Worldwide Solids, LLC

WWSA
WorldWide Solids LLC
ISO 9001:2008 CERTIFIED

Worldwide Solids, LLC is a division of Worldwide Superabrasives, LLC located in Boynton Beach, Florida. Our world class production facility allows us to engineer new products, improve our current products and produce the highest performance products available for the superabrasives marketplace. WWSA ensures that we provide consistent products with every shipment by utilizing our state-of-the-art quality control laboratory. WWSA's commitment to excellence spreads across all of our High Pressure High Temperature (HPHT) engineered products such as diamond mesh, diamond micron, Cubic Boron Nitride (CBN) mesh, CBN micron, world-class metallic coatings, polycrystalline Cubic Boron Nitride (PCBN) and polycrystalline diamond (PCD).

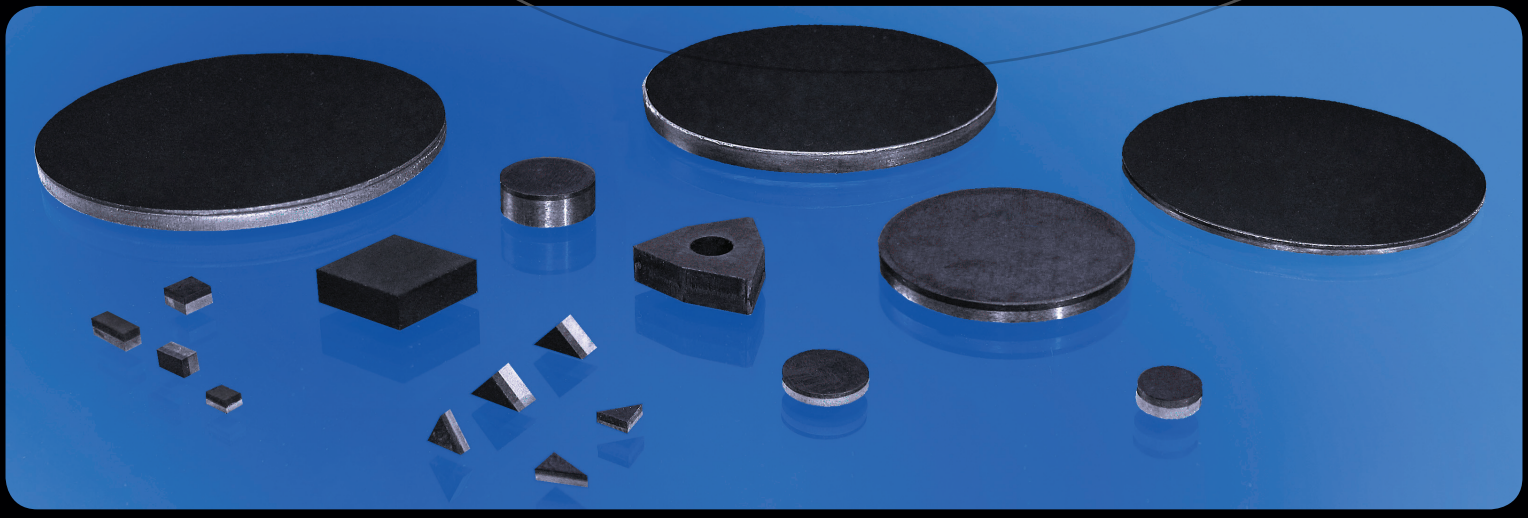
Select your Type

Type	Description	Applications
WBNC	Carbide Supported PCBN	Machining Hardened Steels, Super Alloys, Cast and Nodular Irons
WBNS	Solid PCBN	Machining Hardened Steels, Super Alloys, Cast and Nodular Irons
WPCD	Polycrystalline Diamond	Machining in non-ferrous non–alloy applications

WBNC/WBNS/WPCD Description

WWSA's PCBN is offered in two styles: (1) **WBNC** which is carbide supported and (2) **WBNS** which is a solid PCBN. Both PCBN styles offer grades to cover a wide variety of hardened steels, super alloy, sintered powder metals and grey and hard iron machining applications. The **WBNC** product line is comprised of a polycrystalline CBN layer supported by a cemented tungsten carbide substrate bonded together as a single blank by HPHT process. **WBNS is our solid PCBN that is offered in several grades and shaped geometries that are second to none**.

WPCD is a highly engineered polycrystalline diamond (PCD) product that has been continually developed to offer excellent diamond to diamond bonding. This maximizes product performance across a wide variety of grades and allows targeting specific applications. WPCD is produced with finely graded synthetic diamond crystals bonded to a tungsten carbide support layer. Where needed, WPCD offers a tight diamond particle size distribution (PSD) as well as our "S" style, which offers is a multi-modal product. The "S" style is a unique combination of finely graded particles with medium to coarse particles giving the product a fine finish while offering a longer tool life.

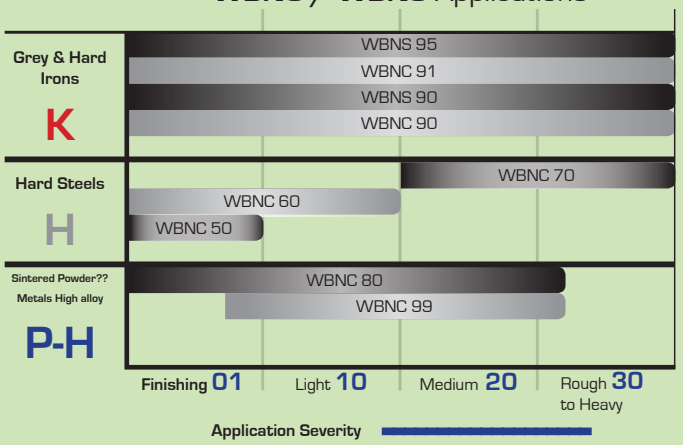


WWSA's Product Breakdown

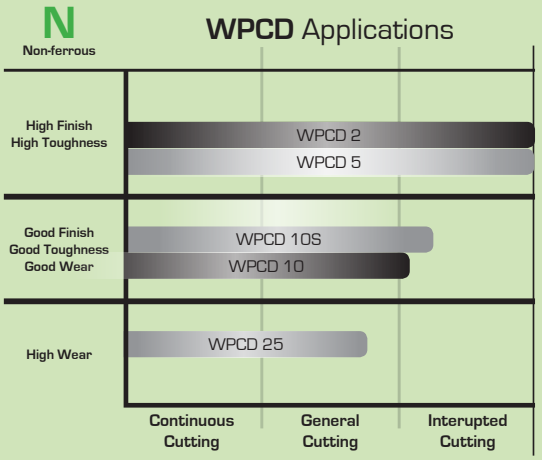
Product	CBN%	Binder	Mciron Size (A.P.S.)	Vickers Hardness (Hv)	TRS (ky./mm²)	Recommended Applications
WBNC						
WBNC50	50	TiN	1.5	2600-2800	90	High Speed, continuous turn of hardened steels
WBNC60	60	TiC	3	2800-3000	90	High speed, intermittent cutting of hardened steels
WBNC70	70	TiN	3	3200-3400	95	Continuous to intermittent cutting of quenched carborized, hardened, tempered, and bearing steels
WBNC80	80	TiN	3	3800-4000	85	Heat resistant alloys and cast iron applications
WBNC90	90	Al	MIXED	3900-4000	100	Grey cast iron and ductile iron
WBNC91	91	TiN	MIXED	4000-4200	100	Grey cast iron and white cast iron
WBNS						
WBNS60	60	TiN		2800-3000	90	Machining of hardened, bearing, and die steels
WBNS85	85	TiN	25	3800-4000	90	Heat resistant alloys and cast iron applications
WBNS90	90	TiN	10	3900-4000	100	High speed turning of gray cast irons and chilled cast irons
WBNS95	95	Co Al	30	3900-4000	100	High speed turnign of carbide, chilled cast iron, and white cast iron
WPCD						
WPCD2			2	9000-10,000	225	Plastics, wood, AL, Cu, High/Low SiAl
WPCD5			5	10,000-12,000	200	Cu, fiberglass, carbon, fiberboard, Low SiAl
WPCD10			10	10,000-12,000	170	High/Low SiAL, graphite, fiberboard, gray iron bi metals, ceramics
WPCD10S			10*	10,000-12,000	190	High/Low SiAL, graphite, fiberboard, gray iron bi metals, ceramics
WPCD25			25	10,000-12,001	140	High/Low SiAL, graphite, fiberboard, gray iron bi metals, ceramics

***Indicates multi-modal diamond structure. Thicker PCD layers available upon request.**

WBNC / WBNS Applications



WPCD Applications



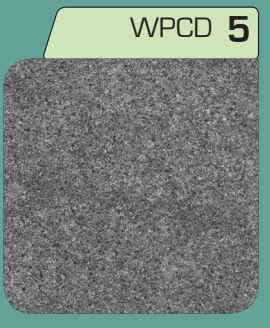
WPCD

Description

WPCD 2

Is sintered with extremely fine diamond particles averaging 2µm, making it the toughest diamond grade offered by WWSA. WPCD2 has a unique combination of high toughness while giving extremely high finish, which makes this grade ideal for applications that require tools for high precision machining.

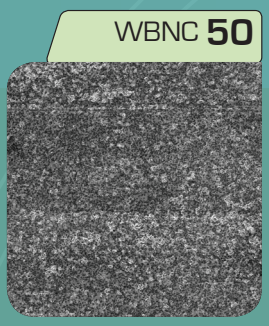


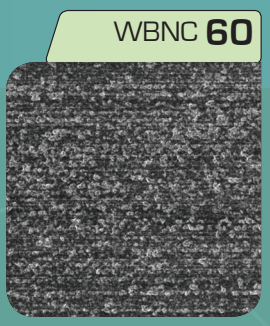


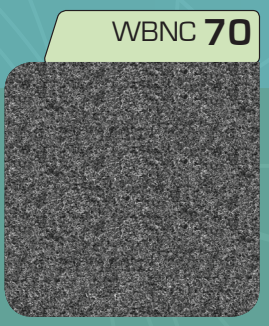
WPCD 5

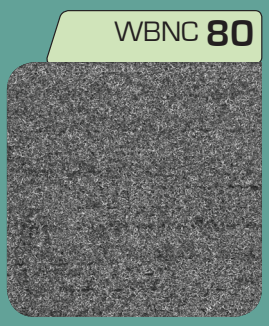
Has a fine diamond grain particle size allowing excellent tool edge sharpness and ease of tool fabrication. WPCD5 offers high finish with a good balance of wear resistance making this a nice intermediate grade between extremely high finish and extremely high wear.

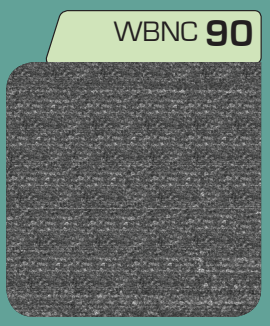
WBNC (Carbide Back PCBN)

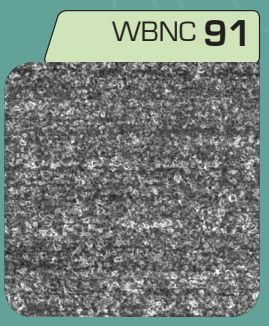












Description

WBNC 50
High speed continuous turning of hardened steels

WBNC 60
Precision machining of hardened steel with slight to medium interruption

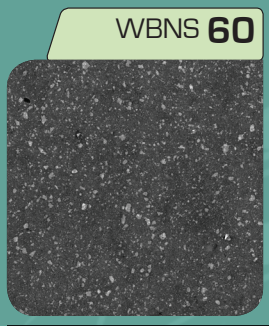
WBNC 70
Precision machining of hardened steel with medium to heavy interruption

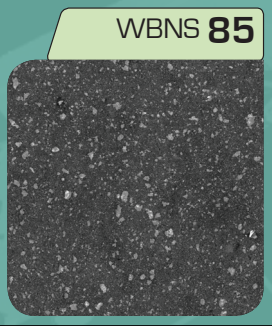
WBNC 80
Roughing and finishing of super alloy materials

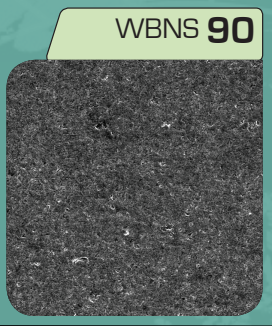
WBNC 90
Roughing and finishing of grey and ductile iron; Good thermal stability

WBNC 91
Roughing and finishing of grey and white cast irons; Good thermal stability

WBNS (Solid PCBN)









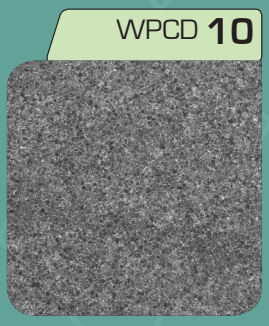
Description

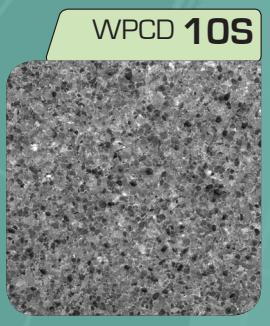
Used in the machining of hardened steels such as bearing and die steels with medium interruptions at medium to high speeds.

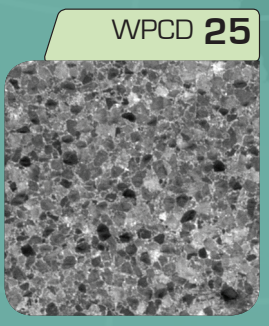
Rough machining and interrupted cutting of gray cast iron, nodular cast iron, difficult materials such as alloys with high content nickel or steels with high content magnesium.

Recommended for use in gray and chilled cast irons under high speed conditions.

Machining of wearable alloy cast steels (Brake drums and disks), nodular vermicular cast irons and powder metals.







WPCD 10
Is a true workhorse of the WWSA PCD product offering. This grade has an average particle size of 10µm, making this ideal for a wide variety of applications where high wear resistance and high toughness is necessary . This multi-purpose grade offers ease of tool fabrication and consistant wire EDM processing.

Description

WPCD 10S
A unique multi- modal 10µm (aps) diamond mixture that offers the same applications as WPCD10 but with higher diamond toughness for interruptions and higher tool edge quality.

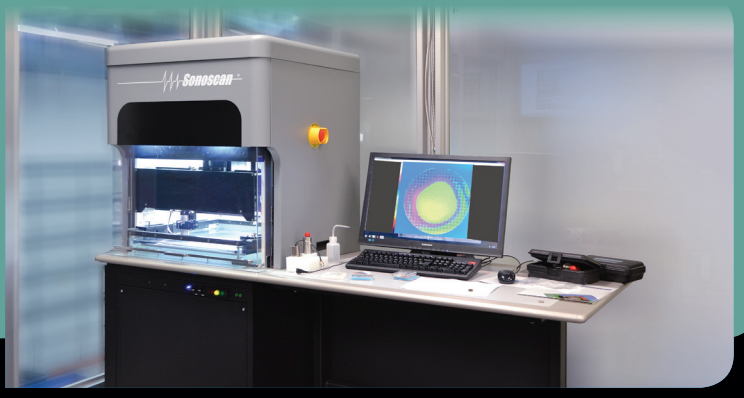
WPCD 25
Ideal material for extreme tool life and abrasive applications where a hard PCD diamond is needed. This grade offers excellent diamond to diamond bonding with over 90% diamond content while maintaining 25µm (aps). Recommended for <14% silicon aluminum alloys, aluminum, gray iron bi metals, sintered ceramics, graphite, carbides and wood composite applications.

Recommended Applications

APPLICATIONS RECOMMENDED CONDITIONS					
Work Piece Material	Work Piece condition	SFM	IPR	D.O.C	WWSA Recommendation
PCD					
Aluminum Alloys 4-8%Si	N/A	3000-10000	0.004-0.025	0.120"	WPCD2/WPCD5/WPC10S
Aluminum Alloys 9-14%Si	N/A	2000-8000	0.004-0.025	0.120"	WPCD2/WPCD5/WPC10S
Aluminum Alloys 15-18% Si	N/A	1000-2300	0.004-0.015	0.120"	WPCD2/WPCD5/WPC10S
Copper Alloy	N/A	2800-3300	0.003-0.011	0.120"	WPCD2/WPCD5/WPC10S
Hard Plastics	N/A	2800-3300	0.003-0.014	0.080"	WPCD2/WPCD5/WPC10S
Wood / Wood Composites	N/A	12000-13000	0.004-0.015		WPCD2/WPC10S/WPCD25
Tungsten Carbide	N/A	30-70	0.003-0.008	0.030"	WPCD10S/WPCD25
Reinforced Plastics	N/A	2800-3300	0.015	0.080"	WPCD2/WPCD10S
PCBN					
Induction Hardened Steel	Continuous	300-700	0.004-0.006	0.020"	WBNC50/WBNS60
Induction Hardened Steel	Interupted (Dry)	300-600	0.004-0.006	0.020"	WBNC60/WBNC70/WBNS60
Carburized Hardened Steel/ Bearing Steel	Continuous	250-600	0.004-0.006	0.020"	WBNC50/WBNC60/WBNS60
Carburized Hardened Steel/ Bearing Steel	Interupted (Dry)	300-601	0.004-0.006	0.020"	WBNC60/WBNC70/WBNS60
Die Steel/High Speed Steel	Continuous	150-500	0.004-0.006	0.020"	WBNC50/WBNC60/WBNS60
Die Steel/High Speed Steel	Interupted (Dry)	150-350	0.004-0.006	0.020"	WBNC60/WBNC70/WBNS60
Gray Cast Iron	Continuous/Interupted	800-2300	0.004-0.006	0.040"	WBNC90/WBNC91/WBNS90/WBNS95
Nodular Cast Iron	Continuous/Interupted	500-1500	0.004-0.006	0.040"	WBNC90/WBNC91/WBNS90/WBNS95
Ductile Iron	Continuous/Interupted	300-900	0.004-0.006	0.040"	WBNC90/WBNC91/WBNS90/WBNS95
Powder Metals	Continuous/Interupted	400-1000	0.004-0.006	0.040"	WBNC80/WBNC90/WBNS85/WBNS90
Chilled Cast Iron	Continuous/Interupted	100-350	0.004-0.009	0.040"	WBNC91/WBNS95

WWSA continues our commitment to innovating new superabrasive products as well as providing industry leading technical support by adding a JEOL SEM with EDS and a Sonoscan D9600 to our materials characterization laboratory.





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