Fifty Years of Fantastic Finishes
50
Scotch-Brite™
Since 1958

**Scotch-Brite™**
Surface Conditioning Wheels

# Convolute, Unitized & Molded Wheels

3M

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# Scotch-Brite™ Wheels

## Scotch-Brite™ wheels, one of the most complete selections of surface conditioning wheels, continue to raise the bar for performance even after five decades.

Today, 3M develops wheels with new and advanced technology while continuously improving its existing product line.

Customers choose Scotch-Brite™ surface conditioning wheels because of their ease of use and consistent results. In addition, to assist in increasing productivity, customers are supported by dedicated Technical Service teams and 3M Innovation Centers around the world.

## Scotch-Brite™ Wheels

- Can improve surfaces without significantly changing the shape or dimension of the workpiece.
- Are well-suited for an array of cleaning, blending, deburring, finishing and polishing applications.
- Help prevent undercutting or gouging through their controlled abrasive action.
- Provide consistent, uniform finishes as fresh abrasives are continually exposed to the work surface.
- Run cool and resist loading due to their open web construction, which reduces the risk of part discoloration and warping, while extending the life of the wheel.

## Factors to consider when choosing a starting point for your application

- Composition of workpiece and material type
- Material hardness
- Desired results to be achieved
- Size and shape of the work piece (area to be conditioned)
- Part variability
- Tool/machinery type, including speed capability
- Previous and possible subsequent abrasive steps

## Selecting Convolute vs. Unitized

This choice will often be determined by the part configuration, wheel size availability, tool speed or other fixed circumstances.

**Convolute** is a wrapped construction on a standard sized core and the “flat” of the web becomes the cutting tool. The wheels are one directional, which is indicated by an arrow on the side of the wheel and arrows printed in the core.

**Unitized** is a layered construction with a selection of center hole sizes and no core. The “edge” of the web becomes the cutting tool. The wheels are non-directional.

*See Convolute and Unitized equivalency chart on page 25.*

## Basic Performance Differences

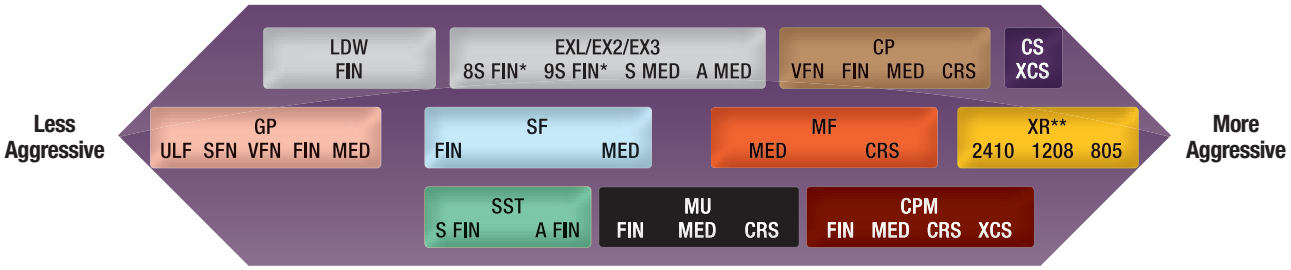
| | Construction | Finish | Density | Size |
|---|---|---|---|---|
| Convolute | Wrapped construction on a standard sized core. One directional | Finer finish (grade for grade) | Softer and more conformable* | 4"–24" dia. 1/2"–36" wide |
| Unitized | Layered construction with no core. Non-directional. | More aggressive and durable (grade for grade) | Harder and less conformable | 1/2"–14" dia. 1/8"–1" wide |

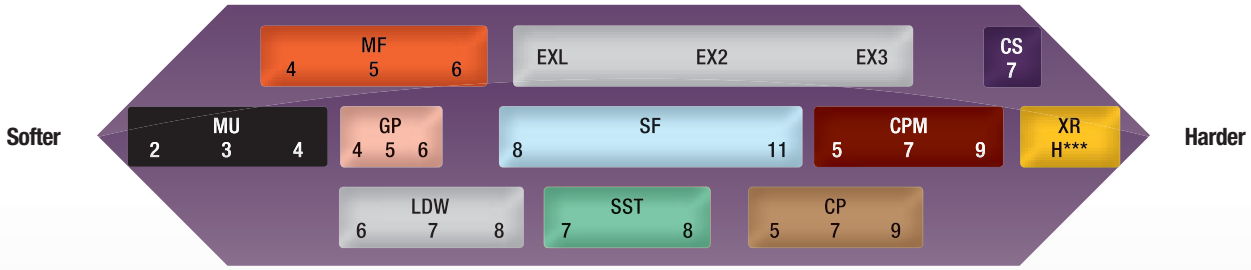
Exceptions depend on product type. Refer to the specific description page for availability.

* When comparing same density numbers

# Convolute / Molded Wheels

Scotch-Brite™ Convolute Wheel performance differences can be attributed to mineral (aggressiveness) and density (hardness). The combination of these two characteristics and subtle variations determine if the wheel will cut more aggressively or will be more durable and less conformable (See depiction below).



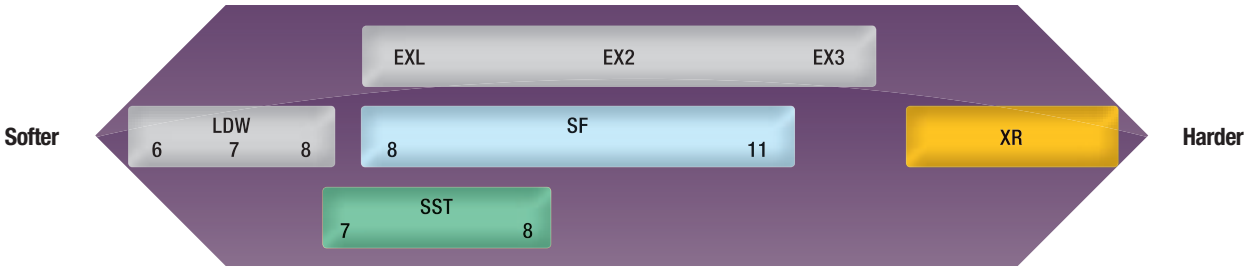

| Legend | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | CP | Cut and Polish Wheel | | GP | General Purpose Wheel | | SF | SF Finishing and Deburring Wheel |
| | CPM | CPM Wheel | | LDW | Light Deburring Wheel | | SST | SST Deburring Wheel |
| | CS | Clean and Strip Rim Wheel | | MF | Metal Finishing Wheel | | XR | XR Metalworking Wheel |
| | EXL | EXL Deburring Wheel | | MU | Multi-Finishing Wheel | | | |

* Numeric designators (8/9) represent mineral aggressiveness; not density.
** XR Wheel Grades: **2410** = 240/100 Grade Mineral; **1208** = 120/80 Grade Mineral; **805** = 80/50 Grade Mineral
*** XR Wheel Density: **H** = Hard

## Convolute Wheel Diameters and Standard Core Sizes

| Wheel Diameter | 4" | 6" | 8" | 10" | 12" | 14" | 16" | 18" | 20" | 24" |
|---|---|---|---|---|---|---|---|---|---|---|
| Standard Core Size | 1" | 1", 1-1/4" | 3" | 5" | 5" | 8" | 10" | 10" | 12" | 12" |

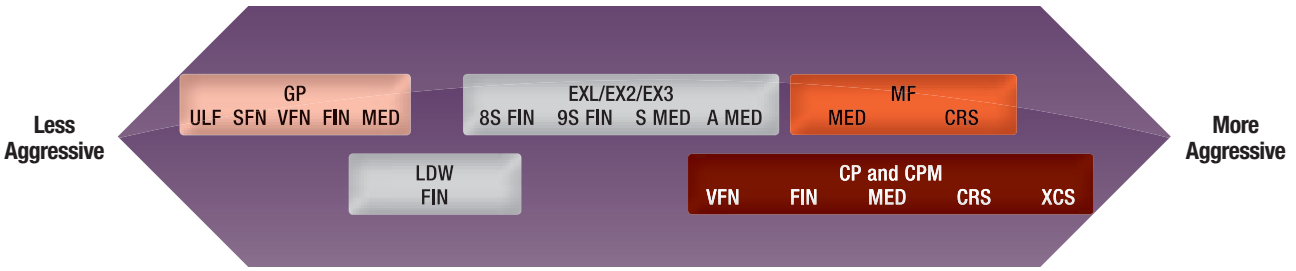
# Scotch-Brite™ Wheels for Deburring




| | Deburring Applications | Starting Point | Alternatives: More Aggressive | Alternatives: Less Aggressive |
|---|---|---|---|---|
| Carbon Steels | Deburr machined or formed parts | EXL Deburring Wheel, 9S-fine (FIN) | EXL Deburring Wheel, 8A-medium (MED) | EXL Deburring Wheel, 8S-fine (FIN) |
| | Deburr shear edges | EX2 Deburring Wheel, 9S-fine (FIN) | EX2 Deburring Wheel, 8A-medium (MED) | EXL Deburring Wheel, 9S-fine (FIN) |
| | Deburr keyways | EXL Deburring Wheel, 9S-fine (FIN) | EXL Deburring Wheel, 8A-medium (MED) | EXL Deburring Wheel, 8S-fine (FIN) |
| Stainless Steel, Titanium (Nickel Alloys) | Deburr turbine blades | EXL Deburring Wheel, 9S-fine (FIN) | SF Finishing and Deburring Wheel, 11S-medium (MED) | EXL Deburring Wheel, 8S-fine (FIN) |
| | Remove wire edges on surgical instruments | EXL Deburring Wheel, 9S-fine (FIN) | SF Finishing and Deburring Wheel, 8S-medium (MED) | EXL Deburring Wheel, 8S-fine (FIN) |
| | Radius edges on stamped parts | EX2 Deburring Wheel, 9S-fine (FIN) | EXL Deburring Wheel, 8A-medium (MED) | EXL Deburring Wheel, 8S-fine (FIN) |
| | Deburr piston rings | EXL Deburring Wheel, 8S-fine (FIN) | EX2 Deburring Wheel, 9S-fine (FIN) | Light Deburring Wheel, 7S-fine (FIN) |
| Aluminum, Copper, Brass (Soft Metals) | Remove aluminum flashing | EX2 Deburring Wheel, 9S-fine (FIN) | EX2 Deburring Wheel, 8A-medium (MED) | EXL Deburring Wheel, 8S-fine (FIN) |
| | Radius edges of aluminum extrusions | EXL Deburring Wheel, 8S-fine (FIN) | EXL Deburring Wheel, 9S-fine (FIN) | Light Deburring Wheel, 8S-fine (FIN) |
| | Deburr automotive or appliance trim | EXL Deburring Wheel, 9S-fine (FIN) | EXL Deburring Wheel, 8A-medium (MED) | Light Deburring Wheel, 7S-fine (FIN) |
| | Deburr brass medallions | Light Deburring Wheel, 7S-fine (FIN) | EXL Deburring Wheel, 9S-fine (FIN) | General Purpose Wheel, 5A-very fine (VFN) |
| Other — Composites, Plastics, Glass, etc. | Deburr plastic parts | Light Deburring Wheel, 6S-fine (FIN) | Light Deburring Wheel, 7S-fine (FIN) | General Purpose Wheel, 5A-very fine (VFN) |

A=Aluminum Oxide S=Silicon Carbide

# Scotch-Brite™ Wheels for Polishing

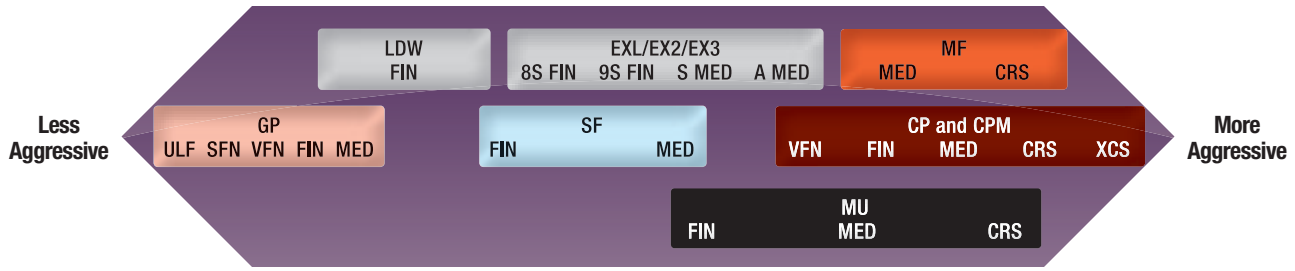



| | Polishing Applications | Starting Point | Alternatives: More Aggressive | Alternatives: Less Aggressive |
|---|---|---|---|---|
| Carbon Steels | Centerless polishing of hydraulic rods | Cut and Polish Wheel, 5A-fine (FIN) | Cut and Polish Wheel, 7A-medium (MED) | EXL Deburring Wheel, 8S-fine (FIN) |
| | Polish roller bearings | EXL Deburring Wheel, 8S-fine (FIN) | Cut and Polish Wheel, 5A-fine (FIN) | Light Deburring Wheel, 7S-fine (FIN) |
| | Polish hydraulic rod spools | Light Deburring Wheel, 7S-fine (FIN) | EXL Deburring Wheel, 8S-medium (MED) | Light Deburring Wheel, 6S-fine (FIN) |
| | Polish molds and dies | Light Deburring Wheel, 7S-fine (FIN) | EXL Deburring Wheel, 8S-fine (FIN) | General Purpose Wheel, 6S-super fine (SFN) |
| Stainless Steel, Titanium (Nickel Alloys) | Final polish of surgical instruments | EX2 Deburring Wheel, 9S-fine (FIN) | Cut and Polish Wheel, 7A-medium (MED) | EXL Deburring Wheel, 8S-fine (FIN) |
| | Final polish on orthopaedic implants | EXL Deburring Wheel, 9S-fine (FIN) | EXL Deburring Wheel, 8A-medium (MED) | Light Deburring Wheel, 7S-fine (FIN) |
| | Polish turbine engine components | EXL Deburring Wheel, 8S-fine (FIN) | EXL Deburring Wheel, 9S-fine (FIN) | Light Deburring Wheel, 7S-fine (FIN) |
| Aluminum, Copper, Brass (Soft Metals) | Pre-plating polish | Light Deburring Wheel, 7S-fine (FIN) | EXL Deburring Wheel, 9S-fine (FIN) | General Purpose Wheel, 6S-very fine (VFN) |
| | Polish brass medallions | Light Deburring Wheel, 7S-fine (FIN) | EXL Deburring Wheel, 8S-fine (FIN) | Light Deburring Wheel, 6S-fine (FIN) |
| | Polish name plates | Light Deburring Wheel, 7S-fine (FIN) | EXL Deburring Wheel, 8S-fine (FIN) | Light Deburring Wheel, 6S-fine (FIN) |
| | Polish jewelry | Light Deburring Wheel, 6S-fine (FIN) | EXL Deburring Wheel, 8S-fine (FIN) | Buff and Polish Wheel,* soft density |
| Other — Composites, Plastics, Glass, etc. | Polish bevel edges of glass | General Purpose Wheel, 6A-very fine (VFN) | Light Deburring Wheel, 8S-fine (FIN) | General Purpose Wheel, 6S-super fine (SFN) |

A=Aluminum Oxide S=Silicon Carbide

*Buff and polish wheels are non-abrasive unitized wheels designed to work with compounds.

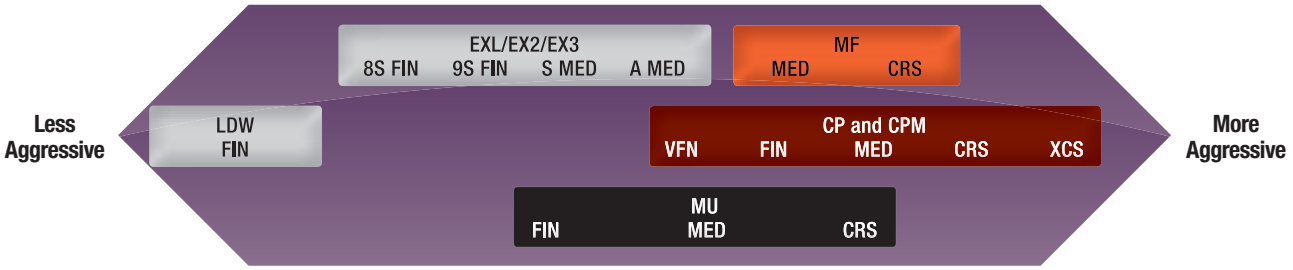
# Scotch-Brite™ Wheels for Finishing




| | Finishing Applications | Starting Point | Alternatives: | |
|---|---|---|---|---|
| | | | More Aggressive | Less Aggressive |
| Carbon Steels | Pre-plating finish on hand tools | EXL Deburring Wheel, 9S-fine (FIN) | Cut and Polish Wheel, 7A-medium (MED) | EXL Deburring Wheel, 8S-fine (FIN) |
| | Decorative satin finish | Metal Finishing Wheel, 5A-medium (MED) | Metal Finishing Wheel, 6A-coarse (CRS) | Multi-Finishing Wheel, 2S-fine (FIN) |
| | Gun barrel finish | Cut and Polish Wheel, 5A-fine (FIN) | Cut and Polish Wheel, 5A-medium (MED) | Cut and Polish Wheel, 7A-very fine (VFN) |
| | Pre-plating finish | EXL Deburring Wheel, 8S-fine (FIN) | Cut and Polish Wheel, 5A-fine (FIN) | Light Deburring Wheel, 7S-fine (FIN) |
| Stainless Steel, Titanium (Nickel Alloys) | #3 Finish | Multi-Finishing Wheel, 2S-coarse (CRS) | Metal Finishing Wheel, 5A-coarse (CRS) | Metal Finishing Wheel, 5A-medium (MED) |
| | #4 Finish | Multi-Finishing Wheel, 2S-medium (MED) | Metal Finishing Wheel, 5A-medium (MED) | Multi-Finishing Wheel, 2S-fine (FIN) |
| | Satin finish on cutlery | Metal Finishing Wheel, 5A-medium (MED) | Metal Finishing Wheel, 5A-coarse (CRS) | Multi-Finishing Wheel, 2S-fine (FIN) |
| | Pre-buff finish | Light Deburring Wheel, 7S-fine (FIN) | Cut and Polish Wheel, 5A-fine (FIN) | General Purpose Wheel, 5A-very fine (VFN) |
| Aluminum, Copper, Brass (Soft Metals) | Decorative finish for builders hardware | Metal Finishing Wheel, 5A-medium (MED) | Cut and Polish Wheel, 7A-medium (MED) | Light Deburring Wheel, 7S-fine (FIN) |
| | Final finish on aluminum | Multi-Finishing Wheel, 2S-medium (MED) | Metal Finishing Wheel, 5A-coarse (CRS) | Multi-Finishing Wheel, 2S-fine (FIN) |
| | Pre-buff and pre-plate finish | Light Deburring Wheel, 7S-fine (FIN) | EXL Deburring Wheel, 9S-fine (FIN) | General Purpose Wheel, 5A-very fine (VFN) |
| Other — Composites, Plastics, Glass, etc. | Satin finish on plastics | Multi-Finishing Wheel, 2S-medium (MED) | Metal Finishing Wheel, 5A-medium (MED) | Light Deburring Wheel, 6S-fine (FIN) |

A=Aluminum Oxide S=Silicon Carbide

# Scotch-Brite™ Wheels for Blending




| | Blending Applications | Starting Point | Alternatives: More Aggressive | Alternatives: Less Aggressive |
|---|---|---|---|---|
| Carbon Steels | Blend 80 grit scratch | Cut and Polish Wheel, 5A-medium (MED) | CPM Wheel, 5A-coarse (CRS) | Cut and Polish Wheel, 5A-fine (FIN) |
| | Blend steel tubing prior to plating | Metal Finishing Wheel, 5A-medium (MED) | CPM Wheel, 5A-medium (MED) | Cut and Polish Wheel 5A-fine (FIN) |
| | Blend compressor shafts | Cut and Polish Wheel 7A-fine (FIN) | Cut and Polish Wheel, 7A-medium (MED) | EXL Deburring Wheel, 8S-fine (FIN) |
| | Blend 60 grit scratch | Cut and Polish Wheel, 7A-coarse (CRS) | CPM Wheel, 9A-coarse (CRS) | Cut and Polish Wheel, 5A-fine (FIN) |
| Stainless Steel, Titanium (Nickel Alloys) | Refine turbine blades | SF Finishing and Deburring Wheel, 8S-medium (MED) | Cut and Polish Wheel 5A-fine (FIN) | EXL Deburring Wheel, 8S-fine (FIN) |
| | Remove parting lines on blades | EXL Deburring Wheel, 9S-fine (FIN) | EXL Deburring Wheel, 8A-medium (MED) | EXL Deburring Wheel, 8S-fine (FIN) |
| | Blend surgical instruments | EXL Deburring Wheel, 9S-fine (FIN) | Cut and Polish Wheel, 5A-fine (FIN) | Light Deburring Wheel, 7S-fine (FIN), |
| | Blend 100 grit scratch | Metal Finishing Wheel, 5A-medium (MED) | Cut and Polish Wheel 7A-medium (MED) | Cut and Polish Wheel, 5A-fine (FIN) |
| Aluminum, Copper, Brass (Soft Metals) | Blend 120 grit scratch | Cut and Polish Wheel, 5A-fine (FIN) | Cut and Polish Wheel, 7A-fine (FIN) | Multi-Finishing Wheel, 2S-fine (FIN) |
| | Remove small surface imperfections | Metal Finishing Wheel, 5A-medium (MED) | Cut and Polish Wheel, 7A-medium (MED) | Multi-Finishing Wheel, 2S-fine (FIN) |
| | Blend prior to plating | Multi-Finishing Wheel, 2S-fine (FIN) | Cut and Polish Wheel 5A-fine (FIN), | Light Deburring Wheel, 7S-fine (FIN) |
| Other — Composites, Plastics, Glass, etc. | Mold flash removal | Cut and Polish Wheel, 7A-fine (FIN) | Cut and Polish Wheel, 7A-medium (MED) | Light Deburring Wheel, 6S-fine (FIN) |

A=Aluminum Oxide S=Silicon Carbide

## Scotch-Brite™ EXL, EX2 and EX3 Deburring Wheels

The EXL convolute wheels are especially well suited for a broad range of deburring and finishing needs and are designed for top performance and value on a variety of applications. This wheel family contains a unique resin system, which helps minimize smearing. EXL wheels can demonstrate performance on stainless steel, titanium, and high nickel alloys.

See page 1 for convolute vs. unitized

| Product Name | Density | Mineral Type | Grade | |
|---|---|---|---|---|
| EXL Deburring Wheel | 8, 9 | Silicon Carbide | FIN | Hard |
| | 8 | Silicon Carbide | MED | |
| | 8 | Aluminum Oxide | MED | |
| EX2 Deburring Wheel | 8, 9 | Silicon Carbide | FIN | Harder |
| | 8 | Silicon Carbide | MED | |
| | 8 | Aluminum Oxide | MED | |
| EX3 Deburring Wheel | 8, 9 | Silicon Carbide | FIN | Hardest |
| | 8 | Silicon Carbide | MED | |
| | 8 | Aluminum Oxide | MED | |

| | |
|---|---|
| **Diameters:** | 4" minimum<br>24" maximum |
| **Widths:** | 3/8"–36" in 4, 6, 8" diameters<br>1/2"–36" in 10, 12" diameters<br>3/4"–36" in 14"–24" diameters |
| **Typical Applications:** | • Cutlery — deburring and edge radius<br>• Turbine blades — blending, finishing, deburring<br>• Gun barrels — polishing<br>• Golf club heads — polishing, finishing<br>• General use deburring |

Some additional sizes may be available by special request.
See pages 23–24 for recommended flanges/accessories.

## Scotch-Brite™ Light Deburring Wheel

The Light Deburring Wheel is designed to provide a clean and economical system for removing fine burrs while providing a highly polished finish. Used for fine deburring, polishing and finishing because of their conformability, Light Deburring Wheels will maintain critical tolerances while still providing a fine polished finish.

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| Light Deburring Wheel | 6, 7, 8 | Silicon Carbide | FIN |

| | | |
|---|---|---|
| **Diameters:** | 4" minimum<br>24" maximum | |
| **Widths:** | 6 density | 1/2"–36" in 4"–12" diameters |
| | | 3/4"–36" in 12"–24" diameters |
| | 7, 8 density | 3/8"–36" in 4, 6, 8" diameters |
| | | 1/2"–36" in 10, 12" diameters |
| | | 3/4"–36" in 14"–24" diameters |
| **Typical Applications:** | • Deburring of fine threads<br>• Mold and die polishing<br>• Finishing prior to buffing<br>• Conditioning surface prior to welding on soft metal | |

See pages 23–24 for recommended flanges/accessories.

## Scotch-Brite™ SST Deburring Wheel

SST Deburring Wheels are designed for deburring on most stainless steel, titanium and other demanding alloys. Burrs from drilling, stamping, punching and other machining operations can easily be removed with SST wheels.

Unlike some higher density products, SST wheels are somewhat softer and more conformable, making them ideal for use on more intricate shapes and contours.

SST wheels are used extensively in the aerospace industry for deburring and finishing parts, and for finishing cast and threaded products used in medical and surgical applications.

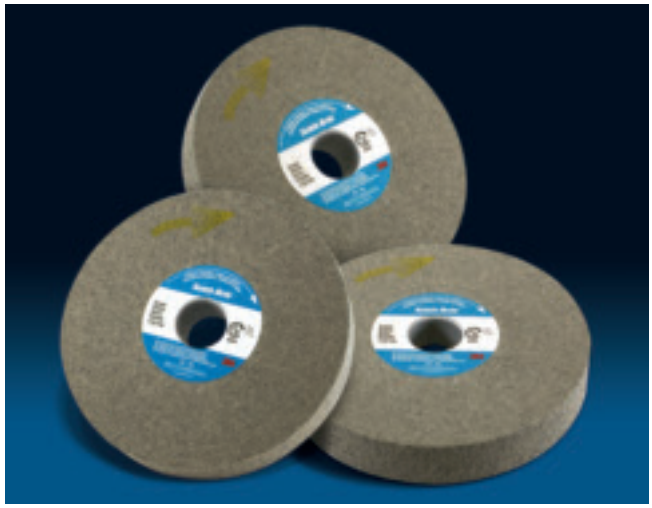
See page 1 for convolute vs. unitized

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| SST Deburring Wheel | 7 | Aluminum Oxide | FIN |
| | 8 | Silicon Carbide | FIN |

| | |
|---|---|
| **Diameters:** | 4" minimum<br>24" maximum |
| **Widths:** | 3/8"–36" in 4, 6, 8" diameters<br>1/2"–36" in 10, 12" diameters<br>3/4"–36" in 14"–24" diameters |
| **Typical Applications:** | • Deburring and finishing turbine blades and vanes<br>• OD polishing roller bearings<br>• Polishing/blending of surgical instruments<br>• Deburring of aluminum die cast flashing |

See pages 23–24 for recommended flanges/accessories.

## Scotch-Brite™ SF Finishing and Deburring Wheel



The SF Wheel is loaded with mineral that is smear resistant yet durable when exposed to metal burrs. This results in a wheel that delivers excellent finishes while still handling burrs. In some applications, this wheel can handle three surface modifying elements — combining finishing, deburring and blending into one operation.

The SF wheel's unique resin construction allows it to run smooth and resist chunking while requiring less frequent dressing. It is an excellent option when finish is critical on deburring applications.

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| SF Finishing and Deburring Wheel | 8, 11 | Silicon Carbide | FIN |
| | 8, 11 | Silicon Carbide | MED |

| | |
|---|---|
| **Diameters:** | 4" minimum<br>24" maximum |
| **Widths:** | 3/8"–36" in 4, 6, 8" diameters<br>1/2"–36" in 10, 12" diameters<br>3/4"–36" in 14"–24" diameters |
| **Typical Applications:** | • General deburring of machined and formed parts<br>• Deburring and finishing turbine blades<br>• Gun barrel polishing<br>• Golf club finishing<br>• Medical component deburring and finishing |

See pages 23–24 for recommended flanges/accessories.

## Scotch-Brite™ Cut and Polish / CPM Wheels

Cut and Polish / CPM Wheels are heavy duty wheels for more aggressive blending and finishing. These long lasting wheels perform well on tough blending and finishing applications such as removing surface defects, coarse grindlines, blending forging marks and machining mismatches while leaving a uniform grain finish.

Cut and Polish / CPM Wheels are very similar but have subtle variations. The CPM Wheel is slightly harder and more aggressive in demanding applications.

Both wheels can demonstrate value in a variety of applications, and are especially well suited for centerless finishing.

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| Cut and Polish Wheel | 5 | Aluminum Oxide | FIN |
| | 7 | Aluminum Oxide | VFN, FIN, MED. CRS |
| CPM Wheel | 5 | Aluminum Oxide | FIN, MED, CRS, XCS |
| | 7 | Aluminum Oxide | FIN, MED, CRS, XCS |
| | 9 | Aluminum Oxide | FIN, MED, CRS, XCS |

| | |
|---|---|
| **Diameters:** | 4" minimum<br>24" maximum |
| **Widths:** | 3/8"–36" in 4, 6, 8" diameters<br>1/2"–36" in 10, 12" diameters<br>3/4"–36" in 14"–24" diameters |
| **Typical Applications:** | • Blending of abrasive grind lines<br>• Centerless finishing of machined parts<br>• Conditioning of machined compressor shafts<br>• Surface finishing of hand tools prior to plating |

See pages 23–24 for recommended flanges/accessories.

## Scotch-Brite™ Metal Finishing Wheel

Highly conformable Metal Finishing Wheels are designed to apply uniform and consistent satin/antique finishes. They are used effectively to blend and match #3 or #4 mill finishes on stainless steel and to create brushed or satin finishes on cutlery.

On softer metals such as aluminum, copper and brass, they are used to blend out minor surface imperfections and handling marks while providing the desired decorative finish.

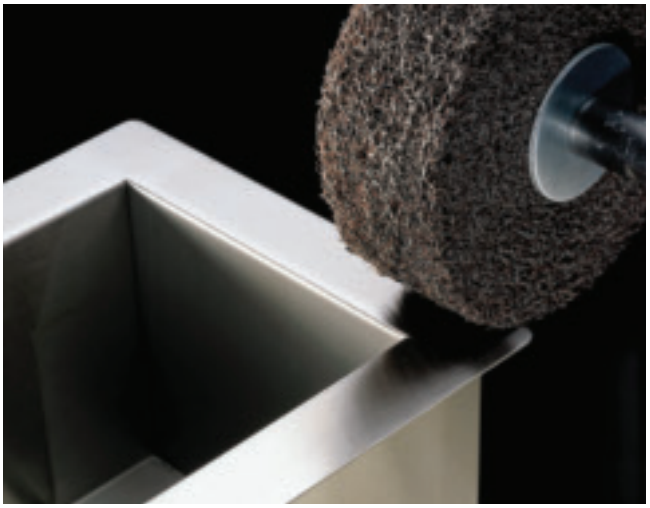
See page 1 for convolute vs. unitized

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| Metal Finishing Wheel | 4, 5, 6 | Aluminum Oxide | CRS |
| | 4, 5, 6 | Aluminum Oxide | MED |

| | |
|---|---|
| **Diameters:** | 4" minimum<br>18" maximum |
| **Widths:** | 3/4"–36" 4 density in 4"–18" diameters<br>1/2"–36" 5, 6 density in 4"–2" diameters<br>3/4"–36" 5, 6 density in 14"–18" diameters |
| **Typical Applications:** | • Stainless steel blending and finishing<br>• Finishing of aluminum molding<br>• Satin finishing of builders hardware<br>• Satin finishing of cutlery |

See pages 23–24 for recommended flanges/accessories.

## Scotch-Brite™ Multi-Finishing Wheel



Multi-Finishing Wheels are highly conformable, soft wheels that create uniform and attractive final finishes on ferrous and non-ferrous metals. They are tough enough to finish edges and welds and soft enough to apply a final finish on large surfaces.

The load resistant open web construction of these wheels removes surface contamination and dirt without re-depositing contaminates onto the work piece. The Silicon Carbide mineral contained in this wheel offers a unique bright surface that is often desired by stainless steel fabricators.

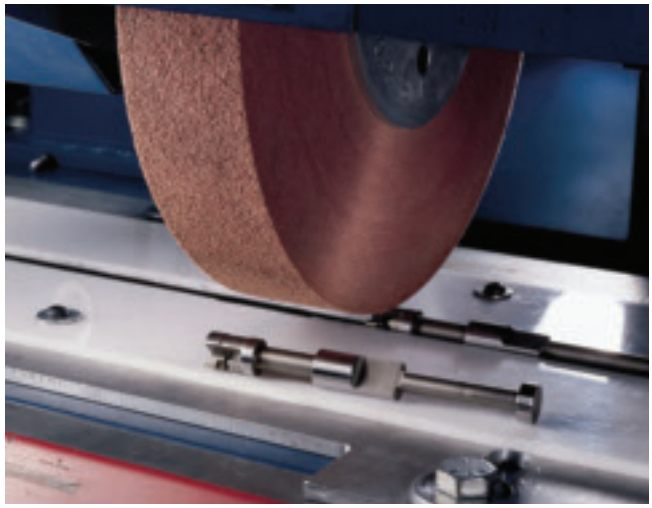
See page 1 for convolute vs. unitized

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| Multi-Finishing Wheel | 2 | Silicon Carbide | FIN, MED, CRS |
| | 3 | Silicon Carbide | FIN, MED, CRS |
| | 4 | Silicon Carbide | FIN, MED, CRS |

| | |
|---|---|
| **Diameters:** | 4" minimum<br>16" maximum |
| **Widths:** | 1"–36" in 4"–16" diameters |
| **Typical Applications:** | • Cleaning of composite parts<br>• Final finish of aluminum extrusions and stainless steel<br>• Finishing/blending<br>• Finishing hardware and cutlery |

See pages 23–24 for recommended flanges/accessories.

## Scotch-Brite™ General Purpose Wheel



General Purpose Wheels offer the greatest selection of grades, densities and mineral types. They are an excellent starting point when the application calls for fine finishing or cleaning.

Like all Scotch-Brite™ products they produce consistent results and can be easier to use than buffs and compounds and other finishing abrasives.

See page 1 for convolute vs. unitized

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| General Purpose Wheel | 4, 5, 6 | Aluminum Oxide | VFN |
| | 4, 5, 6 | Aluminum Oxide | FIN |
| | 4, 5, 6 | Aluminum Oxide | MED |
| | 4, 5, 6 | Silicon Carbide | ULF |
| | 4, 5, 6 | Silicon Carbide | SFN |
| | 4, 5, 6 | Silicon Carbide | VFN |
| | 4, 5, 6 | Silicon Carbide | FIN |
| | 4, 5, 6 | Silicon Carbide | MED |

| | |
|---|---|
| **Diameters:** | 4" minimum<br>24" maximum |
| **Widths:** | 3/4"–24" 4 density in 4"–24" diameters<br>3/8"–24" 5, 6 density in 4, 6, 8" diameters<br>1/2"–24" 5, 6 density in 10, 12" diameters<br>1/2"–24" 5, 6 density in 10, 12" diameters<br>3/4"–24" 5, 6 density in 14"–24" diameters |
| **Typical Applications:** | • Polishing jewelry prior to plating<br>• Selective polish on nameplates<br>• Polish bevel edge of furniture glass<br>• Light oxide removal |

See pages 23–24 for recommended flanges/accessories.

## Scotch-Brite™ Clean and Strip Rim Wheel

An extra coarse open web in a layered construction makes this Scotch-Brite™ Clean and Strip Rim Wheel a perfect choice for the removal of rust, oxides and light scale. They can also show value in applications requiring a bright, coarse-grain finish.

These wheels can be adapted to a broad range of applications including bench grinders and automatic finishing equipment.

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| Clean and Strip Rim Wheel | 7 | Silicon Carbide | XCS |

| | |
|---|---|
| **Diameters:** | 8" minimum<br>16" maximum |
| **Widths:** | 1"–4" in 8"–16" diameters |
| **Typical Applications:** | • Coarse grain finishing<br>• Centerless finishing<br>• Rust removal<br>• Light coating removal |

See pages 23–24 for recommended flanges/accessories.

## Scotch-Brite™ Woodworking Wheel

This wheel is a custom designed non-woven abrasive product for use on white wood sanding. An advantage of this wheel is the open construction and the use of garnet mineral, reducing the potential for part burning. The Scotch-Brite™ Woodworking Wheel may be used in its straight form or shaped to various profiles.

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| Woodworking Wheel | 5 | Garnet | MED |

| | |
|---|---|
| **Diameters:** | 6" minimum<br>8" maximum |
| **Widths:** | 3/4" minimum<br>36" maximum |
| **Typical Applications:** | • Profile sanding<br>• Defuzzing |

See pages 23–24 for recommended flanges/accessories.

## 3M™ XR Metalworking Wheel

The 3M™ XR Metalworking Wheel is loaded with mineral and is designed for demanding applications such as removing sharp burrs that may drastically reduce the life of a non-woven abrasive or rubber bonded wheel.

This wheel retains its shape when dressed, allowing access to tight areas and right angles. Unlike a bonded wheel, the XR won't grab the workpiece, thus requiring less pressure and reducing operator fatigue. It also includes a grinding aid to increase cut rate and run cooler.

The combination of 3M's molded technology and grinding aid helps the XR last longer, which can help save time and money.

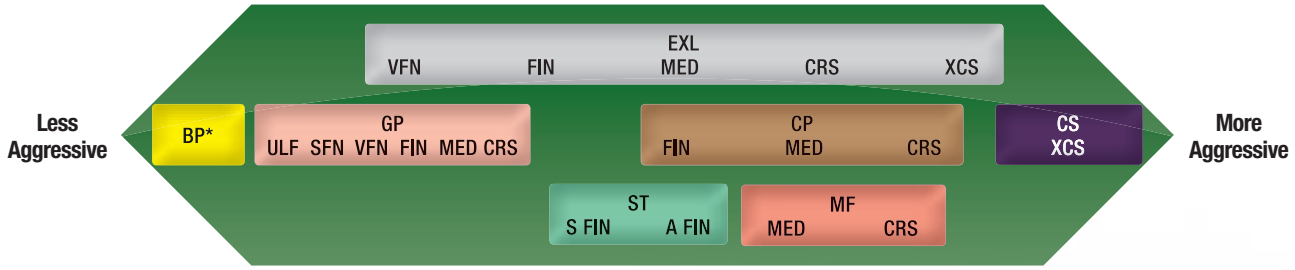
| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| XR Metalworking Wheel HA 805 | Hard | Aluminum Oxide | CRS |
| XR Metalworking Wheel HA 1208 | Hard | Aluminum Oxide | MED |
| XR Metalworking Wheel HA 2410 | Hard | Aluminum Oxide | FIN |

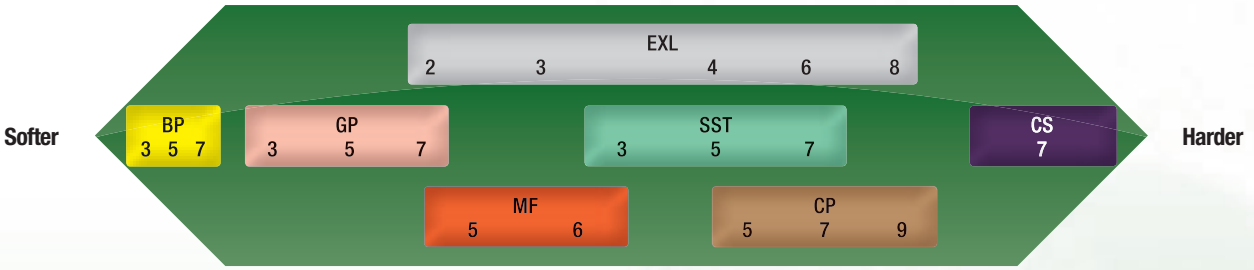
| | |
|---|---|
| **Diameters:** | 6", 8", 12" |
| **Widths:** | 1/2"–2" |
| **Typical Applications:** | • Deburring stainless steel and titanium<br>• Blending milling marks and grindlines<br>• Removing light scale<br>• Removing parting lines<br>• Applying a radius to parts |

See pages 23–24 for recommended flanges/accessories.

# Unitized Wheels

Scotch-Brite™ Unitized Wheel performance differences can be attributed to mineral (aggressiveness) and density (hardness). The combination of these two characteristics and subtle variations determine if the wheel will cut more aggressively or will be more durable and less conformable (See depiction below).

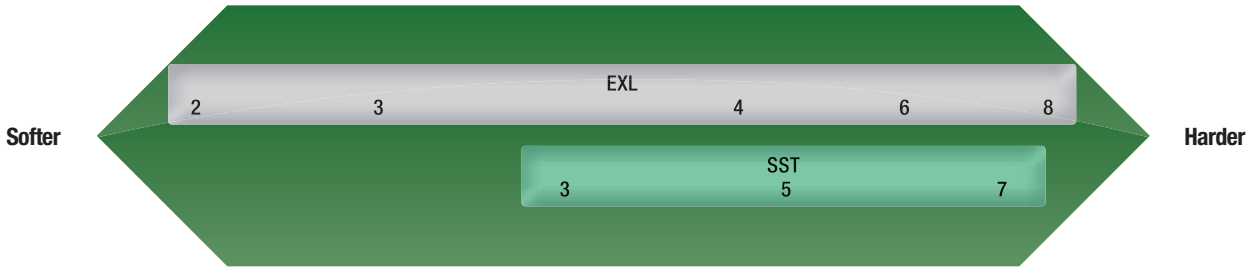



| Legend | | | | | |
|---|---|---|---|---|---|
| | BP | Buff and Polish Unitized Wheel | | GP | General Purpose Unitized Wheel |
| | CP | Cut and Polish Unitized Wheel | | MF | Metal Finishing Unitized Wheel |
| | CS | Clean and Strip Unitized Wheel | | SST | SST Unitized Wheel |
| | EXL | EXL Unitized Wheel | | | |

*No mineral: Use with abrasive compound.

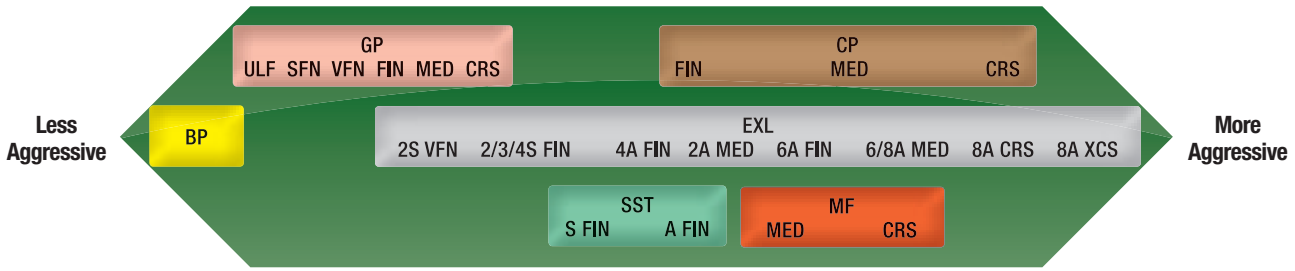
# Scotch-Brite™ Wheels for Deburring




| | Deburring Applications | Starting Point | Alternatives: More Aggressive | Alternatives: Less Aggressive |
|---|---|---|---|---|
| Carbon Steels | Deburr machined parts | EXL Unitized Wheel, 6A-medium (MED) | EXL Unitized Wheel, 8A-coarse (CRS) | EXL Unitized Wheel, 4A-fine (FIN) |
| | Deburr keyways | EXL Unitized Wheel, 2S-fine (FIN) | EXL Unitized Wheel, 2A-medium (MED) | EXL Unitized Wheel, 2S-very fine (VFN) |
| | Radius stamped parts | EXL Unitized Wheel, 2A-medium (MED) | EXL Unitized Wheel, 6A-medium (MED) | EXL Unitized Wheel, 4S-fine (FIN) |
| | Remove laser cut burrs | EXL Unitized Wheel, 8A-medium (MED) | EXL Unitized Wheel, 8A-coarse (CRS) | EXL Unitized Wheel, 6A-medium (MED) |
| Stainless Steel, Titanium (Nickel Alloys) | Deburr and radius root of turbine blades | EXL Unitized Wheel, 2S-fine (FIN) | SST Unitized Wheel, 3S-fine (FIN) | EXL Unitized Wheel, 2S-very fine (VFN) |
| | Deburr piston rings | EXL Unitized Wheel, 4S-fine (FIN) | EXL Unitized Wheel, 6A-medium (MED) | EXL Unitized Wheel, 3S-fine (FIN) |
| | Deburr threaded parts | EXL Unitized Wheel, 3S-fine (FIN) | EXL Unitized Wheel, 4S-fine (FIN) | EXL Unitized Wheel, 2S-fine (FIN) |
| | Radius sharp edges of stainless steel parts | EXL Unitized Wheel, 6A-medium (MED) | EXL Unitized Wheel, 8A-medium (MED) | EXL Unitized Wheel, 4A-fine (FIN) |
| Aluminum, Copper, Brass (Soft Metals) | Remove aluminum flashing | EXL Unitized Wheel, 6A-medium (MED) | EXL Unitized Wheel, 8A-coarse (CRS) | EXL Unitized Wheel, 2A-medium (MED) |
| | Deburr intricate cast parts | EXL Unitized Wheel, 3S-fine (FIN) | EXL Unitized Wheel, 4S-fine (FIN) | EXL Unitized Wheel, 2S-fine (FIN) |
| Other — Composites, Plastics, Glass, etc. | Deburr plastic | EXL Unitized Wheel, 4S-fine (FIN) | EXL Unitized Wheel, 2A-medium (MED) | EXL Unitized Wheel, 2S-fine (FIN) |

A=Aluminum Oxide S=Silicon Carbide

# Scotch-Brite™ Wheels for Polishing, Finishing and Blending

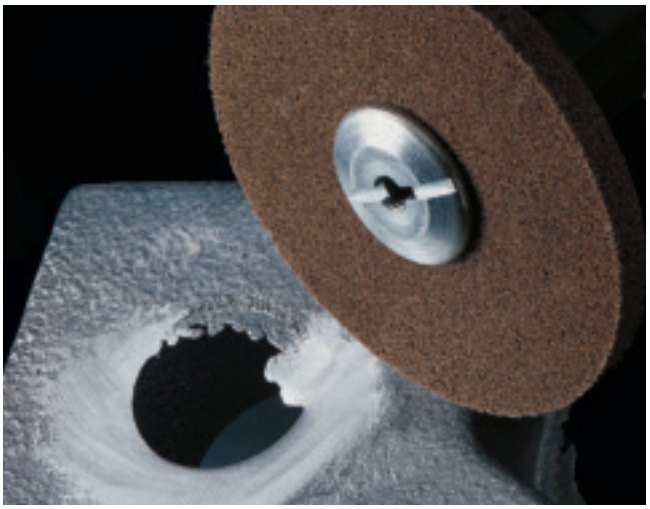



| | Polishing, Finishing and Blending Applications | Starting Point | Alternatives: | |
|---|---|---|---|---|
| | | | More Aggressive | Less Aggressive |
| Carbon Steels | Polish roller bearings | EXL Unitized Wheel, 3S-fine (FIN) | Cut and Polish Unitized Wheel, 5A-fine (FIN) | EXL Unitized Wheel, 2S-fine (FIN) |
| | Polish molds and dies | EXL Unitized Wheel, 2S-fine (FIN) | EXL Unitized Wheel, 3S-fine (FIN) | EXL Unitized Wheel, 2S-very fine (VFN) |
| | Decorative satin finish | Metal Finishing Unitized Wheel, 5A-medium (MED) | Metal Finishing Unitized Wheel, 6A-coarse (CRS) | Cut and Polish Unitized Wheel, 5A-fine (FIN) |
| | Pre-plate finish | EXL Unitized Wheel, 2S-fine (FIN) | Cut and Polish Unitized Wheel, 5A-fine (FIN) | EXL Unitized Wheel, 2S-very fine (VFN) |
| | Blend 80-100 grit grind lines | Cut and Polish Unitized Wheel, 7A-medium (MED) | EXL Unitized Wheel, 8A-coarse (CRS) | Cut and Polish Unitized Wheel, 5A-fine (FIN) |
| Stainless Steel, Titanium (Nickel Alloys) | Polish medical devices | EXL Unitized Wheel, 2A-medium (MED) | EXL Unitized Wheel, 6A-fine (FIN) | EXL Unitized Wheel, 2S-fine (FIN) |
| | Polish turbine engine components | EXL Unitized Wheel, 2S-fine (FIN) | EXL Unitized Wheel, 3S-fine (FIN) | EXL Unitized Wheel, 2S-very fine (VFN) |
| | Near mirror finish | EXL Unitized Wheel, 2S-very fine (VFN) | EXL Unitized Wheel, 2S-fine (FIN) | Buff and Polish Unitized Wheel* |
| | Blend parting lines from turbine blades | EXL Unitized Wheel, 2A-medium (MED) | EXL Unitized Wheel, 6A-fine (FIN) | EXL Unitized Wheel, 3S-fine (FIN) |
| Aluminum, Copper, Brass (Soft Metals) | Pre-plate polish | EXL Unitized Wheel, 2S-fine (FIN) | EXL Unitized Wheel, 4S-fine (FIN) | EXL Unitized Wheel, 2S-very fine (VFN) |
| | Polish jewelry plates | EXL Unitized Wheel, 2S-fine (FIN) | EXL Unitized Wheel, 2A-medium (MED) | EXL Unitized Wheel, 2S-very fine (VFN) |
| | Decorative finish on builders hardware | Metal Finishing Unitized Wheel, 5A-medium (MED) | Cut and Polish Unitized Wheel, 7A-medium (MED) | EXL Unitized Wheel, 2S-fine (FIN) |
| | Blend light imperfections | Metal Finishing Unitized Wheel, 5A-medium (MED) | Cut and Polish Unitized Wheel, 7A-medium (MED) | EXL Unitized Wheel, 2A-medium (MED) |
| Other — Composites, Plastics, Glass, etc. | Remove flash from plastic parts | EXL Unitized Wheel, 3S-fine (FIN) | EXL Unitized Wheel, 2A-medium (MED) | EXL Unitized Wheel, 2S-fine (FIN) |

A=Aluminum Oxide S=Silicon Carbide

*Buff and polish wheels are non-abrasive unitized wheels designed to work with compounds.

## Scotch-Brite™ EXL Unitized Wheel



EXL Unitized Wheels products are an excellent choice for deburring and polishing of all metal alloys as well as many plastics and composites. Similar to the EXL Convolute Wheels (EXL, EX2, EX3 Deburring Wheels) they resist smearing and minimize heat buildup on the workpiece.

There are a wide variety of densities and grades available starting from a very soft 2 density for applications requiring a conformable product extending to a hard, aggressive 8 density for maximum cut and durability.

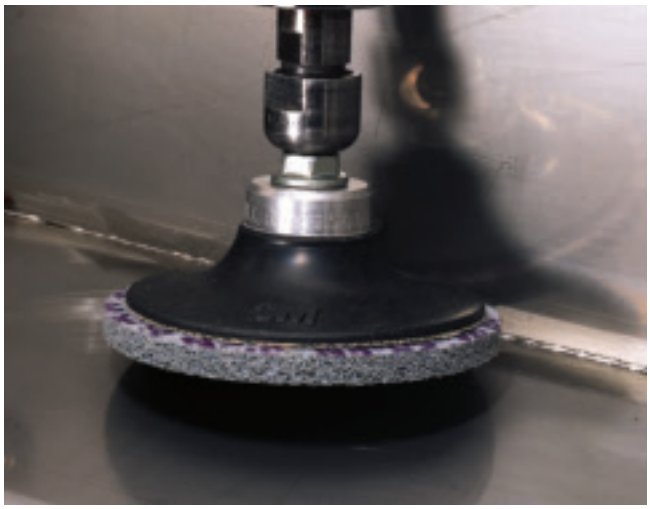
See page 1 for convolute vs. unitized

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| EXL Unitized Wheel | 2 | Silicon Carbide | VFN |
| | 2, 3, 4, 6 | Silicon Carbide | FIN |
| | 4, 6 | Aluminum Oxide | FIN |
| | 2, 6, 8 | Aluminum Oxide | MED |
| | 8 | Aluminum Oxide | CRS |
| | 2, 4, 6, 8 | Aluminum Oxide | XCS |

| | |
|---|---|
| **Diameters:** | 1/2" minimum<br>14" maximum |
| **Widths:** | 3, 6, 8 density in 1/8" minimum<br>2, 4 density in 1/4" minimum<br>1" maximum all diameters |
| **Typical Applications:** | • Weld cleaning<br>• Finishing threaded parts<br>• Turbine blade polishing<br>• Metal stampings |

See pages 23–24 for recommended flanges/accessories.

## Scotch-Brite™ Roloc™ EXL Unitized Wheel



Scotch-Brite™ Roloc™ EXL Unitized Wheels are strong and efficient for edge deburring and finishing. They perform well in a variety of metal working applications and machined parts where close tolerances are important.

Changing wheels is quick and easy with Roloc™ TR, Roloc™ TS, or Roloc™ + holding systems. They allow for use of both the edge and surface of the wheel without interruption of mounting hardware. The mounting system is interchangeable with Scotch-Brite™ Surface Conditioning Discs and Coated Abrasive Discs.

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| Roloc™ EXL Unitized Wheel | 2, 3, 6 | Silicon Carbide | FIN |
| | 2, 6, 8 | Aluminum Oxide | MED |
| | 8 | Aluminum Oxide | CRS |
| | 2, 4, 6, 8 | Aluminum Oxide | XCS |

| | |
|---|---|
| **Diameters:** | 2" and 3" |
| **Widths:** | N/A |
| **Typical Applications:** | • Weld polishing<br>• Deburring aircraft parts<br>• Blending and finishing on a variety of metals, plastics and composites |

See pages 23–24 for recommended flanges/accessories.

## Scotch-Brite™ SST Unitized Wheel

SST Unitized Wheels offer the same deburring and finishing advantages as SST Convolute Wheels *(SST Deburring Wheels; refer to page 8)*. The unitized version of the SST wheel is recommended when the application requires very narrow widths and/or small diameter ranges.

SST Unitized Wheels run well on equipment such as bench motors, floor lathes and portable power tools.

See page 1 for convolute vs. unitized

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| SST Unitized Wheel | 3, 5, 7 | Silicon Carbide | FIN |
| | 3, 5, 7 | Aluminum Oxide | FIN |

| | |
|---|---|
| **Diameters:** | 1/2" minimum<br>14" maximum |
| **Widths:** | 3 density in 1/4"–1"<br>5, 7 density in 1/8"–1"<br>1" maximum all diameters |
| **Typical Applications:** | • Deburring and finishing of aircraft engine components<br>• Finishing of parts used in medical and surgical instruments<br>• Mold and die polishing |

See pages 23–24 for recommended flanges/accessories.

## Scotch-Brite™ Cut and Polish Unitized Wheel

Cut and Polish Unitized Wheels are long lasting and aggressive for heavy duty blending and finishing with uniform results. The layered "unitized" construction of this wheel provides an excellent starting point for jobs requiring the availability of small diameters and narrow widths.

These wheels show value in the industry as they can often be used to replace many conventional abrasive products such as rubber bonded wheels and small set-up wheels.

See page 1 for convolute vs. unitized

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| Cut and Polish Unitized Wheel* | 5 | Aluminum Oxide | FIN |
| | 7, 9 | Aluminum Oxide | MED, CRS |
| | 7, 9 | Silicon Carbide | MED |

| | |
|---|---|
| **Diameters:** | 1/2" minimum<br>14" maximum |
| **Widths:** | 5, 7 density in 1/8", 1/4", 3/8", 1/2", 5/8", 3/4", 1"<br>9 density in 1/8", 1/4", 3/8", 1/2"<br>1" maximum all diameters |
| **Typical Applications:** | • Parting line removal<br>• Pipe thread deburring<br>• Heavy-duty deburring of aerospace components |

See pages 23–24 for recommended flanges/accessories.
*Also available in Roloc™

## Scotch-Brite™ Metal Finishing Unitized Wheel

Metal Finishing Unitized Wheels offer the same unique finishing capability of Metal Finishing Convolute wheels *(Metal Finishing Wheels; refer to page 9)*. These wheels are available in small diameters and narrow widths. In essence, they provide durability and value for finishing of parts that are too narrow, tight or small to finish efficiently with wider width wheels.

See page 1 for convolute vs. unitized

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| Metal Finishing Unitized Wheel | 5 | Aluminum Oxide | MED |
| | 6 | Aluminum Oxide | CRS |

| | |
|---|---|
| **Diameters:** | 1" minimum<br>14" maximum |
| **Widths:** | 1/4", 3/8", 1/2", 1"<br>1" maximum all diameters |
| **Typical Applications:** | • Weld cleaning and blending in stainless steel tank<br>• Manufacturing finishing of builders hardware<br>• Finishing/blending builders hardware<br>• Finishing prior to buffing |

See pages 23–24 for recommended flanges/accessories.

## Scotch-Brite™ Clean and Strip Unitized Wheel / Cup Wheel

Scotch-Brite™ Clean and Strip Unitized Wheel products are excellent for heavy duty cleaning applications.

The extra coarse silicon carbide mineral combined with a tough synthetic web is perfect for removing scale, rust, surface contaminants, paints and coatings. They are also well suited for removing weld discoloration and splatter.

The open construction and the aggressive properties provide a smooth running wheel that resists loading when removing soft coatings.

See page 1 for convolute vs. unitized

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| Clean and Strip Unitized Wheel | 7 | Silicon Carbide | XCS |
| Clean and Strip Cup Wheel | 7 | Silicon Carbide | XCS |

| | |
|---|---|
| **Diameters:** | Unitized Wheels: 1"–14"<br>Cup Wheels: 3" (3/8"–24 threaded nut size)<br>4" (5/8"–11 threaded nut size)<br>4" (M–10 x 1.25 threaded nut size)<br>4" (M–10 x 1.50 threaded nut size)<br>4" (3/8"–24 threaded nut size)<br>6" (7/8"–CH threaded nut size) |
| **Widths:** | Unitized Wheels: 1/4"–1"<br>Cup Wheels: N/A |
| **Maximum Operating Speeds (RPM)** | Unitized Wheels: See chart on page 21<br>Cup Wheels: 3" dia. — 18,100 RPM<br>4" dia. — 12,100 RPM<br>6" dia. — 7,000 RPM |
| **Typical Applications:** | • Rust removal<br>• Coating removal<br>• Gasket removal<br>• Light scale removal<br>• Bright finishing–coarse scratch pattern |

See pages 23–24 for recommended flanges/accessories.

## Scotch-Brite™ General Purpose Unitized Wheel

Similar to the General Purpose convolute wheel, this unitized wheel offers a wide range of grades and densities. Designed for applications requiring fine finishes or light cleaning, the General Purpose Unitized Wheel also tends to be a good starting point when the part shape or size calls for small diameters or narrow width product.

See page 1 for convolute vs. unitized

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| General Purpose Unitized Wheel | 3, 5, 7 | Silicon Carbide | ULF |
| | 3, 5, 7 | Silicon Carbide | SFN |
| | 3, 5, 7 | Aluminum Oxide and Silicon Carbide | VFN |
| | 3, 5, 7 | Aluminum Oxide and Silicon Carbide | FIN |
| | 3, 5, 7 | Aluminum Oxide and Silicon Carbide | MED |
| | 3, 5, 7 | Aluminum Oxide | CRS |

| | |
|---|---|
| **Diameters:** | 1/2" minimum<br>14" maximum |
| **Widths:** | 1/4", 3/8", 1/2", 5/8", 3/4", 1"<br>1" maximum all diameters |
| **Typical Applications:** | • Fine thread polishing<br>• Mold polishing<br>• Jewelry polishing<br>• Polishing turbine blades |

See pages 23–24 for recommended flanges/accessories.

## Scotch-Brite™ Buff and Polish Unitized Wheel

Buff and Polish Unitized Wheels are a unitized constructed, non-abrasive carrier for compounds used for polishing flat and symmetrical contoured surfaces. They can often replace felt or leather wheels, as they hold more compound with even distribution allowing for faster cut and less frequent compound application.

| Product Name | Density | Mineral Type | Grade |
|---|---|---|---|
| Buff and Polish Unitized Wheel | 3, 5, 7 | N/A | N/A Use with compound |

| | |
|---|---|
| **Diameters:** | 1/2" minimum<br>14" maximum |
| **Widths:** | 1/8"–1"<br>1" maximum all diameters |
| **Typical Applications:** | • Jewelry polishing<br>• Surgical instruments<br>• Honing and deburring of knife edges<br>• Fiber optic ends<br>• Medical Instruments |

See pages 23–24 for recommended flanges/accessories.

# Factors Affecting Performance

## Product Surface Speed

Because product speed has a significant effect on performance (cut, life, and finish), it is important to select the proper speed for a particular operation and work piece.

Generally, low speeds are desired for generating very uniform satin finishes, for finishing aluminum alloys without lubricants, and for use on composite or other soft material applications. High speeds are recommended when it is desired to remove or blend surface imperfections and tough burrs. This high speed will result in a faster cut along with finer finishes.

### Recommended Operating Speeds

(**SFPM** = **S**urface **F**eet **P**er **M**inute)

| | |
|---|---|
| Decorative finishing | 500–3000 SFPM |
| Composites/Soft materials | 1200–2700 SFPM |
| Deburring | 5000–6500 SFPM |
| Blending / Polishing | 6000–8000 SFPM |

## Lubricant–Coolant

Coolants, like water and some water soluble oils, reduce heat and extend product life while providing a greater cut. In the case of most oils or tallow lubricants, surface roughness can be reduced. The higher viscosity lubricants produce lower surface roughness, i.e., grease produces a finer surface finish than oil. In automatic or semi-automatic operations, it is desirable to use lubricants or coolants whenever possible.

## Product Hardness (Density)

3M™ Wheels are available in a number of densities or hardnesses. Generally, the softer products (2, 3, 4, and 5 density) are used for decorative finishing. They will conform more readily to surface contours along with generating a more uniform finish. The harder products (6, 7, 8, and 9 density) are to be used for the more difficult blending, cleaning and deburring operations.

### Surface Speed Conversion Chart

| RPM at Arbor or Spindle | Wheel Diameter | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2" | 4" | 6" | 8" | 10" | 12" | 14" | 16" | 18" |
| | Surface Speed in Feet Per Minute (SFPM) | | | | | | | | |
| 100 | 52 | 104 | 157 | 207 | 260 | 314 | 364 | 419 | 471 |
| 200 | 105 | 208 | 314 | 414 | 520 | 628 | 728 | 838 | 942 |
| 300 | 157 | 312 | 471 | 621 | 780 | 942 | 1092 | 1257 | 1414 |
| 400 | 209 | 416 | 628 | 828 | 1040 | 1256 | 1456 | 1676 | 1885 |
| 500 | 262 | 520 | 785 | 1045 | 1310 | 1570 | 1820 | 2094 | 2356 |
| 600 | 314 | 630 | 940 | 1255 | 1570 | 1885 | 2195 | 2513 | 2827 |
| 700 | 367 | 735 | 1100 | 1465 | 1835 | 2200 | 2560 | 2932 | 3299 |
| 800 | 419 | 837 | 1256 | 1675 | 2094 | 2513 | 2932 | 3351 | 3770 |
| 900 | 471 | 942 | 1413 | 1885 | 2356 | 2827 | 3298 | 3770 | 4241 |
| 1000 | 524 | 1047 | 1570 | 2094 | 2618 | 3141 | 3665 | 4189 | 4712 |
| 1100 | 576 | 1152 | 1727 | 2304 | 2880 | 3455 | 4031 | 4608 | 5184 |
| 1200 | 628 | 1256 | 1884 | 2513 | 3142 | 3769 | 4398 | 5027 | 5655 |
| 1300 | 681 | 1361 | 2042 | 2723 | 3404 | 4084 | 4764 | 5445 | 6126 |
| 1400 | 733 | 1466 | 2199 | 2932 | 3666 | 4398 | 5131 | 5864 | 6597 |
| 1500 | 785 | 1571 | 2356 | 3142 | 3927 | 4712 | 5497 | 6283 | 7069 |
| 1600 | 838 | 1675 | 2513 | 3351 | 4189 | 5026 | 5864 | 6702 | 7540 |
| 1700 | 890 | 1780 | 2670 | 3560 | 4451 | 5340 | 6230 | 7121 | 8011 |
| 1800 | 942 | 1885 | 2827 | 3770 | 4713 | 5650 | 6597 | 7540 | 8482 |
| 1900 | 995 | 1989 | 2984 | 3979 | 4975 | 5969 | 6963 | 7959 | 8954 |
| 2000 | 1047 | 2094 | 3141 | 4189 | 5236 | 6283 | 7330 | 8378 | 9425 |
| 2100 | 1100 | 2199 | 3298 | 4398 | 5498 | 6497 | 7696 | 8796 | 9896 |
| 2200 | 1152 | 2304 | 3455 | 4608 | 5760 | 6911 | 8063 | 9215 | 10367 |
| 2300 | 1204 | 2408 | 3612 | 4817 | 6022 | 7225 | 8429 | 9634 | 10839 |
| 2400 | 1257 | 2513 | 3770 | 5027 | 6284 | 7540 | 8796 | 10053 | 11310 |
| 2500 | 1309 | 2618 | 3927 | 5236 | 6545 | 7854 | 9162 | 10472 | 11781 |
| 2600 | 1361 | 2722 | 4084 | 5445 | 6807 | 8168 | 9529 | 10891 | 12252 |
| 2700 | 1414 | 2827 | 4241 | 5655 | 7069 | 8482 | 9895 | 11310 | 12723 |
| 2800 | 1466 | 2932 | 4398 | 5864 | 7331 | 8796 | 10262 | 11729 | 13195 |
| 2900 | 1518 | 3037 | 4555 | 6074 | 7592 | 9110 | 10629 | 12148 | 13666 |
| 3000 | 1571 | 3141 | 4712 | 6283 | 7854 | 9425 | 10996 | 12566 | 14137 |
| 3200 | 1676 | 3351 | 5026 | 6702 | 8378 | 10053 | 11729 | 13404 | 15080 |
| 3400 | 1780 | 3560 | 5340 | 7121 | 8901 | 10681 | 12462 | 14242 | 16022 |
| 3600 | 1885 | 3769 | 5654 | 7539 | 9425 | 11309 | 13193 | 15080 | 16965 |
| 3800 | 1990 | 3979 | 5969 | 7958 | 9948 | 11938 | 13927 | 15917 | 17907 |
| 4000 | 2094 | 4188 | 6283 | 8377 | 10472 | 12566 | 14661 | 16755 | 18850 |

SFPM = RPM x Diameter x $\pi$/12

## Convolute Wheels

**Maximum Operating Speeds (RPM)**

| Diameter | All Wheels (RPM) |
|---|---|
| 4" | 9,000 |
| 6" | 6,000 |
| 8" | 4,500 |
| 10" | 3,600 |
| 12" | 3,000 |
| 14" | 2,550 |
| 16" | 2,250 |
| 18" | 2,000 |
| 20" | 1,800 |
| 24" | 1,500 |

## Unitized Wheels

**Maximum Operating Speeds (RPM)**

| Size (Diameter x Width) | BP-UW | CS-UW | CP-UW | EXL-UW 2S, 3S | EXL-UW 2A MED, 2A XCS, 4A XCS | EXL-UW 4, 6, 8 Except 4A XCS | GP-UW | ST-UW 3 | ST-UW 5, 7 | MF-UW |
|---|---|---|---|---|---|---|---|---|---|---|
| Less than 1" | 40,100 | 40,100 | 40,100 | 35,100 | 30,100 | 40,100 | 35,100 | 40,100 | 40,100 | — |
| 1" x All | 35,100 | 35,100 | 35,100 | 30,100 | 25,100 | 35,100 | 30,100 | 35,100 | 35,100 | 35,100 |
| 1-1/2" x All | 30,100 | 25,100 | 30,100 | 20,100 | 18,100 | 30,100 | 20,100 | 25,100 | 30,100 | 25,100 |
| 2" x 1/4"–1/2" | 24,100 | 20,100 | 22,100 | 16,100 | 16,100 | 22,100 | 16,100 | 20,100 | 22,100 | 18,100 |
| 2" x 3/4"–1" | 24,100 | 20,100 | 22,100 | 16,100 | 14,100 | 22,100 | 16,100 | 18,100 | 22,100 | 18,100 |
| 2-1/2" x 1/8" | 22,100 | — | 20,100 | — | — | 20,100 | 12,500 | — | 20,100 | 15,100 |
| 2-1/2" x 1/4" | 22,100 | 16,100 | 20,100 | 14,100 | 14,100 | 20,100 | 12,500 | 18,100 | 20,100 | 15,100 |
| 2-1/2" x 3/8" | 22,100 | 16,100 | 20,100 | 14,100 | 12,100 | 20,100 | 12,500 | 18,100 | 20,100 | 15,100 |
| 2-1/2" x 1/2" | 22,100 | 16,100 | 18,100 | 14,100 | 12,100 | 18,100 | 12,500 | 18,100 | 18,100 | 15,100 |
| 2-1/2" x 3/4"–1" | 22,100 | 16,100 | 18,100 | 12,500 | 10,000 | 18,100 | 12,500 | 15,100 | 18,100 | 15,100 |
| 3" x 1/8" | 18,100 | — | 18,100 | — | — | 18,100 | 10,000 | — | 18,100 | 12,500 |
| 3" x 1/4" | 18,100 | 14,100 | 18,100 | 12,100 | 12,100 | 18,100 | 10,000 | 14,100 | 18,100 | 12,500 |
| 3" x 3/8" | 18,100 | 14,100 | 18,100 | 12,100 | 10,000 | 18,100 | 10,000 | 14,100 | 18,100 | 12,500 |
| 3" x 1/2" | 18,100 | 14,100 | 15,100 | 10,000 | 10,000 | 15,100 | 10,000 | 12,500 | 15,100 | 12,500 |
| 3" x 3/4"–1" | 18,100 | 14,100 | 15,100 | 10,000 | 9,000 | 15,100 | 10,000 | 12,500 | 15,100 | 12,500 |
| 4" x 1/8" | 14,100 | 10,000 | 12,100 | — | — | — | 8,000 | — | 12,100 | 9,000 |
| 4" x 1/4"–1/2" | 14,100 | 10,000 | 12,100 | 8,500 | 8,000 | 12,100 | 8,000 | 10,000 | 12,100 | 9,000 |
| 4" x 3/4"–1" | 14,100 | 10,000 | 12,100 | 8,000 | 7,000 | 12,100 | 8,000 | 9,000 | 12,100 | 9,000 |
| 5" x All | 12,100 | 8,000 | 9,000 | 6,000 | 5,500 | 9,000 | 6,000 | 7,500 | 9,000 | 7,500 |
| 6" x All | 10,000 | 7,000 | 7,500 | 5,000 | 4,500 | 7,500 | 5,000 | 6,000 | 7,500 | 6,000 |
| 7" x All | 8,000 | 6,000 | 6,000 | 4,500 | 4,000 | 6,000 | 4,500 | 5,000 | 6,000 | 5,000 |
| 8" x All | 7,000 | 5,000 | 5,500 | 4,000 | 3,500 | 5,500 | 4,000 | 4,500 | 5,500 | 4,500 |
| 9" x All | 6,000 | 4,500 | 5,000 | 3,500 | 3,000 | 5,000 | 3,500 | 4,000 | 5,000 | 4,000 |
| 10" x All | 5,000 | 4,200 | 4,500 | 3,200 | 2,800 | 4,500 | 3,200 | 3,750 | 4,500 | 3,750 |
| 11" x All | 4,500 | 3,800 | 4,000 | 2,900 | 2,500 | 4,000 | 2,900 | 3,400 | 4,000 | 3,400 |
| 12" x All | 4,000 | 3,500 | 3,750 | 2,600 | 2,300 | 3,750 | 2,600 | 3,100 | 3,750 | 3,100 |
| 13" x All | 3,500 | 3,200 | 3,450 | 2,400 | 2,100 | 3,450 | 2,400 | 2,800 | 3,450 | 2,800 |
| 14" x All | 3,200 | 3,000 | 3,200 | 2,200 | 2,000 | 3,200 | 2,200 | 2,650 | 3,200 | 2,650 |
| 15" x All | 3,000 | — | — | — | — | — | — | — | — | — |
| 16" x All | 2,800 | — | — | — | — | — | — | — | — | — |
| 17" x All | 2,600 | — | — | — | — | — | — | — | — | — |
| 18" x All | 2,500 | — | — | — | — | — | — | — | — | — |
| 19" x All | 2,300 | — | — | — | — | — | — | — | — | — |
| 20" x All | 2,250 | — | — | — | — | — | — | — | — | — |

Identifies product with "Dual" rating and higher maximum operating speed (see page 22).

UW = Unitized Wheel
BP = Buff and Polish Unitized Wheel
CS = Clean and Strip Unitized Wheel
CP = Cut and Polish Unitized Wheel

EXL = EXL Unitized Wheel
GP = General Purpose Unitized Wheel
ST = SST Unitized Wheel
MF = Metal Finishing Unitized Wheel

## Unitized Wheels

The following Unitized Wheels (in either 1/4" or 3/8" I.D.) have been certified to run at higher maximum operating speeds when using the following hardware (or their equivalents) #990 or #991 Mandrel — or used with 1-1/2" O.D. and 3/8" I.D. flat washers.

**Products with "Dual" ratings and higher Maximum Operating Speeds (MOS)**

| Product Name | Density/Grade | Size (Diameter x Width) | RPM |
|---|---|---|---|
| Clean and Strip Unitized Wheel | 7S XCS | 3" x 1/4" | 18,100 |
| Cutting and Polish Unitized Wheel | 5A FIN | 3" x 1/2" | 18,100 |
| | | 3" x 3/4" | |
| | 7A MED | 3" x 1/2" | |
| | | 3" x 3/4" | |
| | 7S MED | 3" x 1/2" | |
| | | 3" x 3/4" | |
| | 7A CRS | 3" x 1/2" | |
| | 5A FIN | 2-1/2" x 1/2" | 22,100 |
| | | 2-1/2" x 3/4" | |
| | 7A MED | 2-1/2" x 1/4" | |
| | | 2-1/2" x 1/2" | |
| | 7S MED | 2-1/2" x 1/4" | |
| | | 2-1/2" x 1/2" | |
| EXL Unitized Wheel | 4A FIN | 3" x 1/2" | 18,100 |
| | 4S FIN | 3" x 1/2" | |
| | 6A FIN | 3" x 1/2" | |
| | 6S FIN | 3" x 1/2" | |
| | 6A MED | 3" x 1/2" | |
| | 8A MED | 3" x 1/2" | |
| | 8A CRS | 3" x 1/2" | |
| | 6A MED | 2-1/2" x 1/2" | 20,100 |
| | 8A MED | 2-1/2" x 1/2" | |
| General Purpose Unitized Wheel | 5A MED | 3" x 1/2" | 18,100 |
| | | 3" x 3/4" | |
| | 5A FIN | 3" x 1/2" | |
| | | 3" x 3/4" | |
| | 7A FIN | 3" x 1/4" | |
| | | 3" x 1/2" | |
| | 7S FIN | 3" x 1/4" | |
| | | 3" x 1/2" | |
| SST Unitized Wheel | 5S FIN | 3" x 1/2" | 18,100 |
| | 7S FIN | 3" x 1/2" | |

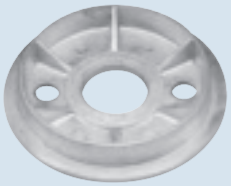
These products have a "Dual" rating and higher maximum operating speed. See page 21 for additional options.

O.D. = Outside diameter
I.D. = Inside diameter

# Accessories

## Convolute Wheels

### Flanges

| Product Name | Product Image | Used With | Diameter x CH |
|---|---|---|---|
| 3M™ Flange Adapter 3 | | 1" CH Wheels | 1" x 1/2"<br>1" x 5/8"<br>1" x 3/4"<br>1" x 7/8" |
| 3M™ Flange Adapter 5 | | 1/2" Wide x 1" CH or<br>1" Wide x 1" CH Wheels* | 1" x 1/2" x 1/2"<br>1" x 1" x 1/2" |
| Flange Adapter 356** | | 3" CH Wheels | 3" x 1-1/2" |
| Flange Adapter 356** |  | 4" CH Wheels | 4" x 1/2"<br>4" x 3/4"<br>4" x 1"<br>4" x 1-1/4" |
| Flange Adapter 356** | | 8" CH Wheels | 8" x 1-3/4" |
| Flange Adapter 356** | | 12" CH Wheels | 12" x 1-1/4"<br>12" x 1-1/2" |

*Telescoping wheel Adapters 1" and 1/2" wide are used to reduce 1" wheel center holes to fit 1/2", 5/8", 3/4" or 7/8" shafts.
**Currently available from CPS, call 1-800-843-0619
CH = Center Hole

# Unitized Wheels

## Mandrels

| Product Name | Product Image | Used with Unitized Wheels | Overall Length x Shank Size x Washer Diameter | Maximum Operating Speed (RPM) |
|---|---|---|---|---|
| 3M™ Mandrel 931 | | 1" to 1-1/2" diameter x 1/4" wide x 1/8" CH | 1-1/2" x 1/8" x 1/2" | 13,000 |
| 3M™ Mandrel 932 | | 1-1/2" to 2" diameter x 1/4" to 1/2" wide x 1/4" CH<br>Note: 5/16" CH is recommended for wheels 6 density and harder. | 2" x 1/4" x 13/16" | 20,000 |
| 3M™ Mandrel 933 | | 2", 2-1/2" or 3" diameter x 1/4", 1/2", 3/4" or 1" wide x 1/4" CH<br>Note: 5/16" CH is recommended for wheels 6 density and harder. | 2" x 1/4" x 1" | 14,000 |
| 3M™ Mandrel 934 | | 3" to 6" diameter x 1/4", 1/2", 3/4" or 1" wide x 1/2" CH | 3-1/16" x 1/4" x 2-1/2" | 12,000 for 3" dia<br>8,500 for 4" dia<br>6,000 for 6" dia |
| 3M™ Mandrel 936 | | 1" diameter x 1" wide x 3/16" CH | 2-1/16" x 1/4" x 3/4" | 22,200 |
| Mandrel 946* | | 1" diameter x 1" wide x 3/16" CH | 1-3/4" x 1/4" x 1/2"<br>Hex Nut Dia. | 35,200 |
| 3M™ Mandrel 990 | | 2" to 3" diameter x 1/8"–1/2" wide x 3/8" CH | 1-3/4" x 1/4" | 25,100 for 2" dia<br>22,100 for 2-1/2" dia<br>18,100 for 3" dia |
| Mandrel 991* | | 2" to 3" diameter x 3/4" to 1" wide x 3/8" CH | 1-7/8" x 1/4" | 25,100 for 2" dia<br>22,100 for 2-1/2" dia<br>18,100 for 3" dia |
| Mandrel 992* | | 1" to 1-1/2" diameter x 1/8" to 1/2" wide x 3/16" CH | 1-1/2" x 1/8" | 35,200 for 1" dia<br>30,200 for 1-1/2" dia |
| Mandrel 994* | | 1" to 1-1/2" diameter x 1/8" to 1/2" wide x 3/16" CH | 1-1/2" x 1/4" | 35,200 for 1" dia<br>30,200 for 1-1/2" dia |
| Mandrel 996* | | 1/2" to 3/4" diameter x 1/8" to 1/4" wide x 1/8" CH | 1-11/16" x 1/8" | 40,200 for 1/2" and 3/4" dia |
| Mandrel 998* | | 1/2" to 3/4" diameter x 1/8" to 1/2" wide x 1/8" CH | 1-11/16" x 1/4" | 40,200 for 1/2" and 3/4" dia |

*Currently available from CPS, call 1-800-843-0619
CH = Center Hole

# Convolute and Unitized Equivalency Chart

| Convolute Wheel | | Unitized Wheel |
|---|---|---|
| Light Deburring Wheel, 6/7/8S-fine (FIN) | ≅ | EXL Unitized Wheel, 2S-very fine (VFN) |
| EXL Deburring Wheel, 8S-fine (FIN) | ≅ | EXL Unitized Wheel, 2 and 3S-fine (FIN) |
| EXL Deburring Wheel, 9S-fine (FIN) and EXL Deburring Wheel, 8S-medium (MED) | ≅ | ↕ N/A |
| EXL Deburring Wheel, 8A-medium (MED) | ≅ | EXL Unitized Wheel, 2A-medium (MED) |
| SST Deburring Wheel, 7A-fine (FIN) | ≅ | SST Unitized Wheel, 3/5/7A-fine (FIN) and EXL Unitized Wheel, 4/6A-fine (FIN) |
| SST Deburring Wheel, 8S-fine (FIN) | ≅ | SST Unitized Wheel, 3/5/7S-fine (FIN) and EXL Unitized Wheel, 4/6S-fine (FIN) |
| Cut and Polish Wheel, 5A-fine (FIN) | ≅ | EXL Unitized Wheel, 6A-medium (MED) and Cut and Polish Unitized Wheel, 5A-fine (FIN) |
| Cut and Polish Wheel, 5/7A-medium (MED) | ≅ | Cut and Polish Unitized Wheel, 7/9A-medium (MED) |
| Cut and Polish Wheel, 7A-coarse (CRS) | ≅ | Cut and Polish Unitized Wheel, 7/9A-coarse (CRS) |
| CPM Wheel, 5/7/9A-medium (MED) | ≅ | EXL Unitized Wheel, 8A-medium (MED) |
| CPM Wheel, 5/7/9A-coarse (CRS) | ≅ | EXL Unitized Wheel, 8A-coarse (CRS) |
| CPM Wheel, 5/7/9A-extra coarse (XCS) | ≅ | EXL Unitized Wheel, 2/4/6/8A-extra coarse (XCS) |
| N/A | ≅ | Cut and Polish Unitized Wheel, 7/9S-medium (MED) |
| Metal Finishing Wheel, 5A-medium (MED) | ≅ | Metal Finishing Unitized Wheel, 5A-medium (MED) |
| Metal Finishing Wheel, 6A-coarse (CRS) | ≅ | Metal Finishing Unitized Wheel, 6A-coarse (CRS) |

## When you have questions, 3M has answers.

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## Important Notice to Purchaser

**Safety Information:** Always read and follow all safety information included with the product. Do not exceed maximum operating RPMs. Use guards provided with machine. Follow safety operation procedures posted in work areas.

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