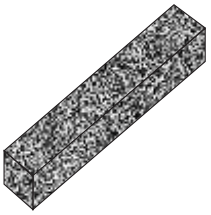
ABRASIVE STONES
(DRESSING STICKS)



Used on Resin and Metal Bonded Wheels to condition and true diamond and CBN. Remove metallic buildup, opening the bond for more aggressive cutting action.

How to Use: Soak the stone in coolant or water for a brief time (approx. two minutes). If possible, reduce grinding wheels R.P.M.'s. This will help condition the wheel quicker and better.

Aluminum Oxide		Silicon Carbide	
1/2 x 1/2 x 4	A150	1/2 x 1/2 x 4	C150
	A220		C220
	A320		C320
	A600		C600
1/2 x 1/2 x 6	A150	1/2 x 1/2 x 6	C150
	A220		C220
	A320		C320
	A600		C600

** 1/2 x 1/2 x 4 A220 are standard*
Resin Bond Products: Aluminum Oxide
Metal Bond Products: Aluminum Oxide or Silicon Carbide

Superabrasive Wheel Grit Size	Dressing Stick Grit Size Recommended
60 - 80	150
80 - 100	
100 - 120	
120 - 140	
140 - 170	220
170 - 200	
200 - 230	
230 - 270	
270 - 325	320
325 - 400	
400 - 500	
500 - 600	600
600 - 800	
800 -1000	

DW GRINDING PINS

RESIN BOND

D	T	S	OAL	DIA. TOOL #	CBN TOOL #
1/8	1/8	1/8	2 1/8	RP2D-125/2	RP2B-125/2
1/8	1/4	1/8	2 1/4	RP2D-125/4	RP2B-125/4
3/16	3/16	1/8	2 3/16	RP2D-187/3	RP2B-187/3
3/16	1/4	1/8	2 1/4	RP2D-187/4	RP2B-187/4
1/4	1/8	1/4	2 1/8	RP4D-250/2	RP4B-250/2
1/4	1/4	1/4	2 1/4	RP4D-250/4	RP4B-250/4
1/4	3/8	1/4	2 3/8	RP4D-250/6	RP4B-250/6
1/4	1/2	1/4	2 1/2	RP4D-250/8	RP4B-250/8
5/16	1/4	1/4	2 1/4	RP4D-312/4	RP4B-312/4
5/16	5/16	1/4	2 5/16	RP4D-312/5	RP4B-312/5
3/8	1/4	1/4	2 1/4	RP4D-375/4	RP4B-375/4
3/8	3/8	1/4	2 3/8	RP4D-375/6	RP4B-375/6
3/8	1/2	1/4	2 1/2	RP4D-375/8	RP4B-375/8
1/2	1/8	1/4	2 1/8	RP4D-500/2	RP4B-500/2
1/2	1/4	1/4	2 1/4	RP4D-500/4	RP4B-500/4
1/2	3/8	1/4	2 3/8	RP4D-500/6	RP4B-500/6
1/2	1/2	1/4	2 1/2	RP4D-500/8	RP4B-500/8
5/8	1/4	1/4	2 1/4	RP4D-625/4	RP4B-625/4
5/8	3/8	1/4	2 3/8	RP4D-625/6	RP4B-625/6
5/8	1/2	1/4	2 1/2	RP4D-625/8	RP4B-625/8
3/4	1/4	1/4	2 1/4	RP4D-750/4	RP4B-750/4
3/4	3/8	1/4	2 3/8	RP4D-750/6	RP4B-750/6
3/4	1/2	1/4	2 1/2	RP4D-750/8	RP4B-750/8
3/4	3/4	1/4	2 3/4	RP4D-750/12	RP4B-750/12
1	1/4	1/4	2 1/4	RP4D-1000/4	RP4B-1000/4
1	3/8	1/4	2 3/8	RP4D-1000/6	RP4B-1000/6
1	1/2	1/4	2 1/2	RP4D-1000/8	RP4B-1000/8

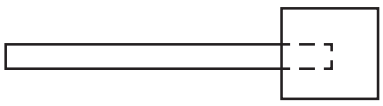
METAL BOND

D	T	S	OAL	DIA. TOOL #	CBN #
1/8	3/16	3/32	2	MP1D-125/3	MP1B-125/3
1/8	1/4	3/32	2	MP1D-125/4	MP1B-125/4
1/8	1/4	1/8	2	MP2D-125/4	MP2B-125/4
5/32	3/16	3/32	2	MP1D-156/3	MP1B-156/3
5/32	1/4	1/8	2	MP2D-156/4	MP2B-156/4
3/16	3/16	1/8	2	MP2D-187/3	MP2B-187/3
3/16	1/4	1/8	2	MP2D-187/4	MP2B-187/4
3/16	1/4	3/16	2 1/2	MP3D-187/4	MP3B-187/4
1/4	1/8	1/8	2	MP2D-250/2	MP2B-250/2
1/4	1/4	1/8	2	MP2D-250/4	MP2B-250/4
1/4	1/4	3/16	2 1/2	MP3D-250/4	MP3B-250/4
1/4	1/4	1/4	2 1/2	MP4D-250/4	MP4B-250/4
9/32	1/4	1/8	2	MP4D-281/4	MP4B-281/4
9/32	1/4	3/16	2 1/2	MP2D-281/4	MP2B-281/4
5/16	1/4	3/16	2 1/2	MP3D-312/4	MP3B-312/4
5/16	5/16	3/16	2 1/2	MP3D-312/5	MP3B-312/5
3/8	1/8	3/16	2 1/2	MP3D-375/2	MP3B-375/2
3/8	1/4	3/16	2 1/2	MP3D-375/4	MP3B-375/4
3/8	3/8	3/16	2 1/2	MP3D-375/6	MP3B-375/6
3/8	3/8	1/4	2 1/2	MP4D-375/6	MP4B-375/6
1/2	1/8	3/16	2 1/2	MP3D-500/2	MP3B-500/2
1/2	1/4	3/16	2 1/2	MP3D-500/4	MP3B-500/4
1/2	3/8	1/4	2 1/2	MP4D-500/6	MP4B-500/6
1/2	1/2	1/4	2 1/2	MP4D-500/8	MP4B-500/8
5/8	1/4	1/4	2 1/2	MP4D-625/4	MP4B-625/4
5/8	3/8	1/4	2 1/2	MP4D-625/6	MP4B-625/6
3/4	1/4	1/4	2 1/2	MP4D-750/4	MP4B-750/4
3/4	1/4	1/4	2 1/2	MP4D-750/6	MP4B-750/6
1	1/4	1/4	2 1/2	MP4D-1000/4	MP4B-1000/4
1	3/8	1/4	2 1/2	MP4D-1000/6	MP4B-1000/6
1	3/8	1/4	3	MP6D-1000/6	MP6B-1000/6

DW SHANK

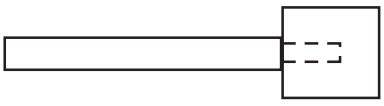
SHANKS
*STEEL,
*CARBIDE
*HEAVY METAL

DWB



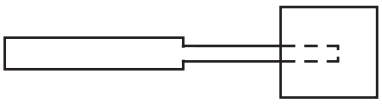
DWB - straight mandrel inserted in wheel

DWF



DWF - shoulder mandrel inserted in wheel

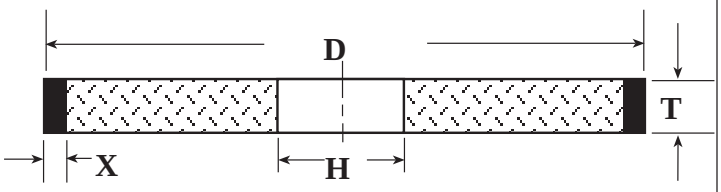
DWK



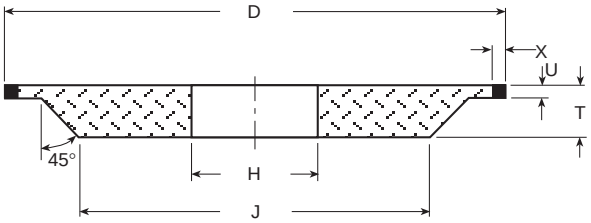
DWK - stepped mandrel inserted in wheel

RESIN/METAL BOND WHEEL STYLE CHART

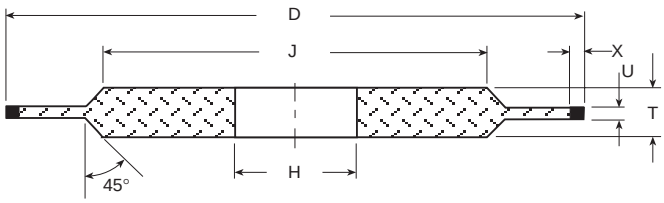
1A1



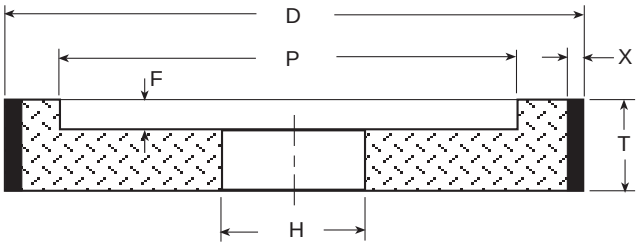
3A1



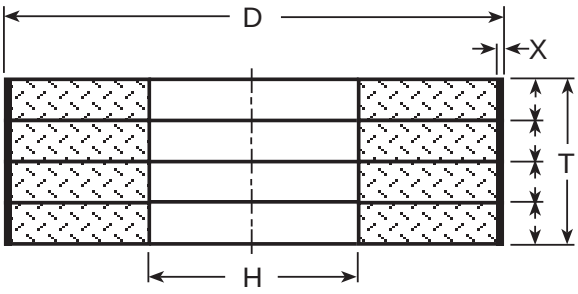
14A1



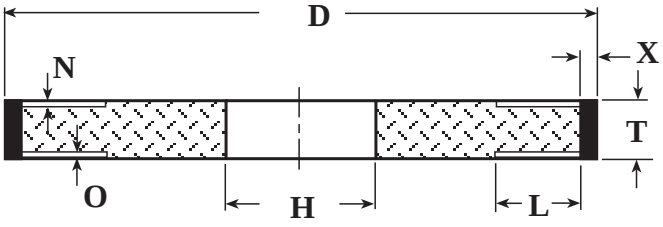
6A1



1A1 - Centerless Large Wheel



1A1R - Tool



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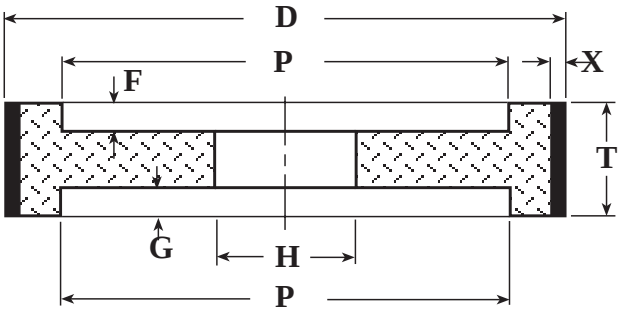

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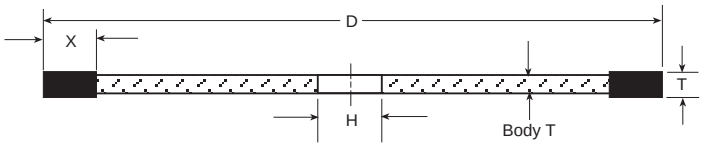

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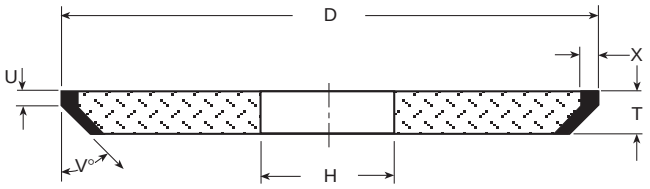

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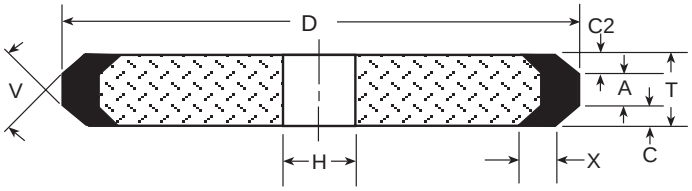
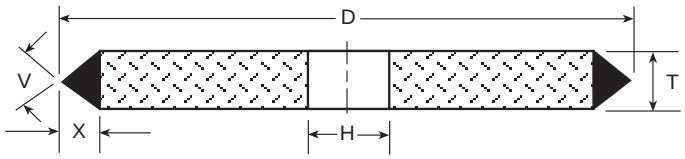


RESIN/METAL BOND WHEEL STYLE CHART

1E1



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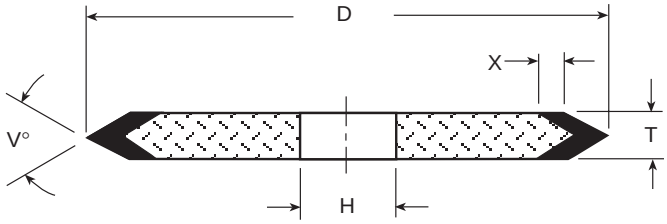
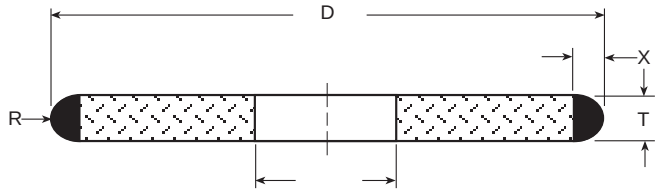


1F1



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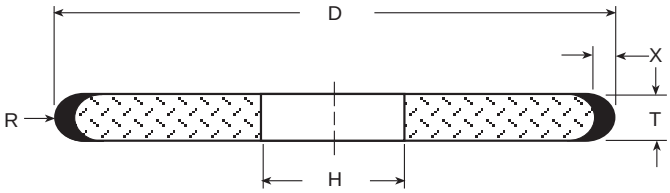
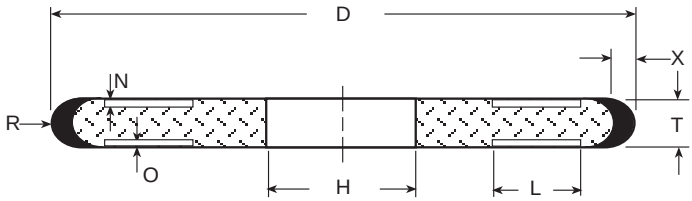
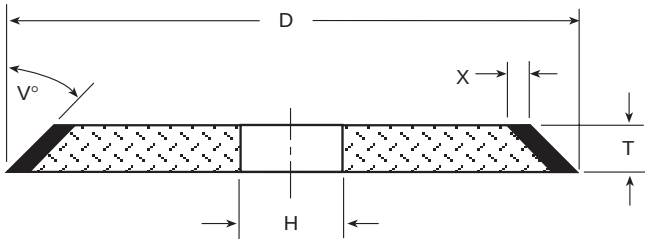


1FF1 R-Tool



1V1



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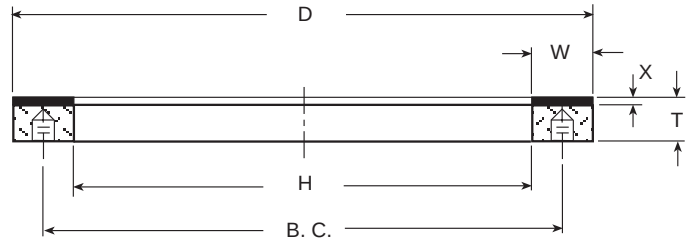

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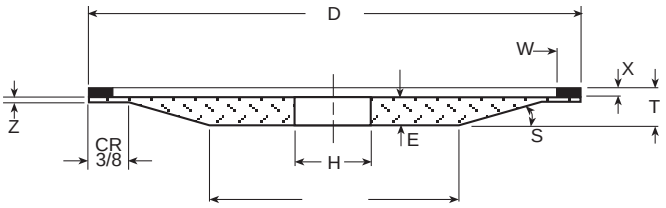

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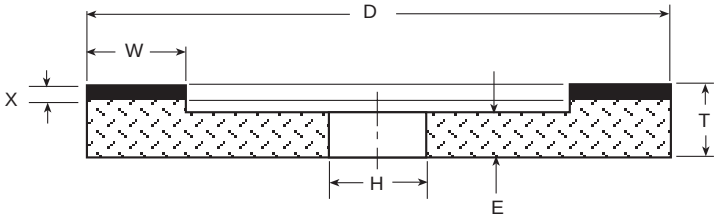

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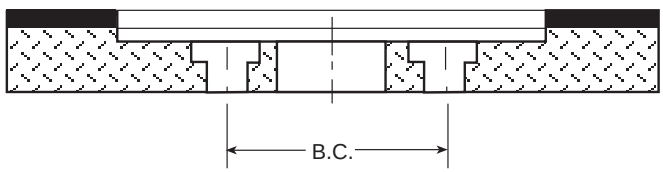
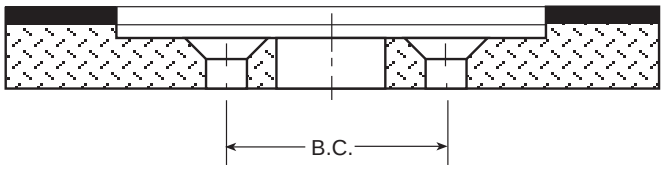
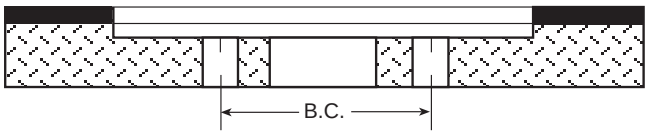


RESIN/METAL BOND WHEEL STYLE CHART

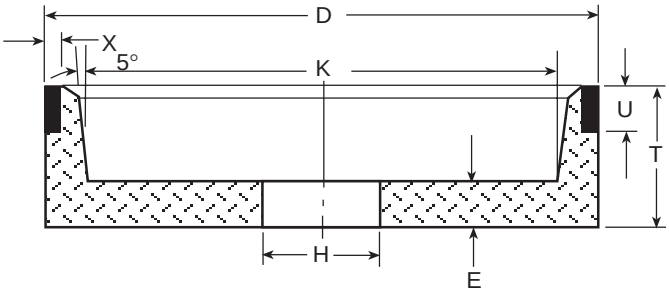
6A2C



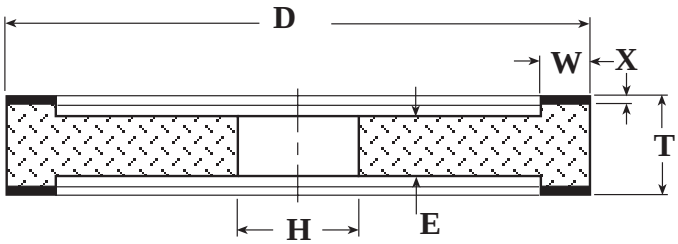
6A2H



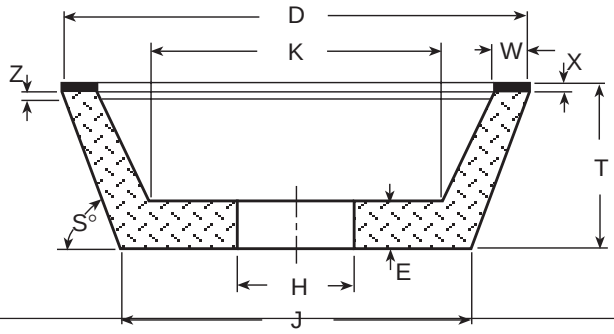
6A9



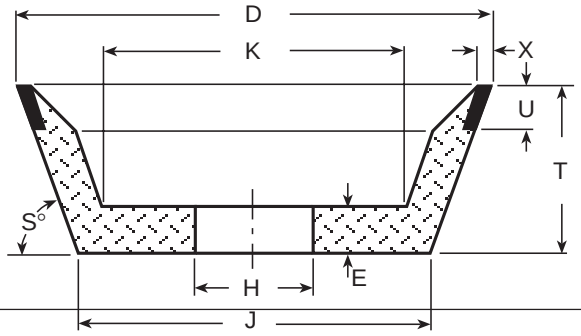
9A3



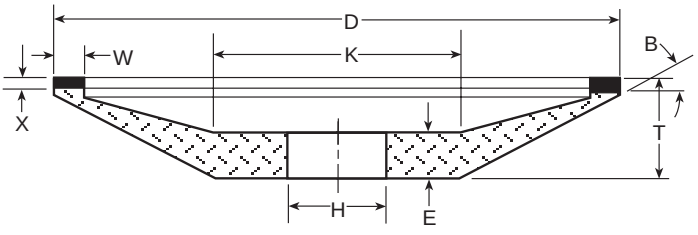
11A2



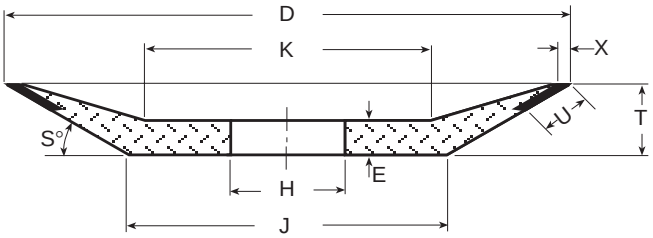
11V9



12A2



12V9



Custom Manufacturing

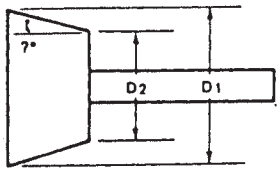
Our shop is set up and tooled so that we are able to engineer and produce quality custom products from a quantity of one to many in a timely manner and within a very competitive price.

Our Customer Service Department

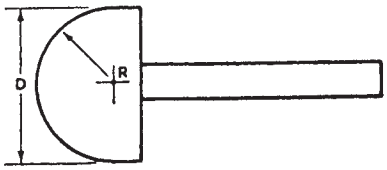
is ready to assist you with technical help, quotations, order entry, availability, and production status with quick response assuring you get the right product at the right price.

WHEEL STYLE CHART

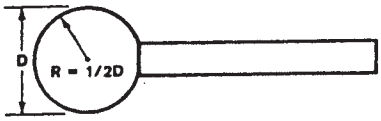
Back-Tapered Wheel



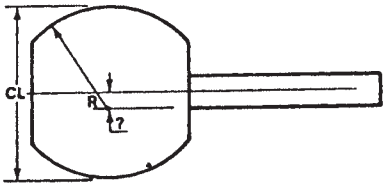
Ball-Nosed Wheel



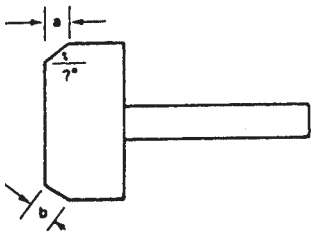
Ball Wheel



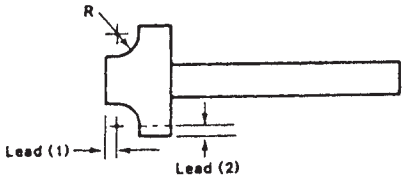
Barrel Shaped Wheel



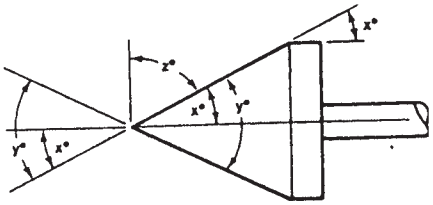
Chamfered Wheel



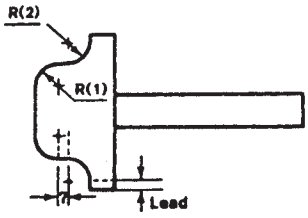
Concave Radius



Cone Wheel

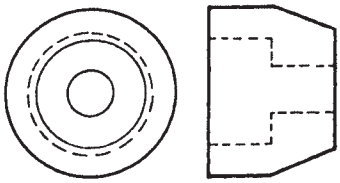


Convex to Concave Radius

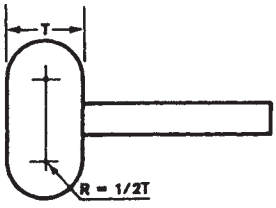


Convex Radius

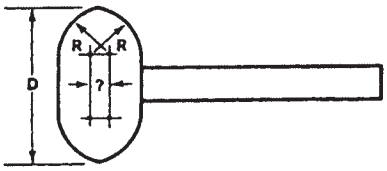
Cup Wheel



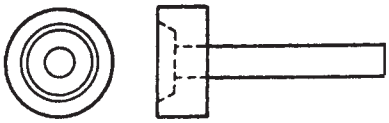
Full Radius



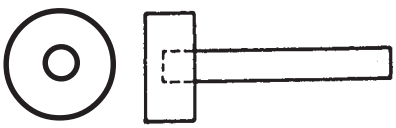
Offset Radius



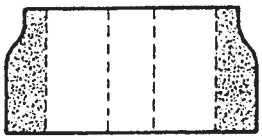
Recessed Face



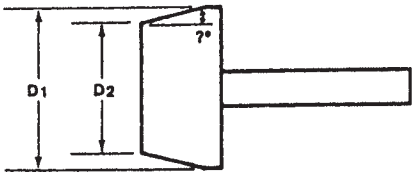
Recessed Shank



Special Wheels

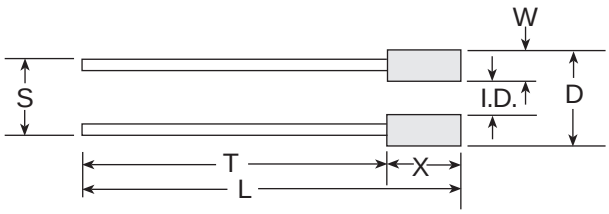


Tapered Wheels

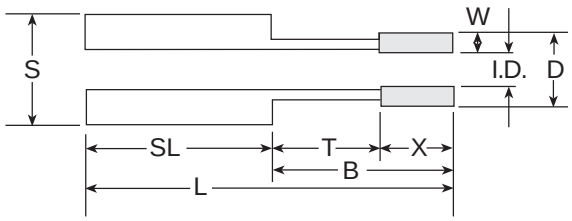


METAL BOND DIAMOND CORE DRILL

For making holes outside diameter critical.



SHANK TYPE: UT



SHANK TYPE: OT

Diameter		Approx. Wall Thickness	Collet Size	Outside Diameter Critical	Inside Diameter Critical
Fractional	Decimal				
3/64"	.046	.012	1	SCD.046	ICD.046
	.050	.015		SCD.050	ICD.050
	.055	.015		SCD.055	ICD.055
1/16	.062	.018		SCD.062	ICD.062
	.070	.020		SCD.070	ICD.070
5/64	.078	.020		SCD.078	ICD.078
	.085	.020		SCD.085	ICD.085
3/32	.093	.020		SCD.093	ICD.093
7/64	.109	.025		SCD.109	ICD.109
1/8	.125	.032		SCD.125	ICD.125
	.130	.032		SCD.130	ICD.130
9/64	.140	.032		SCD.140	ICD.140
5/32	.156	.032		SCD.156	ICD.156
3/16	.188	.032		SCD.188	ICD.188
7/32	.219	.032		SCD.219	ICD.219
1/4	.250	.032		SCD.250	ICD.250
9/32	.281	.032		SCD.281	ICD.281
5/16	.312	.032		SCD.312	ICD.312
11/32	.344	.032		SCD.344	ICD.344
3/8	.375	.032		SCD.375	ICD.375
13/32	.406	.032		SCD.406	ICD.406
7/16	.438	.032		SCD.469	ICD.469
1/2	.500	.032		SCD.500	ICD.500
9/16	.562	.037		SCD.562	ICD.562
5/8	.625	.037		SCD.625	ICD.625
11/16	.688	.037		SCD.688	ICD.688
3/4	.750	.037		SCD.750	ICD.750
13/16	.813	.037		SCD.813	ICD.813
7/8	.875	.037	2	SCD.875	ICD.875
15/16	.938	.037		SCD.938	ICD.938
1	1.000	.037		SCD1.000	ICD1.000
1-1/16	1.063	.037		SCD1.063	ICD1.063
1-1/8	1.125	.037		SCD1.125	ICD1.125
1-3/16	1.188	.037		SCD1.188	ICD1.188
1-1/4	1.250	.037		SCD1.250	ICD1.250
1-5/16	1.312	.037		SCD1.312	ICD1.312
1-3/8	1.375	.037		SCD1.375	ICD1.375
1-7/16	1.438	.037		SCD1.438	ICD1.438
1-1/2	1.500	.042		SCD1.500	ICD1.500

Diameter		Approx. Wall Thickness	Collet Size	Outside Diameter Critical	Inside Diameter Critical
Fractional	Decimal				
1-9/16	1.562	.042	2	SCD1.562	ICD1.562
1-5/8	1.625	.042		SCD1.625	ICD1.625
1-11/16	1.688	.042	3	SCD1.688	ICD1.688
1-3/4	1.750	.042		SCD1.750	ICD1.750
1-13/16	1.813	.042		SCD1.813	ICD1.813
1-7/8	1.875	.042		SCD1.875	ICD1.875
1-15/16	1.938	.042		SCD1.938	ICD1.938
2	2.000	.042		SCD2.000	ICD2.000
2-1/8	2.125	.048		SCD2.125	ICD2.125
2-1/4	2.250	.048		SCD2.250	ICD2.250
2-3/8	2.375	.048		SCD2.375	ICD2.375
2-1/2	2.500	.048		SCD2.500	ICD2.500
2-5/8	2.625	.048		SCD2.625	ICD2.625
2-3/4	2.750	.048		SCD2.750	ICD2.750
2-7/8	2.875	.048	4	SCD2.875	ICD2.875
3	3.000	.052		SCD3.000	ICD3.000
3-1/8	3.125	.052		SCD3.125	ICD3.125
3-1/4	3.250	.052		SCD3.250	ICD3.250
3-3/8	3.375	.052		SCD3.375	ICD3.375
3-1/2	3.500	.052		SCD3.500	ICD3.500
3-5/8	3.625	.052		SCD3.625	ICD3.625
3-3/4	3.750	.052		SCD3.750	ICD3.750
3-7/8	3.875	.052		SCD3.875	ICD3.875
4	4.000	.052		SCD4.000	ICD4.000

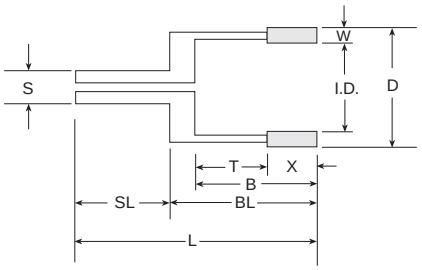
DIAMOND CORE DRILL INFORMATION

Outside Diameter (SCD). Most sizes can be manufactured.

Inside Diameter (ICD). Most sizes can be manufacutured.

STANDARD TOLERANCES:

SCD	
.046 to 1"	+ .004 .000
1 1/6 to 3"	+ .008 -.000
4" up	+ .012 -.000
ICD	
.046 to 1"	+.005 -.000
1 1/6 to 3"	+.010 -.000
4" up	+.015 - .000



Closer tolerances can be held. Please specify.

EXTRA LENGTH
Standard Length

3/64 to 7/64	1 1/2 O.A.L.
1/8" up	2" O.A.L.

DIAMOND WALL THICKNESS:
Standard wall shown in chart
Thin and thick wall thickness available.

DIAMOND DEPTH:

Standard	3/64 to .055	1/16
	1/16 to .085	3/32
	3/32 to 7/64	3/16
	1/8 up	1/4

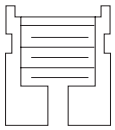
Grit Size - All sizes are available

Concentration - Any

Bonds - CDT has many bonds for different applications.

COLLETS (ADAPTORS)

Tool No.	Collet Size	Thread
CAC #1A	1	5/8 - 18
CAC #1B	1	3/4 - 16
CAC #2	2	1 1/2 - 12
CAC #3	3	2 1/2 - 12
CAC #4	4	2 1/2 - 12
CAC #5	5	2 1/2 - 12
CAC #6	1	1 - 14
CAC #6	2	1 - 14
CAC #UB (ULTRASONIC)	1	



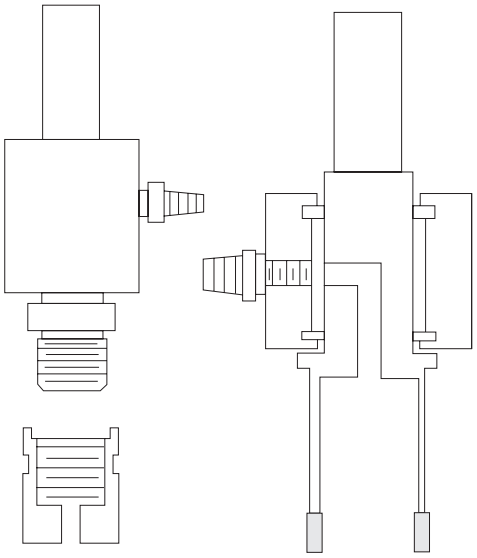
COOLANT FEED DRILL HEAD ASSEMBLY

BEARING TYPE

Tool #	Collet Size	Threads
DHA #1A	1	5/8 - 18
DHA #1B	1	3/4 - 16
DHA #2	2	1 1/2 - 12
DHA #3	3	2 1/2 - 12
DHA #4	4	2 1/2 - 12
DHA #6	1	1 - 14

SEAL TYPE

Tool #	Collet Size	Threads
SHA #1A	1	5/8 - 18
SHA #1B	1	3/4 - 16
SHA #2	2	1 1/2 - 12
SHA #3	3	2 1/2 - 12
SHA #4	4	2 1/2 - 12
SHA #6	1	1 - 14

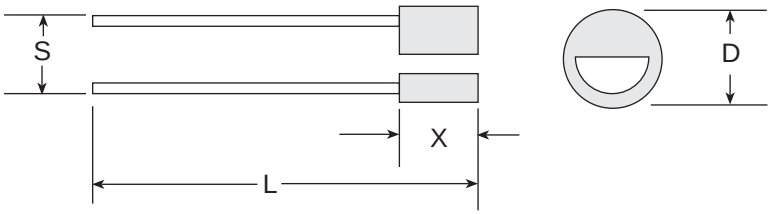


Drill and shank as one unit

Tool #	Drill Size
SHS-1	Up to 1"
SHS-2	1 1/6 to 2"
SHS-3	2 1/16 to 3"
SHS-4	3 1/16 to 4"

DISINTEGRATING CORE DRILLS

For drilling without core formation.

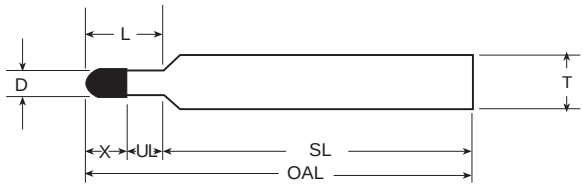


Fractional	Decimal	Part No.
3/32"	.093	BHD093
1/8	.125	BHD125
5/32	.156	BHD156
3/16	.187	BHD187
7/32	.218	BHD218
1/4	.250	BHD250

SOLID DIAMOND DRILL

.035 through .187

Ball End Drill
1/8" Shank
2" OAL



HOW TO ORDER

STD .062

Tool # Size to Drill

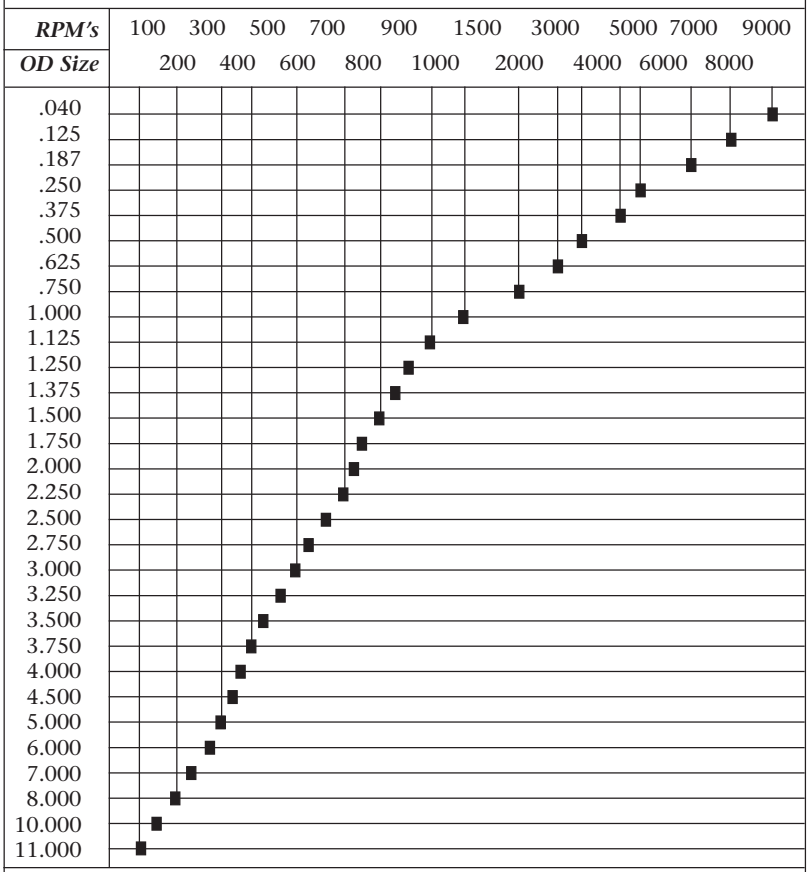
METAL BOND PRODUCTS

Generator Rings
Bevelling Laps
Counter Sinks
Counter Bores

Please inquire.

Recommended RPM's of Diamond Core Drills

For Soft, Abrasive Materials, RPM Should Increase.
For Hard, Dense Materials, RPM Should Decrease.



RPM's will vary depending on the OD size of the drill. To improve drill life and help reduce breakage, it is important to run drills at the proper RPM's and keep the diamonds exposed through frequent dressing.

GRIT / RMS FINISH CHART

CDT Grit Size Call Out	Mesh Range (Grit)	Sieve Size No. (US Mesh)	Theoretical Sieve Opening Micron	Sieve Opening ASTME II Micron	FEPA Size No.	Approx. No. of Stones Per Carat	Normal RMS Finish Expected		Diameter of Abrasive Partical	Plating Total Build Up on Diameter	
							Resin & Metal	Plated Untouched		CBN	Diamond
18	18-20	18	1000	1000	D1001	110			.039		
20	20-25	20	841	850	D851	180			.028		.060
25	25-30	25	707	710	D711	310			.023		.055
30	30-35	30	595	600	D601	510			.019		.050
35	35-40	35	500	500	D501	860			.015		
40	40-50	40	420	425	D426	1,450			.013		.037
50	50-60	50	297	300	D301	4,100			.008		.030
60	60-80	60	250	250	D251	6,900	35-50		.0065	.022	.025
80	80-100	80	177	180	D181	19,500	20-30	90-125	.0055	.018	.020
100	100-120	100	149	150	D151	32,800	16-24	64-90	.0045	.015	.017
120	120-140	120	125	125	D126	55,200	14-20	48-64	.004	.012	.014
150	140-170	140	105	106	D107	93,000	12-17	32-48	.0035	.010	.012
180	170-200	170	88	90	D91	156,000	10-15	24-32	.003	.009	.010
220	200-230	200	74	75	D76	262,000	8-12	20-24	.002	.006	.007
240	230-270	230	63	63	D64	441,000	7-11	16-20	.0016	.005	.006
300	270-325	270	53	53	D54	742,000	6-10	14-16	.0015	.004	.005
400	325-400	325	44	45	D46	1,250,000	5-9	13-14	.0014	.003	.004
500	400-500	400	37	38			4-8	12-13	.001		.003

MESH SIZE EQUIVALENT TO MICRON RANGE

Micronized Grade Nos.	U.S. Bureau of Standards Micron Range	Mesh Size Equivalent
36-54	45	450
30-40	35	500
22-36	30	600
20-30	25	800
15-25	20	1,000
15-20	17	1,100
10-20	15	1,200
8-15	12	1,500
6-12	9	1,800

Micronized Grade Nos.	U.S. Bureau of Standards Micron Range	Mesh Size Equivalent
4-8	6	3,000
2-6	4	6,000
1-5	3	7,500
2-4	3	8,000
0-2	1	14,000
0-1	1/2	60,000
0-1/2	1/4	100,000
0-1/4	1/8	200,000
0-1/5	1/10	250,000

SFPM/SPINDLE RPM CONVERSION TABLE

SFPM/SPINDLE RPM CONVERSION TABLE

Select the grinding wheel SFPM you want and read down to find the equivalent RPM across from the diameter of your wheel

WHEEL SFPM	600	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	9500	10,000	11,000	12,500
1/8	18335	30558	45837	61115	76394	91673	106952	122231	137510	152788	168067	183346	198625	213904	229183	244461	259740	275019	290298	305577	336134	381971
1/4	9167	15279	22918	30558	38197	45837	53476	61115	68756	76392	84032	91672	99212	106952	114591	122231	129870	137510	145149	152788	168067	190985
3 8	6112	10186	15279	20372	25465	30558	35651	40744	46594	50928	56021	61115	66141	71301	76394	81487	86580	91673	96766	101859	112045	127324
1/2	4584	7639	11459	15279	19099	22918	26738	3055	34378	38196	42016	45836	49656	53476	57296	61115	64935	68755	72574	76394	84034	95493
5/8	3682	6136	9204	12272	15341	18409	21477	24545	27502	30557	33615	36669	39865	42954	46022	49090	52158	55226	58294	61362	67498	76703
34	3056	5093	7639	10186	12732	15279	17825	20372	22918	25464	28011	30557	33071	35651	38197	40744	43290	45837	48383	50929	56022	63662
7/6	2619	4365	6548	8731	10913	13096	15279	17462	19644	21827	24009	26192	28346	30558	32740	34923	37106	39288	41471	43654	48019	54567
1	2292	3820	5730	7640	9549	11459	13369	15279	17189	19098	21008	22918	24828	26738	28648	30558	32468	34377	36287	38196	42017	47746
2	1146	1910	2865	3820	4775	5730	6684	7639	8594	9549	10504	11459	12414	13369	14324	15279	16234	17189	18143	19098	21008	23873
3	764	1273	1910	2546	3183	3920	4456	5093	5729	6366	7003	7639	8276	8913	9549	10186	10823	11459	12096	12732	14006	15915
4	573	955	1432	1910	2387	2865	3342	3820	4297	4775	5252	5729	6207	6684	7162	7639	8117	8594	9072	9549	10504	11937
5	458	764	1146	1528	1910	2292	2674	3056	3438	3820	4202	4584	4966	5348	5730	6112	6494	6875	7258	7639	8403	9549
6	382	637	955	1273	1592	1910	2228	2546	2865	3183	3501	3820	4138	4456	4775	5093	5411	5730	6048	6366	7003	7958
7	327	546	819	1091	1364	1637	1910	2183	2455	2728	3001	3274	3547	3820	4093	4365	4638	4911	5183	5457	6002	6821
8	286	477	716	955	1194	1432	1671	1910	2148	2387	2626	2865	3103	3342	3581	3820	4058	4297	4536	4775	5252	5968
10	229	382	573	764	986	1146	1367	1528	1719	1910	2101	2292	2483	2674	2865	3056	3247	3438	3629	3820	4202	4775
12	191	318	477	637	796	954	1114	1273	1432	1591	1751	1910	2069	2228	2387	2546	2706	2865	3024	3183	3501	3979
14	164	273	409	546	682	819	955	1091	1228	1364	1500	1637	1773	1910	2046	2183	2319	2456	2592	2726	3001	3410
16	143	239	358	477	597	716	836	955	1074	1194	1313	1432	1552	1671	1790	1910	2029	2149	2268	2387	2626	2984
18	127	212	318	424	531	637	743	849	955	1061	1167	1273	1379	1485	1592	1698	1804	1910	2016	2122	2334	2653
20	115	191	286	382	477	573	668	764	859	955	1050	1146	1241	1337	1432	1528	1623	1710	1814	1910	2101	2387
22	104	174	260	347	434	521	608	694	781	868	955	1042	1128	1215	1302	1389	1476	1563	1649	1736	1910	2170
24	95	159	239	318	398	477	557	637	716	796	875	955	1034	1114	1194	1273	1353	1432	1512	1592	1751	1989
26	88	147	220	294	367	441	514	588	661	734	808	881	955	1028	1102	1175	1249	1322	1396	1469	1616	1836
28	82	136	205	273	341	409	477	546	614	682	750	818	887	955	1023	1091	1160	1228	1296	1364	1501	1705
30	76	127	191	255	318	382	446	509	573	637	700	764	828	891	955	1019	1082	1146	1210	1273	1401	1592
32	72	119	179	239	298	358	418	477	537	597	656	716	776	836	895	955	1015	1074	1134	1194	1313	1492
34	67	112	169	225	281	337	393	449	505	562	618	674	730	786	843	899	955	1011	1067	1123	1236	1404
36	64	106	159	212	265	318	371	424	477	531	583	637	690	743	796	849	902	955	1008	1061	1167	1326
38	60	101	151	201	251	302	352	402	452	503	553	603	653	704	754	804	854	905	955	1005	1108	1256
40	57	95	143	191	239	286	334	382	430	477	525	573	620	668	716	764	812	859	907	955	1050	1194
42	55	91	136	182	227	273	318	364	409	455	500	546	591	637	682	728	773	819	864	909	1000	1137
44	52	87	130	174	217	260	304	347	391	434	477	521	564	608	651	694	738	781	825	868	955	1085
46	50	83	125	166	208	249	291	332	374	415	457	498	540	581	623	664	706	747	789	830	913	1038
48	48	80	119	159	199	239	279	318	358	398	438	477	517	557	597	637	676	716	756	796	875	994
50	46	76	115	153	191	229	267	306	344	382	420	458	497	535	573	611	649	688	726	764	840	955

The following formula may be used to quickly calculate wheel speed: SFPM = wheel speed in RPM x wheel diameter in inches x .262

SUPER ABRASIVES Safety

Safe operating practices must be part of every grinding wheel user's operation.

Before mounting the wheel, using a tachometer measure the spindle speed directly on the wheel spindle. Speeds should never exceed the maximum speed shown on the wheel on those established ANSI Safety Requirement B7.1.

Ensure the mounting flanges, backplate or adapter supplied by the machine manufacturer are used and kept in good condition. ANSI Safety Requirement B7.1 provides wheel mounting requirements. Always examine the grinding wheel before starting to grind.

Ensure the correct wheel guard is in place before starting the wheel. Allow the wheel to come up to full operating speed before starting to grind.

Superabrasive wheels are expensive, but performance justifies the cost. To obtain maximum performance from the superabrasive wheel, the procedures for the user's operations must extend to what is done with the wheel both before and after it's actual use. The greatest efficiency and lowest overall abrasive cost can be realized only if proven care and use techniques become standard procedure.

Wheel Speeds

Never exceed the maximum operating speed marked on the superabrasive wheel being used, Typical maximum operating speed by bond types are as follows:

Maximum Operating Speeds (established by ANSI safety requirements B7.1)

Metal Bond Cut-off (steel center)
Type 1A1R and 1A1RSS .... 16,000 SFPM
Metal Bond (all others) ..... 12,000 SFPM
Single Layered Products ..... 12,000 SFPM
Resin Bond ..... 9,500 SFPM

The proceeding wheel speeds are the maximum safe speeds and not necessarily the most efficient. Superabrasive diamond wheel operate most effectively at speeds lower than the maximum. The following are general recommendations. CBN Wheels in many cases are used effectively on steels at higher speeds.

Recommended Operating Speeds

Metal Bond ..... 4,000 - 6,000 SFPM
Singled Layered Productions
Diamond ..... 4,000 - 6,000 SFPM
CBN ..... 4,000 - 9,000 SFPM
Resin Bond ..... 4,000 - 6,000 SFPM

For dry applications use lower SFPM to reduce heat from grinding, for wet applications use the higher SFPM.

SUPERABRASIVES INFORMATION

Care of Maintenance of Diamond Wheels

Superabrasive products, diamond and CBN wheels, are precision cutting tools carefully ground and balanced to give superior performance. Achieving the best results from these cutting tools like any other precision tool/instrument requires a minimum amount of preparation. The following steps-mounting, truing, dressing-should be followed to get the best possible performance from these Superabrasive wheels.

Mounting: Diamond Wheels are trued to the bore in the manufacturing process. Flanges, back plates and spindles should be clean, free of burrs and run true. By using an indicator and tapping lightly on a wood block held against the wheel, indicate the wheel until it is within .0005" of true rotation. Tighten the flanges securely and recheck before using. The use of permanent mounting should be practiced where convenient.

Use Rigid Work Support

All workpieces should be supported firmly during the grinding process. Any amount of vibration will cause wheel wear and produce chatter or wave marks on the ground surface. On work ground between centers, be sure the centerholds are properly prepared. Minimize work overhang. If the ground edge is supported by a work finger, ensure the finger is strong enough to provide vibration-free support.

Coolant: Coolant must be applied in the proper place or it will not cool the wheel or material being ground properly. Coolant should always be directed so that the full flow is at the point of contact between the diamond wheel and the work-piece, and in the same direction as the rotation of the wheel.

Soluble oil may be mixed with water to prevent corrosion of machine parts. Weak solutions are recommended, however, because strong alkaline solutions will reduce normal life of resin wheels.

Avoid Excessive Feeds

Every grinding operation is different. What is an excessive removal rate on one operation may be entirely acceptable on another. Excessive feeds on a given operation will always cause premature wheel wear. Excessively high feed rates are characterized by:

- A harsh grinding sound
- Chatter
- Burn
- High sheer wear rate
- Vibration

CAUTION: When ordering Resin Bonded Wheels, specify for wet or dry grinding. All Metal Bonded Wheels must be operated with a coolant.

Avoid Steel When Using Diamond Wheels

When using a diamond wheel try to keep the amount of steel ground to an absolute minimum. On brazed tools, use a conventional abrasive wheel to back off the steel shank.

Grinding Speeds and Feeds

Speeds: Diamond Wheels should not be run at speeds more than 6,000 or less than 3,000 surface feet per minute. The higher speeds are recommended for interrupted cuts and small areas of contact between wheel and work, which have a dressing action on the wheel face. CBN wheels should be used at 6,000-7,000 surface feet per minute.

Feeds: Avoid excessive feeds. The following feeds are recommended for most satisfactory finish and longer wheel life:

> .001" through 120 Grit - .0005" through 220 Grit - .00025" finer than 220 Grit.
>
> On finishing passes, allow wheel to "sound out" to obtain best finish.

Wheel Dressing and Truing: Due to exceptionally free cutting properties of C.D.T. Diamond Wheels, frequent dressing is not necessary. They may be dressed with a soft bonded aluminum oxide or silicon carbide dressing stick. When a beveled or gouged condition has occurred in a face type wheel, it should be taken off the grinder and the diamond section lapped on a cast iron plate using 120 grit silicon carbide and water. Straight type wheels may be trued on the grinder by using a brake type truing device or, for Resin Bonded Wheels only, by dry grinding a piece of low carbon steel until running truth is achieved.

Preparation of Use of CBN Wheels

Truing allows the grinding face to be properly presented to the work-piece. An untrued wheel can adversely affect surface finish, stock, removal capability and wheel life.

Once the CBN wheel is hand mounted to minimum runout (T.I.R.), several techniques can be used to accomplish maximum truth.

- Multiple point (14-40 mesh) or impregnated (40 to 100 mesh and finer) diamond dressing tools.
  - .0005" infeed per pass (.01MM)
  - Single point & cluster diamond tools not recommended
  - Finer mesh diamond allows better initial workpiece finish
- Trueing brake or motorized dresser
  - Coarse grit, J to M hardness, silicon carbide or aluminum oxide wheel
  - .001" Infeed per pass (.025MM)

The truing device should be applied until contact has been made with the entire CBN wheel grinding face.

Flood coolant should be used whenever possible. The use of enriched solutions (5-10%) of "heavy-duty" water soluble oils is effective in extending CBN wheel life.

After truing, a resin bonded wheel must be properly dressed.

Dressing Resin Bonded Wheels

Effective grinding wheel cutting performance requires a sharp abrasive grain whose cutting points are well exposed to the workpiece. Ultra-hard superabrasive crystals remain sharp and once the wheel is cutting well, the grinding process will keep the wheel open, exposing the crystals and virtually eliminating the need for continual dressing. New wheels usually have a smooth grinding face since the superabrasive crystals and the surrounding bond are flush to the cutting surface.

Dressing enhances grain exposure and abrades away some bond. Prior to dressing, a wheel may seem to be "loaded", producing poor cutting performance and work-piece burning.

- Hand held aluminum oxide or silicon carbide stick
  - Soft (G, H hardness)
  - Fine grit (200-400 mesh)

SUPERABRASIVES INFORMATION

Dressing Resin Bond Wheels (cont.)

Lowering the RPM of the spindle will help open the wheel quicker exposing the abrasive for more open condition.

If for some reason the wheel later produces burning and poor cutting action, the same stick can be used to reopen the wheel.

Dress Core

As the abrasive section of a cup wheel wears, the core material (that part of the superabrasive wheel which holds and supports the abrasive bearing section) may become exposed. The core material should never contact the workpiece during grinding or it will rub and generate excessive heat. Hence, it becomes necessary to dress the core material.

A single point carbide or steel tool is the best way to dress a resaloy core. The tool is clamped in a vise with its cutting edge directed accurately to remove enough core material to leave a 1/16" of abrasive section exposed.

Storage and Handling

If the grinding machine has a tapered spindle, mount each straight, flaring cup or dish wheel on a separate collet or adaptor. When changing wheels the entire unit is removed...the wheel remaining in running truth. When needed again, the entire unit can be placed directly on the spindle or arbor, thereby eliminating the time and abrasive lost in retruing.

Ensure the mounting flanges are flat and of equal diameter, especially on wheels with rigid centers, such as vitrified bond wheels.

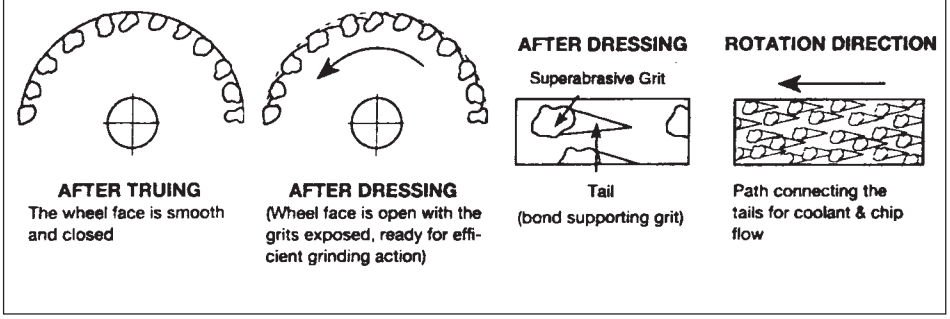
Avoid dropping or bumping the wheel. When not in use, store superabrasive wheels carefully. We suggest they be returned to their original container. This not only offers wheel protection, but gives complete wheel identification for future reference.

Fault Finding and Correction Guide

Diamond Wheels

Problem	Possible Causes	Suggested Correction
	Dry Grinding	
1. Burning	Wheel loaded or glazed.	Dress wheel with a dressing stick.
	Excessive feed rate.	Reduce infeed or wheel or workpiece
	Wheel too durable.	Use freer cutting specification or slow down wheel speed
2. Poor finish	Grit size too coarse.	Select a finer grit size.
	Excessive feed rate.	Reduce infeed of wheel or workpiece
3. Chatter	Wheel out of truth	True wheel (see Truing and Dressing Section)
	Wet Grinding	
1. Poor finish	Excessive dressing.	Use lighter dressing pressure, stop dressing as soon as wheel starts it consume stick rapidly.
	Grit size too coarse	Select finer grit size
	Poor coolant flow or location.	Apply heavy flood so it reaches wheel/work interface.
2. Chatter	Wheel out of truth	True wheel, ensure it is not slipping on mount.
3. Wheel won't cut	Glazed by truing	Dress lightly until wheel opens up.
4. Slow cutting	Low feeds and speeds	Increase feed rate, increase wheel speed (observe maximum wheel speed.)
5. Short wheel life	Incorrect coolant flow	Apply coolant to flood wheel/work surface.
	Low wheel speed.	Increase wheel speed.
	Excessive dressing.	Use lighter dressing pressure.
	Wheel too soft or too hard.	Change grit or grade, use higher concentration.
6. Burning (excessive heat)	Wheel glazed or loaded.	Re-dress wheel.
	Poor placement of coolant.	Apply coolant directly to wheel/workpiece interface.
	Excessive material removal rate.	Reduce downfeed and/or crossfeed.

Properly Dressed Wheel Face



Dressing sticks should be 1 or 2 grit sizes finer than the superabrasive in the wheel. Medium grade sticks, H or I, work best.