

DIAMOND AND CBN PRODUCTS

The “99” line of quality stock Diamond and CBN (cubic boron nitride) grinding products includes resin, vitrified, metal and MSL (metal single layer) bonds. Premium, high performance resin bond diamond and CBN wheels are also available.

Typical Applications

NORTON B99 DIAMOND WHEELS

- Sharpening cemented carbide cutting tools
- Cutting off carbide rod
- Grinding or cutting off nonferrous materials such as ceramics or glass
- Surface grinding dies
- O.D. grinding spray coatings

NORTON B99 CBN WHEELS

- Sharpening high-speed (M2, D2, T15, etc.) steel cutting tools
- Surface and ID grinding hardened steel die components
- Precision grinding steel parts Rc 50 or harder



Diamond Wheels

FEATURES	BENEFITS
• High quality synthetic diamond	• High material removal rates; longer wheel life vs. conventional green silicon carbide wheels
• Pre-engineered resin bond – B99	• Free cutting; superior form holding; efficient wet or dry
• Premium, heavy-duty resin bond – B105	• Ideal for dry toolroom reconditioning applications
• Metal bond – M99	• Ideal for 1A1R cut-off applications and grinding glass or ceramic materials
• MSL (metal single layer) diamond	• Fast stock removal, cool cutting; excellent for dry offhand finishing of carbide tools; no wheel dressing required
• Vitrified bond – V99	• Most durable under high grinding forces; excellent for wet, offhand finishing of carbide tools

CBN Wheels

FEATURES	BENEFITS
• CBN (Cubic Boron Nitride) abrasive material is second in hardness to diamond	• Easily cuts difficult-to-grind steel parts Rc 50 or harder
• Pre-engineered resin bond – B99	• Highly wear resistant and thermally stable
• Premium Aztec III resin bond	• Free cutting, superior form holding
• Premium Aztec .007 resin bond	• Most efficient for dry tool resharpener
	• Most efficient for dry tool resharpener where heavy stock removal is desired

TECHtips

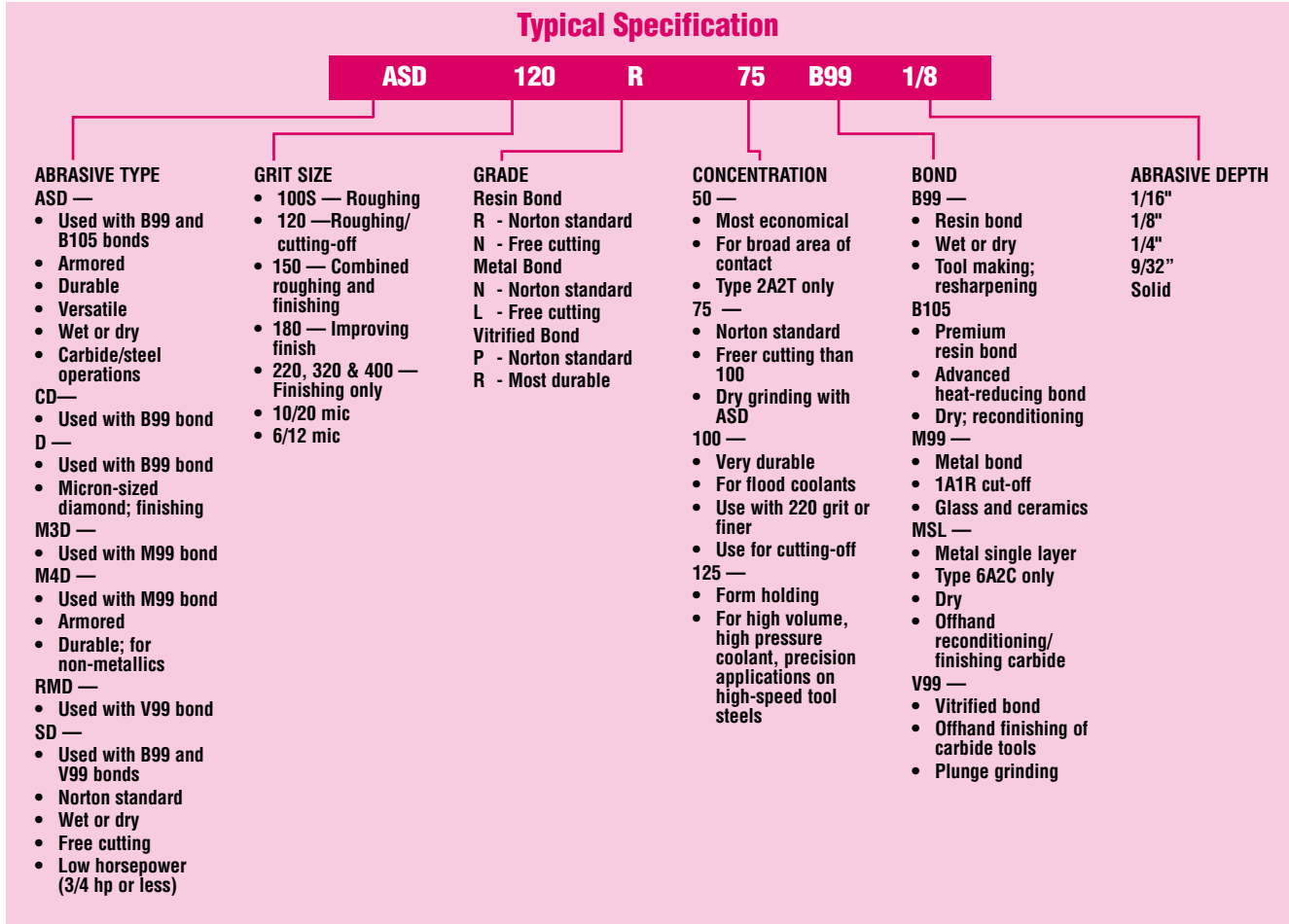
- Truing makes the wheel concentric with the spindle.
- Dressing opens the wheel’s cutting face.
- Always true and dress diamond and CBN wheels prior to use.
- Diamond and CBN wheels with grit sizes 100–180 can be trued with a Brake Controlled Truing Device.

- Refer to the “Mounting, Truing and Dressing Guide” for more information.

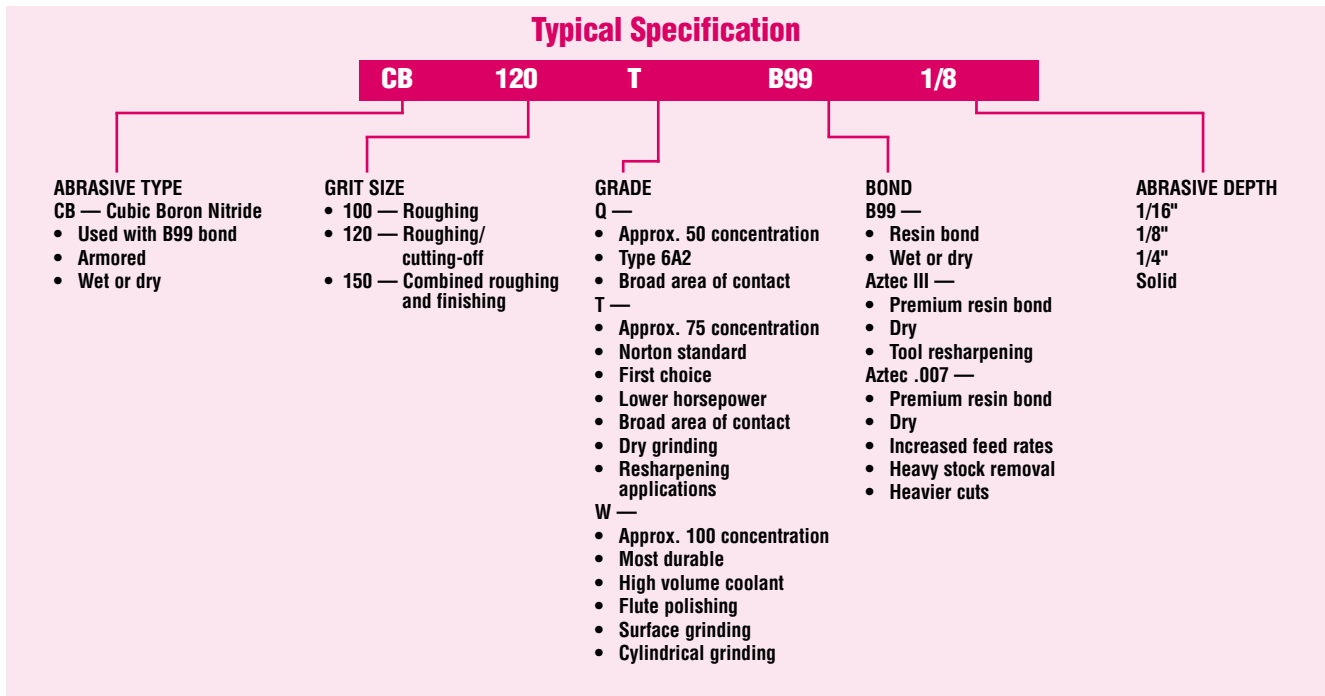


It is the user’s responsibility to refer to and comply with ANSI B7.1

Norton Diamond Product Identification System/Usage Information



Norton CBN Product Identification System/Usage Information





Diamond Wheel Starting Recommendations

APPLICATION OR COMMON MACHINE TYPE	COMMON WHEEL SIZE, TYPE & BLUEPRINT	APPLICATION VARIABLES	RECOMMENDED SPECIFICATION
Carbide Grinding – Toolroom Production			
Blanchard Grinding • Vertical Spindle Surface Grinding	10", 11", 16" & 18" diameters Type 2A2T	Wet – solid carbide • 1" or larger pieces – roughing • Small pieces Carbide & steel (combination)	SD100-R75B99E* ASD100-R75B99E* ASD100-R75B99E*
Hand • Burr Grinding	6" x 3/32" x 1-1/4" Type 1V1P V – 20° ME89562	Dry	ASDC320B-R125B99
Centerless (wet) • Throughfeed Grinding • Unison Dedtru Grinder	12", 14", 16", 18", & 20" diameters Type 1A1 7" x 1" x 1-1/4" Type 1A1	Roughing	ASD100-R75B99E* ASD150-R75B99E*
Cutting Off (wet)	6" x .035" x 1-1/4" Type 1A1R ME43572 10" x .050" x 1-1/4" Type 1A1R ME43565	• Most durable • Free cutting	ASD100S-R100B99 SD100-R75B99 SD120-R100B99
Cylindrical Grinding (wet)	10", 12", 14", 16" & 20" diameters Type 1A1	• Wet, rough grinding of cemented carbides, hard (55 Rc+) plasma and ceramic spray coatings • Wet, finish grinding of all carbides, plasma and ceramic spray coatings	ASD180-R100B99 ASD180-R75B99E* ASD150-R75B99 ASD120-R75B99 SD220-R100B99E*
Tool Sharpener Grinder (wet) • Bench Type	5" x 1" x 1-1/4" Type 6A2H ME27084 Rim Width (W) = 1-1/16	Tool sharpening	SD320-R50B99
Hand Honing (dry)	Various sizes Type HH1 or HH2		ASD100-R100B99 SD320-100V99
Lamination Dies (wet)	Various sizes Type 1A1	Surface grinding of carbide	ASD120-R75B99
Surface Grinding (wet) • Straight Wheels	Various sizes Type 1A1	Roughing • Durable • Free cutting Finishing only General purpose	ASD100S-R100B99E* SD100S-R100B99 SD220-R100B99 ASD150-R75B99
Tool & Cutter Grinding	Various sizes Type 11V9, 12V9 or 15V9	Wet or dry	ASD120-R7599
Carbide Grinding – Offhand			
Single-Point Carbide Tools	6" x 3/4" x 1-1/4" Type 6A2C ME27853	Wet roughing • Durable • Free cutting Wet finishing • Durable • Free cutting Wet or dry grinding where free cutting and self-dressing wheels are required • Roughing • Finishing	RMD150-P50V99* SD150-P50V99 RMD220-P50V99* SD220-P50V99* ASD120-R75B99 SD220-R50B99

NOTE: DIAMOND DEPTHS ARE NOT INDICATED IN ABOVE LISTINGS. WHEN ORDERING, BE SURE TO INCLUDE DIAMOND DEPTH (1/16, 1/8, ETC.).
***NON-STOCK: REFER TO THE NORTON SUPERABRASIVES STANDARD PRODUCT CATALOG FOR B99E EXPRESS MADE-TO-ORDER WHEELS.**



CBN Wheel Starting Recommendations

APPLICATION OR COMMON MACHINE TYPE	COMMON WHEEL SIZE, TYPE & BLUEPRINT	APPLICATION VARIABLES	RECOMMENDED SPECIFICATION
Toolroom Grinding			
Cutter Sharpening • Milling Cutters, Broaches, Reamers, etc.	3-3/4" x 1-1/2" x 1-1/4" Type 11V9 ME92192	Dry Wet	Aztec III 120T CB120-TB99
	6" x 1" x 1-1/4" Type 12A2 ME27758	Wet or dry	CB120-TB99
	6" x 3/4" x 1-1/4" Type 12V9 ME48666	Wet or dry	CB120-TB99
	6" x 3/4" x 1-1/4" Type 15V9 ME40633	Wet or dry	CB100-WB99E*
	10" x 1/2" x 3" Type 1A1	Wet or dry	CB100-TB99E*
Surface Grinding	12" x 1/2" x 3" Type 1A1	Wet or dry	CB150-WB99E*
Cylindrical Grinding	Thinner Than 1/2" Type DW	Wet or dry	CB100-WB99
Internal Grinding Tools	1/2" or Thicker Type 1A1	Wet or dry	CB120-TB99E*
	7" x .040" x 1-1/4" Type 1A1R	Water-base coolant	CB120-WB99E*

NOTE: CBN DEPTHS ARE NOT INDICATED IN ABOVE LISTINGS. WHEN ORDERING, BE SURE TO INCLUDE CBN DEPTH (1/16, 1/8, ETC.)
*** NON-STOCK: REFER TO THE NORTON SUPERABRASIVES STANDARD PRODUCT CATALOG FOR B99E EXPRESS MADE-TO-ORDER WHEELS.**

Expected Surface Finish by Grit Size

Use these charts as guides only. Surface finish is affected by a number of variables i.e., machine type and condition, type of material ground, coolant, wheel speed, bond system, etc.

DIAMOND GRIT SIZE	EXPECTED FINISH MICRO INCH AA	MAXIMUM DEPTH OF CUT PER PASS FOR GRIT SIZE	CBN GRIT SIZE	EXPECTED FINISH WITH OSCILLATION	EXPECTED FINISH PLUNGE
100	24 to 32	0.001" to 0.002"	100	35 – 40	40 – 45
120	16 to 18	0.001" to 0.002"	120	30 – 35	35 – 40
150	14 to 16	0.001" to 0.002"	150	25 – 30	30 – 35
180	12 to 14	0.0007" to 0.001"	180	20 – 25	25 – 30
220	10 to 12	0.0007" to 0.001"	220	15 – 20	20 – 25
320	8	0.0004" to 0.0006"	320	10 – 15	15 – 20
400	7 to 8	0.0003" to 0.0005"	400	4 – 8	5 – 10

Recommended Wheel Speeds for Diamond and CBN Wheels

	WET GRINDING		DRY GRINDING	
	CUP WHEELS	PERIPHERAL WHEELS	CUP WHEELS	PERIPHERAL WHEELS
Diamond Grinding Wheels				
	11V9, 12V9, 15V9, etc.	1A1, 1V1, 1A1R, etc.	11V9, 12V9, 15V9, etc.	1A1, 1V1, 1A1R, etc.
Resin Bond Wheels	4921 to 7874 SFPM 25 to 40 m/s	4921 to 7874 SFPM 25 to 40 m/s	2756 to 3543 SFPM 14 to 18 m/s	2756 to 3543 SFPM 14 to 18 m/s
Metal Bond Wheels		3937 to 5906 SFPM 20 to 30 m/s		
Vitrified Bond Wheels	2953 to 5906 SFPM 15 to 30 m/s	2953 to 5906 SFPM 15 to 30 m/s		
CBN Grinding Wheels				
Resin Bond Wheels	5906 to 9843 SFPM 30 to 50 m/s	5906 to 9843 SFPM 30 to 50 m/s	2953 to 5906 SFPM 15 to 30 m/s	2953 to 5906 SFPM 15 to 30 m/s

NOTE: THESE ARE NOT THE MAXIMUM OPERATING SPEEDS (MOS). CONSULT ANSI B7.1 OR CALL YOUR NORTON REPRESENTATIVE FOR MOS.

TECHtips

■ Avoid Grinding Steel

- Avoid steel when grinding with diamond wheels. Keep the amount of steel ground to an absolute minimum.
- On brazed tools, use an aluminum oxide wheel to back off the steel shank.
- A high lubricity grinding fluid should be used.
- For some steels, an armored (AMD) diamond wheel may prove most economical.

■ Work Support – 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, centerholds should be properly prepared.
- Minimize work overhang.
- If the ground work is supported by a work finger, ensure the finger is strong enough to provide vibration-free support.



It is the user's responsibility to refer to and comply with ANSI B7.1

■ Coolant – Grind Wet

- Diamond wheels should be used with a full flood coolant properly directed toward the grinding zone. Water with a rust inhibitor is recommended.
- Vitriified diamond wheels should be used only with a coolant.
- When a flood application can not be used, try a mist or spray application.
 - Use compressed air to “atomize” water or soluble oil.
 - Direct the spray at the grinding zone to help dissipate heat and prevent heat damage to the work.

■ Feeds – Avoid Excessive Feeds

- Excessive feeds will result in premature wheel wear. Excessive feed rates are characterized by:
 - A hard grinding sound
 - Chatter
 - Burn
 - High wheel wear rate
 - Vibration

SPECcheck

Troubleshooting Guide – Dry Grinding

PROBLEM	POSSIBLE CAUSES	SUGGESTED CORRECTION
Burning (excessive heat)	Wheel loaded or glazed Excessive feed rate Wheel too durable	Dress wheel with a dressing stick Reduce infeed of wheel or workpiece Use freer cutting specification or slow down wheel speed
Poor finish	Grit size too coarse Excessive feed rate	Select a finer grit size Reduce infeed of wheel or workpiece
Chatter	Wheel out of truth	True wheel; ensure it is not slipping on mount (See “Mounting, Truing and Dressing Guide”)

Troubleshooting Guide – Wet Grinding

PROBLEM	POSSIBLE CAUSES	SUGGESTED CORRECTION
Burning (excessive heat)	Wheel glazed or loaded Poor coolant placement Excessive material removal rate	Re-dress wheel Apply coolant directly to wheel/workpiece interface Reduce downfeed and/or crossfeed
Poor finish	Excessive dressing Grit size too coarse Poor coolant flow or location	Use lighter dressing pressure Stop dressing as soon as wheel starts to consume stick rapidly Select a finer grit size Apply heavy flood so it reaches wheel/work interface
Chatter Wheel will not cut	Wheel out of truth Glazed by truing Wheel loaded	True wheel; ensure it is not slipping on mount Dress lightly until wheel opens up Dress lightly until wheel opens up Increase coolant flow to keep wheel surface clean Never run wheel with coolant turned off
Slow cutting	Low feeds and speeds	Increase feed rate; increase wheel speed (Observe maximum wheel speed)
Short wheel life	Incorrect coolant flow Low wheel speed Excessive dressing Wheel too soft or too hard	Apply coolant to flood wheel/work surface Increase wheel speed (observe maximum operating speed) Use lighter dressing pressure Change grit or grade; use higher concentration

Wheel Speed Calculation:

TO CONVERT M/S TO SFPM: MULTIPLY M/S X 196.85 = SFPM

EXAMPLE: 40 M/S X 196.85 = 7874 SFPM

TO CONVERT SFPM TO M/S: DIVIDE SFPM BY 196.85 = M/S

EXAMPLE: 5423 SFPM ÷ 196.85 = 27.5 M/S

TO CONVERT RPM TO SFPM: MULTIPLY WHEEL DIAMETER X RPM X 0.262

EXAMPLE: 6" DIAMETER X 3450 RPM X 0.262 = 5423 SFPM

M/S = Meters/Second

RPM = Revolutions Per Minute

SFPM = Surface Feet Per Minute

Diamond and CBN Wheel Mounting, Truing and Dressing Guide

To achieve the best results using Norton diamond and CBN products, the following steps for mounting, truing and dressing should be practiced:

MOUNTING – Putting Wheel on Machine Spindle

- Examine wheel flanges and spindle carefully.
- Be sure flanges' surfaces are clean and free of damage.
- Ensure that the mounting flanges are flat and of equal diameter, especially on wheels with rigid centers, such as vitrified bond wheels.
- Inspect machine spindle for excessive runout.
 - TIR (Total Indicated Runout) should be no greater than 0.0002".
- Mount wheel between hand-tightened flanges.
- Using a dial indicator, tap the wheel lightly with a rubber or wooden block to minimize runout to less than .0010".
- Tighten flange securely and recheck with indicator.
- Allow a newly mounted wheel to operate for one full minute before grinding.
- The use of one permanent mounting for the life of the wheel is recommended whenever possible:
 - If the grinding machine has a tapered spindle, mount each straight, flaring cup or dish wheel on a separate collet or adapter.
 - When changing wheels the entire unit is removed, keeping the wheel 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 retrueing.

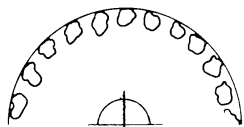
TRUING – Making Wheel Round and Concentric with the Spindle Axis

- Prior to truing the wheel, run a wax crayon over the wheel face. Important: do not use any liquid based ink on superabrasive wheels.
- Any crayon left on the wheel face after truing will reveal untrued areas.
- Indicate the superabrasive wheel runout before starting... usually within .001" to .002", to minimize wheel loss.
- Norton Brake Controlled Truing Devices are most commonly used to true Diamond and CBN straight, cup and cylinder wheels.
 - Mount the device spindle parallel to the wheel spindle to ensure proper straight face truing.
 - For cup wheels, the device spindle will be mounted perpendicular to the wheel spindle.
 - Always use Brake Controlled Truing Device dry.
 - Bring the diamond/CBN wheel and the truing wheel together until they almost touch.
- Start the diamond/CBN wheel to normal speed; start the truing wheel in the same direction.
- Bring the two wheels together until they touch.
- Make sure the truing wheel is spinning at time of contact.
- Traverse the wheel back and forth at 30 to 60 inches per minute.
- Downfeed .0005" to .001" at the end of each traverse.
- At the end of truing, the diamond/CBN wheel should be smooth and in truth.
- Apply a dressing stick to sharpen the truing wheel.
- See the "Diamond Tool" section for Brake Controlled Truing Devices and wheel operating recommendations.

DRESSING – Opening the Face of a Trued Wheel

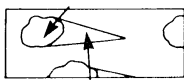
- Dressing the abrasive – a cleaning/sharpening process to expose sharp, free-cutting grit:
 - For resinoid and vitrified bond wheels, the dressing stick should be one or two grit sizes finer than the abrasive in the diamond/CBN wheel – in a soft grade such as H or I.
 - For metal bond wheels, choose a stick with the same grit or one grit coarser than the wheel abrasive – in a medium grade (K – M).
 - See the "Dressing Stick" section for recommendations.
- Dressing the core – The core material (the part of the wheel that holds and supports the abrasive-bearing section) should never contact the work piece during grinding; rubbing will generate excessive heat. As the abrasive section of a cup wheel wears, the core material might become exposed, necessitating dressing.
 - Use a single-point carbide or steel tool to dress an exposed resaloy core.
 - Clamp the tool in a vise.
 - Direct the cutting edge accurately to leave a 1/16" of abrasive section exposed.

PROPERLY DRESSED WHEEL FACE

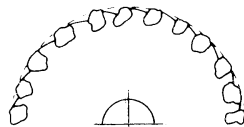


**AFTER TRUING
THE WHEEL FACE IS SMOOTH AND
CLOSED**

AFTER DRESSING CBN GRIT

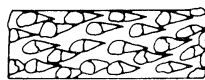


**TAIL
(BOND SUPPORTING GRIT)**



**AFTER DRESSING
THE WHEEL FACE IS OPEN WITH THE
GRITS EXPOSED, READY FOR
EFFICIENT GRINDING ACTION**

AFTER DRESSING



**PATH CONNECTING THE TAILS FOR
COOLANT AND CHIP FLOW**



NORTON

SIZE D X T	BETTER	
	SPEC	UPC NO.

TYPE DW MOUNTED POINTS – DIAMOND

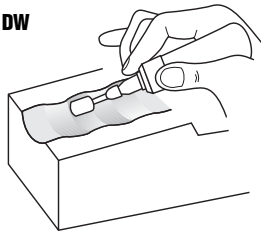
1/8 x 1/4 Steel Spindle 1/8 x 1-1/2	SD150-R100B99-SOLID SD220-R100B99-SOLID	69014192235 69014192236
3/16 x 1/4 Steel Spindle 1/8 x 1-1/2	SD100-R100B99-SOLID	69014192238
1/4 x 1/4 Steel Spindle 1/8 x 1-1/2	SD100-R100B99-SOLID	69014192240
3/8 x 1/4 Steel Spindle 1/8 x 1-1/2	SD100S-R100B99-SOLID	69014192243
1/2 x 1/2 Steel Spindle 1/4 x 1-1/2	SD100S-R100B99-SOLID SD220-R100B99-SOLID	69014192248 69014192249
3/4 x 3/8 Steel Spindle 1/4 x 1-1/2	SD150-R100B99-SOLID	69014192251
1 x 1/2 Steel Spindle 1/4 x 1-1/2	SD100-R100B99-SOLID	69014192428

TYPE DW MOUNTED POINTS – CBN

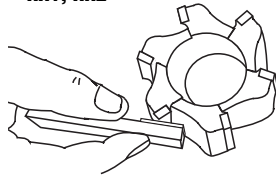
3/16 x 1/4 Carbide Spindle .125 x 1-3/4	CB150-WB99-SOLID	69014192258
1/4 x 1/4 Carbide Spindle .125 x 1-3/4	CB120-WB99-SOLID	69014192260
3/8 x 3/8 Carbide Spindle .250 x 2-1/4	CB100-WB99-SOLID	69014192266
1/2 x 1/2 Carbide Spindle .250 x 2-1/4	CB100-WB99-SOLID	69014192272
3/4 x 1/4 Carbide Spindle .250 x 2-1/4	CB100-WB99-SOLID	69014192276
1 x 1/4 Carbide Spindle .250 x 2-1/4	CB100-WB99-SOLID	69014192277

STANDARD PACKAGE = 1 MOUNTED POINT

DW



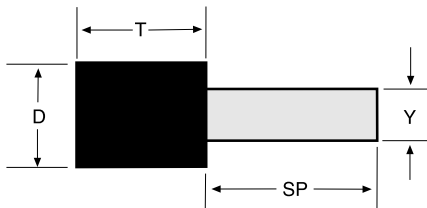
HH1, HH2



Type DW

D - DIAMETER

T - THICKNESS
Y - SPINDLE DIAMETER
SP - SPINDLE LENGTH



SIZE T X W X L	BETTER	
	SPEC	UPC NO.

TYPE HH1 HAND HONES – DIAMOND

1/4 x 1/4 x 6 One 1/16 deep 1" long insert in one 1/4 surface	ASD220-R100B99-1/16	69014192139
1/4 x 3/8 x 4 One 1/16 deep 1" long insert in one 3/8 surface	ASD100-R100B99-1/16	69014192141
	ASD180-R100B99-1/16	69014192142
	ASD220-R100B99-1/16	69014191670
	ASD320-R100B99-1/16	69014191672
	ASD400-R100B99-1/16	69014192143
	D10/20MIC-R100B99-1/16	69014192144
	SD220-100V99-1/16 SD320-100V99-1/16	69014191671 69014192140

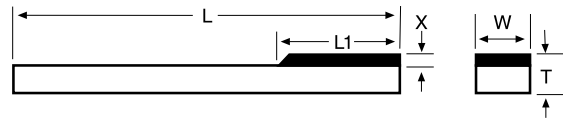
TYPE HH2 HAND HONES – DIAMOND

1/4 x 3/8 x 4 Two 1/16 deep 1" long inserts in one 3/8 surface	ASD120/220-R100B99-1/16	69014192150
	ASD150/320-R100B99-1/16	69014192177
	ASD220/320-R100B99-1/16	69014192178
	ASD220/400-R100B99-1/16	69014192179
	ASD320/400-R100B99-1/16	69014192180
	SD220/320-100V99-1/16	69014192149
	SD320/400-100V99-1/16	69014192182

STANDARD PACKAGE = 1 HAND HONE

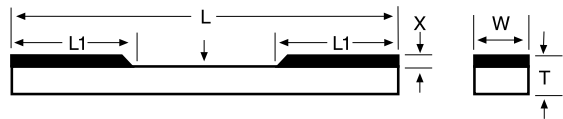
Type HH1

L - LENGTH
L1 - LENGTH OF ABRASIVE
X - ABRASIVE DEPTH
W - WIDTH
T - THICKNESS (BACK)



Type HH2

L - LENGTH
L1 - LENGTH OF ABRASIVE
X - ABRASIVE DEPTH
W - WIDTH
T - THICKNESS (BACK)

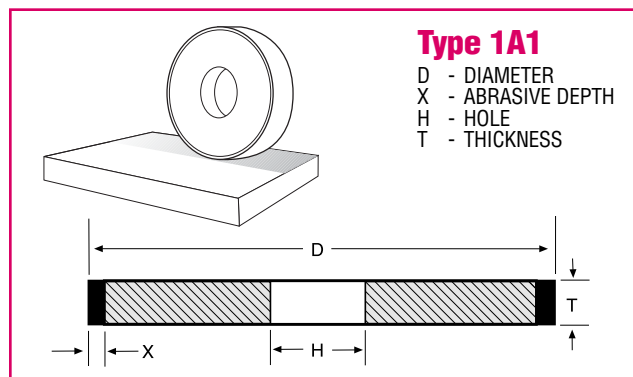


SIZE D X T X H	BETTER	
	SPEC	UPC NO.
TYPE 1A1 STRAIGHT – DIAMOND		
3/4 x 1/4 x 1/4	ASD150-R100B99-1/8	69014192174
1 x 1/4 x 1/4	SD100-R100B99-1/8	69014192175
1-1/2 x 1/2 x 1/2	D6/12MIC-N100B99-1/8	69014192176
2 x 1/8 x 1/4	SD100-R100B99-1/8	69014192184
3 x .006 x 1/2 (ME12098)	M3D220-N75M99-1/8	69014192342
3 x .010 x 1/2 (ME12098)	M4D220-L100M99-1/8	69014192345
3 x 1/4 x 3/4	SD180-R100B99-1/8	69014192187
4 x .020 x 1-1/4	SD320-R100B99-1/8	69014192188
4 x 1/32 x 1-1/4	SD100S-R100B99-1/4	69014192192
4 x 1/16 x 1-1/4	SD100S-R100B99-1/4	66260273583
	SD150-R100B99-1/4	66260273584
	SD220-R100B99-1/4	66260273586
4 x 1/8 x 3/4	SD150-R100B99-1/8	69014192024
4 x 1/8 x 1-1/4	SD150-R100B99-1/8	69014191677
4 x 1/4 x 1/2	SD150-R100B99-1/4	66260273590
4 x 1/4 x 3/4	SD150-R100B99-1/4	66260273592
4 x 1/4 x 1-1/4	SD100S-R100B99-1/4	66260273587
	SD120-R100B99-1/4	66260273588
	SD150-R100B99-1/4	66260273589
4 x 1/2 x 1-1/4	SD150-R100B99-1/4	66260273594
6 x 1/32 x 1-1/4	SD220-R100B99-1/8	69014192197
6 x 1/16 x 1-1/4	SD100-R100B99-1/4	66260273596
	SD150-R100B99-1/4	66260273597
	SD180-R100B99-1/4	66260273598
	SD220-R100B99-1/4	66260273599
6 x 1/8 x 1-1/4	ASD150-R75B99-1/4	66260273617
	SD100-R100B99-1/4	66260273611
	SD120-R100B99-1/4	66260273612
	SD150-R100B99-1/4	66260273613
	SD180-R100B99-1/4	66260273614
	SD220-R100B99-1/4	66260273615
6 x 1/4 x 1-1/4	ASD100S-R75B99-1/8	69014192205
	ASD120-R75B99-1/8	69014191689
	ASD150-R75B99-1/8	69014191690
	ASD120-R75B99-1/4	69014192769
	ASD150-R75B99-1/4	66260273609
	ASD180-R75B99-1/4	69014192770
	ASD220-R75B99-1/4	69014192771
	ASD320-R75B99-1/4	69014192772
	RMD180-P100V99-1/8	69014192203
	SD120-R100B99-1/8	69014191691
	SD150-R100B99-1/8	69014191692
	SD180-R100B99-1/8	69014191693
	SD220-R100B99-1/8	69014191694
	SD220-R100B99-1/4	69014192764
6 x 3/8 x 1-1/4	ASD150-R75B99-1/8	69014191695
	ASD120-R75B99-1/4	69014192773
	SD150-R100B99-1/8	69014191696
6 x 1/2 x 1-1/4	ASD120-R75B99-1/8	69014191697
	ASD150-R75B99-1/8	69014191698
	ASD120-R75B99-1/4	69014192777
	ASD220-R75B99-1/4	69014192779
	ASD320-R75B99-1/4	69014192780

CONTINUED

SIZE D X T X H	BETTER	
	SPEC	UPC NO.
TYPE 1A1 STRAIGHT – DIAMOND		
6 x 1/2 x 1-1/4	SD120-R100B99-1/8	66260273557
	SD150-R100B99-1/8	69014191699
	SD180-R100B99-1/8	69014191700
	SD150-R100B99-1/4	66260273561
7 x 1/4 x 1-1/4	ASD150-R75B99-1/8	69014191701
	SD100S-R100B99-1/8	69014192210
	SD120-R100B99-1/8	69014191702
	SD150-R100B99-1/8	69014191703
	SD180-R100B99-1/8	69014191704
	SD220-R100B99-1/8	69014191705
	SD120-R100B99-1/4	66260273566
7 x 3/8 x 1-1/4	ASD150-R75B99-1/8	69014191848
	SD120-R100B99-1/8	69014191849
	SD220-R100B99-1/8	69014191852
7 x 1/2 x 1-1/4	ASD100-R75B99-1/8	69014192211
	ASD150-R75B99-1/8	69014191853
	ASD180-R75B99-1/8	69014192212
	SD120-R100B99-1/8	69014191854
	SD150-R100B99-1/8	69014191855
	SD180-R100B99-1/8	69014191856
	SD220-R100B99-1/8	69014191857
8 x 1/2 x 1-1/4	SD150-R100B99-1/8	66260273574
10 x 1/2 x 3	ASD120-R75B99-1/8	69014192305
	ASD180-R100B99-1/8	69014192306
12 x 1/2 x 3	ASD150-R75B99-1/8	69014192310
12 x 1/2 x 5	ASD150-R75B99-1/8	69014192311
12 x 1 x 3	ASD120-R75B99-1/8	69014192312
12 x 1 x 5	ASD120-R75B99-1/8	69014192313
14 x 1/2 x 5	ASD150-R75B99-1/8	69014192314
14 x 1 x 5	ASD120-R75B99-1/8	69014192316
20 x 1 x 12	ASD120-R75B99-1/8	69014192325

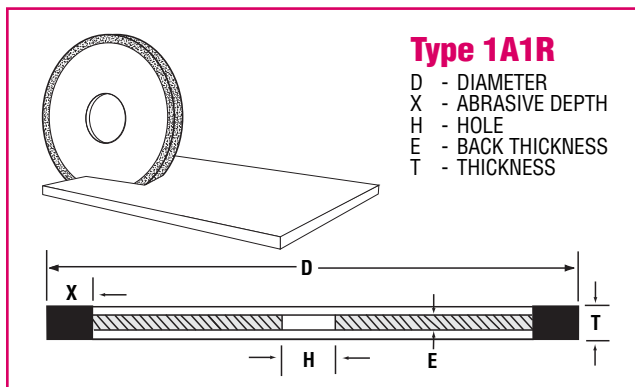
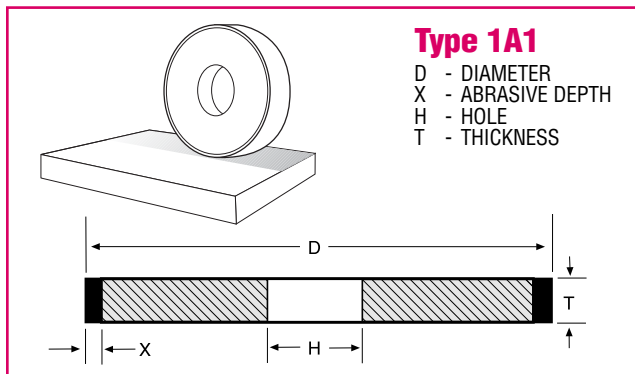
STANDARD PACKAGE = 1 WHEEL



Refer to “Brake Controlled Truing Devices” and “Dressing Sticks” sections for truing and dressing products.

SIZE D X T X H	BETTER	
	SPEC	UPC NO.
TYPE 1A1 STRAIGHT – CBN		
6 x 1/8 x 1-1/4	CB120-TB99-1/8	66260273601
6 x 1/4 x 1-1/4	CB120-TB99-1/8	66260273605
6 x 1/2 x 1-1/4	CB120-TB99-1/8	66260273607
7 x 1/4 x 1-1/4	CB120-TB99-1/8	69014192021
7 x 1/2 x 1-1/4	CB120-TB99-1/8	66260273567
12 x 1/2 x 5	CB150-TB99-1/8	66260273560
12 x 1 x 5	CB150-TB99-1/8	66260273562

STANDARD PACKAGE = 1 WHEEL



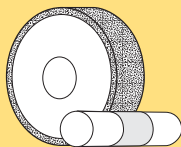
SIZE D X T X H	BETTER	
	SPEC	UPC NO.
TYPE 1A1R CUT-OFF – DIAMOND		
3 x .020 x 1/2 (ME104177)	M4D150-N50M99-1/8	69014192060
4 x .012 x 1/2 (ME104180)	M4D180-N75M99-1/8 M4D220-N75M99-1/8	69014192063 69014192064
4 x .020 x 1/2 (ME104180)	M4D220-N100M99-1/8	69014192067
4 x .030 x 1/2 (ME104180)	M4D150-N75M99-1/8	69014192068
4 x 1/32 x 3/4 (ME43570)	SD100S-R100B99-1/4 SD120-R100B99-1/4	69014192151 69014191706
4 x 1/32 x 1-1/4 (ME43570)	SD100S-R100B99-1/4	69014192152
5 x .015 x 1/2 (ME104180)	M4D150-N100M99-1/8 M4D220-N100M99-1/8	69014192069 69014192070
6 x .017 x 1-1/4 (ME104180)	M4D150-N100M99-1/8 M4D220-N100M99-1/8	69014192082 69014192083
6 x .025 x 1-1/4 (ME104180)	M4D150-N100M99-1/8	69014192086
6 x .035 x 5/8 (ME104177)	M4D100-N75M99-1/8	69014192088
6 x .035 x 1-1/4 (ME43572)	ASD120-R75B99-1/4 SD100-R75B99-1/4	69014191707 69014192155
	ASD100S-R100B99-1/4 ASD120-R100B99-1/4	69014192158 69014192159
	SD100-R100B99-1/4 SD100S-R100B99-1/4 SD220-R100B99-1/4	69014191858 69014192156 69014192157
6 x .035 x 1-1/4 (ME73316)	ASD100S-R100B99-9/32 ASD120-R100B99-9/32	69014192164 69014192165
	SD100-R100B99-9/32 SD120-R100B99-9/32 SD150-R100B99-9/32	69014192161 69014192162 69014192163
6 x .045 x 1-1/4 (ME83991)	SD100-R50B99-1/8	69014192166
6 x .055 x 1-1/4 (ME104177)	M4D100-N75M99-1/8	69014192099
7 x .035 x 1-1/4 (ME82347)	ASD100-R100B99-1/4	66260238686
7 x .040 x 1-1/4 (ME104177)	M4D120-N75M99-1/8	69014192105
7 x .055 x 1-1/4 (ME104177)	M4D120-N100M99-1/8	69014192108
8 x .030 x 1-1/4 (ME104180)	M4D180-N75M99-1/8	69014192110

CONTINUED

TECHtips

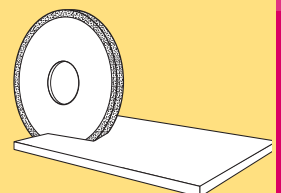
■ Cylindrical grinding applications – 1A1 wheels:

- Include all outside grinding of round parts, even though the finished product is not always a true cylinder.
- Infeed at both ends of the traverse to keep wheel face flat.
- Use work supports to prevent deflection.
- Rough grinding traverse speed should be 1/2 to 2/3 of the thickness of the wheel per work revolution.
- Finishing grinding traverse speed should be 1/2" or less per work revolution.



■ Cut-off applications – 1A1R wheels:

- Use the largest diameter flanges possible
 - Use flanges of equal diameter
 - Use the thickest wheel possible for increased stiffness and straightness of cut
- CBN wheels are used on hardened steels.
 ■ Diamond wheels are used to cut or slot carbide, glass or ceramic parts.



It is the user's responsibility to refer to and comply with ANSI B7.1

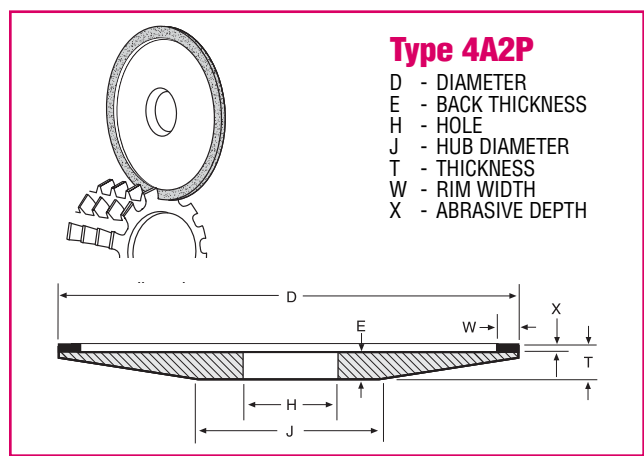
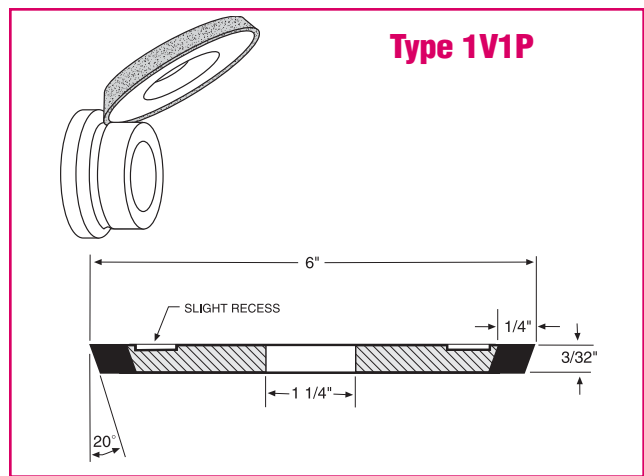
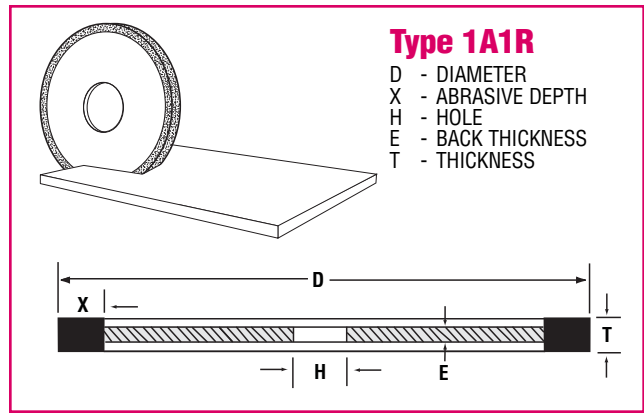
SIZE D X T X H	BETTER	
	SPEC	UPC NO.
TYPE 1A1R CUT-OFF – DIAMOND (CONT'D)		
8 x .045 x 5/8 (ME43569)	SD120-R100B99-1/4	69014192167
8 x .045 x 1 (ME43569)	SD120-R100B99-1/4	69014192168
8 x .045 x 1-1/4 (ME43569)	SD120-R100B99-1/4	69014192169
8 x .050 x 1-1/4 (ME104180)	M4D180-N75M99-1/8	69014192114
10 x .050 x 1-1/4 (ME 43565)	ASD120-R100B99-1/4 CD100-R100B99-1/4 SD120-R100B99-1/4	66260230236 69014192815 69014192170
10 x .050 x 3 (ME 43565)	ASD100S-R75B99-1/4	69014192172
12 x .070 x 3/4 (ME 43567)	SD150-R100B99-1/4	69014192173
14 x .070 x 3/4 (ME 106589)	SD120-R100B99-1/4	66260259011

TYPE 1A1R CUT-OFF – CBN		
6 x .035 x 1-1/4 (ME43572)	CB100-WB99-1/4	69014192160

TYPE 1V1P FLUTING – DIAMOND		
6 x 3/32 x 1-1/4 Face Bevel 1 Side 20 Deg Copper Core (ME89562)	ASD320B-R125B99-1/4 ASDC320C-R100B99-1/4	69014192302 69014192761

TYPE 4A2P DISH – DIAMOND		
6 x 3/8 x 1-1/4 Rim Width 1/4" (ME88369)	ASD120-R75B99-1/16	69014192280

STANDARD PACKAGE – 1 WHEEL



TECHtips

DIAMOND GRINDS:

- Cemented carbide
- Ceramics
- Plastics
- Abrasives
- Glass
- Fiberglass
- Stone
- Electronic components and materials

CBN GRINDS:

- High speed tool steels
- Hardened carbon steels
- Aerospace alloys
- Abrasion-resistant ferrous materials
- Die steels
- Alloy steels
- Hard stainless steel

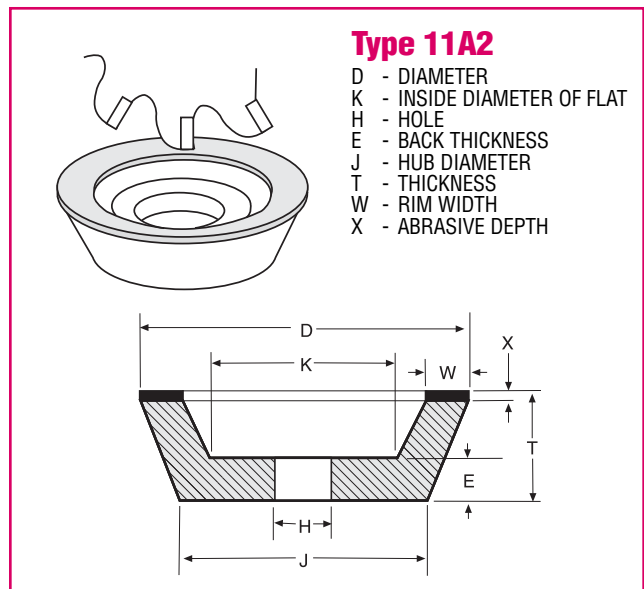
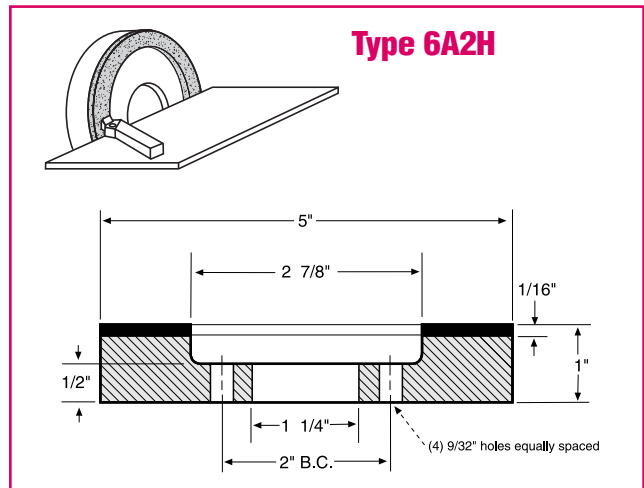
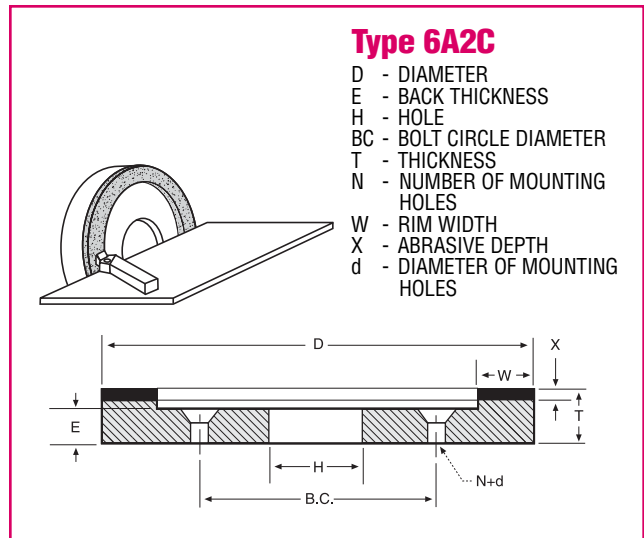
SIZE D X T X H	BETTER	
	SPEC	UPC NO.
TYPE 6A2C STRAIGHT CUP – DIAMOND		
6 x 7/16 x 1-1/4 Rim Width 1" (0640185M)	D120/140-H-MSL	66260269172
6 x 3/4 x 1-1/4 Rim Width 3/4" (ME27853)	SD220-R50B99-1/16	69014191665
	ASD120-R75B99-1/16	69014191860
	ASD120-R75B99-1/8	69014192786
6 x 3/4 x 1-1/4 Rim Width 1/2" (ME30621)	SD150-P50V99-1/16	69014192217
	SD220-R50V99-1/16	69014191623
6 x 3/4 x 1-1/4 Rim Width 1/2" (ME30621)	ASD120-R75B99-1/8	66260273565
TYPE 6A2H STRAIGHT CUP – DIAMOND		
5 x 1 x 1-1/4 Rim Width 1-1/16" (ME27084)	SD320-R50B99-1/16	69014192221
TYPE 11A2 FLARING CUP – DIAMOND		
6 x 1-1/2 x 1-1/4 Rim Width 1/4" (ME128467)	ASD150-R100B99-1/4	69014192799

STANDARD PACKAGE = 1 WHEEL

Can't Find Your Specification Here? Refer to our B99 Express Made-To-Order Wheels Service



The Norton B99 Express line is designed to offer you up to 65,000 made-to-order choices of resin bond Diamond and CBN wheels. 25 wheel shapes are available. Size and shape availability are shown in the Norton Superabrasive Standard Product Catalog. 12" and less diameter B99 Express wheels will ship within two weeks from the date the order is received by Norton. 14" and greater diameter B99 made-to-order wheels will ship within standard lead-times.

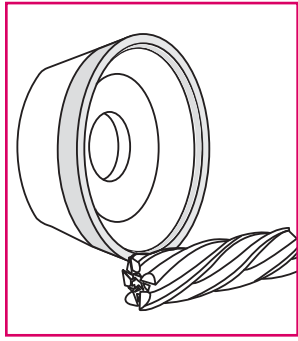


Refer to "Brake Controlled Truing Devices" and "Dressing Sticks" sections for truing and dressing products.

DIAMOND AND CBN PRODUCTS

BEST ASD Diamond / B105 Bond Wheels – Ideal for dry grinding carbide tools	
FEATURES	BENEFITS
• Premium quality diamond	• Produces keen cutting tools that hold their shape, are easier to sharpen, and require fewer reconditionings
• Advanced, heat-reducing bond	• Minimizes heat generation and thermal damage to tool • Increases tool life and productivity • Lasts more than 2X as long as standard diamond wheels • Lowest total wheel costs; highest productivity
• Self-lubricating bond	• No steel or braze loading • Uses less power
• Unique self-dressing core	• Eliminates wheel core damage • Eliminates downtime to dress core

SIZE D X T X H	BEST		BETTER	
	SPEC	UPC NO.	SPEC	UPC NO.
TYPE 11V9 FLARING CUP – DIAMOND				
3 x 1-1/4 x 3/4 Insert Length 3/8" (ME93912)			ASD120-R75B99-1/16	69014192291
			ASD150-R75B99-1/16	69014192292
			SD150-R100B99-1/16	69014192293
3-3/4 x 1-1/2 x 3/4 Insert Length 3/8" (ME92192)			ASD120-R75B99-1/16	69014192022
3-3/4 x 1-1/2 x 1-1/4 Insert Length 3/8" (ME92192)			ASD150C-R50B99-1/8	69014190751
	ASD100S-R75B105-1/16	69014191904	ASD120-R75B99-1/16	69014191660
	ASD120-R75B105-1/16	69014191905	ASD150-R75B99-1/16	69014191725
	ASD150-R75B105-1/16	69014191906	ASD180-R75B99-1/16	69014191658
			ASD220-R75B99-1/16	69014192363
	ASD100S-R75B105-1/8	69014191908	ASD100S-R75B99-1/8	69014191653
	ASD120-R75B105-1/8	69014191909	ASD120-R75B99-1/8	69014191652
	ASD150-R75B105-1/8	69014191910	ASD150-R75B99-1/8	69014191651
			ASD180-R75B99-1/8	69014191650
			SD120-R100B99-1/16	69014191657
			SD150-R100B99-1/16	69014191656
			SD220-R100B99-1/16	69014191654
			SD320-R100B99-1/16	69014192814
			SD100S-R100B99-1/8	69014192427
			SD120-R100B99-1/8	69014191649
		SD150-R100B99-1/8	69014191648	
		SD180-R100B99-1/8	69014191647	
		SD220-R100B99-1/8	69014191646	
5 x 1-3/4 x 1-1/4 Insert Length 7/16" (ME98298)	ASD120-R75B105-1/16	69014191913	ASD100S-R75B99-1/16	69014191645
	ASD150-R75B105-1/16	69014191914	ASD120-R75B99-1/16	69014191644
			ASD150-R75B99-1/16	69014191643
	ASD100S-R75B105-1/8	69014191916	ASD100S-R75B99-1/8	69014191637
	ASD120-R75B105-1/8	69014191917	ASD120-R75B99-1/8	69014191636
	ASD150-R75B105-1/8	69014191918	ASD150-R75B99-1/8	69014191635
			ASD180-R75B99-1/8	69014191634
			ASD320-R75B99-1/8	69014192810
			SD120-R100B99-1/16	69014191641
			SD150-R100B99-1/16	69014191640
			SD180-R100B99-1/16	69014191639
			SD220-R100B99-1/16	69014191638
			SD150-R100B99-1/8	69014191632
			SD180-R100B99-1/8	69014191631

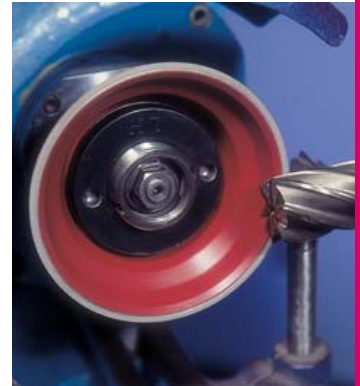


STANDARD PACKAGE = 1 WHEEL

DIAMOND AND CBN PRODUCTS

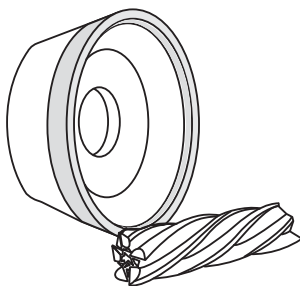
BEST Norton Aztec CBN Wheels – Ideal for dry tool reshaping	
FEATURES	BENEFITS
<ul style="list-style-type: none"> • Consistent, high quality CBN abrasive • Advanced heat-reducing bond conducts heat away from the workpiece 	<ul style="list-style-type: none"> • 85% longer life than standard CBN wheels • Eliminates heat build-up and damage • Extends wheel life • Freer cutting action • Maintains cutting tool steel integrity • Extends cutting tool life
AZTEC III	<ul style="list-style-type: none"> • Eliminates steel and braze loading • Reduces drag • Allows greater infeeds
AZTEC .007	<ul style="list-style-type: none"> • High stock removal rate • Heaviest cuts with less wheel wear • Lower grinding forces • Elimination of chatter

SIZE D X T X H	BEST		BETTER		
	SPEC	UPC NO.	SPEC	UPC NO.	
TYPE 11V9 FLARING CUP – CBN					
3-3/4 x 1-1/2 x 1-1/4 Insert Length 3/8" (ME92192)	AZTEC .007-100-1/16	69014195683			
	AZTEC .007-150-1/16	69014195679			
	AZTEC .007-150-1/8	69014195680			
	AZTEC III 100T-1/16	69014191832	CB100-TB99-1/16	69014191719	
	AZTEC III 120T-1/16	69014191833			
	AZTEC III 150T-1/16	69014191834			
	AZTEC III 100T-1/8	69014191838	CB100-TB99-1/8	69014191722	
	AZTEC III 120T-1/8	69014191839	CB120-TB99-1/8	69014191723	
	AZTEC III 150T-1/8	69014191840	CB150-TB99-1/8	69014191724	
		AZTEC III 100W-1/16	69014191835	CB120-WB99-1/16	69014191720
	AZTEC III 150W-1/16	69014191837	CB150-WB99-1/16	69014191721	
5 x 1-3/4 x 1-1/4 Insert Length 7/16" (ME98298)	AZTEC .007-100-1/16	69014195685			
	AZTEC .007-100-1/8	69014195686			
	AZTEC .007-150-1/8	69014195682			
	AZTEC III 100T-1/16	69014191841	CB100-TB99-1/16	69014191711	
	AZTEC III 120T-1/16	69014191842	CB150-TB99-1/16	69014192300	
	AZTEC III 150T-1/16	69014191843			
		AZTEC III 100T-1/8	69014191844	CB120-TB99-1/8	69014191715
				CB150-TB99-1/8	69014191716



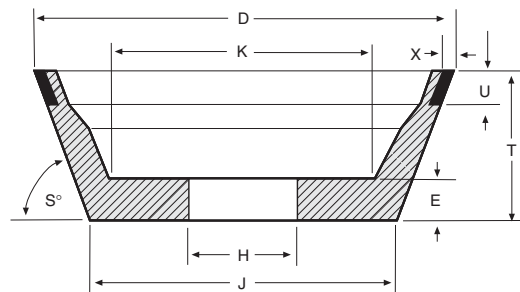
STANDARD PACKAGE – 1 WHEEL

Refer to “Brake Controlled Truing Devices” and “Dressing Sticks” sections for truing and dressing products.



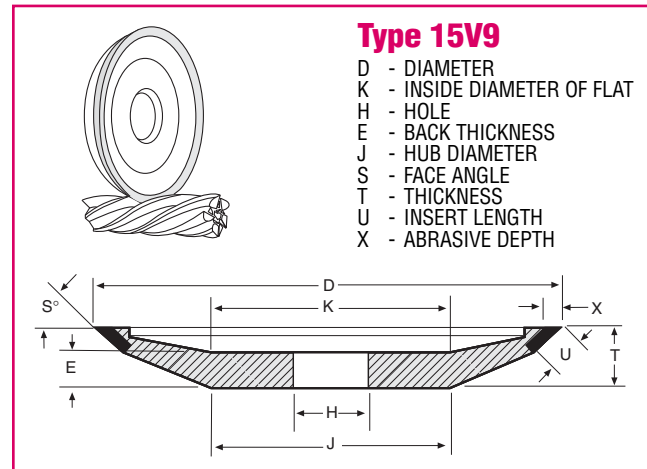
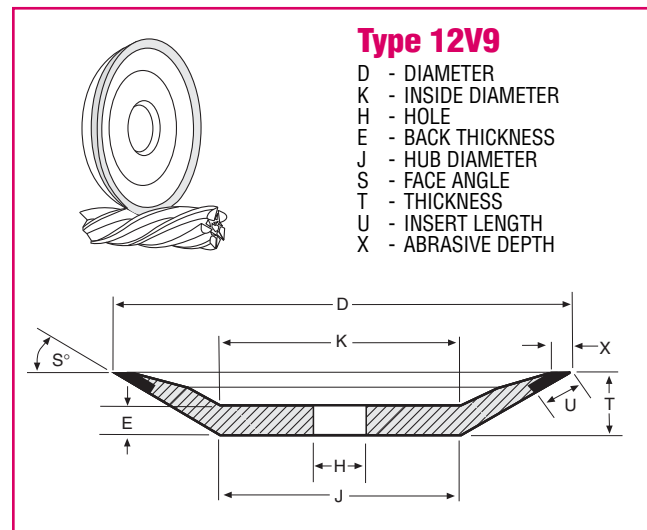
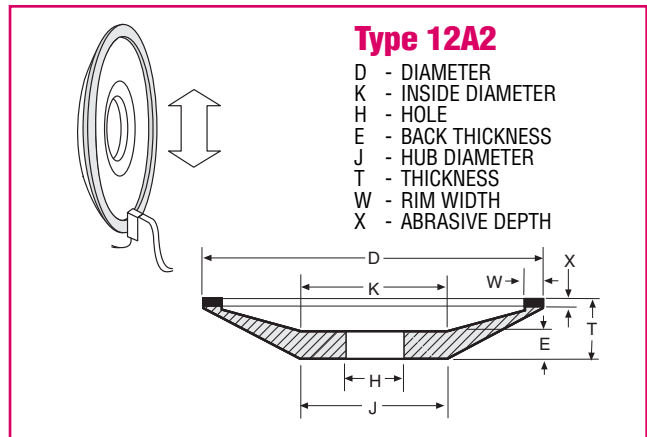
Type 11V9

- D - DIAMETER
- K - INSIDE DIAMETER OF FLAT
- H - HOLE
- E - BACK THICKNESS
- T - THICKNESS
- J - HUB DIAMETER
- U - INSERT LENGTH
- X - ABRASIVE DEPTH
- S - FACE ANGLE



SIZE D X T X H	BETTER	
	SPEC	UPC NO.
TYPE 12A2 DISH – DIAMOND		
4 x 1/2 x 1-1/4 Rim Width 1/4" (ME40745)	SD180-R75B99-1/8	69014192223
6 x 1 x 1-1/4 Rim Width 3/16" (ME27758)	ASD120-R75B99-1/8 ASD180-R75B99-1/8	69014191630 69014192226
TYPE 12A2 DISH – CBN		
6 x 1 x 1-1/4 Rim Width 3/16" (ME27758)	CB120-TB99-1/16	69014192227
TYPE 12V9 DISH – DIAMOND		
3 x 7/16 x 3/4 Insert Length 7/16" (ME41755)	SD150-R100B99-1/16	69014192228
4 x 1/2 x 1-1/4 Insert Length 1/4" (ME58734)	SD180-R100B99-1/8	69014191629
6 x 3/4 x 1-1/4 Insert Length 3/8" (ME48666)	ASD150-R75B99-1/16	69014191628
TYPE 12V9 DISH – CBN		
4 x 1/2 x 1-1/4 Insert Length 1/4" (ME58734)	CB120-TB99-1/8	69014192229
6 x 3/4 x 1-1/4 Insert Length 3/8" (ME48666)	CB120-TB99-1/8 CB150-TB99-1/8	69014192020 69014192784
TYPE 15V9 DISH – DIAMOND		
6 x 3/4 x 1-1/4 Insert Length 3/8" (ME40633)	SD150-R100B99-1/16	69014192230

STANDARD PACKAGE = 1 WHEEL



TECHtips

DIAMOND GRINDS:

- Cemented carbide
- Ceramics
- Plastics
- Abrasives
- Glass
- Fiberglass
- Stone
- Electronic components and materials



It is the user's responsibility to refer to and comply with ANSI B7.1

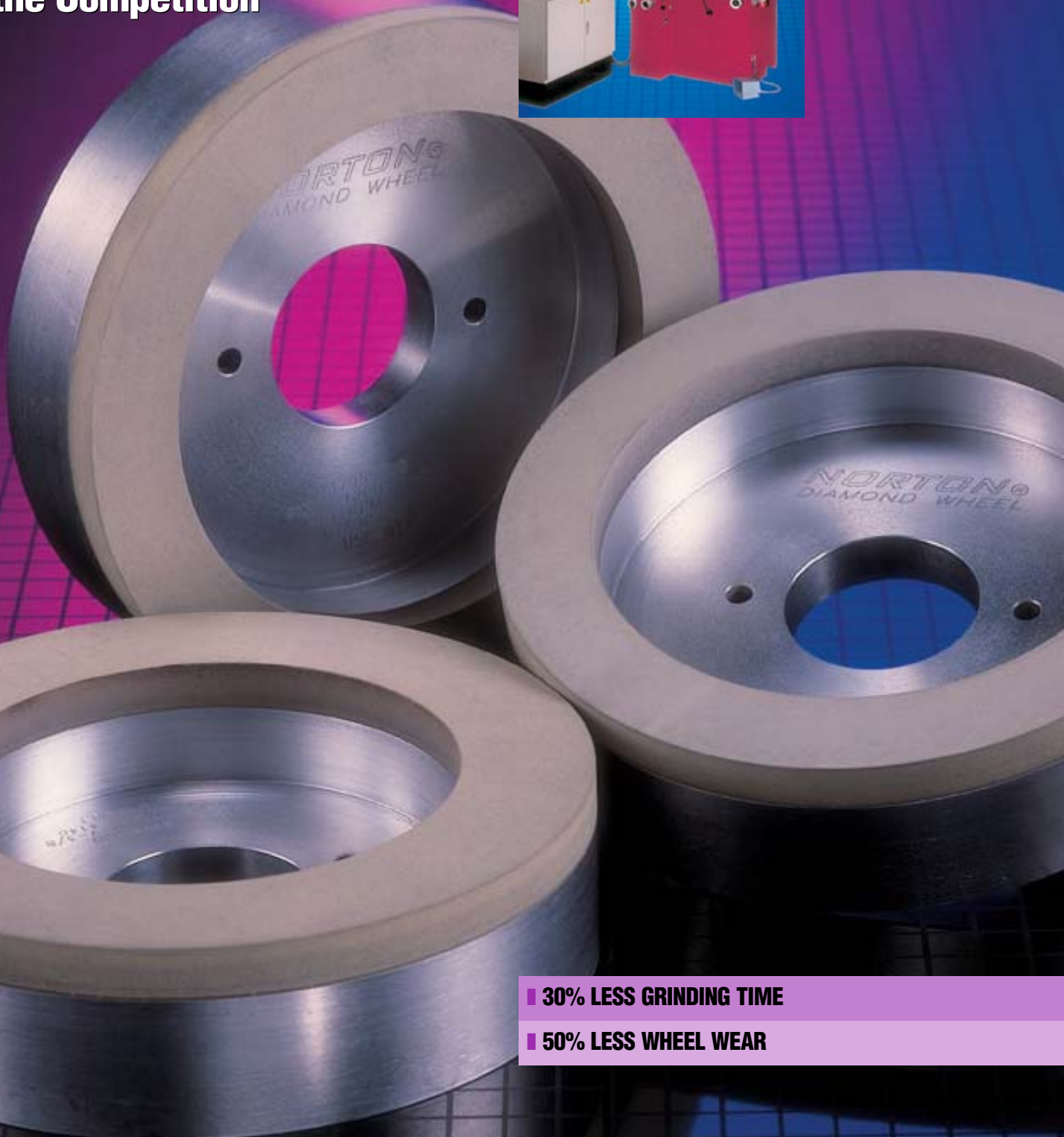
CBN GRINDS:

- High speed tool steels
- Hardened carbon steels
- Aerospace alloys
- Abrasion-resistant ferrous materials
- Die steels
- Alloy steels
- Hard stainless steel

NORTON

**DIAMOND VITRIFIED
VRF BOND WHEELS
FOR ROUGHING AND
FINISHING POLYCRYSTALLINE**

**Achieve Better Edges Faster
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the Competition**



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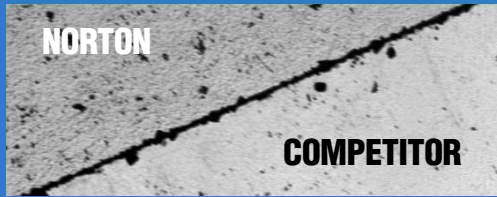
■ 30% LESS GRINDING TIME

■ 50% LESS WHEEL WEAR

DIAMOND VITRIFIED VRF BOND WHEELS

Longer Lasting and Faster Cutting Than Any Currently Available Superabrasive Wheel for PCD and PCBN Grinding

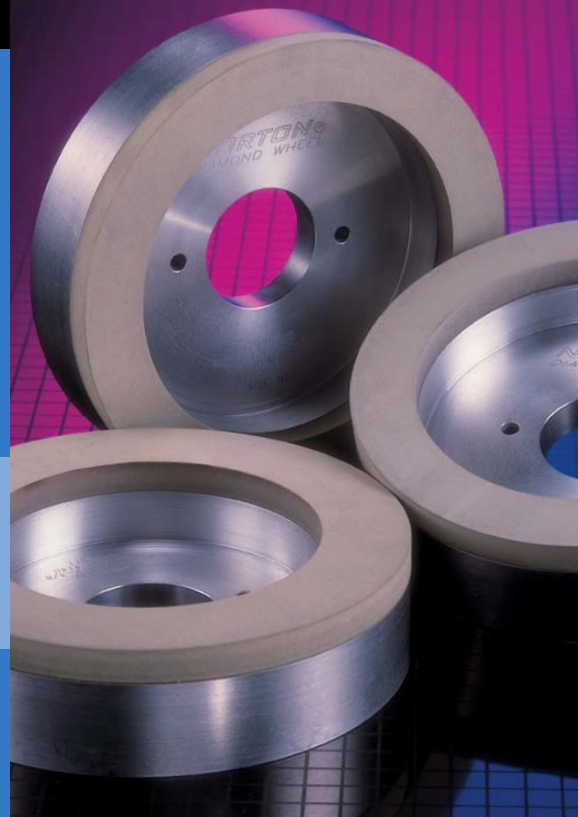
The new Norton VRF wheels can help you significantly lower your grinding costs per part by allowing you to produce more superior edges in less time. You can generate up to two times better edge quality with one VRF wheel that does both roughing and finishing operations.



MICROSCOPIC VIEW OF CUTTING TOOL EDGES

SINGLE NORTON VITRIFIED ROUGHING AND FINISHING WHEEL GENERATES SUPERIOR CUTTING EDGE VERSUS COMPETITIVE TWO-WHEEL OPERATION.

In on-the-job tests, the new VRF wheels achieved less flaking and chipping on CVD, and hard grade PCD inserts. An additional benefit of using one wheel for roughing and finishing is less chance of error when changing over wheels.



Suggested Starting Operating Parameters for both PCD and PCBN

	WHEEL SPEED	GRINDING PRESSURE	DRESSING STICK
Coborn RG6	1900 RPM	5+	400-600 grit roughing
	1900 RPM +	5+	800 grit finishing
Ewag RS12	1900 RPM roughing	400 Newtons	400-600 grit roughing
	2200 RPM finishing	400 Newtons	800 grit finishing
Ewag RS09	1900 RPM roughing	85-90 psi	400-600 grit roughing
	2200 RPM finishing	85-90 psi	800 grit finishing

Availability PCD1200VRF

3/4" RIM WIDTH	1" RIM WIDTH
6" x 1-1/2" x 40mm 6A2HA	
UPC #66260259642	UPC #66260259641
ME178318	ME176936
6" x 1-7/8" x 40mm 6A2HA	
UPC #66260260043	UPC #66260260044
ME178409	ME178410

THESE WHEELS FIT BOTH THE EWAG AND COBORN MACHINES.

case history



ON PCD	WW / TOOL	GRIND TIME	WW	TIME	EDGE
Competition 800	0.0035"	3:09 min.	100%	100%	Good
PCDF1200VRF	0.00021"	2:16 min.	60%	70%	2X better
Competition 1000	0.00064"	3:42 min.	100%	100%	Good
PCDF1200VRF	0.00043"	2:48 min.	50%	70%	Equal Edge

Best

For most abrasive applications, Norton offers up to three product performance levels – GOOD, BETTER and BEST. Norton Diamond Vitrified VRF Bond Diamond Wheels are in the BEST tier. They represent products that are unmatched in the industry and provide the lowest total cost for the application.

To put Norton abrasives to work, contact your local Norton distributor. Call (508) 795-5000 or email us at buynorton@nortonabrasives.com and we'll put you in contact with your local Norton industrial distributor. Or, visit our website at www.nortonabrasives.com to view our online catalog and learn about our latest products and applications.

NORTON

YOUR SOURCE FOR COST SAVING ABRASIVE SOLUTIONS™

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