

# Selection of Sumitomo Grades (Turning)

Selection Guide by Work Material and Cutting Process



A  
Grades

Cutting Process	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				
ISO Classification	-	P01	P10	P20	P30	P40	-	M01	M10	M20	M30	M40	-	K01	K10	K20	K30
<b>Coated Carbide</b>		AC810P <sup>C</sup>						AC6020M <sup>New</sup>		AC6030M		AC6040M		AC405K <sup>C</sup>			
			AC8025P <sup>New</sup>							AC610M	AC630M			AC415K <sup>C</sup>			
			AC820P <sup>C</sup>								AC830P <sup>C</sup>				AC420K <sup>C</sup>		
						AC830P <sup>C</sup>					AC520U	AC530U				AC8025P <sup>New</sup>	
Small Product Machining A24 A22			AC1030U <sup>New</sup>								AC1030U <sup>New</sup>					AC1030U <sup>New</sup>	
<b>Coated Cermet</b>		T1500Z															
			T3000Z														
<b>Cermet</b>		T1000A						T1000A						T1000A			
			T1500A						T1500A								
<b>Carbide</b>			ST10P	ST20E	A30										G10E		
<b>Ceramic</b>														NB90S			
<b>Uncoated CBN Coated CBN</b>																BNS800	
																BN7000	
																BN500	
																BNC500 <sup>P</sup>	

Cutting Process	S Exotic Alloy					H Hardened Steel				N Non-Ferrous Metal				Sintered Components						
	Wear Resistance ← Fracture Resistance					Wear Resistance ← Fracture Resistance				Wear Resistance ← Fracture Resistance				Wear Resistance ← Fracture Resistance						
ISO Classification	-	S01	S10	S20	S30	-	H01	H10	H20	H30	-	N01	N10	N20	N30	-	01	10	20	30
<b>Coated Carbide</b>		AC510U							AC503U											AC510U
			AC520U																	
<b>Cermet</b>																				T1000A
<b>Carbide</b>			EH510												H1					
				EH520																
<b>Ceramic</b>			WX120						NB100C											
<b>Coated CBN</b>									BNC2010											
									BNC2020											
										BNC300										
									BNC100											
										BNC160										
										BNC200										
<b>Uncoated CBN</b>			BN7000						BN1000											BN7500
									BN2000											BN7000
										BNX20										
										BN350										
										BNX10										
<b>PCD</b>														DA1000						
														DA150						



# Selection of Sumitomo Grades (Milling)

A  
Grades

Cutting Process	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 →					
ISO Classification	-	P01	P10	P20	P30	P40	-	M01	M10	M20	M30	M40	-	K01	K10	K20	K30
<b>Coated Carbide</b> <small>ISO A24</small>			<b>ACP100</b>					<b>ACM100</b>		<b>ACM200</b>		<b>ACM300</b>		<b>ACK100</b>			
				<b>ACP200</b>										<b>ACK200</b>			
					<b>ACP300</b>											<b>ACK300</b>	
<b>Cermet</b> <small>ISO A27</small>			<b>T250A</b>						<b>T250A</b>								
					<b>T4500A</b>					<b>T4500A</b>							
<b>Carbide</b> <small>ISO A28</small>					<b>A30N</b>						<b>A30N</b>				<b>G10E</b>		
<b>Ceramic</b> <small>ISO A34</small>														<b>NB90M</b>			
<b>Uncoated CBN</b> <b>Coated CBN</b> <small>ISO A30</small>																<b>BNS800</b>	
																<b>BN7000</b>	

Cutting Process	S Exotic Alloy						H Hardened Steel				N Non-Ferrous Metal					
	Wear Resistance ← Fracture Resistance →						Wear Resistance ← Fracture Resistance →				Wear Resistance ← Fracture Resistance →					
ISO Classification	-	S01	S10	S20	S30	S40	-	H01	H10	H20	H30	-	N01	N10	N20	N30
<b>Coated Carbide</b> <small>ISO A24</small>		<b>ACM100</b>														
			<b>ACM200</b>											<b>DL1000</b>		
<b>Carbide</b> <small>ISO A28</small>				<b>EH520</b>												<b>H1</b>
<b>Uncoated CBN</b> <small>ISO A30</small>										<b>BN7000</b>						
									<b>BN350</b>							
<b>PCD</b> <small>ISO A32</small>																<b>DA1000</b>



**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 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
Mainly CBN grains fused together		High	44	BN700 BN7000 BN7500 BNS800	<ul style="list-style-type: none"> <li>Carbide</li> <li>Chilled cast iron</li> <li>Ni-Hard cast iron</li> </ul>	<ul style="list-style-type: none"> <li>High carbon content. Structure consists of strongly fused CBN grains.</li> <li>Suited to cutting cast iron, heat-resistant alloy, ultra-hard alloy, and other hard materials.</li> </ul>
Mainly CBN grains held together with a binder		Low	21	BN500 · BNC500 BN1000 · BN2000 BN350 · BNX10 BNX20 · BNX25 BNC2010 · BNC2020 BNC300 · BNC100 BNC160 · BNC200	<ul style="list-style-type: none"> <li>Alloy steel</li> <li>Case hardened steel</li> <li>Carbon tool steels</li> <li>Bearing steel, Die steel</li> <li>Ductile cast iron</li> </ul>	<ul style="list-style-type: none"> <li>CBN grains are fused together strongly with a special ceramic binder.</li> <li>Strong CBN binding force gives superior wear resistance and toughness when cutting hardened steel and cast iron.</li> </ul>

### Grade Range Map

Work Materials	Series	Finishing to Light		Medium	Medium	Rough to Heavy
		—	H01	H10	H20	H30
<b>H</b> Hardened Steel	Coated SUMIBORON	BNC2010		BNC2020		BNC300
		BNC100		BNC160		BNC200
		BN1000		BN2000		BNX20
		BNX10		BNX20		BNX25, BN350
		BN7500		BN7000		
		BN7500		BN7000		
<b>Sintered alloy</b>	Uncoted SUMIBORON	BN7500		BN7000		
		BN7500		BN7000		
<b>K</b> Cast Iron	Coated SUMIBORON	K01		K10	K20	K30
		BNC500*		BNS800		
	Uncoted SUMIBORON	BN7000		BN500		
		BN7000		BN500		

\*For Ductile Cast Iron



**Excellent wear resistance with longer tool life in high-speed, high-efficiency and 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 in high speed, high efficiency and high precision non-metal cutting and non-ferrous metal applications including aluminum, copper, magnesium and zinc alloys.

A

Grades

Coated Carbide

Cermet

Ceramic

Carbide

CBN Layer

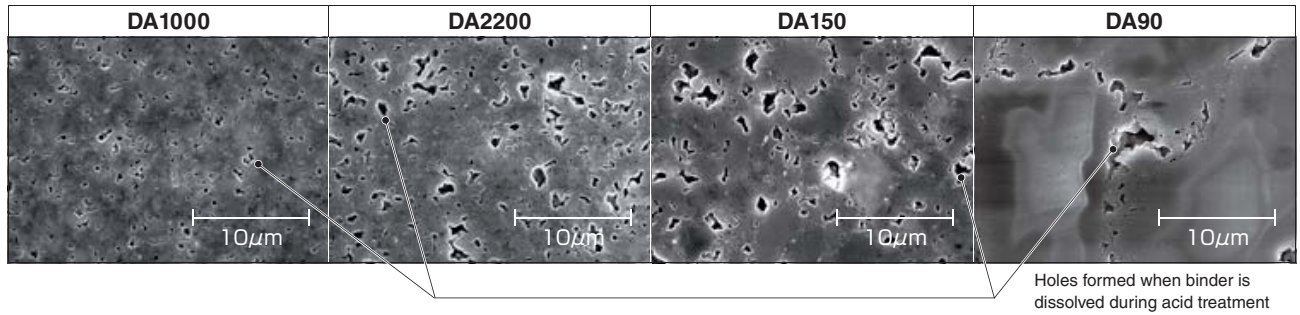
PCD

**Characteristics**

● Conventional Polycrystalline Diamond

High density sintered material made of diamond particles with particle sizes ranging from submicron to tens of microns.

Structure of Conventional Polycrystalline Diamond after Acid Treatment



**Grade Range Map**

Work Materials	Series	Finishing to Light		Medium	Rough to Heavy
		01	10	20	30
Hard Brittle Material	Classification	01	10	20	30
	SUMIDIA Binderless	NPD10			
	SUMIDIA	DA90			
Non-Ferrous Metal	Classification	N01	N10	N20	N30
	SUMIDIA	DA1000			
		DA2200			
		DA90		DA150	



### Superb wear for ultra-high speed machining.

Sumitomo Electric Hardmetal's "Advanced Ceramic" is created through a unique process that ensures excellent sharpness, making possible stable ultra-high speed cutting of cast iron, and cutting of heat-resistant alloys and ultra-hard rolled materials.

### Grade Range Map

#### For Turning

Work Materials	High-Speed	Finishing to Light	Medium	Rough to Heavy		
	—	01	10	20	30 40	
<b>K</b> Cast Iron	NB90S					
<b>S</b> Exotic Alloy	WX120					
<b>H</b> Hardened Steel	NB100C					