

Plastic and Composite Repair

Student Handouts



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PLA03-STHO02-E

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Two-Sided Plastic Repair SOP

STEP	Description	Part #
Clean The Part	Clean the front and backside of the part with silicone-free soap and water, followed by the product maker recommended cleaner.	
Taper	Grind the front of the repair area, making a wide and gradual taper with soft edges. Also, if recommended, taper the backside.	
Sand & Adhesion Promoter/Surface Modifier	After grinding the taper, use ____ grit to sand any melted plastic and soften any sharp edges. Blow off, then apply adhesion promoter, if recommended, to the backside.	
Backing	Blow off the sanded area. Apply aluminum tape to the front side. Apply adhesive to the backside. Imbed the backing into the adhesive. Apply more adhesive to cover the backing if needed. Allow it to cure.	
Sand Front Side	Remove the aluminum tape. Sand any cured adhesive down to the proper level. Do not sand through the backing.	
Apply Repair Product	Blow off the sanded area. Apply adhesion promoter/surface modifier to the front side if recommended. Allow it to flash. Apply the recommended repair product to the front side of the repair and allow it to cure.	
Finish Sand Front Side	Sand the front side with ____ grit on a DA at slow speed. Then block sand the repair product with ____ grit to the proper level. Inspect for any deep scratches or pinholes and reapply the correct filler product if needed.	
Precautions	Always follow the product maker directions. Always level the plungers. Always run a bead through the static mixer before using any two-part product. Make sure that the compressed air is dry and oil free.	

Plastic TAB Repair SOP

STEP	Description	Part #
Clean The Part	Clean the front and backside of the part with silicone-free soap and water, followed by the product maker's recommended cleaner.	
Taper	Grind the front and backside of the repair area with ___grit, making a wide and gradual taper with soft edges. Add pinning holes if recommended.	
Sand & Adhesion Promoter/Surface Modifier	After grinding the taper, use ____ grit to sand any melted plastic and soften any sharp edges. Then apply adhesion promoter, if recommended, to the tab.	
Apply The Adhesive	Blow off the sanded area. Using a plastic film, apply adhesive to the tab and form it. It may be recommended to add a reinforcement into the adhesive. Allow it to cure.	
Shape Tab	Remove the plastic film. Grind the tab using ___ grit to form the tab. Drill the correct size hole in the tab. Featheredge the tab using ___ grit.	
Precautions	Always follow product maker directions. Always level the plungers. Always run a bead through the static mixer before using any two-part product. Make sure that the compressed air is dry and oil free.	

Two-Sided SMC Repair SOP

STEP	Description	Part #
Clean The Part	Tape off any exposed fibers. Clean the front and backside of the part with silicone-free soap and water, followed by the product maker's recommended cleaner.	
Taper	Cut away any loose fibers. Grind the front and backside of the repair area with ___ grit, making a wide and gradual taper with soft edges.	
Sand & Adhesion Promoter/Surface Modifier	After grinding the taper, use ___ grit to sand and soften any sharp edges. Clean using a vacuum or a blow gun with oil-free air.	
Backing	Apply aluminum tape to the front side. Apply adhesive to the backside. Imbed the backing into the adhesive. Apply more adhesive to cover the backing if needed. Allow it to cure.	
Sand Front Side	Remove aluminum tape. Sand any cured adhesive with ___grit down to the proper level. Do not sand through the backing.	
Apply Repair Product	Vacuum or blow off the sanded area. Apply the recommended repair product to the front side of the repair and allow it to cure.	
Finish Sand Front Side	Sand the front side with ___ grit on a DA at slow speed. Then block sand the repair product with ___ grit to the proper level. Inspect for any deep scratches or pinholes and reapply the correct filler product if needed.	
Precautions	Always follow product maker directions. Always level the plungers. Always run a bead through the static mixer before using any two-part product. Make sure that the compressed air is dry and oil free.	

Plastic Weld Repair SOP

STEP	Description	Part #
Clean The Part	Clean the front and backside of the part with silicone-free soap and water, followed by the product maker's recommended cleaner.	
Taper	Grind the front of the repair area using a V-groove. Then remove any overspray from the backside of the repair area.	
Backing	Apply aluminum tape to the front side. Use the correct filler rod. If hot air welding, use a wide ribbon. If airless welding, use the correct filler rod and metal screen.	
Front Side Repair	Remove aluminum tape. Use the correct filler rod to fill the front side. Allow it to cool. Sand the area with ___ grit, making sure to remove any shiny melted plastic. Blow off the area.	
Apply Repair Product	Apply adhesion promoter/surface modifier, if recommended, to the front side. Allow it to flash. Apply the recommended repair product to the front side of the repair and allow it to cure.	
Finish Sand Front Side	Sand front side with ___ grit on a DA at slow speed. Then block sand the repair product with ___ grit to the proper level. Inspect for any deep scratches or pinholes and reapply the correct filler product if needed.	
Precautions	Always follow product maker directions. Always level the plungers. Always run a bead through the static mixer before using any two-part product. Make sure that the compressed air is dry and oil free.	

Top 10 Reasons Plastic Adhesive Repairs Fail

Cleaning

The step that seems to be most often skipped or done incorrectly is cleaning the plastic or composite parts. It is absolutely critical to wash the front and backside of the part thoroughly with silicone-free soap and water and the product maker recommended cleaner. If this step is skipped, it will lead to a repair failure.

Lack of Stress Relieving

If a deformation is not removed with heat before any adhesive repair is started, it may lead to a repair failure once the part is exposed to heat. This is because the plastic part has some memory and the heat may, depending on the extent of damage, return the part to its original shape.

Poor Repair Taper

When making the repair taper, it must be made wide and gradual with soft edges. If the taper has sharp edges, like a v-groove, the repair area will be visible after the repair is completed. This is because the repair area does not have enough surface area to allow for thermal expansion of the part and the adhesive.

Poor Surface Prep

After the taper is complete, it must be sanded with about P80 grit sandpaper. Check product maker instructions for the recommended grit. This will remove any melted or shining plastic, which the adhesive will not stick to. It is also recommended to use a DA at slow speed to prevent overheating. To avoid deep scratches, it may be recommended to sand the outside edge of the repair area with finer grits, like P180 for example.

Adhesion Promoter/Surface Modifier Mistakes

There are many ways adhesion promoters/surface modifiers can be misused. One of the top ones is that it may be applied too heavy. Most product makers recommend a light mist coat. More is not better. If too much is applied, it can actually lead to adhesion problems. Do not use paint maker adhesion promoters instead of the product maker. The paint maker adhesion promoter was not designed to help adhesive stick to plastic, but instead was designed to help paint stick to adhesives and plastics. Keep in mind that some product makers do not require adhesion promoters. Always follow the product maker guidelines.

Poor Reinforcement

When repairing two-sided damage like a puncture, tear, or crack, it is important to apply reinforcement to the backside of the repair. This adds extra strength to the repair area, to make a quality and lasting repair. Put down a layer of adhesive, and push the reinforcement into the adhesive. A fiberglass cloth or mesh can be used as the reinforcement. Then apply another layer of adhesive.

Filler Misuse

One common mistake is using a metal body filler or glaze on plastic parts. This should never be done, as they are not made to adhere to plastic or to be flexible. When a flexible plastic polyester glaze is used, it should only be over small pinholes and scratches, not a crack or hole. Polyester glazes were not designed for these types of repairs. Some product makers warn against using a polyester glaze over their product, as they are not compatible.

Cure Times

All product makers have recommended work, sand, and cure times. The reason for this is to ensure proper adhesion is achieved. If the adhesive is sanded too early, it may peel or lift because the adhesive has not yet fully bonded with the part. Temperature can have an effect on the work time. For example, for every 7°C (20°F) over 21°C (70°F), the work time will be cut in half. For every 7°C (20°F) below 21°C (70°F), the work time will double.

Improper Mixing

Most adhesives are mixed using a dual cartridge with a static mixing tip. It is important to follow what all the product makers recommend. That is, before installing the static mixing tip, level the plungers. This ensures that both parts of the adhesive come out and mix evenly. If this step is skipped, it may lead to the product not curing or adhering properly. Once the plungers are leveled, the static mixing tip should be installed. A bead should be run out to ensure that it is properly mixed. Again, if this step is skipped, it may cause the adhesive to not cure.

Not Following Instructions

This simple step can save a lot of problems. Follow the instructions and stay within the product line, because the chemical makeup of the products may differ. The product makers call them instructions and not suggestions for a reason.