

# **SA** SUPERABRASIVES

## **MAXIMIZER VITRIFIED CBN PRODUCTS**

**GRINDING WITH CBN IS NOW YOUR OPTION  
WITH 2 BOND STRUCTURES TO CHOOSE FROM**

### **The Maximizer**

FOR ROTARY DRESSING APPLICATIONS

### **The MaximizerST**

FOR ROTARY OR SINGLE POINT TECHNOLOGY APPLICATIONS



# About Us

Founded in 1977, SuperAbrasives, Inc. specializes in the design, manufacture and application of diamond and CBN grinding and finishing products and services for a wide range of industries. These include: Automotive, Aerospace, Medical, Electronics, Custom Job Production, Cutting Tool Fabrication, Wood Working, as well as many others.

Since our beginning we have prided ourselves on effectively providing our customers with the most cost-efficient solution for the job. Today, our product line includes Vitrified Ceramic, Resin, Metal and Electroplated bonding systems, along with accessory items like metal bond dressing wheels, wheel adapters, quills and dressing sticks designed for both manual and CNC machines.

Our goal is to educate our customers on who we are, the services we offer and the products we manufacture. Our technical sales staff and application engineers all have years of hands on experience in all types of grinding applications and all SuperAbrasives' personnel are trained to work closely with customers far beyond product design, and are available for consultation anytime problems occur to ensure the solutions we provide meet all of their your needs.

SA's main office and manufacturing facility are located in Wixom, Michigan. This direct link

between sales and manufacturing enables us to have constant communication on and provide up to date information to our customers. We work hard at providing timely delivery and responding quickly in emergencies. All of this plays a role in our total commitment to customer satisfaction. Although other companies also supply superabrasive products, we believe this commitment gives us the "Distinctive Edge."



We work hand in hand with our customers to achieve the goals set for each application and we continue this partnership throughout the entire life of the job. We take great pride with each success and always strive to improve. See results of some our success stories by visiting our website at [www.superabrasives.com](http://www.superabrasives.com) or ask your sales representative for details.

**SuperAbrasives, Inc. means superabrasives**

# Products and Services

At SA we manufacture diamond and CBN grinding wheels and honing stones used in a vast variety of operations. All of our products are engineered around application specific requirements and designed for optimal performance. Our products range from small diameter mounted wheels used for ID grinding to large diameter form wheels used in automotive production applications like camshaft and crankshaft grinding. Whether your need is big or small, we have the knowledge and desire to work with you and get you the best product for your job.

## PRODUCT DEVELOPMENT

SA's constant development and enhancement process for all our bond structures assures that our customers are getting the best products available. You see, at SA, we don't try to make the application fit our wheel, we make our wheel fit the your application. As a result, we work with our customers tirelessly to establish the best wheel for your need, for your application every time. We work hand in hand with our customers to achieve the goals set for each application and we continue this partnership throughout the entire life of the job. We take great pride with each success and always strive to improve. Please speak to your sales representative or visit our website at [www.superabrasives.com](http://www.superabrasives.com) to learn of our success stories and to find out how this our services can work for you.

## TECHNICAL SUPPORT

### EVALUATE ANALYZE RECOMMEND IMPLEMENT SUPPORT

At SA we like to help our customers not only with providing them with a product, but also with providing them with insight on how to use our products. We'll work with you to **EVALUATE** your application and operation; **RECOMMEND** target operating parameters; **INSTALL** and **IMPLEMENT** our grinding wheels; and **MONITOR** and **SUPPORT** the operation.




We have compiled some useful information and tools to help you in different areas of wheel use; from truing and dressing, to feeds and speeds and beyond more. Our proprietary software applications and calculators provide useful insight into your operations and give us a proven method to follow to analyze and optimize your operation.

Being a manufacturer ourselves we know problems can arise quickly and without warning. That's why SA offers two types of technical support to our customers: Remote via telephone or email and On-site. Remote assistance is available Monday through Friday to assist customers with all their immediate needs and is available via phone or email. For On-site service, arrangements can be made with your sales representative to work with you at your facility and around your schedule. Depending upon the depth of service that you require, be sure to speak with your sales representative about our power load and acoustic sensing monitoring service as well as all of the other information and services listed above.

In the pages that follow you'll get some insight into the different products we manufacture and how they can work for you. For more detailed product information and copies of our Case Studies ask your sales representative, give us a call directly at 800-341-4426 or email us at [sales@superabrasives.com](mailto:sales@superabrasives.com).



The Maximizer product line includes CBN grinding wheels designed for use in both rotary and single point technology dressing applications. The unique characteristics of this bond structure produce a product that is flexible and versatile allowing for seamless integration into Job Shop, Tool Room and Production run environments.

The namesake of this product line, **The Maximizer**, is for use in rotary dress applications where the need for a traditional high concentration vitrified CBN product isn't necessary but the end results are. Applicable in both standard and production grinding settings, The Maximizer can adapt to many grinding variables with minimal adjustments required to your operation. Because of the porous structure of The Maximizer, faster cutting speeds can be achieved while maintaining low grinding pressures. Perfect for lower horsepower machines! You'll increase productivity and save costs since:

-  Dressing is **REDUCED** by at least 7.5 times
-  Wheel life is **INCREASED** by 20-100 times
-  Cycle Times are **REDUCED** by at least 50%

The other option, **The MaximizerST**, can be dressed with single point technology or rotary dressed and used on both new and older machinery without requiring alterations to your current grinding conditions. Part finishes and tolerances are maintained while also providing a burn free part. The versatility of the MaximizerST allows for grinding of a vast variety of materials with one wheel specification — no need to change the wheel when you change the material being ground. This results in decreased down time, increased productivity and reduced cycle times.



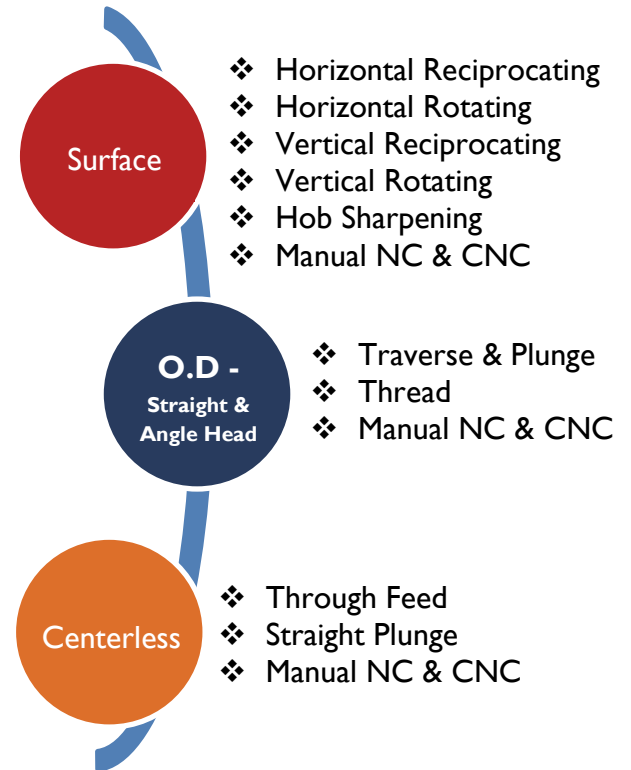
-  Productivity is **IMPROVED** on average 200%.
-  Cycle times are **REDUCED** on average 4X current rates

The MaximizerST can take deeper cuts with faster traverse rates with no wheel breakdown and reduced dressing.

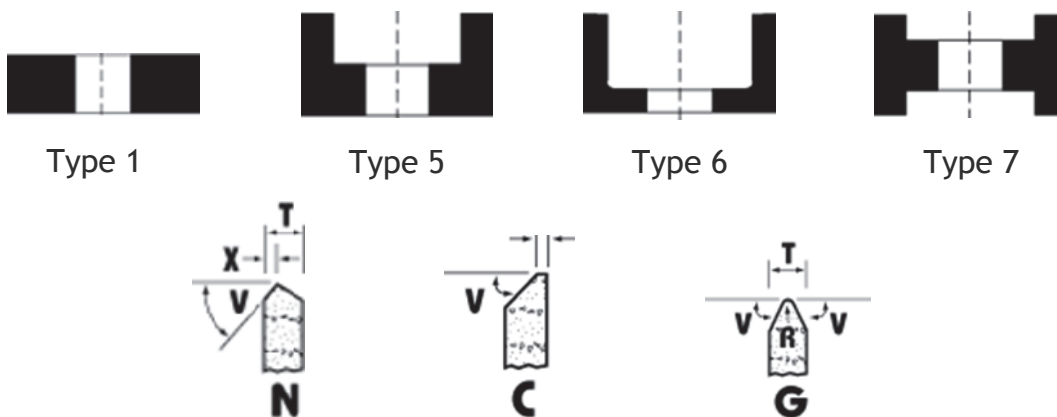
Both The Maximizer and MaximizerST products can produce the exact finish you require without the need for multiple wheels and operations for roughing and finishing. All that's needed is adjustments to the dress traverse rate and exact finishes can be achieved using **one wheel and one mesh size**.

**INCREASE PRODUCTIVITY—REDUCE CYCLE TIMES—INCREASE PROFITS**

These products are so versatile that they can grind all types of materials and on all type of machines. Listed below are many options but just because it's not listed here doesn't mean we can't do it - ask us for about your specific application.



## COMMON WHEEL SHAPES<sup>1</sup>



<sup>1</sup> These common wheel shapes are shown as examples but both the Maximizer and the MaximizerST can be made in many other forms, both custom and standard, see the Standard Superabrasive Wheel Shapes on page 10. If you don't see a shape that you're looking for please contact us. Our engineers can work from sample wheels, wheel drawings or many of the most commonly used CAD program files to develop the form, so ask your sales representative or contact us directly at 800-341-4426 or email us at [sales@superabrasives.com](mailto:sales@superabrasives.com).

# HOW TO CHOOSE THE MAXIMIZER OR THE MAXIMIZERST

APPLICATION SPECIFICS		BOND OPTIONS	
Grinding Type	Process	MaximizerST	Maximizer
Cylindrical Grinding, O.D., I.D. & Centerless (Angle Head)	Plunge Grinding	✓	✓
	Plunge & Traverse Grinding	✓	✓
	Plunge & Traverse and Face Grinding	✓	✓
	Traverse Grinding	✓	✓
Surface Grinding (Including Creep Feed)	Horizontal Reciprocating Grinding	✓	✓
	Vertical Reciprocating Grinding	✓	✓
	Horizontal Rotary Grinding	✓	✓
	Vertical Rotary Grinding	✓	✓
Machine Types and Controls		MaximizerST	Maximizer
Non - NC (hand wheel only) machines		✓	✓
NC machines and CNC Machines		✓	✓
Wheel Head Power and Velocity		MaximizerST	Maximizer
<p>Wheel Head Power is calculated based on the principal of per one linear inch (1") of contact. Wheel Velocity is calculated on the principal of per one inch (1") of contact. If your application has different requirements please contact us for assistance.</p>			
		MaximizerST	Maximizer
Wheel Head Power (Minimum)		2 HP (1.5 Kw)	3 HP
Wheel Velocity *		6,500 S.F.P.M. (33M/sec.) +	8,500 SFPM
Coolant Types and Delivery		MaximizerST	Maximizer
Optimal Delivery (Flow & Pressure)		✓	✓
Poor Coolant Delivery		✓	N/A
Water Soluble Oil		✓	✓
Oil		✓	✓
Synthetic		✓	✓
Dry		N/A	N/A
Truing and Dressing Method		MaximizerST	Maximizer
Single Point Technology (Multi point rod diamond)		✓	N/A
Single Point Technology (Multi grain diamond nib)		✓	N/A
Rotary Dresser Traverse or Plunge Type		✓	✓
Cone and Phono Points		N/A	N/A

✓ = No Restrictions

N/A = Not Applicable

Whatever your dressing requirements are we can help by recommending the right tool for your job. Whether it be single point type dressing tools or precision metal bond dressing wheels we have developed dressing tools engineered around our vitrified CBN and diamond wheels—which means that they perform according to our tolerances and YOUR expectations.

## 3 DIAMOND PRISM BLADE WHEEL DRESSERS

Our 3 Diamond Blade dressers are engineered specifically for our MaximizerST bond system but work equally as well on Maximizer bond wheels, too. They come in 2 different designs—Straight and Offset. Each come standard with 3 individual diamonds and differ only in the position of the blade head.



Blade size for these tools is 3/8” wide and the diamond size is .044 x .044 x .120  
Available Shank Sizes are 3/8 x 1-1/4” and 7/16 x 1-1/4”

## DIAMOND ROD DRESSERS



These dressers are special. The cobalt tungsten based matrix impregnated with diamond abrasive creates a product with excellent wear characteristics and aggressive yet tolerant dressing performance. If you like the hands-on dressing technique then this tool is definitely for you!

Available Shank Sizes are 3/8” x 1-1/4” and 7/16” x 1-1/4”

## DIAMOND DRESSING WHEELS

Our metal bond diamond dressing wheels are designed especially for dressing our diamond and CBN vitrified grinding wheels. These products are available in most industry standard shapes and sizes and provide a cost-effective solution for all your dressing needs. For more detailed product information ask your sales representative, give us a call directly at 800-341-4426 or email us at [sales@superabrasives.com](mailto:sales@superabrasives.com).



## CYLINDRICAL OD, PLUNGE AND TRAVERSE

**APPLICATION**

True Job Shop environment consisting of various models of old machinery where demands include a wide range of part geometries and tolerances for a wide range of material types.

Machine:	TOS c. 1920-1950	Wheel:	16 x 1 x 5 IAI (Type 1)
Material:	10 Different Types		CBN-MaximizerST-1/2
Stock Removal:	Varied per material		
Finish Req:	16 Ra standard		
Coolant:	Synthetic	Dressing Process:	Single Point Dress

**MACHINE CONDITION**— Well used machine with no gauging, non-cnc and variable work speed but with broken controls so exact monitoring was difficult.

**MATERIALS**— 10 different materials were ground during this test and consisted of 52100, 8620, Colomony 5 & 6, Titanium, Stellite, 1018, D2, Inconel and 440 Stainless.

**TEST CONDITIONS**—

In one 8 hour shift all of the above materials were ground on the TOS grinder using both plunge and traverse grinding operations.

Plunge Operation on 52100 at a depth of cut of .160

The MaximizerST wheel cut through the material with ease and produced a better finish than the currently used SiC wheel.

Plunge Operation on 1018 at a depth of cut of .130

The MaximizerST wheel cut through this material with ease but did have slight chatter (although less than produced with the SiC wheel) but the part condition was excellent and far superior to the currently used process.

This wheel was run under these conditions for 5 straight days and the end result was a loss on diameter of only .020.

**RESULTS**—

**PART QUALITY**—No burning on any material and all required finishes were held or improved.

**SUMMARY**—

The machine operator and business owner were extremely pleased with the above results. This has opened options for the business to reduce perishable tooling and inventory expenses while offering increased flexibility to adjust to same-day delivery demands.



## ANGLE HEAD GRINDING

**APPLICATION**

This is a production run application at a global transmission components manufacturer. The customer's request was to find a way to improve productivity and overall output. The initial test ran one week (24/7) and results were then projected for annual savings. MaximizerST running since 2010.

Machine:	Okuma Angle Head	Wheel:	21 x 4 x 10 (V=30) IVISP
Make:	Not Specified		CBN-MAXIMIZER ST-1/2
Material:	8620 Alloy Steel	Wheel R.P.M:	1,300
Stock Removal:	.0265" Per Side	Wheel S.F.P.M.:	8,168
Finish Req:	20 Ra		
Coolant:	Synthetic	Dressing Process:	Rotary Straight Dress

**RESULTS - EXTREME CYCLE TIME REDUCTION**

The MaximizerST CBN wheel completed the entire grind – floor to floor – in 44.4 seconds. The incumbent conventional wheel was taking 70.5 seconds.

**REDUCTION IN EQUIPMENT**

When implementing CBN on this process we took a 16 machine multiple cell operation and reduced it down to 2 machines which in turn reduced the labor force from 16 dedicated employees down to 2. This was a key benefit for the customer who was then able to utilize these employees in other key operations.

**REDUCTION IN WHEEL CONSUMPTION AND STOCKING COSTS**

With the conventional wheel process the customer used 45 wheels annually and kept a floating stock to accommodate 3 months' worth of usage. The improvement with the MaximizerST, the annual usage was reduced to 2 wheels and due to projected wheel wear and life no stock was required.

**KEY BENEFITS** attained by converting to CBN and the MaximizerST included

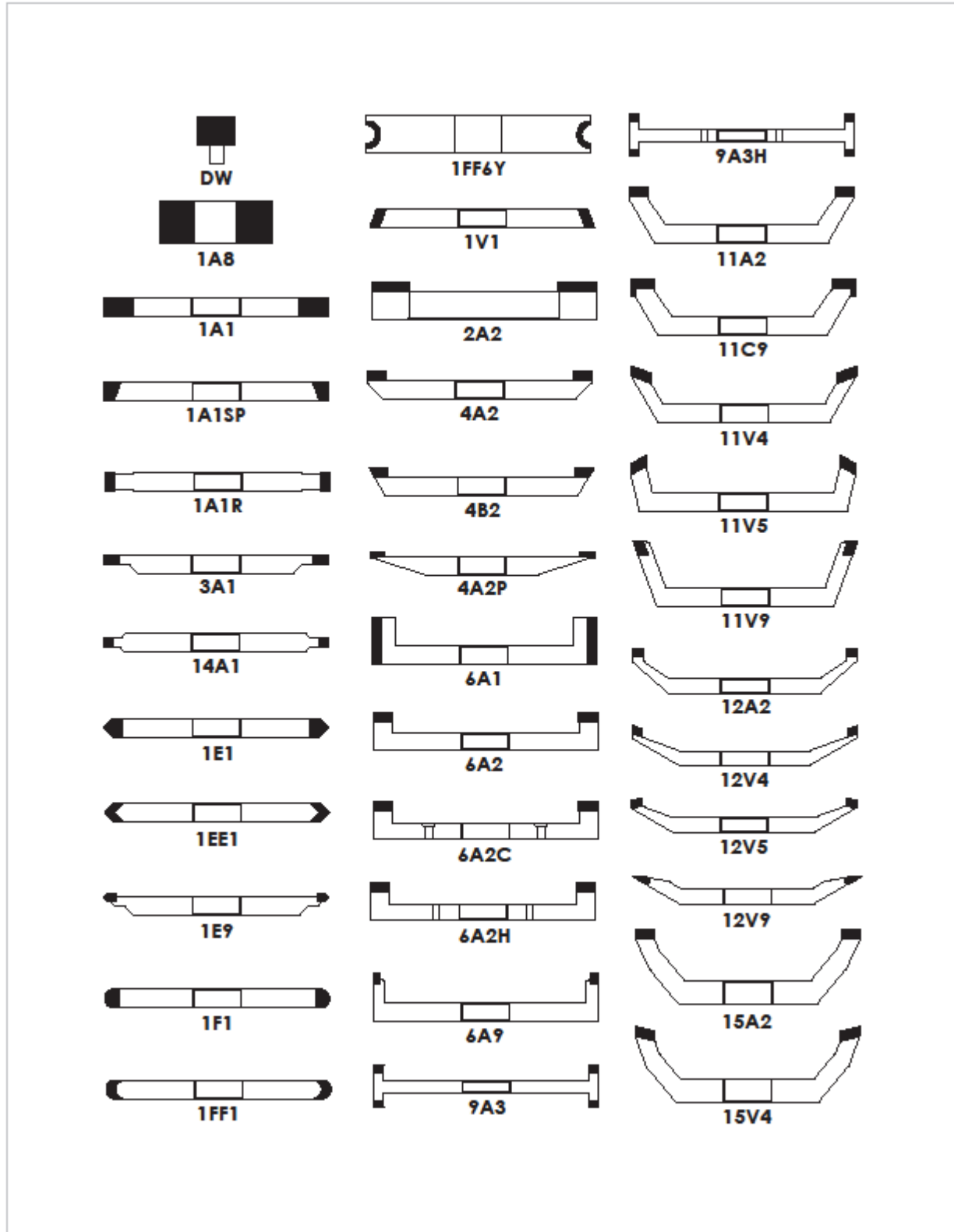
- 🔗 Reduction in Cycle Time
- 🔗 Increased Wheel Life
- 🔗 Reduced Dressing Intervals
- 🔗 Tighter Part Tolerances

**SAVINGS SUMMARY**

COST SAVINGS	Cost Per Piece Savings	\$ 0.067	Annual Savings	\$ 134,000.00
PRODUCTIVITY SAVINGS	<b>40% INCREASE</b> in Production Capacity			

- 🔗 Freed up equipment available for other jobs
- 🔗 Reduced overhead costs (including operating expenses and labor)
- 🔗 Freed up Labor to work on other jobs
- 🔗 Created the opportunity to accept new/additional business

# STANDARD SUPERABRASIVE GRINDING WHEEL SHAPES



All products shown in this section are available in diamond and CBN. And in most cases, all products are available in resin, metal, vitrified and electroplated bonds, but some limitations do apply. Please contact your sales representative for further details.

# APPLICATION ANALYSIS AND ASSISTANCE

## APPLICATION ANALYSIS AND ASSISTANCE AT YOUR FINGERTIPS

Just review the questions below and have your answers ready, then contact your sales representative or us directly and we'll help you decide on what's the best option for your application. With just a few standard details on your operation and specific requirements, we can evaluate and recommend our best

### Are You Currently Grinding With Vitrified CBN?

YES	NO
Please complete the information below for us to provide you a competitive quote	Interested in converting to CBN for better tool life and productivity? Please complete the information below for our Maximizer Vitrified CBN Wheels
<b><u>WHEEL INFORMATION</u></b>	<b><u>WHEEL INFORMATION</u></b>
Wheel Type <input type="text"/>	Wheel Type <input type="text"/>
Wheel Diameter <input type="text"/>	Wheel Diameter <input type="text"/>
Wheel Width/Thickness or Width <input type="text"/>	Wheel Stub Diameter <input type="text"/>
Arbor Hole <input type="text"/>	Wheel Width/Thickness or Width <input type="text"/>
Abrasive Depth <input type="text"/>	Arbor Hole <input type="text"/>
Current Wheel Manufacturer <input type="text"/>	
Current Wheel Specification <input type="text"/>	
<b><u>OPERATION &amp; MACHINE INFORMATION</u></b>	<b><u>OPERATION &amp; MACHINE INFORMATION</u></b>
Type of Grind <input type="text"/>	Type of Grind <input type="text"/>
Wheel RPM or Velocity <input type="text"/>	Spindle Power (H.P.) <input type="text"/>
<input type="checkbox"/> SFFM <input type="checkbox"/> M/S	Wheel RPM or Velocity <input type="text"/>
	<input type="checkbox"/> SFFM <input type="checkbox"/> M/S
	Is wheel capable of constant velocity? <input type="checkbox"/> YES <input type="checkbox"/> NO
	Maximum RPM <input type="text"/>
<b><u>APPLICATION SPECIFICS</u></b>	<b><u>APPLICATION SPECIFICS</u></b>
Part Material <input type="text"/>	Part Material <input type="text"/>
Hardness <input type="checkbox"/> HRC <input type="checkbox"/> HRB	Hardness <input type="checkbox"/> HRB <input type="checkbox"/> HRC
Surface Finish Requirements <input type="text"/>	Surface Finish Requirements <input type="text"/>
<input type="checkbox"/> Ra <input type="checkbox"/> Rz <input type="checkbox"/> Rt <input type="checkbox"/> RMS	<input type="checkbox"/> Ra <input type="checkbox"/> Rz <input type="checkbox"/> Rt <input type="checkbox"/> RMS
Coolant Type <input type="checkbox"/> SYNTHETIC <input type="checkbox"/> WATER <input type="checkbox"/> OIL	Coolant Type <input type="checkbox"/> SYNTHETIC <input type="checkbox"/> WATER <input type="checkbox"/> OIL
OTHER <input type="text"/>	OTHER <input type="text"/>
Coolant Delivery	Coolant Delivery
Gallons Per Minute <input type="text"/>	Gallons Per Minute <input type="text"/>
PSI at Nozzle or Manifold <input type="text"/>	PSI at Nozzle or Manifold <input type="text"/>
Dresser Type <input type="checkbox"/> Rotary Single Point <input type="checkbox"/> Rotary Plunge	Dresser Type <input type="checkbox"/> Single Point <input type="checkbox"/> Cluster <input type="checkbox"/> Multi Point <input type="checkbox"/> Rotary
<p><b>Do you have a drawing of the wheel and/or dresser?</b>  <b>If yes, please send it along with your request and this can help expedite the process.</b></p>	

# **SA** SUPERABRASIVES

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