

# BASIC APPLICATION GUIDELINES

APPLICATIONS	PCD	CBN
HARD CAST IRON	NO	YES
SOFT CAST IRON	NO	YES
HARDENED STEEL	NO	YES
SUPER ALLOYS	NO	YES
ABRASIVE NONMETALLIC	YES	NO
NONFERROUS MATERIALS	YES	NO

## ***Cubic Boron Nitride (CBN)***

CBN tipped tools and inserts are excellent for the continuous cutting of a wide range of hardened steels, powdered metals, cast irons and super alloys. The products are precision ground with hones for machining to sub-micron finishes with maximum tool life. CBN tipped tools can take the place of grinding.

## ***Polycrystalline Diamond (PCD)***

PCD tipped boring bars and inserts are excellent for continuous cutting of a wide range of non-ferrous and non-metal materials. The products are precision ground for machining to sub-micron finishes with maximum tool life. PCD tipped tools allow for higher cutting speeds with longer tool life.

### **Guidelines for CBN**

(Ideal for hard ferrous metal -45 Rc plus)

Depth of cut should not exceed 30% of CBN tip length.  
 Coolant use is not advised as it could cause thermal cracking  
 Do not stop the machine with the tool in cut - this will result in tool breakage.  
 Make sure the machine and setup is rigid and solid; chatter will cause chipping.  
 Tool height when boring should be slightly above center; tool deflection will put the tool on center.  
 Do not contact the tool to a hard surface prior to the machining process - this will cause chipping.

### **Guidelines for PCD**

(Ideal for non-ferrous materials)

Higher speeds minimize tool buildup.  
 Depth of cut should not exceed 70% of PCD tip length.  
 Use of coolant will reduce heat and improve surface finish.  
 Do not stop the machine with the tool in cut - this will result in tool breakage.  
 Make sure the machine and setup is rigid and solid; chatter will cause chipping.  
 Tool height when boring should be slightly above center; tool deflection will put the tool on center.  
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- CBN and PCD tipped solid carbide boring bar minimum bore options starting at 0.120"
- CBN and PCD tipped indexable boring bar minimum bore options starting at 0.220"
- All CBN and PCD tipped boring bars have premium submicron carbide bodies and a precision ground flat
- CBN and PCD tipped indexable inserts are sold separately
- CBN and PCD indexable inserts are available for triangle or diamond shaped left or right-hand bars

# CBN APPLICATIONS

APPLICATIONS	
HARD CAST IRON	Pumps
	Impellers
	Shafts
SOFT CAST IRON	Engine Blocks
	Brake Rotors
	Transfer Housings
HARDENED STEEL	Pinion Gears
	Shafts
	Bearings
SUPER ALLOYS	Turbine Disk
	Turbine Blade
	Engine Shafts

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Coolant use is not advised as it could cause thermal cracking.
Do not contact the tool to a hard surface prior to the machining process. This will cause chipping.
Depth of cut should not exceed 30% of CBN tip length.

## CBN TIPPED TOOLS SPEEDS AND FEEDS

MATERIAL	BHN/Rc	SPEED RANGE (SFM)	FEED IPR	INDEXABLE BORING CBN TIPPED INSERTS		SINGLE POINT CBN TIPPED BARS			
				MAX DOC ACD & ATD	MAX DOC ACP & ATP	TOOL DIAMETER			
						.120-.160 MAX DOC	.180-.230 MAX DOC	.290-.320 MAX DOC	.360+ MAX DOC
HEAT TREATED ALLOY	45-60Rc	200-600	.001-.005	0.01	0.04	0.003	0.004	0.006	0.009
TOOL STEEL	45-60Rc	200-600	.001-.005	0.01	0.04	0.003	0.004	0.006	0.009
NODULAR IRON	N/A	600-1500	.001-.005	0.009	0.035	0.006	0.01	0.02	0.03
PEARLITIC IRON	220-240BHN	600-2500	.001-.007	0.009	0.035	0.006	0.01	0.02	0.03
WHITE/CHILLED IRON	54-60Rc	200-500	.001-.005	0.008	0.035	0.005	0.008	0.012	0.015
SUPER ALLOY Ni BASE	240-475 BHN	200-800	.001-.005	0.008	0.035	0.003	0.004	0.006	0.025
COBALT BASED ALLOY, STELLITE	45-55Rc	200-500	.001-.005	0.008	0.035	0.003	0.004	0.006	0.009
INCONELS	45-55Rc	200-500	.001-.005	0.008	0.035	0.003	0.004	0.006	0.009

SFM = Surface Feet per Minute    DOC = Depth of Cut

**AS THE DOC DECREASES THE FEED RATE CAN INCREASE**

SCT CBN tools and inserts are excellent for continuous cutting of a wide range of hardened steels, powdered metals, cast irons and super alloys. The products are precision ground with hones for machining to sub-micron finishes with maximum tool life. CBN tipped tools and inserts can take the place of grinding.

# PCD APPLICATIONS

APPLICATIONS	
ABRASIVE NONMETALLIC	Carbon Fiber Bicycles
	Carbon Fiber Car Parts
	Ceramic Gas Turbine Parts
	Ceramic Bearings
	Fiberglass Bodies for Cars and Boats
NONFERROUS MATERIALS	Aluminum Rims
	Aluminum Spools
	Brass Fittings
	Precious Metals
	Presintered Tungsten Carbide

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Use of coolant will reduce heat and improve surface finish.
Do not contact the tool to a hard surface prior to the machining process- this will cause chipping.
Higher speeds minimize tool buildup.
Depth of cut should not exceed 70% of PCD tip length.

## PCD TIPPED TOOLS SPEEDS AND FEEDS

MATERIAL	BHN/Rc	SPEED RANGE (SFM)	FEED IPR	INDEXABLE BORING PCD TIPPED INSERTS		SINGLE POINT PCD TIPPED BARS			
						TOOL DIAMETER			
				MAX DOC ACD & ATD	MAX DOC ACP & ATP	.120-.160 MAX DOC	.180-.230 MAX DOC	.290-.320 MAX DOC	.360+ MAX DOC
LOW SILICON ALUMINUM	225-350 BHN	1000-5000	.001-.007	0.025	0.08	0.015	0.021	0.03	0.045
HIGH SILICON ALUMINUM	270-425 BHN	600-3000	.001-.007	0.025	0.08	0.015	0.021	0.03	0.045
METAL MATRIX COMPOSITIES	N/A	500-2000	.001-.007	0.015	0.035	0.008	0.012	0.02	0.03
COPPER ALLOYS, BRASS, BRONZE	80-120 BHN	750-3500	.001-.007	0.025	0.08	0.015	0.021	0.03	0.045
PRESINTERED TUNGSTEN CARBIDE	140-300 BHN	100-350	.001-.005	0.007	0.012	0.003	0.005	0.007	0.012
ACRYLICS	N/A	700-1500	.001-.007	0.025	0.08	0.015	0.021	0.03	0.045
FIBERGLASS	N/A	600-1000	.001-.007	0.02	0.06	0.012	0.02	0.03	0.045
GRAPHITES	N/A	600-1000	.001-.007	0.025	0.08	0.015	0.021	0.03	0.045
NYLON, PLASTIC	N/A	700-1500	.001-.007	0.025	0.08	0.015	0.021	0.03	0.045
HARD RUBBER	N/A	500-2500	.001-.007	0.025	0.08	0.015	0.021	0.03	0.045

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