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WENDT

Precision

Diamond/CBN Grinding Wheels

Resin & Metal Bond

Hard Metal Grinding

Range Offered

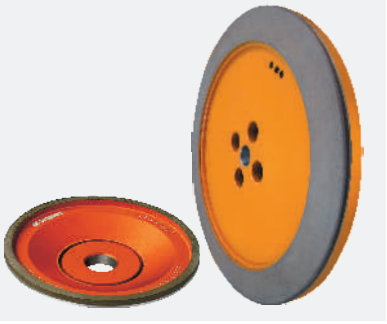
Wendt India manufactures and supplies the widest range of Diamond and CBN Wheels as per International Standards. When it comes to Complex grinding or tough to machine material, WENDT has always been the automatic Choice. Its technological superiority comes from its heritage and access to the latest technology.

Bonds

The bond decisively influences both the grinding behavior and the service life of the grinding tool. Wheel performance and the economics of grinding depend largely on the selection of the right bond.

The choice of Resin or Metal Bond depends on:

Form holding properties / Free cutting	Heat conductivity
Ability to stay sharp.	Conditions of the machine
Dry or Wet grinding.	Shape and dimension of the tool
Shock absorbing, elasticity of Abrasive layer	Surface finish required
Heat resistance of Abrasive	Material to be ground
Oscillation grinding / Creep feed grinding	



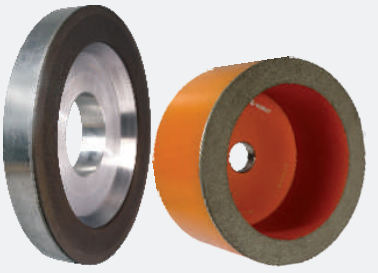
The bond must adhere to the grains as long as possible while simultaneously wearing in such a way that the tips of the abrasive grains can cut freely in the course of the metal removal process. This process is called the "self-sharpening effect". It results from the combined effect of the bond, grain size and concentration on the one hand, and bond wear caused by chip formation on the other hand.

The optimal bond is the one that offers the most cost-effective balance between the stock removal rate on the workpiece and the wear of the abrasive layer. In order to accomplish a wider variety of grinding tasks, a wide variety of bonds must be made available. Our engineers will help you select the right specification for your application.

Resin Bond

Resin Bond is a very versatile type of bond. Its range of application covers more than half the machining tasks for which Diamond and CBN grinding tools can be used.

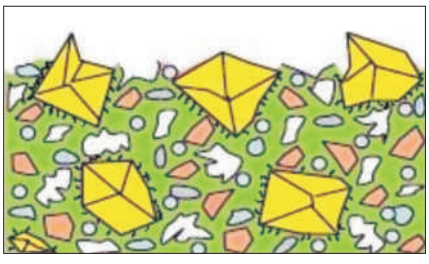
The outstanding features of a Resin Bond are that it enables large cutting volumes and ensures soft and cool grinding.



Resin Bond Properties

Diamond	Standard Bonds	CBN
BXH	Very Soft	RXF
BJ ; BXJ BJ..D ; BXN BJ...W	Soft Grinding	RXJ
BN BJ..D ; BXR BN...W ; BXR...W	Free Cutting, Stable	RN...D RN...W ; RXN RN...S ; RXR
BN BR...D BR...W; BXS BR...S; BXR...S	Wear Resistant	RR...D RR...W RR...S ; RXS
BY BY...W; BXY BXY...S	Extremely Wear Resistant	RX...S

Pictorial view of Resin Bond Wheel abrasive section



Bond Fillers

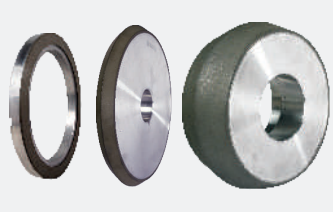
Coated Diamond / CBN Grit

Resin Bond Applications and Industries

Wendt offers Resin Bond Diamond/CBN Wheels conforming to FEPA standard from 5mm to 675mm diameter for Industries / Applications.

- Rotary Tools
- Cutting Tool Industries
- Printing and Paper Roll grinding
- Ceramic and Tile grinding
- Wood Working Tools
- Creep Feed grinding
- Notch and Slot grinding
- Tungsten Carbide Roll grinding
- Tool Resharpening/Restoring
- Optical Profile grinding
- Double Disc grinding
- Centreless grinding

Also on offer are customised Resin Bond Wheels for grinding precision components in Machine Tools, Aerospace, Defense, Watch and Die & Mould Industries.

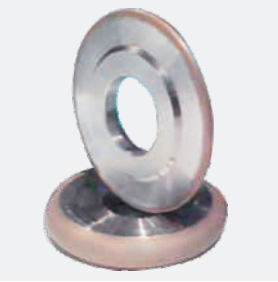


Metal Bond

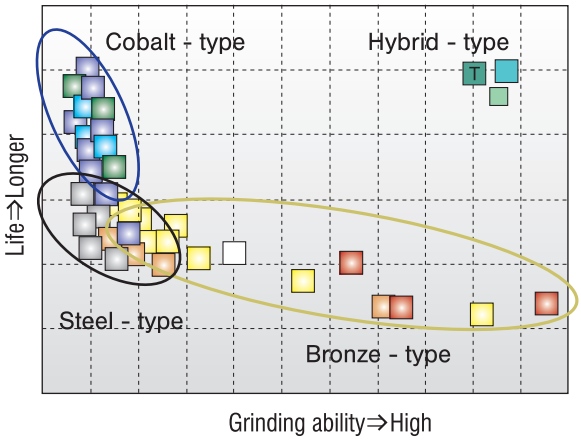
Sintered metal bonds can be divided into four main groups:

Bronze, Steel, Cobalt and Hybrid bonds.

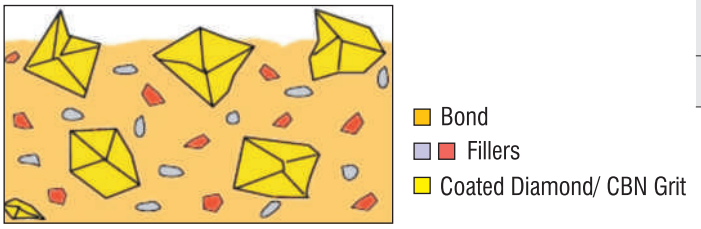
The higher mechanical stability and thermal load capacity of Sintered Metal Bonds gives them a greater resistance to wear than offered by Resin Bonds. This is utilized especially in connection with grinding tools for profile grinding and machining of materials which exhibit a strong abrading effect, such as glass, ceramics, ferrite etc.



Metal Bond System



Pictorial view of Metal Bond Wheel abrasive section



Sintered Metal Bond Properties

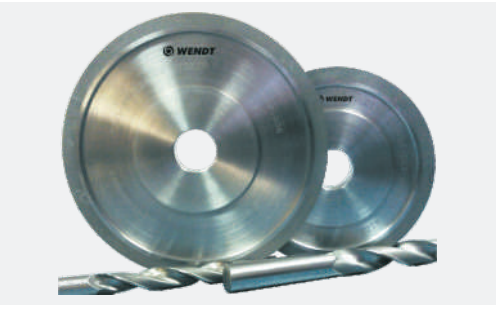
Diamond	Standard Bonds	CBN
MHJ...J	Extremely Soft	SF...N
MJ ; MHJ...N	Soft Grinding	SJ...N
MHL...J MHL...N MHL...r	Soft Stable	SML...N
MN...J ; MHN...J MN...N ; MHN...N MN...R ; MHN...R	Free Cutting, Stable	SN...N ; SMN...N SMN...R
MR...J ; MHR...J MR...N ; MHR...N MR...R ; MHR...R	Wear Resistant	SR...N ; SMR...R
MX...J MX...N ; MHS...R MX...R	Extremely Wear Resistant	SX...N ; SMX...N SMX...R
MC...N ; MHC...N	Profile Crushable	SC...N ; SMC...N

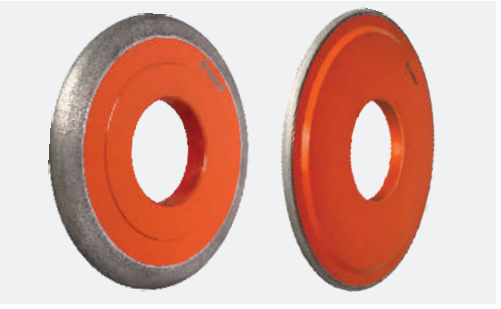
Metal Bond Applications and Industries

Wendt offers Metal Bond Diamond/CBN Wheels conforming to FEPA Standard ranging from 6mm to 700mm in diameter for Industries / Applications.

- Ceramic and Refractory grinding
- Tile grinding
- TC Roll grinding
- Rotary Tools grinding
- Automotive and Construction Glass grinding
- Flute grinding
- Centreless grinding
- Wheel Dressing
- Concrete/RCC Core Drilling
- Precision Component Form grinding

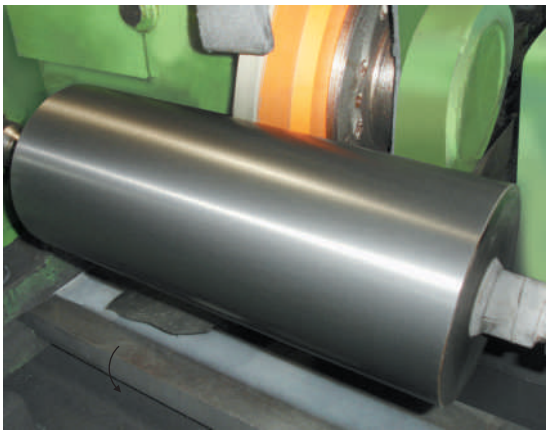
In addition, we offer the most exclusive range of Metal Bond Diamond Wheels and Tools for customer specific critical applications.

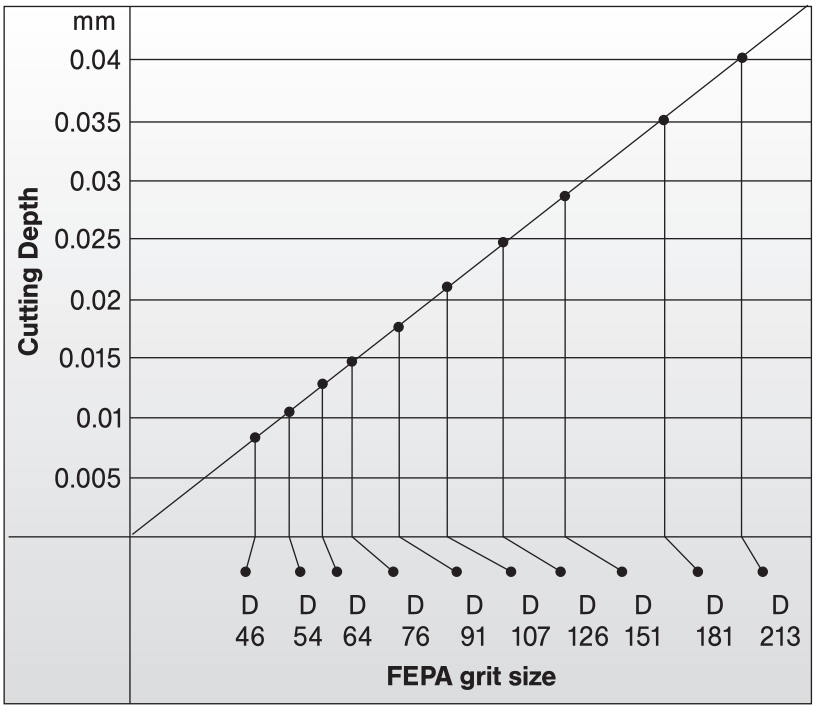




Permissible Cutting Depth

For Oscillation Grinding

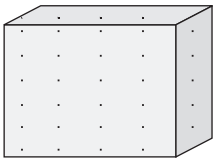


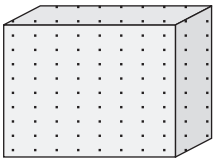


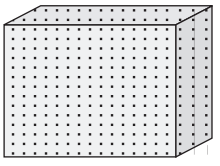
Concentration

1 carat = 0.2 grams

Concentration is defined as percentage weight of grinding grit per cubic unit of grinding layer. Internationally accepted standards for concentration are not available. However Wendt standards of concentration are provided below.







Low		Medium		High		
25	38	50	75	100	125	150
		Carat/cm^3				
1,1	1,65	2,2	3,3	4,4	5,5	6,6
		Volume-related concentration data:				
V6	V9	V12	V18	V24	V30	V36
V60	V90	V120	V180	V240	V300	V360

Surface Finish Recommendation

FEPA - grit size		Mean Roughness		Surface quality	Grinding process
Diamond	CBN	Diamond	CBN	N	
-	B301	-	2.10	N8	
-	B251	-	1.77	N8-N7	
-	B213	-	1.41	N7	
-	B181	-	1.12	N7-N6	Very rough grinding
-	B151	-	0.75	N6	
	B126		0.66	N6	
D181	B107	0.53	0.53	N6-N5	
D151	B91	0.50	0.50	N6-N5	Rough grinding
D126	B76	0.45	0.45	N6-N5	
D107	B62	0.4	0.4	N5	
D91	B54	0.33	0.33	N5-N4	Semi-finish grinding
D76	B46	0.25	0.25	N5-N4	
D64	-	0.18	-	N4	
D54	-	0.16	-	N4-N3	Fine grinding
D46	-	0.15	-	N4-N3	
MD25	-	0.12	-	N3	
MD20	-	0.05	-	N3-N2	Ultra-fine grinding
MD10	-	0.025	-	N2-N1	

Surface Comparison

	N1	N2	N3	N4	N5	N6	N7 N8
Ra(μm)	0.025	0.05	0.10	0.2	0.4	0.8	1.603.20
Rt(μm)	0.500	0.80	1.25	2.5	5.0	8.0	16.032.0
Rz(μm)	0.400	0.63	1.00	2.0	4.0	6.3	10.016.0

Recommendations & guidelines for selection of concentration in relation to grinding forces

Grinding factors	Area of contact between wheel and workpiece		Bond		Profile and edge strength	Cutting efficiency Soft Grinding
	Large	Small	Hard	Soft		
	⬇	⬇	⬇	⬇	⬇	⬇
Concentration	Low	High	High	Low	High	Low

Surface Finish

Three factors affect the choice of Abrasive grit :

Quantity of material to be removed,

Surface-finish and wheel life.

Material removal and wheel-life

Depend on the adjustment when oscillation grinding, and (on pass and in-feed depth) when plunge-grinding. A wheel used properly shows a grit penetration depth equal to 1/5 - 1/8 of the grit dimension. If the level of roughness needed is known, it is possible to choose the right grit using the following charts:

Grit Comparison Chart

Mesh size	Average Dia.(μm)	JIS	U.S.A	B.S.S.	FEPA
50	297	50/60	50/60	50/60	D301
60	250	60/85	60/85	60/85	D252
80	177	85/100	85/100	85/100	D181
100	149	100/120	100/120	100/120	D151
120	125	120/140	120/140	120/150	D126
140	105	140/170	140/170	150/170	D107
170	88	170/200	170/200	170/200	D91
200	74	200/230	200/230	200/240	D76
230	62	230/270	230/270		D64
270	53	270/325	270/325	240/300	D54
325	44	325/400	325/400		D46
400	37		36-54μ		M40
600	28		22-36μ	27-40μ	M25
1000	15		12-22μ	12-18μ	M16
1500	10		8-12μ	8-12μ	M10
2000	8		5-12μ		
2500	6		4-8μ	4-8μ	M 6.3
3000	5		2-6μ	2-6μ	

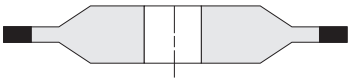
Average Diameter slightly varis due to each regulation. Also some grit sizes are not available.

FEPA - Shapes

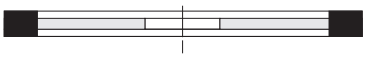
These drawings show the most important grinding wheel geometries:

1A1/′10A

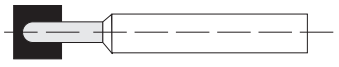
14AI/′10B



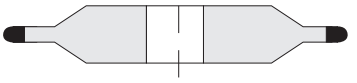
1A1R/′10T



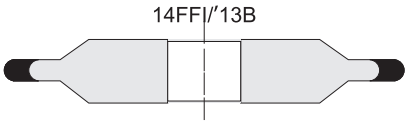
1AW1/′12A



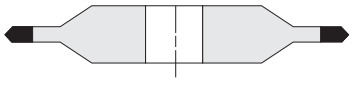
14FI/′13A



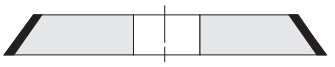
14FFI/′13B



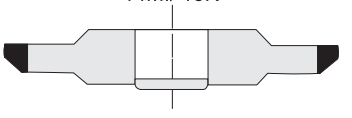
14EI/′14C



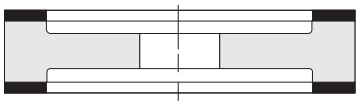
1V1/′15A



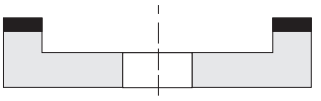
14MI/′15K



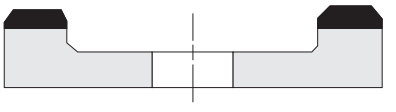
9A3/′28A



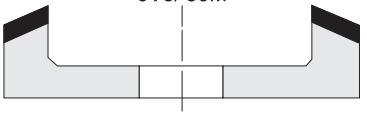
6A2/′30A



6L2/′30L

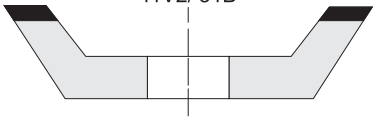


6V5/′30M

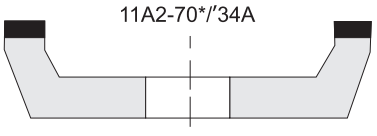


12A2-20*/′31A

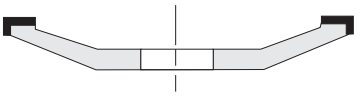
11V2/′31B



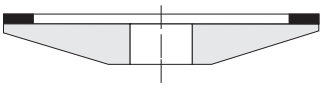
11A2-70*/′34A



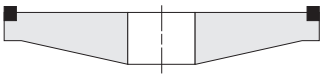
12C9-20*/′36B



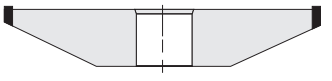
4A2/′37A



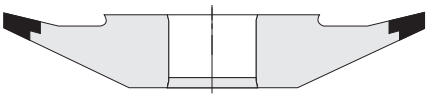
4A9/′37E



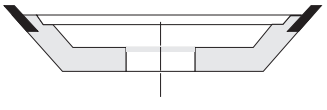
4ET9/′39B



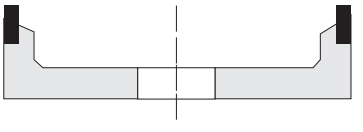
48T9/′39C



12V9/′41A



6A9/′43A



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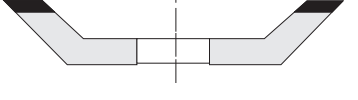
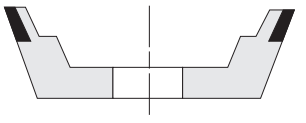


11V9/′40A

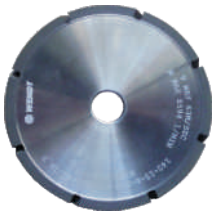


Bore Size Standards

Wheel Diameter (mm)	Bore Sizes Available with Tolerance
300 ø	127 H7
175 ø to 250 ø	20, 31.75, 32, 50.8, 76, 76.2, 127 H7
75 ø to 125 ø	10, 20, 31.75, 32, 50.8 H7
50 ø	10, 20, 31.75 H7

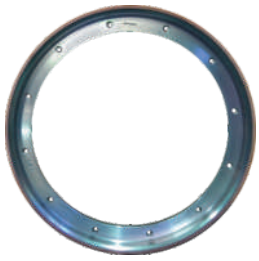
Applications and Components

Wheels

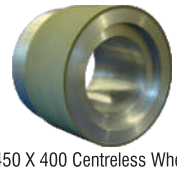

Wheels with Internal Cooling

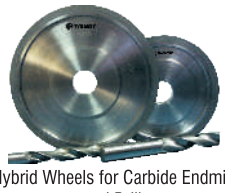

Cutoff Wheels


Wheels for Wood working Machines

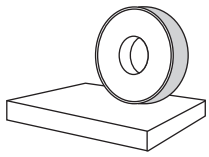

675 ø Cup Wheel for Ceramic Grinding

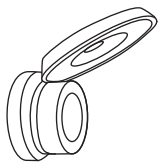

Double Cup Gundrill Reshapening Wheels

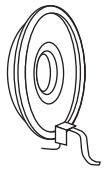

450 X 400 Centreless Wheel

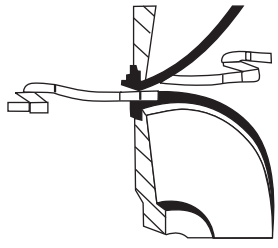

Hybrid Wheels for Carbide Endmills and Drills

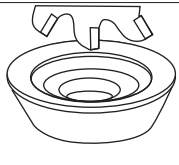
Wheel Shapes

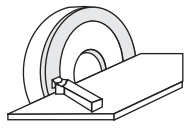

TYPE 1A1


TYPE 1V1


TYPE 12A2

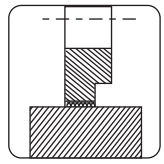

TYPE 3A9

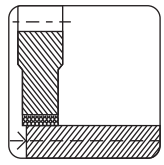

TYPE 11A2

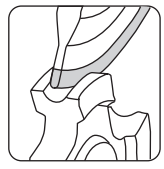

TYPE 6A2

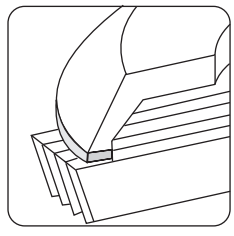

TYPE 15V9

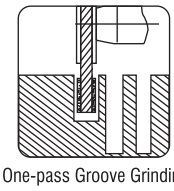
Geometric Representation


Flat Surface Grinding

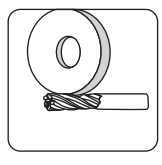

Cylindrical Surface Grinding


Profile Grinding


Face Grinding


One-pass Groove Grinding


Centerless Grinding

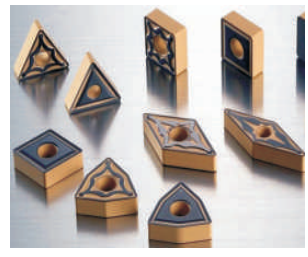

Flute Grinding

Components


Ferrite Cores


Ceramic Rods, Cylinders


Profiled Jobs – ground on OPG


Carbide Inserts


Piston Rings


Carbide Rods


Carbide / HSS Drills Tools

Since continuous improvements are made, specifications are subject to change without notice.

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