

## MMA SYSTEM COSMETIC FRACTURE REPAIR FOR BATHTUBS & SHOWERS

### DESCRIPTION

September 08

The **MMA** repair system has been designed for repairing standard color **acrylic** surfaces in bathtubs and showers. Colors are matched to the original bath/shower manufacturer's colors. This system is preferred by manufacturers, since it **can** be buffed and polished to achieve the highest quality finished surface, therefore looking brand new. The fillers can also be used to repair gelcoat/FRP bath products in combination with gelcoat resin matched to the manufacturer. The materials and procedures can also be adapted to other plastic products.

Multi-Tech Products also provides a "Quick Glaze" system designed as a "spray and go" repair to meet the needs of professional repair people doing in-home, in a clean environment, work. However, if adequate time is allowed for drying, it can be sanded, buffed, and polished. Please visit [multitechproducts.com](http://multitechproducts.com) for more information on this alternative system, as well as procedures for other types of surface or structural damage.

Cosmetic repair to bath or shower surfaces starts with a special filler, designed to avoid causes of failure in standard polyester auto body fillers and putties. These auto body products absorb water and fail prematurely, when used to repair bathtubs and showers. The filled repair is spray-coated (using an air brush) with a color matched basecoat. Toners allow adjustment of the basecoat color to be lighter or darker. Toner kits are available to adjust base color and hue. The repair is finished by applying a protective clear topcoat. These repair coatings allow the damaged surface to be repaired to an appearance almost like new. The clear topcoat is required to prevent discoloration and deterioration in the basecoat from long exposures to chemicals, water and UV exposure.

While there is no implied warranty, these materials and techniques were designed to perform very well in normal bath room environments. However, the experience and skill of the individual repair technician contribute greatly to the overall quality of a repair.

### MATERIALS

- One of two choices for a filler
  - 1) Poly-filler ( a modified polyester resin product) and cream hardener- this is the product of choice for most bath applications
  - 2) Acrylic filler (parts "A" & "B") – for use when repair will be exposed for long periods to water, steam heat, and chemicals
- Acrylic basecoat, which is matched to the surface color
- Basecoat thinner, which is offered in three application temperature ranges (Low = < 70°F, Medium = 70° to 90°F, and High = > 90°F)
- Lightening and darkening toners (for adjusting the colors to achieve best color match)
- One of two choices for a clear topcoat
  - 1) K2000 Clearcoat (polyurethane), which has superior durability, but does not facilitate buffing & polishing
  - 2) MMA Acrylic Clear topcoat, which should not be used when the repair will be exposed to water & chemicals for long periods, but it can be buffed & polished
- If the K-2000 topcoat is used, also required are:
  - 1) K2000 Hardener
  - 2) K2000 Reducer/Thinner, which is used to aid spraying and as a finishing solvent for the topcoat
  - 3) Hand Glaze
- If the MMA Acrylic Clear topcoat is used, also required is:
  - 1) MMA Acrylic Monomer Thinner
- A rubbing compound or buffing bar
- Sand paper (wet and dry type 100, 220, 320, 400, and 600 grit)
- Isopropyl alcohol

- Optional - MMA Acrylic Finishing Solvent – for reducing “halo” effect, which frequently occurs in higher ambient temperatures or windy work areas.
- Optional - MMA Toner Kit – for adjusting base color ( special skills are required for this operation)



## EQUIPMENT

The equipment listed below is needed to use the **MMA** repair system. Most of the equipment is available from Multi-Tech Products. Other equipment can be purchased at paint stores. A working knowledge of the equipment and application techniques is assumed for these repair procedures.

- A ¼” Die Grinder (electrical or pneumatic) with cylinder grinding points (Dremel-type tools typically are not robust enough for this job)
- Industrial Heat Gun (Again, a hair blow dryer is not sufficient)
- A ⅜” Variable Speed Drill (electrical or pneumatic)
- A rubber disc assembly for the drill (similar to the Roloc Disc pad)
- 3” Sanding Discs - 50, 36, 24 grit. (50 grit is optimum.)
- An Airbrush like Paasche #H with a “3” or “5” tip (kits include a 2½ oz., and a ½oz. spray cup, and a cloth braided hose). Extra cups for mixing may be necessary.
- For large (> 1 sq.ft.) repair areas, a Touch Up Spray Gun like a Binks Model #115 with siphon cup is useful. The touch-up spray gun can also be gravity fed.
- High pressure (> 45psi) and flow( 1 CFM) air source – A compressor needs to be a tank-type, to provide adequate CFM. A motor or pump alone is inadequate.
- High Speed, Heavy Duty Polisher/Buffer - at least 2500 – 3500 rpm is recommended (variable speed is optimum).
- Buffer Pad (Industrial Grade)
- Rubbing Compound or Buffing Bar.
- Vapor/Particulate Respirator - NIOSH/MSHA TC-23C.



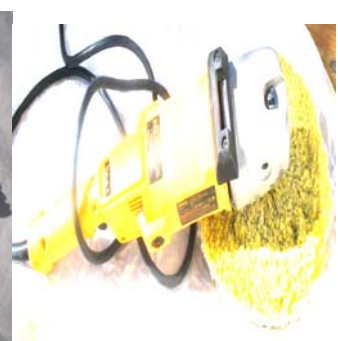
Airbrush



Heat Gun



Grinder & Drill



Buffer

## **SAFETY PRECAUTIONS**

Bathtub and shower surface repairs require personal contact with a variety of components, each having its own unique characteristics. When handling these materials, read and follow the safe handling procedures on the labels and the MSDS. During grinding, drilling, sanding, etc., eye and hand protection is required. Do not breathe vapors or mists. Individuals with a history of lung or breathing problems should not use or be exposed to this product. Keep away from heat, sparks and flame. Vapors may cause a flash fire. Close containers after each use. Dispose of properly.

Even though most of the MMA coating system is non-toxic, it is recommended that users wear a vapor/particulate respirator (NIOSH/MSHA TC-23C) while mixing and spraying these coatings. Do not permit anyone without protection in the painting area. Follow the respirator manufacturer's directions for respirator use. If the K2000 polyurethane topcoat system is used, additional precautions may be required to prevent over exposure to isocyanates.

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## **PROCEDURE**

Before a repair can be started, the bathtub should be dry and clean. The immediate area around the repair should be cleaned with isopropyl alcohol. The steps used to repair a fracture (crack) in the surface of an acrylic bathtub or shower are:

- 1) Crack preparation (grinding and sanding)
- 2) Filling the enlarged surface void
- 3) Applying the color coat
- 4) Applying a protective clear topcoat
- 5) Final buffing/polishing (optional)

It is recommended that the surface be allowed to cure for 12 hours or overnight before water is re-introduced to the surface. Cool temperatures will lengthen the cure time.

### **Preparing the crack and filling**

Acrylic bathtubs and showers are produced using an acrylic sheet that is formed to the shape and reinforced from the back using a fiberglass composite or other polymer.

The steps for preparing the crack for filling are:



## Fracture (crack) preparation

1) Terminate the crack by routing it out from one end to the other using the rotary grinder. Material should be removed so that a V-shape groove, which is approximately 1/8" to 1/4" deep, is created.

The grinding should extend 1/4" beyond each end of the crack. It should be ground to have a 30° to 45° angle at the top edge. Unless the original fracture extends into or through the reinforcement, the grinding should stop when the back material is exposed. Try not to create a hole. However, techniques for repairing holes can be obtained at our website.



2) Remove all loose fragments from the edge by sanding with 100 grit dry sandpaper. Control the sanding to the immediate area of the crack to minimize the total area of the repair.

3) After sanding, clean the area again with a soft cloth or paper towel moistened with isopropyl alcohol.

All chemicals should be at normal room temperature.



## Filling Preparation:

There are two choices of filler, a modified polyester resin, and an acrylic resin product.

The polyester filler or Poly-filler is preferred by professional repair people for use on bathtubs and showers.



4a) The Poly-filler is prepared by adding 3% to 5% cream hardener to the filler. The mixed material has to be used within 5 minutes. Place three small, separate piles of the filler on a piece of cardboard (or substitute), and squeeze a separate pile of cream hardener alongside each. The cream hardener should be about 1/20<sup>th</sup> of the filler.

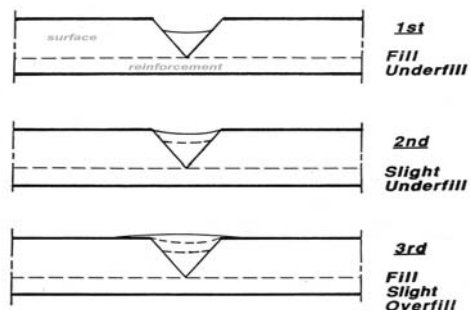


4b) Manufacturers prefer the acrylic filler. It is prepared by dispensing the desired amount of component "A" into a plastic graduated mixing cup. Add 30 drops of component "B" per each 1/2 ounce of "A". Mix thoroughly with the wooden stirrer, and use immediately, since it will harden within 15 minutes.



## Filling Application:

5) Mix one pile of the filler and hardener very well, and use it to fill the crack with the material to slightly below the surface. Use gentle continuous heat with the heat gun around the edge of the crack, without pointing the gun directly on the crack. This will accelerate the curing process. Allow to cure for 5 to 10 minutes. Repeat this filling and curing process using thin layers in each application. Best results are when 3 or 4 thin layers are completed. The final fill will finish slightly above the surface. The heat will shorten curing time, but using too much material in a single application frequently causes air bubbles.



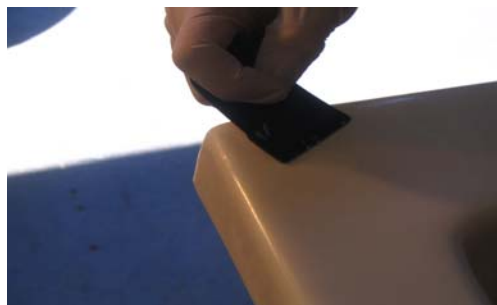
6) After final filling and curing, grind the area with the 3" grinding wheel installed in the drill. Frequently, grinding is not necessary for the Poly-Filler. Sanding with 100 grit sandpaper is sufficient. If grinding, use a slow speed to avoid overheating. Continue until the surface is flat and even with the surrounding surface. This technique is also good for contours and radius edges.



Dry sand with 100 grit sandpaper.

If pinholes or other imperfections exist, a thin layer (skim coat) of the same filler can be wiped over the area. This thin layer will cure rapidly.

DO NOT use any other type filler or spot putty.



Apply heat to finish the curing.



Begin sanding with a progression from 220 grit to 320 grit to 400 grit wet/dry sandpaper.



Now the surface is ready to start the color renewal process.

### **Color finishing the filled repair area**

Refer to our website for examples of colors and bath manufacturers' products that can be repaired. The materials needed to complete this repair include a basecoat, which matches the product being repaired, and a clear topcoat. Thinners are used to facilitate spraying. The thinners come in three ambient temperature ranges. If the complete MMA system is used, the final repair can be buffed and polished.

Two top coat systems are available. The MMA acrylic topcoat system, and the K2000 polyurethane system.



The basecoat has a set of toners for lightening or darkening.



### **Basecoat Preparation:**

1) Dab a drop of the basecoat on the bath surface, spread to a thin layer, and let it dry. Check color match. It can be lightened or darkened with the toners. Multi-Tech also offers a toning kit containing the primary colors, so that the actual color can be adjusted. Special expertise is necessary for color adjustment. Color toning is often required since different batches of product are slightly different in color. Refer to the Multi-Tech Toner Guide for instructions.



2) Dilute the basecoat with the appropriate ambient temperature thinner to achieve an acceptable spray viscosity. Low = <70°F, Medium = 70°to 90°F, and High = >90°F Start the dilution at equal parts of each component.

Test the viscosity with a test spray on a piece of cardboard and adjust as needed. Add more thinner in 10% increments until satisfactory spray results are obtained. The target spray pattern is a smooth, high-gloss surface. For example, if a rough surface is experienced, additional thinner is required. The air pressure should be 35psi and the airbrush should be held 2 to 3 inches from the surface.

### Basecoat Application:

3) Spray the repair area with this mixture until the filler has been covered. Repeat this process with more basecoat to duplicate the bath or shower surface color, gloss, and appearance.

4) Feather the outside edges to blend the color into the surrounding surface. Feathering is especially important on the final coat. Finishing solvent can be used to improve wetting. It is sprayed on with the airbrush.

5) When spraying is completed, and the surface is dry, rough surfaces can be sanded with 400/600 grit sandpaper, but do not sand through the feathered edges. If you sand completely through the coating, simply re-spray. Drying can be accelerated by using indirect heat from the heat gun, but use caution to avoid overheating.

### Topcoat Preparation: K2000 polyurethane system

The K2000 product is generally preferred by professionals doing in-home repairs. Although it provides exceptional resistance to water and chemicals, it cannot be buffed or polished. However, it cures rapidly.



To use the K2000 system:

1) Using hand glaze, broadly clean the surface around the repair by applying the product similar to a wax application. Use a cloth for application, and a separate, clean cloth for removal. This should remove film and static from the surface.



2) Pour the desired amount of the K2000 clear topcoat in a mixing cup or airbrush bottle. Add 1 part K2000 hardener to 3 parts topcoat and stir. Mixture is ready to spray. Perform a test spray, and add K2000 thinner in 10% increments if needed, to achieve acceptable spray viscosity. The goal is a smooth glossy spray laydown.

3) Spray the clear material over the painted area including the feathered edges creating a glossy finish and even coverage. Feather the clear coat as well to match and blend into the surrounding surface.



4) Now, use the K2000 thinner alone, as the finishing solvent to blend and wet out the “halo” effect in the feathered area. The airbrush should be held 8” to 12” from the surface during this operation. The heat gun can be used to accelerate drying. Allow the finished coatings to dry, and if properly applied in a clean environment, it should not require buffing and polishing.

### **MMA acrylic clear topcoat,**

The MMA acrylic topcoat is generally preferred by manufacturers, since it can be buffed and polished.

1) Wiping and cleaning with hand glaze is not required.

2) Dilute the MMA clearcoat with the monomer thinner using 2.5 parts thinner to 1 part clear topcoat. You can test spray to confirm that the viscosity produces a fine spray.



3) Spray several thin coats using procedures similar to above. Stay within the sanded area, but allow each coat to dry. Heat can be used to accelerate drying.



4) Allow the final coat to dry for 15 minutes before attempting to sand, buff, and polish. It can be wet sanded with 400 and/or 600 grit sandpaper to improve gloss and smoothness. Frequently, you can skip 400 and go directly to 600 grit.



Buff at 2500rpm with rubbing compound.



Multi-Tech Products supplies Plexus, which can be used for added gloss.

Refer to Multi-Tech Products' professional buffing and polishing video for assistance.



PLEASE REFER TO OUR WEBSITE ([multitechproducts.com](http://multitechproducts.com)) FOR INFORMATION ON OTHER TYPES OF REPAIRS

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