

TECHNICAL BULLETIN

BELT FINISHING WITH MICRO-MESH

MICRO-MESH™ finishing belts provide desired surface qualities and economic benefits to many types of finishing operations, and are available in a range of standard as well as custom sizes.

Generally recommended for fine finishing steps, MICRO-MESH is constructed with a thin layer of soft resilient material between the cloth back and the abrasive crystals which provide the unique "cushioned" suspension action for the abrasive. This unique design allows the abrasive crystals to recede into the resilient layer and align at an even cutting plane. This eliminates deep random scratching and results in uniform scratch patterns and significantly longer product life than conventional abrasives.

MICRO-MESH cuts rapidly due to its larger crystals. This design allows more abrasive crystals to contact the workpiece. MICRO-MESH outlasts conventional abrasives because the relatively large crystals do not load up, fracture or generate heat into the workpiece.

Equipment

MICRO-MESH belts work well with almost any of type floor or bench machines including centerless, flat belt and platen sanders. Since regulating speed and pressure is difficult with portable belt sanders, they are not recommended. It is generally more effective to take the part to the machine, rather than the machine to the part.

Speed

In general, surface belt speed should be set at less than 5500 surface feet per minute (SFPM). Harder materials typically are run at 3000 - 5000 sfpm while 2500 - 3000 sfpm is better for softer metals, such as brass. Even softer materials such as plastic, should run at 600 - 1000 sfpm and should always be worked wet. Too great a speed and/or pressure will ultimately defeat the cushioning system.

Pressure

For best results, pressure should be kept light. The work of the MICRO-MESH belts is done with the abrasive crystal tips, very similar to the action of a brush. Increased pressure either by the operator or mechanically will cause stretching, premature wear of belts and unsatisfactory results.

Lubrication

The use of a very light water mist on the MICRO-MESH belt is recommended. This mist should be applied at the opposite end of the belt from the contact wheel, allowing the belt to feed the water forward to the part. The amount of mist used should be adjustable. The belt should be wet to the touch where the part contacts the

belt, but not flooded. Generally if the proper amount of water is used, no water should be dripping off the belt at any point.

Water is the best lubricant/coolant to use for all materials except aluminum. Where flash rusting is a problem, as with ferrous parts, an inorganic rust inhibitor such as sodium dichromate can be added to the water. Many organic rust inhibitors contain solvents that may cause crystal loss or delamination. It is always recommended to test any water additive's compatibility with a scrap piece of MICRO-MESH.

Belt "grease" compounds should **never** be used on MICRO-MESH. Grease fills the abrasive crystals and particles of material removed (swarf) will pack into the grease, loading the MICRO-MESH and rendering it totally useless. Such belt compounds are used to soften the cut of common abrasives and to lubricate. **The use of grease compounds is not recommended with MICRO-MESH.**

Process

The finishing process used for a given part depends on such factors as beginning surface condition of the part, finish desired, and the type of material being finished. Surface evaluation is a matter of experience, trial and error.

If the surface of the part is too rough, a common abrasive belt may be necessary to bring the surface to a starting point MICRO-MESH can handle in a time-effective manner. However, since common abrasives usually leave random scratches deeper than the grit size of the belt, it is better to start with as fine a grit as possible for deburring or roughing steps. The random scratches can then be more easily removed with the initial MICRO-MESH step.

Evaluation and process recommendations can be made by sample part testing in the *Micro-Surface Finishing Products* Applications Lab. Call 1-800-225-3006 for details.

06/01/02

Technical Bulletin-#1

MICRO-MESH REGULAR

DESCRIPTION: A scientifically engineered series of cloth-backed, cushioned abrasives.

MICRO-MESH Regular was originally developed to polish most hard plastics. It will restore surface finish, clarity, and transparency quickly and easily. MICRO-MESH will also polish fiberglass, epoxy, gel-coat, raw and finished wood, gold and silver, cultured marble etc.

MATERIALS: Silicon Carbide crystals on a resilient layer over a cloth back. The material back is stamped with the following grade number for easy identification:

1500	3600	*8000
1800	4000	*12000
2400	6000	
3200		*aluminum oxide crystals.

AVAILABLE IN:	Sheets:	3" x 6" 6" x 12" 12" x 12"	Discs: 5" - 6" - 8" other sizes available upon request loop and PSA backing available
	Rolls:	4" x 50' 6" x 50' 6" x 25' 12" x 25'	Tapes: Various call for assistance
	Kits:	Plastic, Aquarium, Wood, Hobby Tub/Spa, Marine, Vinyl, etc.	Soft Touch Pads: 2" x 2" 3" x 4"
	Buffers & Files:	1/2" x 5 3/4" 5/8" x 5 3/4" Same grit on both sides or multiple grits up to 2 per side.	

STORAGE &

HANDLING: When stored between 0-120 degrees Fahrenheit and in a clean and dry environment, life is nearly unlimited. No special handling is required.

APPLICATION: MICRO-MESH Regular is not an aggressive stock remover. Common sandpaper is required for the removal of deep scratches before using MICRO-MESH.

Complete instructions are available on request from MICRO-SURFACE at 1-800-225-3006. Special sizes and shapes are available, please contact MICRO-SURFACE. Kits can be made to specification.

01/2004

Technical Bulletin-#11

MICRO-MESH MX

DESCRIPTION: MICRO-MESH is a series of cloth-backed cushioned abrasives designed to produce very low roughness average (Ra) scratch patterns on a variety of materials. On metal the coarse grades of MICRO-MESH MX can achieve finishes below 1.0 micro inch with proper surface preparation and application.

Surface preparation prior to MICRO-MESH MX use includes establishing the geometry of the part reduction of the Ra to 20 micro inch or less using the most economical conventional method available. One application of MICRO-MESH MX should reduce the Ra to 10 micro inch.

Subsequent applications will further reduce the Ra by approximately 1/2 until the specified finish is reached. Using a combination of one or more of the MX series and variation of material feed, speed or pressure can produce sub 1.0- micro inch finish.

MICRO-MESH MX can also be used on painted metal surfaces and other hard surfaced materials.

MATERIALS: Silicon carbide crystals on a resilient layer over cloth back. The backing is stamped with the following grade number for easy identification.

60MX	120 MX	240 MX	400 MX	*1200 MX
80 MX	150 MX	320 MX	600 MX	
100 MX	180 MX	360 MX	*800 MX	* aluminum oxide crystals

AVAILABLE IN:	Sheets: 3" x 6" 6" x 12" 12" x 12"	Tapes: 1/2" - 2" widths	Discs: Various Sizes
	Rolls: 4" x 50' 6" x 50' 6" x 25' 12" x 25'	Handi-Files: 1/2" x 5 3/4" 5/8" x 5 3/4"	Soft Touch Pads: 2" x 2" 3" x 4"
	Kits : MX-90 Metal Finishing	Belts: Various Sizes	

STORAGE & HANDLING: When stored between 0-120 degrees Fahrenheit a clean and dry environment, life is nearly unlimited. No special handling required.

APPLICATION: MICRO-MESH MX may be used by hand or machine. A firm foam block should be used as back-up during hand applications. The cutting ability of MICRO-MESH MX is increased by increasing the rigidity of the back-up material. MICRO-MESH MX may be used wet or dry. Most water or oil base lubricants are acceptable for used with MX. Lubricants should be tested for compatibility before general use. Always finish clean-up with soap and water to remove solvent.

When using water as a lubricant do not soak MX in water for more than four hours. Apply water by dipping or spraying.

Using MX with a sharp edged back-up may cause it to wear faster on the narrow edge.

Specific application instructions are available upon request from MICRO-SURFACE at 1-800-225-3006.

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METAL FINISHING WITH MICRO-MESH® MX

Sanding is used to establish a part's geometry or finish. Geometry is commonly established with coarse grits of coated abrasives, bonded abrasive wheels or by hand turning. Finishing is generally achieved with successively finer grades of abrasives until the desired surface quality (appearance) is obtained.

MICRO-MESH MX is a series of cushioned abrasives with a slightly stiffer backing, and several coarser grades than the MICRO-MESH Regular series. MICRO-MESH MX enables the user to achieve the desired finish faster and often with less steps than with conventional abrasives. Start to use MX as soon as practical in the finishing sequence.

All MICRO-MESH Regular and MX grades are constructed with a thin layer of soft resilient material between the cloth back and the abrasive crystals. This provides the unique "cushioned" action for the abrasives. This unique design allows the abrasive crystals to recede into the resilient layer and float to an even cutting plane. This eliminates deep random scratches and results in uniform scratch patterns and significantly longer product life than conventional abrasives.

MX grades cut rapidly due to the relatively large crystals and because the flexing action allows more abrasive crystals to contact the workpiece. The flexibility of the crystals keeps the swarf loose and prevents loading. MICRO-MESH outlasts conventional abrasives because the relatively large crystals do not load up. The flexibility prevents the crystals from fracturing and generating heat into the workpiece.

MX is economical to use. In dry applications, it outlasts conventional abrasives 5 - 7 times, When used wet, the life advantages increase 7 - 15 times that of conventional abrasives. MX can be used with most standard cutting oils, honing oils or coolants, either water or oil based. The objective is to flush the surface of the MX and the workpiece to keep it free of swarf. MX can not be used with solvents like acetone or certain chlorinated solvents. Lubricating with grease type or filler type lubricants will cause rapid loading. Such belt compounds are used to soften the cut of common abrasives which is not necessary since MX is engineered to have a controlled aggressiveness. Once the abrasive crystals have receded to their given level, further down pressure will not increase the rate of removal or surface quality but will put stress on the material. Keep the pressure light.

Machine Speeds

On plastics and woods - speeds of 1000 sfpm (less if possible). Plastics should always be worked with a water mist.

Metals - Speeds below 6000 sfpm are recommended.

The floating action of the abrasive crystals in MX does not require high speed operation to achieve super finishes. If higher speeds are used, feed rates and pressure should be reduced. As a general rule, higher speeds promote a faster cut, while slower speeds produce a better finish.

Contact wheels should be kept as soft as possible for best finish and longest life. A non-serrated 40 durometer rubber wheel or a cloth wheel should be used. MX can also be used on inflatable wheels as replacement for buffing wheels.

If a "mirror" or highly reflective surface with no visible scratches are required, more steps are needed than for a #4 or #7 finish.

Steel, stainless and ferrous metals

The following is general information to help, not meant as an instruction sheet. Variables such as speed, pressure and differences in materials to be finished may change the combination of MX used. When starting with mill finished or ferrous stock, it may be desirable to use a conventional 240 or 280 p grit to remove all mill marks, scale, etc. A combination such as 100MX and 240MX. 400 MX is recommended for finishing steels. 400 MX cuts like a 400-600 grit but should leave a 1200-1500 grit finish. When a finer finish is required, use 600, 800 or 1200 MX. Sand casted material will require more steps with conventional abrasives before using MX.

Copper, brass, bronze, aluminum and other soft metals

The procedure is similar to that of steel. However, the starting point can be 80 MX, 100 MX or finer depending on the softness of the material. Coarse castings will require conventional abrasive steps prior to using MICRO-MESH. When finishing aluminum, it is important to slow the surface speed down and use a coolant made for aluminum.

Hataloys, titanium, nickel, stellite and other special materials and alloys

Each of these materials requires a trial piece run to determine the best sequence for achieving the desired finish. For more information and reference call 1-800-225-3006.