

# DIAMOND AND CBN WHEEL SPECIFICATIONS

**NCD**

**150**

**R**

**100**

**B**

**Q**

**1/8**

ABRASIVE	GRIT SIZE	GRADE	CONCENTRATION	BOND TYPE	BOND MODIFICATION	DEPTH OF DIAMOND SECTION
MD = Uncoated Diamond		RESIN METAL	LOW 25			
NCD = Nickel Coated Diamond (Most Standard)	40 180 600 60 200 800 80 240 1000 100 300 1200 120 400 150 500	R A-Glass AS C - Ceramic	50 75 HIGH 100 125	B - Resin M - Metal	Designates Bond Modification	1/16 1/8 1/4 3/8 1/2
NCTD = 30% Nickel Coated Diamond						
CCD = Copper Coated Diamond						
CSGD = Nickel Coated Diamond for High Steel Content Grinding						
NC8D = Nickel Coated More Friable Diamond						
BZ = Cubic Boron Nitride (CBN)						

### ORDERING INFORMATION

**TYPE:** As pictured in contents, such as 1A1, 6A2, 11V9.

**SIZE:** All physical Dimensions (Diameter, thickness, hole size, etc.)

**SPECIFICATIONS:** As outlined.

**LIST OF MATERIAL GRINDING** (Carbide, Steel, Glass, Stainless, ect.) List appr. % example - (90% carbide 10% steel)

**LIST WET OR DRY GRINDING.**

Example: 1A1,  
6" x 1/4 x 1 1/4, NCD120R100BQ1/8 PA, 80% Carbide, 20% Steel, Wet Grinding.

CORE MATERIAL	
PA	Plastic Aluminum
AL	Metal Aluminum
PC	Plastic Copper
ST	Steel
PI	Plastic Iron
BR	Bronze

## RESIN BOND DIAMOND AND CBN ABRASIVE APPLICATIONS

MD - Uncoated Diamond - Free Cutting, Least Heat, Lower Power, Limited Duty, Shorter Wheel Life. Wet or Dry.

NCD - Nickel Coated Diamond - General Purpose, Universally Usable, Multi-Duty, Long Life, Quality Finish. Wet or Dry.

NCTD - Nickel Coated Diamond - Special Purpose, Dry Grinding, Carbide or Carbide and Steel Requires Less Power, Minimal Workpiece Burn, Limited Duty. Wet or Dry.

CCD - Copper Coated Diamond - Special Purpose Dry Grinding WC, Longer Life, Higher Power, Limited Duty, Carbide Only. Dry.

CSGD - Nickel Coated Diamond for High Steel Content Grinding Special Purpose, Longer Life, Lower Power, Limited Duty, For 30% or more Steel with Carbide. Wet.\*

NC8D - Nickel Coated Diamond - Special Purpose Wet Grinding of Carbide, Longer Life, Lower Power Limited Duty and Free Cutting Characteristics. Wet.\*

BZ - Cubic Boron Nitride (CBN) - Special Purpose, Precision Grinding of Tool and Die Steel, Superalloys, Stainless Steels and other Hardened Alloy Steels. Wet or Dry.

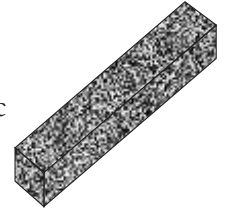
\* May have extra cost.

### MAN-MADE RESIN BOND DIAMOND SELECTION GUIDELINES

	DRY GRINDING		WET GRINDING	
	Cemented Carbide	Cemented Carbide/Steel	Cemented Carbide	Cemented Carbide/Steel
MD	Fair	Good	Good	Good
NCD	Good	Better 0-15% Steel	Better	Better
NCTD	Good	Best Overall	Good	Good
NC8D	Better	No	Best	No
CCD	Best	No	No	No
CSGD	No	Best Over 33%	No	Best

# 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	220
140 - 170	
170 - 200	
200 - 230	320
230 - 270	
270 - 325	
325 - 400	600
400 - 500	
500 - 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

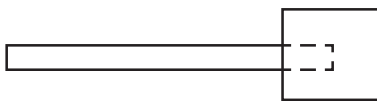
D	T	S	OAL	DIA. TOOL #	CBN #
1/8	3/16	3/32	2	MP1D-125/3	MP1B-125/3
1/8	1/4	3/32	2	MP1D-125/4	MP1B-125/4
1/8	1/4	1/8	2	MP2D-125/4	MP2B-125/4
5/32	3/16	3/32	2	MP1D-156/3	MP1B-156/3
5/32	1/4	1/8	2	MP2D-156/4	MP2B-156/4
3/16	3/16	1/8	2	MP2D-187/3	MP2B-187/3
3/16	1/4	1/8	2	MP2D-187/4	MP2B-187/4
3/16	1/4	3/16	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

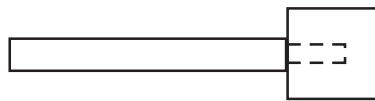
\*STEEL  
\*CARBIDE  
\*HEAVY METAL

#### DWB



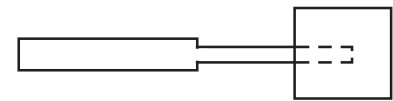
DWB - straight mandrel inserted in wheel

#### DWF



DWF - shoulder mandrel inserted in wheel

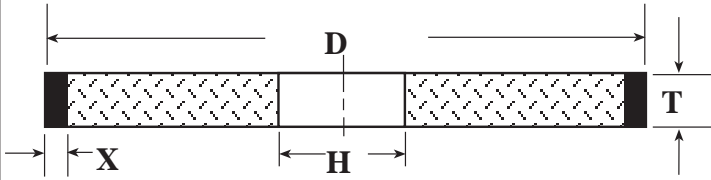
#### DWK



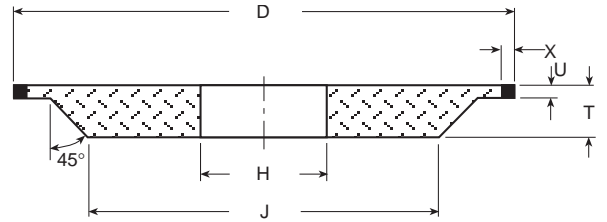
DWK - stepped mandrel inserted in wheel

# RESIN/METAL BOND WHEEL STYLE CHART

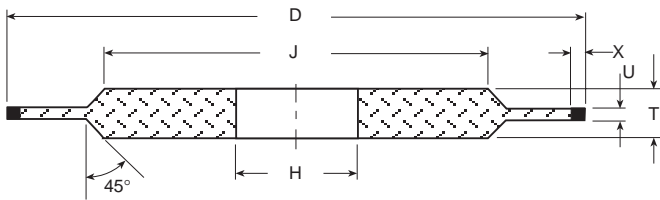
**1A1**



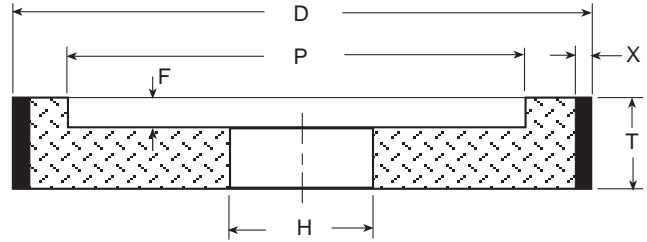
**3A1**



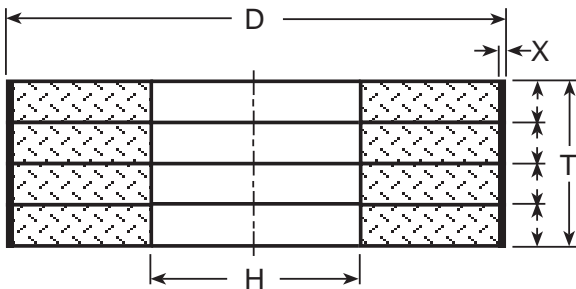
**14A1**



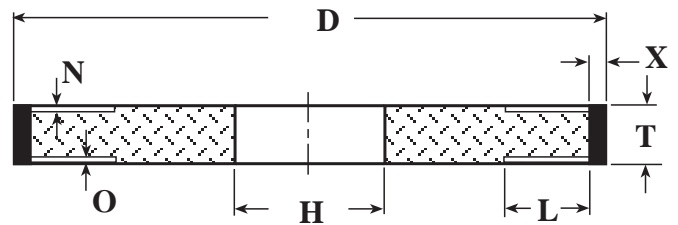
**6A1**



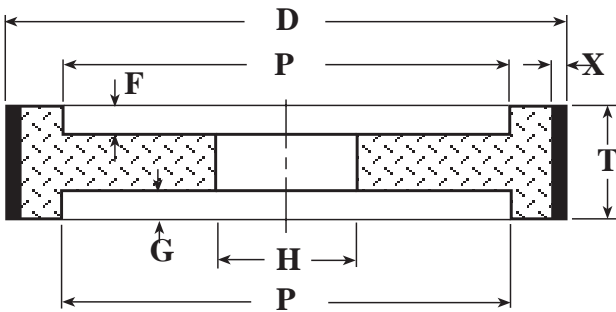
**1A1 - Centerless Large Wheel**



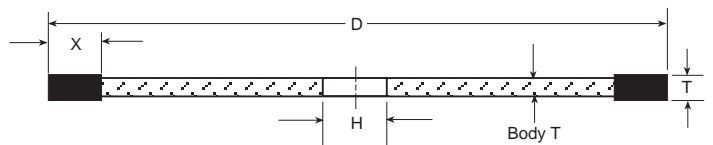
**1A1R - Tool**



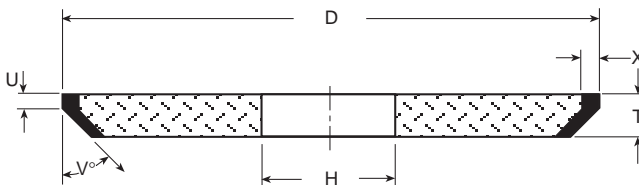
**9A1**



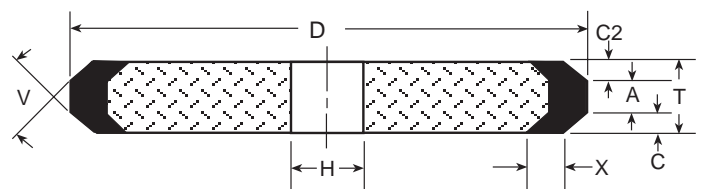
**1A1R**



**1Y1**

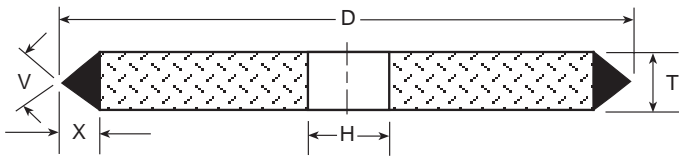


**1DD1**

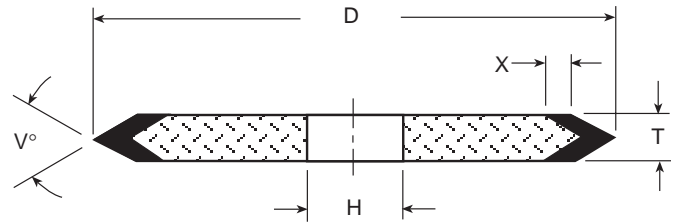


# RESIN/METAL BOND WHEEL STYLE CHART

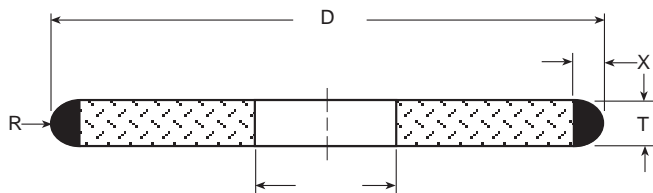
1E1



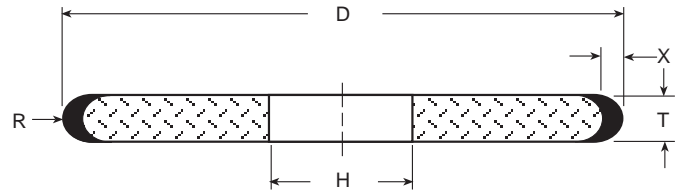
1EE1



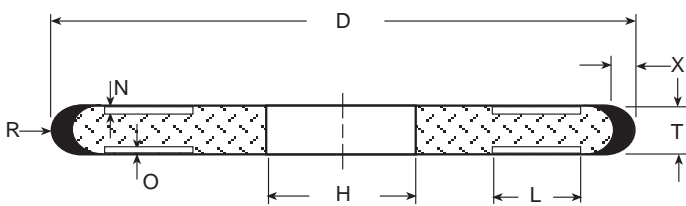
1F1



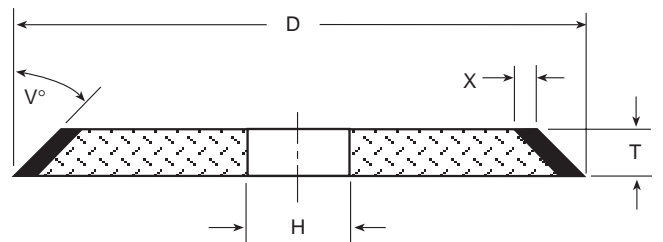
1FF1



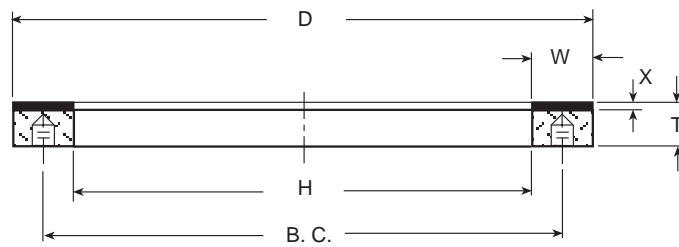
1FF1 R-Tool



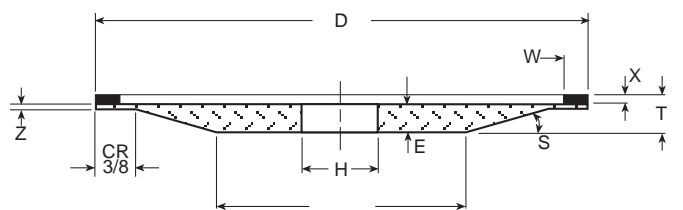
1V1



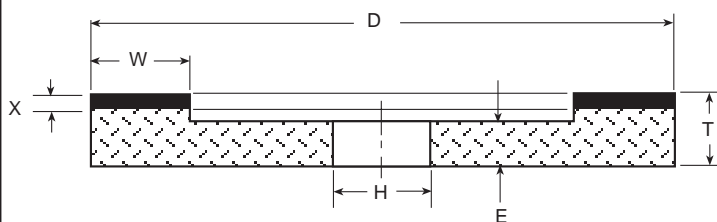
2A2T



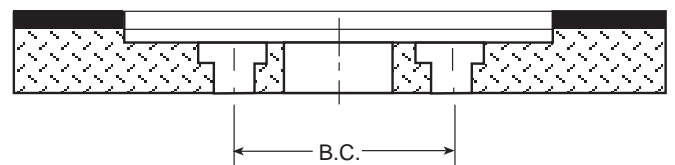
4A2P



6A2

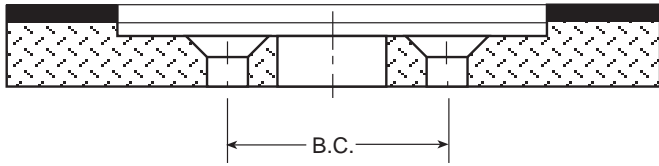


6A2B

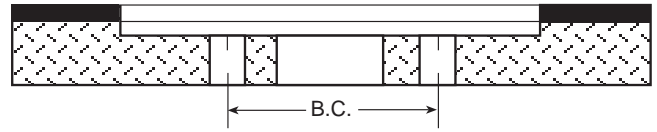


# RESIN/METAL BOND WHEEL STYLE CHART

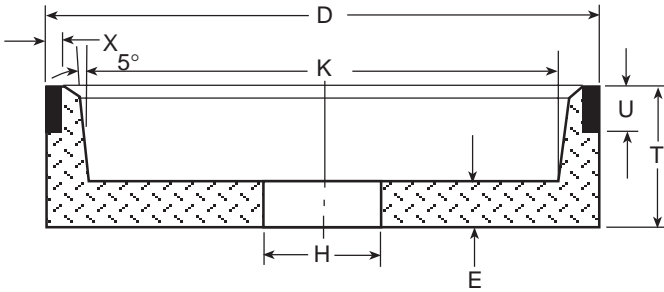
6A2C



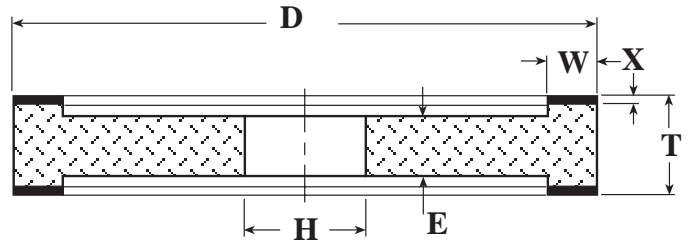
6A2H



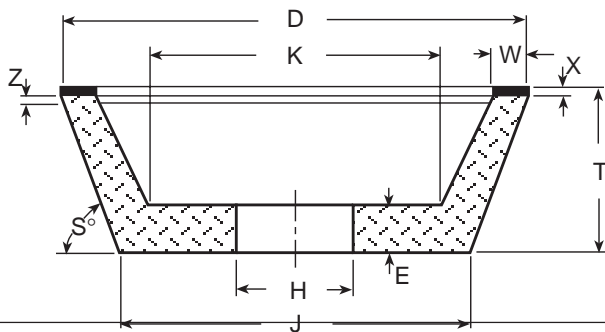
6A9



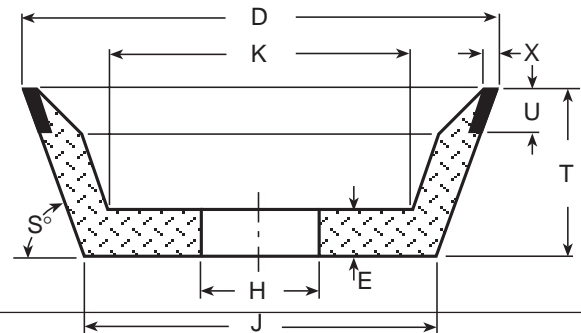
9A3



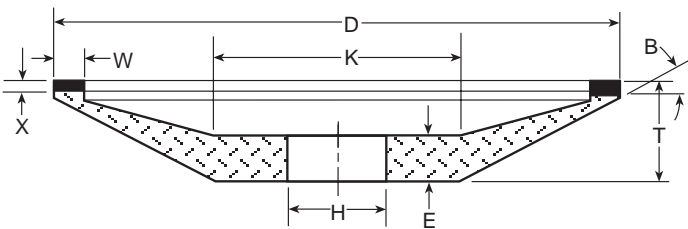
11A2



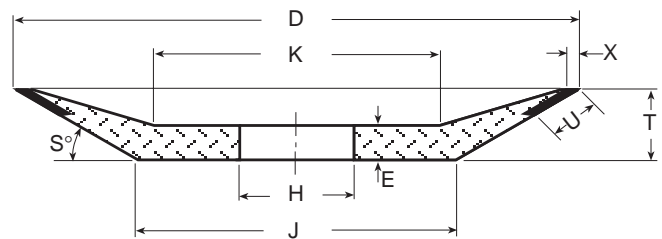
11V9



12A2



12V9



## Custom Manufacturing

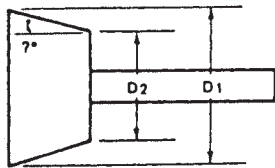
Our shop is set up and tooled so that we are able to engineer and produce quality custom products from a quantity of one to many in a timely manner and within a very competitive price.

## Our Customer Service Department

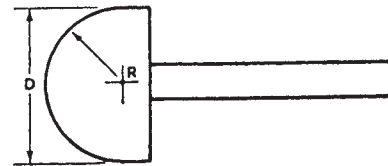
is ready to assist you with technical help, quotations, order entry, availability, and production status with quick response assuring you get the right product at the right price.

# WHEEL STYLE CHART

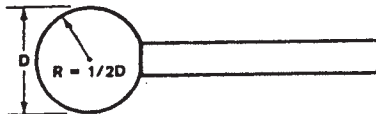
Back-Tapered Wheel



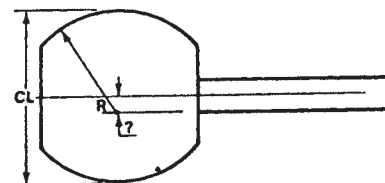
Ball-Nosed Wheel



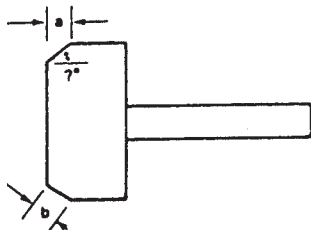
Ball Wheel



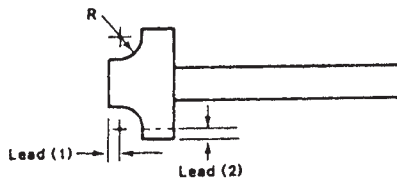
Barrel Shaped Wheel



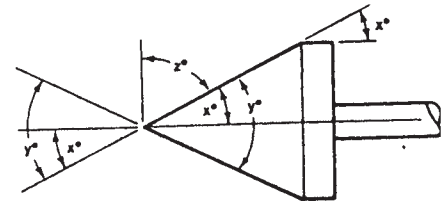
Chamfered Wheel



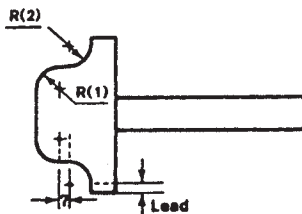
Concave Radius



Cone Wheel



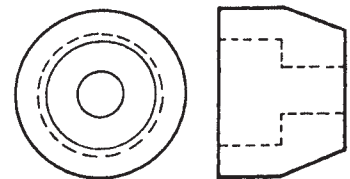
Convex to Concave Radius



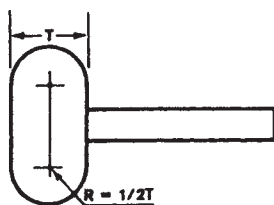
Convex Radius



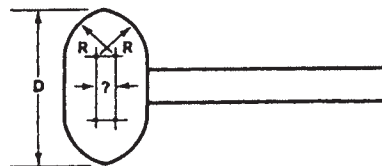
Cup Wheel



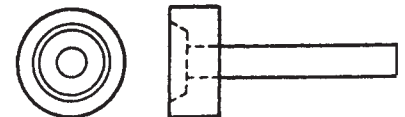
Full Radius



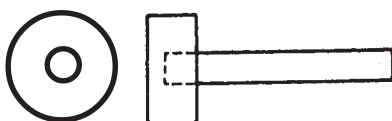
Offset Radius



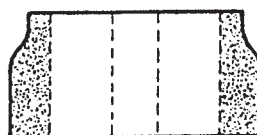
Recessed Face



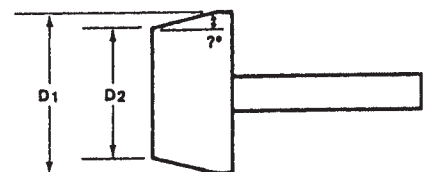
Recessed Shank



Special Wheels



Tapered Wheels



# "SOPKO" PRECISION GROUND WHEEL ADAPTERS

## STYLE No. 2

1/2" WIDE WHEEL  
Part #200-1 L.H. Thread  
Part #200-2 R.H. Thread



## STYLE No. 1

3/4" WIDE WHEEL  
Part #100-1 L.H. Thread  
Part #100-2 R.H. Thread



## STYLE No. 3

1" WIDE WHEEL  
Part #300-1 L.H. Thread  
Part #300-2 R.H. Thread



## STYLE No. 4

2" WIDE WHEEL  
Part #400-1A L.H. Thread  
1/2" Long  
Part #400-2A R.H. Thread  
1/2" Long  
Part #400-1B L.H. Thread  
1 1/2" Long  
Part #400-2B R.H. Thread  
1 1/2" Long



*Hardened and ground with heat treated nuts.  
Please order by part number.*

## STYLE No. 2

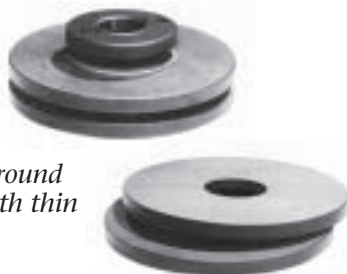
LONG EXTENDED TYPE  
Part #200-1 Long L.H. Thread  
Part #200-2 Long R.H. Thread  
For use with 1/2" wide wheel  
and extends wheel forward  
1 5/8"



*Hardened and ground with heat  
treated nuts. Please order by part  
number.*

## STYLE No. 4.5

FLANGED ADAPTER  
(COMPLETE)  
Part #4.5-1 L.H. Thread  
Part #4.5-2 R.H. Thread  
*One piece hardened and ground  
flanged adapter for use with thin  
cut off wheels.*



Mating side flange plate is 5/16" thick and 4 1/2" O.D.  
Hardened and ground. Flanges only order Part #4.5-SP.

## COMBINATION SPANNER AND SOCKET WRENCH

A precision ground wheel adapter for tool and form grinding wheels designed with a wheel-pulling accessory to reduce wheel breakage. This is the first low cost adapter to incorporate the pull feature. The precision adapter consists of the ground adapter hub, adapter lock washer, and adapter nut. The assembled unit with the wheel in place is locked to the spindle by means of a hex head spindle nut.



The precision adapter design employs a hex head instead of the conventional slotted head spindle nut. In conjunction with this the wrench offered with the adapter in a combination spanner-type and socket wrench. As the socket head wrench is used to turn the spindle nut, the wrench cannot slip off, nor can the nut be damaged.

Order by number 35135 Combination Spanner and Socket Wrench.

## PULLER BUSHING AND SCREW

The adapter puller consists of a threaded steel bushing which screws into the open end of the adapter. A 1 1/2" puller bolt screws through the puller bushing pressing against the end of the spindle, gently forcing the adapter assembly off the spindle. **Order by number 116 Puller and Screw.** All Sopko adapters manufactured with puller screw feature.



## LOCK WASHER

Part #030 - 1/32" x 2 1/4" OD  
Part #062 - 1/16" x 2 1/4" OD

Also in stock, lock washers  
Part #030 - 2 1/2" OD  
Part #062 - 2 1/2" OD



## ADAPTER NUT

Part #200-N.L.  
1 1/4-16 L.H. Threads  
Part #200-N.R.  
1 1/4-16 R.H. Threads



# "SOPKO" PRECISION GROUND WHEEL ADAPTERS

## SPINDLE HEX NUT

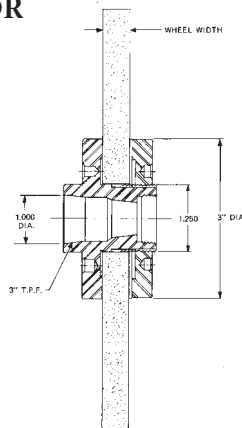
11/16" Hex Flange Spindle Nuts  
for use with #35135 Sopko  
Combination Hex Socket  
Spanner Wrench.



- Part #500-1—1/2-13 L.H.
- Part #500-2—1/2-13 R.H.
- Part #500-3—31/64-14 L.H. Excello
- Part #500-4—31/64-14 R.H. Excello
- Part #500-5—3/8-16 L.H.
- Part #500-6—3/8-16 R.H.
- Part #500-7—1/2-16 L.H. Pope
- Part #500-8—1/2-16 R.H. Pope
- Part #500-9—9/16-18 L.H.
- Part #500-10-1/4-20 R.H.
- Part #500-11-5/16-18 R.H.
- Part #500-12-1/2-20 L.H.
- Part #500-13-1/2-20 R.H.
- Part #500-14- Blank soft #5 drill

## 3" DIA. WHEEL ADAPTERS FOR 8" DIA. GRINDING WHEELS

PART NO.	WHEEL WIDTH
130-1 L.H. Thds.	3/4"
130-2 R.H. Thds.	
230 - 1 L.H. Thds	1/4" to 1/2"
230 - 2 R.H. Thds.	
330 - 1 L.H. Thds	1"
330 - 2 R.H. Thds.	
430 - 1A L.H. Thds.	2"
430 - 2A R.H. Thds.	
430 - 1B L.H. Thds.	1" to 2"
430 - 2B R.H. Thds.	



## CINCINNATI ADAPTERS

1/2" WIDE WHEEL

- Part #C-200-1 L.H. Thread
- Part #C-200-2 R.H. Thread



1" WIDE WHEEL

- Part #C-100-1 L.H. Thread
- Part #C-100-2 R.H. Thread



*Hardened and ground with heat treated nuts. Please order by part number.*

## REVERSIBLE WHEEL ADAPTERS

PART NO. 222 R.W.A.

This reversible wheel adapter is designed for Diamond wheel use. They may be reversed without dismounting the wheel from the adapter by removing the wheel and adapter from the spindle as a unit, and reverse.



These adapters make it possible to use the same dressed angle for both right and left ground tool bits. Just remove the unit from spindle nose and reverse.

Sopko Reversible Wheel Adapters are manufactured with a double taper and securely locked against loosening by wheel rotation. Made of hardened precision ground steel, they will not vibrate even at high speeds.

For use on all spindles having 1" opening and 3" T.P.F.

Also a model manufactured and stocked for use on Cincinnati No. 2 and all other spindles having a 7/8" opening and 4 1/2" T.P.F. (Part No. 122C-R.W.A.)

## TRUING ARBORS

For use with Standard Surface and Tool Grinder Adapter.  
Part No. 100 T.A. Hardened and ground.



For use with Cincinnati, Covel and Gallmeyer Livingston Adapters. Part No. 875 T.A. Hardened and ground.

## THIN HEAD GROUND WHEEL SCREWS

1/8" to 7/8", both R.H. and L.H. threads in stock for immediately delivery.





# DRESSERS FOR DIAMOND AND CBN GRINDING WHEELS

## Model 1. For Surface Grinders

- For Abrasive Wheels order equipped with: NR-20, NM-24, or NF-36 Wheel/NSC-5 Cutter.
- For Diamond and CBN Wheels order equipped with: ND1-46 or ND2-46 Wheel.
- Use for Grinding Wheels sizes to 18" diameter by 3" wide.
- Replacement Bearing Assembly: Part 100.
- Dimensions Height: 3" Width: 2 1/8" Length: 2 7/8"



## Model 11. For Diamond and CBN Grinding Wheels - Brake Controlled

- Advanced Constant Drag Centrifugal Brake Controls precision dressing - Right angle release minimizes chipping and diamond loss.
- Furnished with Starting Handle.
- Dresser Wheel Sizes: 3" x 1" x 3/4".
- For Diamond Wheels order equipped with: ND-3 Medium or ND-4 Fine Finish Wheel.



## Model 12. For Diamond and CBN Grinding Wheels - Pneumatic Drive

- Use on Grinding Wheels up to 1" wide.
- Fully equipped with Air Regular, Filter, Oiler and Reversing Valve.
- Operates at 80 psi constant.
- Dresser Wheel Sizes: 3" x 1" x 3/4".
- For Diamond or CBN Wheels order equipped with: ND-3 Medium or ND-4 Fine Finish Wheel.



## Metal Matrix Diamond and CBN Wheel Dresser

SIZE	TOOL #
1/4" x 2	MMD250
3/8" x 2	MMD375
1/2" x 2	MMD500



This amazing material is the only cost effective alternative to expensive brake dressers. Simply hold the dresser in any workhead or vice and feed in slowly while traversing at a moderate speed. Use the 1/4" dresser for shaft mounted and I.D. grinding wheels under 3", 3/8" for grinding wheels 3" thru 5", and 1/2" for wheels over 6". The amount of dresser consumed will vary with the wheel size and the width of the abrasive section. Small wheels with a thin section will consume approximately .003 - .005 to each .001 of abrasive removed. A 5" cup wheel .008 - .015, a 6x1/4 straight wheel .025 - .050 to each .001. A two inch piece of this amazing material can dress and true dozens, maybe hundreds of your superabrasive grinding wheels.

# 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
3/4	3056	5093	7639	10186	12732	15279	17825	20372	22918	25464	28011	30557	33071	35651	38197	40744	43290	45837	48383	50929	56022	63662
7/8	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	18144	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	4366	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	956	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	2728	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	1719	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:  
 $SFPM = \text{wheel speed in RPM} \times \text{wheel diameter in inches} \times .262$

### 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 its 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.