Introduction

Most Fibratex products consist of a non-woven web of nylon fibers, impregnated throughout with abrasive grain and bonded with synthetic resins. This design produces a cushioned, three-dimensional material that is extremely pliable and long lasting.

The uniform dispersion of abrasive throughout the web provides a continuous supply of new grain as the old grain and fibers wear away during use.

Fibratex products, with their open mesh construction, are waterproof, washable, resilient, conformable, non-loading, non-conductive, non-metallic, and non-rusting. Fibratex wheels are easily pre-formed to conform to special-shaped workpieces.

Since Fibratex products are designed for use where stock removal is not required, they begin where other abrasives leave off. The relatively non-aggressive nature of nylon and grit inherent in the Fibratex material makes it ideal as a finishing tool. While 60 to 80 grit are considered intermediate sizes in other products, they are considered coarse for Fibratex items.

Used wet or dry, Fibratex products offer the following advantages:

- Controlled cut without stock removal
- Consistent, uniform finish
- Minimized smearing and discoloration of the workpiece (heat is dissipated through the open mesh of the product)
- Increased production; time savings
- Ability to automate operations
- Reduced operator training
- Less maintenance required
- Greater safety than other methods
- Conformability to irregular surfaces

These advantages make Fibratex products excellent alternatives to bristle brushes, set-up wheels, greaseless compounds and steel wool.

Abrasives

Silicon carbide or aluminum oxide abrasives are available. Silicon carbide is sharper, cuts faster, and produces finer scratch patterns on most surfaces. Aluminum oxide is more durable and tends to last longer, produces less discoloration on aluminum, and is more aggressive on certain applications such as hardened steel parts. Fibratex hand pads and rolls are available in a non-abrasive material.

Grits

Grit refers to the size of the abrasive grain impregnated into the nylon web. Use of large particles results in more aggressive cut and a coarser finish. Small size particles produce fine surface finishes, if all other conditions are equal.

GRIT DESIGNATIONS	COMPARABLE GRIT SIZE
Extra Coarse (XC)	24 – 36
Coarse (C)	50 – 80
Medium (M)	100 – 150
Fine (F)	180 – 220
Very Fine (VF)	240 – 360
Super Fine (SF)	400
Ultra Fine (UF)	600
Micro Fine (MF)	800 – 1200

Densities

The product "density" refers to the number of fibers which have been compressed into the nylon web material. Under identical conditions, harder (closed) density wheels cut faster, last longer, and produce finer finishes than softer (more open) density wheels. Softer density wheels offer greater conformability and have less tendency to load or burn the workpiece.

Fiber Sizing

Several nylon fiber sizes (the denier) are used in the manufacture of Fibratex web material because the fiber size is a significant factor in the coating process, as each produces distinct cutting characteristics.

As the intended applications for the specific item determines the fiber size used, the denier is not an optional ingredient and, therefore, is not included in the product offering specifications.

Bonding Agents

Waterproof resins are used in the manufacture of Fibratex web material to bond the nylon fibers together and to firmly anchor the abrasive grains throughout the web. A variety of resins are utilized in order to obtain the required softness, hardness, toughness, flexibility and other characteristics required of the finished product.

As the intended applications for the specific Fibratex item determine the resin type, the resin is not an optional ingredient and, therefore, is not included in the product offering specifications.

Conventional Finishing Methods Versus Fibratex Products

The following chart outlines the advantages achievable when using Fibratex products as alternatives to other cleaning, blending, deburring, and finishing methods. Fibratex products are listed in the sequence of normal preference for the application stated. However, because of the numerous variables, only testing can ensure selection of the most cost-effective product.

CONVENTIONAL FINISHING METHOD	KEY APPLICATION	FIBRATEX PRODUCT AS AN ALTERNATIVE	ADVANTAGES OF FIBRATEX PRODUCT VERSUS ALTERNATE FINISHING METHODS
Bristle Brushes	Cleaning	Clean and Finish Wheel Metal Finishing Wheel Flap Wheel	Superior cleaning performance Higher productivity More consistent finish No slurry or compound required Eliminates compound dust and flying bristles
Greaseless Compounds	Finishing	Flap Wheel Convolute Wheel Unified Wheel	Reduced maintenance No compound, instant set-up Elimination of compound dust More uniform finish More consistent work rate
Set-up Wheels	Blending/ Deburring	Convolute Wheel Unified Wheel	No break-in time required More consistent cut More uniform finish Maintain geometry Safer, no flying wheel pieces
Steel Wool	Cleaning	Rolls Discs Hand Pads	Faster, longer life Less pressure required Non-rusting, cleaner Safer, no splinters

Getting the Most Out of Fibratex Wheels

Maximum wheel life and best surface conditioning results can be achieved by closely adhering to the following recommendations.

1) Wheel Direction

Convolute wheels and interleaf flap wheels must always run in the direction indicated by the arrow printed on the side of each wheel. Conventional flap wheels and unified wheels can be run in either direction.

2) Wheel Speed

Wheel speed is an important factor in that it affects product finish, rate of cut and wheel life. In general, fast wheel speeds give harder action and a finer finish; whereas, slower speeds give a softer action and a coarser finish for the same wheel density.

The following are recommended operating speeds for the most common applications.

APPLICATION	RECOMMENDED SPEED
Cleaning and upgrading of surface conditions	2200 to 6000 SFPM
Cut-buffing on metal surfaces	6500 to 8000 SFPM
Deburring	5500 to 8000 SFPM
Decorative finishing	500 to 3000 SFPM
Imparting decorative finishes	900 to 3000 SFPM
Oxide removal	3500 to 6500 SFPM

Testing may show that a slower or faster speed is desirable for specific operations. Never exceed the maximum RPM rating of the wheel.

3) Pressure

Light to medium pressure is recommended for most operations. Flap wheels require much lighter pressure to perform properly than other Fibratex wheels. Unified wheels can withstand much higher pressures in order to perform deburring jobs. In all cases, avoid excessive pressure which may result in wheel deformation and damage to the work surface.

4) Feed Speed

Feed speeds directly affect the number of pieces completed over a given period of time. Slow feed speed reduces the number of workpieces completed, while producing a shorter scratch pattern. Slow feed speed allows for longer dwell time and permits more work to be done on each piece. Conversely, a fast feed speed increases the number of workpieces completed, while producing a longer scratch pattern.

5) Oscillation

Oscillation may be used to break up scratch lines and produce a more uniform finish. Additionally, an increase in cut may be experienced. A general starting point for oscillation is 3/8" amplitude at 200 cycles per minute.

6) Lubricants

Lubricants, such as water, water-soluble oil and straight oil, will decrease the heat generated while running, improve the luster and reduce the surface finish. The higher the viscosity of the lubricant, the lower the surface finish (RMS value) produced.

Factors in Wheel Choice

This chart provides a relative comparison of other Fibratex wheel variables. It can serve as a useful guide in choosing the most suitable product for a given application. However, as many other factors affect wheel performance, this chart can only be general in nature. The most cost-effective results can always be obtained by wheel testing on the application.

1. Wheel Conformability	MOST CONFORMABLE (SOFT) Flap Wheel	Clean and Finish	Metal Finishing	Deburr and Finish 6 & 7 Density	Deburr and Finish 8 & 9 Density	LEAST CONFORMABLE (HARD) Heavy Deburring 8 & 9 Density
2. Wheel Openness	OPEN MESH	Clean and Finish	Metal Finishing	Deburr and Finish 6 & 7 Density	Deburr and Finish 8 & 9 Density	CLOSED MESH Heavy Deburring 8 & 9 Density
3. Wheel Aggressiveness	MOST AGGRESSIVE	Metal Finishing	Heavy Deburring	Clean and Finish	Deburr and Finish	LEAST AGGRESSIVE Flap Wheels
4. Finishing Action*	COARSER	Metal Finishing	Clean and Finish	Heavy Deburring	Deburr and Finish	FINER Flap Wheels
5. Pressure for Best Results	LIGHTER	Flap Wheels	Clean and Finish Deburr and Finish 6 Density	Metal Finishing Deburr and Finish 7 Density	Deburr and Finish 8 & 9 Density	HIGHER Heavy Deburring 8 & 9 Density

**** On steel surfaces, silicon carbide wheels will produce a brighter finish than aluminum oxide wheels.***

Surface Finish Variables

Changes in any one of many factors can affect the surface finish on the workpiece. This chart shows the effect on surface finish by changes in single factors of product specifications. Arrows have been used to signify the trend direction. The arrow length does not signify that the effect of each factor is equal.

VARIABLE FACTOR	ROUGH FINISH *High RMS Reading*	SMOOTH SURFACE *Lower RMS Reading*
1. Grit Size	COARSE	VERY FINE
2. Wheel Grade	SOFT	HARD
3. Wheel Speed	SLOW	FAST
4. Feed Speed	FASTER (LONG SCRATCH)	SLOWER (SHORT SCRATCH)
5. Oscillation	NO OSCILLATION	OSCILLATION
6. Lubricants and Compounds	DRY ← WATER — WATER-SOLUBLE OIL → STRAIGHT OIL; COMPOUNDS	

CARBORUNDUM

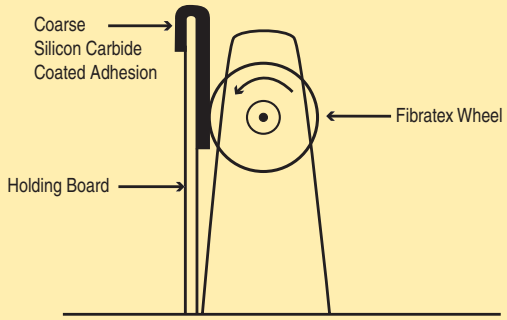
Dressing Fibratex and Carbo-Cut Wheels

A properly dressed Fibratex wheel will yield the optimum cut, finish and production, while minimizing operator effort and fatigue. To dress or restore a square, even face on a Fibratex wheel, follow the simple steps below.

Narrow Width Wheels (under 8" wide)

1. Use a coarse (24 or 36 grit) piece of silicon carbide coated abrasive that is wider than the wheel to be dressed.
2. Obtain a flat piece of wood that also is wider than the wheel to be dressed. This "holding board" must be long enough to rest on the floor while reaching 12" above the center line of the wheel to be dressed.
3. The coated abrasive piece should be securely adhered to the "holding board" at a height in which it will come into contact with the Fibratex wheel.
4. Bring the "holding board", resting on the floor, into contact with the Fibratex wheel, removing only enough material to restore a square, even face.
5. Burnish loose fibers with bare piece of wood to expose new abrasive grains.

Note: The faster the wheel is running, the easier it is to dress a wheel. If possible, run close to the maximum operating speed of the wheel. Never exceed the maximum operating speed of the wheel.



Shaping a Fibratex Wheel

Fibratex wheels can be shaped to match the part to be finished. The procedure is similar to dressing, except that the coarse piece of silicon carbide coated abrasive is affixed to a sample workpiece. A file or dressing stick can be used as an alternate method.

Wide Width Wheels (8" and wider)

A wide Fibratex wheel should be prepared for use each time it is mounted or remounted to ensure the wheel runs smoothly. Follow these steps:

1. Prior to start-up, or whenever the workpiece thickness changes, make sure the wheel has uniform and proper pressure. Then convey a piece of scrap laminate, approximately the same width as the wheel, under the wheel, turning off the conveyor and hand rotating the wheel. A 1/4" to 3/8" uniformly wide band or "footprint" should appear across the entire panel. See Condition #1.
2. If a pattern like Condition #2 appears, it is an indication that there may be misalignment between the wheel shaft and backup roll. Adjust the wheel shaft to produce parallel and uniform cleaning.
3. If a pattern similar to Condition #3 appears, the wheel needs to be trued. Mount a coarse (36 grit) piece of sandpaper on a rigid material, such as stainless steel or laminate, and convey through the machine with sufficient pressure to slowly reduce the larger diameter on the ends of the wheel. This operation should be performed with water off.

After truing, convey a wide panel of tempered pegboard (or like material) under the wheel with the rough side of material in contact. This should be performed with minimum wheel pressure, water off, and conveyor set at 5 – 6 FPM. After 8 to 10 passes, the wheel should be ready for processing. Adjust wheel for thickness of scrap laminate and perform step 1 above. It may be necessary to convey two or three pieces of scrap to properly "seat" the wheel.