2000
	Carbide	H1	0,3- 1,0 -5,0	0,1- 0,20 -0,5	-1000

Grades

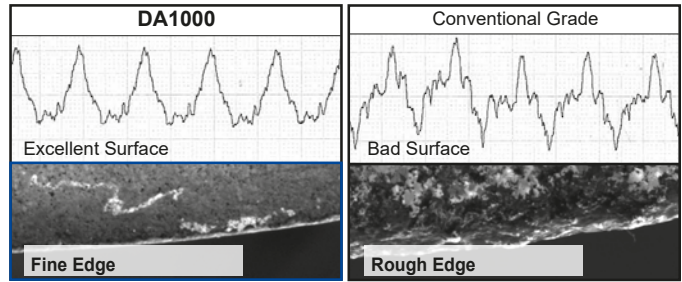
DA1000

- Ultra-high-density sintered, ultra-fine diamond particles
- Significantly improved surface roughness on machined surfaces
- World's best wear resistance and strength
- Suitable for use with all aluminium and non-ferrous alloys

DA1000 Wear Resistance

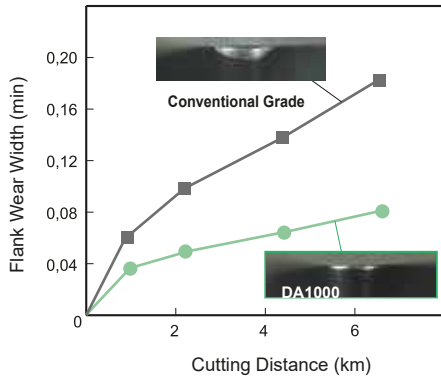


Comparison of Surface Roughness of Nose Radius Cutting Edge



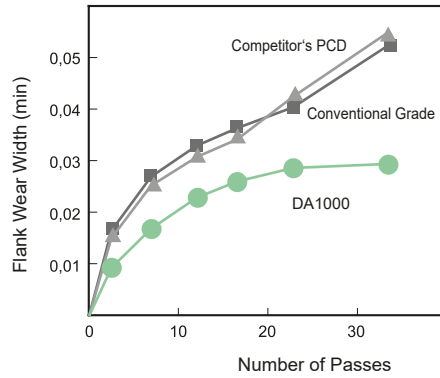
Insert: TPGW 160308
Cutting Conditions: $v_c = 1000$ m/min, $f = 0,15$ mm/rev, $a_p = 0,2$ mm, Wet

Wear Resistance in Turning Applications



Insert: TPGN160304
Cutting Conditions: $v_c = 800$ m/min, $f = 0,12$ mm/rev, $a_p = 0,5$ mm, wet

Wear Resistance in Milling Applications



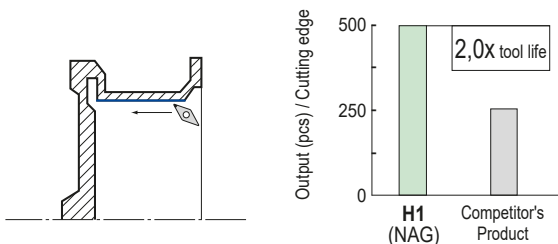
Insert: SNEW1204 ADFR-NF
Cutting Conditions: $v_c = 2000$ m/min, $f = 0,15$ mm/rev, $a_p = 3,0$ mm, wet

Application Examples

H1 + NAG Type Breakers

ADC12 Aluminium Wheel

Excellent adhesion resistance.
Longer tool life.

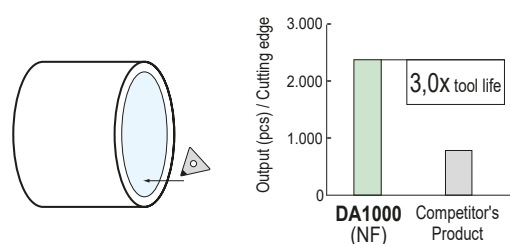


Insert: VCGT160408 NAG (H1)
Cutting Conditions: $v_c = 2000$ m/min, $f = 0,25$ mm/rev, $a_p = 2,0$ mm, wet

DA1000

Copper Alloy Bush

Stable surface roughness with no edge breakage (3,2S).
Tool life improved to 3x that of conventional models.



Insert: TPGN160308 NF (DA1000)
Cutting Conditions: $v_c = 300$ m/min, $f = 0,07$ mm/rev, $a_p = 0,08$ mm, wet

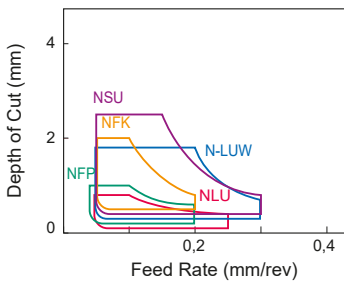
Grades

Category	Application Range			Work Material					
	High Precision	Finish-Light Cut	Medium Cut	P General Steel	M Stainless Steel	K Cast Iron	S Heat Resistant Steel	H Hardened Steel	N Non-Ferrous Metal
Coated Carbide (PVD)	ACZ150			⊙	⊙				○
	New AC5015S			○	⊙		⊙		
	New AC5025S			○	⊙		⊙		
	AC530U			⊙	⊙	○	⊙		○
	AC1030U			⊙	⊙	○	○		○
Cermet/Coated Cermet	T1000A			⊙	○	⊙			○
	T1500A/T1500Z			⊙	○	○			○
Carbide	H1			○	○	○			⊙
	EH510			○	○	○	⊙		○
CBN (SUMIBORON)	BN1000/BN2000					⊙	○	⊙	
	BN7000								
SUMIDIA	DA1000								⊙

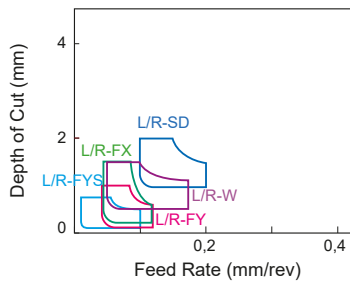
⊙ Preferred Choice ○ Suitable

Chipbreakers

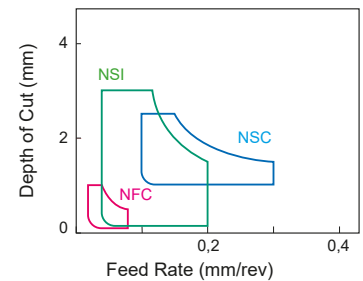
M-Class Finishing to Light Cut



G-Class Chipbreaker (Groove Design)



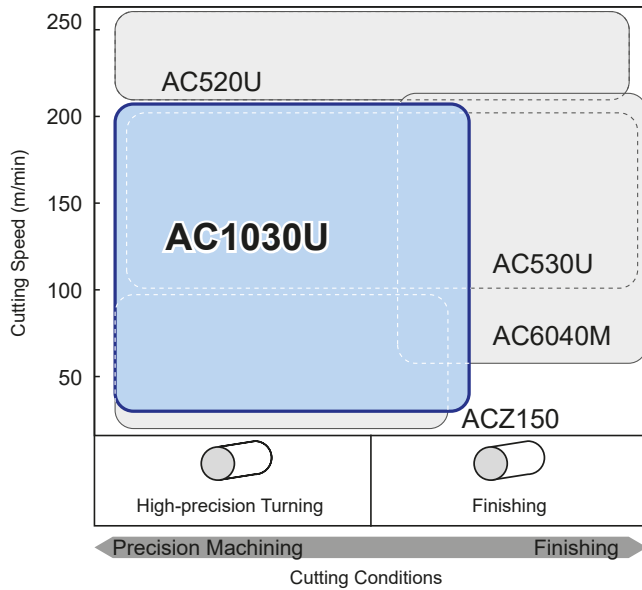
G-Class Chipbreaker (3D Design)



Recommended Cutting Conditions

Grade	P Free Cutting Steel		P Carbon Steel		M Stainless Steel		S Heat Resistant Steel		H Hardened Steel		N Aluminium		N Brass	
	v_c (m/min)	f (mm/rev)	v_c (m/min)	f (mm/rev)	v_c (m/min)	f (mm/rev)	v_c (m/min)	f (mm/rev)	v_c (m/min)	f (mm/rev)	v_c (m/min)	f (mm/rev)	v_c (m/min)	f (mm/rev)
ACZ150	50-200	0,02-0,10	50-150	0,01-0,08	50-150	0,01-0,05					70-300	0,05-0,20	70-300	0,05-0,20
AC5015S	50-200	0,02-0,15	50-200	0,02-0,10	50-200	0,02-0,10	30-100	0,02-0,10					70-300	0,05-0,20
AC525S	50-200	0,02-0,15	50-200	0,02-0,10	50-200	0,02-0,10	30-100	0,02-0,10					70-300	0,05-0,20
AC530U	50-200	0,02-0,15	50-200	0,02-0,10	50-200	0,02-0,10							70-300	0,05-0,20
AC1030U	50-200	0,02-0,15	50-200	0,02-0,10	50-150	0,02-0,10							70-300	0,05-0,20
T1000A	50-200	0,02-0,15	50-200	0,02-0,10	50-150	0,02-0,10					70-300	0,05-0,20	70-300	0,05-0,20
T1500A	50-200	0,02-0,15	50-200	0,02-0,10	50-150	0,02-0,10					70-300	0,05-0,20	70-300	0,05-0,20
T1500Z	50-200	0,02-0,15	50-200	0,02-0,10	50-150	0,02-0,10					70-300	0,05-0,20	70-300	0,05-0,20
BN1000									120-300	0,03-0,15				
BN2000									50-200	0,03-0,20				
BN7000							50-200	0,05-0,20						
DA1000											70-300	0,02-0,10	70-300	0,02-0,10

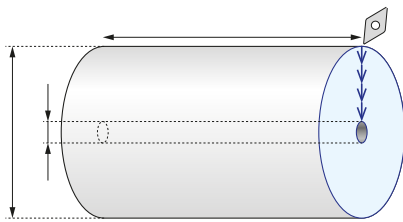
Application Range



AC1030U

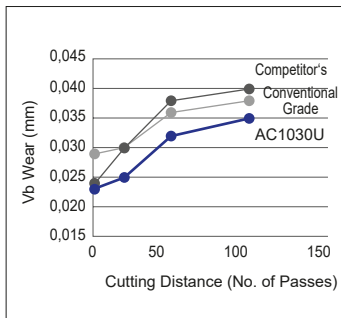
Employs "Absotech Bronze", a new PVD coating, with a special tough carbide substate. Achieving excellent machined surface quality with a high-quality cutting edge that reduces adhesion and micro-chipping.

AC1030U Performance

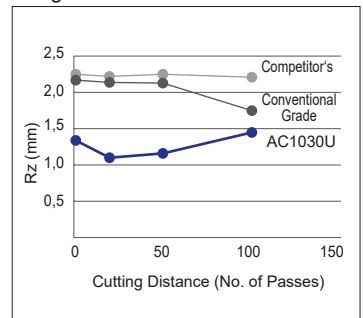


Material: X5CrNiS18-10, 1.4301
 Insert: DCGT11T302RFY (AC1030U)
 Cutting Data: $v_c=100$ m/min, $f=0,05$ mm/rev, $a_p=0,1$ mm, wet (Oil)

Wear Resistance

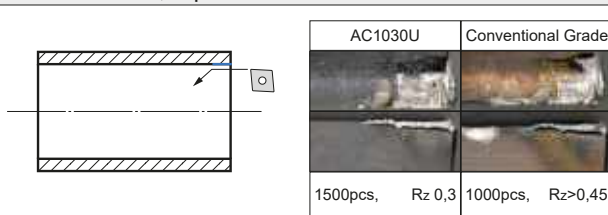


Roughness



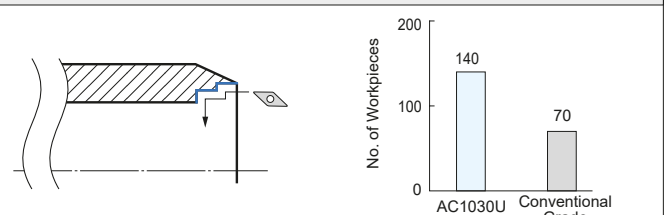
Application Examples

STKM12C-EC, Pipe



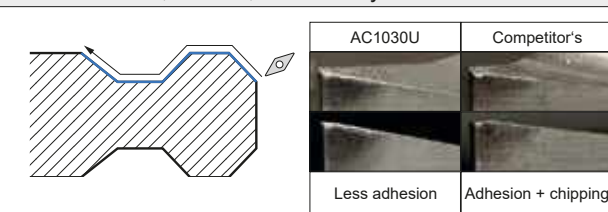
Insert: CCGT060201LFX (AC1030U)
 Cutting Data: $v_c = 196$ m/min, $f = 0,04$ mm/rev, $a_p = 0,4$ mm, wet

C45, Stator Shaft



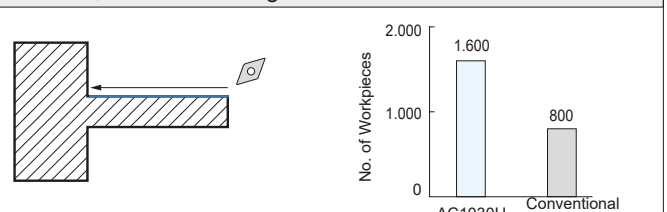
Insert: VCGT110302RFX (AC1030U)
 Cutting Data: $v_c=195$ m/min, $f = 0,12$ mm/rev, $a_p = 0,175-0,25$ mm, wet

X5CrNiS18-10, 1.4301, Valve Body



Insert: VCGT110301RFY (AC1030U)
 Cutting Data: $v_c = 31,5$ m/min, $f = 0,025$ mm/rev, $a_p = 0,2$ mm, wet

X6Cr17, Sensor Housing



Insert: DCGT11T304M NFC (AC1030U)
 Cutting Data: $v_c = 50$ m/min, $f = 0,06$ mm/rev, $a_p = 0,2$ mm, wet

Grades

B



B1–B14



Grades

Coated Grades	Coating Series	B2
	CVD / PVD Series	B3–4
Coated and Uncoated	Cermet	B5
Uncoated Carbide	“Igetalloy”	B6
CBN Grades	“SUMIBORON”	B7–8
PCD Grades	“SUMIDIA”	B9
	“SUMIDIA” Binderless	B10
Chart	Grades Comparison Chart	B11–14

Coated Carbide

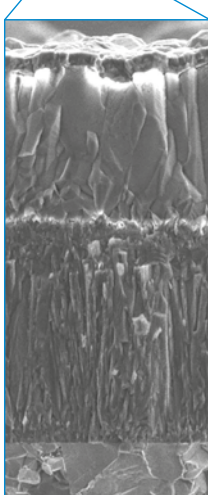
The hardmetal's coating series combines a proprietary tough cemented carbide substrate with a multi-layered coating for use in high-speed, high-efficiency applications on a wide range of work materials including steel, cast iron and exotic alloys.

Features

ABSOTECH: New coating technology that realises absolute stability.

Grades

CVD



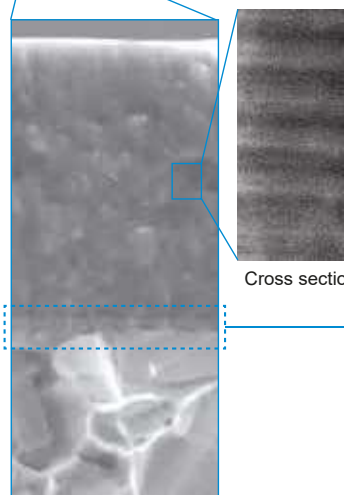
- Special Surface Treatment:** Chipping resistance and adhesion resistance are significantly improved by special surface treatment applied to suit the application.
- High Strength Alumina Layer:** Significantly improves the coating strength by controlling crystal growth direction.
- High Hardness Micro-Grain TiCN Layer:** Significantly improves the coating hardness by using a fine and uniform crystal structure.
- High Adhesion Technology:** Significantly improves adhesion strength through a smooth interface between the coating and carbide substrate.

- Suppresses abnormal damage such as chipping and adhesion. Stable machining is achieved in various situations.
- Next-level high strength and high hardness coating is achieved. Achieves long, stable tool life even in high-efficiency machining.

Applicable Grades

For steel turning	AC8015P, AC8025P, AC8035P
For stainless steel turning	AC6020M, AC6030M
For cast iron turning	AC4010K, AC4015K
For Milling	ACP2000, ACK2000

PVD



- The Proprietary Super Multi-layered Coating Structure:** Advanced nanotechnology enables nanometer-level thickness (1 nanometer is one billionth of a meter). Hardness, thermal resistance and toughness are significantly improved by alternately layering one thousand layers of super thin films.
- High Adhesion Technology:** Significantly improves adhesion strength through advanced control technology at the interface of the coating and carbide substrate.

- Optimised coating composition according to application. Achieves stable machining regardless of the work material.
- Significantly improves chipping resistance by improving coating adhesion strength. Stable machining is realised even under high load conditions.

Applicable Grades

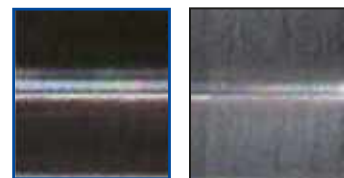
For stainless steel turning	AC6040M
For exotic alloy turning	AC5015S, AC5025S
For small lathes	AC1030U
For Milling	AC2500, ACP3000, ACK3000

Brilliant Coat

Brilliant Coat provides excellent lubricity for higher quality machining.



- PVD coating with excellent wear resistance and lubricity.
- Suppresses reactions with work material and realises beautiful machined surfaces.



Brilliant Coat **Conventional Coating**

Work Material: STKM13A
 Insert: CNMG120408NLU
 Cutting Conditions: v_c : 100 m/min
 f_t : 0,15 mm/rev
 a_p : 1,0 mm, wet

Applicable Grades

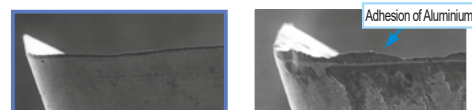
For steel turning T1500Z

AURORA Coat (DLC : Diamond Like Carbon)

Using our proprietary PVD process technology, we have developed a hydrogen-free DLC coating that is extremely hard and smooth.



Comparison of Cutting Edge Adhesion After Cutting ADC12



AURORA Coat **Uncoated**

Work Material : ADC12
 Cutting Conditions: v_c : 300 m/min
 f_t : 0,15 mm/t
 $a_p = a_e$: 5mm, dry

- Second only to diamond in terms of hardness, this smooth coating has a low coefficient of friction and provides excellent adhesion resistance to deliver better-quality machined surfaces.
- Can be used for high-speed, high-efficiency cutting of aluminium alloys, copper alloys, resins, and more.

Applicable Grades

For Milling DL1000, DL2000
 For Endmilling DL1000, DL1200
 For Drilling DL1300, DL1500

Characteristic Values

For Turning (CVD)

Class	Grade	Hardness (HRA)	TRS (GPa)	Coating Type	Coating Thickness (µm)	Characteristics	Old Grades
P	AC810P	91,0	2,2	Super FF Coat	18	A P10 grade with excellent wear resistance that features stability and longer tool life. Utilises a special carbide substrate with Super FF Coat for high to medium speed cutting.	AC700G
	New AC8015P	91,0	2,3	Absotech	14	For high-speed and high-efficiency machining of steel. Crystal orientation control technology is used to drastically suppress the advancement of crater wear, achieving long, stable tool life during high-speed and high-feed cutting.	AC810P
	AC820P	90,1	2,2	Super FF Coat	14	A P20 grade that features stability and longer tool life. Employs special carbide substrate and Super FF Coat to improve on P20 wear and fracture resistance.	AC2000
	AC8025P	90,1	2,3	Absotech	12	A P20 grade that drastically reduces the occurrence of abnormal damage and achieves long and stable tool life by employing a special carbide substrate and the new Absotech Platinum coating.	AC820P
	AC830P	89,4	2,6	Super FF Coat	8	Stable long-life grade employs special tough, carbide substrate and Super FF Coat. Improves on P30 grade fracture resistance and approaches P20 grade in terms of wear resistance.	AC3000
	New AC8035P	89,4	2,6	Absotech	9	For interrupted machining of steel. Coating layer tensile stress removal technology greatly improves fracture resistance and achieves long, stable tool life during heavy interrupted cutting.	AC830P
M	AC610M	91,0	2,2	Super FF Coat	5	A high efficiency M10 grade featuring improved wear resistance during stainless steel cutting. Employs special, ultra-hard substrate and thin Super FF Coat.	—
	AC6020M	90,1	2,3	Absotech	5	An M20 grade that maintains wear resistance in stainless steel machining while drastically reducing the occurrence of abnormal damage by employing a special carbide substrate and the new Absotech Platinum coating.	AC610M
	AC6030M	89,5	2,7	Absotech	5	The first recommended grade for general machining of stainless steel that drastically reduces the occurrence of abnormal damage in stainless steel machining and achieves long and stable tool life by employing a new coating: Absotech Platinum.	AC630M
	AC630M	89,5	2,7	Super FF Coat	5	A general purpose grade featuring improved wear and fracture resistance during stainless steel cutting. Utilises a special tough carbide substrate with a thin Super FF Coat.	AC304
K	AC405K	92,0	2,4	Super FF Coat	18	Employs an ultra-hard substrate and ultra-hard Super FF Coat to provide excellent resistance to wear and plastic deformation. Suitable for high-speed continuous cutting of cast iron.	AC410K
	New AC4010K	91,1	2,5	Absotech	20	1st recommended grade for turning grey cast iron. For high-speed cast iron milling. New thick coating realizes stable long tool life even with ultra-high-speed machining of grey cast iron at $v_c = 700$ m/min.	AC405K
	New AC4015K	91,1	2,5	Absotech	16	1st recommended grade for turning ductile cast iron. New high-adhesion, high-strength coating realises high wear resistance and chipping resistance for stable long tool life over a wide range of cutting conditions.	AC415K
	AC415K	91,1	2,5	Super FF Coat	18	Employs a special dedicated ultra-hard substrate that is also suitable for interrupted cutting and ultra-hard Super FF Coat to provide stability and long tool life in a wide range of processes. First recommended grade for cast iron turning.	AC410K
	AC420K	91,1	2,5	Super FF Coat	12	A new, extremely versatile grade that can be used for rough, interrupted cutting of ductile and grey cast iron. Employs special, ultra-hard carbide substrate and Super FF Coat to provide stability and long tool life.	AC700G

For Milling (CVD)

Class	Grade	Hardness (HRA)	TRS (GPa)	Coating Type	Coating Thickness (µm)	Characteristics	Old Grades
P	ACP100	89,3	3,1	Super FF Coat	6	A grade that employs a tough carbide substrate and thin-layer Super FF Coat to provide superior thermal crack and wear resistance in high-speed milling of steel.	AC230
	New ACP2000	89,5	3,2	Absotech	10	For high-speed machining of steel. Stable long tool life with high-speed machining is realized by adopting a tough carbide substrate and a new coating with excellent thermal crack resistance.	ACP100
M	ACM200	89,8	3,4	Super FF Coat	6	A grade ideal for hardened steel machining that provides excellent wear and heat resistance by employing a newly-developed ultra-hard carbide and Super FF Coat.	AC230
K	ACK100	92,0	2,4	Super FF Coat	6	A grade that employs a high-strength carbide substrate and Super FF Coat to provide excellent wear resistance in high-speed milling.	—
	ACK200	91,7	2,5	Super FF Coat	6	A grade that employs a tough carbide substrate and thin-layer Super FF Coat to provide superior thermal crack and wear resistance for high-speed milling.	AC211
	New ACK2000	91,7	3,1	Absotech	10	For high-speed cast iron milling. Stable long tool life with high-speed machining is realized by adopting a tough carbide substrate and a new coating with excellent thermal resistance.	ACK100 ACK200

Characteristic Values

For Turning (PVD)

Class	Grade	Hardness (HRA)	TRS (GPa)	Coating Type	Coating Thickness (µm)	Characteristics	Old Grades
P	T1500Z (Cermet)	92,0	2,2	Brilliant Coat*	3	Brilliant Coat* PVD coating gives excellent lubricity for higher quality machining. General-purpose coated cermet grade that can maintain high-quality machined surfaces and also gives excellent wear resistance.	T2000Z
	T3000Z (Cermet)	91,3	2,4	ZX Coat	3	An ultra-reliable coating grade with tough cermet substrate.	—
	AC530U	91,4	3,3	Super ZX Coat	3	For interrupted and general steel cutting. Utilizing the super multi-layered PVD coating of nanometre thick TiAlN and AlCrN layers, coupled with a fine-grained super tough substrate for excellent fracture resistance.	ACZ310
M	AC6040M	91,6	3,8	Absotech	3	The first recommended grade for interrupted machining of stainless steel that drastically improves the reliability in unstable machining thanks to the excellent adhesion and peel-off resistance of the new Absotech Bronze PVD coating, as well as the improved fracture resistance of the exclusive ultra-hard carbide substrate.	AC530U
	AC530U	91,4	3,3	Super ZX Coat	3	Heavy interrupted machining and stainless steel machining. Utilizing the super multi-layered PVD coating of nanometre thick TiAlN and AlCrN layers, coupled with a fine-grained super tough substrate for excellent fracture resistance.	ACZ310
S	AC510U	92,6	2,6	Super ZX Coat	3	Finishing to medium cutting of exotic alloys. Utilizing the super multi-layered PVD coating of nanometre thick TiAlN and AlCrN layers. Superior wear and heat resistance, and stable, long tool life.	EH510Z EH10Z
	AC5015S	92,7	3,2	Absotech	5	The first recommended grade for turning exotic alloy. Adopts a carbide substrate with excellent thermal resistance and a new coating with excellent wear resistance and chipping resistance, realizing stable long tool life over a wide range of cutting conditions.	AC510U
	AC520U	91,7	3,0	Super ZX Coat	3	Medium to rough cutting of exotic alloys. Utilizing the super multi-layered PVD coating of nanometre thick TiAlN and AlCrN layers. Superior wear and heat resistance, and stable, long tool life even in interrupted cutting.	EH520Z EH20Z
	AC5025S	91,8	3,6	Absotech	5	For partially interrupted to interrupted machining of exotic alloy. Adopts a carbide substrate with excellent fracture resistance and a new coating with excellent wear resistance and chipping resistance, realizing stable long tool life with unstable cutting conditions.	AC520U
Small Product Machining	ACZ150	91,4	3,3	ZX Coat	1	For small tools, and high-precision finishing to general finishing applications. TiN ultra-thin coating and fine-grained, super tough substrate combine to give good edge sharpness and superior cut finish.	—
	AC1030U	91,6	3,8	Absotech	2	For precision machining that supports a wide range of work materials. Employs the new "Absotech Bronze" coating with excellent adhesion and peel-off resistance to deliver excellent machined surface quality with improvements in cutting edge quality and superb stability.	—

For Milling (PVD)

Class	Grade	Hardness (HRA)	TRS (GPa)	Main Coating Components	Coating Thickness (µm)	Characteristics	Old Grades
P	ACU2500	91,6	3,8	Absotech	3	General purpose grade supporting steel, stainless steel and cast iron machining. Adopts a carbide substrate with excellent fracture resistance and wear resistance, plus a new coating with wear and chipping resistance, realizing stable long tool life with various work material grades.	—
	ACP200	89,5	3,2	Super ZX Coat	3	For general machining of general and die steel. Employs PVD coating consisting of multiple nanometre-thin layers. A general grade that achieves a good balance between fracture resistance and wear resistance when combined with an exclusive tough substrate.	ACZ330
	ACP300	89,3	3,1	Super ZX Coat	3	For interrupted machining and stainless steel machining. Employs PVD coating consisting of multiple nanometre-thin layers. Provides excellent fracture resistance when combined with an ultra-tough substrate.	ACZ350
	ACP3000	89,5	3,2	Absotech	3	1st recommended grade for milling steel. Carbide substrate with excellent thermal crack resistance, plus a new coating with excellent wear and chipping resistance, realizes stable long tool life over a wide range of cutting conditions.	ACP200 ACP300
M	ACM100	91,4	3,3	Super ZX Coat	3	A grade that provides excellent wear resistance by employing an ultra-hard fine-grained carbide and New Super ZX Coating.	ACZ310
	ACM300	89,8	3,4	Super ZX Coat	3	The first recommended grade for stainless steel machining that achieves a good balance between wear resistance and fracture resistance by employing a newly-developed ultra-hard carbide and New Super ZX Coating.	—
K	ACK300	91,4	3,3	Super ZX Coat	3	General-purpose grade with an excellent balance of wear and fracture resistance.	ACZ310
	ACK3000	91,7	3,1	Absotech	3	1st recommended grade for milling cast iron. Adopts a high thermal conductivity carbide substrate and a new coating with excellent wear and chipping resistance, realizing stable long tool life over a wide range of cast iron machining operations.	ACK300
N	DL1000	92,9	2,1	AURORA Coat (DLC Coat)	0,5	For milling non-ferrous metal, utilizing DLC coat with a low coefficient of friction and excellent adhesion resistance.	—
	DL2000	91,6	3,8	AURORA Coat (DLC Coat)	0,5	For milling non-ferrous metal, utilizing DLC coat with a low coefficient of friction and excellent adhesion resistance.	—

*There may be minor differences in the colour tone/lustre of Brilliant Coat grades due to the interference of light. Such differences have no effect on performance.

TiC / TaC (Titanium Carbide) Cermet



Various grades and expanded lineup of catalogue items meet a wide range of finishing needs.

Lineup includes wear-resistant T1000A, general purpose T1500A, general purpose coated cermet T1500Z and tough T2500A. Significantly expanded lineup of catalogue items for a wide variety of finishing applications.

Characteristics

Uncoated Cermet

T1000A High Speed Finishing Grade
High speed finishing grade with excellent wear resistance.

- Improved wear and fracture resistance.
- Solid solution hard phase reduces reaction with steel.
- Perfect for high-speed continuous finishing of steel, cast iron and powdered metal.

Uncoated Cermet

T1500A New General Purpose Grade
General purpose cermet grade that provides both wear and fracture resistance with better quality finished surfaces.

- Mixing hard phases of different functionality, grain size and compositions improves balance of wear and fracture resistance.
- Reduces adhesion of work material for beautiful finished surfaces.

Uncoated Cermet

T2500A
Tough grade with excellent fracture resistance and thermal crack resistance.

- Fine, uniform grain structure greatly improves toughness
- Improves thermal crack resistance due to the high thermal conductivity and realizes long stable tool life.

Coated Cermet

T1500Z New General Purpose Grade
General purpose coated cermet grade that employs new Brilliant Coat* PVD coating with excellent lubricity.

- Excellent wear resistance provides long tool life.
- Reduces adhesion of work material for beautiful finished surfaces.

Characteristic Values

For Turning

Class	Grade	Hardness (HRA)	TRS (GPa)	Coating Type	Coating Thickness (µm)	Characteristics	Old Grades
P	T1000A	93,3	1,8	—	—	Uncoated cermet grade with excellent wear resistance that provides good cost efficiency. Demonstrates excellent wear resistance in continuous finishing applications, and stable finishing of cast iron and sintered alloy as well as steel.	T110A
	T1500A	92,0	2,2	—	—	A general purpose grade that employs a substrate with improved balance of fracture and wear resistance to deliver superior finished surfaces in a wide variety of cutting conditions.	T1200A
	New T2500A	91,8	2,4	—	—	For interrupted machining of steel. Fine, uniform grain structure greatly improves toughness, realizing long tool life and excellent surface finish even with interrupted cutting.	—
	T1500Z	92,0	2,2	PVD Brilliant Coat*	3	Brilliant Coat's* new PVD coating gives excellent lubricity for higher quality machining. General-purpose coated cermet grade that can maintain high-quality machined surfaces and also gives excellent wear resistance.	T2000Z
	T3000Z	91,3	2,4	PVD ZX Coat	3	An ultra-reliable coated grade with tough cermet substrate.	—
K	T1000A	93,3	1,8	—	—	Exclusive uncoated cermet grade with excellent cost efficiency suitable for cast iron finishing, which requires high hardness.	T110A

For Milling

Class	Grade	Hardness (HRA)	TRS (GPa)	Coating Type	Coating Thickness (µm)	Characteristics	Old Grades
P	T1500A	92,0	2,2	—	—	A general-purpose grade that employs a substrate with an improved balance between fracture and wear resistance to deliver superior finished surfaces in a wide variety of cutting conditions.	T1200A
	T250A	91,4	2,1	—	—	Tough cermet grade with enhanced crack advancement resistance.	—
M	New T2500A	91,8	2,2	—	—	For finishing of steel and stainless steel. Fine, uniform grain structure greatly improves toughness, realizing long tool life and excellent surface finishing.	T250A
	T4500A	91,0	2,3	—	—	For finishing of steel and stainless steel. Tough grade with excellent fracture resistance and reduced thermal cracking.	—

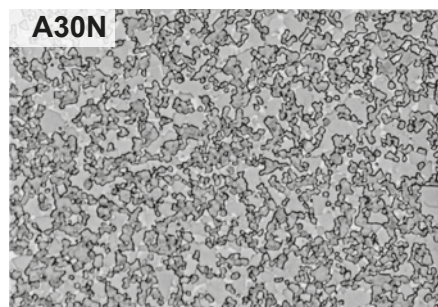
*There may be minor differences in the colour tone/lustre of Brilliant Coat grades due to the interference of light. Such differences have no effect on performance.

WC (Tungsten Carbide) „Igetalloy“

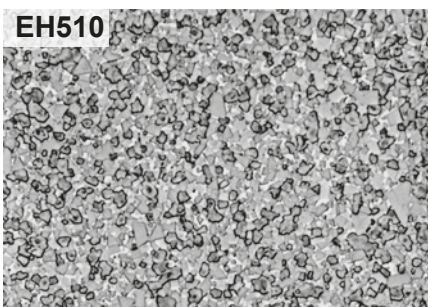
Igetalloy carbides have a solid history and a big variety of grades to suit many different applications. They are widely used and appreciated for their superior performance.

The Igetalloy line-up consists of carbide cutting tools that are available in a variety of different structures and compositions, each differing in terms of WC grain size and containing varying amounts of CO binder and TiC, TaC, and other double carbide components. The wide selection enables excellent wear resistance and toughness with a variety of work materials and cutting conditions.

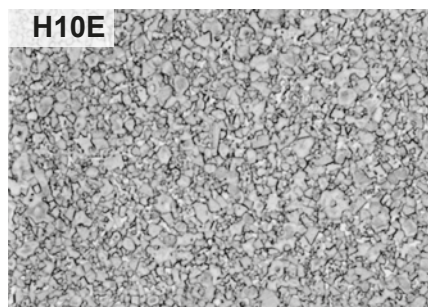
● For Steel



● For Stainless Steel



● For Cast Iron



Characteristic Values

Application	Grade	Hardness (HRA)	TRS (GPa)	Young's Modulus (GPa)	Thermal Conductivity (W/m·°C)	Compressive Strength (GPa)	Linear-Thermal Expansion Coefficient (X 10 ⁻⁶ /°C)
P	ST10P	92,1	1,9	470	25	4,9	6,2
	ST20E	91,8	1,9	550	42	4,8	5,2
	A30	91,3	2,1	520	—	—	5,2
	A30N	91,2	2,2	520	—	—	—
	ST40E	90,4	2,6	—	75	—	—
M	EH510	92,6	2,6	—	—	—	—
	EH520	91,7	3,0	—	—	—	—
	A30	91,3	2,1	520	—	—	5,2
	A30N	91,0	2,4	—	—	—	—
K	BL130	94,3	2,9	—	—	—	—
	H2	93,2	1,8	600	105	6,1	4,4
	H1	92,9	2,1	650	109	6,1	4,7
	EH510	92,6	2,6	—	—	—	—
	H10E	92,3	2,0	—	67	—	—
	EH520	91,7	3,0	—	—	—	—
	G10E	91,1	2,2	620	105	5,7	—
N	H1	92,9	2,1	650	109	6,1	4,7
	New H20	91,6	3,8	—	—	—	—
S	EH510	92,6	2,6	—	—	—	—
	EH520	91,7	3,0	—	—	—	—

CBN (Cubic Boron Nitride) SUMIBORON



High hardness and heat resistance for cutting high hardness steel and hard cast iron. Long tool life with high-speed finishing of grey cast iron.

In 1977, Sumitomo Electric Hardmetal successfully developed a revolutionary CBN sintered tool - SUMIBORON. The main component in SUMIBORON is Cubic Boron Nitride with a special ceramic binder sintered under super high pressure and temperature. As compared to other conventional tool materials, CBN has higher hardness and excellent heat resistance.

With these distinct characteristics, SUMIBORON can perform machining of hardened steel, high hardness cast iron and exotic metals where previously only grinding was done. Furthermore, excellent efficiency and longer tool life can also be achieved from high speed machining of cast irons.

Characteristics

Classifications	Structure	CBN Content	Hardness (GPa)	Grades	Application	Characteristics
Purely CBN particles, firmly bonded		High	54	NCB100	Cast Iron, Titanium Alloy, Pure Titanium, Co-Cr-Alloy, Cemented Carbide, Cermet	Containing no binder, the nano-to sub-micron CBN particles have a directly bonded structure. The high hardness and thermal conductivity make it highly efficient with a long tool life when machining exotic alloys such as titanium alloys and Co-Cr alloys.
Mainly CBN grains fused together		↑ ↓	↑ ↓	BN700 BN7000 BN7500 BNS800	Carbide, Chilled cast iron, Ni-Hard cast iron, Heat-resistant alloy, Cast iron Sintered ferrous alloy	High carbon content. Structure consists of strongly fused CBN grains. Suited to cutting cast iron, heat-resistant alloy, ultra-hard alloy, and other hard materials.
Mainly CBN grains held together with a binder				BN1000, BN2000, BN350 BNX10, BNX20, BNX25 BN500, BN2010, BN2020 BNC300, BNC100, BNC160 BNC200, BNC500	Alloy steel, Case hardened steel, Carbon tool steels, Bearing steel, Die steel, Ductile cast iron	CBN grains are fused together strongly with a special ceramic binder. Strong CBN binding force gives superior wear resistance and toughness when cutting hardened steel and cast iron.

Grade Range Map

Class	Application	High-speed Cutting	Finishing – Light Cutting	Medium Cutting		Rough – Heavy Cutting
		—	H01	H10	H20	H30
H	Coated SUMIBORON	BNC2010		BNC2020		BNC300
		BNC100		BNC160	BNC200	
	Uncoated SUMIBORON	BN1000		BN2000		
		BNX10			BNX20	BNX25, BN350
		BN7500		BN7000		
		BN500*		BN500		BNS800
Sintered Components	Classification	—	01	10	20	30
	Uncoated SUMIBORON	BN7500		BN7000		
		BN500*		BN500		BNS800
		BN7000		BN7000		
K	Classification	—	K01	K10	K20	K30
	Coated SUMIBORON	BNC500*		BNC500*		
		BN500*		BN500		
	Uncoated SUMIBORON	BN7000		BN7000		
		BNS800		BNS800		
S	Classification	—	S01	S10	S20	S30
	Uncoated SUMIBORON	BN7000		BN7000		
		BNS800		BNS800		
		BNS800		BNS800		

* Dedicated for Ductile Cast Iron.

CBN (Cubic Boron Nitride)

SUMIBORON

Characteristic Values

Class	Grade	Binder	Carbon Content (%)	Grain Size (µm)	Hardness HV (GPa)	TRS (GPa)	Main Coating Components	Coating Thickness (µm)	Characteristics
H	BNC2010	TiCN	50–55	2	30–32	1,10–1,20	TiCN multi-layered	1,5	Improves the wear resistance of coating and substrate and stably achieves excellent surface roughness.
	BNC2020	TiN	70–75	5	34–36	1,20–1,30	TiAlN multi-layered	1,5	Provides long tool life in general and high-efficiency cutting thanks to tough substrate coated with a highly wear-resistant and highly adhesive layer.
	BNC100	TiN	40–45	1	29–32	1,05–1,15	TiAlN	1	Highly wear resistant coating makes this grade suited for high speed finishing.
	BNC160	TiN	60–65	3	31–33	1,10–1,20	TiAlN/TiCN	2	Stable, high precision finishing of hardened steel.
	BNC200	TiN	65–70	4	34–36	1,15–1,25	TiAlN/TiCN	2	Tough substrate with high wear resistant coating provide longer tool life.
	BNC300	TiN	60–65	1	33–35	1,15–1,25	TiAlN	2	Suited for finishing when there is a combination of continuous and interrupted cutting.
	BNX10	TiCN	40–45	3	27–31	0,80–0,90	–	–	Optimum wear resistance. Suited to continuous, high-speed cutting.
	BN1000	TiCN	40–45	1	27–31	0,90–1,00	–	–	Ultimate wear and fracture resistance. Suited to high-speed cutting.
	BNX20	TiN	55–60	3	31–33	0,95–1,10	–	–	Crater resistant grade, suitable for high efficiency cutting under high temperature conditions.
	BNX25	TiN	65–70	4	29–31	1,00–1,10	–	–	Excellent fracture resistance during high speed cutting. Suited to high speed interrupted cutting of hardened steel.
	BN2000	TiN	50–55	2	31–34	1,05–1,15	–	–	A general purpose grade for hardened steel that provides a high degree of fracture and wear resistance.
	BN350	TiN	60–65	1	33–35	1,20–1,30	–	–	High cutting edge strength. suited to heavy interrupted cutting.
Sintered Components	BN7500	Co Compound	90–95	1	41–44	1,40–1,50	–	–	Maintains optimum cutting edge sharpness. Suited for finishing of sintered alloy.
	BN700	Co Compound	90–95	2	40–43	1,20–1,30	–	–	Maintains good wear and fracture resistance in rough cutting of sintered components.
	BN7000	Co Compound	90–95	2	41–44	1,30–1,40	–	–	Improved wear and fracture resistance in rough cutting of sintered components.
K	BN700	Co Compound	90–95	2	40–43	1,20–1,30	–	–	Maintains good wear and fracture resistance in rough cutting of cast iron and exotic alloy.
	BN7000	Co Compound	90–95	2	41–44	1,30–1,40	–	–	Improved wear and fracture resistance in rough cutting of cast iron and exotic alloy.
	BNS800	Al Alloy	85–90	8	39–42	0,95–1,10	–	–	100% solid CBN structure with good thermal impact resistance.
	BNC500	TiC	60–65	4	32–34	1,00–1,10	TiAlN	2	Substrate with excellent wear resistance and coating makes this grade suited for hard-to-cut cast iron.
S	New NCB100	–	100	–0,5	51–54	1,8–1,9	–	–	Achieves high-efficiency, improved machining accuracy and long tool life in machining of exotic alloys such as titanium alloy and Co-Cr alloys.

PCD (Polycrystalline Diamond) SUMIDIA



Excellent wear resistance, longer tool life, and high-speed, high-efficiency, high-precision cutting of non-ferrous metals and non-metals.

SUMIDIA is a polycrystalline diamond material made from sintered diamond powder that was first created using our proprietary technology in 1978.

SUMIDIA's superior wear resistance achieves longer tool life, high speed, high efficiency and high precision in non-metal cutting and non-ferrous metal applications including aluminium, copper, magnesium and zinc alloys.

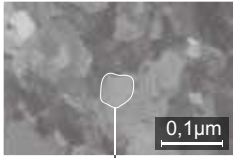
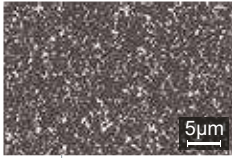
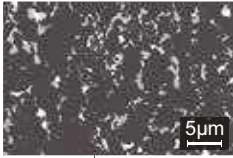

SUMIDIA Binderless uses nano-polycrystalline diamond for the cutting edge, demonstrating excellent wear resistance and fracture resistance.

In particular, it achieves extended tool life and machining accuracy superior to conventional polycrystalline diamond when machining hard brittle materials such as cemented carbides.

Features

Diamond particles on the order of submicrons to several dozen microns, sintered at high density.

Structure

SUMIDIA Binderless	SUMIDIA		
NPD10	DA1000	DA150	DA90
			
Diamond particles	Black areas in image are diamond particles.		

Grade Range Map

Class	Series	Finishing – Light Cutting		Medium Cutting	Rough – Heavy Cutting
Brittle Materials	Classification	01	10	20	30
	SUMIDIA Binderless	NPD10			
	SUMIDIA		DA90		
N	Classification	N01	N02	N20	N30
	SUMIDIA	DA1000			
		DA150			
		DA90			

Characteristic Values

Class	Grade	Binder	Carbon Content (%)	Grain Size (µm)	Hardness HV (GPa)	TRS (GPa)	Characteristics
Brittle Materials	NPD10	Co	100	<=0,05	120–130	≈ 3,15	100% diamond that directly binds nano-order diamond particles with high strength. Demonstrates optimum wear and fracture resistance as well as the best edge sharpness.
N	DA1000	Co	90–95	–0,5	110–120	≈ 2,60	High density sintered material made of ultra-fine diamond particles that demonstrates optimum wear and fracture resistance, and edge sharpness.
	DA150	Co	85–90	5	100–120	≈ 1,95	Sintered material made of fine diamond particles that provides a good balance of workability and wear resistance.
	DA90	Co	90–95	50	50–65	≈ 1,10	Coarse sintered diamond particles, with high diamond content for excellent wear resistance.

PCD (Polycrystalline Diamond) SUMIDIA Binderless

Grades



SUMIDIA Binderless Series uses nano-polycrystalline diamond for the cutting edge and demonstrates excellent wear and fracture resistance compared to conventional sintered diamond tools.

In particular, SUMIDIA Binderless Series allows for improvements in tool life and machining precision that go far beyond conventional diamond tools in the machining of hard brittle materials, such as carbide.

Excellent for High Precision Machining of Carbide

Nano-polycrystalline diamond with excellent wear resistance achieves high precision machining of carbide.

Maintains Superior Dimensional Tolerances Over Many Hours

Greatly reduces the number of tool replacements compared to conventional diamond tools and increases work efficiency while reducing total costs.

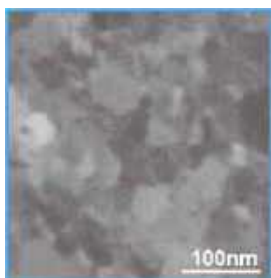
Suitable for Hard Brittle Material Machining

Hard brittle materials (such as ceramics) that could only be ground before can now be cut.

Characteristics

Comparison of Structure

Nano-Polycrystalline Diamond
SEM Structure



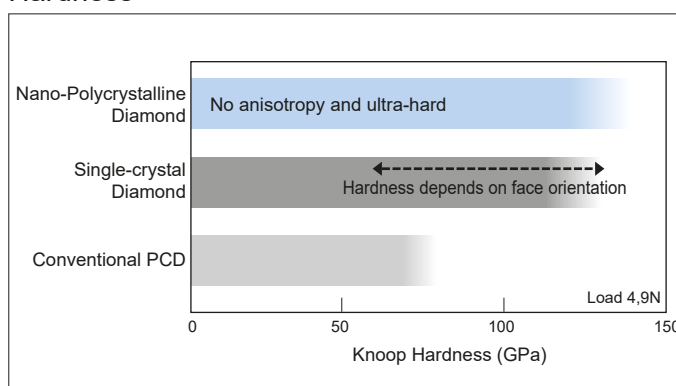
Diamond Particles
(30–50 nm)

Conventional PCD
SEM Structure



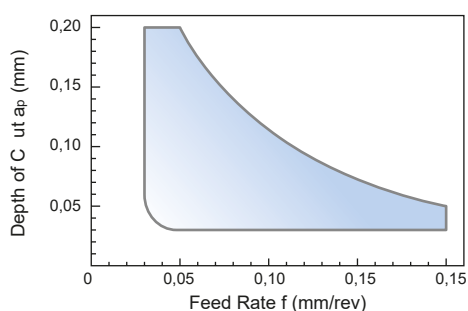
Diamond Particles
(1–10 µm)

Hardness

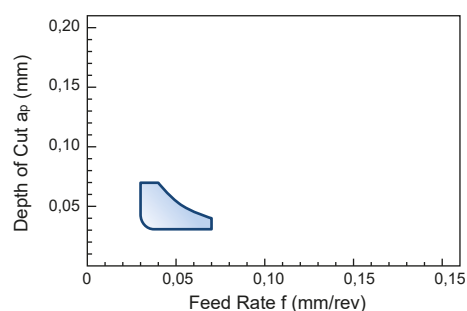


Application (Carbide Machining)

Hardness < 88HRA



Hardness ≥ 88HRA



Recommended Cutting Conditions (Carbide Machining)

Coolant: Dry

Min. - Optimum - Max.

Work Material			Cutting Conditions		
Classification	Hardness (HRA)	SEH Grade	Cutting Speed v_c (m/min)	Feed Rate f (mm/rev)	Depth of Cut a_p (mm/rev)
VM VC	70 60 50	G7 G6	5–20–30	0,03–0,10–0,20	0,03–0,10–0,20
VM VC	40	G5 G2	5–15–30	0,03–0,05–0,07	0,03–0,10–0,20

Grade Comparison Chart

Coated Carbide (CVD)

Application	Class	Grade	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	Mitsubishi-Hitachi	Sandvik	Kennametal	SECO Tools Japan	WALTER	ISCAR	Taegu Tec	NTK	
Turning	P	P05	AC8015P AC810P	UE6105	T9105	CA510 CA5505	HG8010	GC4305 GC4205	KCP05 KCP05B KC9105	TP0501 TP0500	WPP05S WPP05 WPP01	IC8005 IC8150 IC428	TT8105		
		P10	AC8015P AC810P	MC6015 UE6110	T9105 T9115	CA510 CA515 CA5515	HG8010	GC4305 GC4215 GC4315	KCP10 KCP10B	TP1501 TP1500	WPP10S WPP10	IC5100 IC8150 IC8250 IC9015	TT8115	CP7	
		P20	AC8025P AC820P	MC6025 UE6020	T9115 T9125	CA025P CA525	HG8025 GM8020	GC4315 GC4225 GC4325 GC1515	KCP25 KCP25B	TP2501 TP2500	WPP20S WPP20	IC8150 IC8250 IC8350 IC9015	TT5100 TT8125	CP7	
		P30	AC8035P AC830P AC6030M AC630M	MC6035 UE6035	T9125 T9135 T6130	CA025P CA525 CA530	GM25	GC2025 GC4325 GC4335 GC4235	KCP30 KCP30B	TP3500	WPP30S WPP30	IC8350 IC8025	TT7100 TT8135		
		P40	AC8035P AC830P AC6030M AC630M	UH6400	T9135 T6130	CA530 CA5535	GX30 GM8035	GC4335 GC4235 GC30	KCP40 KCP40B	TP3500		IC8350 IC8025	TT7100		
	M	S	M10 S10	AC610M AC6020M	MC7015 US905 US7020	T9115	CA6515	HS9105	GC2015 GC1515 S05F	KCM15			IC6015 IC8025 IC8150 IC8250 IC5820	TT9215	
			M20 S20	AC6020M AC6030M AC610M	MC7025 US7020	T6120 T9125	CA6525	HG8025	GC2025 GC1515	KCM25	TP2501 TP2500 TM2000		IC6015 IC6025 IC8350	TT5100 TT9225	
			M30	AC6030M AC630M AC8035P AC830P	MC7025 US735	T6130	CA6535	GM8035 GX30 GM25	GC2035 GC235	KCM35 KC9240	TP3500 TM4000		IC6025	TT9235	
			M40	AC6040M AC630M	US735				GC235 GC2035		TM4000			TT7800	
	K	K05	AC4010K AC405K	MC5005 UC5105 UC5115	T5105	CA310 CA4505 CA4010	HG3305 HX3505	GC3005 GC3205 GC3210	KCK05	TK1000 TK1001	WAK10 WKK10S	IC5005	TT7005 TT7505	CP1	
		K10	AC4010K AC4015K AC405K AC415K	MC5005 MC5015 MC5020 UC5105 UC5115	T515 T5105 T5115 T5125	CA315 CA4505 CA4515 CA4115	HX3305 HG3315 HX3515 HG8010 TH315 ATH10E	GC3005 GC3210 GC4305	KCK15	TK1000 TK1001	WAK10 WAK20 WKK10S WKK20S	IC5005 IC5010 IC5100	TT7015	CP1	
		K20	AC4015K AC415K AC420K AC425K	MC5015 UC5115 UE6110	T5125 T9125	CA320 CA4515 CA4120 CA4115	HX3315 HG3315 HG8025	GC3215 GC4325	KCK15 KCK20	TK2000 TK2001	WAK20 WAK30 WKK20S	IC5010 IC8150	TT7015		
	Milling	P	P10	ACP2000 ACP100	FH7020 F7030 MV1020	T3130 T3030			GC4220 GC4230 GC3040	KC930M KC935M	MP1500 MP2500	WKP25 WKP25S WPP35G WKP35S	IC4100 IC4050 IC520M DT7150 IC5400	TT7080 TT7515 TT9300	
			P20	ACP2000	F7030				GC2040 GC4240	KCPM20				TT7400	
			P30	ACP2000	F7030					KCPK30 KCMP30				TT7800	
M		S	M10	ACM100											
			M20	ACM200	F7030	T3130	CA6535	GX2160 AX2040	GC2040		MS2500	WKP35S		TT7800	
			M30		F7030					KC994M			IC5820	TT7800	
K		K10	ACK2000 ACK100 ACK200							KCK15			IC5100	TT7515	
		K20	ACK2000 ACK200	MV1020 MC5020 F5010 F5020	T1115	CA420M	GX2120	GC3330 GC3220 GC3225 GC3020 GC3040	KC915M KC930M KC935M	MK1500	WAK15 WKP25S	IC5100 DT7150 IC4010 IC4050 IC4100	TT6800 TT7080		

Coated Carbide (PVD)

Application	Class	Grade	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	Mitsubishi-Hitachi	Sandvik	Kennametal	SECO Tools Japan	WALTER	ISCAR	Taegu Tec	NTK
Turning	P	P05	ACZ150		AH710 AH110	PR915 PR1005								
		P10	AC1030U ACZ150 AC5025S AC520U	VP15TF MS6015	AH120 AH725	PR930 PR1215 PR1225						IC807		TM1 VM4 DT4 DM4
		P20	AC1030U AC5025S AC520U AC530U	VP15TF VP20RT	AH120 AH725 AH3135	PR1225 PR1425	IP2000	GC15 GC1125	KCU25			IC807 IC808 IC810	TT9080	TM1 TM4 VM1 QM3 DM4
		P30	AC1030U AC530U	VP15TF VP20RT	AH120 AH725 SH730	PR1425 PR1525 PR1535	IP3000 CY250	GC1125				IC328 IC330 IC830 IC928	TT8020 TT8080 TT9080	QM3
		P40	AC1030U				PR660	IP3000	GC4335 GC4235				IC830	TT8020 TT8080

Grade Comparison Chart

■ Coated Carbide (PVD)

Application	Class	Grade	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	Mitsubishi-Hitachi	Sandvik	Kennametal	SECO Tools Japan	WALTER	ISCAR	Taegu Tec	NTK	
Turning	M S	M10 S10	AC5015S AC5025S AC510U AC520U ACZ150	MP9005 MP9015 VP15TF VP05RT VP10RT	AH110 AH710 AH725 AH905 AH8005	PR005S PR015S PR915 PR1025 PR1215 PR1225 PR1305 PR1310	IP050S IP100S JP9105 JP9115	GC1105 GC1115	KC5510 KCU10	TS2000	WSM01 WSM10 WSM10S	IC807 IC808 IC907 IC908	TT5080 TT3010	TM1 VM1 DT4 DM4 ZM3 ST4	
		M20 S20	AC520U AC1030U AC5015S AC5025S	MP9015 MP9025 VP15TF VP20RT VP20MF UP20M	AH630 AH120 AH725 AH8015	PR015S PR915 PR930 PR1025 PR1125 PR1215 PR1225 PR1325	IP100S HS9115	GC15 GC1115 GC1125	KC5525 KCU25 KC5025	TS2500	WSM20 WSM20S	IC330 IC806 IC808 IC830 IC908 IC928	TT9080 TT9020 TT3020	DT4 DM4 ZM3 QM3 TM4 ST4	
		M30	AC5025S AC6040M AC520U AC530U AC1030U	MP7035 VP15TF VP20MF	AH630 AH645 AH725	PR1125 PR1525 PR1535		GC1125				WSM30 WSM30S	IC328 IC330 IC830 IC840 IC882	TT8020 TT8080 TT9080	QM3 TM4 DT4 DM4
		M40	AC6040M AC530U AC1030U	MP7035 VP15TF MS6015	AH645	PR1125 PR1535	GX30						IC830 IC928	TT8020 TT8080	
	K	K10	ACZ150 AC1030U AC510U	VP10RT	AH110 AH120	PR905	HX3305 HG3305 HG3315 HX3515 HG8010 TH315 ATH10E	GC15					IC810	TT6080	
		K20	ACZ150 AC1030U AC510U AC530U	VP10RT VP20RT VP15TF	AH120	PR905								TT6080	DM4 QM3
		K30	AC1030U AC530U	VP15TF VP20RT	AH110 AH120 AH725								IC830 IC908 IC910 IC928		
	Milling	P	P10	ACU2500 ACP200	VP15TF MP6120	AH120 AH725	PR930 PR1225	PN215 PN15M JP4005 JP4105 JP4115 JP4120 GX2140		KC715M	T250M T350M F25M		IC807 IC903	TT2510 TT7080	TM1 DT4 DM4
			P20	ACP3000 ACU2500 ACP200 ACP300	VP15TF VP20RT MP6120 MP6130	AH9030 AH120 AH725 AH3135	PR1525 PR1225 PR1230 PR830	JP4020 JP4120 JS4045	GC1010 GC1025		MP3000 F30M	WSM20 WSM20S	IC807 IC808 IC810 IC380 IC330	TT7080 TT9030 TT9080	TM1 TM4 DT4 DM4
			P30	ACP3000 ACU2500 ACP200 ACP300	VP15TF VP30RT MP6130	AH3035 AH3135 AH120 AH130 AH140 AH725	PR1525 PR1535 PR1230	JD4045 JS4060 JX1045 JX1060 CY150 CY250 PTH30E	GC1030 GC1130 GC2030	KC725M KC730M KC735M KC7140 KCU40	MM4500 F40M	WSM35 WSP45 WSP45S	IC328 IC330 IC380 IC830 IC928	TT8080 TT8020	DM4 TM4 ZM3
P40			ACP3000 ACU2500 ACP300	VP30RT	AH140		JS4060 JM4160 PTH40H						IC830	TT8020 TT8080	
M		M10 S10	ACM100 ACU2500 ACK300 ACP300	MP9120 VP15TF VP10RT	AH110 AH120 AH330 AH725	PR1025 PR1225	JX1020 CY9020 JP4020 JP4120 PN08M PN215	GC1025 GC1030 GC1130	KC522M				IC807 IC808 IC903 IC907 IC908		TM1 DT4 DM4 ZM3
		M20	ACM300 ACU2500 ACP300	MP7130 MP9120 MP9130 UP20M VP15TF VP20RT	AH120 AH130 AH725 AH3135 AH6030	PR1025 PR1225 PR1525	JP4120 JS1025 JX1015 CY150 CY15		KC730M KC525M	F25M F30M T350M	WSM35 WSM35S WXM35	IC330 IC808 IC830 IC840 IC882 IC908 IC928	TT9080 TT9030	DT4 DM4 ZM3	
		M30	ACM300	MP7130 MP7140 MP9130 VP15TF	AH130 AH140 AH330 AH725 AH3135	PR1525 PR1535	JX045 JM4160 PTH30E	GC2030 GC1040	KC725M KC7140 KCU40	F30M F40M MM4500	WSM35 WSM35S WXM35	IC328 IC330 IC830 IC840 IC882	TT8020 TT8080 TT9080	DT4 DM4 ZM3	
		M40	ACM300	MP7140 VP15TF VP30RT	AH140	PR1535	GX30 JM4160 PTH40H						IC830 IC928	TT8020 TT8080	
K		K05	ACK3000		AH110		TH303 TH308 ATH80D								
		K10	ACK3000 ACU2500		AH110 AH120	PR905 PR1210							IC810	TT6080 TT7080	
		K20	ACK3000 ACU2500 ACK300	VP20RT VP15TF	AH120 AH9030	PR905 PR1210 PR1510	JP4020 JP4120 PTH13S	K15W K20D K20W		MK3000 T150M	WKK25	IC808 IC810 IC830	TT6080 TT7515	DM4	
		K30	ACK3000 ACU2500 ACK300	VP15TF VP20RT	AH725 AH110 AH120 AH330 GH110 GH130	PR1510 PR1210	JS4045 JX1045 CY150 CY250	GC1010 GC1020 GC1025 GC1030 GC1130	KC510M KC520M KC525M KCU40	MK2050 MH1000			IC830 IC810 IC908 IC910 IC928 IC950	TT6080	

Grade Comparison Chart

■ Cermet

Application	Class	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	Mitsubishi-Hitachi	Sandvik	Kennametal	Dijet	Valenite	SECO Tools Japan	WALTER	ISCAR
Turning	P	P10	T1500Z* T1000A T1500A	AP25N* NX2525 NX3035 VP25N*	GT720* GT9530* J9530* NS520	TN30 PV30* TN60 TN6010 TN610 PV710 PV7005* PV7010*	CZ25* CH550	CT5015	KT125 HTX KT1120	LN10 CX50	VC605		IC20N IC30N IC520N
		P20	T1500Z* T3000Z* T1500A T2500A	AP25N* NX2525 NX3035 MP3025*	NS530 GT530* NS730 AT9530* NS9530 GT9530* GT730*	TN60 TN6020 TN620 PV60* TN90 PV7020* PV7025* PV720	CZ25* CH550	GC1525*	KT6215 KT315* KT175 KT5020*	CX50 CX75	VC610	CM CMP C15M TP1020	IC20N IC30N IC520N IC530N
		P30	T2500A T3000Z*	MX2525 MP3025* VP45N	NS9530 GT9530* AT9530*	TN620 PV7025* PV90* PV720					CX90 CX99		
Milling	P	P30	T2500A T250A T4500A	NX2525 MX3030 NX4545 VP45N*	NS540 NS740	TN90 TC60M TN100M	MZ1000* MZ2000* MZ3000* CH7030 CH7035	CT530	KT530M* KTPK20*	CX90	VC630	C15M	IC30N

* denotes coated cermet

■ Uncoated Carbide

Class	Grade	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	Hitachi	Sandvik	Kennametal	Dijet	SECO Tools Japan	ISCAR
P	P10	ST10P		TH10		WS10	S1P		SRT		
	P20	ST20E	UTi20T	KS20		EX35	SMA	K125M	SRT		IC70 IC50M
	P30	A30 A30N	UTi20T	KS15F UX30	PW30	EX35 EX40	SM30		DX30		IC54 IC28
	P40	ST40E		TX40		EX45	S6		SR30		IC54 IC28
M	M10	EH510		TH10		EX35 WA10B	H10A	KU10 K313 K68 KYSM10	UMN	890	IC07 IC08 IC20
	M20	EH520	UTi20T	KS20		EX35	H13A	K313 K68	DX25 UMS	HX 883	IC07 IC08 IC20
	M30	A30 A30N	UTi20T	UX30			H10F SM30		UMS UM40		IC28
K	K01	H2 H1	HTi05T	KS05F		WH01 WH05		KU10 K68 K313 K115M	KG03		IS8
	K10	H1 EH510	HTi10	TH10	KW10 GW15	WH10	H13A	KU10 K313 K68 K115M K110M KY3500	KG10 KT9 CR1	890	IC20 IS8
	K20	G10E EH520	UTi20T	KS15F KS20	GW25	WH20	H13A	KMF KY3500 KYHS10	KT9 KG20 CR1	890 883 HX	IC20 IS8
	K30	G10E	UTi20T			WH30		KY3500	KG30	883	
S	S10 S20	EH510 EH520	RT9005 RT9010 MT9015 TF15	TH10 KS05F KS15F KS20	SW05 SW10 SW25 KW10 GW15	WH10	H10A H10F H13A	KU10 K313 K68 KMF K110M K1025 KYHS10	KG10 KG20	HX H25	IC20 IC07 IC08 IC28
	Fine-grained Carbide	A1		UM		NM25	N6F H10F		FZ20 FB20	883	IC08

Grade Comparison Chart

■ CBN

Class	Grade	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	NGK	Sandvik	Kennametal	Dijet	SECO Tools Japan	
K	K01	NCB100 BNC500 BN7000	MB710 MB5015	BX930 BX870 BX910	KBN475 KBN60M	B30 B16	CB7525 CB7925	KB1340	JBN795		
	K10	BN700 BN7000 BN7500	MB710 MB730 MB5015	BX470 BX480 BX950	KBN65B KBN60M KBN900	B23 B16	CB7925 CB7525		JBN330	CBN200, CBN300 CBN300P, CBN400C	
	K20	BN700 BN7000 BNS800	MB730 MBS140 BC5030	BX470 BX480 BXC90 BX90S	KBN900						
	K30	BNS800	MBS140	BX90S BXC90					KB5630		CBN500
S	S01	NCB100 BN700 BN7000	MB730 MB4020 MB4120	BX950 BX470 BX480					KB5630 KB1340		
H	H01	BNC2010 BNC100 BN1000 BN2000 BNX10	BC8105 BC8110 MBC010 MB810 MB8110	BXM10 BX310	KBN05M KBN25M KBN510	B5K B52			KB5610		CH0550 CBN10 CBN100 CBN60K
	H10	BNC2010 BNC2020 BNC160 BNC200 BN2000	BC8110 BC8120 MBC020 MB8025 MB825	BXM10 BX330 BX530	KBN05M KBN25M KBN525	B5K B6K B52 B36	CB7015 CB7115 CB20	KBH20 KB5610 KB5625	JBN300		CBN10, CBN150 CBN100, CBN60K CBN160C
	H20	BNC2020 BNC200 BNX20	BC8120 BC8020 MBC020 MB825	BXA20 BXM20 BX360	KBN30M KBN35M KBN900	B36 B40 B6K	CB7025 CB7125 CB50	KBH20 KB5625 KB5630	JBN245		CH2540 CBN150 CBN160C
	H30	BNC300 BN350 BNX25	MB835 MB8130 BC8130	BXM20 BXA20 BXC50 BX380	KBN30M KBN35M KBN900	B40	CB7525 CB7135	KB5630			CH3515

■ PCD

Class	Grade	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	Sandvik	Kennametal	Dijet	SECO Tools Japan
N	N01	DA90 DA1000	MD205	DX180 DX160	KPD001	CD05 CD10	KD1400	JDA30 JDA735	
	N10	DA150 DA1000	MD205 MD220	DX140	KPD001 KPD010 KPD230	CD1810	KD1400 KD1425		PCD05 PCD10
	N20	DA1000 DA2200	MD220 MD230	DX120 DX110	KPD230		KD1400 KD1425	JDA10 JDA715	PCD05 PCD20
	N30	DA1000 DA2200	MD2030 MD230	DX110			KD1400		PCD05 PCD30 PCD30M