

# 105 Epoxy General Use

## Safety

- Avoid skin contact with resin, hardener or mixed epoxy. Wear adequate protective clothing and the liquid-proof gloves supplied with this kit to keep the epoxy off your skin.
- Avoid eye contact with resin, hardener or mixed adhesive. Wear protective glasses. In case of contact with eyes, flush with water for 15 minutes. If discomfort persists, seek medical attention.
- Avoid inhaling vapors. Provide adequate ventilation. Wear a dust mask when sanding epoxy, especially epoxy that has not fully cured.
- Read and follow safety information on resin/hardener packets.
- Keep resins and hardeners out of the reach of children.

## Starting out

- Check all parts for proper fit.
- Gather all necessary application tools, clamps and equipment before mixing epoxy.
- Protect work surfaces with plastic.
- Keep a roll of paper towels handy.

## Mixing and curing

Cut off the top of the WEST SYSTEM 105 Resin/205 Hardener packet with a pair of scissors. Squeeze epoxy resin and hardener into a mixing cup (1) and stir for at least one full minute. Use the flat end of the mixing stick to scrape the sides and bottom of the cup while mixing (2).



Each 105/205 packet in this kit contains the correct proportion of resin and hardener required to reach full cure. Be sure to squeeze out all of the contents of each resin/hardener packet you open.

Mixing the resin and hardener together starts a chemical reaction that transforms the combined liquid ingredients into a solid. After mixing 105 Resin and 205 Fast Hardener, you will have 10-15 minutes, at 72°F (22°C), to apply the mixture before it begins to gel.

Epoxy cures faster in warmer temperatures and in thicker applications. When the mixture is spread out in a thin layer, the heat is dissipated and the working time and cure time are extended. Epoxy cures slower in cooler temperatures and thinner applications.

The epoxy mixture will reach a workable cure in five to seven hours at 72°F (22°C). Clamps can be removed and the epoxy may be sanded, but it should not be subjected to high loads for 24 hours. When a quicker cure is desired, applying moderate heat will substantially reduce cure time.

WEST SYSTEM 105 Resin/205 Hardener will cure in temperatures as low as 40°F (4°C), but will cure very slowly. Use a heat lamp or heat gun to warm and accelerate the cure. When working in cool temperatures, store resin/hardener at room temperature before mixing.

## Cleanup

Clean uncured epoxy from skin and clothes with a waterless skin cleaner, followed by washing with soap and water.

Remove excess epoxy from work surfaces with the flat end of a mixing stick or with paper towels. Clean up residue with a solvent such as lacquer thinner or acetone.

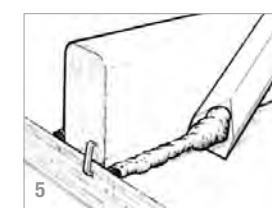
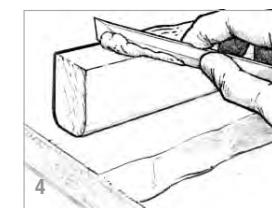
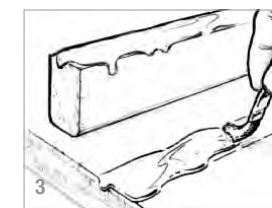
## Surface Preparation

For best adhesion, be sure all surfaces to be coated or bonded to are clean, dry and sanded.

1. Remove loose, chalky or flaky coatings, and contaminants such as grease, oil, wax, and mold release. Clean contaminated surfaces with an appropriate solvent applied with plain white paper towels.
2. Allow repair areas to dry thoroughly or accelerate drying with a heat lamp or heat gun.
3. Sand smooth, non-porous surfaces to a dull finish with 80-grit sandpaper.

## Bonding

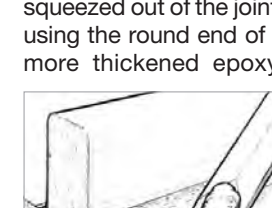
Glue most parts together in a two-step operation. First, *wet-out* (pre-coat) bonding surfaces with unthickened epoxy (3) to improve adhesion and help prevent an epoxy-starved joint, especially when bonding porous surfaces. A pipe cleaner or syringe may be used to wet out hard to reach areas such as fastener holes when bonding hardware.



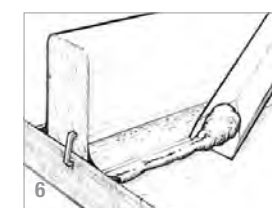
After bonding surfaces have been wet out, add 406 Adhesive Filler to an epoxy mixture, thoroughly mixing in filler until it reaches the desired consistency—thick (non-sagging) for larger gaps and uneven mating surfaces—thinner for tight joints and large smooth surfaces. Apply a generous amount of the thickened epoxy mixture to one of the surfaces (4) and clamp the components in position before the epoxy begins to gel. Use just enough clamping pressure to squeeze a small amount of thickened epoxy out of the joint. Remove excess epoxy (5) and allow the epoxy to cure thoroughly before removing clamps or stressing the joint.

## Making fillets

When parts are joined at or near right angles, fillets can be used to add strength to the joint by increasing the surface area of the bond. Shape the excess thickened epoxy that has squeezed out of the joint into a cove section using the round end of a mixing stick. Add more thickened epoxy to shape a smooth, continuous fillet. Clean off the excess mixture with the square end of the mixing stick (6).



After bonding surfaces have been wet out, add 406 Adhesive Filler to an epoxy mixture, thoroughly mixing in filler until it reaches the desired consistency—thick (non-sagging) for larger gaps and uneven mating surfaces—thinner for tight joints and large smooth surfaces. Apply a generous amount of the thickened epoxy mixture to one of the surfaces (4) and clamp the components in position before the epoxy begins to gel. Use just enough clamping pressure to squeeze a small amount of thickened epoxy out of the joint. Remove excess epoxy (5) and allow the epoxy to cure thoroughly before removing clamps or stressing the joint.

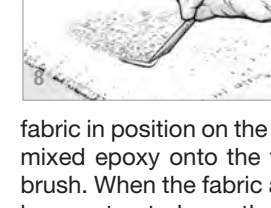


## Fairing (surface filling)

Wet out the surface with unthickened epoxy to improve adhesion. Stir 410 Fairing Filler into an epoxy mixture until it reaches the consistency of stiff peanut butter. Use the mixing stick to apply and shape the mixture slightly higher than the desired surface contour (7). Sand to shape after the epoxy cures. Seal the sanded fairing compound with unthickened epoxy before painting.

## Fabric application

Cut the fabric to fit the area. If heavier reinforcing is desired, use multiple layers as necessary to achieve the desired thickness. Properly prepare the surface before applying fabric.



Coat the substrate with mixed 105/205 epoxy. Lay the fabric in position on the wet epoxy. Spread mixed epoxy onto the fabric using a glue brush. When the fabric and substrate have been saturated, use the side of the mixing stick as a squeegee to smooth and remove excess epoxy (8). Repeat the process with additional layers.

## Coating

Apply the epoxy mixture as a coating using a disposable brush. Brush the epoxy over the area and finish with long, light strokes to evenly distribute the epoxy over the surface. Add a small amount of 406 Adhesive Filler to create a thicker coating. Keep in mind that the thicker the coating, the less smooth it will be.

If you are gluing to or applying more coats of epoxy, apply the next coat while the previous coating is still tacky—about 2-3 hours after applying at 72°F (22°C). Cured 105/205 epoxy can be varnished, painted, or re-coated or bonded to with epoxy. Wash cured epoxy with water and sand surfaces to a dull finish, providing a texture for good adhesion. ■

## More about fiberglass boat repair

If you have larger repair issues or problems with your fiberglass boat not covered by the size or scope of this kit, WEST SYSTEM has a solution for you. The 002-550 *Fiberglass Boat Repair & Maintenance* manual is a complete, illustrated guide to repairing, restoring and prolonging the life of fiberglass boats. Chapters include:

- Repairing minor cracks and holes
- Repairing stringers and floors
- Repairing solid fiberglass laminate
- Repairing cored fiberglass laminate
- Repairing and upgrading soles and decks
- Installing hardware
- Repairing keels and rudders

This 84-page manual also includes detailed instructions on repairing delaminated and rotted plywood, fairing keels, finishing and installing teak veneer decks.

This manual is available at WEST SYSTEM dealers and *free online* at [westsystem.com](http://westsystem.com). As always, or at least weekdays 8:00 AM to 5:00 PM ET, our Technical Staff is available to help you with any repair questions.

## More about 105 Epoxies

105 Resin is a clear, low-viscosity, epoxy resin that can be cured in a wide temperature range to yield a high-strength, rigid solid that has excellent cohesive properties and is an outstanding bonding adhesive and moisture vapor barrier.

For larger repair projects WEST SYSTEM 105 Epoxies are available in larger quantities, with a choice of four hardeners to suit your specific working conditions.

## WEST SYSTEM Hardeners

Select a hardener for the cure speed best suited for the temperature range in which you are working.

205 Fast Hardener®—the hardener in this kit—is used for general bonding, barrier coating and fabric application. It is formulated to cure at lower temperatures and to produce a rapid cure that develops its physical properties quickly at room temperature. At 72°F (22°C) pot life is 9-12 minutes and cure to a solid is 6-8 hours.

206 Slow Hardener® is used for general bonding, barrier coating and fabric application. It is formulated for a longer working and cure time or to provide adequate working time at higher temperatures. At 72°F (22°C) pot life is 20-25 minutes and cure to a solid is 10-15 hours.



## WEST SYSTEM reliability

WEST SYSTEM is the world's leading brand of marine epoxy, created by Gougeon Brothers—sailors, boatbuilders, and formulators who literally wrote the book on wood/epoxy boat building. We know the engineering and chemistry required to formulate epoxies for high-performance composite structures. It requires thorough research, rigorous test programs, skillful shop work and direct experience with today's high-performance boats and other engineered structures. This experience and dedication to performance sets WEST SYSTEM apart from other brands of epoxy.

Since 1969, reliability has been the hallmark of WEST SYSTEM. We adhere to the highest standards of quality assurance in our formulating and manufacturing practices, from raw material qualification to testing and certification of finished resins and hardeners. This means that every properly mixed batch of WEST SYSTEM resin and hardener will cure as it is supposed to, every time. This commitment to quality has earned certification to the ISO 9001:2008 standard. WEST SYSTEM is your reliable solution.

Complete product information, free downloadable repair manuals, how-to videos and dealer location information is available at [www.westsystem.com](http://www.westsystem.com).

## Outstanding customer service

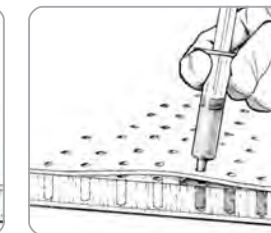
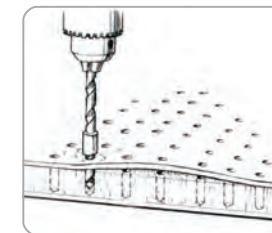
WEST SYSTEM provides you with something else as reliable as our epoxy—knowledge. Whether your project is large or small, the WEST SYSTEM Technical Staff and comprehensive instructional publications will help assure the success of your building and repair project. WEST SYSTEM is renowned for its outstanding customer service.

The WEST SYSTEM website provides detailed epoxy handling and product information, free downloadable repair manuals, dealer locations and links, project articles and galleries, and safety information. Visit [westsystem.com](http://westsystem.com).

For assistance contact our friendly and knowledgeable Technical Staff. Send e-mail to [tech-support@westsystem.com](mailto:tech-support@westsystem.com) or call 866-937-8797 (toll free).

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# 105-K FIBERGLASS BOAT Repair Kit



## Repair fiberglass boats

Step-by-step instructions show you how to use the materials in this kit to repair cracks and scrapes, gelcoat blisters, loose hardware, delaminated decks and panels, damaged keels and holes up to 1" diameter in solid laminates up to ¼"-thick and smaller holes in thicker laminates. Instructions include basic epoxy techniques for bonding, bonding with fillets and barrier coating.

## Tools required

In addition to the materials in this kit, you may need one or more of the following: a small grinder/sander, drill with bit assortment, scraper or chisel, a pair of scissors, a hand plane, a file, a wire brush, a hammer, 60 or 80-grit sand paper, 180-grit wet/dry sandpaper, lacquer thinner or acetone and paper towels.

## Finishing

105 Epoxy is compatible with most primers, paints and gelcoats to match existing finishes.

## Kit contents

8 pre-measured packets of 105 Epoxy Resin + 205 Fast Hardener (16 g + 3.2 g = 19.2 g of mixed epoxy per packet), 4g of 406 Adhesive Filler, 9g of 410 Fairing Filler, 3 mixing cups, 15"×15" of 12 oz fiberglass reinforcing fabric, 1 reusable mixing stick/applicator, 1-12 cc syringe, 2 coating brushes, 3 pair of disposable neoprene gloves and complete handling and repair instructions.

POISON May be harmful if ingested or absorbed through the skin. May cause chemical burns to eyes and skin. May cause allergic reaction. Avoid skin and eye contact. Do not ingest. Wear protective gloves and eye protection. FIRST AID SKIN—wash with soap and water. EYES—flush with water for at least 15 minutes. Consult physician. INGESTION—Do not induce vomiting. Consult physician. WARNING: This product contains a chemical known to the State of California to cause cancer, reproductive harm, or both. KEEP OUT OF REACH OF CHILDREN. 105 RESIN CONTAINS: bisphenol-a epoxy resin, bisphenol-f epoxy resin, benzyl alcohol. 205 HARDENER CONTAINS: reaction products of triethylenetetramine with phenol/formaldehyde, polyethylenepolyamine, triethylenetetramine, hydroxybenzene, reaction products of triethylenetetramine with propylene oxide, tetraethylenepentamine. 406 ADHESIVE FILLER CONTAINS: amorphous silica. 410 FAIRING FILLER CONTAINS: sodium metaborate tetrahydrate mixture, copolymer microspheres, formaldehyde polymer with 1,3-dimethylbenzene, isobutane, tris(dimethylaminomethyl)phenol.



SCAN FOR VIDEO

Manufactured for WEST SYSTEM by:  
  
Gougeon Brothers, Inc. / Bay City, MI US  
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# Fiberglass Boat Repair

Fiberglass boats can be in need of repair for many reasons. Impacts and fatigue can result in damage that ranges from scrapes and cracking to punctures and core delamination. Manufacturing defects and material limitations can contribute to these problems along with gelcoat blistering and other moisture related problems. WEST SYSTEM Epoxy is ideal for repairing this damage. It is stronger and more moisture resistant than polyester resins. And, it does not shrink when cured, making it better for the secondary bonding these kinds of repairs require.

## Repair cracks and scrapes

Cracks in decks or hulls can be a result of impact damage or excessive flexing. Cracking can be minor, penetrating the gelcoat only, or they can penetrate deeper, into the fiberglass laminate.

### Repair minor cracks

Minor cracks can be repaired with this kit and the following items:

- V-shaped scraping tool.
- 180-grit wet/dry sandpaper.
- Finish paint or gelcoat.

1. Open cracks with a sharp, V-shaped tool, scraping down to the bottom of the crack (1). (If the cracks penetrate the fiberglass laminate, go to *Repair Deep Cracks*.) Remove loose or damaged material. Dry out the damaged area if wet. Feather the edges with a scraping tool or 80-grit sandpaper.

2. Mix a packet of 105/205 epoxy in a mixing cup. Refer to *Mixing and Curing* under *105 Epoxy General Use* on the reverse side of this sheet.

3. Apply enough epoxy mixture, using the disposable brush, to saturate the opened cracks (2).

4. Thicken the epoxy mixture remaining in the cup with 406 Adhesive Filler. Mix in enough filler to make a thick, non-sagging mixture.

5. Trowel the mixture into the cracks using the mixing stick (3). Mix more epoxy and filler as necessary to fill the cracks.

Allow to cure about 24 hours at 70°F (21°C) (longer in cooler temperatures) if you will be applying paint or gelcoat.

6. Wet sand with 180-grit sandpaper to prepare for painting or gelcoat. Follow the paint manufacturer's recommendation for final preparation and application.

### Repair deep cracks

Cracks that penetrate into the fiberglass laminate require structural reinforcing. Repair deep cracks with this kit and the following items:

- Disc sander w/60-grit sandpaper.
- Scissors.
- 180-grit wet/dry sandpaper.
- Finish paint or gelcoat.

1. Grind out the crack until you reach solid laminate. Taper all sides of the crack to a shallow (about 12:1) slope (4).

2. Cut multiple pieces of fiberglass to fit within and fill the void. Cut the bottom, largest layer about ¾" (19 mm) smaller than the width of the void. Cut each successive layer about ¾" (19 mm) smaller—⅜" (9 mm) on each edge—than the layer below it.

3. Mix a packet of 105/205 epoxy in a mixing cup. Refer to *Mixing and Curing* on the reverse of this sheet. Note: each packet of mixed resin and hardener will saturate about 48 square inches of fabric.

4. Apply the largest piece of fiberglass in the center of the void and saturate it with epoxy using the disposable brush. Apply and saturate the progressively smaller pieces, center-



ing them evenly over the larger pieces (5). Mix more epoxy as necessary to saturate all layers of fiberglass in the void with epoxy.

Allow the epoxy to cure until it begins to gel.

5. Fair the surface when the epoxy begins to gel and is still

## Repair delaminated cored panels

Delamination of a fiberglass skin from the core occurs most often in decks, and most often as a result of a manufacturing defect. It can lead to moisture related core and structural damage if not corrected.

Re-bond delaminated skin to the core material with this kit and the following items:

- Drill with ¼" bit
- Heat gun or heat lamp
- Plastic sheet
- Weights
- 180-grit sandpaper

1. Define the delaminated area. When pushed or stepped on, delaminated skin flexes, indicating a gap between the skin and core. Also, delaminated skin sounds flatter—less resonant than solid laminate when tapped with a coin or other small hard object.

2. Drill ¼" (6mm) holes, 1" (2.5cm) apart and about 3" (7.5cm) beyond the delaminated area. Drill through the skin and about 1/3 of the way into the core (7).

If the core is wet, dry it thoroughly before re-bonding. A sample drilling from the core will indicate the degree of dryness. Use a hot air gun or heat lamp to accelerate drying. Be careful not to damage the skin with excessive heat.

3. Mix a packet of 105/205 epoxy in a mixing cup. Refer to *Mixing and Curing* under

tacky. Mix a packet of 105 Resin/205 Hardener. Blend in 410 Fairing Filler to make a thick, non-sagging mixture. Trowel this mixture onto the fiberglass cloth with a mixing stick (6). Smooth the mixture slightly higher than the surrounding surface. Allow to cure.

6. Sand the surface to shape. Refill any voids as necessary.

7. Coat with unthickened epoxy to ensure an excellent surface for the final finish. Allow to cure.

8. Wet sand with 180-grit sandpaper to prepare for painting or gelcoat. Follow the paint manufacturer's recommendations for final preparation and application. ■

*105 Epoxy General Use* on the reverse side of this sheet.

Thicken the epoxy mixture with 406 Adhesive Filler to a "catsup" consistency.

4. Load the thickened mixture into a syringe. Trim the syringe tip to allow the epoxy to flow easily.

5. Inject the thickened mixture into all holes drilled in the delaminated area (8). Flex the skin several times to work the epoxy into all areas between the skin and core. Repeat steps 3 through 5 as necessary to fill all holes.

6. Place weights on the skin to force it into contact with the core until the epoxy cures. A plastic sheet placed under the weights will prevent inadvertent bonding. Scrape up excess epoxy before it gels.

7. Fill any remaining voids with epoxy thickened with 407 Fairing Filler (9), then allow to cure.

8. Wet sand with 180-grit to fair the surface and prepare for painting or gelcoat. Follow the paint manufacturer's recommendations for final preparation and application. ■

## Repairing loose hardware

Excessive loads and fatigue can cause threaded fasteners to strip or loosen and allow water to penetrate. Reinstall hardware with this kit and the following items:

- Drill with assorted bits
- Heat gun or heat lamp (optional)
- 80-grit sandpaper

1. Remove the existing loose hardware.

2. Clean dirt, old sealants and other materials from the hardware, boat's surface and fastener holes.

3. Drill oversized holes to expose uncontaminated deck material and increase bonding area. Drill the oversize holes only ¾ the depth of the original hole if the hardware is not thru bolted. Allow core material to dry thoroughly if wet. Use a heat gun or lamp to speed drying.

4. Place hardware in position. Trace the outline with a pencil. Remove the hardware and tape the marked perimeter with masking tape.

5. Sand the surface thoroughly to a dull finish with 80-grit sandpaper.

6. Mix a packet of 105/205 epoxy in a mixing cup. Refer to *Mixing and Curing* under *105 Epoxy General Use* on the reverse side of this sheet.

7a. Coat both the deck surface and the

hardware mating surface with the epoxy mixture. Saturate the inside of the fastener holes (10).

7b. Scrub all epoxy-wet metal hardware surfaces with 80-grit sandpaper before the epoxy gels.

8. Thicken the epoxy mixture remaining in the cup with 406 Adhesive Filler to a non-sagging consistency.

9. Apply generously to the mating surfaces, in fastener holes and on fastener threads. Use a syringe to fill deep holes, if necessary. (Optional: pre-coat fastener threads and hardware base with paste wax if you anticipate removing hardware in the future.)

10. Position the hardware and insert and tighten the fasteners until some of the epoxy mixture squeezes out.

11. Clean excess epoxy away with the flat end of the mixing stick. Remove the masking tape. Allow to cure for 24 hours at 72°F (22°C) before applying loads. ■

Do not over tighten.

11. Clean excess epoxy away with the flat end of the mixing stick. Remove the masking tape. Allow to cure for 24 hours at 72°F (22°C) before applying loads. ■

## Repair minor gelcoat blisters

Repair minor, isolated gelcoat blisters using this kit and the following items not included in this kit:

- Small disc sander w/60-grit sandpaper
- Isopropyl alcohol
- 80 to 120-grit wet/dry sandpaper.

1. Open blisters with a small abrasive tool with 60-grit sandpaper. Remove the entire blister, including the edges of the blister dome (13).

2. Wipe the cavity clean with paper towels soaked in isopropyl alcohol. Be generous with the alcohol and change towels frequently to remove all contaminants.

Repeat the alcohol wipe process, particularly on blisters that were fluid filled at the time they were ground away. Allow the laminate to dry.

3. Mix a packet of 105/205 epoxy in a mixing cup. Refer to *Mixing and Curing* under *105 Epoxy General Use* on the reverse side of this sheet.

4. Thicken the epoxy mixture with 406 Adhesive Filler to a non-sagging mixture.



5. Fill the cavities with the thickened epoxy mixture using the flat end of the mixing stick (14).

6. Trowel the thickened epoxy flush with the surrounding hull using the side of the mixing stick. Avoid overfilling the cavities because ep-



oxy thickened with adhesive filler is difficult to sand. Wet sand with 80-120-grit wet/dry sandpaper (15).

### Repair holes in critical areas

The fiberglass included in this kit will repair up to a 1" (2.5cm) diameter hole in a solid ¼" (6mm) fiberglass laminate. Thicker laminates and larger holes will require more fiberglass. The repair can be performed from one or both sides.

In addition to the materials in this kit, you will need the following items:

- Disc sander w/60-grit sandpaper
- Scissors
- 180-grit wet/dry sandpaper.



1. Grind out area around hole and taper the perimeter of the hole to a shallow (about 12:1) slope.

2. Cut multiple pieces of fiberglass to fit within and fill the void. Cut the bottom, largest layer about ¾" (19 mm) smaller than the width of the void. Cut each successive layer about ¾" (19 mm) smaller—⅜" (9 mm) on each edge—than the layer below it.

3. Mix a packet of 105/205 epoxy in a mixing cup. Refer to *Mixing and Curing* under *105 Epoxy General Use* on the reverse side of this sheet.

4. Apply the largest piece of fiberglass in the center of the void and saturate it with epoxy using the disposable brush. Apply and satu-

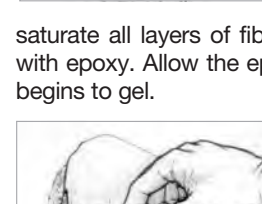


rate the progressively smaller pieces, centering them evenly over the larger pieces. Mix more epoxy as necessary to saturate all layers of fiberglass in the void with epoxy. Allow the epoxy to cure until it begins to gel.

5. Fair the surface when the epoxy begins to gel and is still tacky. Mix a packet of 105 Resin/205 Hardener.



6. Sand the surface to shape. Refill any voids as necessary.



7. Coat with unthickened epoxy to ensure an excellent surface for the final finish. Allow to cure.

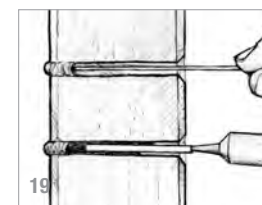
8. Wet sand with 180-grit sandpaper to prepare for painting or gelcoat.

9. Trowel the mixture into the voids, slightly overfilling the voids. Allow the mixture to cure.

10. Sand the surface to shape with 80-grit sandpaper. Refill any voids as necessary.

11. Apply several coats of unthickened epoxy over the repair and allow to cure. Wet sand the final coat with 180-grit before applying bottom paint. Follow the paint manufacturer's recommendation for final preparation and application. ■

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1. Use a drill or round file to clean out and abrade the sides of hole and chamfer top edge of the hole.

2. Place a piece of tape on the backside of the hole if the hole goes all the way through the laminate. (If there is no access to the back of the hole force small piece of paper towel into the bottom of the hole.)

3. Mix a packet of 105/205 epoxy in a mixing cup. Refer to *Mixing and Curing* under *105 Epoxy General Use* on the reverse side of this sheet.

Thicken the epoxy mixture with 406 Adhesive Filler to a "catsup" consistency.

4. Load the thickened mixture into a syringe. Trim the syringe tip to allow the ep-

oxy to flow easily. Place a small diameter straw over the tip if necessary for deep holes.

5. Inject the thickened mixture into the hole. Mix additional epoxy as necessary to fill the hole.

For holes more than ¼" in (6mm) diameter, fill the hole in layers, with no layer thicker than ⅛" (10mm). To avoid excessive heat, allow each layer to gel before filling the next layer.

6. Clean excess epoxy away with the flat end of the mixing stick. Allow to cure for 24 hours at 70°F (21°C).

7. When the epoxy has cured, wet sand with 180-grit to prepare for painting or gelcoat. Follow the paint manufacturer's recommendation for final preparation and application. ■

8. Thicken the epoxy mixture remaining in the cup with 410 Fairing Filler. Mix in enough filler to make a thick, non-sagging mixture.

9. Trowel the mixture into the remaining voids. For maximum adhesion, immediately scrub the wet epoxy-coated metal surfaces with a wire brush.

10. Sand the surface to shape with 80-grit sandpaper. Refill any voids as necessary.

11. Apply several coats of unthickened epoxy over the repair and allow to cure. Wet sand the final coat with 180-grit before applying bottom paint. Follow the paint manufacturer's recommendation for final preparation and application. ■



1. Dry the damaged area. Use a heat gun, heat lamp or fans to accelerate drying.



2. Remove any loose material. Always wear an approved respirator when working around lead.

3. Hammer displaced lead toward voids. A bulge each side of a dent is typical. Some lead may be forged back into the dents and re-shaped.

4. Plane or file remaining bulges flush with flush the surface.

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