Norton diamond lapping compound polishes all materials – hard and soft. Diamond powders are uniformly distributed in a liquid vehicle for aggressive polishing and consistent part quality. Easy-to-use plastic syringe for quick clean-up.

Applications:
For mold, die, and tool polishing, polishing to final tolerance of ceramic parts, initial charging of lapping plates and discs, and other processes that require mirror finish and close tolerance performance.

Syringe Size:
5 and 18 gram syringes

Type:
Water soluble – when soap/water is used for clean-up
Oil soluble – when solvent is used for clean-up

### Diamond Compound – Water Soluble

<table>
<thead>
<tr>
<th>PRODUCT #</th>
<th>MICRON GRADE</th>
<th>COLOR</th>
<th>PART #</th>
</tr>
</thead>
<tbody>
<tr>
<td>5PS1/4WSSTD</td>
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<td>66260300362</td>
</tr>
<tr>
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<td>1/2 Ultra Fine</td>
<td>Lt. Gray</td>
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<td>5PS1WSSTD</td>
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<td>Ivory</td>
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<td>5PS3WSSTD</td>
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### Diamond Compound – Oil Soluble

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### Diamond Compound Application Guide

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<th>MESH SIZE</th>
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<td>Blue</td>
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TECH TIP

Marking System

- **5 PS 1/4 OS STD**
  - SYRINGE SIZE: 5 Gram
  - CARTRIDGE TYPE: PS
  - MICRON GRADE: 1/4 – Gray
  - VEHICLE TYPE: OS (Oil Soluble)
  - CONCENTRATION: Standard

- 18 Gram (Plastic Syringe)
  - SYRINGE SIZE: 18 Gram
  - CARTRIDGE TYPE: PS
  - MICRON GRADE: 1/4 – Gray
  - VEHICLE TYPE: OS (Oil Soluble)
  - CONCENTRATION: Standard

Full-Line Industrial Market
330
www.nortonabrasives.com
**WARNING**

Improper use of abrasive products might cause grinding wheel breakage and serious injury. Comply with ANSI B7.1, OSHA and Safety Guide furnished with package. Don’t overspeed, abuse, or drop wheel. Always use a guard, personal protective equipment and proper mounting procedures.

- **Speeds**
  Check machine spindle speed and speed listed on machine against safe maximum operating speed marked on the grinding wheel. Do not overspeed the wheel. Refer to the "Proper Grinding Wheel Operating Speeds and Safety" article on page 336 for more information.

- **Flanges**
  When mounting most grinding wheels, use flanges of equal diameter and bearing surface. For exceptions, see ANSI B7.1.

- **Safety Gloves**
  Grinding applications are conducted in harsh environments. The use of proper fitting gloves is recommended.

- **Wheel Guard**
  Always use the wheel guard as supplied by the machine manufacturer, in the proper position.

- **Do Not Use Damaged Wheel**
  Always check each wheel for cracks or damage before use. Never use a damaged wheel.

- **Eye/Face Protection**
  Always wear government-approved face and eye protection when using abrasive products.

- **Hearing Protection**
  Use of abrasive products can create elevated sound levels. Hearing protection must be worn where required.

- **Dust Protection**
  Exposure to dust generated from workpiece and/or abrasive materials can result in lung damage and/or other physical injury.

  Use dust capture or local exhaust as stated in the SDS. Wear government-approved respiratory protection and eye and skin protection. Failure to follow this warning can result in serious lung damage and/or physical injury.

  This is a general dust warning and does not cover specific situations. For more information, refer to the SDS dust warning provided with your products, and workpiece.

---

Safety Guides, SDS and Wheel Warning Messages
Before using any abrasive materials, READ:

- The Safety Guides
- Wheel Warning Messages
- Safety Data Sheets (SDS)

All Norton products provide information pertaining to safe use. Please take the time to read it carefully. Contact suppliers of the workpiece and abrasive materials for copies of the SDS if one is not readily available. Norton abrasives SDS can be obtained on www.nortonabrasives.com

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**Properly matched flanges**

**Mis-matched flanges – do not use**

**Safety Gloves**

Grinding applications are conducted in harsh environments. The use of proper fitting gloves is recommended.
100 Years of Safety Leadership

The year 2016 marked the 100-year anniversary of the leadership of the former Norton Company in the creation of the first ever safety code for abrasives.

In 1916, following more than a decade of safety research, advocacy, and leadership by the Norton Company (now Norton | Saint-Gobain Abrasives), “The Safety Code for the Use and Care of Abrasive Wheels” was published. This 13-page booklet, containing an unprecedented set of safety device recommendations and procedures, was a spark that changed the entire future of the abrasives industry.

In the 1970s, this code received the ultimate endorsement when selected by OSHA as the basis of new federal regulations concerning abrasive wheel machinery. Today, the ever-evolving “Safety Requirements for the Use, Care and Protection of Abrasive Wheels” (commonly known as the ANSI B7.1 standard) continues to mirror the latest technologies and remains the global authoritative abrasives safety standard.

Breakages/Personal Injury

In the event of on-machine breakage of Norton abrasive products, call your local Norton distributor immediately. Whether involving personal injury or not, the abrasive user should leave the equipment and other evidence undisturbed until a Norton sales representative has been notified and conducts an investigation. Prompt action on the part of abrasive users, distributor, and Norton sales personnel is important to ensure swift determination of the breakage cause and to guard against recurrence.

It is the user’s responsibility to refer to and comply with ANSI B7.1 and B7.7 – Contact us for a free copy.

Abrasive Safety References

Safety Information on the Web


UAMA (United Abrasives Manufacturers Association) website at http://www.safety.uama.org

Safety Video

Watch our videos on: YouTube.com/NortonAbrasives

- Norton Abrasives: Safety, It's The Smart Thing To Do (Safety information for portable grinding and cutting wheels)
- Norton Abrasives: Foundry Safety
- Norton Abrasives: First in Precision Grinding Safety
- Norton Abrasives: Proper Grinding Wheel Mounting
- Norton Abrasives: Railroad Abrasive Safety
- Norton Abrasives: Coated Abrasive Belt and Disc Safety
Safe Operating Practices

Safe operating practices must be part of every grinding wheel user's operation. The greatest efficiency and lowest overall abrasive cost can be realized only if proven care and use techniques become standard practice.

- Be sure to read any safety material/guidelines provided with the abrasive product.
- Always check the wheel for cracks or damage before use.
- Always properly maintain your machine; especially governors on pneumatic machines and linkage on floorstand machines.
- Never use the incorrect air, hydraulic or electric power supply.
- Never mount grinding wheels directly on electric motors.
- Never mount grinding wheels on the wrong size machine for the grinding wheel.
- Before mounting the wheel, use a tachometer to measure the spindle speed.
- 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. Check mounting flanges for equal and correct diameter and use blotters when supplied.
- Always mount, true and dress the wheel in conformance with the guidelines published in the ANSI Safety Requirements B7.1.
- 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 for a minimum of one minute, and stand out of the plane of rotation.
- NEVER use a high speed air sander as a portable grinder.
- NEVER use grinding wheel with a rated speed less than that of the grinder.
- NEVER exceed the maximum operating speed marked on the wheel being used. The following formula may be used to calculate wheel speed:
  \[ \text{SFPM} = \text{Spindle Speed in RPM} \times \text{Wheel Dia. in inches} \times 0.262 \]
- Avoid dropping or bumping the wheel.
- When not using the wheel, store the wheel in its original packing materials. This protects the wheel from chips and cracking, as well as provides easy identification of the wheel.
- Refer to proper safe storage schematic on page 266.

A Deadly Equation

Pistol Grip Air Sander + Grinding Wheel = Certain Injury!

- Never use a high-speed air sander as a portable grinder
- Use only sanding discs specifically designed for sanders
- Because the speed of these sanders far exceeds the maximum rated speeds for grinding wheels, a potentially lethal wheel breakage might occur

Dangerous Pairing: Die grinders and Cut-off Wheels

While die grinders and portable cut-off tools may look similar, they are by no means interchangeable. Several crucial differences exist between the two handheld machines.

GUARD

Cut-off wheels must be used on guarded machines for the safety of the operator and bystanders.

SPEED

Cut-off wheels must be used at or below their maximum operating speed, marked clearly on the side of the wheel. Excessive speed can result in breakage and serious personal injury.

Die grinders often operate above 25,000 rpm and therefore are too fast for abrasive wheels. The speed hazard is increased by the absence of a guard. Portable cut-off tools, however, rotate at speeds compatible with the abrasive wheels for which they are designed. And, their guards prevent use of an oversize wheel.

MOUNTING

Cut-off wheels must be mounted between proper flanges, as described in the national safety standard for abrasive wheels, ANSI B7.1. Die grinders make use of a collet for mounting.

Portable cut-off tools use flanges for mounting, flanges designed according to the ANSI B7.1 safety standard.

Now that you have learned the three crucial differences between die grinders and portable cut-off tools – GUARD, SPEED and MOUNTING – be on watch for the dangerous pairing of cut-off wheels and die grinders, and warn your friends and colleagues of the same.
What are the Major Causes of Grinding Wheel Breakages?

- Using a grinding wheel damaged during transportation, storage or as a result of careless or improper handling. Inspect all grinding wheels before mounting them on a machine. NEVER MOUNT A DAMAGED GRINDING WHEEL.
- Selecting the wrong grinding wheel for the job. DON'T GRIND MATERIAL FOR WHICH THE WHEEL IS NOT DESIGNED.
- Incorrect machine. NEVER MOUNT A GRINDING WHEEL ON A MACHINE NOT DESIGNED AND GUARDED FOR THAT GRINDING WHEEL.
- Machine speed higher than the grinding wheel speed. NEVER OVER-SPEED A GRINDING WHEEL.
- Poor machine maintenance. FAILURE TO PROPERLY MAINTAIN A GRINDING MACHINE CAN CAUSE GRINDING WHEEL BREAKAGES RESULTING IN SERIOUS INJURY OR DEATH.
- The improper mounting of grinding wheels. See ANSI B7.1 and literature provided for proper mounting procedures.
- Operator carelessness. ALL GRINDING WHEELS CAN BE BROKEN IF NOT USED PROPERLY.
- Lack of knowledge or training. IF YOU DO NOT KNOW HOW TO USE A GRINDING WHEEL OR THE GRINDER, GET HELP!
- Poor wheel balance caused by the failure to turn off coolant before stopping the grinding wheel. Always spin coolant out of a grinding wheel before shutting the operation down.
- Jamming the work into the grinding wheel.
- Force grinding, so that the motor slows noticeably or the work gets hot.
- Grinding on the wrong surface of a grinding wheel, i.e. grinding on the side of a Type 1 straight grinding wheel.
How to Perform a Ring Test on a Grinding Wheel

One method of grinding wheel inspection is called ring testing. OSHA, ANSI and the grinding wheel manufacturers require this method of grinding wheel inspection. It must be performed BEFORE the wheel is mounted on a grinding machine. Ring testing depends on the damping characteristics of a cracked wheel to alter the sound emitted when the wheel is tapped lightly. It is subject to interpretation by the inspector and is primarily applicable to vitrified bonded wheels. To perform the ring test, wheels should be tapped gently with a light nonmetallic implement, such as the handle of a screwdriver for light wheels, or a wooden mallet for heavier wheels.

- Tap wheels about 45 degrees each side of the vertical line and about 1" or 2" from the periphery. Rotate the wheel 45 degrees and repeat the test.
- Large and thick wheels may be given the ring test by striking the wheel on the periphery rather than the side of the wheel.
- A sound and undamaged wheel will give a clear tone. If cracked, there will be a dead sound and not a clear ring and the wheel should not be used.
- Wheels must be dry and free of sawdust when applying the ring test, otherwise the sound may be deadened. The ring test is not applicable to certain wheels because of their size, shape or composition.
Proper Grinding Wheel Operating Speeds and Safety!

As abrasive wheel producers have known for many years, most grinding wheel breakages and injuries are caused by one major oversight. That oversight is operating a grinding wheel in an over-speed condition. A grinding wheel should never be operated at speeds greater than the wheel's rated speed.

- Never use a grinding wheel with a rated speed less than that of the grinder
- Never mount grinding wheels on sanders (Pistol Grip Air Sanders)
- Never mount grinding wheels directly on electric motors
- Never mount grinding wheels on the wrong size machine for the grinding wheel
- Always properly maintain your machine: especially governors on pneumatic machines and linkage on floorstand machines
- Never use the incorrect air, hydraulic or electric power supply
- Never use the improper speed setting on a machine

What you might not be cognizant of is that slight over-speed can cause damage to a wheel. If an operator continues to use this damaged wheel, it might break. In a reinforced wheel for example, cracks might form, be forced open and jam or catch the wheel on the workpiece resulting in a wheel breakage. The use of a 9" Type 27 Wheel on a 7" angle grinder is very dangerous! Normal stresses that occur during grinding along with the additional stress caused by over-speed are additive. The act of operating a wheel in a slight over-speed condition is very dangerous. We must understand and communicate this danger.

One of the major forces at work on a grinding wheel is called "centrifugal force." To demonstrate this force take a piece of string and tie a small weight to one end. Hold the other end of the string so the weight will travel in a circle. Rotate the weight and you will feel a pull on the string. The weight tries to fly off in a straight line, but the string holds it and compels it to travel in a circle. This pull on the string is called "centrifugal force." Warning: If you attempt this experiment take all the proper precautions related to the object used to avoid injury to yourself or others.

If you swing the weight at a speed of 50 revolutions per minute (RPM) and could measure the pull on the string at this speed, then increase the swing to 100 revolutions per minute and again measure the pull, you would find the pull was not merely two times greater, but was actually four times greater than it was at one half the speed. Therefore, the force increases exponentially with the speed or RPM.

Centrifugal force increases in proportion to the square of the velocity. Think again of the weight and the string. We find that the square of 50 is 2,500, (50 x 50 = 2,500); and the square of 100 is 10,000, (100 x 100 = 10,000). As 10,000 is four times as great as 2,500, so is the pull on the string at 100 revolutions per minute four times as great as it was at 50 revolutions per minute.

Centrifugal force applies to grinding wheels in the same manner as the weight to the string. Increasing the RPM or speed beyond the maximum safe operating speed (MOS) might be more dangerous than might be expected. Placing and operating a 9" Type 27 grinding wheel with a maximum operating speed of 6,600 RPM on a 5" right angle grinder with a rated speed of 10,000 RPM represents an overspeed of approximately 1.515 times the wheel's designated speed. The resulting rotational stress caused by the centrifugal force would be approximately 2.3 times greater than the maximum allowed. Add this additional stress to the stresses that occur during normal grinding and even the strongest wheel might break.

In short, NEVER over-speed a grinding wheel. Always compare the speed marked on the wheel or package to make sure the machine's speed is at, or below, the speed or MOS of the grinding wheel. Speed can kill. NEVER over-speed a grinding wheel.
### Conversion Table – Wheel Speeds

#### Surface Speed in Feet Per Minute (SFPM)

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<thead>
<tr>
<th>Diameter of Wheel in Inches</th>
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<th>7,500</th>
<th>8,000</th>
<th>8,500</th>
<th>9,000</th>
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<th>16,000</th>
<th>16,500</th>
<th>17,000</th>
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<td>4</td>
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For intermediate diameters not listed use the formula listed in Section 1.2.10 of ANSI B7.1

\[
\text{SFPM} = 0.262 \times \text{wheel diameter in inches} \times \text{RPM}
\]

To convert meters per second (m/s) to SFPM: \( \text{m/s} \times 196.85 = \text{SFPM} \)

To convert SFPM to m/s: \( \frac{\text{SFPM}}{196.85} = \text{m/s} \)

To convert RPM to SFPM: \( \text{Wheel Diameter} \times \text{RPM} \times 0.262 = \text{SFPM} \)
Product Warranty

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and others
Norton | Saint-Gobain is so confident of the superior performance of our abrasive products, as recommended for specific applications, that we invite in-plant tests against any other brand of abrasive product on the market.

1. The test will be conducted in the user’s own plant, on their own machines, using their own workpieces
2. Even if the user purchases only a minimum quantity of Norton abrasive products, the user will receive the same quantity discount as would apply to their normal production orders
3. If the Norton product tested proves completely unsatisfactory, the user will receive a full refund
4. If the Norton product tested performs at a lower level than the product presently in production, the user will receive an adjustment to make up the difference in performance
5. The user is the final judge of performance!

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To place an order, contact our customer service support center with:

- Customer number and contact name
- Any special shipping needs
- Complete product information:
  » 11-digit Part Number
  » Product description
  » Quantity and unit of measure
  » Price by unit of measure

To ensure minimal errors and faster turnaround, using electronic media is preferred. For assistance with www.abrasiveconnection.com or EDI setup, contact us at:

Email: nacustomerservice@saint-gobain.com
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This printed catalog is a great starting resource for Norton and Merit product selection. Our website is the ideal resource for a more comprehensive outline of product, safety, and application information. It is continually updated with all our most current information and offers more electronic queries for deeper detail, at a click of a button.

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