

HOW TO ACHIEVE THE BEST FINISH USING MICRO-MESH®

The polishing of surfaces can be very exacting. Success or failure depends on the technician's knowledge of, and his ability to follow, an established sequence.

MICRO-MESH® Can be Used by Hand. Wrap the abrasive around a foam sanding block to give you even, uniform pressure during your sanding strokes.

MICRO-MESH® Can be Used With an Electric or Pneumatic Random Orbital Sander. Keep sanders to no more than 3500 rpms. Do not use with high speed die grinders or vibratory sanders. Ripples and swirls are typically caused by sanding with an uneven motion, tilting the sander, or working in one spot too long. For best results, sand smoothly with even, sweeping motions.

Keep Belt Machines at 5500 Rpm or Less. Adjust pressure and tension so that the contact point allows the abrasive to work without smearing. Typically durometers of 30-40 in rubber are best for a cushioned abrasive or cotton buffing wheels work well. Do not use lubricants containing solvents, alcohol or ammonia that could delaminate the MICRO-MESH®.

Pressure Should be Light. Remember the cushioned abrasive cuts with the abrasive crystal tips. The sharp cutting edges are floating on a resilient matrix. Extreme pressure pushes the tips back into the matrix rendering them ineffective and resulting in surface smearing, burning, and possible orange peel and distortion. If using with a belt machine, polish on the slack of the belt on using a soft contact wheel. If using a random orbital sander, polishing steps may require a soft back up pad between the MICRO-MESH® disc and the sander head.

KEEP EVERYTHING YOU USE CLEAN. This includes equipment, sandpapers, MICRO-MESH®, and all wiping materials. A minor scratch here or there is not a crisis situation, but picking up a piece of metal or other contaminate from the top of a work area can be a disaster. Watch where you set things down.

Acceptable Cleaning and Maintenance Materials:

- 100 % cotton flannel
- Genuine chamois, not synthetic or imitation
- Biodegradable liquid detergent
- MICRO-MESH® Anti-Static cream
- MICRO-GLOSS® polish and cleaner
- WinBRIGHT Spray plastic cleaner
- Bug Blaster Spray bug remover

Unacceptable Cleaning and Maintenance Materials:

- Paper towels or other paper products
- Shop towels or synthetic fiber fabrics
- Commercial window cleaners
- Any product containing ammonia or solvents or alcohol

Clean the Work Surface between each step, especially in cracks and crevices. Flush surface several times with clean water to remove dust and dirt before touching it with anything. Clean abraded particles from the work piece by rinsing and then dry and inspect.

Inspect the Work Piece between steps with a bright light to ensure you are removing the previous scratch pattern before continuing on.

Keep the Abrasives Clean. Keeping them clean will improve performance and extend life.

To Avoid Scratching the Surface, do not wear watches, rings, or bracelets. Long fingernails should be covered with gloves.

For Superficial and Light Surface Damage, use MICRO-GLOSS® liquid abrasive following the directions on the label of the bottle.

For Deep Damage and Cracking, you will be required to remove the damage firstly with sandpaper and then restore the surface to its original state using MICRO-MESH®. After damage is removed by using sandpaper in a succession of steps from coarse to fine, ie: 120 grit, 220 grit, 400 grit wet/dry, then begin the MICRO-MESH® series with MICRO-MESH® 1500 and proceed through the series to 12000 or until the original surface is matched.

Use a Straight-line Crossing Pattern. Do not use a circular pattern except in the final hand buffing or anti-static operations. When using a random orbital sander, use sweeping motions from left to right for one grit, then change the pattern to an up and down motion on the next.

Using MICRO-MESH® with Water and a few drops of detergent will generally result in a less effort having to be used and a slightly better finish. Only use enough water to provide lubricity to the surface, but not so much that poor contact is made with the work piece.

DO NOT wear out one of the meshes by trying to make it do too much work on your first step. If your estimated damage is not readily removed, go immediately to the next coarser mesh. Removing the initial damage with the sandpaper series will take up 85% of the restoral time. The MICRO-MESH series and the buffing procedures will take as little as 15% of the time. **DO NOT** skip steps in either the sandpaper or the MICRO-MESH® series.

Work an area slightly larger with each step to blend. Working one small area on a highly curved section could create flat spots or distortion.

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GUIDELINES FOR ACRYLIC FINISHING BY HAND

To avoid scratching the surface, do not wear watches, rings, or bracelets. Long fingernails should be covered with gloves.

MICRO-MESH® will remove surface discoloration, but not tinting that is throughout the plastic. If unsure, test in a small inconspicuous area.

Keep MICRO-MESH® clean; contamination can cause scratches. When your restoral is complete, rinse MICRO-MESH® pieces, air dry, and return them to their original packaging. MICRO-MESH® is reusable!

Use only 100% cotton flannel for wiping. Keep it clean, wash in warm soapy water, rinse, dry and return to the kit box.

Wrap MICRO-MESH® or conventional sandpaper tightly around foam block and hold in palm of hand. Sanding without a block will produce a rippled or distorted surface.

MICRO-MESH® is numerically graded. The higher the number, the finer the cutting action.

Do not work in a circular pattern. Cross your sanding pattern at 90 degree angles from one step to the next to be sure of total removal of the previous sanding pattern. Incomplete removal will result in an incomplete restoral! Damage not removed with the beginning step will most likely remain after the process is complete.

To remove heavy damage from highly curved surfaces, it may be beneficial to sand in an alternating pattern of diagonally, horizontally and vertically, in a straight line motion. This will assist in achieving an even removal of material over the entire surface.

Thin plastic (1/8" or less) may develop surface distortion if sanding the surface creates heat. Work the surface slowly and work wet.

Check your scratch pattern frequently. It is helpful to set a bright light on the side opposite your restoral side. For better viewing on non-transparent surfaces, place the light at an angle.

DISTORTION

It is always easier to prevent distortion than to remove it! There are two types of distortion that can be caused by the use of improper restoral methods, localized and surface. Localized distortion is caused by working one small spot and not blending the damage removal over a large enough area.

Surface distortion is almost always a sign of incomplete restoration. This could be the result of:

1. the incomplete removal of one sanding pattern before proceeding to the next step
2. not working a larger area with each new step
3. heat build-up
4. skipping steps
5. not cleaning the surface between steps

HINTS FOR POLYCARBONATE RESTORAL (LEXAN, TUFFAK, ETC.)

Polycarbonates have one very serious and unredeeming feature. They are easily scratched and next to impossible to restore without leaving haziness. Unlike acrylic, which is hard and can be almost rubbery. Some scratches and other damage can be removed, but the final polishing is not truly effective. MICRO-MESH will produce a "better-than-anything else" finish on polycarbonates, but does leave a slight haze.

If restoring polycarbonates, it is important that each step in the process can be an improvement to the quality of the surface. For this reason, sandpaper and coarser abrasives should be avoided.

In most cases it is better to minimize the damage than to attempt to totally remove it. Sandpaper may leave scratches that are more objectionable than original damage. Begin with 2400 or 3600 MICRO-MESH and follow the basic procedure. Extra time and effort may be required to obtain best results. Upon completion of the MICRO-MESH steps the surface will still appear less than optically clear. The use of MICRO-GLOSS (available where MICRO-MESH is sold) will improve the finish, and may be used for an extended period of time to obtain desired results. In many cases the use of MICRO-GLOSS will improve the original damage to the point of acceptability, without the work involved in the sanding procedure.

CARE AND MAINTENANCE OF ACRYLIC AND PLASTIC SURFACES

Use clean fresh water with a drop of detergent and flannel for cleaning. Avoid paper towels, napkins and tissue.

Keeping the surface clean and smooth helps prevent scratching and crazing.

Never use rubbing compound, polishing cleaner or auto waxes on acrylic. These materials contain abrasive and solvents that damage the surface or accelerate crazing.

MICRO-GLOSS is a liquid abrasive. It contains no waxes or silicones. MICRO-GLOSS is used to remove very minor surface scratches. It contains a uniformly graded abrasive grain in suspension.

MICRO-GLOSS may be used to remove superficial damage and maintain polished surfaces. It is used to shorten the final finishing process for plastics and other soft materials. It can be applied by hand with a clean damp flannel cloth, or it can be used with a buffer and a natural wool buffing pad.

Note: Keep the flannel clean and you can use it many times. Rinsing is needed to remove dirt and abrasive particles that are trapped in the flannel.

Please contact our restoral department Monday - Thursday between the hours of 8 a.m. and 4 p.m. CST for an explanation on how to remove distortion.

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Guidelines for Acrylic Finishing By Hand

HOW TO DETERMINE IF YOU ARE WORKING ON ACRYLIC OR POLYCARBONATE

REQUIREMENTS:

1. 3-WAY MICRO-MESH BUFFER; GRADES 2400 (PINK); 4000 (WHITE); 12000 (GRAY)
2. SPRAY BOTTLE OF WATER
3. LIGHT SOURCE

PROCEDURE:

Work on an approx. 2" x 2" inconspicuous area of the window

Set a light behind the window so inspection can be easily done

Spray the area with a mist of water

Using the buffing stick - pink 2400, make 6 back and forth, using **light** strokes. Sand in a horizontal motion.

Now, sanding in a vertical motion, use the 4000 white side of the buffer to cross over and remove the 2400 scratch pattern you put in the window.

Stop and assess your progress. You should notice a white, milky slurry forming from the sanding action. This is a combination of the water and small abraded particles of acrylic. Did you remove the 2400 sanding pattern? If so and you have a slurry forming - the window is acrylic.

If not, the window is most likely polycarbonate. Making sure the repair area is wet, continue sanding, but this time use the 12000 MICRO-MESH side of the buffer and sand in a horizontal pattern to try the 4000 sanding pattern.

Using a soft flannel or cotton cloth only, put a dime's worth of MICRO-GLOSS on the repair area and polish and wipe clean.

If your window is polycarbonate ask about our restoral products for POLYCARBONATE.

There are many different grades of both acrylic and polycarbonate, so testing is imperative. In some cases, with polycarbonate, less is best and optical clarity may not be possible. Polycarbonate is much softer than acrylic and is more difficult to repair. It's like sanding on rubber.

MICRO-MESH® Procedures for Wood

MICRO-MESH® is a unique cushioned abrasive that produces a very fine and uniform scratch pattern. The nine grades range from 1500 to 12000. The 1500 is similar in grit range to conventional 400 grit wet/dry sandpaper. The 12000 will leave a scratch pattern that cannot be detected by the human eye.

MICRO-MESH® abrasives can polish to a high reflective state or leave a matte or satin finish depending upon where you stop while using the series.

1. **Bare Woods**

Before starting the MICRO-MESH® series, coarse sanding should be done using up to 320 grit sandpaper. Shaping, sawing or turning of the work piece should be complete.

Begin with 1500 MICRO-MESH®. Sand until all of the sandpaper scratches are removed. Continue with the MICRO-MESH series (1800, 2400, 3200, 3600, 4000, 6000, 8000, 12000) You may stop at any point during this process when you have reached the finish that you desire.

Thinned lemon oil or Danish oil can be applied as a finish on bare wood.

2. **Wood Finishes** (polyurethane, polyester, epoxy, lacquer, etc.)

**Follow the manufacturer's recommended cure times prior to recoating or applying the finish coat.* When you are applying multiple coats, sand from 1500 MICRO-MESH® to 3200 or 3600 between coats to remove any orange-peel or dirt. *Note, for soft or thin finishes, only sand with 3200 to 3600 between coats.

After the final coat has fully cured, polish the surface beginning with 2400 MICRO-MESH® and continue through the series (3200-12000) until the desired gloss is achieved.

Satin finishes are achieved by sanding up to the 3600 grade. The satin finish gets progressively higher in gloss through the 6000 step. High gloss finishes will appear by the 6000 through 12000 step. The wood, the finish used and personal preference determine where to stop. MICRO-GLOSS® liquid abrasive can be hand rubbed onto the finish following the 12000 MICRO-MESH® step for an "ultra" high gloss finish.

MICRO-MESH® replaces steel wool and both pumice and rotten stone for final finishing.

3. Repair of Wood Finishes

Burn ins – Sand to remove discoloration. Cover with three coats of lacquer. Wet sand with 1500, then apply one more coat of lacquer. Polish with MICRO-MESH® series beginning with 2400 MICRO-MESH® and continue on thru the series stopping after each grade to see if you've reached the finish you are trying to match.

Guidelines for matching a satin finish - Begin with 1500 MICRO-MESH® , followed by 1800, 2400 and 3600, or until you've reached the finish you're trying to match.

To match a high gloss finish – Begin with 1500 MICRO-MESH® and continue up through the series to 12000 or until you have reached the desired finish. For gloss beyond the 12000, buff with MICRO-GLOSS® liquid abrasive.

4. Hints

MICRO-MESH® can be used wet or dry. When using MICRO-MESH® dry, it can be "unloaded" by rapping against the palm of your hand.

MICRO-MESH® can also be cleaned by using a stiff, short bristled brush.

It may not be necessary to go through every grade of MICRO-MESH® to reach the desired finish. You can experiment skipping every other step.

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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.

TECHNICAL BULLETIN

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.