UNDERSTANDING ABRASIVES & HOW THEY WORK

• Types of Abrasives: Roll, Disks, Sheets, Pads, Wheels, Screens
• Types of Mineral: Silicon Carbide, Aluminum Oxide, Zirconium, Ceramic
  • Grits Available: General 12-3000, Hardwood 12-240
  • Backing: Cloth or Paper - Hard or Soft
  • Abrasive Bond: Resin, Glue, Glue/Resin or Paper/Resin
• Belt Splices: Sine, Pro-Lap, Bi-Directional, Minimal or No Chatter
  • Open Coat or Closed Coat: Open Coat has 60% of Less Grit
  • Wet or Dry Operation
• Care of Abrasives:

Proper Temperature, Humidity, Storage, Hinging & Cupping

• Type of Back-up: Driver Pad or Adhesive, Drum Pad, Contact Wheel
• Flexibility of Back-up: Hard Rubber, Soft Rubber or Felt Pad. Cloth

• Abrasive speed = Diameter of the Contact Wheel multiplied by the Rotation Speed of Machine

• Pressure – Force Pushing on Back of Paper (weight) to the surface
  • Hardness of Work Piece: Wood, Marble or Metal
  • Wood Grain Direction: Straight, 6°, 20°, 30°, 45°, or Perpendicular
  • Machine Type: Drum, Belt, Edger, Buffer, Random Orbital
PRODUCTION PROCESS
1. Unrolling the Backing material
2. Applying “maker” bond
3. Electrostatic application of grit
4. Oven treating the “maker” bond
5. Applying the “sizer” bond
6. Oven treating the “sizer” bond
7. Creating a jumbo roll
1. Backing Material
2. Maker Bond
3. Grit Material
4. Sizer Bond

Electrostatic coating guarantees that more than 95% of the grit being applied will attach to the backing flat side down leaving the sharp edges pointing out. This allows the abrasive to be as aggressive as possible.

After the jumbo rolls are cooled and flexed they are ready for use, punching and cutting the roll into discs, belts and smaller rolls. The product is then packaged and ready for the distributor and contractor.
ABRASIVES
The ability to make scratches on other kinds of materials. Related to the hardness of diamond at 100%, the following scale is applicable:

- Diamond: 100%
- Silicon carbide: 99.5%
- Zirconium: 98.5%
- Brown Alum. Oxide: 98.0%
TOUGHNESS

The mechanical force a grit particle can resist before being crushed. The easier a grit is crushing, the lower the mechanical forces can be applied during grinding. The sequence in toughness is as follows:

1. Zirconium
2. Brown Aluminum Oxide
3. White Aluminum Oxide
4. Silicon Carbide
5. Emery
6. Flint
A coated abrasive grit always needs a pointed or pyramidal shape. This means the point at the top is sharp, for fast and efficient sanding power. It also creates a big bonding surface with Resin.
MINERALS
SILICON CARBIDE

- Durable mineral which remains sharp through the sanding process
- 12 - 30 grit removes old gummy finishes and fractures at low pressure allowing the belt to clean itself
- Fractures and re-sharpens effectively throughout belt life
  - Perfect for the 500 - 600 sq ft jobs
- Created to finish dark stain, pine and very hard species
  - Widely used on wood floors and throughout the furniture industry
ALUMINUM OXIDE

- Works longer than Silicone Carbide by approximately 20% - Aluminum Oxide is more durable but doesn't fracture as easy, making it great for most jobs (especially for a natural finish)

- Aluminum Oxide is the most economical mineral

- Great for production work and is widely used in the all wood industries
DIAMONDBACK ZIRCONIUM

• Cuts 900-1000 sq. ft. per belt. Last 2 to 3 times longer than other minerals.

• High percentage Zirconium mineral makes a very fast consistent cut

• Less belt changes + Less Down Time = More Profits
  • Don’t confuse this with other look alike belts

• DBZ Belts are so tough they will sand through nail stick ups
  • Lowest cost sandpaper to use per square foot

• Heat resistant - Last 10 times longer than paper.
  • Sharpness of Silicon Carbide and more durable than Aluminum Oxide
CERAMIC

- Designed to remove ceramic and aluminum oxide finishes
  - Excellent for production work
- Surface preparation on almost any surface
  - Highly durable
  - Resistant to loading
- Grits 36 to 80 (recommend finish with AOS/AOP or SIC minerals)
- Works well for cutting over wood and cupping and crowning wood floors
Several years ago the Automotive Industry in Europe made the change from Lacquer (Enamel) finishes to Water Base/Clear Coat Finishes. The clear coat magnified all imperfections and caused immediate problems with the selling of the Automobiles. A standard was then developed to insure quality to the end user.

FEPA grading guarantees constant grit and smooth sanding. FEPA “P” grading, is the most stringent grading system in the world for abrasives, insuring that 95% of the grit is the specified size, compared with other grading systems that allow only 60%.

Note: A “P” will precede the Grit # on all FEPA Grades. Example; P-100
Dry sanding

-A- Weight Manual Sanding  35-40#

-B- Weight Manual Sanding, Flexible  50-06#

-C- Weight Manual and Orbital Sanding, Flexible  70-80#

-D- Weight Manual Sanding, Orbital and Disc Sanding  85-90#

-E- Weight Heavy Belt or Disc Sanding  120-140#

-F- Weight Heavy Belt or Disc Sanding  160-175#

Wet Sanding

-A- Weight Manual Sanding, very Flexible  60#

-C- Weight Manual Sanding Flexible  90#

-D- Weight Manual or Disc Sanding  105#
CLOTH

J-Cloth: Very Flexible light Cotton Twill
F-Cloth: Highly flexible, but higher tensile strength
X-Cloth: Heavy and Strong Cotton Twill with high mechanical and thermal stability
Y-Cloth: Polyester, very heavy and strong, with extremely high mechanical and thermal stability

COMBINATION

Special backing made from an –E- weight paper laminated with a cotton screen. This gives a good combination of the strength of the cloth and the smoothness of the paper

• Extra durability
• More tear resistant than standard paper
• Excellent high speed use
GLUE

• Sharp and Flexible
• Finish Product is inexpensive
• Heat/Moisture Sensitive
• Has a weak backing to mineral bond
  • Water soluble

RESIN

• Urea-Resin:
  • Superior flexibility
  • Phenolic Resin:
    • Strong and durable: extends belt life
      • Waterproof
    • Excellent Mineral Bond
  • Rigid cure makes mineral more aggressive
    • More expensive than urea resin
VELCRO / HOOK & LOOP

2”-19” Paper/Cloth Silicon Carbide – Aluminum Oxide - Zirconium

• Velcro Advantages
  • Easy to remove and replace
  • Saves Edger Pads
  • Not Tools Required
  • Disks last longer – Saves $ 

Conversion Disk

• Conversion Pad bolts easily to any standard edger
• Conversion Pad accepts any Velcro Type Paper
• To Change, zip off old paper and apply new. No Tools, No Mess, No Experience Necessary

Velcro Waffle Disks

*Registered TM of the 3M Company
DOUBLE SIDE DISK

• DSD is the best product for flattening the floor. It resists slipping like single side disks. Use with standard buffer and Pad driver or Hard plate

• DSD are made with Special Silicon Carbide that continues to sharpen during the sanding process leaving a finely sanded floor

• DSD are manufactured with “clean out cuts”. Finger cuts in the disc eliminate loading, Thus reducing swirl marks and scratches in the floor.

• DSD 12,16,24 grits - Used to remove glue, mastic, abrade paint, smoothing concrete and sub floor preparation

• DSD 24,30,36 grits - Cut heavy finishes or waxes before belt or drum sander

• DSD 36,40,60 grits - Flattens floors that are cupped or crowned before using a belt or drum sander. Reduces the possibility of a wave in the floor

• DSD 80,100,120,150 grits - Stiffer than single discs or screens. They perform better to remove chatter, edger and drum scratches and will not dish out soft grain.

• DSD 80,100,120,150 grits - Perfect for parquet inlays, multi species, adjacent hard and soft species, all metals and most stone (additional grits 220 280 340 400 500)
ROLLS
SIC Silicon Carbide (Black) 400-500 sq. ft. Used for general drum sanding by Professional Sanders. SIC mineral fractures easily during use creating a new sharp edge. Easy cut paper backing allows rapid change for your drum sander. Grits 12-36 are great for gummy finishes, waxes and paint. Grits 40-60 are good for leveling and removing deep scratches. Grits 80-120 are best for fine finishes. Silicon Carbide cuts fast, starts and stays sharp.
High quality extremely durable cloth backed abrasive rolls are great for large jobs (gym floors and commercial buildings). Longer life and less changing creates better productivity. Cloth with double resin prevents mineral loss allowing the abrasive to cut faster and run cooler for better productivity.

**AOS Aluminum Oxide (Reddish) 700 sq. ft.** AOS mineral on a cloth backing. The most economical cloth backed product. Lasts 2 to 3 times longer than standard paper product. Aluminum Oxide is more durable but doesn't fracture as easy, making it great for most jobs (especially for a natural finish).

**DBZ DiamondBack Zirconium (Blue) 1000 sq. ft.** Aggressive, extremely sharp and durable. Fast cutting DBZ lasts 5-6 times longer than paper and provides double the life of AOS. DBZ is so tough it will sand through nail stick ups. Less belt changes + Less Down Time = More Profits. DBZ has the sharpness of SIC with more durability than AOS. Don't confuse this with other look products.

**CER Ceramic (Red brown) 1800-2000 sq. ft.** Ceramica™ is ceramic grain bonded to heavy duty cloth that is extremely durable and remains sharp under the most aggressive situations. Designed to remove ceramic and aluminum oxide finishes. CER cloth backed abrasive is high ratio product. It performs best for large jobs. Best for cutting over wood or cupping and crowning wood floors. Works best with large rider machines.
BELTS
- Non-directional Pro-Loc Splice makes your belts reversible for longer life, better alignment, and less chance of breaking and hinging. Inside splice has a smooth low profile scribe and is covered with reinforced tape to reduce chatter.

- Belts are electro-statically coated with a newly developed molded pyramidal shaped mineral. The mineral is applied to the backing on the square or flat bottom of the pyramid assuring maximum adhesion area and allowing the pinnacle or sharp point to come in contact with the material being sanded for a sharp, clean finish.

- FEPA "P" grading, the most stringent grading system in the world for abrasives, insuring that 95% of the grit is the specified size, compared with other grading systems that allow only 60%. FEPA grading guarantees constant grit and smooth sanding.
SIC SILICON CARBIDE (Black)

500-600sq.ft.  Grits 24-120

- Durable mineral which remains sharp through the sanding process

- 12 - 30 grit removes old gummy finishes and fractures at low pressure allowing the belt to clean itself

- Fractures and re-sharpens effectively throughout belt life

- Perfect for the 500 - 600sq ft jobs

- Created to finish dark stain, pine and very hard species

- Widely used on wood floors and throughout the furniture industry
• Designed to remove ceramic and aluminum oxide finishes
• Excellent for production work
• Surface preparation on almost any surface
  • Extremely durable
• Excellent resistance to loading
• Grits 36 to 80 (recommend finish with AOS/AOP or SIC minerals)
• Best for cutting over wood and cupping and crowning wood floors
• High percentage Zirconium mineral makes a very fast consistent cut
• Belts last 2 to 3 times longer than other minerals
• Less belt changes + Less Down Time = More Profits
• Heat Resistant - Durable cloth backing
• Don't confuse this with other look alike belts
• DBZ Belts are so tough they will sand through nail stick ups
• Lowest cost sandpaper to use per square foot
  • Last 10 times longer than paper
• Sharpness of Silicon Carbide and more durable than Aluminum Oxide
• Works longer than Silicone Carbide by approximately 20% - Aluminum Oxide is more durable but doesn't fracture as easy, making it great for most jobs (especially for a natural finish)

  • Aluminum Oxide is the most economical belt we offer

• Great for production work and is widely used in the all wood industries
Belt Sanders & Belt Sizes
SANDING SCREENS

- SS are the best you can buy because SIC fractures with minimum pressure and heat. This produces the most consistent scratch proof floor.
- SS stay sharp until the mineral is completely utilized
- SS minerals are graded closely and bonded to both sides of the mesh to ensure consistency. No clogged screen holes.
- SS can be used wet or dry from 178 - 330 rpm
- SS screens cut flatter & more aggressively when on thin pads. Thick pads cut less aggressively and follow the contour of the floor sometimes removing soft grain leaving an uneven appearance.
- SS 80 - 100 screens are used on raw wood before stain operations to blend the edges to the field.
- SS 120 - 150 - 180 are used between finish coats and when the finest scratches must be removed
- SS 150 - 220 grits may also be used between coats on oil or solvent based poly. 220 grit may also be used on water based finish
- Grits available: 60, 80, 100, 120, 150, 180, 220
- Sizes: 4”, 5”, 6”, 7”, 8”, 12”, 15”, 16”, 17”, 19”, 20”, & 12”x18”
EXTREME DISK

- DiamondBack (DBZ) Cloth
- backed Zirconium single
- sided disks. Used for heavy
- duty concrete preparation
- and taking the cup out of wood
- floors prior to sanding. Can be
- used wet with adhesive
- removers, Available in grits 24-
  - 120
Choosing the Right Abrasive

**Unfinished Floors**
(new floors)
*over wood greater than 1/32 or a business card may require 36 grit

<table>
<thead>
<tr>
<th>Cut</th>
<th>Grit</th>
<th>Best</th>
<th>Economy</th>
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<tbody>
<tr>
<td>First</td>
<td>36*-40</td>
<td>D</td>
<td>S</td>
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<tr>
<td>Second</td>
<td>56-60</td>
<td>D</td>
<td>S</td>
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<tr>
<td>Third</td>
<td>80-100</td>
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**Dark Wood/Dark Stains**
(Serious Professionals)

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<tr>
<th>Cut</th>
<th>Grit</th>
<th>Best</th>
<th>Economy</th>
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<td>First</td>
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<td>A/A</td>
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<tr>
<td>Third</td>
<td>80</td>
<td>S</td>
<td>A</td>
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<tr>
<td>Fourth</td>
<td>100</td>
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**Very Hard Wood**
*Beginning with higher grit sandpaper creates fewer and shallower scratch patterns. Following with SIC offers the best way to remove scratches. For excessive over wood cut twice with 50 grit.*

<table>
<thead>
<tr>
<th>Cut</th>
<th>Grit</th>
<th>Best</th>
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<tbody>
<tr>
<td>First</td>
<td>50</td>
<td>S</td>
<td>D</td>
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<tr>
<td>Second</td>
<td>80</td>
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<tr>
<td>Third</td>
<td>100</td>
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**Soft Wood Pine / Walnut**

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<thead>
<tr>
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<th>Grit</th>
<th>Best</th>
<th>Economy</th>
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<tbody>
<tr>
<td>First</td>
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<td>D</td>
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<tr>
<td>Third</td>
<td>100</td>
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</table>

**Drum Machines**
Residential, Light Commercial

<table>
<thead>
<tr>
<th>Cut</th>
<th>Grit</th>
<th>SIC Paper</th>
<th>Economy</th>
</tr>
</thead>
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<tr>
<td>First</td>
<td>36-40</td>
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<td>D</td>
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<tr>
<td>Third</td>
<td>80-100</td>
<td>S</td>
<td>S</td>
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</table>

**Drum Machines**
Large Gyms, Commercial, Residential

<table>
<thead>
<tr>
<th>Cut</th>
<th>Grit</th>
<th>Best per sq ft Performance</th>
<th>SIC Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>OPT</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>Second</td>
<td>OPT</td>
<td>D</td>
<td>D</td>
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<tr>
<td>Third</td>
<td>OPT</td>
<td>S</td>
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**Ceramic/Alumina Finish**
DBZ best product for hard finishes

<table>
<thead>
<tr>
<th>Cut</th>
<th>Grit</th>
<th>Solid Strip</th>
<th>Engineered</th>
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<tr>
<td>First</td>
<td>60</td>
<td>D</td>
<td>80</td>
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<tr>
<td>First A</td>
<td>60</td>
<td>D</td>
<td>80</td>
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<tr>
<td>Third</td>
<td>80</td>
<td>DS</td>
<td>100</td>
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<tr>
<td>Fourth</td>
<td>100</td>
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</table>
SELECTING THE PROPER GRIT SEQUENCE
• First - Determine the Customers environmental and job expectations. Example: If the job is dark stain or wood, multiple can lights, floor to ceiling windows or one very picky customer you may choose to extend the final grit sequence one additional step. Example: Instead of finishing with 80 or 100 grit, finish with 120-150 grit.

• Second – Determine what the minimum grit necessary for the first cut to flatten the floor, remove old varnish, etc. Test small areas. Use the least aggressive grit that will get the job done. This test will save you money and sanding procedure steps.

Example: You have a new floor with minimum over wood, no stain, satin finish. Sequence should be 40, 60, 100.

Example: You have an old wax floor, dark stain, semi-gloss. Sequence should be 30, 40, 60, 100. The extra step will insure customer satisfaction.
IMPROPER SANDING SEQUENCE
• Coarse sanding grits create large peaks and valleys in the floor surface. If you skip the second step grit and go directly to a fine grit you will leave the deep scratches in the floor.

• The results of skipping a grit in the sanding sequence will result in the sealer filling the deep scratches but leaving course peaks above the sealer and intruding into the finish coats. This adversely effects the appearance and the life of the finish coat.

• The life expectancy of the finish may be reduced by as much as 70% by using improper sanding techniques.
PROPER SANDING SEQUENCE
• Using Proper Sanding Sequence the sealer completely covers the wood resulting in a strong bond and a total seal allowing the two coats of finish to rest above the sealer. This offers a much greater mil thickness of finish increasing the wear 300% to 400%
CHOOSING THE RIGHT ABRASIVE FOR THE JOB

• As a floor man you have very little control over most of the variables on a job. Old or new floor, pre-finished, ceramic finish, stain, water or oil finish, variety of wood specie, job cost per area where you have total control is you selection of abrasives. Correctly selecting your abrasives can affect the finish quality, customer acceptance, and your bottom line.

• DiamondBack Abrasives are the only abrasives manufactured specifically for the wood floor industry. Many components go into making our quality flooring abrasives.

• Special Heavy Weight Cotton or Polyester Cloth Backing for Strength and Durability

• Two Resin Bonding procedure insures maximum mineral adhesion with the cloth backing guaranteeing less grain fall out.
APPLICATIONS FOR DIFFERENT GRITS

• Stripping: Removal of old finishes and material that tend to lead use grades 12, 16, 20, 24. Suggested mineral, Diamondback Silicon Carbide

• Heavy Stock Removal: For a quick removal where a deep cut is needed use grade 20, 24, 30, 36, or 40. Suggested Mineral, DiamondBack Zirconium

• Medium Stock Removal: When going from rough finish or initial sanding on relatively smooth surfaces, requiring less stock removal use grades 50, 60, or 80. Suggested mineral, DiamondBack Aluminum Oxide, Silicon Carbide or Zirconium

• Light Stock Removal: Where only minor removal is needed, use grades 80, 100, 120, or 150. DiamondBack Silicon Carbide or Zirconium

• Finishing and Polishing: Very little stock removal grade 180 to 600. Suggested Mineral, DiamondBack Silicon Carbide
MINERAL MIXTURES
Percentage of Premium vs. Other

• There are several ways to fool the consumer when selling Abrasives. We all know that Ceramics means great Coats and durability. What we don’t know is the percentage of the premium cut is actually on the belt and what are they using for the remaining percent.

• Many Manufacturers use 5-10 of the premium material the remaining may be a filler (Almost no abrasive value) or an inexpensive Mineral to make the up the difference.
MINERALS

How They Stack UP

Best Fine Finish

<table>
<thead>
<tr>
<th>Material</th>
<th>Ceramics</th>
<th>DB Zirconium</th>
<th>Aluminum Oxide</th>
<th>Silicon Carbide</th>
</tr>
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<tbody>
<tr>
<td>Value</td>
<td></td>
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Durability

<table>
<thead>
<tr>
<th>Material</th>
<th>Ceramic</th>
<th>Zirconium</th>
<th>Aluminum Oxide</th>
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<tbody>
<tr>
<td>Value</td>
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Sharpness of Cut

<table>
<thead>
<tr>
<th>Material</th>
<th>Ceramic</th>
<th>DB Zirconium</th>
<th>Aluminum Oxide</th>
<th>Silicon Carbide</th>
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<tbody>
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DRUM SANDING
1st Cut

• Eliminate Over Wood / Flatten Floor
  • If Over Wood is 1 Business Card, Use 40 grit.
  • If Over Wood is More than 1 Business Card, Use 36 grit
  • Old Varnish use 24-36 grit, Sand Backwards Only
    • Always Cut Left to Right
  • Drum Pressure Should be 90-95%. Walking Speed should be Slow.
    • Fill Floor with Wood Filler after First Cut

2nd Cut

• Over Wood Should Be Gone
• Old Varnish Should Be Gone
  • Maintain Drum Pressure and Increase Walking Speed
  • Objective: To Remove Scratches From First Cut
  • Observe the Floor Closely for, Bad Boards, Wood Rot, Insects, Nails and Stains
    • This is the Best time to Replace a Board if Necessary
  • Use 60 grit on this cut. There should be No Over Wood or Bad End Joints
3rd Cut

- Final Sanding with Big Machine
- Floor Should be Near Perfect
- Final Cut should be made with 10-15% Reduction in Drum Pressure
- Walking Speed should be Fast
- You are Ready for Finish Step
BELT SANDING
1st Cut

- Eliminate Over Wood / Flatten Floor
- If Over Wood is 1 Business Card, Use 40 grit.
- If Over Wood is More than 1 Business Card, Use 36 grit
- Old Varnish use 24-36 grit, Sand Backwards Only
  - Always Cut Left to Right
- Drum Pressure Should be 90-95%. Walking Speed should be Slow.
  - Fill Floor with Wood Filler after First Cut

2nd Cut

- Over Wood Should Be Gone
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3rd Cut

- Final Sanding with Big Machine
- Floor Should be Near Perfect
- Final Cut should be made with 10-15% Reduction in Drum Pressure
- Walking Speed should be Fast
- You are Ready for Finish Step

### Dark Wood/Dark Stains

(Serious Professionals)

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<th>Grit</th>
<th>Best</th>
<th>Economy</th>
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<tbody>
<tr>
<td>First</td>
<td>40</td>
<td>D</td>
<td>A</td>
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<tr>
<td>First A</td>
<td>40</td>
<td>D</td>
<td>A</td>
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<tr>
<td>Second</td>
<td>60</td>
<td>D</td>
<td>A</td>
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<tr>
<td>Third</td>
<td>80</td>
<td>S</td>
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<tr>
<td>Fourth</td>
<td>100</td>
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### Refinish Old Floors

*Thick or Gummy Floors may require a more aggressive abrasive*

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<tbody>
<tr>
<td>First</td>
<td>24-36</td>
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<tr>
<td>Second</td>
<td>40-50</td>
<td>D</td>
<td>A D</td>
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<tr>
<td>Third</td>
<td>80-80</td>
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<td>A S</td>
</tr>
</tbody>
</table>

### Very Hard Wood

*Beginning with higher grit sandpaper creates fewer and shallower scratch patterns. Following with SIC offers the best way to remove scratches. For excessive over wood cut twice with 50 grit.*

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</thead>
<tbody>
<tr>
<td>First</td>
<td>50</td>
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<td>D</td>
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<tr>
<td>Second</td>
<td>80</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Third</td>
<td>100</td>
<td>S</td>
<td>S</td>
</tr>
</tbody>
</table>

### Unfinished Floors (new floors)

*over wood greater than 1/32 or a business card may require 36 grit*

<table>
<thead>
<tr>
<th>Cut</th>
<th>Grit</th>
<th>Best</th>
<th>Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>36*-40</td>
<td>D</td>
<td>S</td>
</tr>
<tr>
<td>Second</td>
<td>56-60</td>
<td>D</td>
<td>S</td>
</tr>
<tr>
<td>Third</td>
<td>80-100</td>
<td>S</td>
<td>A S</td>
</tr>
</tbody>
</table>

---

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1st Cut

• Trim in Outside Borders
• Use 50/60 grit on New Floors
• Use 36 grit on Old Varnished Floors. Move Fast to keep your disk from getting Gummy
  • 1 Zirconium Disk outlasts 10 SIC paper disks

2nd Cut

• Over Wood Should Be Gone
• Old Varnish Should Be Gone
• Objective is to remove scratches from first edger cut
• Use 80/100 grit if: 1st cut was 50/60 grit.
• Use 50/60 grit if: 1st cut was 36 grit. Will Require a 3rd cut with 80/100 grit
BUFFERS

Pad Driver
Pad
- Sandpaper 150-240 grit
- Use with Pad
- Double Side Disk – 4 Times Stronger,
Minimum Loading, Finger Cut Outs

- Blend Scratch Patterns from Edger and Big Sander
- Flattens Floors Much Better Than Screens
- Minimizes Scratches on Dark Woods and Dark Stains
  - Minimizes Scratch Patterns on Soft Wood
  - Makes Floor Flat
- Doesn’t Cut Out Summer Wood Like Screens

or

Multi Head Sander 3-6 Rotating Heads 150-240 grit

Pad Driver
Pad
- Sandpaper 150-240 grit
- Use with Pad
- Double Side Disk – 4 Times Stronger,
FINE SANDING SCREENS

- Remove all Visible Scratches
- Sharp SIC Mineral for Fast Cut
- Very Close Grading to Produce Fine Sand
- Removes Scratches and Swirl Marks

or

6
5” Screens
120-150 grit
FINISH RITE SYSTEM

• **FRS** can be used for fine sanding or between coats utilizing a maroon pad and PSA Finishrite Roll abrasives that can be applied in many configurations.
  - Removes Grain Raise
  - Reduces swirl marks and picture framing
  - Variety of grits 150, 180, 240, 320, & 400
  - **FRS** Strips reduce loading 90%
  - Better finish appearance and depth
  - Less finish removal and swirl marks than screens
• **FRS** 60 - 80 - 100 grit - Used to remove scratches, swirl marks and picture framing from raw wood
• **FRS** 120 - 150 grit - Creates a fine finish on raw wood
• **FRS** 150 - 180 grit - Used between coats of oil or poly for abrading or after first seal coat.
• **FRS** 240 grit - Used to cut down grain raises prior to the final coat
• **FRS** 320 – 360 grit - Used for ultra fine finish with water based finish

786 fpm or 242 mpm

326 fpm or 100 mpm

178 rpm, 4 mpm, 14 fpm

17” - 43cm

• Remove Center Pad to Produce Consistent Scratch Pattern

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PADS

• White - Perfect to drive screen or to clean or polish wood floors. White pads follow the natural flow of the floor.

• Red - Best to drive screen or use with Finish Rite Strips, to remove edger marks, blend to field or for waxing.
• Maroon - Use between coats with minimum abrasion. Use with double sided disc or screens. Makes screens more aggressive with less dish out. Reduces swirl marks and helps eliminate “picture framing”. Removable 7” center can be used on edgers or as a hand pad.
• See “Finish Rite System(tm)” – Uses finish abrasives strips
• Sizes available: 7”, 8”, 12”, 15”, 16”, 17”, 19”, 20” or 12”x18”
MULTI HEAD SANDERS

• Machines use 4, 6, or 8” Rotating Disks
• Flattens Floors and Eliminates Over Wood
• Velcro Backed Disks for easy removal and replacement

Satellite Disk

Velcro Waffle Sandpaper Disk  Innovative Waffle Disk Design rides over imperfections without distressing the wood. Waffle Pads and Screens also available

• Use 24Z-36Z grit for Paint and Glue Removal
  • Use 60-100 grit to Flatten Floor
  • Use 120-180 grit for Fine Finishing
  • Use 240-320 grit For Ultra Fine Finish
## Wood Toxicity

<table>
<thead>
<tr>
<th>Wood</th>
<th>Reaction</th>
<th>Level</th>
<th>Wood</th>
<th>Reaction</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bald Cypress</td>
<td>S</td>
<td>Low</td>
<td>Oleander</td>
<td>DT</td>
<td>Very High</td>
</tr>
<tr>
<td>Beech</td>
<td>S, C</td>
<td>Medium</td>
<td>Olivewood</td>
<td>I, S</td>
<td>High</td>
</tr>
<tr>
<td>Birch</td>
<td>S</td>
<td>Medium</td>
<td>Opepe</td>
<td>S</td>
<td>Low</td>
</tr>
<tr>
<td>Black Locust</td>
<td>I</td>
<td>High</td>
<td>Padauk</td>
<td>S</td>
<td>Low</td>
</tr>
<tr>
<td>Blackwood</td>
<td>S</td>
<td>Medium</td>
<td>Pau Ferro</td>
<td>S</td>
<td>Low</td>
</tr>
<tr>
<td>Boxwood</td>
<td>S</td>
<td>Medium</td>
<td>Peroba Rosa</td>
<td>I</td>
<td>Medium</td>
</tr>
<tr>
<td>Cashew</td>
<td>S</td>
<td>Low</td>
<td>Purpleheart</td>
<td>S</td>
<td>Medium</td>
</tr>
<tr>
<td>Cocobolo</td>
<td>I, S</td>
<td>High</td>
<td>Quebracho</td>
<td>I, S, C, P</td>
<td>Medium</td>
</tr>
<tr>
<td>Dahoma</td>
<td>I</td>
<td>Medium</td>
<td>Redwood</td>
<td>S, P, C</td>
<td>Medium</td>
</tr>
<tr>
<td>Ebony</td>
<td>I, S</td>
<td>Medium</td>
<td>Rosewoods</td>
<td>I, S</td>
<td>Very High</td>
</tr>
<tr>
<td>Elm</td>
<td>I</td>
<td>Low</td>
<td>Satinwood</td>
<td>I</td>
<td>High</td>
</tr>
<tr>
<td>Goncalo Alves</td>
<td>S</td>
<td>Medium</td>
<td>Sassafras</td>
<td>S, C, DT</td>
<td>Low</td>
</tr>
<tr>
<td>Greenheart</td>
<td>S</td>
<td>High</td>
<td>Sequoia</td>
<td>I</td>
<td>Low</td>
</tr>
<tr>
<td>Hemlock</td>
<td>C</td>
<td>Unknown</td>
<td>Snakewood</td>
<td>I</td>
<td>Medium</td>
</tr>
<tr>
<td>Iroko</td>
<td>I, S, P</td>
<td>High</td>
<td>Walnut, black</td>
<td>S</td>
<td>Medium</td>
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<tr>
<td>Mahogany</td>
<td>S, P</td>
<td>Low</td>
<td>Wenge</td>
<td>S</td>
<td>Medium</td>
</tr>
<tr>
<td>Mansonia</td>
<td>I, S</td>
<td>High</td>
<td>Willow</td>
<td>S</td>
<td>Low</td>
</tr>
<tr>
<td>Maple</td>
<td>S, P</td>
<td>High</td>
<td>W. Red Cedar</td>
<td>S</td>
<td>High</td>
</tr>
<tr>
<td>Myrtle</td>
<td>S</td>
<td>Medium</td>
<td>Teak</td>
<td>S, P</td>
<td>Medium</td>
</tr>
<tr>
<td>Oak</td>
<td>S, C</td>
<td>Medium</td>
<td>Yew</td>
<td>I, DT</td>
<td>Very High</td>
</tr>
<tr>
<td>Obeche</td>
<td>I, S</td>
<td>High</td>
<td>Zebrwood</td>
<td>S</td>
<td>Medium</td>
</tr>
</tbody>
</table>

I = Irritant  
S = Sensitizer  
C = Cancer  
P = Hyper-sensitivity pneumonia  
DT = Direct Toxin
WOOD HARDNESS

RELATIVE HARDNESS OF SELECTED WOOD FLOORING SPECIES
(Ranked by Janka hardness rating)

The Janka (or side) hardness test measures the force required to embed a .444-inch steel ball to half its diameter in wood. It is one of the best measures of the ability of a wood species to withstand denting and wear. By the same token, it is also a good indicator of how hard or easy a species is to saw or nail. Northern red oak, for example, has a Janka hardness rating of 1290. Brazilian cherry, with a rating of 2350, is nearly twice as hard. If you’re accustomed to working with red oak and decide to tackle a job with Brazilian cherry, you can expect it to be much harder to cut and nail.

- Source: Hardness ratings for most species taken from Wood Handbook: Wood as an Engineering Material (Agriculture Handbook 72, Forest Products Laboratory, Forest Service, U.S. Department of Agriculture; revised 1987), except for Australian cypress, wenge, African pauka, merbau and Santos mahogany, which were provided by International Hardwood Flooring; heart pine by Mountain Lumber; and mesquite by Mesquite Products of Texas.
- Douglas fir rating is an average of ratings for Coast, Interior West and Interior North species.
## Sanding Steps & Grit Progression

<table>
<thead>
<tr>
<th>Step</th>
<th>Machine</th>
<th>Procedures</th>
<th>Cupped/Crowning</th>
<th>Unfinished New Floor</th>
<th>Dark Stains Dark Wood</th>
<th>Soft Wood Pine Cedar Fir</th>
<th>Paint Varnish Gummy Floor</th>
<th>Very Hard Wood Maple, Santos</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPT</td>
<td>Disk Machine</td>
<td>Surface Prep, Hard Plate or MultiDisk</td>
<td>24-30 [A]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Edger</td>
<td>First Sanding</td>
<td>40</td>
<td>60</td>
<td>80</td>
<td>80</td>
<td>36 [D]</td>
<td>80 [S]</td>
</tr>
<tr>
<td>3</td>
<td>Belt or Drum</td>
<td>Second Sanding</td>
<td>60</td>
<td>60-80</td>
<td>80</td>
<td>80</td>
<td>50 [S]</td>
<td>80 [S]</td>
</tr>
<tr>
<td>4</td>
<td>Edger</td>
<td>Second Sanding</td>
<td>80</td>
<td>80-100</td>
<td>100</td>
<td>120</td>
<td>60/80 [S]</td>
<td>100 [S]</td>
</tr>
<tr>
<td>5</td>
<td>Belt or Drum</td>
<td>Third Sanding</td>
<td>80-100</td>
<td>100</td>
<td>100</td>
<td>100-120</td>
<td>80-100 [S]</td>
<td>100 [S]</td>
</tr>
<tr>
<td>6</td>
<td>Disk Machine</td>
<td>Fine Sanding, Screen or Finish Rite [7] [9]</td>
<td>120/180</td>
<td>100-120/120</td>
<td>120/120</td>
<td>120/150</td>
<td>100/120-150</td>
<td>120-150</td>
</tr>
</tbody>
</table>

1A] Use before belt or drum to reduce cup/crowning & to prevent a wave in the floor. Using a Belt Sander always work left to right. Extreme Duty D disks or DSD disks (Always use FINER grit necessary to solve the problem)

1B] Gummy floors to cut, wax or shellac 24 grit can be cleaned with a wire brush. Also 36D grit edger disks

2] Diagonal 3 cut - cupping/crowning

3] Used to make flattest possible floor.

4] When Over Wood exceeds 1/32” (one business card) Drop one grit

5] For Dark Stains, Clear Finishes, Ceiling Lights, Dark Woods

6] First cut with Belt Or Drum Should be made @ 6 degree angle to reduce overwood on butt and end joints.

7] Use thin pad to be more aggressive and flat, use 1” pad for less aggressive to follow floor contour

8] After hard plating screen with same grit or finer (example hard plate with 100g or screen with 100-120g)

9] Finish Rite strips are the best for very fine sanding. Strips do not load up or create excess scratches.


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<table>
<thead>
<tr>
<th>Generic Name</th>
<th>U.S.</th>
<th>Symbol</th>
<th>Micron</th>
<th>European</th>
<th>Japan</th>
<th>Uses</th>
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</thead>
<tbody>
<tr>
<td>1200 (5.50)</td>
<td>ANSI</td>
<td>Grade</td>
<td>1200</td>
<td>5.50</td>
<td>3000</td>
<td>5.30</td>
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<tr>
<td>1000 (8.95)</td>
<td></td>
<td></td>
<td>1000</td>
<td>8.95</td>
<td>2500</td>
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<tr>
<td>800 (11.05)</td>
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<td></td>
<td>800</td>
<td>11.05</td>
<td>2000</td>
<td>8.00</td>
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<tr>
<td>600 (14.50)</td>
<td></td>
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<td>600</td>
<td>14.50</td>
<td>1500</td>
<td>10.20</td>
</tr>
<tr>
<td>500 (18.20)</td>
<td></td>
<td></td>
<td>500</td>
<td>18.20</td>
<td>1200</td>
<td>13.00</td>
</tr>
<tr>
<td>400 (22.10)</td>
<td></td>
<td></td>
<td>400</td>
<td>22.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>360 (27.30)</td>
<td></td>
<td></td>
<td>360</td>
<td>27.30</td>
<td>1000</td>
<td>16.25</td>
</tr>
<tr>
<td>320 (34.25)</td>
<td></td>
<td></td>
<td>320</td>
<td>34.25</td>
<td>600</td>
<td>28.50</td>
</tr>
<tr>
<td>280 (42.00)</td>
<td></td>
<td></td>
<td>280</td>
<td>42.00</td>
<td>500</td>
<td>34.00</td>
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<tr>
<td>240 (51.75)</td>
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<td>240</td>
<td>51.75</td>
<td>400</td>
<td>40.50</td>
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<td>220 (66.00)</td>
<td></td>
<td></td>
<td>220</td>
<td>66.00</td>
<td>320</td>
<td>57.25</td>
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<tr>
<td>180</td>
<td></td>
<td></td>
<td>180</td>
<td></td>
<td>280</td>
<td>67.75</td>
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<tr>
<td>Ultra Fine</td>
<td>150</td>
<td>4/0</td>
<td>P180</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine</td>
<td>120</td>
<td>3/0</td>
<td>P150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>100</td>
<td>2/0</td>
<td>P120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coarse</td>
<td>80</td>
<td>1/0</td>
<td>P100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open Cut</td>
<td>60</td>
<td>1/2</td>
<td>P80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>1</td>
<td>P60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>1 1/2</td>
<td>P50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>36</td>
<td>2</td>
<td>P40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>2 1/2</td>
<td>P36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>3</td>
<td>P30</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>20</td>
<td>3 1/2</td>
<td>P24</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>16</td>
<td>4</td>
<td>P20</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>12</td>
<td>4 1/2</td>
<td>P16</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Ultra Fine**: Final sanding of certain conifers where a smooth surface is desired.
- **Fine**: Sanding of certain hardwoods where a smooth surface is desired.
- **Medium**: Clean-up from initial 36-40 grit cut.
- **Coarse**: First sanding of new flooring (oak, walnut). Minor imperfections on old floors.
- **Open Cut**: Fast leveling of uneven floors.
- **Removing imperfections**: Restoring evenness to old flooring.
- **Remove build-up of paint & varnish**:
Grit sizes are determined by the size of the mineral’s grain. Grits 12-220 are grated by passing through the opening in a screen mesh. Finer grits are measured through an air classification process. Newer applications measure grit by the average particle diameter in microns. There are 12 micron grits. The coarsest grit - 60 is close to grit 220, whereas a 0.3 micron has no grit equivalent, but would be close to 50,000 grit.

OPEN COAT - Mineral grains cover roughly 40% to 70% of the backing. Best used where loading concerns would be an issue.

CLOSED COAT - Mineral grains cover 100% of the backing. Best used where loading would not be a problem.
ABRASIVE TESTING PROGRAM

1. Compare the diagonal cut for accuracy.

2. In the sunlight, compare the consistency of grit. How tight is its grading? For example is the 80 grit 99% eighty grit or 60% eighty grit and 40% other grit.

3. Compare the “Skive”, does it vary in depth, is the line jagged and rough?

4. Compare the splice, do you prefer lap, butt or sine? Personally I prefer sine for better alignment and less movement. No hinging or creases, more surface contact and runs in either direction.

5. Look hard at the splice, will it cause chatter?
COMPARE THE MINERAL

**Silicon Carbide**- Most common used abrasive. Very sharp, backed with cloth for belts or paper for drum machines. Belts have a non-directional interlocking sine splice. Silicon Carbide’s best uses are coarse grits (36 or lower) on old refinish or gummy floors. As Silicon Carbides loads, it fractures and a new sharp corner arises.

**Aluminum Oxide**- Has over the past years grown fast with contractors. Tough abrasive, very good. Not recommended for old gummy floors. Aluminum Oxide mineral is not as sharp and doesn’t fracture like the Silicon Carbide but it’s harder and will remain a steady cut through the job.

**Zirconium**- New to the flooring industry, this synthetic abrasive is very durable and cuts fast with a smooth finish. Material is very consistent, stays sharp and out lasts any competitive priced mineral. Product cost about 15% more than other minerals, however life expectancy is from 50% to 300% longer.
## ABRASIVE TESTING PROGRAM

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Product</th>
<th>Grade</th>
<th>Percent</th>
<th>Best use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon Carbide</td>
<td>Belt, Disk, Screen</td>
<td>P**</td>
<td>100***</td>
<td>Old Floor</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>Belt Disk</td>
<td>P**</td>
<td>100***</td>
<td>mid-grade</td>
</tr>
<tr>
<td>Zirconium</td>
<td>Belt Disk</td>
<td>P**</td>
<td>100***</td>
<td>High Quality</td>
</tr>
</tbody>
</table>

* Skive is the etching of the backing before the glue and splice is applied

**P** is a standard that insures constancy in mineral grading on belts, disk and screens.

*** Compare other companies mix grades and minerals. Pure products yields a perfectly constant job.

Field Test: 1 Evaluate consistency of cut

2 Compare against the best you have. Brand Y Brand X

- Speed
- Material removal
- Loading
- Longevity