

33 Stapleton Street  
Winnipeg, Manitoba, Canada, R2L 1Z9

Ph: 204 988-3484  
Fax 204 988-3480

## **P.R.I.M.E.** **(Plastic Repair Instructions Made Easy)**

### **Defining Plastics**

How to identify plastics used in the automotive and trucking industry. Certain plastics are used for specific applications (**Refer to the ID Chart**). There are two basic groups of plastics:

**THERMOPLASTIC** – Thermoplastic can be rigid or flexible. It can be heated and reshaped (recycled). Our Mechanical Welding process works excellent with Thermoplastic plastics; use our Pro Tech **Welder #WG700** with one of our Fusion Grade Welding Wires (**Series PW**) and our Welding Reinforcement Screen **# RM990**.

**THERMOSET** – Thermoset can be rigid or flexible. It cannot be melted with heat. The best repair is with our Chemical Welding process; use one of our Structural Adhesives Kits (**SE Series**) and our **Fiberglass Reinforcement Tape #RM890**. A good example of thermoset plastic is fiberglass and Sheet Molded Compound (SMC).

The one exception to this rule is Polyurethane (**PU, PUR**). They may be welded with our Polyurethane Welding wire **#PW682**. This will not give you a true fusion grade weld, but will give you a very structural sound repair when used with our Welding Reinforcement Screen #RM990.

Many plastic parts have an International Standards Organization (ISO) code on the inside of the part: example: (**PUR**) Polyurethane, (**PC**) Polycarbonate, (**PP**) Polypropylene, or (**TPO**) Thermal Plastic Olefin. Refer to ID chart for the majority of other codes.

One group in the Thermoplastic family is called Olefin plastics: e.g. **TPO, TPE, PP, PE** and **EPDM**. These have a waxy greasy feeling and smear when sanded with a power sander. Olefin plastics need an extra step to be repaired properly, whether you Mechanical or Chemical weld the part (**see Note 1 in the repair procedures**)

If after reviewing the information and referring to our ID chart you are still unsure of the type of plastic you are trying to Mechanical Weld (refer to our Mechanical Welding Instructions), do a few test welds with different welding wires in a hidden area and let cool (**refer to Helpful Hints**). After cooling (may be cooled with water and or air), try and remove the wire, if it sticks, that is the proper welding wire to use. After this process, if you are still not confident in the quality of the weld, do a Chemical Weld on the repair with one of our Structural Epoxies (**SE Series**) and our Fiberglass Reinforcement Tape (**refer to our Chemical Welding Instructions**)

## MECHANICAL WELDING - THERMOPLASTIC

1. Define the type of plastic you are working with. Refer to the **I. D. Chart** and the Helpful Hints.
2. Wash the damaged area with soap and water then clean with our wax and grease remover **(Part# PP500)**.
3. If the part is out of shape, preheat with a hot air gun, and push back into shape with block of wood or the end of a hammer handle, then cool quickly with water or an air blower.
4. Preheat the welding gun to the desired temperature (approx. 10 min). Refer to the settings on the side panel of the welder. **Note:** If you don't have the plastic ID code, start with a setting of 5 and go hotter or colder depending on weld performance. You may also perform a rod stick test as follows: In a hidden area test a small amount of 2 or 3 different types of welding wire to see how they bond. The welding wire that bonds the best is the one to use.
5. With a 36 to 50 grit disc, remove paint and contaminants from weld area, then "V" grind and taper the edges of the tear extending about 1 ½" on either side of tear and half way through the material. Always start your repair on the non-visible side.
6. Hold the tear together with aluminum tape on the opposite side of your repair **(Part # RM770)**  
(Aluminum tape also helps retain the heat and produces a better weld).
7. Tack weld various points along the tear by pressing the tip of the shoe into the plastic at a 90-degree angle until it penetrates halfway through the plastic.
8. Place a piece of welding reinforcement screen **(Part # RM990)** into the "V" grind area so it extends one inch on each side of the tear. With the welding shoe flat press the screen completely into the plastic and cool.
9. Insert your welding wire into the preheat tube and feed the wire in with a steady motion while moving the flat end of the shoe in a circular motion. This will join and embed the molten weld into the original plastic part completely covering the welding reinforcement screen **(Part # RM990)**. Continue this process the full length of the tear. Cool the weld.  
You can repeat the above process with multiple layers of welding reinforcement screen for added strength.  
**Note:** This screening process can also be used to make tabs, repair holes, etc.
10. On the reverse side of the tear remove the aluminum tape (visible side), "V" grind a ¼" groove along the tear until the welding reinforcement screen is visible.
11. Insert your welding wire into the preheat tube and feed the wire in with a steady motion while moving the flat end of the shoe in a circular motion. This will join and embed the molten weld into the original plastic part. Fill the groove completely with welding wire.
12. Once the weld is cooled, grind the weld area smooth using 60 - 80 grit disc at slow to medium speed. Grind the welded area slightly below the surface. Be sure not to create too much heat, as this will cause the plastic to melt and ball up.
13. Sand the repair and surrounding areas with 80-120 grit paper at slow to medium speed.
14. Remove any dust then clean with wax and grease remover.
15. You are now ready to apply our epoxy finishing filler. Choose the appropriate filler depending on whether the part is a flexible or rigid plastic.

**(Refer to the "Instructions for Finishing Filler")**

**Note:** It is not necessary to install screen on the front side of repair, as it will be ground off in preparation for the topcoat.

## Mechanical Welding - Thermoset Plastic (Polyurethane)

1. Wash the damaged area with soap and water then clean with our Wax and Grease Remover **(Part# PP500)**.
2. If the part is out of shape, preheat with a hot air gun, and push back into shape with block of wood or the end of a hammer handle, then cool quickly with water or an air blower.
3. Preheat the welding gun to the desired temperature (approx. 10 min).
4. Always start your repair on the non-visible side. If the part is ripped or torn, push the two sides together and hold them in place with Aluminum Tape **(Part# RM770)** on the opposite side or use our Liquid Adhesive Kit. **(Part# CA180)**.  
Aluminum tape also helps retain the heat and produces a better weld; it can also be used as a base to back-fill holes, repair attachment tabs, etc.  
**Note:** Always pre fit the parts before applying the liquid adhesive as once it is set it is very difficult to remove.
5. With a 36 to 50 grit disc, remove paint and contaminants from weld area, then "V" grind and taper the edges of the tear extending about 1 ½" on either side of tear and half way through the material.
6. Insert welding wire into the preheat tube and feed the wire in a steady motion through the welder into the groove. Move the flat end of the shoe in a circular motion spreading the melted wire over the groove and extending out to the edge of the repair. Repeat this until "V" groove is completely covered.
7. Place a piece of welding reinforcement screen **(Part # RM990)** into the "V" groove area so it extends one inch on each side of the tear. With the welding shoe press the screen into the welded area and add extra welding wire to completely cover the screen one inch at a time, cooling the weld as you go.  
**Note:** This screening process can also be used to make tabs, repair holes, etc.
8. Cool the weld completely before removing aluminum tape.
9. On the reverse side of the tear remove the aluminum tape (visible side), "V" grind a ¼" groove along the tear until the welding reinforcement screen is visible.
10. Insert your welding wire into the preheat tube and feed the wire in with a steady motion while moving the flat end of the shoe in a circular motion. This will join and embed the molten weld into the reinforcement screen and weld on the opposite side. Fill the groove completely with welding wire one inch at a time, cooling the weld as you go.
11. Once the weld is cooled, grind the weld area smooth using 60 - 80 grit disc at slow to medium speed. Grind the welded area slightly below the surface. Be sure not to create too much heat, as this will cause the plastic to melt and ball up.
12. Sand the repair and surrounding areas with 80-120 grit paper at slow to medium speed
13. Remove any dust then clean with our Wax and Grease Remover. **(Part # PP500 / 501)**
14. You are now ready to apply our epoxy finishing filler. Choose the appropriate filler depending on whether the part is a flexible or rigid plastic.  
**(Refer to the "Instructions for Finishing Filler")**

**Note:** When using the filler rod, if at any time it turns brown and watery this is a sign that the welder setting is too hot and you must discard material from the preheat tube.

**Note:** It is not necessary to install screen on the front side of repair, as it will be ground off in preparation for the topcoat.

## Chemical Welding with Structural Epoxy Adhesives

1. Define the type of plastic you are working with. Refer to the **I. D. Chart** and the Helpful Hints
  2. If the part is out of shape, preheat with a hot air gun, and push back into shape with block of wood or the end of a hammer handle, then cool quickly with water or an air blower.
  3. Always start your repair on the non-visible side. If the part is ripped or torn, push the two sides together and hold them in place with Aluminum Tape (**Part# RM770**) on the opposite side or use our Liquid Adhesive Kit. (**Part# CA180**). Apply our liquid adhesive to one edge of the tear and the accelerator to the other edge. Position and hold it in place for approximately 3 - 5 seconds. For fiber reinforced plastics, such as FRP or SMC, which are more porous materials, it is preferable to use an additional amount of our Liquid Adhesive.  
**Note:** Always pre fit the parts before applying the liquid adhesive as once it is set it is very difficult to remove.
  4. "V" grind and taper the edges 1 ½ - 2 inches on each side of the damaged area.
  5. If you are repairing an Olefin based plastic, (**TPO, PP, PE and EPDM**), apply Adhesion Promoter (**Part# AD500**) to the entire repair area. Use a spray gun or wipe on with a clean cloth. It should take about 3 to 5 min. to dry. It is very important that this product is dry before any material is applied over it. May be forced dry with heat.
  6. Cut a minimum of 3 pieces of Fiberglass Reinforcement Tape (**Part# RM890**), each one approximately ½" bigger than the other to cover the repair area.
  7. Choose the appropriate Structural Epoxy Kit (**SE Series**), for either flexible or rigid plastic.
  8. Insert the Structural Epoxy Kit into the applicator gun; remove retainer nut and both end caps. Dispense a small amount of product until both barrels flow evenly. Discard this material. Dispense enough material on a mixing board to do the repair. Mix thoroughly to a consistent color.  
**Note: (Static mixing tips should only be used when you need a long even continuous bead for bonding side panels, roof panels and hard to reach areas).**
  9. Apply epoxy over the repaired area, pressing it into the "V" groove. Place your smallest piece of reinforcement tape into the groove and press it into the epoxy using a spreader. Cover it with a layer of epoxy and then repeat process with your second and third piece of reinforcement tape.
  10. Finish with a coat of epoxy. Cover with a clear plastic sheet (plastic bag) and use a spreader to apply pressure over the repair area, this will embed the epoxy into the reinforcement tape and leave a smooth finish. Allow the epoxy to cure before removing clear plastic sheet  
**Note:** Epoxies are cured by a chemical reaction, which creates heat when parts A and B are combined. This curing process is called an exothermic reaction. The thinner you apply our epoxy the longer the curing process takes. You may speed the curing process by applying heat with a hot air gun. Heating too much will cure the epoxy but will keep the epoxy soft, so just the right amount of heat (approx. 2 - 3 minutes) will produce excellent results.
  11. Repeat the process (steps 7 to 10) on the visible side.
  12. Once the repair is cured, grind down the structural epoxy slightly below the surface of the part using a 60-80 grit disc at slow to medium speed. Be sure not to create too much heat, as this will cause the epoxy to lose adhesion around the edges.
  13. Sand the repair and surrounding areas with 80-120 grit paper at slow to medium speed.
  14. Remove any dust then clean with our Wax and Grease Remover.
- You are now ready to apply our epoxy finishing filler. Choose the appropriate filler depending on whether the part is flexible or rigid plastic.  
**(Refer to the "Instructions for Finishing Filler")**.

## Instructions for Finishing Filler

**Our Epoxy Finishing Filler is for cosmetic use only and is for final finishing of repaired areas. Any damage in a high stress area, or a severely damaged part, must be repaired by either our Mechanical Welding or our Chemically Welded process before applying finishing filler.**

1. Remove any dust with an air blower or clean cloth and wipe down with our Wax and Grease Remover (**Part# PP500**).
2. Sand the repair and surrounding area with 80grt sandpaper
3. If you are repairing an Olefin based plastic, (**TPO, PP, PE and EPDM**) an extra step is required here. (**See step 4**)
4. Apply Adhesion Promoter (**Part# AD500**) with a spray gun or wipe on with a clean cloth and force dry with compressed air or heat gun. It is very important that this product is completely dry before applying any material.
5. You are now ready to apply our Epoxy Finishing Filler (**EF Series**). Choose the appropriate filler depending on whether the part is a flexible or rigid.
6. Dispense equal amounts of parts A and B on a plastic mixing board and mix to a consistent color. Apply the mixture to the area of repair with a rubber or plastic applicator. Allow 15 - 20 minutes before sanding (Depending on shop conditions).
7. Machine sand (medium to low speed) or hand sand down with 120 – 180 grit sandpaper.
8. Re-apply if necessary.
9. To finish sand use 220 - 280 grit sandpaper. Be careful as this material has high resin content and glazing may occur if sanded with sand paper that is too fine.
10. If you are repairing an Olefin based plastic, (**TPO, PP, PE and EPDM**) you should apply a coat of adhesion promoter (**Part# AD500 / 501**) over entire repair area before priming.
11. You are now ready to prime and / or color coat with a waterborne or solvent-based coating. For general pre-paint preparation of plastic please refer to your paint manufacturer's instructions.

## Instructions for Adhesion Promoter

**AD500&501 Adhesion Promoter allows for the top coating of Olefin based plastics such as T.P.O., POLYPROPYLENE (PP), and Polyethylene (PE), with automotive base-coats, inks, polyurethane foams and adhesives.**

Adhesion Promoter (**Part# AD500, 501**) should be applied as received, using conventional spray equipment. For small areas you can also wipe it on with a dry clean cloth. Avoid a thick build up, as drying time will be longer. Dries in approximately 3 to 5 min, (depending on shop temperatures). Drying time can be accelerated with the use of an infrared heat system, heat gun or compressed air. It is very important that this product is completely dry before applying any material over the top.

Normal tap water can be used to clean up equipment. If Adhesion Promoter has been sitting on a repaired plastic part for any length of time, it should be lightly wiped off with a tack cloth.

**Note:** This Adhesion Promoter is a non-conductive water-based surface modifier that does not react adversely with other materials.