

Repairing Sheet-Molded Compound (SMC) With Epoxy

1. Properties:

- A. It does not dent.
- B. It does not rust
- C. Panels are formed using a flat sheet or compound that is heat molded in a press.

2. Preparation for repair

- A. Relieve any cause for the repair.
 - 1. Broken attachment point
 - 2. Stress Crack
- B. Remove any material that has disintegrated, it will make the repair easier.
- C. Access to the back side of the area to be repaired.
 - 1. This area is sometimes crucial to give the repair a certain amount of strength.
Supporting the repair from the back will hold it in place.

3. Supplies

A. Epoxies

1. Why epoxy.

a. SMC is a polyester-based material, but it cannot be repaired with polyester resin. This is due to the mold release agent that is present throughout the entire SMC part. Unlike conventionally molded parts where release agents are applied to the mold surface, SMC is compounded with them in the resin mix for quicker processing. This means that as the damage is sanded to prepare a good bonding surface, fresh mold release agent is exposed. Polyester resin products are not strong enough to adhere to this surface.

2. West System SIX 10.

- a. Thickened adhesive. Initial mix is thicker than a regular type of epoxy.
- b. Properties of SIX 10 is that it thins as it is worked.
- c. 42 minutes work time. Allow 24 hours to cure completely.
- d. West Marine (<https://www.westmarine.com>), Jamestown Distributors (<https://www.jamestowndistributors.com>)



B. Fiberglass cloth and mat

1. Support and structure

- a. Epoxy by itself is brittle. The mat or cloth gives a bonding area to support the repair. Like rebar in concrete.



2. Cloth or mat

- a. The higher the weight the more dense the material.
 1. Mat is made with crossed fibers and supports the repair better.
 2. Cloth is woven and very thin and does not shred as easily as mat.
- b. Cuts with scissors.

C. Tools

1. Foam or a small regular type brush
2. Spreaders and small brushes
3. Protective Gloves and dust mask
4. Scissors
5. Drill, bits and screw drivers.
6. Mixing board
7. Wax paper

4. Prepping the area

A. Size of area to be prepped.

1. Only repair the area not the panel. Outline an area with at least an inch of circumference around the repair area.



B. Preparing the area to repair.

1. Begin by using either a Dremel tool or some other tool and make a graduated valley along the of the area seams. The valley should reach out to about 3/4 of an inch on both sides on the seam. This creates a void for the patch to adhere too for strength and allows feathering of the repair material later on. You want to get rid of any dirt,
2. Sand the remaining area surrounding edges with at least 80 grit sandpaper to give a good mechanical surface for the epoxy to adhere too.
3. Blow area down with clean dry air. Wipe the area clean with dry paper cloth. Don't use solvents.





C. Supporting the area to be repaired

1. Splint the area if the crack is not stable. You can use paint stirrs or thin strips of Aluminum. Use self-tapping screws to attach. Put the splints across the corners or at the end of the repair. Vise Grips work also. You want to hold the break or patch in place as the Epoxy cures. You can fill the screw holes after the Epoxy cures.







5. Applying the patch

1. Put on your gloves.

- A. Cut out your Fiber or cloth to match the length between your splints with an overhang of a $\frac{1}{2}$ inch on each side.
- B. Lay out some wax paper and mix the Epoxy on it. Don't start with a lot at first, you can always mix more.
- C. Using a small brush, apply some Epoxy to the sides of the patch area you cleaned between the splints.
- D. Lay your mat strips out on the wax paper. Wet the mat until it is completely saturated with epoxy. Use a cut down acid brush or a plastic spreader. Be easy when you wet the cloth. The mat will want to separate as you apply the epoxy. Just take it slow and work the epoxy into the material.



- E. Using either the spreader or a knife, lift the cloth off the wax paper and lay it on to the gap of your patch between the splints and slowly work it to get any air out from under it, the cut down acid brush works well for this. But dab at it don't brush it. Let this application cure for 24 hours.







2. Finishing

- A. Remove the splints. After mixing more Epoxy, apply a small amount to wet the seam that was under the splinted areas with a brush. Or as in the photo above, leave the splint in and cover it with wet mat. This will support the repair from breaking again.
- B. Wet 1/2" strips of mat or cloth then lay it into the gap that was covered by the splint and work out any air. Now you can add layers of wet mat or cloth to fill and cover the entire repair. What you want is to fill the repaired area completely and close to level with the surrounding surfaces. Fill any screw holes also. Let cure for 24 hours, and then sand it down to allow a surface filler to be applied for finishing.

C. Fillers for holes or surfaces building



1. Mix in some West 406 Colloidal Silica filler (for thickening) or 410 Microlight Fairing filler (for making a workable surface). Mix it to sticky putty texture.
2. Using a spreader, work the mixture into the gap. Don't worry about getting it smooth. You can sand it flat after it cures.

6. Finishing

- A. Rough sand the outside seam with 80 grit sand paper to get it down to a just below surface level. Blow out any residue with dry air. Wipe area with a dry cloth.
- B. Use a leveling compound to smooth the repaired area. Sand with at least a 180 grit paper. Spray with a primer and paint as best you see fit.



References and guides

<http://www.westsystem.com/instruction-manuals/>

<https://www.youtube.com/user/WestSystemEpoxy/videos>

<https://www.youtube.com/watch?v=ogoPfYD64fQ>

http://www.fibreglast.com/product/fiberglass-repair-composite-repair/Learning_Center



